Appendix 7-J: South Gardena Recycled Water Pipeline Project Supporting Documents

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NEWS RELEASE

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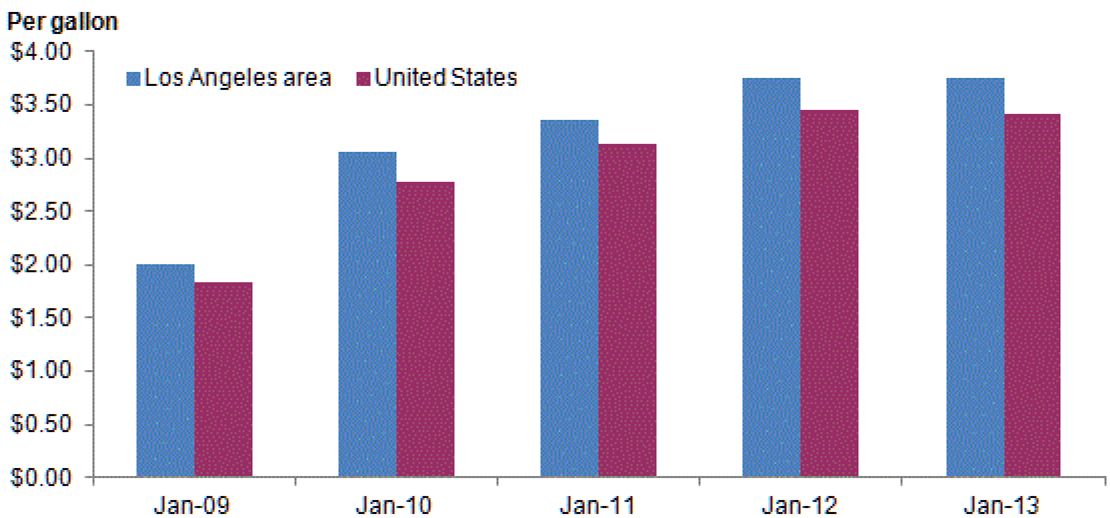
AVERAGE ENERGY PRICES, LOS ANGELES AREA–JANUARY 2013

Gasoline prices averaged $3.749 a gallon in the Los Angeles area in January 2013, the U.S. Bureau of Labor Statistics reported today. Regional Commissioner Richard J. Holden noted that area gasoline prices were similar to last January when they averaged $3.747 per gallon. Los Angeles area households paid an average of 23.2 cents per kilowatt hour (kWh) of electricity in January 2013, up from 20.4 cents per kWh in January 2012. The average cost of utility (piped) gas at $1.013 per therm in January was similar to the $0.996 per therm spent last year. (Data in this release are not seasonally adjusted; accordingly, over-the-year-analysis is used throughout.)

At $3.749 a gallon, Los Angeles area consumers paid 10.0 percent more than the $3.407 national average in January 2013. A year earlier, consumers in the Los Angeles area paid 8.7 percent more than the national average for a gallon of gasoline. The local price of a gallon of gasoline has exceeded the national average by more than six percent in the month of January in each of the past five years. (See chart 1.)

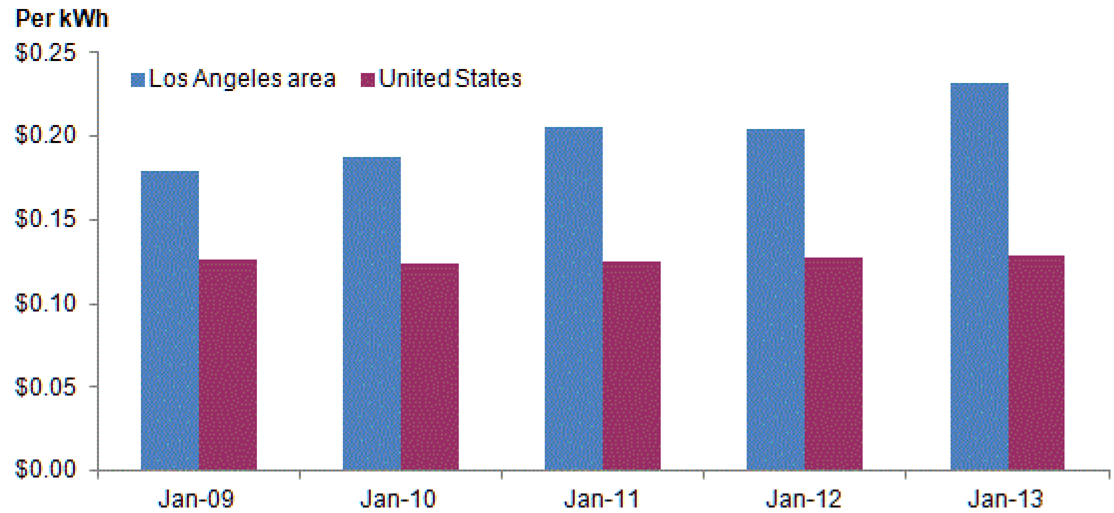
Chart 1. Average prices for gasoline, Los Angeles-Riverside-Orange County and the United States, 2009-2013 (as of January)



SOURCE: U.S. Bureau of Labor Statistics

The 23.2 cents per kWh Los Angeles households paid for electricity in January 2013 was 79.8 percent more than the nationwide average of 12.9 cents per kWh. Last January, electricity costs were 59.4 percent higher in Los Angeles compared to the nation. In the past five years, prices paid by Los Angeles area consumers for electricity exceeded the U.S. average by more than 42 percent in the month of January. (See chart 2.)

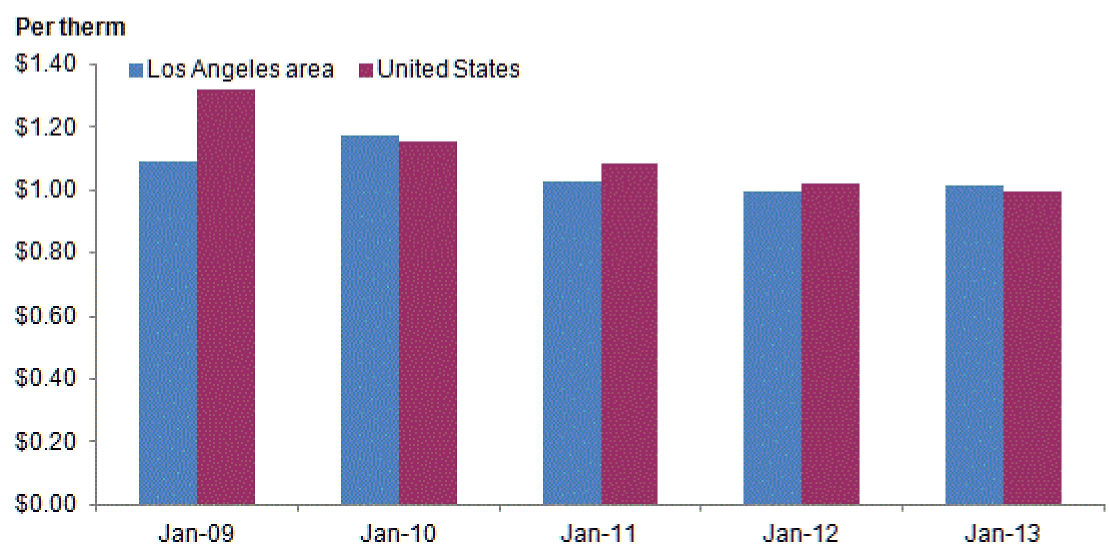
Chart 2. Average prices for electrictity, Los Angeles-Riverside-Orange County and the United States, 2009-2013 (as of January)



SOURCE: U.S. Bureau of Labor Statistics

Prices paid by Los Angeles area consumers for utility (piped) gas, commonly referred to as natural gas, were $1.013 per therm, similar to the national average in January 2013 ($0.996 per therm). A year earlier, area consumers also paid close to the same price per therm for natural gas compared to the nation. In three of the past five years, the per therm cost for natural gas in January in the Los Angeles area has been within three percent of the U.S. average. (See chart 3.)

Chart 3. Average prices for utility (piped) gas, Los Angeles-Riverside-Orange County and the United States, 2009-2013 (as of January)



SOURCE: U.S. Bureau of Labor Statistics

The Los Angeles-Riverside-Orange County, Calif. metropolitan area consists of Los Angeles, Orange, Riverside, San Bernardino and Ventura Counties in California.

Technical Note

Average prices are estimated from Consumer Price Index (CPI) data for selected commodity series to support the research and analytic needs of CPI data users. Average prices for electricity, utility (piped) gas, and gasoline are published monthly for the U.S. city average, the 4 regions, the 3 population size classes, 10 region/size-class cross-classifications, and the 14 largest local index areas. For electricity, average prices per kilowatt-hour (kWh) and per 500 kWh are published. For utility (piped) gas, average prices per therm, per 40 therms, and per 100 therms are published. For gasoline, the average price per gallon is published. Average prices for commonly available grades of gasoline are published as well as the average price across all grades.

Price quotes for 40 therms and 100 therms of utility (piped) gas and for 500 kWh of electricity are collected in sample outlets for use in the average price programs only. Since they are for specified consumption amounts, they are not used in the CPI. All other price quotes used for average price estimation are regular CPI data.

With the exception of the 40 therms, 100 therms, and 500 kWh price quotes, all eligible prices are converted to a price per normalized quantity. These prices are then used to estimate a price for a defined fixed quantity.

The average price per kilowatt-hour represents the total bill divided by the kilowatt-hour usage. The total bill is the sum of all items applicable to all consumers appearing on an electricity bill including, but not limited to, variable rates per kWh, fixed costs, taxes, surcharges, and credits. This calculation also applies to the average price per therm for utility (piped) gas.

Information from this release will be made available to sensory impaired individuals upon request. Voice phone: 202-691-5200, Federal Relay Services: 800-877-8339.

Table 1. Average prices for gasoline, electricty, and utility (piped) gas, Los Angeles-Riverside-Orange County and the United States, January 2012-January 2013, not seasonally adjusted

Year and month	Gasoline per gallon		Electricity per kWh		Utillity (piped) gas per therm	
	Los Angeles area	United States	Los Angeles area	United States	Los Angeles area	United States
2012						
January	$3.747	$3.447	$0.204	$0.128	$0.996	$1.021
February	4.013	3.622	0.204	0.128	0.931	0.986
March	4.394	3.918	0.204	0.127	0.931	0.978
April	4.257	3.976	0.204	0.127	0.883	0.951
May	4.333	3.839	0.204	0.129	0.978	0.907
June	4.037	3.602	0.193	0.135	1.054	0.927
July	3.800	3.502	0.193	0.133	1.053	0.943
August	4.073	3.759	0.193	0.133	1.072	0.960
September	4.175	3.908	0.193	0.133	1.027	0.953
October	4.499	3.839	0.211	0.128	1.052	0.962
November	3.924	3.542	0.211	0.127	0.995	0.994
December	3.677	3.386	0.211	0.127	1.042	1.004
2013						
January	3.749	3.407	0.232	0.129	1.013	0.996

The State Water Project

Final Delivery Reliability Report 2011

June 2012

State of California
Natural Resources Agency
Department of Water Resources

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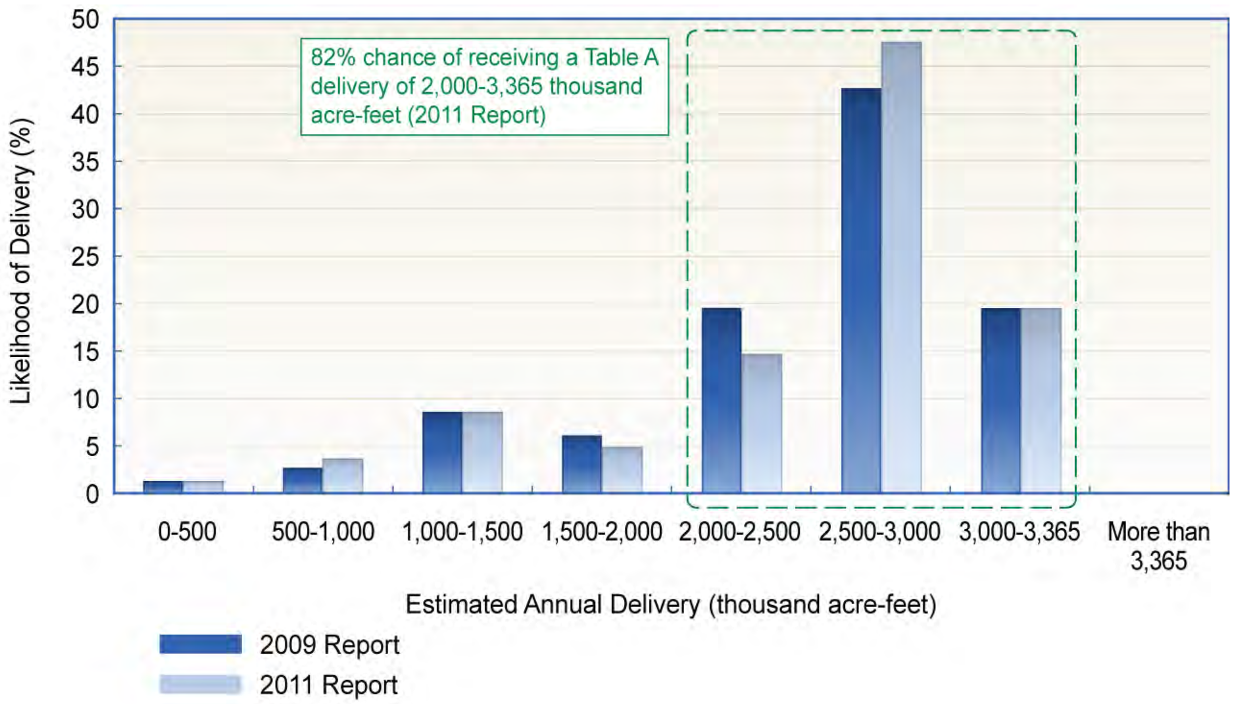

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	Long-term Average	Single Dry Year (1977)	2-Year Drought (1976–1977)	4- Year Drought (1931–1934)	6-Year Drought (1987–1992)	6-Year Drought (1929–1934)
2009 Report	2,483 (60%)	302 (7%)	1,496 (36%)	1,402 (34%)	1,444 (35%)	1,398 (34%)
2011 Report	2,524 (61%)	380 (9%)	1,573 (38%)	1,454 (35%)	1,462 (35%)	1,433 (35%)

Table 6-4. Estimated Average and Wet-Period Deliveries of SWP Table A Water (Existing Conditions), in Thousand Acre-Feet (Percent of Maximum SWP Table A Amount, 4,133 taf/year)

	Long-term Average	Single Wet Year (1983)	2-Year Wet (1982–1983)	4-Year Wet (1980–1983)	6-Year Wet (1978–1983)	10-Year Wet (1978–1987)
2009 Report	2,483 (60%)	2,813 (68%)	2,935 (71%)	2,817 (68%)	2,817 (68%)	2,872 (67%)
2011 Report	2,524 (61%)	2,886 (70%)	2,958 (72%)	2,872 (69%)	2,873 (70%)	2,833 (69%)

Analysis of the Energy Intensity of Water Supplies for West Basin Municipal Water District

March, 2007

Robert C. Wilkinson, Ph.D.

Note to Readers

This report for West Basin Municipal Water District is an update and revision of an analysis and report by Robert Wilkinson, Fawzi Karajeh, and Julie Mottin (Hannah) conducted in April 2005. The earlier report, *Water Sources "Powering" Southern California: Imported Water, Recycled Water, Ground Water, and Desalinated Water*, was undertaken with support from the California Department of Water Resources, and it examined the energy intensity of water supply sources for both West Basin and Central Basin Municipal Water Districts. This analysis focuses exclusively on West Basin, and it includes new data for ocean desalination based on new engineering developments that have occurred over the past year and a half.

Principal Investigator: Robert C. Wilkinson, Ph.D.

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Overview

Southern California relies on imported and local water supplies for both potable and non-potable uses. Imported water travels great distances and over significant elevation gains through both the California State Water Project (SWP) and Colorado River Aqueduct (CRA) before arriving in Southern California, consuming a large amount of energy in the process. Local sources of water often require less energy to provide a sustainable supply of water. Three water source alternatives which are found or produced locally and could reduce the amount of imported water are desalinated ocean water, groundwater, and recycled water. Groundwater and recycled water are significantly less energy intensive than imports, while ocean desalination is getting close to the energy intensity of imports.

Energy requirements vary considerably between these four water sources. All water sources require pumping, treatment, and distribution. Differences in energy requirements arise from the varying processes needed to produce water to meet appropriate standards. This study examines the energy needed to complete each process for the waters supplied by West Basin Municipal Water District (West Basin).

Specific elements of energy inputs examined in this study for each water source are as follows:

- Energy required to **import water** includes three processes: pumping California SWP and CRA supplies to water providers; treating water to applicable standards; and distributing it to customers.
- **Desalination of ocean water** includes three basic processes: 1) pumping water from the ocean or intermediate source (e.g. a powerplant) to the desalination plant; 2) pre-treating and then desalting water including discharge of concentrate; and 3) distributing water from the desalination plant to customers.
- **Groundwater** usage requires energy for three processes: pumping groundwater from local aquifers to treatment facilities; treating water to applicable standards; and distributing water from the treatment plant to customers. Additional injection energy is sometimes needed for groundwater replenishment.
- Energy required to **recycle water** includes three processes: pumping water from secondary treatment plants to tertiary treatment plants; tertiary treatment of the water, and distributing water from the treatment plant to customers.

The energy intensity results of this study are summarized in the table on the following page. They indicate that recycled water is among the least energy-intensive supply options available, followed by groundwater that is naturally recharged and recharged with recycled water. Imported water and ocean desalination are the most energy intensive water supply options in California. East Branch State Water Project water is close in energy intensity to desalination figures based on current technology, and at some points along the system, SWP supplies exceed estimated ocean desalination energy intensity. The following table identifies energy inputs to each of the water supplies including estimated energy requirements for desalination. Details describing the West Basin system operations are included in the water source sections. Note that the Title 22 recycled water energy figure reflects only the *marginal* energy required to treat secondary effluent wastewater which has been processed to meet legal discharge requirements, along with the energy to convey it to user

Energy Intensity of Water Supplies for West Basin Municipal Water District

	af/yr	Percentage of Total Source Type	kWh/af Conveyance Pumping	kWh/af MWD Treatment	kWh/af Recycled Treatment	kWh/af Groundwater Pumping	kWh/af Groundwater Treatment	kWh/af Desalination	kWh/af WBMWD Distribution	Total kWh/af	Total kWh/year
Imported Deliveries											
State Water Project (SWP) [1]	57,559	43%	3,000	44	NA	NA	NA	NA	0	3,044	175,209,596
Colorado River Aqueduct (CRA) [1] (other that replenishment water)	76,300	57%	2,000	44	NA	NA	NA	NA	0	2,044	155,957,200
Groundwater[2]											
natural recharge	19,720	40%	NA	NA	NA	350	0	NA	0	350	6,902,030
replenished with (injected) SWP water [1]	9,367	19%	3,000	44	NA	350	0	NA	0	3,394	31,791,598
replenished with (injected) CRA water [1]	11,831	24%	2,000	44	NA	350	0	NA	0	2,394	28,323,432
replenished with (injected) recycled water	8,381	17%	205	0	790	350	0	NA	220	1,565	13,116,278
Recycled Water											
West Basin Treatment, Title 22	21,506	60%	205	NA	0	NA	NA	NA	285	490	10,537,940
West Basin Treatment, RO	14,337	40%	205	NA	790	NA	NA	NA	285	1,280	18,351,360
Ocean Desalination	20,000	100%	200	NA	NA	NA	NA	3,027	460	3,687	82,588,800

Notes:

NA Not applicable

[1] Imported water based on percentage of CRA and SWP water MWD received, averaged over an 11-year period. Note that the figures for imports do not include an accounting for system losses due to evaporation and other factors. These losses clearly exist, and an estimate of 5% or more may be reasonable. The figures for imports above should therefore be understood to be conservative (that is, the actual energy intensity is in fact higher for imported supplies than indicated by the figures).

[2] Groundwater values include entire basin, West Basin service area covers approximately 86% of the basin. Groundwater values are specific to aquifer characteristics, including depth, within the basin.

Energy Intensity of Water

Water treatment and delivery systems in California, including extraction of "raw water" supplies from natural sources, conveyance, treatment and distribution, end-use, and wastewater collection and treatment, account for one of the largest energy uses in the state.[1] The California Energy Commission estimated in its 2005 Integrated Energy Policy Report that approximately 19% of California's electricity is used for water related purposes including delivery, end-uses, and wastewater treatment.[2] The total energy embodied in a unit of water (that is, the amount of energy required to transport, treat, and process a given amount of water) varies with location, source, and use within the state. In many areas, the energy intensity may increase in the future due to limits on water resource extraction, and regulatory requirements for water quality, and other factors.[3] Technology improvements may offset this trend to some extent.

> ***Energy intensity*** is the total amount of energy, calculated on a whole-system basis, required for the use of a given amount of water in a specific location.

The Water-Energy Nexus

Water and energy systems are interconnected in several important ways in California. Water systems both provide energy – through hydropower – and consume large amounts of energy, mainly through pumping. Critical elements of California's water infrastructure are highly energy-intensive. Moving large quantities of water long distances and over significant elevation gains, treating and distributing it within the state's communities and rural areas, using it for various purposes, and treating the resulting wastewater, accounts for one of the largest uses of electrical energy in the state.[4]

Improving the efficiency with which water is used provides an important opportunity to increase related energy efficiency. ("*Efficiency*" as used here describes the useful work or service provided by a given amount of water.) Significant potential economic as well as environmental benefits can be cost-effectively achieved in the energy sector through efficiency improvements in the state's water systems and through shifting to less energy intensive local sources. The California Public Utilities Commission is currently planning to include water efficiency improvements as a means of achieving energy efficiency benefits for the state.[5]

Overview of Energy Inputs to Water Systems

There are four principle energy elements in water systems:

1. primary water extraction and supply delivery (imported and local)
2. treatment and distribution within service areas
3. on-site water pumping, treatment, and thermal inputs (heating and cooling)

4. wastewater collection, treatment, and discharge

Pumping water in each of these four stages is energy-intensive. Other important components of embedded energy in water include groundwater pumping, treatment and pressurization of water supply systems, treatment and thermal energy (heating and cooling) applications at the point of end-use, and wastewater pumping and treatment.[6]

1. Primary water extraction and supply delivery

Moving water from near sea-level in the Sacramento-San Joaquin Delta to the San Joaquin-Tulare Lake Basin, the Central Coast, and Southern California, and from the Colorado River to metropolitan Southern California, is highly energy intensive. Approximately 3,236 kWh is required to pump one acre-foot of SWP water to the end of the East Branch in Southern California, and 2,580 kWh for the West Branch. About 2,000 kWh is required to pump one acre foot of water through the CRA to southern California.[7] Groundwater pumping also requires significant amounts of energy depending on the depth of the source. (Data on groundwater is incomplete and difficult to obtain because California does not systematically manage groundwater resources.)

2. Treatment and distribution within service areas

Within local service areas, water is treated, pumped, and pressurized for distribution. Local conditions and sources determine both the treatment requirements and the energy required for pumping and pressurization.

3. On-site water pumping, treatment, and thermal inputs

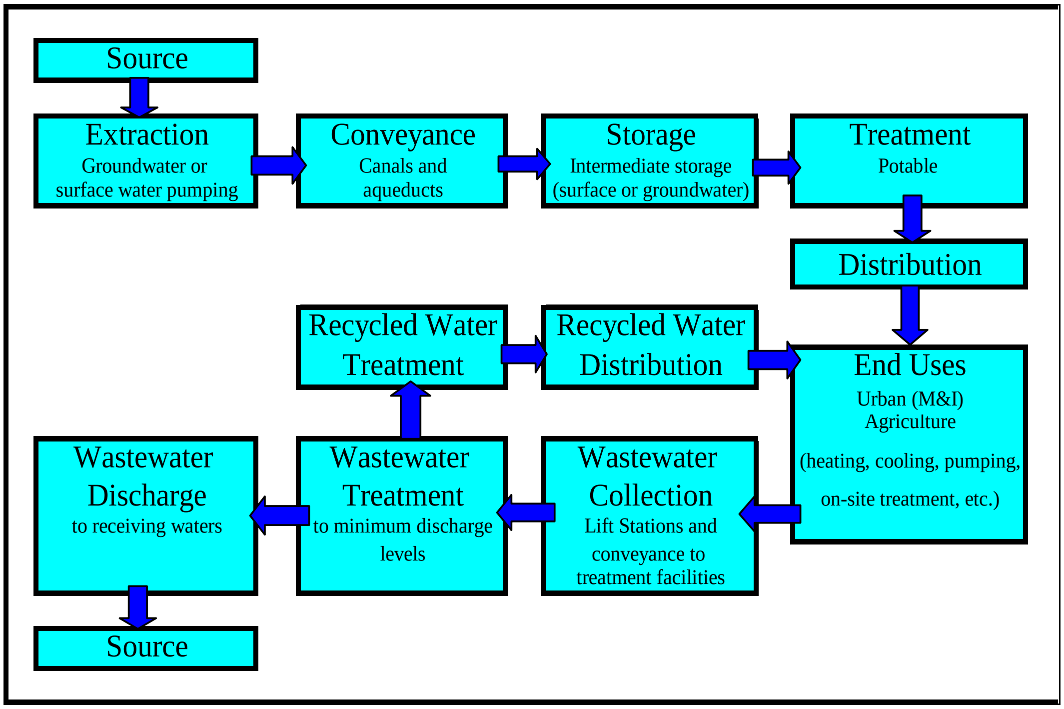
Individual water users use energy to further treat water supplies (e.g. softeners, filters, etc.), circulate and pressurize water supplies (e.g. building circulation pumps), and heat and cool water for various purposes.

4. Wastewater collection, treatment, and discharge

Finally, wastewater is collected and treated by a wastewater authority (unless a septic system or other alternative is being used). Wastewater is often pumped to treatment facilities where gravity flow is not possible, and standard treatment processes require energy for pumping, aeration, and other processes. (In cases where water is reclaimed and re-used, the calculation of total energy intensity is adjusted to account for wastewater as a *source* of water supply. The energy intensity generally includes the additional energy for treatment processes beyond the level required for wastewater discharge, plus distribution.)

The simplified flow chart below illustrates the steps in the water system process. A spreadsheet computer model is available to allow cumulative calculations of the energy inputs embedded at each stage of the process. This methodology is consistent with that applied by the California Energy Commission in its analysis of the energy intensity of water.

Simplified Flow Diagram of Energy Inputs to Water Systems



Source: Robert Wilkinson, UCSB[8]

Calculating Energy Intensity

Total energy intensity, or the amount of energy required to facilitate the use of a given amount of water in a specific location, may be calculated by accounting for the summing the energy requirements for the following factors:

- imported supplies
- local supplies
- regional distribution
- treatment
- local distribution
- on-site thermal (heating or cooling)
- on-site pumping
- wastewater collection
- wastewater treatment

Water pumping, and specifically the long-distance transport of water in conveyance systems, is a major element of California's total demand for electricity as noted above. Water use (based on embedded energy) is the next largest consumer of electricity in a typical Southern California home after refrigerators and air conditioners. Electricity required to support water service in the typical home in Southern California is estimated at between 14% to 19% of total residential energy demand. [9] If air conditioning is not a factor the figure is even higher. Nearly three quarters of this energy demand is for pumping imported water.

Interbasin Transfers

Some of California's water systems are uniquely energy-intensive, relative to national averages, due to the pumping requirements of major conveyance systems which move large volumes of water long distances and over thousands of feet in elevation lift. Some of the interbasin transfer systems (systems that move water from one watershed to another) are net energy producers, such as the San Francisco and Los Angeles aqueducts. Others, such as the SWP and the CRA require large amounts of electrical energy to convey water. On *average*, approximately 3,000 kWh is necessary to pump one AF of SWP water to southern California,[10] and 2,000 kWh is required to pump one AF of water through the CRA to southern California.[11]

Total energy savings for reducing the full embedded energy of *marginal* (e.g. imported) supplies of water used indoors in Southern California is estimated at about 3,500 kWh/af.[12] Conveyance over long distances and over mountain ranges accounts for this high marginal energy intensity. In addition to avoiding the energy and other costs of pumping additional water supplies, there are environmental benefits through reduced extractions from stressed ecosystems such as the delta.

Imported Water: The State Water Project and the Colorado River Aqueduct

Water diversion, conveyance, and storage systems developed in California in the 20th century are remarkable engineering accomplishments. These water works move millions of AF of water around the state annually. The state's 1,200-plus reservoirs have a total storage capacity of more than 42.7 million acre feet (maf).[13] West Basin receives imported water from Northern California through the State Water Project and Colorado River water via the Colorado River Aqueduct. The Metropolitan Water District of Southern California delivers both of these imported water supplies to the West Basin.

California's Major Interbasin Water Projects

The State Water Project

The State Water Project (SWP) is a state-owned system. It was built and is managed by the California Department of Water Resources (DWR). The SWP provides supplemental water for agricultural and urban uses.[14] SWP facilities include 28 dams and reservoirs, 22 pumping and generating plants, and nearly 660 miles of aqueducts.[15] Lake Oroville on the Feather River, the project's largest storage facility, has a total capacity of about 3.5 maf.[16] Oroville Dam is the tallest and one of the largest earth-fill dams in the United States.[17]

Water is pumped out of the delta for the SWP at two locations. In the northern Delta, Barker Slough Pumping Plant diverts water for delivery to Napa and Solano counties through the North Bay

Aqueduct.[18] Further south at the Clifton Court Forebay, water is pumped into Bethany Reservoir by the Banks Pumping Plant. From Bethany Reservoir, the majority of the water is conveyed south in the 444-mile-long Governor Edmund G. Brown California Aqueduct to agricultural users in the San Joaquin Valley and to urban users in Southern California. The South Bay Pumping Plant also lifts water from the Bethany Reservoir into the South Bay Aqueduct.[19]

The State Water Project is the largest consumer of electrical energy in the state, requiring an average of 5,000 GWh per year.[20] The energy required to operate the SWP is provided by a combination of DWR's own hydroelectric and other generation plants and power purchased from other utilities. The project's eight hydroelectric power plants, including three pumping-generating plants, and a coal-fired plant produce enough electricity in a normal year to supply about two-thirds of the project's necessary power.

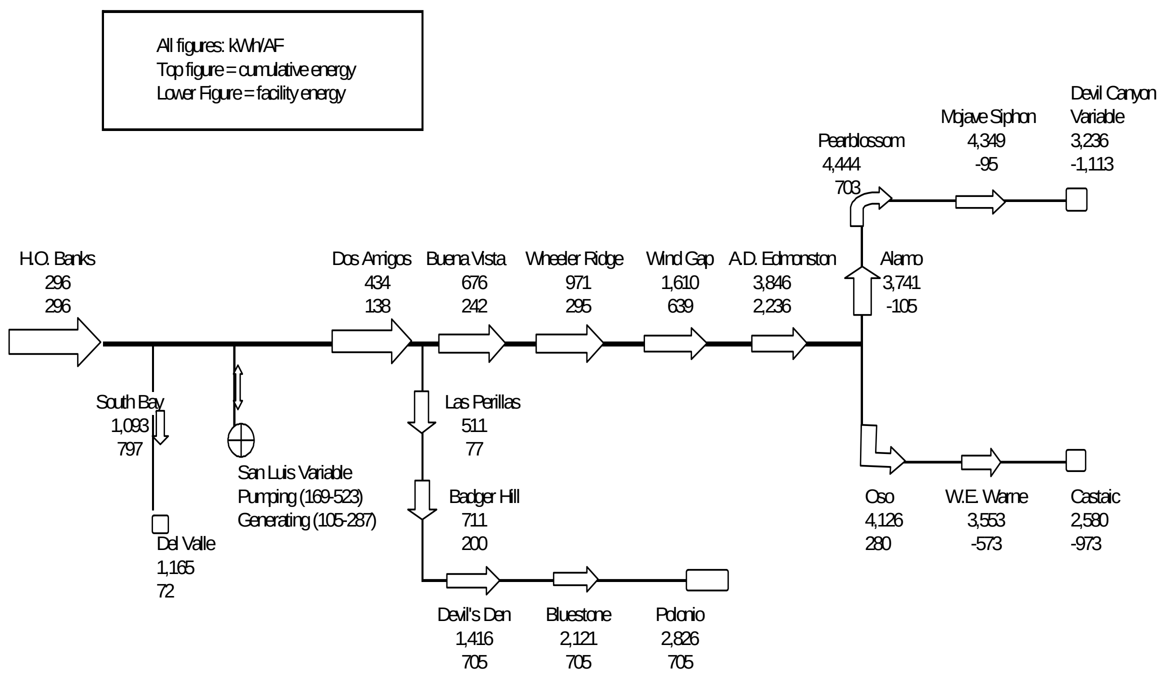
Energy requirements would be considerably higher if the SWP was delivering full contract volumes of water. The project delivered an average of approximately 2.0 mafy, or half its contracted volumes, throughout the 1980s and 1990s.[21] Since 2000 the volumes of imported water have generally increased.

The following map indicates the location of the pumping and power generation facilities on the SWP.

Names and Locations of Primary State Water Delivery Facilities

The following schematic shows each individual pumping unit on the State Water Project, along with data for both the individual and cumulative energy required to deliver an AF of water to that point in the system. Note that the figures include energy recovery in the system, but they do not account for losses due to evaporation and other factors. These losses may be in the range of 5% or more. While more study of this issue is in order, it is important to observe that the energy intensity numbers are conservative (e.g. low) in that they assume that all of the water originally pumped from the delta reaches the ends of the system without loss.

State Water Project
Kilowatt-Hours per Acre Foot Pumped
(Includes Transmission Losses)



Source: Wilkinson, based on data from: California Department of Water Resources, State Water Project Analysis Office, Division of Operations and Maintenance, *Bulletin 132-97*, 4/25/97.

Calculating Constant-Reliability Water Supply Unit Costs

Gary Wolff, P.E., Ph.D.[1]

Abstract

Water planners facing a choice between water "supply" options (including conservation) customarily use the average unit cost of each option as a decision criterion. This approach is misleading and potentially costly when comparing options with very different reliability characteristics. For example, surface water, desalinated seawater or recycled wastewater, and some outdoor demand management programs have very different yield patterns. This paper presents a method for calculating constant-reliability unit costs that adapts some concepts and mathematics from financial portfolio theory. Comparing on a constant-reliability basis can significantly change the relative attractiveness of options. In particular, surface water, usually a low cost option, is more expensive after its variability has been accounted for. Further, options that are uncorrelated or inversely correlated with existing supply sources – such as outdoor water conservation -- will be more attractive than they initially appear. This insight, which implies options should be evaluated and chosen as packages rather than individually, opens up a new dimension of yield and financial analysis for water planners.

Keywords

Reliability, value of reliability, portfolio theory, water supply planning, drought planning, integrated resource planning, water conservation, uncertainty, adjusted unit costs.

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Introduction

Water planners commonly estimate an average unit cost for each water supply option (including conservation measures) by dividing average annual total yield of the option by annual average total cost (the sum of average annual fixed plus variable costs).[2] Lower unit cost options are preferred on a financial basis, although other decision criteria are also used (e.g., see Bureau of Reclamation 1983 or DWR 2005). A time sequence of new facilities is often planned based on anticipated growth of demand, with new facilities brought on line in time to prevent a supply shortfall under appropriate hydrologic (e.g., dry-year rainfall) or other (e.g., average reservoir yield) assumptions. Facilities with lower estimated average unit costs are typically built first.

This procedure is understandable and often appropriate when water supply options do not vary enormously in availability. Two source watersheds with very different rainfall patterns might have similar variation in annual water availability if there are appropriately sized reservoirs in each watershed. Similarly, the variation in availability between a surface water reservoir and a groundwater aquifer might not be that different if the reservoir is large relative to annual demand.

However, annual availability may also vary significantly between options. Consider a run-of-the-river system on an intermittent stream as compared with a deep groundwater aquifer. Furthermore, when demand grows more rapidly than supply, there is an implicit

[2] Since variable costs tend to rise over time, planners often compare "levelized average costs" over the planning horizon (e.g., 30-50 years).

decline in the adequacy or reliability of a variable water source because the frequency with which demand exceeds supply increases. In addition, new sources of supply, such as surface and groundwater from previously unutilized watersheds or aquifers, desalinated seawater, recycled wastewater, and demand management programs often have very different patterns of availability than traditional surface water supplies.

Retirement fund and water managers face a similar challenge. Each must deliver a minimum quantify of something (money or water) every year while the source of that something (e.g., securities markets or nature) varies randomly. Fortunately, random variation can be at least partially characterized with statistics. Of course past investment success is not a prediction of future performance; just as past hydrologic patterns (at least since modern records became available) are not necessarily predictive of future patterns in a world whose climate is changing. Nonetheless, retirement managers who use the statistical tools of portfolio theory are much more successful than those who ignore such considerations.[3] This paper shows water planners how to improve their performance by applying a mathematical adaptation from financial portfolio theory.

What Is Water-Supply Reliability and How Do We Measure It?

Water-supply reliability is an important characteristic of all municipal systems. For example, California's water utilities invest substantial amounts of money to reduce the risk of supply interruptions due to earthquakes. They understand that the cost to their customers of supply disruptions is often far greater than the cost of improved system

[3] Markowitz (1952) provided the first mathematically rigorous analysis of the value of diversification in investment portfolios. There have since been thousands of peer-reviewed articles on this subject.

reliability. Similarly, dams and reservoirs are widely used to reduce the risk of supply interruption due to dry weather. Other threats to water supply reliability include climate change, changes in runoff patterns as more impermeable surfaces are created by land development, changes in water quality or environmental regulations, variation in important cost factors (e.g., interest rates, labor, or energy), legal issues related to water rights or contracts for water deliveries, and cultural and political factors.

There is no widely accepted method for measuring water-supply reliability. The simplest method is to measure the risk of projected supply falling below projected demand, on average. For example, a system with a reliability level of 95% implies that supply will meet or exceed demand 19 years out of 20. This approach has the advantage of being simple. However, like most simple approaches, it has drawbacks. The most notable one is that it does not measure the severity of the water shortfalls. One can imagine a system with reliability of 90% that is more desirable than another system with reliability of 95% because the shortfalls in water supply in the first system are very small while the less frequent shortfalls in the second system are very large.

Nonetheless, for the discussion below we use this definition because it allows a clear discussion of an important issue. The reliability percentages presented in the numeric illustration are intended as a summary statistic for all of the uncertain issues mentioned above, although in practice many of these factors are very difficult to quantify accurately.

How Do We Measure or Account for the Value of Reliability?

Economists typically address this question by assessing customer willingness to pay for a slightly reduced chance of water shortages. For example, suppose the chance of a water shortage that would require rationing is 1 in 20 in any given year, but an investment in a new reservoir can reduce that chance to 1 in 21. If additional water isn't needed (except in severe drought), then customer willingness to pay for the reservoir is a measure of the value customers place on increased reliability. Numerous economic studies have found high willingness to pay to avoid drought-related or other restrictions on water use; ranging from $32 to $421 dollars per household per year (Griffin and Mjelde 2000, Carson and Mitchell 1987, Howe, et.al. 1994, Barakat and Chamberlin 1994), in year 2003 dollars. When the estimated quantity of water use foregone due to a drought restriction is multiplied by the probability (frequency) of the drought scenario investigated, these annual household WTP estimates imply a reliability value to residential customers as high as about $4,000 per acre-foot (Raucher et al., 2005).

This approach, unfortunately, doesn't help answer our question. Customers don't need to know <u>how</u> reliability will increase in order to value it. Customers aren't saying anything about the relative value of different options for increasing reliability. They're just saying that more reliability – regardless of how it is achieved – has a value. Consequently, we developed a method for adjusting estimated average unit costs of water supply options, including conservation and end-use efficiency, to obtain "constant-reliability unit costs" that fairly compare supply options with different uncertainty characteristics. Our approach is quite different than that presented in papers that quantify the value of reliability (e.g., Howe, et.al. 1994). We do not quantify the value of reliability, but instead estimate the costs of options when they are sized to provide equal reliability.

Our method involves a two-step process. In the first step, water managers define the level of reliability benefit they want to maintain or achieve. For example, they might want to ensure that enough water is available to meet demand in 19 out of 20 years, on average. We call this a reliability level (R) of 95%. In the second step, they create an "apples to apples" comparison of options by adjusting average unit costs ($/unit of water) to get constant-reliability unit costs. The following example illustrates the method. The relevant math is presented in Appendix A.

Constant-Reliability Unit Costs Illustrated

Suppose a community is served by a run-of-the-river water supply. Figure 1 shows the maximum supply available from the river for human extractive purposes[4] each year as having a normal distribution. Although flow data usually follows distributions other than normal,[5] the normal distribution is useful for an illustration. The method presented in this paper can be applied to any statistical distribution.[6]

Insert Figure 1 here

[4] That is, in-stream flows required by law have been subtracted from gross flow before drawing this graph.
[5] The Pearson Type III distribution, for example, is often used for extreme events like floods and droughts.
[6] A reviewer of this paper remarked that a water system he once worked with had a hydrologic probability of annual shortage of only 1 in 3,000. However, it once experienced an ice clog in the main water treatment supply pipeline, and when operators went to activate a bypass valve to bring water from a backup source, the valve broke. At the worst point in time, only hours of treated water remained. Ideally, the probability of supply failure from events like this will be included in the statistical distributions representing supply from each option. But some uncertainty cannot be quantified.

In the normal distribution, the average supply is the most common amount. Low and high supplies are increasingly rare as they get further from the average. The relative “flatness” of the bell is described by the coefficient of variance (V): the standard deviation (SD) divided by the mean (A). The larger the coefficient of variance, the flatter the bell; and the more variable is the annual supply available for human extractive purposes in percentage terms.

The average (S_A) and critical (S_C) year supplies are represented by tick marks on Figure 1. We define critical year supply as the supply that is just large enough to satisfy critical year demand (D_C). Critical year demand is usually higher than average year demand because outdoor water use will increase when rainfall is below average or temperature is above average. Because maximum water available for supply will decrease when weather is drier, critical demand will always equal maximum water available for supply at some quantity. That quantity is the critical supply = critical demand shown in the Figure.

The figure shows critical supply at “Z (R)” standard deviations below average supply. This number is related to the reliability of existing supply, and will vary from system to system. A property of the normal distribution is that in about 5% of the years, flow will be less than the lower tick mark when it is located 1.65 standard deviations below the mean. That is, if Z(R) has value of 1.65, the figure shows a system reliability of 95% (shortage about 1 year in 20).

If the system had another reliability level, say 84%, the critical supply would be 1.00 standard deviation below average supply. The appropriate multiplier (e.g., 1.65, 1.00, etc.) for a chosen reliability level is found from a table (or formula) that is present in most statistics textook:[7] the area under one tail of the standard normal distribution (expressed as a number between 0 and 1) as a function of the standard normal variable. The relevant area under one tail is equal to one minus the reliability level (e.g., 1.00 - 0.95 = 0.05). The multiplier is equal to the value of the standard normal variable that is paired with this area (e.g., a tail area of 0.05 implies 1.65; a tail area of 0.16 implies 1.00).

Assume for our example that average annual maximum supply is 100,000 kilolitres (kL) and the standard deviation of annual maximum supply is 10,000 kL. This implies that the coefficient of variance of the supply is 10% (10,000/100,000). Under these assumptions, the lower tick mark in Figure 1 has value 84,000 kL per year. Suppose critical demand (and therefore the critical supply level) is projected[8] to grow to 90,000 kL over the next decade. As critical demand grows, reliability will decrease. The likelihood of a water shortage will increase from 1 in 20 (95% reliability) to 1 in 6 (84% reliability) as the part of the bell curve left of critical supply grows from 5% to 16%. One of the standard jobs of water managers is to prevent reliability from deteriorating too much. But how they augment supply or manage demand growth in response to their projection of demand growth affects reliability in ways that are often not fully understood or evaluated.

[7] For example, Table A-3 in Khazanie (1990).
[8] A water demand projection is based on many factors, including projected growth in population and employment in the service area, changes in water distribution or use technologies, etc.

Suppose they want to maintain reliability at 95%. This is the first step in the planning process – chose a design reliability level based on the willingness of customers to pay for reliability. Second, the planner will consider various options for new supply and conservation measures sufficient to satisfy customer needs. The amount of physical water or conservation required to do this in a critical year is the difference between projected critical demand (PD_C) and existing critical demand (D_C). This has been labeled S_N in Figure 1, and in our example is 6,000 kL. If a supply option were to provide exactly this amount in every year, the planner should procure S_N of new supply. Water from advanced treatment processes (e.g., desalinated seawater or recycled wastewater) has this characteristic if treatment facilities are designed with enough redundancy to prevent downtime other than for regularly scheduled maintenance.[9]

But if the yield from a water supply or conservation option is variable from year to year, the planner must procure enough of it to have S_N available 19 out of 20 years or reliability will fall. For example, when the chosen option is a surface water source, the amount available in an average year must be greater than S_N in order to ensure S_N is available in the critical, drier-than-average year.

The amount of water supply greater than S_N that has to be purchased depends on two factors. First, higher standard deviations of annual yield from the new surface water source imply that more water needs to be procured to ensure adequate water in a critical

[9] Some indoor water conservation measures may also have this characteristic of supplying exactly D_N every year if they are designed carefully. While the issue of "savings decay" in water conservation has been hotly debated, the author believes savings decay can be eliminated or made quite small by carefully specifying water-use efficiency devices.

year. Second, lower correlations of annual yield between the new source and the existing source imply that less of the new source will be required, on average, to ensure S_N is available when water from the existing source is at or below the lower tick mark in Figure 1. That is, if the new source is wet when the existing source is dry, one can procure less than S_N on average and still get S_N when the existing source is at its critical, drier-than-average level.

What this means is that comparing unit costs for options based on the average amount of water each option will deliver leaves out an important piece of the economic picture. Suppose for illustration purposes that advanced treatment of a low-quality water,[10] a new surface water supply, and outdoor conservation, all have an average unit cost of US$1.00 per kL. Ignoring reliability impacts, there is no financial difference between these sources. But a constant-reliability comparison of unit costs (Figure 2), as described below and mathematically in Appendix A, will show substantial financial differences.

Insert Figure 2 here

For the purpose of this illustration, we've assumed that advanced treatment is neither variable from year to year nor correlated with the existing water source. Consequently, a facility designed to deliver 6,000 kL per year[11] will satisfy the growth in demand in all years: average, critical, or otherwise. The average cost per unit is the same as the cost per unit in the critical and all other years.

[10] This could be seawater desalination, brackish water desalination, wastewater reclamation, or other processes. The average unit cost provided is generic and does not represent any particular technology.
[11] After allowing for normal interruptions in operation such as downtime for maintenance.

However, we've assumed that the new surface water supply is perfectly correlated with the existing surface water supply (has a similar pattern of wet and dry years), but is more variable. Then ensuring the 6,000 kL of new supply that will be needed in a critical year requires that the new source be sized to deliver more than 6,000 kL of water each average year, just as the old source was capable of providing 100,000 kL on average but only 84,000 kL with the desired level of reliability. If the new surface water source has a coefficient of variance of 20%, the water planner will need to procure 8,955 kL in an average year to ensure 6,000 in the 95% reliability design year (8,955 – 1.65 x 0.2 x 8,955 = 6,000). This in turn implies that each unit of water during drought will cost US$1.49 per kL on a constant-reliability benefit basis (US$1.00/ (1 – 1.65 x 0.2)). On a reliability-adjusted basis, this option is 49% more costly than it first appeared.[12]

If an outdoor water conservation measure were to save more water during dry weather, [13] its constant-reliability unit cost would be less than the assumed US$1.00 per kL. If it were perfectly counter-correlated with the current surface water source, and had a coefficient of variation of 10%, its constant-reliability unit cost would be $0.86 per acre-foot ($1.00/(1+1.65 x 0.1)). Since the current water source has been assumed to have a coefficient of variance of 10%, this 14% adjustment in unit cost is purely the result of the

[12] Stated differently, the utility could pay 49% more ***per average unit*** of water from the advanced treatment facility (US$1.49/US$1.00=149%) compared to each ***average*** unit in the new surface water alternative -- and provide the same economic benefit at the same cost to customers. Note that the premium is not in total, but per unit. The smaller advanced treatment facility is just as good as the larger surface water facility at reliably providing 6,000 kL in the critical year, so a ***per unit*** premium is justified.

[13] For example, laser leveling, drip or micro-spray irrigation, evapo-transpiration (ET) controllers, adjustments in sprinkler heads to improve distribution uniformity, all reduce the percent of applied water that percolates or evaporates. Since applied water goes up during dry weather, these measures will save more water during drought than during average or wet weather. Auto-rain shut-off devices, in contrast, save more water when it rains than when it is dry.

counter-correlation. Conventional sensitivity analysis of the financial impact of the variability in yield from the option would miss this adjustment entirely.

Stated in terms of yield, ensuring 6,000 kL of water in the critical year would require outdoor conservation measures sized to deliver only 5,150 kL in an average year. The counter-correlation implies that during a drought where maximum supply from the current surface water source is 1.65 standard deviations below its mean, outdoor conservation would save 1.65 standard deviations above its mean, which equals 6,000 kL when the mean is 5,150 kL and the standard deviation is 515 kL (10% of the mean).

Conclusion

Accounting for variance and correlation between water supply sources – as is done for securities when managing a portfolio of financial assets – is clearly important. Water supply planners who do not consider these factors might think options are similar in cost when they are in fact quite different once reliability benefits of the options are equalized. Worse yet, an apparently inexpensive source might turn out to be very expensive on a constant-reliability basis, or an apparently expensive source might turn out to have the lowest unit cost once reliability is considered.

The method presented in this paper is a powerful starting point for quantitative evaluation of the cost implications of uncertainty in water supply and demand management options. For the first time in the published water literature, it quantitatively evaluates these impacts on a portfolio rather than individual option basis. An option that is attractive when combined with an existing water supply in one setting might be unattractive if combined with a different existing water supply in a different setting. The correlation between the yields of options is a new dimension of overall yield and financial analysis for water planners. For water supply portfolios with numerous sources, as is the case in some regional systems, quantifying the impacts of these correlations may lead to surprising outcomes and changes in water supply plans.

Application of the method may be hindered, however, by data limitations or patterns that are difficult to describe via normal or other statistical distributions. As many a financial planner has found, the mathematics of portfolio theory do not guarantee superior investment results. One must struggle with the data and other decision criteria every time an investment decision is made. Nonetheless, better or additional tools have value.

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Appendix A: Constant-Reliability Unit Cost Adjustment

Finding constant-reliability unit costs involves a two-step process. First, a constant-reliability-benefit standard must be specified. When supply is modeled as normally distributed, the standard normal variable (Z) will be a function of the reliability design standard (R) the planner chooses (e.g., 95%). Mathematically, this means that the annual average of the supply portfolio (P) minus the standard normal variable times the standard deviation of the supply portfolio must be equal to projected future critical demand:

(1) $$A(P) - Z(R)SD(P) = PD_C$$

The average supply of a portfolio is the sum of the average supplies of its components. If the portfolio has only two components[14] – existing supply (E) and a new supply or demand management program (N), the average supply of the portfolio is:

(2) $$A(P) = A(E) + A(N)$$

$$\text{Where} \quad A(x) = \frac{1}{n}\sum_{i=1}^{n} Q_{xi}$$

$$x = A \text{ or } N$$

$$n = \text{the number of years of annual yield data for each option}$$

$$Q_{xi} = \text{the annual yield in year } i \text{ from option } x$$

[14] The mathematics for three or more components is a straightforward extension of the equations shown here. However, there will not be a unique answer when three or more components are involved. Instead, one would find numerous pairs of components two and three that would combine with existing supply to satisfy projected demand and the reliability design standard. Choosing between these pairs would require a straightforward but journal-space-consuming third planning step – cost minimization – to select from among the many possible portfolios that satisfy demand with suitable reliability.

The standard deviation of a portfolio depends on the standard deviation and average of each component, the correlation between the components, and the percentage of water from each component. The standard deviation of a portfolio is the square root of the variance of the portfolio. The appropriate formula (modified by the author from Tucker et. al. 1994) when two components are involved is:

$$(3)\quad V(P) = \sqrt{W(E)^2 V(E)^2 + W(N)^2 V(N)^2 + 2W(E)W(N)Rho(E,N)V(E)V(N)}$$

$$\begin{aligned} &\textit{Where}\quad W(E) + W(N) = 1 \\ &W(x) \equiv \frac{A(x)}{A(P)} \\ &V(x) \equiv \frac{SD(x)}{A(x)} \\ &Rho(E,N)\ \textit{is the correlation coefficient between E and N} \end{aligned}$$

Formulas for the standard deviation (SD) and correlation coefficient (Rho) are provided in any statistics textbook. One can calculate these summary statistics for each water supply option using any spreadsheet program. Combining (1), (2) and (3) yields:

$$(4)\quad \sqrt{\left(\frac{A(E)}{A(P)}\right)^2 V(E)^2 + \left(\frac{A(N)}{A(P)}\right)^2 V(N)^2 + 2\left(\frac{A(E)}{A(P)}\right)\left(\frac{A(N)}{A(P)}\right) Rho(E,N)V(E)V(N)} = \frac{A(P) - PD_C}{Z(R)A(P)}$$

$$\textit{Where}\quad A(P) = A(E) + A(N), \textit{as above}$$

If one specifies a reliability standard (R) and projected critical year demand (PD_C), and knows the average existing supply (A(E)), the coefficients of variance of the existing and new sources of supply (V(E) and V(N)), and the correlation coefficient between supplies (Rho(E,N), equation (4) will contain only one unknown (A(N)). This is the average new supply required to ensure that the chosen reliability standard (e.g., 95%) will be achieved. A(N) can be found by assuming a value for A(N), seeing how close or far apart the left and right hand sides of the equation are, and iteratively adjusting the assumed value until the value of A(N) that solves the equation is found.

For example, in this paper, we have specified R=95% (which implies Z(R) = 1.65) and PD_C=90,000 kL, and assumed A(E)=100,000 kL, V(E)=0.10, and D_C=84,000 kL. Then the A(N) that solves (4) under various assumptions about the supply options is:

Table A-1: Sample Calculations

Option	**V(N)**	**Rho(E,N)**	**A(N)**
New Surface Water	0.2	1.0	8,955 kL
Advanced Technology	0.0	0.0	6,000 kL
Outdoor Water Conservation	0.1	-1.0	5,150 kL

Finally, the constant reliability unit price for each option is found by multiplying the average unit cost for each option by the ratio of A(N)/ S_N. When A(N) equals growth in critical demand (S_N)[15], as with desalination and similar options, the average unit cost for that water supply option is also the constant-reliability unit cost. When A(N) is greater than or less than S_N , as with the surface water and outdoor conservation examples, the constant-reliability unit cost for each option is higher or lower than the average unit cost for that option, respectively.

[15] Recall that S_N = equals PD_C-D_C. In our example, 6,000 kL = 90,000 kL – 84,000 kL.

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Figure 1: Yield Uncertainty For a Run-of-the-River Water Supply

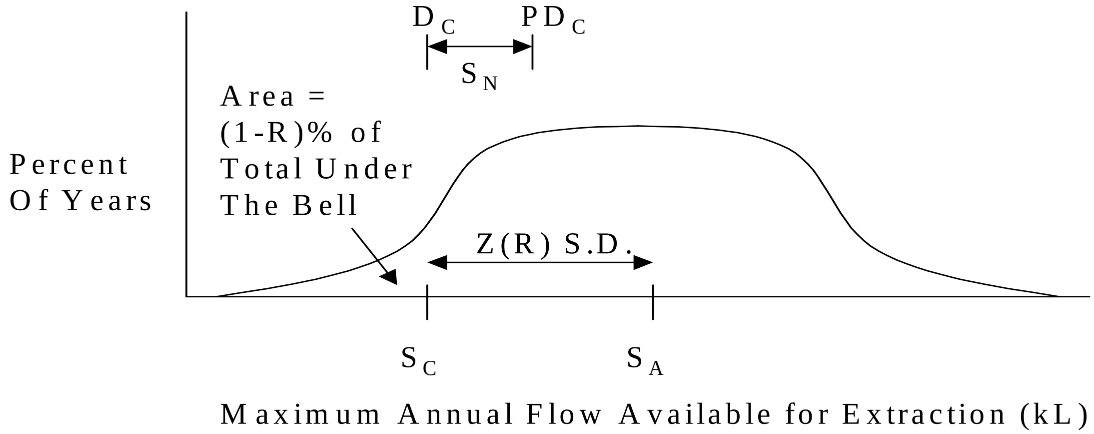
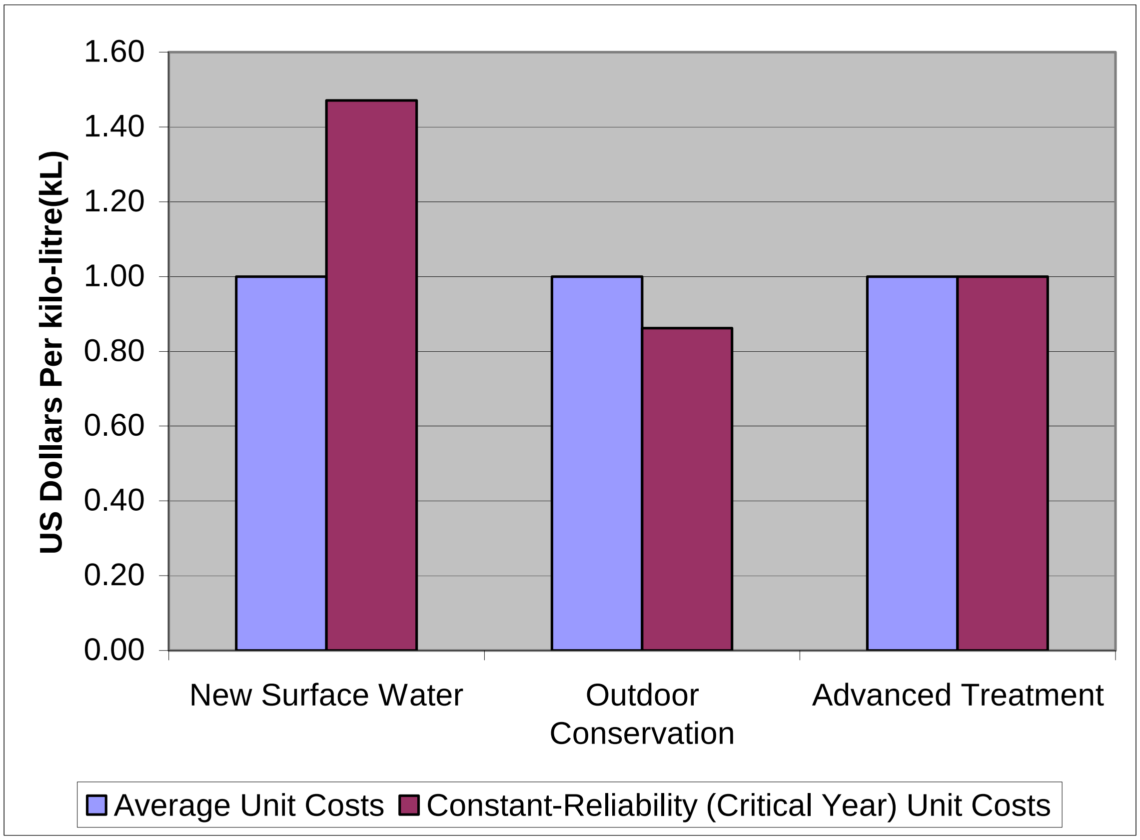


Figure 2: Illustration of Average and Constant-Reliability Unit Costs



West Basin Municipal Water District

CAPITAL IMPLEMENTATION MASTER PLAN
FOR RECYCLED WATER SYSTEMS

FINAL REPORT
June 2009

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WEST BASIN MUNICIPAL WATER DISTRICT

CAPITAL IMPLEMENTATION MASTER PLAN FOR RECYCLED WATER SYSTEMS

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LIST OF ABBREVIATIONS

Abbreviation	Description
AACE	Association for the Advancement of Cost Engineering
AAD	average annual demand
ADD	average day demand
af	acre-feet
afy	acre feet per year
AOP	advanced oxidation processes
aSAR	adjusted sodium adsorption ratio
B	barrier
Carollo	Carollo Engineers, a Professional Corporation
CBOD	carbonaceous biochemical oxygen demand
CC	construction cost
CC+C	construction cost plus contingency
CCTV	closed circuit television
CIMIS	California Irrigation Management Information System
CIMP	Capital Implementation Master Plan
CIP	Capital Improvement Program
Cl	chloride
CMF	Continuous Microfiltration
CMLC	cement mortar lined and coated
CNF	Chevron Nitrification Facility
CRWRF	Carson Regional Water Recycling Treatment Facility
CSUDH	California State University Dominguez Hills
CT value	the product of total chlorine residual and modal contact time measured at the same point
DCS	distributed control system
DIP	ductile iron pipe
EC	electrical conductivity
ELWRF	Edward C. Little Water Reclamation Facility
EMWRF	ExxonMobil Water Recycling Facility
ENR	Engineering and News Record
EPS	extended period simulation
ET	evapotranspiration
FM	force main
fps	feet per second
frp	fiber reinforced plastic
ft	feet
ft/kft	foot per 1,000 feet
FY	fiscal year
GIS	Geographic Information Systems

Page No.

Abbreviation	**Description**
gpd/ac	gallons per day per acre
gpm	gallons per minute
HCO_3	bicarbonate
HDPE	high-density polyethylene
HP	horsepower
HPBF	high pressure boiler feed
HSEFM	Hyperion Secondary Effluent Force Main
HSEPS	Hyperion Secondary Effluent Pump Station
HWWTP	Hyperion Wastewater Treatment Plant
IIMM	International Infrastructure Management Manual, Edition 2006
IN	industrial
IR	irrigation
JWPCP	Joint Water Pollution Control Plant
K_d	density factor
K_{mc}	microclimate factor
K_s	species factor
LACDPW	Los Angeles County Department of Public Works
LACSD	Los Angeles County Sanitation District
LADWP	Los Angeles Department of Water and Power
LF	leaching fraction
LPBF	low pressure boiler feed
MCL	maximum contaminant level
MDD	Maximum Day Demand
MF	Microfiltration
MFP	Mobile Facility Plant
Mg	magnesium
MG	million gallons
mg/L	milligrams per liter.
mgd	million gallons per day
MinDD	minimum day demands
MMD	maximum month demand
MPN	most probable number
MU	mixed use
MWD	Metropolitan Water District of Southern California
N	total nitrogen
Na	sodium
NH_3	ammonia
NO_3	nitrate
NPDES	National Pollutant Discharge Elimination System

Page No.

Abbreviation	Description
O&M	Operations and Maintenance
OD	outer diameter
PS	pump station
psi	pounds per square inch
PVC	polyvinyl chloride
RO	reverse osmosis
RPM	revolutions per minute
SAR	sodium absorption ratio
SCADA	supervisory control and data acquisition
SDR	Standard Dimension Ratio
SE	secondary effluent
sf	square feet
TDS	total dissolved solids
TOC	total organic carbon
UV	ultraviolet
WBMWD	West Basin Municipal Water District
WDF	water demand factor
West Basin	West Basin Municipal Water District
WSPG	Water Surface Pressure Gradient (software package)

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EXECUTIVE SUMMARY

ES.1 PROJECT BACKGROUND

The West Basin Municipal Water District's (West Basin) service area encompasses approximately 185 square miles in southwest Los Angeles County. The West Basin service area, shown on Figure ES.1, includes 17 cities and unincorporated areas of Los Angeles County, and serves a population of about one million.

As of 2007, West Basin wholesaled approximately 220,000 acre-feet per year (afy) or 196 million gallons per day (mgd) of imported potable water to its customers within the service area. In addition, West Basin served about 31,861 afy or 28 mgd of recycled water to over 200 customer sites within the service area for landscape irrigation, industrial applications, and seawater intrusion barrier applications.

West Basin is planning to expand its recycled water system to continue offsetting potable water demands in its service area and improve overall water supply reliability by reducing dependency on less reliable imported water supplies.

Major capital investments are required to expand and maintain West Basin's recycled water system to meet expected needs and establish reliable recycled water supply for existing and new recycled water customers through year 2030. To define and prioritize the capital improvement projects needed to achieve this goal, West Basin retained Carollo Engineers (Carollo) and team members AKM Consulting Engineers, SPI Technologies, and E.W. Moon, to develop this Capital Implementation Master Plan (CIMP) for recycled water systems.

In addition, West Basin is currently preparing its long-term financial plan that includes a forecast of expenditures for future expansions, repair, replacement, and rehabilitation requirements, and operation and maintenance of the overall recycled water system required to serve approximately 70,000 acre-ft/yr of recycled water by year 2020. This CIMP and the long term financial plan will provide a roadmap for West Basin to achieve its mission of providing reliable water supplies to its customers and the southern California region, increasing recycled water usage and lessening dependency on imported water supplies.

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ES.2 EXISTING RECYCLED WATER SYSTEM

West Basin currently delivers about 31,860 afy of recycled water to over 200 recycled water customer sites. These customers include oil refineries, other industrial facilities, commercial buildings, golf courses, parks, school districts, Caltrans, and the Water Replenishment District of Southern California. West Basin receives secondary effluent from the City of Los Angeles' Hyperion Wastewater Treatment Plant (HWWTP) as a source water to produce five different recycled water quality levels, also referred to as "designer water", at four recycled water facilities. These five designer water types are:

- Title 22 Water
- Barrier Water (Softened Reverse Osmosis [RO])
- Industrial RO
- Industrial RO Ultra
- Nitrified Water

West Basin distributes this designer water through different networks of conveyance systems to its customers. The four treatment plants and designer water types are listed in Table ES.1.

Table ES.1 Designer Water Types
Capital Implementation Master Plan
West Basin Municipal Water District

Treatment Plant	Source Water	Designer (Product) Water Types	Capacity (mgd)
Edward C. Little Water Recycling Facility (ELWRF)	Secondary Effluent from HWWTP	Title 22 (T22)	40.0
		Barrier Water (MF/RO/UV)	12.5
		Industrial RO (single pass)	1.7
		Industrial RO Ultra (double pass)	2.6
Chevron Nitrification Facility (CNF)	T22 from ELWRF	Nitrified Water	4.9
ExxonMobil Water Recycling Facility (EWRF)	T22 from ELWRF	Nitrified Water	4.9
		Industrial RO (Single Pass)	3.2
Carson Regional Water Recycling Facility (CRWRF)	T22 from ELWRF	Nitrified Water	1.0
		Industrial RO (Single Pass)	5.0

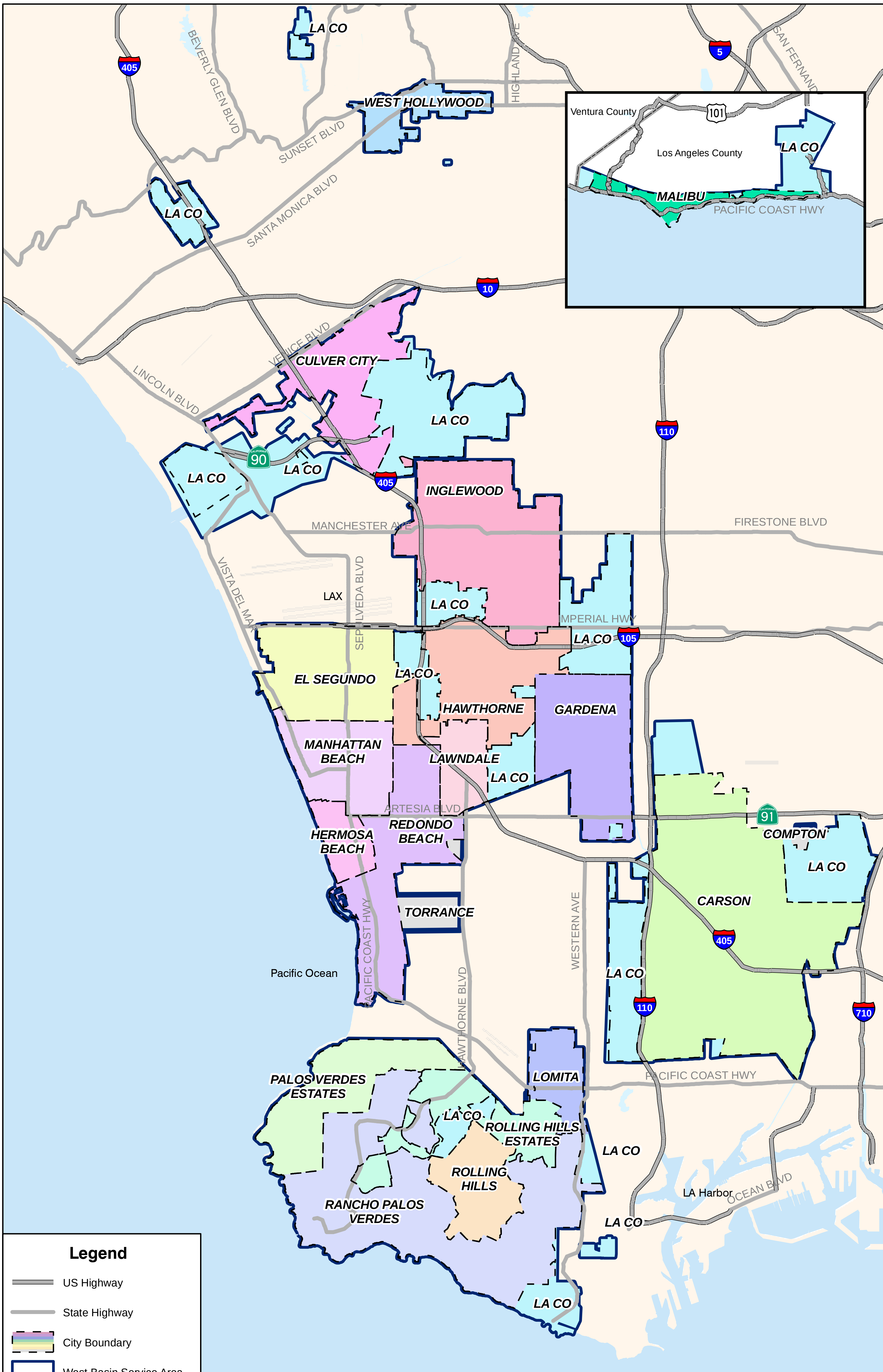

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Figure ES.1
West Basin Municipal Water District Service Area

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

The five different designer water types are conveyed through various networks of nearly 100 miles of recycled water distribution pipelines ranging in diameter from 4 to 60 inches. The existing distribution systems consist of ten subsystems that were categorized by West Basin, depending on specific industrial customer location and "designer water" conveyance system, location of the treatment system, and waste discharge system. The ten existing subsystems are:

- Hyperion Secondary Effluent Pumping System (HSEPS)
- Title 22 Distribution System
- West Coast Barrier Water System
- Chevron Low Pressure Boiler Feed (LPBF) System (Industrial RO Water)
- Chevron High Pressure Boiler Feed (HPBF) System (Industrial RO Ultra Water)
- Chevron Nitrified Water System
- Carson Regional Water Recycling Facility (CRWRF) Brine Line
- Edward C. Little Water Recycling Facility (ELWRF) Brine Line
- bp Reverse Osmosis System (Industrial RO Water)
- bp Nitrified Water System

These distribution systems and location of the West Basin's treatment facilities are shown on Figure ES.2. Characteristics for each subsystem are summarized in Table ES.2, while a detailed description of each subsystem is provided in Chapter 2 of this CIMP.

Table ES.2 Existing Recycled Water Systems Summary
Capital Implementation Master Plan
West Basin Municipal Water District

System Name	Distribution System(1)	Other Facilities(2)
HSEPS	3 mi (48"-60")	PS: 51 mgd
Title 22	78 mi (4"-60")	Storage: 10 MG Tank 1 PS: 25 mgd Tank 2 PS: 26 mgd Diversion PS: 18 mgd
West Coast Barrier Water	1 mi (30")	Storage: 0.5 MG PS : 15 mgd
Chevron LPBF	2 mi (10"-12")	PS : 3 mgd
Chevron HPBF	2 mi (12"-16")	PS : 3 mgd

Table ES.2 Existing Recycled Water Systems Summary Capital Implementation Master Plan West Basin Municipal Water District		
System Name	**Distribution System(1)**	**Other Facilities(2)**
Chevron Nitrified	0.5 mi (20")	PS : 5 mgd storage
CRWRF Brine Line	5 mi (14")	none
ELWRF Brine Line	3 mi (18")	none
bp Reverse Osmosis	1 mi (24"-30")	PS: 5 mgd
bp Nitrified	1 mi (12")	PS: 1 mgd

Notes:
(1) Approximate Length.
(2) Pumping station (PS) capacities refer to firm capacity (excluding the largest pump unit)

ES.3 RECYCLED WATER DEMANDS

ES.3.1 Existing Demands

West Basin currently serves 175 recycled water customers at more than 200 customer sites that can be categorized into four usage types: industrial, irrigation, mixed use, and barrier customers. Mixed use refers to customers that use recycled water for more than one usage type (e.g., irrigation and cooling tower applications). The existing customer demands by usage type are listed in Table ES.3.

Table ES.3 Existing Demand by Usage Type Capital Implementation Master Plan West Basin Municipal Water District				
Customer Type	**Usage Type Code**	**Number of Customers**	**Existing Demand(1) (afy)**	**Percent of Total (%)**
Barrier	B	1	11,380	36
Industrial	IN	5	17,018	53
Irrigation	IR	165	3,257	10
Mixed Use	MU	4	205	<1
Total		**175**	**31,860**	**100**

Note:
(1) Demand of 31,860 afy is based on the average usage obtained from historical billing records as presented in Table 3.2. The 2007 recycled water sales were 32,200 afy.

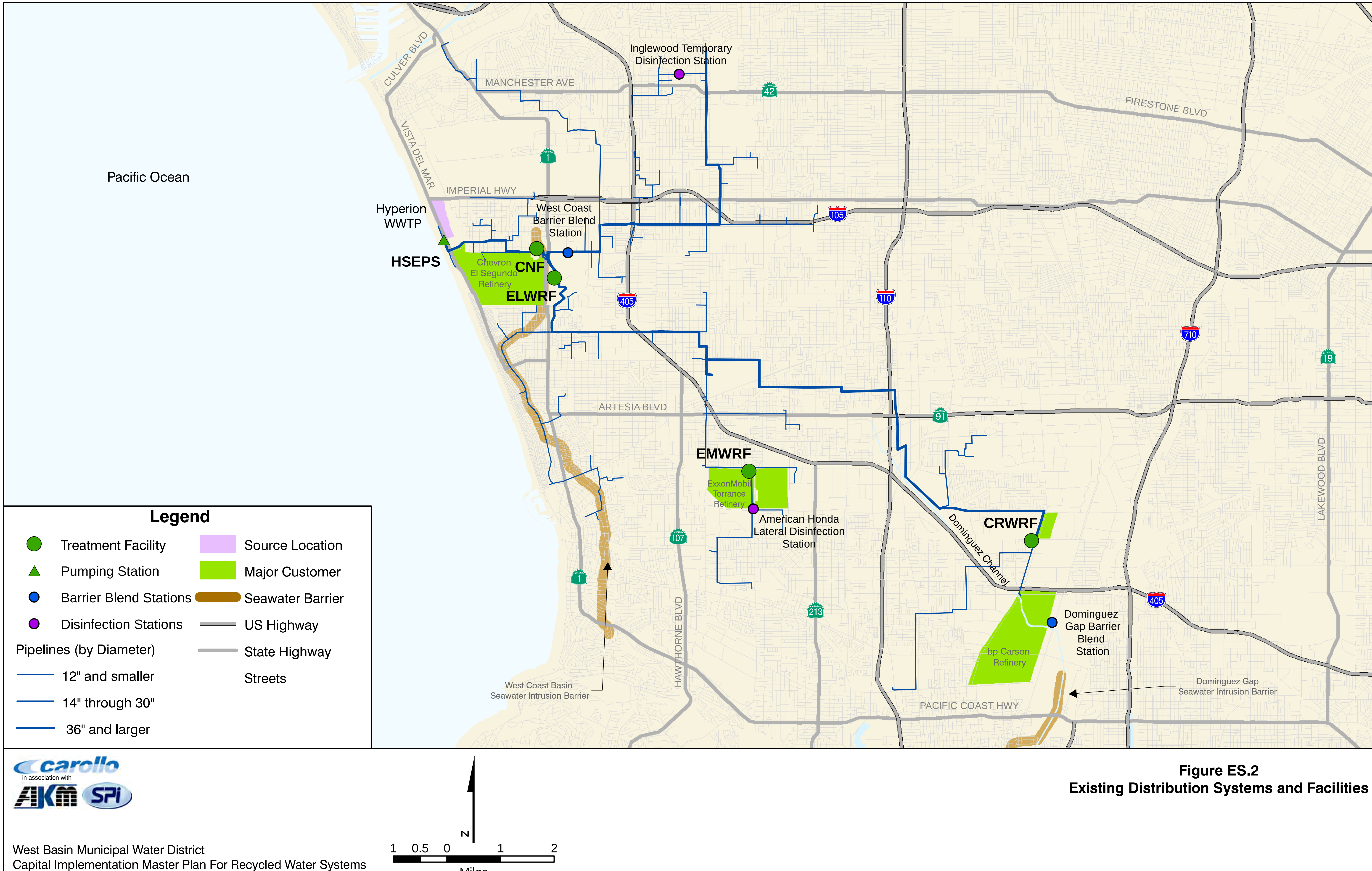

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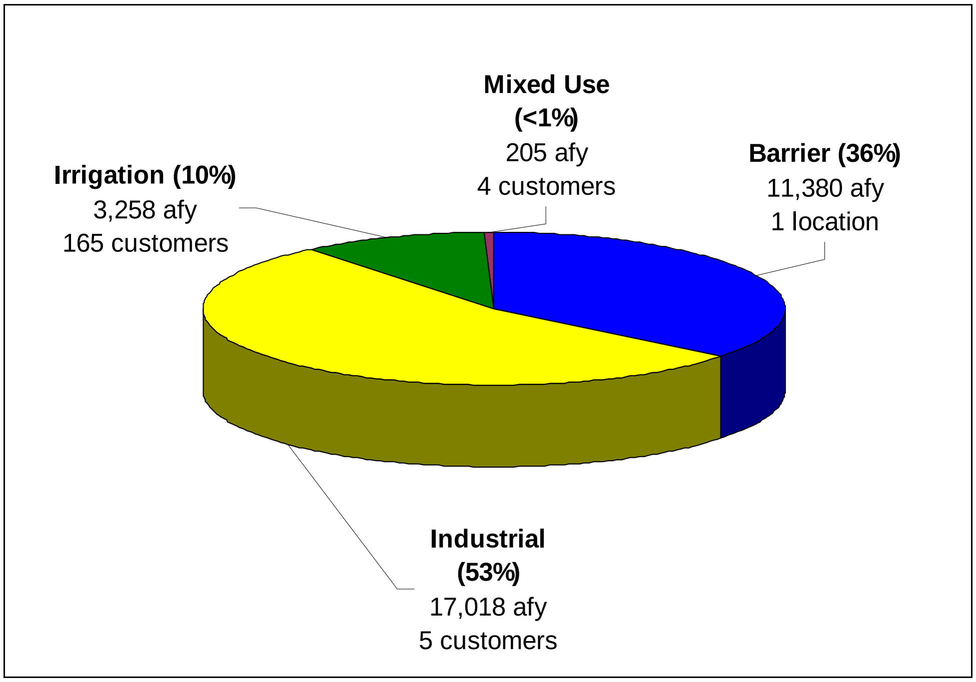
Figure ES.2
Existing Distribution Systems and Facilities

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

As listed in Table ES.3 and shown on Figure ES.3, the industrial usage accounts for the majority of the existing system recycled water demand, while irrigation usage accounts for the majority of customers. Therefore, the industrial demands present a significant portion of overall recycled water demand and provide a solid baseline of usage within the West Basin's customer base. A complete list of all existing customers and their respective usage type, demand, and peaking factors are provided in Chapter 3, while detailed location maps of all customers are included in Appendix B.

Figure ES.3
Existing Demand by User Type



ES.3.2 Potential Demands

A list of 120 potential customers with their associated demands and peaking factors was compiled. Detailed information for each of these potential customers is included in Chapter 3, while detailed location maps are included in Appendix B. The total estimated demand of potential customers anticipated to be connected by 2020 is approximately 26,400 afy. The distribution of the recycled water demands by usage type is shown on Figure ES.4. The total estimated demand of all potential customers (through 2030) is approximately 36,000 afy and is shown on Figure ES.5.

Figure ES.4
Demand Distribution Through 2020 by User Type

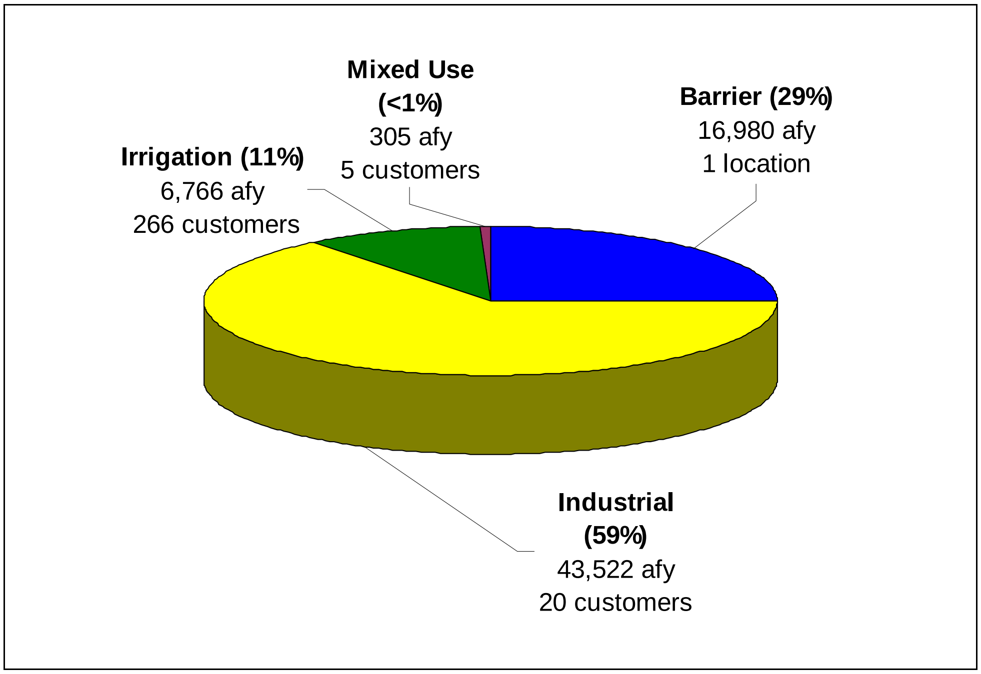
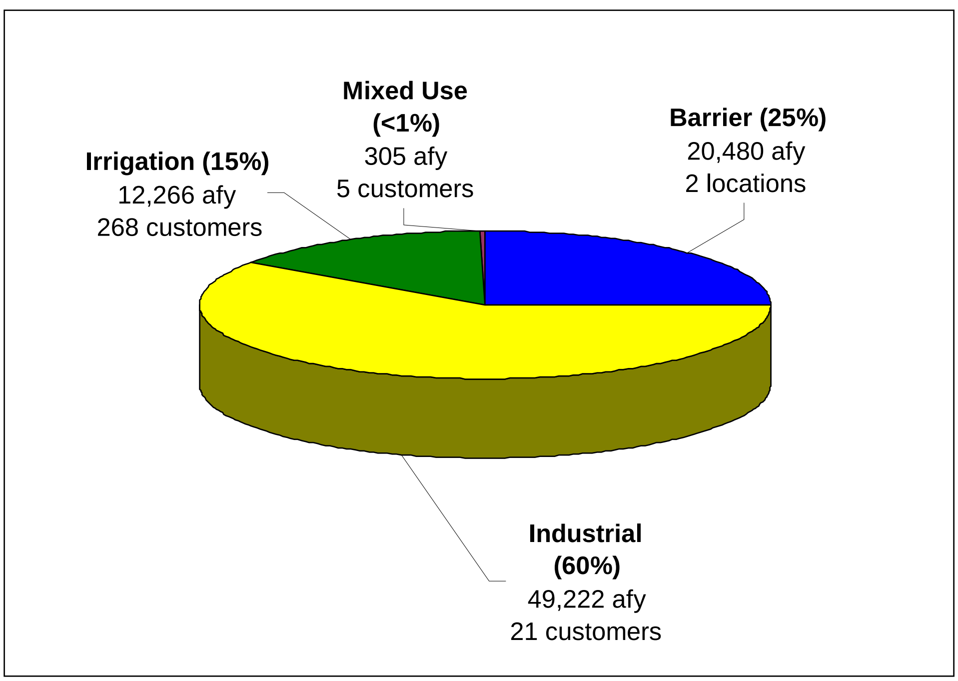


Figure ES.5
Demand Distribution Through 2030 by User Type



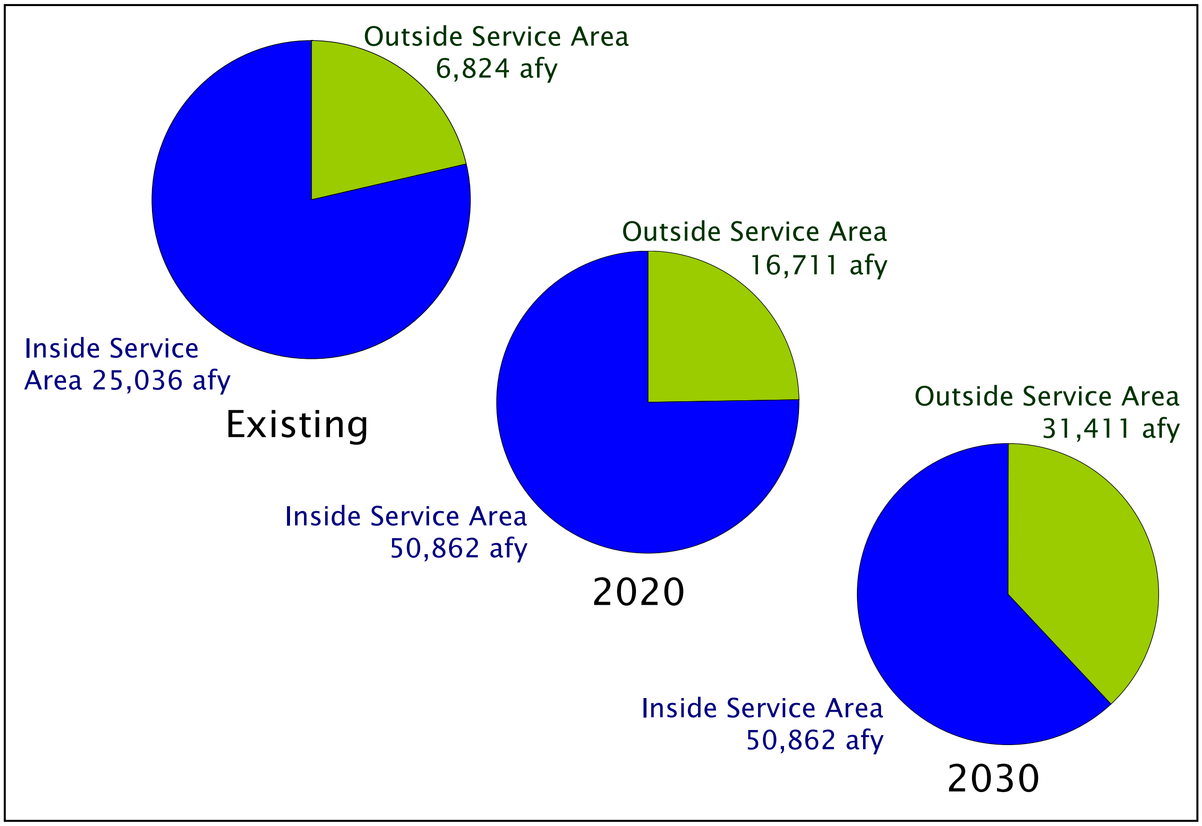
As shown on Figure ES.4 and Figure ES.5, industrial usage represents the majority of the total demand with approximately 59 percent of the potential demand of customers anticipated by 2020 and 60 percent of the potential demand of all potential customers.

ES.3.3 Future Demands

The recycled water demands are projected to increase from 31,860 afy to 82,273 afy, which equates to an average demand increase of about 4 percent per year through year 2030. This projection is based on the assumption that all potential customers are connected to the future system expansion and use the estimated recycled water demands.

A breakdown of recycled water demands with respect to West Basin's service area for the existing system, year 2020 demand projection, and year 2030 demand projection are presented on Figure ES.6.

Figure ES.6
Demand Breakdown by Location



As shown on Figure ES.6, the demand of the customers located outside West Basin's service area is anticipated to increase from 6,824 afy (21 percent of the total demand) to 16,711 afy (25 percent of the total demand) in 2020. The projected average annual demand (AAD) is summarized in Table ES.4. This table shows that the year 2020 demand is estimated at 67,575 afy or 60 mgd. When the seasonal peaking factors are applied, the estimated maximum month demand (MMD) is 82 mgd. It should be noted that the MMD is assumed to be the same as the maximum day demand (MDD) as the MDD of large customers typically does not coincide with each other as discussed in detail in Chapter 3.

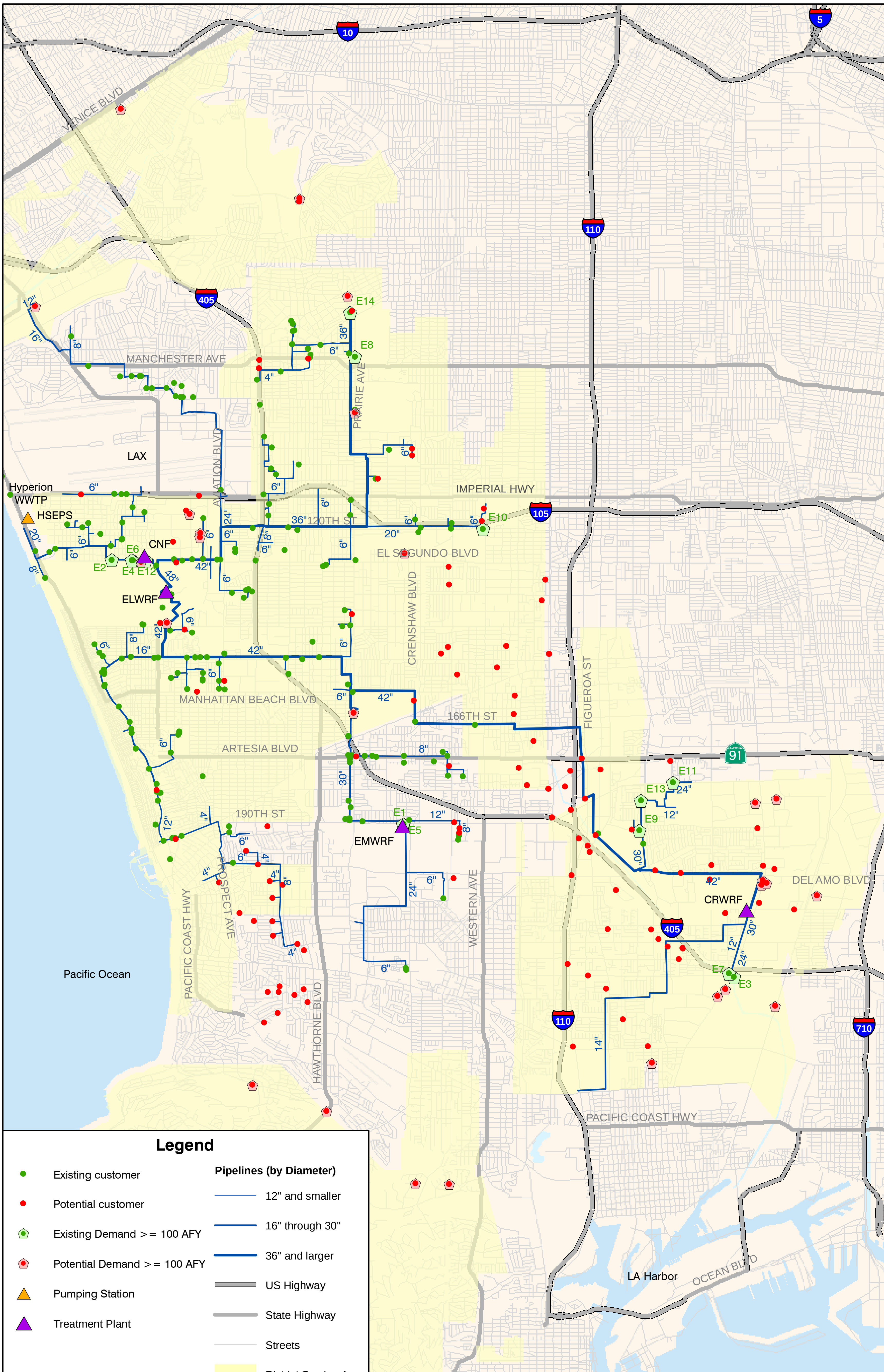
Table ES.4 Projected Future Recycled Water Demand
Capital Implementation Master Plan
West Basin Municipal Water District

Usage Type	2008 AAD (afy)	2008 MMD (mgd)	2010 AAD (afy)	2010 MMD (mgd)	2020 AAD (afy)	2020 MMD (mgd)	2030 AAD (afy)	2030 MMD (mgd)
Irrigation	3,257	7.6	4,178	9.1	6,766	14.8	12,266	27.1
Industrial	17,018	20.2	17,488	20.7	43,522	51.4	49,222	58.6
Mixed Use	205	0.4	205	0.4	305	0.6	305	0.6
Barrier	11,380	10.2	11,380	10.2	16,980	15.2	20,480	18.3
Total	**31,860**	**38.4**	**33,251**	**40.4**	**67,573**	**82.0**	**82,273**	**104.5**

ES.4 RECYCLED WATER SUPPLIES

The City of Los Angeles' Hyperion Wastewater Treatment Plant (HWWTP) is currently the sole source of supply for West Basin's treatment facilities and recycled water systems. The HWWTP has a maximum design flow of 550 mgd and a minimum design flow of 160 mgd. The maximum and minimum monthly flows recorded in 2007 were 471 mgd and 299 mgd, respectively. As recycled water demands are typically high during the nighttime, when wastewater flows are low, the minimum hourly flow needs to be considered when sizing storage facilities. The minimum hourly flow in 2007 was about 95,800 gpm (equivalent to 138 mgd).

In 2007, West Basin received on average 32.4 mgd or 36,300 afy from HWWTP, with a maximum day supply of 40.5 mgd. It should be noted that the historical supplies exceed the historical demands due to system losses during treatment and conveyance. Based on field data collected during the model calibration effort, it was estimated that the system demand is approximately 81 percent of the amount of recycled water supplied in the same time period. Therefore, it is assumed that the future supply needs will be 125 percent of the future demand.



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Capital Implementation Master Plan For Recycled Water Systems

Figure ES.7
Existing and Potential Recycled Water Customers

West Basin does not currently operate any source equalization facilities to accommodate daily peaking in source supplies. Flow equalization storage is not currently necessary due to the significantly larger source of supply available at the HWWTP compared to the existing demands. Even the minimum flows observed in daily flow patterns (138 mgd) at the HWWTP exceed West Basin's current maximum pumping capacity of 51 mgd at the Hyperion Secondary Effluent Pump Station (HSEPS). If demand for the secondary effluent (SE) from HWWTP by West Basin and/or other agencies increases significantly in the future, flow equalization storage facilities may have to be considered to meet the future recycled water demands.

West Basin owns the following four treatment facilities:

- Edward C. Little Water Recycling Facility (ELWRF)
- Carson Regional Water Recycling Facility (CRWRF)
- Chevron Nitrification Facility (CNF)
- ExxonMobil Water Recycling Facility (EMWRF)

The locations of these facilities are shown on Figure ES.2.

ELWRF is the only treatment facility that receives supply from the HWWTP. The remaining satellite facilities rely on Title 22 recycled water from ELWRF as a supply source. The existing treatment capacities of these facilities, along with expansions anticipated within near-term, are summarized in Table ES.5.

Table ES.5 Treatment Facility Capacities
Capital Implementation Master Plan
West Basin Municipal Water District

	Existing Capacity (mgd)	Near-Term Expansion (mgd)	Near-Term Capacity (mgd)	Expansion Phase
ELWRF	56.8	6.5	63.3	Phase V
CRWRF	6.0	17.0	23.0	Phase II
CNF	4.9	1.5	6.4	Phase Va
EMWRF	8.1	-	8.1	-

As shown in Table ES.5, West Basin is currently planning the expansion of three of its treatment facilities to accommodate increasing demands. These expansion efforts are the ELWRF Phase V Expansion Project, CRWRF Phase II Expansion Project, and the expansion of the CNF (also referred to as ELWRF Phase Va).

HSEPS currently has the capacity to pump 51.0 mgd (57,100 afy) of SE from HWWTP. On average, the HSEPS conveys a flow of 33 mgd, with maximum day supplies of up to 40.5 mgd. To accommodate projected demand increases, additional pumping capacity will need to be added to the HSEPS between fiscal year (FY) 2010/2011 and FY2014/2015.

Projected supply requirements, using a recovery ratio of 80 percent and maximum month demands, are presented on Figure ES.8. West Basin's existing firm pumping capacity of 51.0 mgd is sufficient to meet average annual demands through FY2009/10. However, a supply shortfall to meet the projected maximum month demand is expected to occur following year 2010. Therefore, West Basin will be required to increase supply capacity from HWWTP and/or develop a new source of supply to accommodate new customers. The addition of new customers is therefore dependent upon West Basin's ability to increase the supply capacity from HSEPS and/or the development of a new supply source. A detailed projection by calendar year for the HSEPS firm capacity requirements is presented on Figure ES.9.

Figure ES.8
Projected Maximum Month Supply Requirements

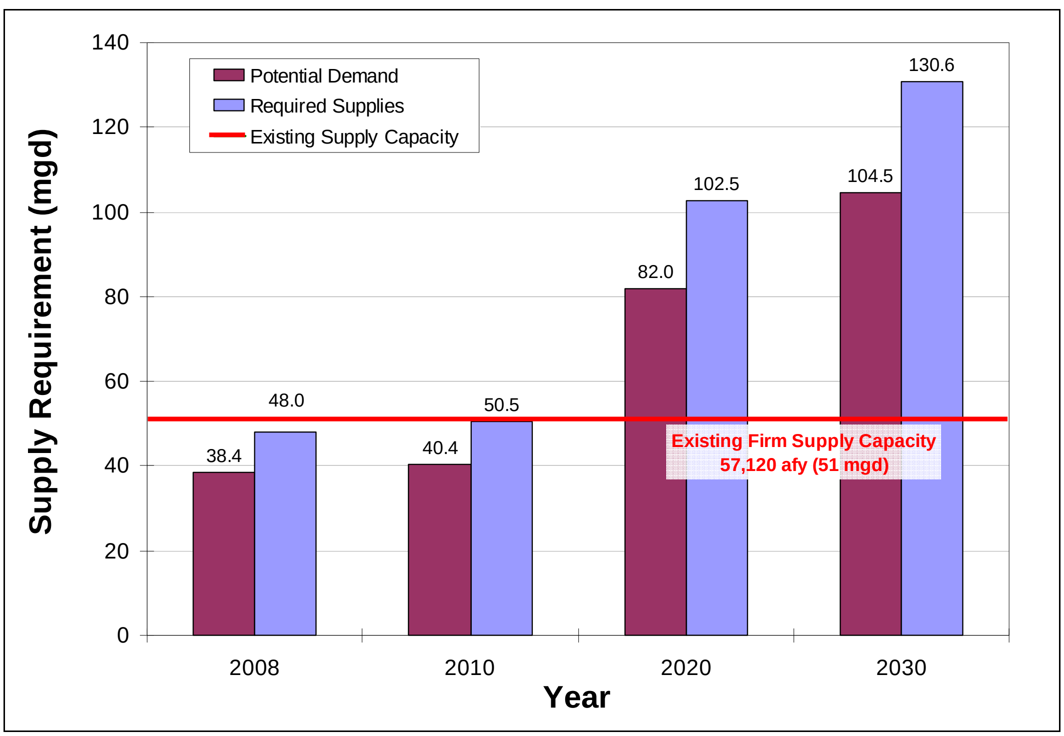
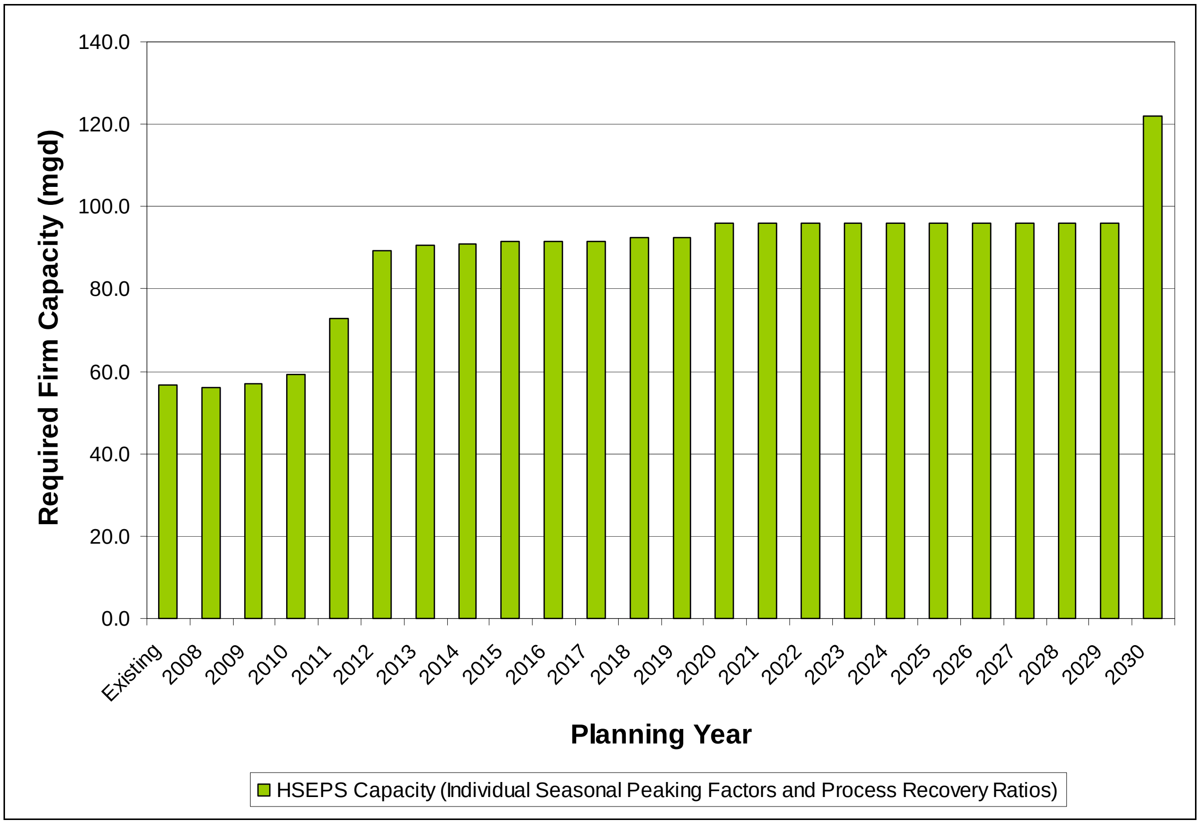


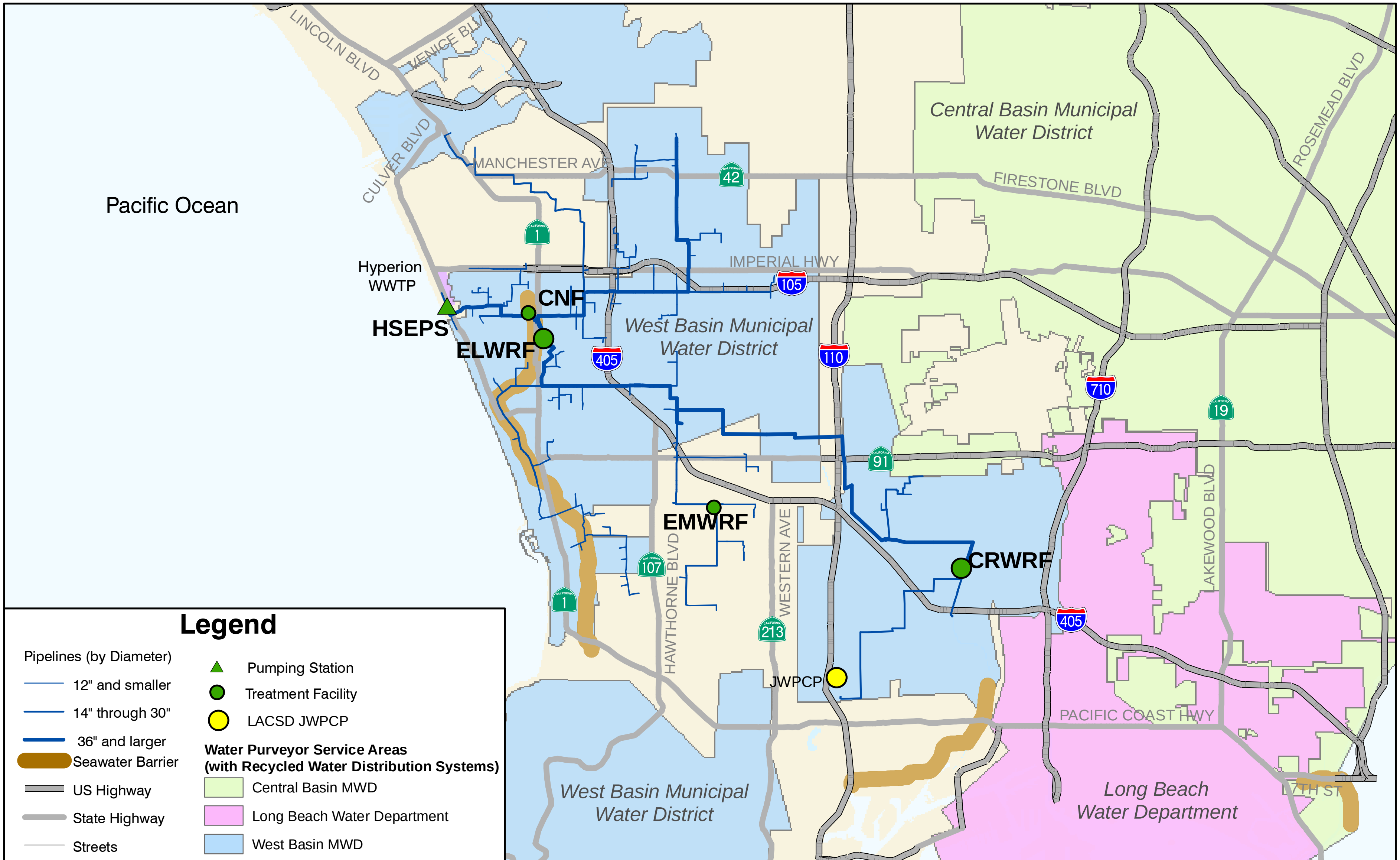
Figure ES.9
Projected Maximum Month Supply Requirements by Year



To provide redundancy and reliability in supply of recycled water to existing and potential new customers, a potential new supply source has been identified. This new supply source is the Los Angeles County Sanitation District's (LACSD) Joint Water Pollution Control Plant (JWPCP), which is located about 4 miles southwest of the West Basin's CRWRF as shown on Figure ES.10.

The JWPCP treats on average approximately 300 mgd to secondary effluent standards. Since JWPCP treats only to secondary effluent quality, additional advanced treatment processes and conveyance systems would be required to meet specific West Basin customer demands.

The use of LACSD's JWPCP as a water supply source was evaluated to determine feasibility and potential capital impacts. Three supply source options were considered although there could be several additional alternative ways of utilizing this identified new source.



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West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

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Figure ES.10
Potential Sources of Supply

A comparison of the three supply options is summarized in Table ES.6. In Option 1, all future demands would be supplied from HWWTP, which would require extensive pump station upgrades, parallel pipelines in the HSEPS and Title 22 system to satellite facilities, as well as significant treatment plant expansion at ELWRF. In Option 2, a portion of the future demands is assumed to be supplied from a new treatment plant (NTP) located at the JWPCP. It is assumed that a 26-mgd NTP would provide recycled water to the Dominguez Gap and the bp expansions. In Option 3, this NTP is expanded to a capacity of 49 mgd, and would serve additional customers in the southwest portion of West Basin's service area.

Table ES.6 Comparison of Supply Sources
Capital Implementation Master Plan
West Basin Municipal Water District

Option	Description	Supply from HWWTP(1)	Supply from JWPCP(1)	Capital Cost(2) ($M)
Option 1	Supply from Hyperion Only	82,275 afy	0 afy	$666.5
Option 2	Partial Supplies from JWPCP (26 mgd)	64,684 afy	16,591 afy	$639.0
Option 3	Maximize Supply from JWPCP (49 mgd)	50,684 afy	31,591 afy	$558.6

Notes:
(1) On an average annual basis. Treatment in comparisons is sized for pre-treatment MMD supply levels. Pump stations in comparisons are sized for peak hour MDD levels.
(2) For relative comparison only. For further details on costs shown in this table, see Chapter 8.

As shown in Table ES.6, it is more cost-effective to utilize the JWPCP as a secondary supply source than to supply all future demands solely from Hyperion. Additional benefits of using a secondary supply source include increased reliability and redundancy, as well as reduced expenditures in retrofitting or constructing large diameter portions of the Title 22 conveyance system for the long distance through the South Bay area.

Based on discussions with West Basin staff it was determined that Option 2 is the most practical and cost effective method for the development of the capital improvement program of this CIMP. However, use of the LACSD supply source should be analyzed in more detail as part of future project planning efforts.

ES.5 RECYCLED WATER SYSTEM EVALUATION

The condition and performance of the recycled water systems were evaluated using three different methodologies:

- Condition Assessment of the four treatment facilities by conducting field visits;
- Hydraulic modeling of the ten different recycled water systems under existing and future demand conditions;
- Modeling of the overall recycled water system including the four treatment facilities on a unit process level.

The condition assessment was used to determine the remaining useful life of equipment as well as repair, replacement, and rehabilitation needs to ensure long term system integrity and reliability. The findings of this condition assessment are included in Appendix F of this report. Cost estimates for the recommended replacement and rehabilitation projects were developed and phased by planning period. These rehabilitation and replacement costs are included the capital improvement program (CIP) as presented in section ES.7.

Ten different hydraulic models were developed using H_2OMAP Water and WSPG modeling software to model pressurized distribution systems and gravity conveyance systems, respectively. These models were calibrated and used to evaluate the hydraulic performance of each system under various demand conditions and system configurations. The Title 22 system hydraulic model was also used to evaluate water age in the system. The hydraulic model development and calibration process is described in Chapter 6, while the calibration technical memorandum, covering details of the hydraulic model calibration, is included in Appendix E of this report. Recommendations made to address deficiencies under existing demand conditions and to meet the hydraulic evaluation criteria under future demand conditions are described for each system in Chapters 7 and 8, respectively. These recommendations are included in the CIP as presented in section ES.7.

In addition to the hydraulic models, a customized treatment planning model was developed that incorporated all recycled water systems and the treatment plants to a unit process level. This model, developed in *OPTIMO*™, was used to conduct flow balancing between the various systems to identify hydraulic restrictions. The model also traces up to 15 water quality parameters and could therefore be used to identify treatment process upgrade needs to meet water quality standards for increased flow conditions and/or comply with more stringent regulations. The treatment model development and calibration process is described in Chapter 8, while the model user manual is included in Appendix H of this report. Recommendations made to address deficiencies to meet the hydraulic criteria under future demand conditions are included in the CIP as presented in section ES.7.

ES.6 SUSTAINABILITY

West Basin's ongoing sustainability efforts include "green" planning and design of future projects. Where applicable, it is assumed that West Basin projects will be designed for certification in accordance with the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. However, specific decisions to incorporate green building technology will be implemented and refined at the preliminary design level. In addition, life cycle economic analysis of potential green building options should also be investigated at preliminary design levels. Although the current LEED Rating System is generally focused on human occupied structures, there are several general planning and design strategies that West Basin may consider implementing to enhance their sustainability efforts. A few of these strategies are discussed below:

- Water Conservation - Promote water conservation, drip irrigation systems, and xeriscaping with native plants that require minimal irrigation to West Basin's customers. Implement water conservation practices at all West Basin facilities, including recycled water usage for irrigation and non-potable usage (e.g., toilet flushing).
- Energy Conservation - Specify variable frequency drive (VFD) pumps for energy efficient system operations. Require fleet automobiles or other vehicles to be low emitting or fuel efficient vehicles (e.g., electric or solar powered).
- Renewable Energy Production - Implement solar/wind power production. For example, specify the installation of solar panels on roofs of new treatment and storage facilities.
- Materials Reuse - Salvage equipment or materials that have adequate remaining useful life that can be reused locally, thereby reducing landfill wastes.
- Carbon Footprint - Include carbon footprint calculations for selected projects (e.g., long pipelines that require significant amounts of material resources) and consider carbon footprint in construction material specifications.
- LEED Certified Design - Specify LEED certification requirements for selected projects, especially facilities with a high public visibility and/or public outreach and education component.

ES.7 CAPITAL IMPROVEMENT PROGRAM

The CIP summarizes the recommended improvements, cost estimates, and project cost allocated to specific programs and for the recommended improvements to the distribution systems. The CIP also establishes phasing of projects through the planning horizon. The purpose of this CIP is to provide West Basin with a guideline for the planning and budgeting of future improvements of its distribution systems and facilities.

A detailed CIP is described in Chapter 9 of this report and includes three subsections that present the recommended projects in different ways. These are:

- Summary of recommended projects by system
- Phasing of recommended projects by planning period
- Summary of entire CIP cost by planning year and facility type

All capital costs presented in this chapter are based on 2009 dollars and include construction cost, construction cost contingency and markups for engineering, design, project administration, construction management, and public outreach.

ES.7.1 CIP by System

All recommended projects are listed by system in Section 9.1. These systems include the ten different recycled water distribution systems and five treatment facilities (four existing and one future facility). The estimated project costs through 2020 for each system are summarized in Table ES.7.

As shown in Table ES.7, the total capital cost for all facilities through 2020 is estimated at approximately $615 million (M). A significant portion of the total CIP costs are contributed by five of the 15 systems, the T22, BPN, BPRO, CRWRF, and ELWRF, which accounts for about 60 percent of the total CIP.

ES.7.2 CIP by Planning Period

The CIP is divided into nine (9) different planning periods, six 1-year periods from fiscal year (FY) 2009/2010 through FY2014/2015, and three 5-year planning periods from FY2015/2020 though FY2025/2030. The CIP by planning period is summarized in Table ES.8.

Table ES.7 Capital Improvement Project Summary by System
Capital Implementation Master Plan
West Basin Municipal Water District

Facility ID	System/Treatment Plant Name	No. of Projects	Capital Cost	Percentage of Total
CL	Chevron Low Pressure Boiler Feed System	2	$2,100,000	0.3%
ESPP	El Segundo Power Plant System	3	$5,875,000	1.0%
CH	Chevron High Pressure Boiler Feed System	2	$3,350,000	0.5%
CN	Chevron Nitrified Water System	1	$1,575,000	0.3%
CNF	Chevron Nitrification Facility	7	$10,295,000	1.7%
BW	West Coast Barrier Water System	3	$32,675,000	5.3%
HPS	Hyperion Secondary Effluent Pumping System	5	$33,205,000	5.4%
BPN	bp Nitrified Water System	6	$48,035,000	7.8%
BPRO	bp RO System	3	$85,985,000	14.0%
CBRN	CRWRF Brine Line	1	$1,260,000	0.2%
EBRN	ELWRF Brine Line	2	$2,515,000	0.4%
T22	Title 22 Distribution System	24	$101,770,000	16.5%
ELWRF	Edward C. Little Water Recycling Facility	28	$147,792,600	24.0%
CRWRF	Carson Regional Water Recycling Facility	11	$102,995,278	16.7%
NTP	New Treatment Plant	2	$13,325,000	2.2%
EMWRF	ExxonMobil Water Recycling Facility	12	$17,300,000	2.8%
SW	System Wide Improvements	5	$4,885,000	0.8%
Total		**117**	**$614,937,878**	**100.0%**

As presented in Table ES.7, the total capital cost for all facilities through 2020 is estimated at $615 million (M). Table ES.8 presents the anticipated phasing of capital cost through 2030, which shows that the total capital cost for all facilities through 2030 is estimated at $963M. The planning period with the largest portion of the overall CIP cost is FY11/12 with $252M (26 percent) of the total CIP.

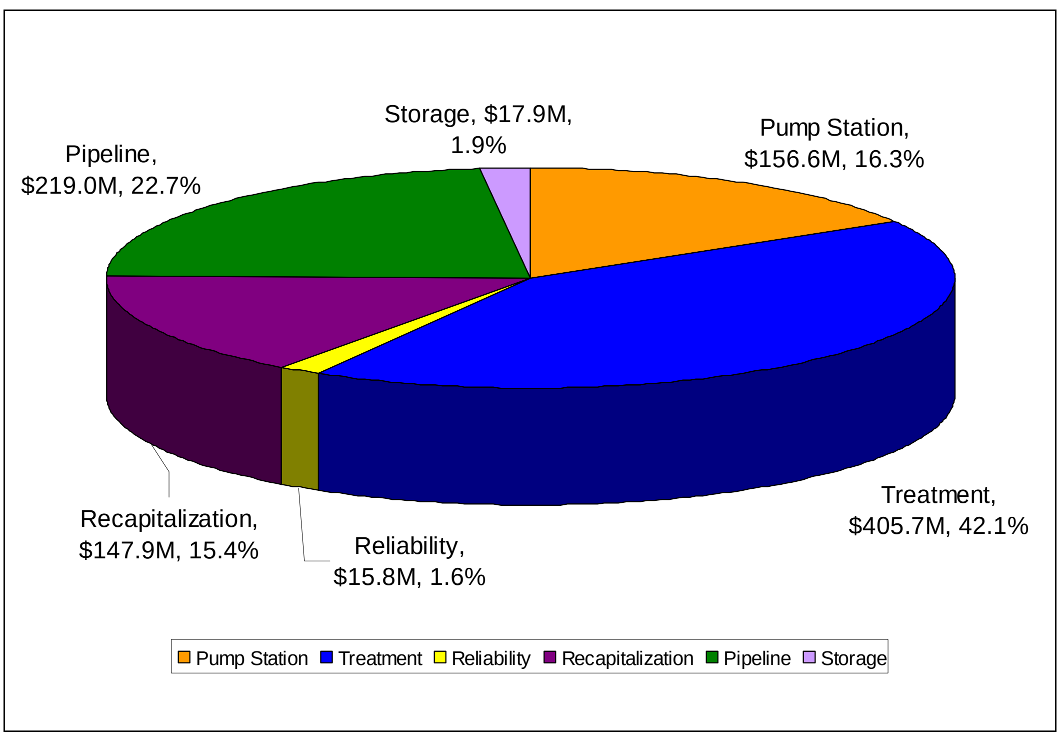
It should be noted that the indentified costs per fiscal year include the total required capital costs for funding each project. Actual capital expenditures for projects could extend out over the course of the project duration, which in some cases could be several years.

Table ES.8	Summary of Project Phasing Capital Implementation Master Plan West Basin Municipal Water District		
Planning Phase	**Planning Year**	**Capital Cost**	**Percentage of Total Capital Cost**
FY09/15	FY09/10	$15,103,800	1.6%
	FY10/11	$68,910,280	7.2%
	FY11/12	$251,866,558	26.2%
	FY12/13	$16,715,280	1.7%
	FY13/14	$25,520,280	2.7%
	FY14/15	$9,990,280	1.0%
	FY09/15	***$388,106,478***	***40.3%***
FY15/20		$226,831,400	23.6%
Subtotal	***FY09-20***	***$614,937,878***	
FY20/25		$163,327,500	17.0%
FY25/30		$184,597,500	19.2%
Total		**$962,862,878**	**100.0%**

ES.7.3 CIP by Facility Type

The CIP cost distribution by project type is depicted on Figure ES.11.

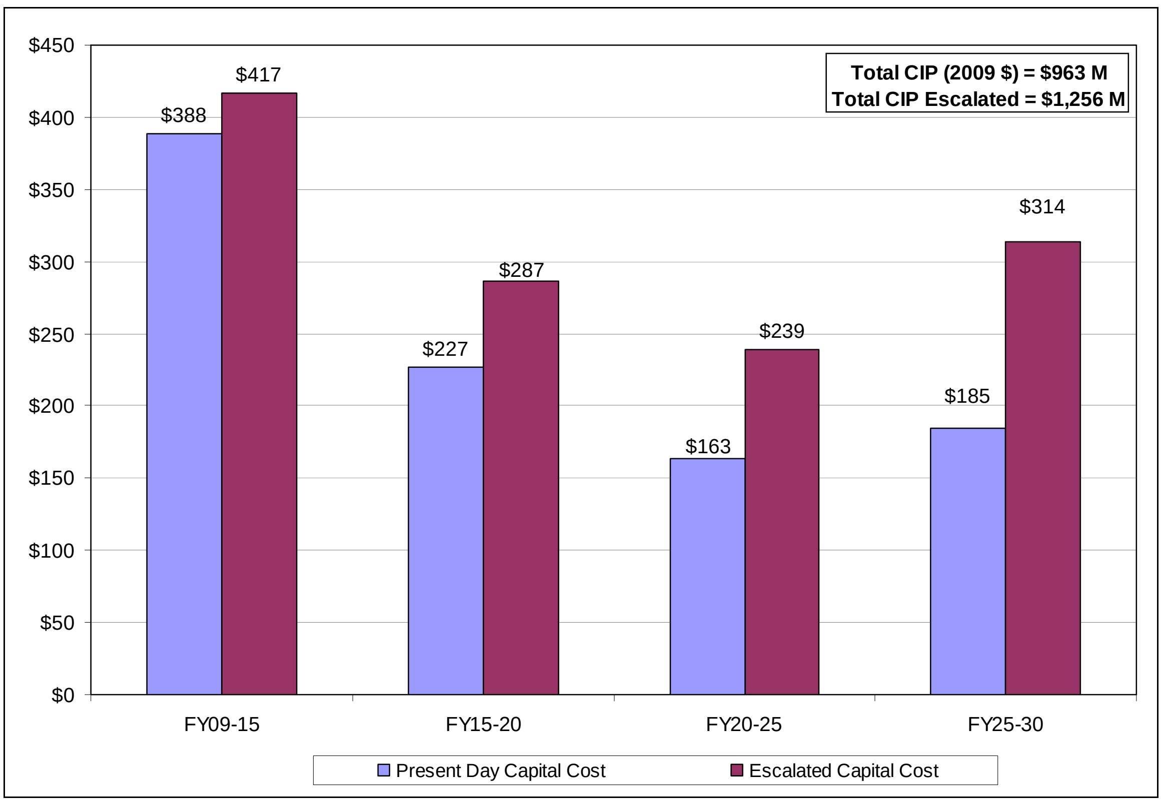
Figure ES.11
Distribution of Capital Improvement Costs by Facility Type



As shown on Figure ES.11, the majority of costs are related to water treatment, consisting of $406M (42 percent) of the 2030 CIP. It should be noted that the additional treatment capacity is required to meet the projected demand and is not associated with any particular treatment plant location. As discussed in Section ES.5, adding a treatment plant to treat secondary effluent from the JWPCP is approximately $25M less costly than using the Hyperion WWTP as West Basin's sole source of supply. The total CIP would be approximately $987M if West Basin does not take supply from JWPCP.

The CIP costs presented above are all based on 2009 dollars. However, as most projects will be implemented in the future, the actual CIP cost will be higher based on the phasing of each project. The CIP presented on Figure ES.12 shows the escalated CIP cost for each project phase with and without cost escalation, using an annual inflation rate of 3 percent. As presented in Figure ES.12, the escalated cost of the $963M (2009 Dollars) is $1,256M.

Figure ES.12
Breakdown of Capital Costs by Phase including Escalation



The anticipated project locations are shown on Figures ES.13, ES.14, ES.15, and ES.16. Projects shown on these figures are labeled with project identifiers which are discussed in Chapter 9. Only pipeline projects are depicted on these figures. Details on other types of projects included in the CIP can be found in Chapter 9.

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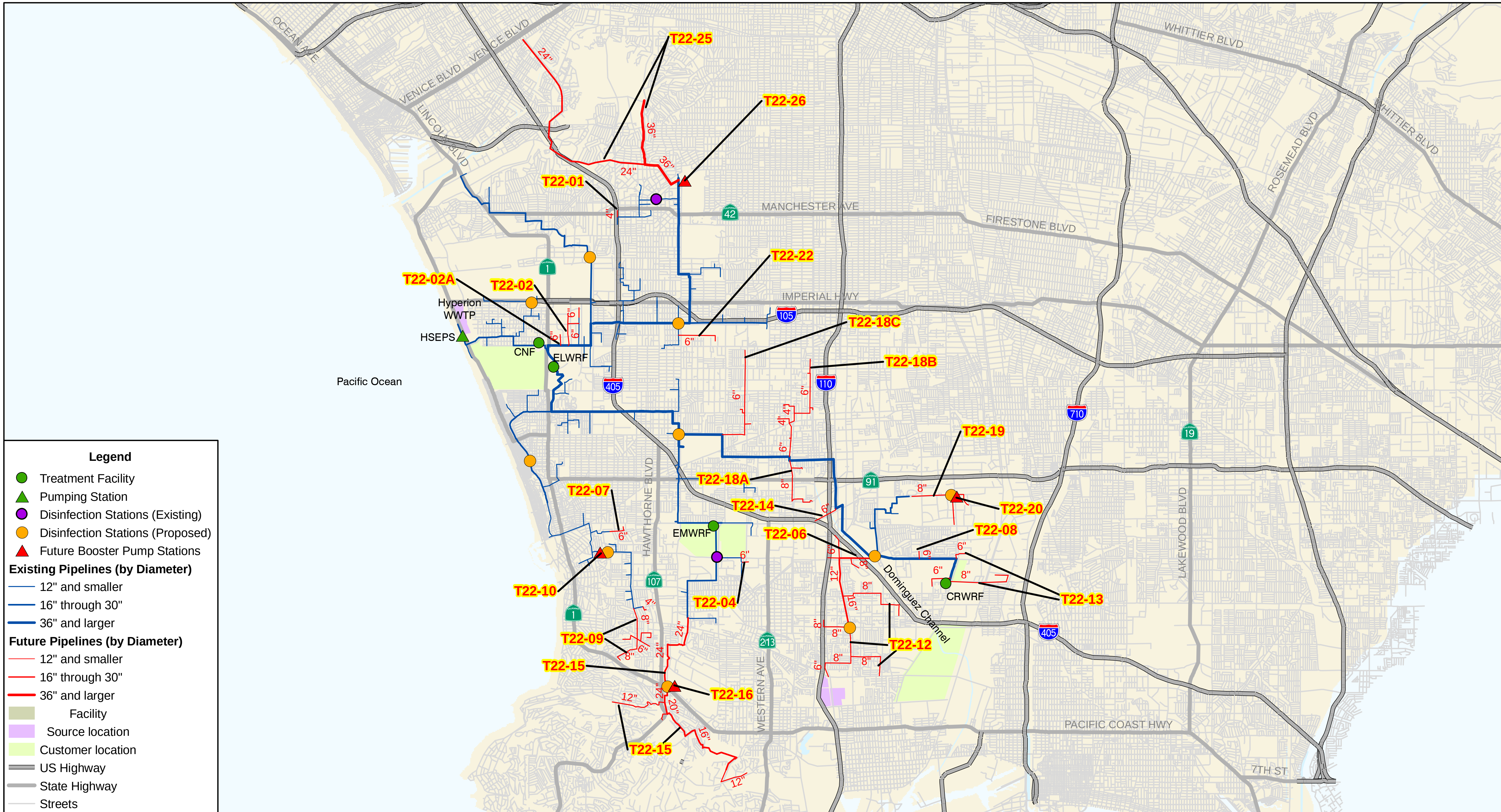

Figure ES.13
Title 22 CIP Projects

carollo in association with AKM SPI

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

1 0.5 0 1 2 3
Miles

carollo
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SPI

Figure ES.14
Edward C. Little Water Recycling Facility (ELWRF) Area CIP

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

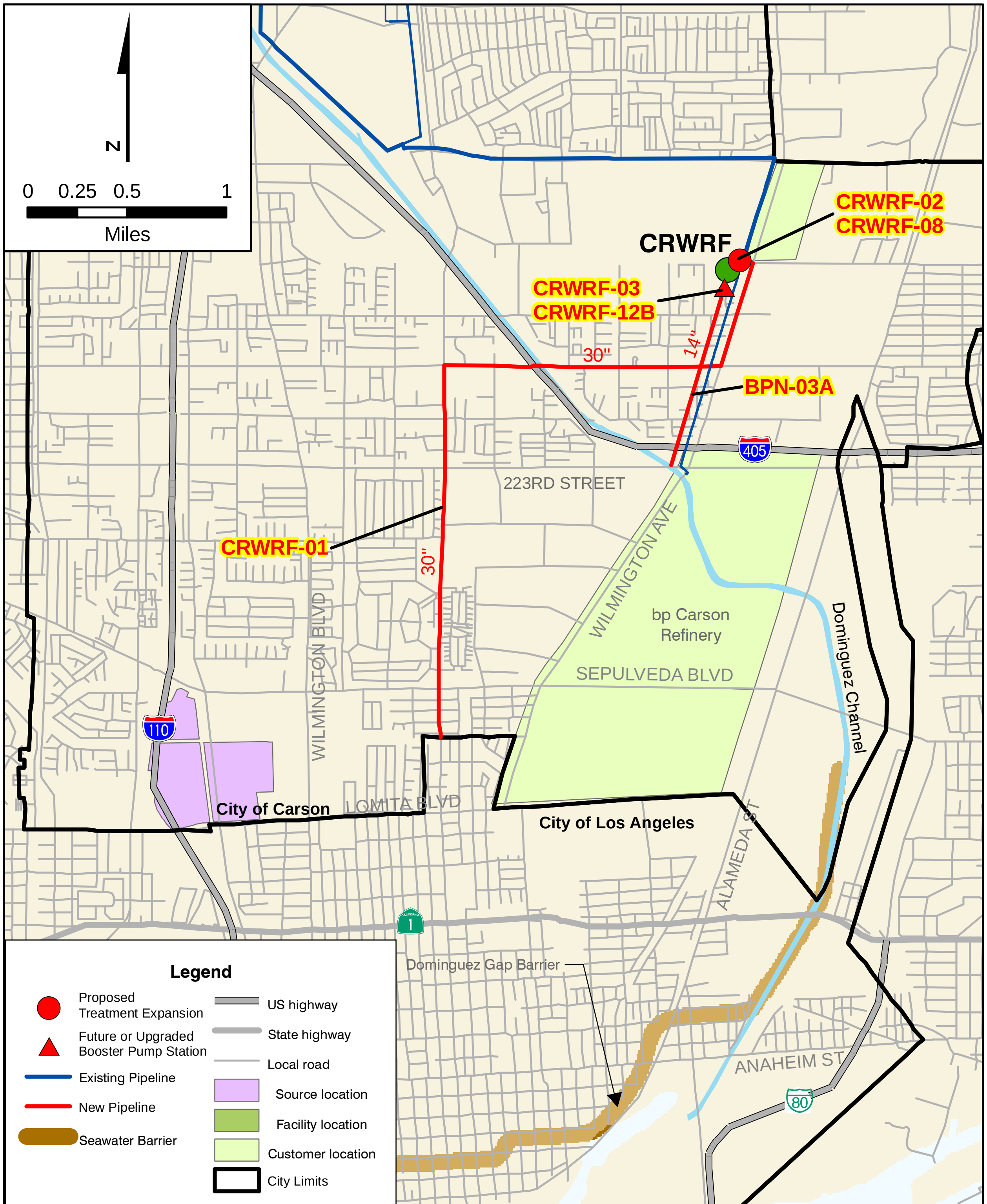

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Figure ES.15
Carson Regional Water Recycling Facility (CRWRF) Area CIP

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

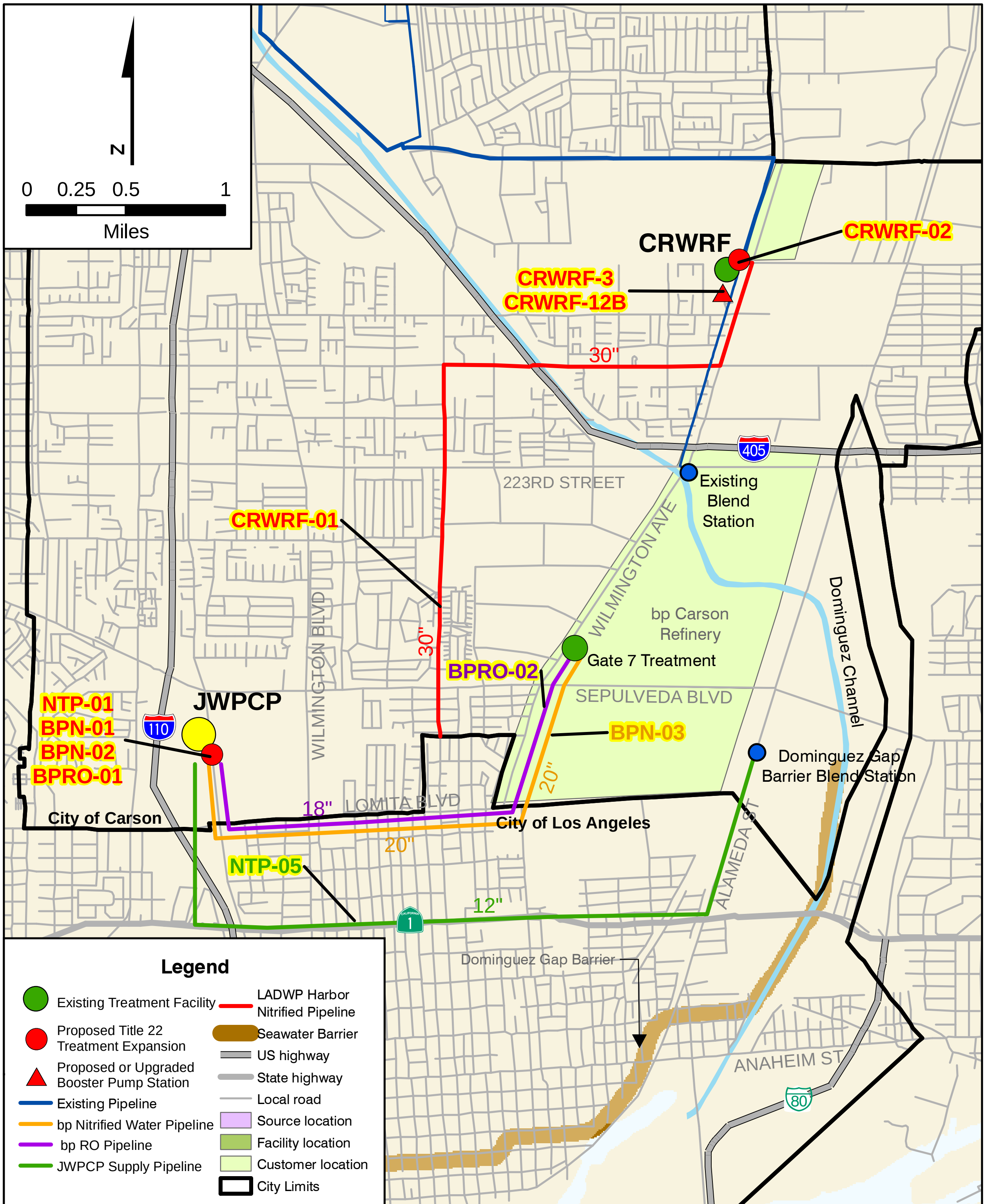

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Figure ES.16
New Treatment Plant (NTP) Area CIP

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

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RECYCLED WATER DEMANDS

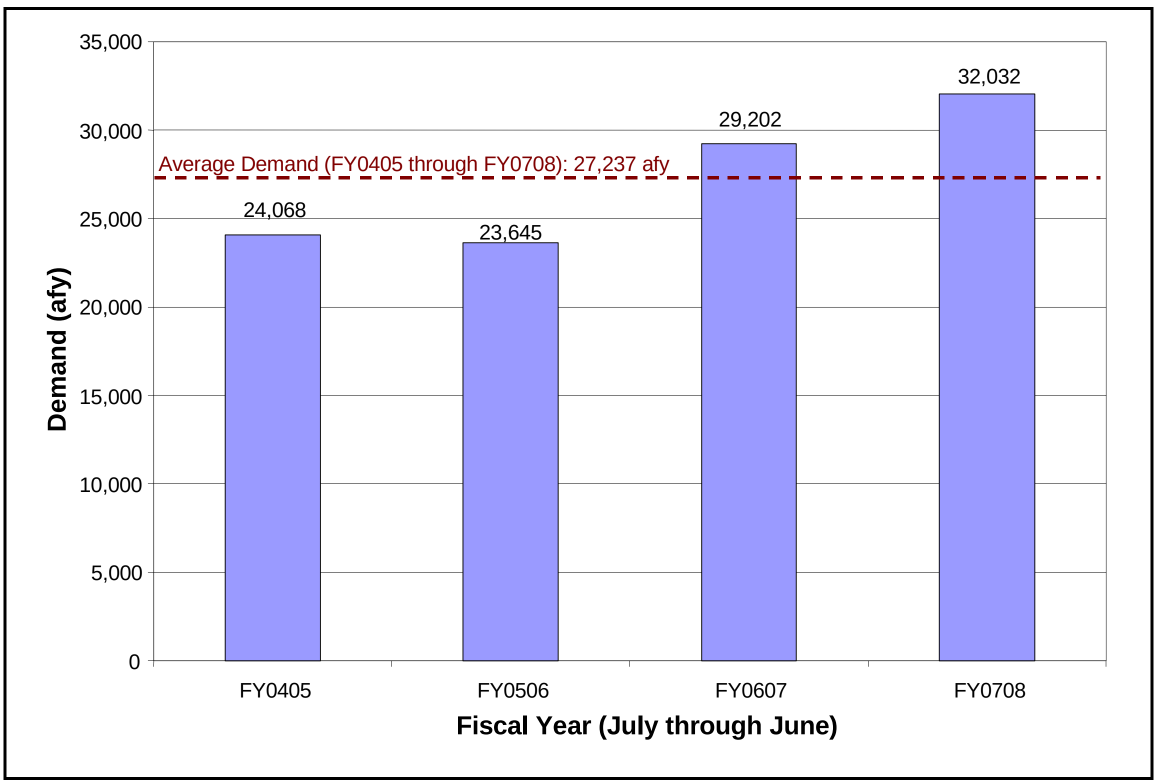
This chapter presents a discussion of the West Basin Municipal Water District (West Basin) recycled water demands. West Basin's historical recycled water demand is presented first, followed by a discussion of the recycled water demand factors and peaking factors that are used to estimate the recycled water demands of potential future recycled water customers. The projected recycled water demands are included at the end of the chapter.

3.1 HISTORICAL RECYCLED WATER DEMANDS

West Basin's existing recycled water customer sites and the existing recycled water distribution system are shown on Figure 3.2. The current recycled water customers can be divided into four user types: industrial, irrigation, mixed use, and barrier customers. Mixed use refers to customer that use recycled water for more than one usage type (e.g., irrigation and cooling towers).

The historical demand presented on Figure 3.1 is derived from West Basin's historical recycled water usage records for the last four years, fiscal year (FY) 2004/05 through FY 2007/08.

Figure 3.1
Historical Recycled Water Usage



As shown on Figure 3.1, the recycled water demands have increased from 24,068 to 32,032 acre-feet per year (afy) during this period, which equates to an average increase of nearly 7.5 percent per year. Based on FY2007/08, the existing average annual demand is 32,032 afy or 28.6 million gallons per day (mgd).

3.2 EXISTING CUSTOMERS

West Basin's customer database summarizes the historical consumption of all existing customers, and lists the customer type, water purveyor, and address information for each customer.

As of September 2008, West Basin serves over 200 customer connections with various types of recycled water qualities. The existing customer demands and usage types are summarized in Table 3.1. The distribution of the existing recycled water demand by customer type is also shown on Figure 3.3.

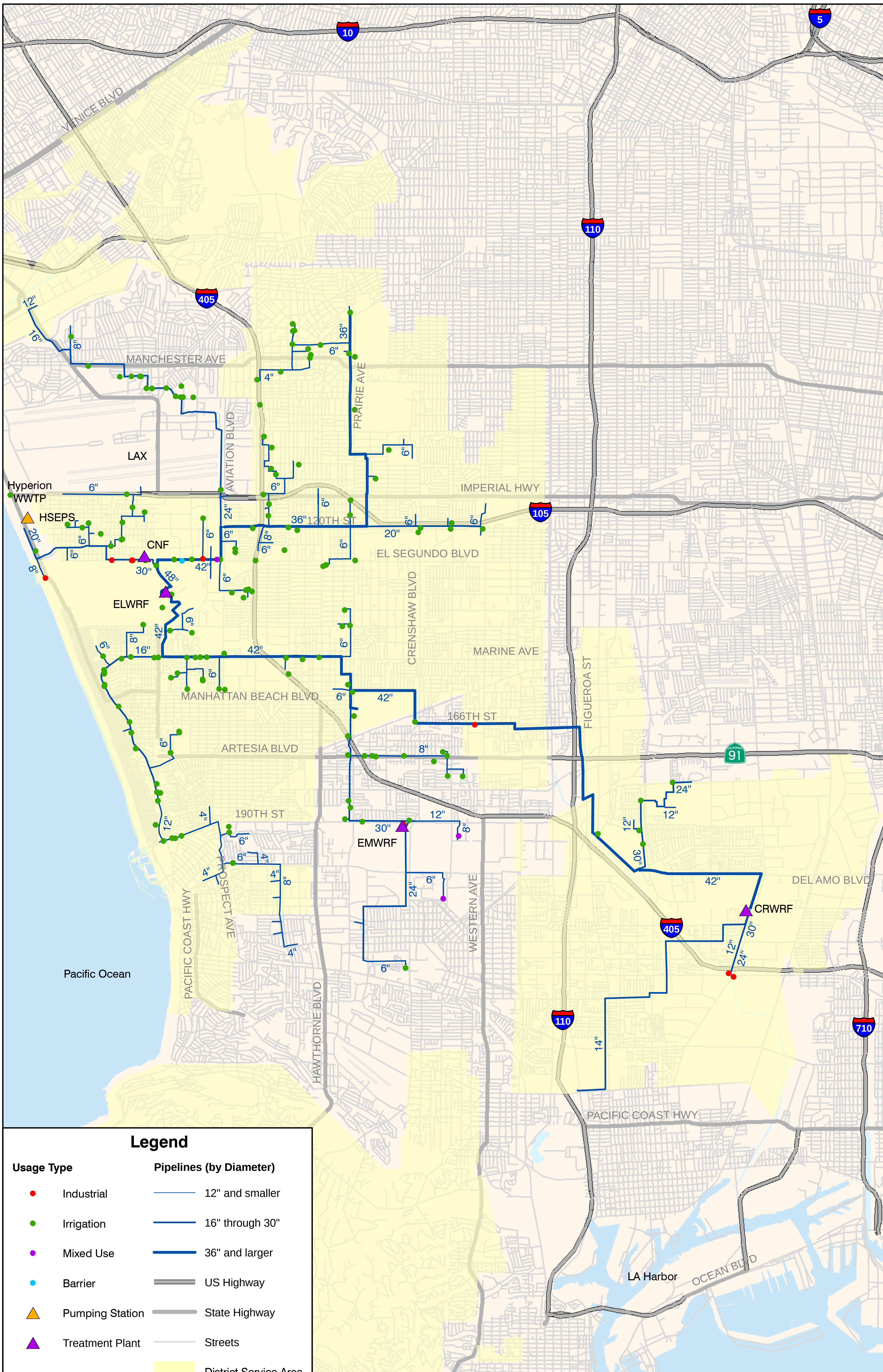
Table 3.1 Existing Demand by Usage Type
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Type	Usage Type Code	Customers	Demand[1] (afy)	Percent of Total (%)
Barrier	B	1	11,380	36
Industrial	IN	5	17,018	53
Irrigation	IR	165	3,257	10
Mixed Use	MU	4	205	<1
Total		**175**	**31,860**	**100**

Note:
(1) Based on the planning average demand (from Table 3.2)

As shown on Table 3.1 and Figure 3.3, the majority of the existing demand is categorized as Industrial, representing approximately 53 percent of the existing demand while the majority of customers are categorized as irrigation usage. This indicates that the industrial demands present a significant portion of overall recycled water usage and provide a solid baseline of usage within the West Basin's customer base.

The existing customers and their respective usage type and average annual demands are listed in Table 3.2. Table 3.2 also indicates the Database IDs that correspond with the detailed customer maps that are included in Appendix B. The customers listed in Table 3.2 are sorted based on the Database IDs to allow easy referencing with the customer maps.



in association with

Figure 3.2
Existing Recycled Water Customer by User Type

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID[1]	Customer Name	Usage Type Code[2]	Service Area	Average Historic Demand (afy)[3]	Maximum Month Demand[3] (acre-feet)	Seasonal Peaking Factor[4]	Planning Average Annual Demand[5] (afy)	Planning Maximum Month Demand (mgd)
E1	ExxonMobil Torrance Refinery - Cooling Towers	IN	No	4,136	408	1.2	4,135	4.38
E2	Chevron Nitrification Plant	IN	Yes	3,487	399	1.4	3,500	4.27
E3	bp Carson Refinery - Industrial RO Component	IN	Yes	2,783	394	1.7	2,800	4.22
E4	Chevron El Segundo Refinery - High Pressure Boiler Feed	IN	Yes	2,804	250	1.1	2,800	2.68
E5	ExxonMobil Torrance Refinery - Boiler Feed	IN	No	2,015	223	1.3	2,015	2.38
E6	Chevron El Segundo Refinery - Low Pressure Boiler Feed	IN	Yes	1,107	139	1.5	1,100	1.49
E7	bp Carson Refinery - Nitrified Component	IN	Yes	571	65	1.3	600	0.69
E8	Inglewood Park Cemetery	IR	Yes	469	89	2.3	470	0.96
E9	Victoria Golf Course	IR	Yes	235	59	2.8	250	0.63
E10	Chester Washington Golf Course	IR	Yes	227	50	2.6	230	0.53
E11	Cal State Univ Dominguez	IR	Yes	121	26	2.1	150	0.28
E12	Chevron El Segundo Refinery - Irrigation	IR	Yes	131	20	1.8	130	0.21
E13	Anschutz So Cal Sports (Home Depot Center)	IR	Yes	109	18	2.0	109	0.20
E14	Centinela (Vincent) Park	IR	Yes	105	18	2.1	105	0.20
E15	Toyota	MU	No	94	15	1.9	95	0.16
E16	LAX @ 6400 Westchester Parkway	IR	No	89	16	2.2	89	0.17
E17	Columbia Park	IR	No	88	19	2.6	96	0.22

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID[1]	Customer Name	Usage Type Code[2]	Service Area	Average Historic Demand (afy)[3]	Maximum Month Demand[3] (acre-feet)	Seasonal Peaking Factor[4]	Planning Average Annual Demand[5] (afy)	Planning Maximum Month Demand (mgd)
E18	So Cal Edison - El Segundo Generating Station	IN	Yes	67	11	1.9	67	0.11
E19	Hyperion Treatment Plant	IR	No	58	18	3.7	58	0.19
E20	American Honda	MU	No	50	8	2.2	50	0.10
E21	El Segundo Golf Course	IR	Yes	49	10	2.4	50	0.11
E22	Morningside School	IR	Yes	47	10	2.4	50	0.11
E23	Goodyear Airship Station	IR	Yes	44	12	3.4	44	0.13
E24	Loyola Marymount University	IR	No	21	16	4.5	43	0.17
E25	Westchester Park	IR	No	42	10	3.0	42	0.11
E26	Mira Costa High School	IR	Yes	38	6	1.9	38	0.06
E27	Dominguez Park	IR	Yes	36	7	2.2	36	0.07
E28	Recreation Park - El Segundo	IR	Yes	34	6	2.2	34	0.07
E29	Polliwog Park	IR	Yes	33	10	3.6	33	0.11
E30	LA Airforce Base Area B	MU	Yes	29	7	2.7	30	0.07
E31	ExxonMobil Torrance Refinery - Irrigation	IR	No	29	7	2.9	29	0.08
E32	Glasgow Park	IR	Yes	73	10	4.9	24	0.10
E33	Hermosa Greenbelt	IR	Yes	23	5	2.3	23	0.05
E34	Hawthorne Blvd/Marine	IR	Yes	22	4	2.1	22	0.04
E35	Alondra Park (West)	IR	Yes	20	5	2.9	20	0.05
E36	Avalon Median N/Elsmere	IR	Yes	20	3	1.9	20	0.03
E37	Hawthorne High School	IR	Yes	21	6	3.4	20	0.06

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID(1)	Customer Name	Usage Type Code(2)	Service Area	Average Historic Demand (afy)(3)	Maximum Month Demand(3) (acre-feet)	Seasonal Peaking Factor(4)	Planning Average Annual Demand(5) (afy)	Planning Maximum Month Demand (mgd)
E38	LAX @ 6662 West 88th St	IR	No	20	3	1.9	20	0.03
E39	Washington Park	IR	Yes	20	4	2.6	20	0.05
E40	Hermosa Valley Park II	IR	Yes	19	4	2.7	19	0.05
E41	Marine Avenue Park	IR	Yes	19	4	2.5	19	0.04
E42	Rogers Park	IR	Yes	19	3	2.0	19	0.03
E43	Grandview Elementary / Ladera	IR	Yes	6	1	2.0	18	0.03
E44	Pennekamp Elementary School	IR	Yes	13	2	1.5	18	0.02
E45	Center Elementary School	IR	Yes	17	5	3.2	17	0.05
E46	Scattergood Power Plant	IR	No	3	1	5.0	17	0.08
E47	Carl Neilson Youth Park	IR	No	16	3	2.2	16	0.03
E48	Condon Park (Lennox Park)	IR	Yes	8	2	1.1	16	0.02
E49	Hawthorne Medians	IR	Yes	16	2	1.5	16	0.02
E50	Holly Park	IR	Yes	16	3	2.3	16	0.03
E51	Middle School (prev LA Raiders Headquarters)	IR	Yes	16	4	2.9	16	0.04
E52	El Segundo High School	IR	Yes	15	3	2.3	15	0.03
E53	Lennox Middle School	IR	Yes	15	4	3.1	15	0.04
E54	Plaza El Segundo	IR	Yes	12	3	2.5	15	0.03
E55	Sports Park	IR	Yes	15	3	2.0	15	0.03
E56	Caltrans (I-405/La Cienega)	IR	Yes	14	11	3.8	14	0.05
E57	Guenser Park	IR	No	14	3	2.6	14	0.03

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID[(1)]	Customer Name	Usage Type Code[(2)]	Service Area	Average Historic Demand (afy)[(3)]	Maximum Month Demand[(3)] (acre-feet)	Seasonal Peaking Factor[(4)]	Planning Average Annual Demand[(5)] (afy)	Planning Maximum Month Demand (mgd)
E58	Mar Brad Middle School - La Marina Field	IR	Yes	14	3	2.1	14	0.03
E59	Rogers Anderson Park	IR	Yes	14	4	3.8	14	0.05
E60	Valley/Ardmore Greenbelt @ 19th St	IR	Yes	14	3	2.4	14	0.03
E61	Caroline Coleman Stadium	IR	Yes	13	3	2.9	13	0.03
E62	Lawndale Union High School District	IR	Yes	13	3	2.9	13	0.03
E63	Caltrans (I-405/Imperial)	IR	Yes	12	4	3.8	12	0.04
E64	Dana-Burnett Elementary School	IR	Yes	12	5	5.4	12	0.06
E65	Del Air Park	IR	Yes	12	3	2.6	12	0.03
E66	Federal Building - Hawthorne	IR	Yes	12	3	2.5	12	0.03
E67	Hughes Way Storm Drain Plant # 18	IR	Yes	12	6	5.6	12	0.06
E68	Leuzinger High School	IR	Yes	12	5	4.8	12	0.05
E69	Manhattan Studios	IR	Yes	12	2	1.6	12	0.02
E70	MB Middle School (Bell Ave South of Park)	IR	Yes	12	2	2.0	12	0.02
E71	Sunny Glenn Park	IR	No	12	2	2.2	12	0.02
E72	Caltrans (I-405/117th)	IR	Yes	10	3	3.4	10	0.03
E73	Manhattan Village Park	IR	Yes	9	2	2.4	10	0.02
E74	Marine Avenue Median	IR	Yes	4	1	2.0	10	0.02
E75	South Park - Hermosa Beach	IR	Yes	10	2	2.4	10	0.02
E76	Torrance Business Center	IR	No	10	2	1.9	10	0.02
E77	Valley/Ardmore Greenbelt @ 2nd	IR	Yes	10	2	2.6	10	0.02

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID(1)	Customer Name	Usage Type Code(2)	Service Area	Average Historic Demand (afy)(3)	Maximum Month Demand(3) (acre-feet)	Seasonal Peaking Factor(4)	Planning Average Annual Demand(5) (afy)	Planning Maximum Month Demand (mgd)
E78	Anza Elementary School	IR	Yes	13	4	5.1	9	0.04
E79	Clark Park	IR	Yes	9	2	2.2	9	0.02
E80	Hawthorne Memorial Park	IR	Yes	9	1	1.9	9	0.01
E81	Inglewood City Hall	IR	Yes	9	1	1.6	9	0.01
E82	Magruder Middle School	IR	No	9	2	3.1	9	0.02
E83	Sepulveda Elementary School	IR	Yes	9	2	2.5	9	0.02
E84	Valley/Ardmore Greenbelt @ Ardmore	IR	Yes	9	3	3.6	9	0.03
E85	Aviation Park	IR	Yes	9	2	3.3	8	0.02
E86	Caltrans (I-105/Van Ness)	IR	Yes	6	2	3.3	8	0.02
E87	Caltrans (I-105/York St)	IR	Yes	8	5	7.7	8	0.05
E88	Casimir School	IR	No	8	3	3.7	8	0.03
E89	The Edge at Campus El Segundo	IR	Yes	N/A	N/A	2.5	8	0.02
E90	Hermosa Valley Elementary School	IR	Yes	8	2	2.7	8	0.02
E91	Imperial Ave. Parkway	IR	Yes	8	1	2.1	8	0.02
E92	LAX @ 5985 Westchester Parkway	IR	No	8	1	1.8	8	0.01
E93	11310 Aviation Blvd	IR	No	7	2	2.9	7	0.02
E94	Begg Elementary School	IR	Yes	7	2	3.0	7	0.02
E95	Caltrans (I-405/135th)	IR	Yes	7	3	5.1	7	0.03
E96	El Segundo Library Park	IR	Yes	7	1	2.1	7	0.01
E97	Eucalyptus Avenue School	IR	Yes	7	1	2.3	7	0.01

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID(1)	Customer Name	Usage Type Code(2)	Service Area	Average Historic Demand (afy)(3)	Maximum Month Demand(3) (acre-feet)	Seasonal Peaking Factor(4)	Planning Average Annual Demand(5) (afy)	Planning Maximum Month Demand (mgd)
E98	Inglewood Water Treatment Plant	IR	Yes	7	1	1.7	7	0.01
E99	Jane Addams Park	IR	Yes	7	2	2.8	7	0.02
E100	McMaster Park	IR	No	7	2	3.1	7	0.02
E101	Robinson Elementary School	IR	Yes	7	2	3.9	7	0.02
E102	Valley/Ardmore Greenbelt @ M.B.B.S.	IR	Yes	7	1	2.2	7	0.01
E103	Center Park	IR	Yes	6	1	2.3	6	0.01
E104	Eucalyptus Park	IR	Yes	6	1	2.7	6	0.01
E105	LAX @ 6100 Will Rogers Street	IR	No	6	2	4.1	6	0.02
E106	Meadows Elementary School	IR	Yes	6	1	2.7	6	0.01
E107	Nash & Continental Medians	IR	Yes	6	1	2.1	6	0.01
E108	Richmond School	IR	Yes	6	2	3.3	6	0.02
E109	Arlington School	IR	No	5	1	3.4	5	0.02
E110	Buford Elementary School	IR	Yes	5	2	5.6	5	0.02
E111	Crozier Jr. High	IR	Yes	7	2	2.9	5	0.01
E112	Descanso Park	IR	No	5	1	2.9	5	0.01
E113	Hawthorne Intermediate School	IR	Yes	5	1	2.9	5	0.01
E114	Hughes Way Median	IR	Yes	5	1	2.3	5	0.01
E115	LAX @ 6100 Westchester Parkway Park	IR	No	6	1	2.5	5	0.01
E116	Market Street Medians	IR	Yes	5	1	1.3	5	0.01
E117	Valley/Ardmore Greenbelt @ 8th St	IR	Yes	5	1	3.2	5	0.01

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID[1]	Customer Name	Usage Type Code[2]	Service Area	Average Historic Demand (afy)[3]	Maximum Month Demand[3] (acre-feet)	Seasonal Peaking Factor[4]	Planning Average Annual Demand[5] (afy)	Planning Maximum Month Demand (mgd)
E118	York Avenue School	IR	Yes	5	1	3.2	5	0.01
E119	Marine & Sepulveda Median	IR	Yes	5	1	2.9	4	0.01
E120	Bell Industries	IR	Yes	4	1	2.5	4	0.01
E121	Cabrillo Elementary School	IR	Yes	4	2	4.7	4	0.02
E122	Caltrans (I-405/Redondo Beach)	IR	Yes	4	3	2.4	4	0.01
E123	Florence Median	IR	Yes	4	1	2.0	4	0.01
E124	Hermosa Beach Community Center	IR	Yes	4	1	2.6	4	0.01
E125	LAX @ 5990 Westchester Parkway	IR	No	4	1	2.9	4	0.01
E126	Marine Avenue Median	IR	Yes	1	1	2.0	4	0.01
E127	MB Fire & Police Landscape	IR	Yes	1	1	3.2	4	0.01
E128	Queen Park	IR	Yes	4	1	2.5	4	0.01
E129	Caltrans (I-405/El Segundo)	IR	Yes	3	2	6.0	3	0.02
E130	El Segundo Medians	IR	Yes	3	1	2.6	3	0.01
E131	LAX @ 6101 Westchester Parkway Park	IR	No	3	1	4.7	3	0.01
E132	Lowe's	IR	Yes	3	1	3.4	3	0.01
E133	Maryland Hilltop Park	IR	Yes	2	1	1.8	3	<0.01
E134	Valley/Ardmore Greenbelt @ 15th St	IR	Yes	3	1	2.8	3	0.01
E135	190th St./Prospect Ave Medians	IR	Yes	2	0	2.1	2	<0.01
E136	Artesia Blvd / Kornblum	IR	No	2	1	3.4	2	0.01
E137	Artesia Blvd / Prairie	IR	No	2	0	2.4	2	<0.01

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID[1]	Customer Name	Usage Type Code[2]	Service Area	Average Historic Demand (afy)[3]	Maximum Month Demand[3] (acre-feet)	Seasonal Peaking Factor[4]	Planning Average Annual Demand[5] (afy)	Planning Maximum Month Demand (mgd)
E138	Artesia Blvd / Van Ness	IR	No	2	1	3.2	2	0.01
E139	Artesia Blvd median	IR	No	2	1	4.6	2	0.01
E140	Caltrans (I-405/Century)	IR	Yes	2	2	11.6	2	0.02
E141	Caltrans (I-405/Inglewood)	IR	Yes	2	2	12.0	2	0.02
E142	Del Taco DT895	IR	Yes	2	2	11.0	2	0.02
E143	Felton Elementary School	IR	Yes	1	1	4.2	2	0.01
E144	Holly Glen Park	IR	Yes	2	0	2.2	2	<0.01
E145	Jefferson School	IR	Yes	2	1	4.0	2	0.01
E146	LAX @ 6440 West 88th St Median	IR	No	2	1	2.7	2	<0.01
E147	LAX @ 6450 West 88th St Sound Wall	IR	No	2	0	2.2	2	<0.01
E148	Live Oak Park	IR	Yes	2	1	3.3	2	0.01
E149	Marine & Herrin Median	IR	Yes	2	0	2.0	2	<0.01
E150	MB Unified School District Admin	IR	Yes	2	1	2.5	2	<0.01
E151	Rosecrans Medians @ Pine	IR	Yes	2	1	3.4	2	0.01
E152	Sycamore Park	IR	Yes	2	1	2.9	2	0.01
E153	Washington Avenue School	IR	Yes	2	1	3.5	2	0.01
E154	190th St, 3403 - Median	IR	No	<1	<1	7.1	1	0.01
E155	Crenshaw Lumber	IN	Yes	1	1	8.8	1	0.01
E156	Del Aire Assembly of God	IR	Yes	1	1	8.0	1	0.01
E157	Falda Ave	IR	Yes	1	2	3.6	1	<0.01

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Database ID(1)	Customer Name	Usage Type Code(2)	Service Area	Average Historic Demand (afy)(3)	Maximum Month Demand(3) (acre-feet)	Seasonal Peaking Factor(4)	Planning Average Annual Demand(5) (afy)	Planning Maximum Month Demand (mgd)
E158	Hermosa Beach Library And City Hall	IR	Yes	1	0	2.4	1	<0.01
E159	Herondo/Francisca Median	IR	Yes	1	0	3.2	1	<0.01
E160	LAX @ 6147 Westchester Parkway Park	IR	No	1	0	2.0	1	<0.01
E161	LAX @ 6525 West 88th St	IR	No	1	0	4.3	1	<0.01
E162	Marine Triangle Median	IR	Yes	1	0	4.1	1	<0.01
E163	PCH/Herondo-King Harbor Park	IR	Yes	1	1	9.7	1	0.01
E164	The Parking Spot	IR	No	1	0	1.7	1	<0.01
E165	Redondo Union High School	IR	Yes	N/A	N/A	2.7	34	0.08
E166	Aerospace	MU	Yes	N/A	N/A	2.5	30	0.07
E167	Hawthorne Municipal Airport	IR	Yes	<1	0	6.8	0	<0.01
E168	PCH/190th Street Median	IR	Yes	<1	<1	3.6	0	<0.01
E169	Redondo Technology Center	IR	Yes	4	1	2.6	4	0.01
E170	City Storm Water Detention	IR	Yes	<1	0	3.3	0	<0.01
E171	Storm Drain Plant 17	IR	Yes	<1	0	1.9	1	<0.01
E172	Caltrans (1-105 / Crenshaw)	IR	Yes	6	4	4.4	10	0.04
E173	City Service Yard	IR	Yes	<1	0	4.8	0	<0.01
E174	Grevillea Mall Park	IR	Yes	4	1	2.9	4	0.01
E175	Hollywood Park	IR	Yes	18	3	1.8	18	0.03
E176	1508 Aviation	IR	Yes	<1	0	2.1	0	<0.01
E177	2202 Aviation	IR	Yes	<1	0	2.4	1	<0.01

Table 3.2 Existing Customers
Capital Implementation Master Plan
West Basin Municipal Water District

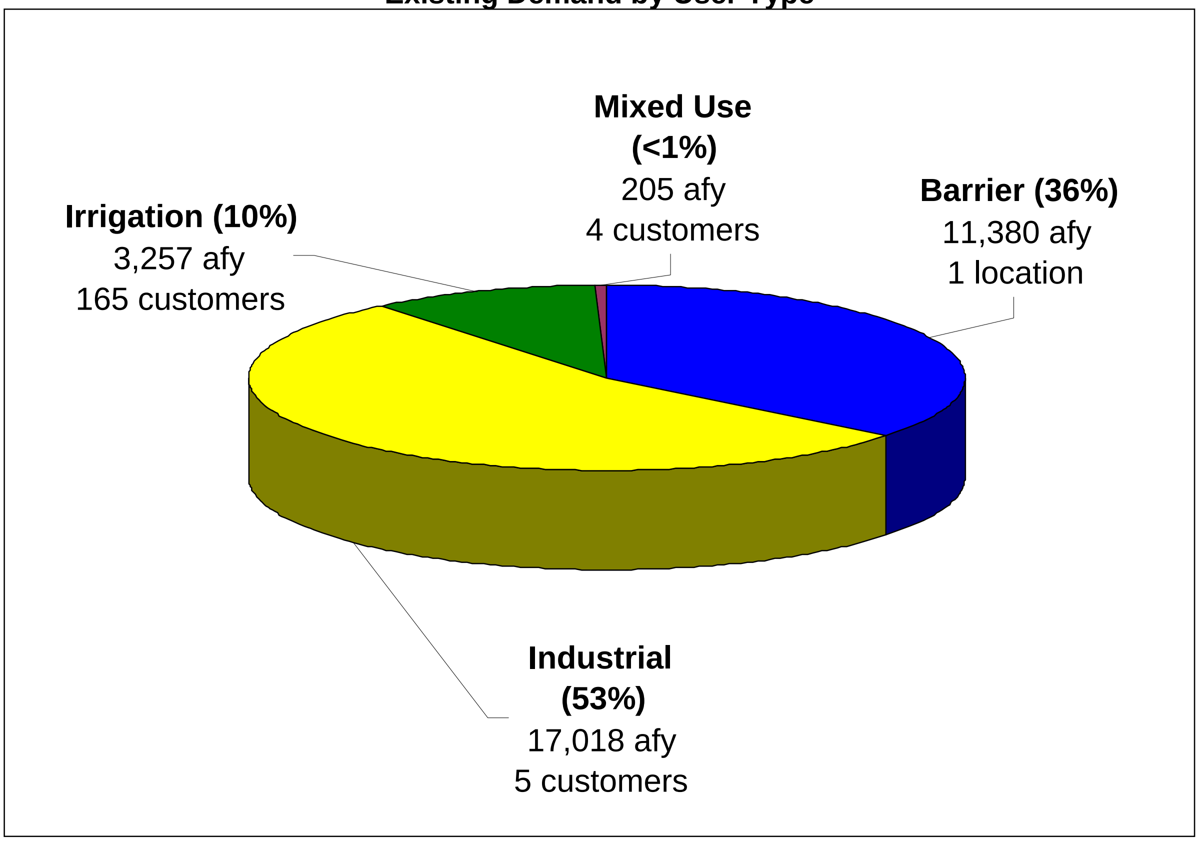
Database ID[1]	Customer Name	Usage Type Code[2]	Service Area	Average Historic Demand (afy)[3]	Maximum Month Demand[3] (acre-feet)	Seasonal Peaking Factor[4]	Planning Average Annual Demand[5] (afy)	Planning Maximum Month Demand (mgd)
E178	Dorsey Field	IR	Yes	8	2	2.2	8	0.02
E179	Voorhees Sump	IR	Yes	<1	<1	2.6	1	<0.01
E180	City of Lawndale	IR	Yes	<1	1	11.5	1	0.01
E181	West Coast Barrier	B	Yes	7,104	1,075	1.0	11,380	10.16
Total (Customers in Service Area[7])				20,495	2,910		25,037	30.01
Total (Customers Outside Service Area[7])				6,723	769		6,824	8.41
Total				**27,218**	**3,680**	**1.4[6]**	**31,860**	**38.42**

Notes:
(1) The locations of these customers are depicted on detailed customer maps in Appendix B.
(2) IR = Irrigation; IN = Industrial; MU = Mixed Use; B = Barrier
(3) Calculated using historical monthly billing records from FY2004/05 through FY 2007/08. For customers which were connected after FY2004/05, average was only calculated for period of connection. Source: Historical Usage by Customer (West Basin, 2008). N/A indicates no historical data available.
(4) Maximum Month Demand divided by Average Historic Demand, corrected for variation in the number of days in each month. In some cases, peaking factors were adjusted to correct erroneous billing data. For future planning years, seasonal peaking factors over 3.0 were reduced to 3.0.
(5) Existing Demand established in the customer database through consultation with West Basin staff. Customer Database can be found in Appendix C.
(6) Based on weighted demand of all customers by historical average use.
(7) Service area designation is included in the customer database in Appendix C and was established based on consultation with West Basin staff.

The seasonal peaking factors listed in Table 3.2 are based on the average maximum month peaking factor obtained from historical records of the last four fiscal years.

As shown in Table 3.2, the total planning demand of the existing customers is 31,860 afy or 28.4 mgd. Using the seasonal peaking factors of each customer, this corresponds to a maximum day demand of 38.4 mgd. As shown in Table 3.2, the aggregate seasonal peaking factor representing maximum month demand for all existing customers is calculated to be 1.4. In this study, it is assumed that the seasonal peaking factors, which are based on the maximum month demand also represent the maximum day demands. Based on discussions with West Basin staff, it was determined that this was reasonable since high demand periods in West Basin's recycled water systems extend over longer periods than those experienced in potable water systems. A more detailed discussion on the use of maximum month versus maximum day demand is provided in Section 3.4.2.1.

Figure 3.3
Existing Demand by User Type



It should be noted that the number of Database IDs shown in Table 3.2 does not exactly correspond to the number of customers served by West Basin, since demands for customers receiving multiple types of recycled water are listed individually by water quality type in Table 3.2.

West Basin provides five different types of recycled water qualities specifically processed to accommodate its existing customer needs. Customers historically receiving multiple types of recycled water, as well as customers using recycled water for multiple applications, are listed in Table 3.3. Table 3.3 lists four types of recycled water qualities. The fifth type is Barrier Water, a specific water quality for injection into the West Coast Seawater Barrier.

**Table 3.3 Existing Multi-Use Customers
Capital Implementation Master Plan
West Basin Municipal Water District**

	Title 22					
Customer Name	**Irriga-tion (afy)**	**Non-Potable (afy)**	**Cooling (afy)**	**Nitrified (afy)**	**Industrial RO (afy)**	**Industrial RO Ultra (afy)**
bp Carson Refinery	0	0	0	571	2,783	0
Chevron El Segundo Refinery	131	0	0	3,487	1,107	2,804
Los Angeles Air Force Base (Area B)(1)	12	17	0	0	0	0
American Honda(1)	18	3	30	0	0	0
Toyota Campus(1)	24	14	56	0	0	0
ExxonMobil Torrance Refinery	29	0	0	4,136	2,015	0
Total	**213**	**34**	**86**	**8,194**	**5,905**	**2,804**

Note:
(1) Approximate breakdown. Exact usage for different types is not metered for billing.

As shown in Table 3.3, of the customers using multiple types of recycled water, the Nitrified water is the most significant, with nearly 8,200 afy used on average. Industrial RO water is the second most significant type, with approximately 5,900 afy used on average. Water demands shown in Table 3.3 are calculated using historical monthly billing records from FY2004/05 through FY 2007/08.

3.3 POTENTIAL FUTURE CUSTOMERS

West Basin staff provided a list of potential customers and their estimated demands. The potential demands, along with the probability and potential timing of providing recycled water services to these customers were determined in collaboration with the West Basin staff. A total of 120 potential new customers were identified, as presented in Table 3.4. The locations of these potential customers are shown on Figure 3.4, and detailed maps can be found in Appendix B showing Database IDs for all existing and potential customers. The Database IDs for the potential new customers are indicated with prefix “P”, while the Database IDs for the existing customers are indicated with a prefix “E”. Customers with an estimated demand greater than 100 afy are indicated with their Database ID on Figure 3.4. The potential customers in Table 3.4 are sorted based on Likelihood of Service from highest probability to lowest probability of service connection, then by year of anticipated service and Database ID.

The estimated demand for the potential customers is based on historical potable water usage, as available. For customers without proper historical data, demands are estimated based on discussions with the potential customer and/or water demand factors discussed in Section 3.4. The seasonal peaking factors listed Table 3.4 are based on analysis conducted on historical billing records from existing customers of similar types. It is assumed that seasonal peaking factors for existing customers with current seasonal peaking factors over 3.0 will be reduced to 3.0, based on efforts by West Basin to work with customers to manage the hours of operation to reduce excessive peaking in the system. Seasonal peaking factors were assigned by usage type and are further discussed in Section 3.4.2.1.

As shown in Table 3.4, the total estimated demand of all potential customers is 50,413 afy. However, when the likelihood of service for these customers is multiplied with the estimated demand, the combined demand of all potential customers is reduced to 33,216 afy. As it is unknown at this time which customers will not receive recycled water, the proposed systems are sized for all potential customers.

As shown in Table 3.4, the estimated demand of potential customers is evenly distributed between customers within (25,826 afy) and outside (24,587 afy) West Basin’s service area.

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[1]	Usage Type Code[2]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[3] (afy)	Seasonal Peaking Factor
Entradero Park	P1A-1	IR	90%	2009	25	2.5
West Torrance High School	P1A-2	IR	90%	2009	30	2.5
Victor Elementary School	P1A-3	IR	90%	2009	13	2.5
St. James Catholic School	P1A-4	IR	90%	2009	5	2.5
Victor Park	P1A-5	IR	90%	2009	15	2.5
Paradise Park	P1A-6	IR	90%	2009	9	2.5
Anza Elementary School	P1A-7	IR	90%	2009	9	2.5
Jefferson Middle School	P1A-8	IR	90%	2009	7	2.5
Raytheon (Hughes)	P2	IR	90%	2009	80	2.5
El Camino College	P3	IR	90%	2009	40	2.5
Inglewood High School	P41	IR	90%	2009	23	2.5
Monroe Jr High School	P49	IR	90%	2009	11	2.5
Clyde Woodworth Elem	P54	IR	90%	2009	8	2.5
Ashwood Park	P57	IR	90%	2009	5	2.5
Vincent Park	P58	IR	90%	2009	2	2.5
Cal Trans I-405 / Hillcrest (near Manchester)	P60	IR	90%	2009	10	2.5
The Pointe at South Bay	P66	IR	90%	2009	10	2.5
Jim Thorpe Park	P70	IR	90%	2009	19	2.5

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[1]	Usage Type Code[2]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[3] (afy)	Seasonal Peaking Factor
Pier Avenue	P72	IR	90%	2009	5	2.5
El Segundo Power Plant	P13A	IN	90%	2010	325	1.0
Imperial Ave	P36	IR	90%	2010	26	2.5
Equinix	P61A	IN	90%	2010	100	1.0
Mattel Lateral	P73	IN	90%	2010	15	1.0
Chevron Expansion - Nitrification Component	P10A	IN	90%	2011	1,706	1.4
Chevron Expansion - High Pres Boiler Feed Component	P10B	IN	90%	2011	419	1.1
Chevron Expansion - Low Pres Boiler Feed Component	P10C	IN	90%	2011	210	1.5
Hollywood Park Development	P15	IR	90%	2011	200	2.5
Playa Vista	P59	IR	90%	2011	150	2.5
Equinix	P61B	IN	90%	2011	100	1.0
West Coast Barrier	P7	B	90%	2011	5,600	1.0
bp Carson Refinery - Industrial RO Component	P5	IN	90%	2012	5,980	1.3
LADWP Harbor Area	P6A-1	IN	90%	2012	9,000	1.4
LADWP Harbor Area	P6A-2	IR	90%	2012	300	2.5
bp Carson Refinery - Nitrified Component	P8	IN	90%	2012	7,111	1.3
Bishop Montgomery High School	P1B-1	IR	90%	2013	14	2.5
Lomita Park Extension	P1B-10	IR	90%	2013	5	2.5
Lomita Blvd Median	P1B-11	IR	90%	2013	1	2.5

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[(1)]	Usage Type Code[(2)]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[(3)] (afy)	Seasonal Peaking Factor
Bishop Montgomery Retention Basin	P1B-2	IR	90%	2013	20	2.5
Ocean Avenue Retention Basin	P1B-3	IR	90%	2013	18	2.5
La Paloma Park	P1B-4	IR	90%	2013	2	2.5
Arnold Elementary School	P1B-5	IR	90%	2013	5	2.5
Seaside Elementary	P1B-6	IR	90%	2013	6	2.5
Sea Aire Golf Course	P1B-7	IR	90%	2013	15	2.5
Calle Mayor Middle School	P1B-8	IR	90%	2013	5	2.5
South Torrance High School	P1B-9	IR	90%	2013	25	2.5
El Segundo Power Plant	P13B	IN	90%	2015	300	1.0
Kobata Nursery	P69	IR	75%	2008	20	2.5
Marriott Golf Course	P30	IR	75%	2009	42	2.5
Pet Haven	P78	IR	75%	2009	8	2.5
Cal Trans I-105 / Western	P65	IR	75%	2010	10	2.5
Grammercy Toyota	P71	IR	75%	2010	8	2.5
Carson Mall Development	P37	IR	75%	2011	25	2.5
Campus El Segundo	P62	MU	75%	2011	100	1.7
LA Southwest College	P64	IR	75%	2011	50	2.5
Victoria Park	P29	IR	75%	2014	50	2.5
Carson Medians	P99	IR	50%	2009	2	2.5
Virco	P101	IN	50%	2010	10	1.3
Alondra Golf Course	P14	IR	50%	2010	300	2.5
USD Redondo Beach	P26	IR	50%	2010	10	2.5

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[1]	Usage Type Code[2]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[3] (afy)	Seasonal Peaking Factor
Torrance USD West Torrance High School	P39	IR	50%	2010	25	2.5
Toyota - North Campus	P45	IR	50%	2010	20	2.5
Toyota - North Campus Cooling Towers	P46	IN	50%	2010	20	1.3
Dominguez Tech Center	P79	IR	50%	2010	100	2.5
Del Amo Park	P48	IR	50%	2011	11	2.5
Mills Park	P52	IR	50%	2011	10	2.5
Kilroy Airport Center	P74	IN	50%	2011	30	1.0
Texollini	P17	IN	50%	2013	200	1.3
Manhattan Heights Park	P56	IR	50%	2013	4	2.5
Boeing	P67	IN	50%	2013	70	1.3
Del Amo Medians	P68	IR	30%	2010	5	2.5
Peters Nursery	P38	IR	30%	2012	25	2.5
Caltrans (110/190th St)	P50	IR	30%	2013	10	2.5
Caltrans (405/Main St)	P51	IR	30%	2013	10	2.5
Cal Trans I-405 / Artesia Blvd	P53	IR	30%	2013	8	2.5
Carson Community Center	P86	IR	30%	2013	21	2.5
City of Carson	P87	IR	30%	2013	21	2.5
Andrew Carnegie Middle School	P88	IR	30%	2013	20	2.5
Caltrans (91/Fig)	P25	IR	30%	2014	69	2.5
Caltrans (110/182nd St)	P31	IR	30%	2015	36	2.5
Rowley Park	P102	IR	30%	2018	31	2.5

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[1]	Usage Type Code[2]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[3] (afy)	Seasonal Peaking Factor
City of Carson Police Station	P85	IR	30%	2018	21	2.5
Rhodia	P12A	IN	30%	2020	457	1.0
Solec	P19	IN	30%	2020	174	1.0
Marriot Textile Service (Sodexho)	P22	IN	30%	2020	100	1.2
Western Tube Corporation	P28	IN	30%	2020	56	1.3
SAMYANG USA	P32	IN	30%	2020	33	1.3
Edmund Kim Productions	P33	IN	30%	2020	31	1.3
Caltrans (D07)	P47	IR	30%	2020	13	2.5
Dominguez Gap Barrier	P9A	B	30%	2025	2,000	1.0
LADWP Westside Demand	P100	IR	30%	2030	4,000	2.5
Kenneth Hahn State Park	P117	IR	30%	2030	1,500	2.5
Dominguez Gap Barrier	P9B	B	30%	2030	1,500	1.0
Pete’s Nursery	P76	IR	25%	2012	25	2.5
MB Nursery	P77	IR	25%	2012	25	2.5
Anderson Park	P91	IR	20%	2010	19	2.5
Carson Park	P92	IR	20%	2013	15	2.5
City of Carson Corporate Maintenance Yard	P96	IR	20%	2013	10	1.5
Dolphin Park	P97	IR	20%	2013	16	2.5
Fukai (Recreation) Park	P103	IR	20%	2018	7	2.5
Freeman Park	P104	IR	20%	2018	3	2.5
Bell Park	P105	IR	20%	2018	3	2.5

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[1]	Usage Type Code[2]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[3] (afy)	Seasonal Peaking Factor
Arthur Lee Johnson Memorial Park	P106	IR	20%	2018	33	2.5
Thornburg Park	P107	IR	20%	2018	4	2.5
Gardena High School	P108	IR	20%	2018	27	2.5
Serra High School	P109	IR	20%	2018	18	2.5
Vermont Medians	P114	IR	20%	2018	24	2.5
LAUSD - Peary Jr High	P44	IR	20%	2018	20	2.5
Calas Park	P89	IR	20%	2018	20	2.5
Caltrans I-405/190th St.	P93	IR	20%	2018	14	1.5
General Scott Park	P94	IR	20%	2020	14	2.5
Dominguez Hills Golf Course	P75	IR	10%	2012	25	2.5
Stephen M White Middle School	P80	IR	10%	2013	29	2.5
Caltrans I-405/Figueroa St.	P81	IR	10%	2013	28	1.5
Caltrans I-405/Edgar St.	P84	IR	10%	2013	23	1.5
LACMTA	P34	IN	10%	2017	30	1.3
Prime Wheel	P35	IN	10%	2018	27	1.3
Carson High School	P98	IR	10%	2018	41	2.5
One Hundred Fifty Third Street E	P110	IR	10%	2020	3	2.5
Crescendo Charter School	P111	IR	10%	2020	1	2.5
Roosevelt Cemetery	P112	IR	10%	2020	93	2.5
C Star Nursery	P113	IR	10%	2020	14	2.5
Rosecrans Recreation Center	P115	IR	10%	2020	24	2.5
Moneta Nursery	P116	IR	10%	2020	8	2.5

Table 3.4 Potential Customers
Capital Implementation Master Plan
West Basin Municipal Water District

Customer Name	Database ID[1]	Usage Type Code[2]	Likelihood of Service	Anticipated Year of Service	Estimated Future Demand[3] (afy)	Seasonal Peaking Factor
Palos Verdes - Palos Verdes Golf Course	P11A	IR	10%	2020	188	2.5
Palos Verdes - Landfill	P11B	IR	10%	2020	150	2.5
Palos Verdes - Rolling Hills Country Club	P11C	IR	10%	2020	100	2.5
Palos Verdes - Green Hills Memorial	P11D	IR	10%	2020	233	2.5
Palos Verdes - Naval Reservation	P56	IR	10%	2020	50	2.5
Veterans Park and Sports Complex	P82	IR	10%	2020	27	2.5
Caltrans I-110 & Del Amo Blvd.	P83	IR	10%	2020	23	1.5
Stevenson Park	P90	IR	10%	2020	19	2.5
Carriage Crest Park	P95	IR	10%	2020	10	1.5
LADWP Harbor Area	P6B	IN	10%	2030	5,700	1.4
TRW - E/D Sector (Northrop Grumman Space Technology)	P18	IR	5%	2020	20	2.5
Total (Customers Located Inside Service Area[8])					**25,826**	**1.3**
Total (Customers Located Outside Service Area[8])					**24,587**	**1.6**
Total					**50,413**	**1.5**

Notes:
(1) The locations of these customers are depicted on detailed customer maps in Appendix B. Additional details are shown in the customer database in Appendix C.
(2) IR = Irrigation; IN = Industrial; MU = Mixed Use; B = Barrier
(3) Source: Customer Database Development Workshop.

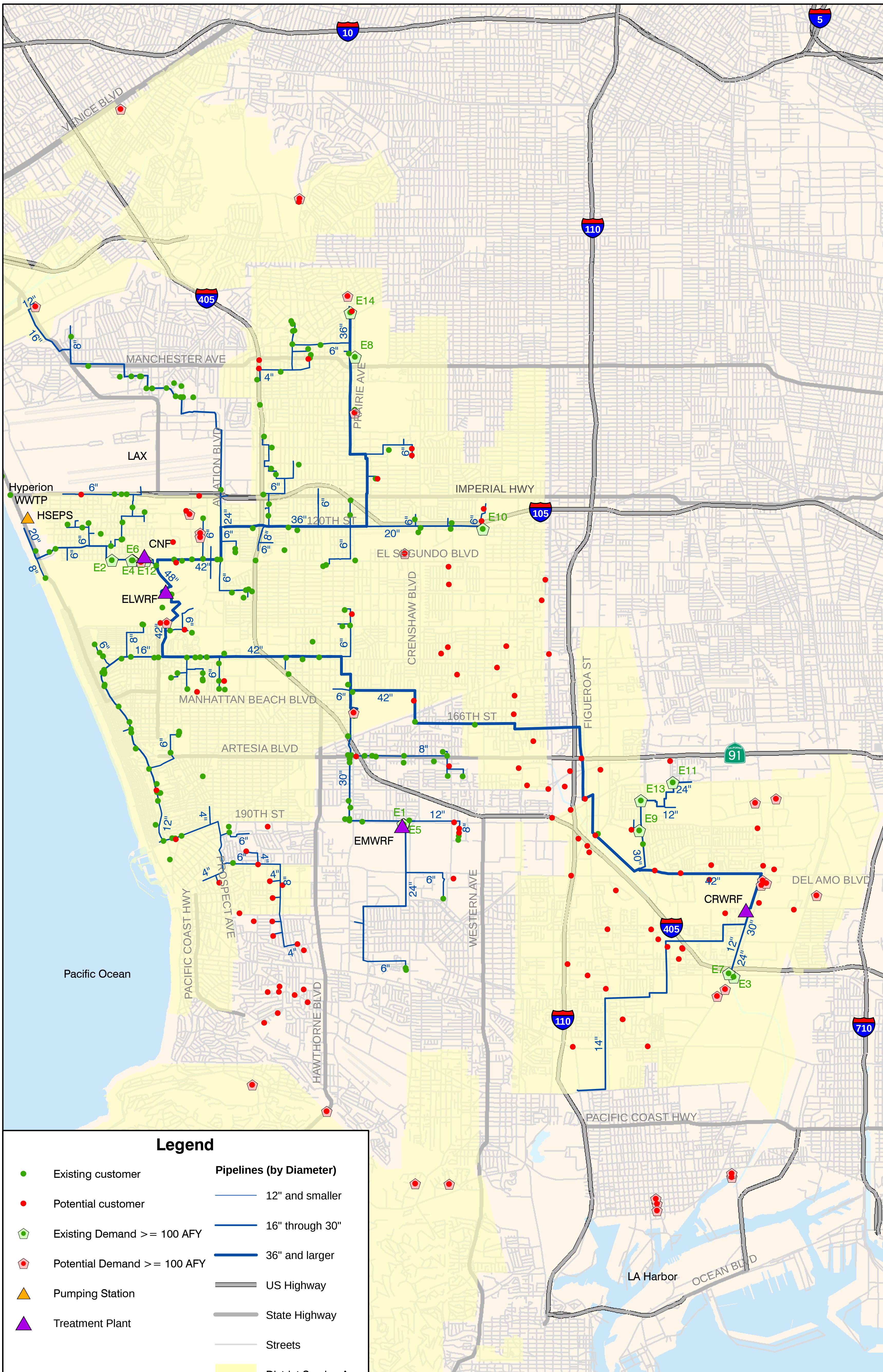


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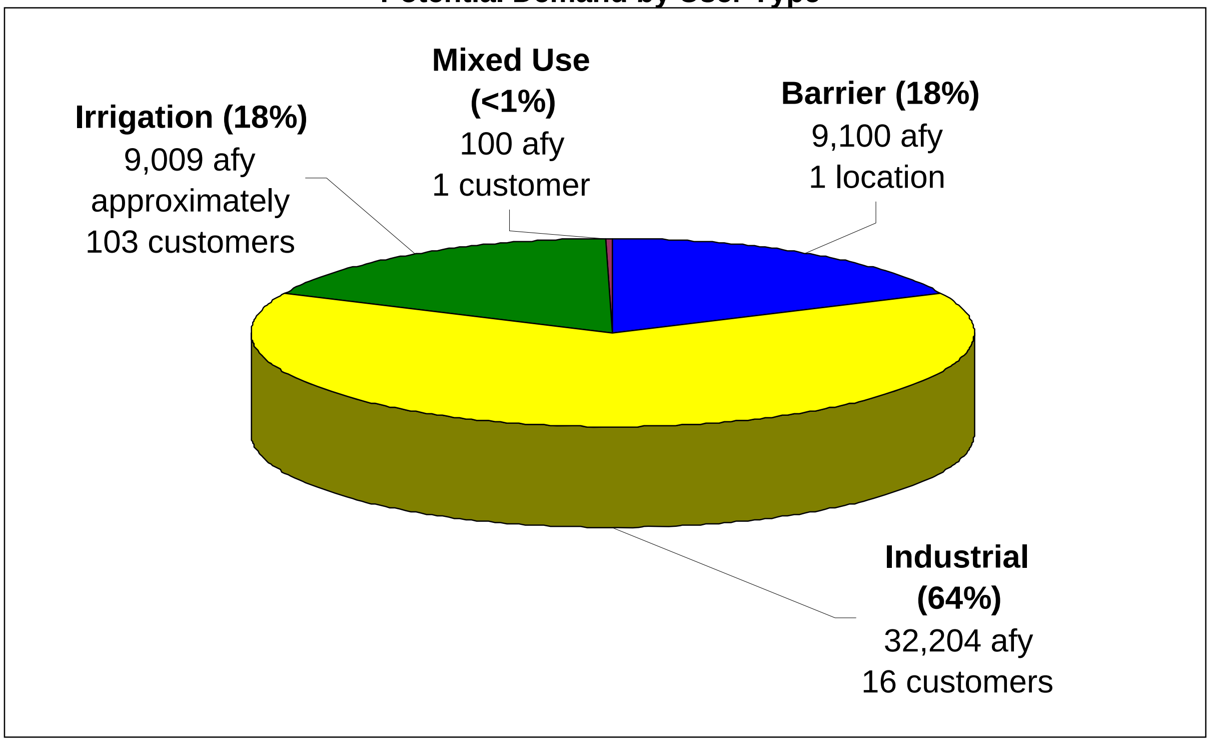
Figure 3.4
Existing and Potential
Recycled Water Customers

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

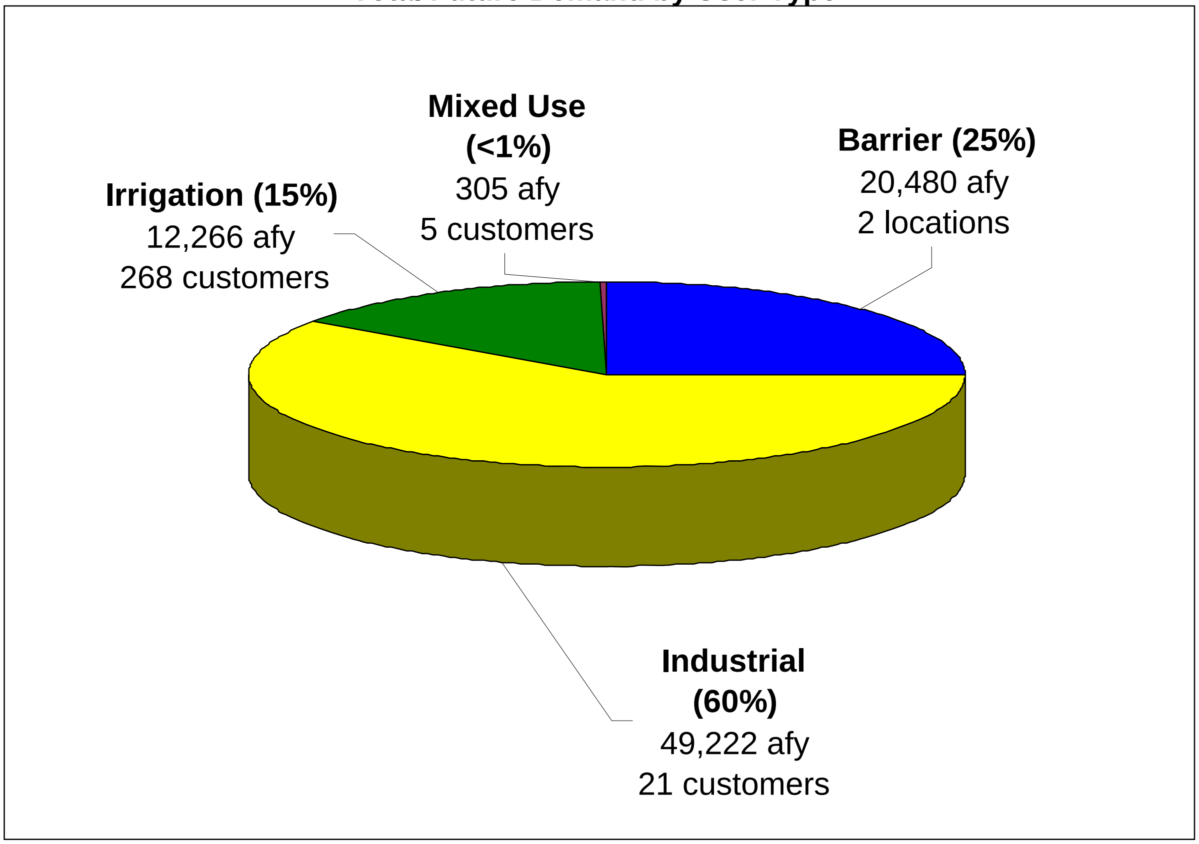
The distribution of potential demands by customer type is illustrated on Figure 3.5, which indicates that the majority of the potential demand is categorized as Industrial, representing approximately 64 percent of the potential demand. It should be noted that this figure represents the potential customers only, and excludes the existing demand distribution shown in Figure 3.3.

Figure 3.5
Potential Demand by User Type



The combined distribution of recycled water, including both existing and potential demands, by customer type is shown on Figure 3.6. This figure indicates that the majority of the demand in the future will most likely remain categorized as Industrial, representing approximately 60 percent of the future system demand. The total combined ultimate demand of all usage categories is estimated to be 82,273 afy (31,860 afy for existing customers plus 50,413 afy for potential customers).

Figure 3.6
Total Future Demand by User Type



3.4 WATER DEMAND AND PEAKING FACTORS

This section discusses the water demand factors and peaking factors that were used to estimate future recycled water demands. The definitions of these factors are discussed below.

3.4.1 Water Demand Factors

A water demand factor (WDF) is defined as the estimated amount of water usage per area of a certain land use type. WDFs are typically expressed in gallons per day per acre (gpd/ac). These factors are used to estimate the Average Day Demand (ADD) for existing and potential customer sites by multiplying the WDF with the total number of acres of the corresponding land use category. WDFs are typically determined from a combination of historical billing records and land use information using spatial GIS routines. WDFs can also be obtained and/or verified with WDFs from other agencies with similar land use and climate conditions.

3.4.1.1 Climate

Irrigation demand is dependent on climate. The climate in the West Basin service area is influenced by Santa Monica Mountains to the north and the Pacific Ocean to the south and west. The year-round highs range from the 60s to 70s and lows between the 40s and 50s. The warmest months are June through October. The average monthly precipitation and average monthly temperature from years 1944 to 2007 are presented in Table 3.5. As shown, the average precipitation for the area is 1.01 inches per month, which equates to an average annual rainfall of 12 inches.

Table 3.5 Average Monthly Precipitation and Temperature Data
Capital Implementation Master Plan
West Basin Municipal Water District

Month	Average Precipitation (inches)	Average. High Temperature (°F)	Average Low Temperature (°F)
January	2.71	65.0	47.4
February	2.72	65.4	48.9
March	1.90	65.3	50.4
April	0.79	67.4	52.9
May	0.17	69.2	56.3
June	0.05	72.0	59.6
July	0.02	75.3	62.9
August	0.07	76.4	63.8
September	0.17	76.1	62.6
October	0.36	73.6	58.5
November	1.43	70.3	52.3
December	1.72	66.1	47.9
Average:	**1.01**	**70.2**	**55.3**

Note:
Source: Western Regional Climate Center, Station No. 045114. Period of Record from August 1944 to December 2007.

3.4.1.2 Irrigation Requirements

Expected landscape irrigation requirements for the West Basin service area can be based on evapotranspiration and rainfall data for all sites where irrigable acreage was available. Calculated irrigation requirements, as defined below, were used to estimate irrigation for all existing and future sites.

The amount of irrigation water required for the potential irrigation customers is directly dependent on precipitation and evapotranspiration quantities in the region. To calculate the amount of evapotranspiration occurring in the study area, the following formula can be used:

$$ET_L = K_L * ET_o \quad (1)$$

Where:

ET_L = Evapotranspiration of landscaped areas (in inches)

K_L = Landscape coefficient

ET_o = Reference Evapotranspiration (in inches)

The reference evapotranspiration used was based on the value for the Los Angeles Basin, which was obtained from the California Irrigation Management Information System (CIMIS).

To calculate the landscape evapotranspiration, the landscaped area crop coefficient was estimated using information contained in the Guide to Estimating Irrigation Water Needs of Landscape Plantings in California by the California Department of Water Resources. The landscape coefficient is the product of an average species factor (k_s), density factor (k_d), and microclimate factor (k_{mc}). These were estimated to be 0.7, 1, and 1, respectively. The landscape coefficient was then multiplied by the reference evapotranspiration to determine the average landscape evapotranspiration for the study area. The amount of precipitation, evapotranspiration, and irrigation required for irrigation customers are listed in Table 3.6.

As listed in Table 3.6, the net annual average landscape irrigation requirement in the study area is approximately 30.1 inches or about 2.5 feet per year. Based on this data, recycled water demands for potential customers could be estimated by multiplying the irrigated area in acre by 2.5 to obtain an annual demand estimate in afy. However, as part of this study, demand estimates were provided by West Basin staff and are mostly based on historical potable water demand usage and where not available using the following rule of thumb:

- 2.0-2.5 afy/acre for irrigating areas with turf
- 1.0 afy/acre for irrigating areas with shrubs

It can be concluded that the irrigation requirements listed in Table 3.6 confirm the demand factors that are typically applied to the West Basin service area when estimating potential irrigation demands.

It should be noted that as a part of this study, demands for individual potential customers were estimated by West Basin staff and historical potable water demand usage was typically available and considered more accurate than the above methodology.

Table 3.6	Average Annual Landscape Irrigation Requirements Capital Implementation Master Plan West Basin Municipal Water District			
Month	**Evapo-transpiration(1) (inches)**	**Average Rainfall(2) (inches)**	**Net Irrigation Requirement(3) (inches)**	**Percent of Annual Net Irrigation Requirement(4) (%)**
January	1.25	2.71	0.00	0%
February	1.48	2.72	0.00	0%
March	2.31	1.9	0.55	2%
April	3.14	0.79	3.18	11%
May	3.31	0.17	4.25	14%
June	3.52	0.05	4.70	16%
July	3.78	0.02	5.09	17%
August	3.77	0.07	5.00	17%
September	2.76	0.17	3.50	12%
October	2.38	0.36	2.73	9%
November	1.69	1.43	0.36	1%
December	1.55	1.72	0.00	0%
Total	**31.0 inches**	**12.1 inches**	**29.4 inches**	**100%**
			2.5 feet	

Notes:
(1) Source: The data was obtained from the California Irrigation Management Information System [2]. The ET values are adjusted for the landscape irrigation coefficient K_L, where $K_L = K_s{*}K_{mc}{*}K_d$ which accounts for the species, microclimate and vegetation density.
(2) Source: Western Regional Climate Center [1].
(3) [Evapotranspiration - Rainfall]*1.15/0.85. Where 0.85 = 85% Irrigation Factor (Average value from Carlos and Guitjens, University of Nevada) and 1.15 = 15% Leaching Fraction [3].
(4) Current month net irrigation requirement divided by total net irrigation requirement.

3.4.2 Peaking Factors

In addition to WDFs, peaking factors are used to estimate water demands for conditions other than average annual demand (AAD) conditions. Peaking factors account for fluctuations in demands on a seasonal or hourly basis.

3.4.2.1 Seasonal Peaking Factor

During hot summer days, water use is typically higher than on a cold winter day because of increased irrigation demands. Common peaking factors include Maximum Day Demands (MDD), Maximum Month Demands (MMD), and Minimum Day Demands (MinDD). In recycled water systems, the MDD factors is typically similar to the MMD factor as irrigation sprinkler systems are often changed on a seasonal basis, rather than a daily basis, unless moisture sensors are used. Because of the significant industrial demands present in West Basin's recycled water system, a comparison between MMD and MDD seasonal peaking factors for large industrial water customers is presented in Table 3.7.

Table 3.7 Comparison of MMD and MDD Seasonal Peaking Factors
Capital Implementation Master Plan
West Basin Municipal Water District

Large Industrial User	AAD (mgd)	MMD Peaking Factor	MMD (Peak Month)	MDD Peaking Factor	MDD (Peak Day)
E6 - Chevron Industrial RO	0.98	1.5	Aug 2004	1.7	19 Jul 2005
E4 - Chevron Industrial RO Ultra	2.50	1.1	Jun 2008	1.2	25 Aug 2007
E2 - Chevron Nitrified	3.12	1.4	Mar 2008	1.6	29 Sep 2005
E3 – bp Carson Refinery Industrial RO	2.50	1.7	Sep 2007	1.7	9 Feb 2006
E7 - bp Carson Refinery Nitrified	0.54	1.3	Dec 2007	1.5	9 Feb 2006
E1 - ExxonMobil Nitrified	3.69	1.2	Jul 2007	1.5	21 Nov 2006
E5 - ExxonMobil Industrial RO	1.80	1.3	Oct 2004	1.5	17 Dec 2007
Total Large Industrial User Demand(1)	**15.1**	**20.3 mgd**		**23.0 mgd**	
Total Large Industrial User Weighted Peaking Factor		1.3		1.5	

Note:

(1) The sum of each Average Annual Demand multiplied by the corresponding peaking factor.

As seen in Table 3.7, the weighted MDD seasonal peaking factor for all of the large industrial customers exceeds the MMD seasonal peaking factor by approximately 20 percent, as compared to the AAD. However, historic data suggests the likelihood of simultaneous peaking of all large industrial seasonal peaking is rather low, as the MDD and MMD of all major industrial customers did not even occur in the same month. Table 3.7 also shows that the occurrence of MMD and MDD between the customers greatly varies. Based on the peaking shown in Table 3.7, it was determined that the MMD peaking represents a conservative estimate of seasonal peaking across the industrial customers in the system. For the purpose of this master plan, the MMD/ADD ratio is used to estimate the maximum demand conditions that West Basin needs to plan for.

The seasonal variation in demand of existing customers, as listed in Table 3.3, was used to estimate the average seasonal peaking factors by user type. These factors are listed in Table 3.8 and are used to estimate the maximum month demands of the potential customers, except for those customers that have a specific peaking factor (as listed in Table 3.4).

Table 3.8 Seasonal Peaking Factors Based on Historic Data
Capital Implementation Master Plan
West Basin Municipal Water District

Usage Type	Historical Seasonal Peaking Factor (Weighted Average)	Historical Seasonal Peaking Factor (Average)	Planning Seasonal Peaking Factor
Irrigation	2.5	3.1	2.5
Industrial	1.3	2.2	1.3
Mixed Use	1.7	1.7	1.7
Barrier	1.0	1.0	1.0
Aggregate	**1.4**(1)	**2.0**	**1.4**(1)

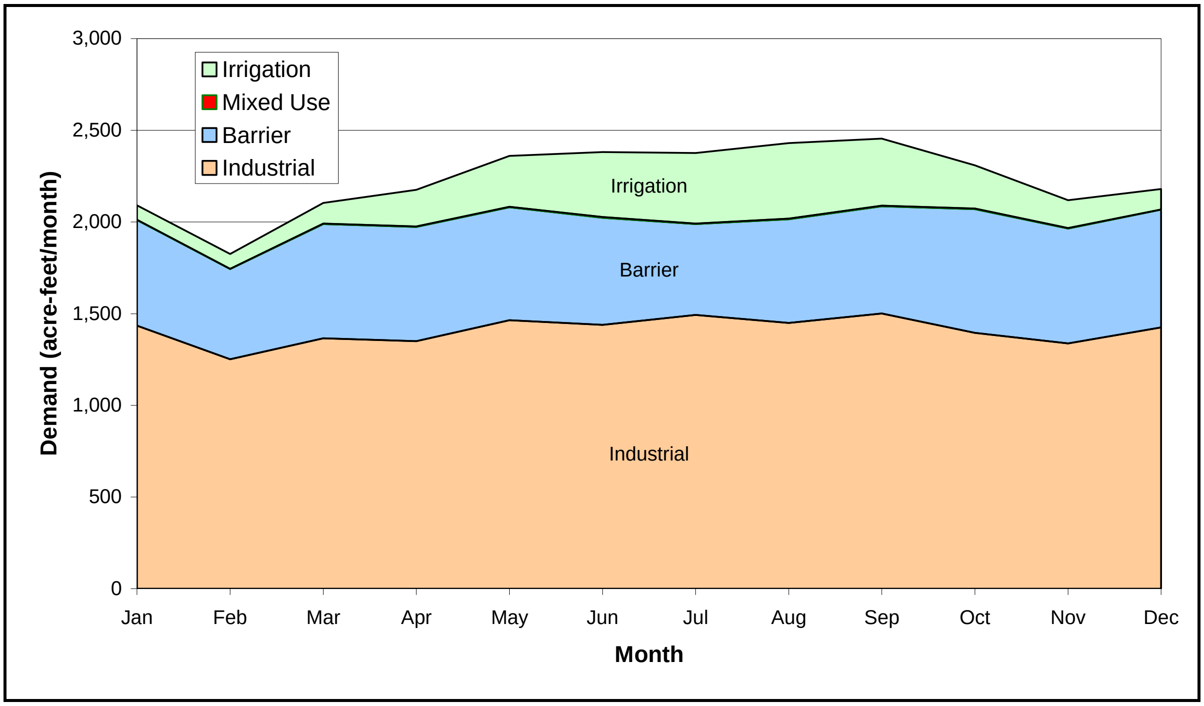
Note:
(1) Based on the demand weighted average of all usage types.

Based on historical data, the weighted average of seasonal peaking factors for irrigation customers was 2.5. This indicates that, on average, the maximum monthly demand for typical irrigation customers is 2.5 times the average annual demand. This same seasonal peaking factor was selected for analysis of future systems. This factor will be applied to all potential irrigation customers for the future system analysis. For existing customers, the historical seasonal peaking factors are used for each individual customer, with the exception of existing customers with seasonal peaking factors over 3.0, which are assumed to be reduced to 3.0 for future planning years through efforts conducted by West Basin to work with customers to reduce excessive seasonal peaking. Seasonal peaking factors for both existing and future analysis are listed in the customer database in Appendix C.

Based on historical data, the weighted average of seasonal peaking factors for industrial customers is 1.3. This indicates that, on average, the maximum monthly demand for typical industrial customers is 1.3 times the average annual demand. This factor will be applied to all potential industrial customers for the future system analysis. For existing customers, the historical seasonal peaking factors are used for each individual customer, as listed in the customer database in Appendix C. Thus, for the existing and potential customers, the overall seasonal peaking factor corresponds to the weighted average industrial factor of 1.3, as shown in Table 3.8.

It should be noted that the factors presented in Table 3.8 are based on the maximum month peaking factors of each individual customer and that these factors do not always coincide with the same calendar month. As a result, the average seasonal peaking factor per usage type may result in an overly conservative maximum monthly demand. The aggregate peaking factor listed in Table 3.8 is based on the demand weighted average of all peaking factors. Due to the large contribution of industrial and barrier water demands, the aggregate peaking factor is relatively low. This effect is also illustrated on Figure 3.7.

Figure 3.7
Seasonal Variations by Usage Type



As shown on Figure 3.7, the peak irrigation demand occurs in the summer months, while for the demand of barrier and industrial customers are relatively constant throughout the year. Figure 3.7 illustrates that the significant peaking of irrigation demand is buffered by the much more significant industrial "anchor" customers, whose low seasonal variability provide a consistent baseline of required demand throughout the year.

3.4.2.2 Hourly Peaking Factors / Diurnal Curves

Variations in water demands also occur during a 24-hour period. Customers irrigating non-restricted areas typically experience peak demand periods late at night through the early morning hours, while industrial customers experience peaking consistent with their industrial production patterns.

Recycled water systems are characterized by substantial variations in demand during the day. The demand patterns, which are also referred to as diurnal curves, were developed for each of the large customers based on field measurements obtained for the hydraulic model calibration. The flow monitoring conducted as part of this study provided customer specific diurnal curves for the 15 customers listed in Table 6.1 of Chapter 6 and shown in Appendix E. For other smaller and potential customers, generic diurnal curves were developed for each user type. Figure 3.8 depicts the generic curve developed for golf course, school, and park irrigation customers. Figure 3.9 depicts the generic curve developed for greenbelt irrigation customers.

Figure 3.8
Irrigation (Golf Course, School, and Park) Diurnal Curve

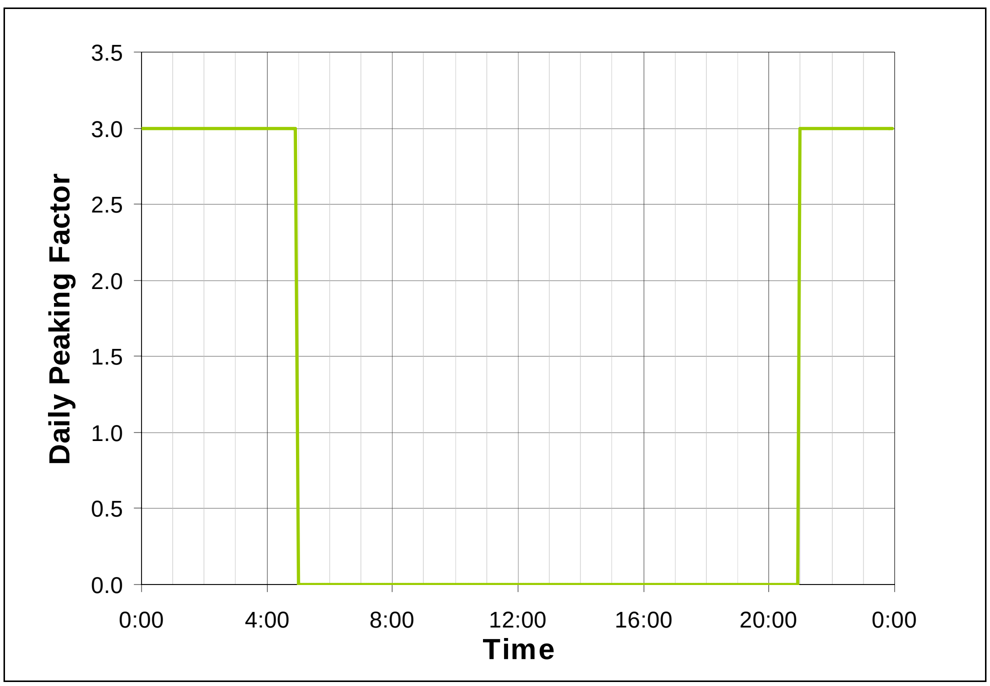
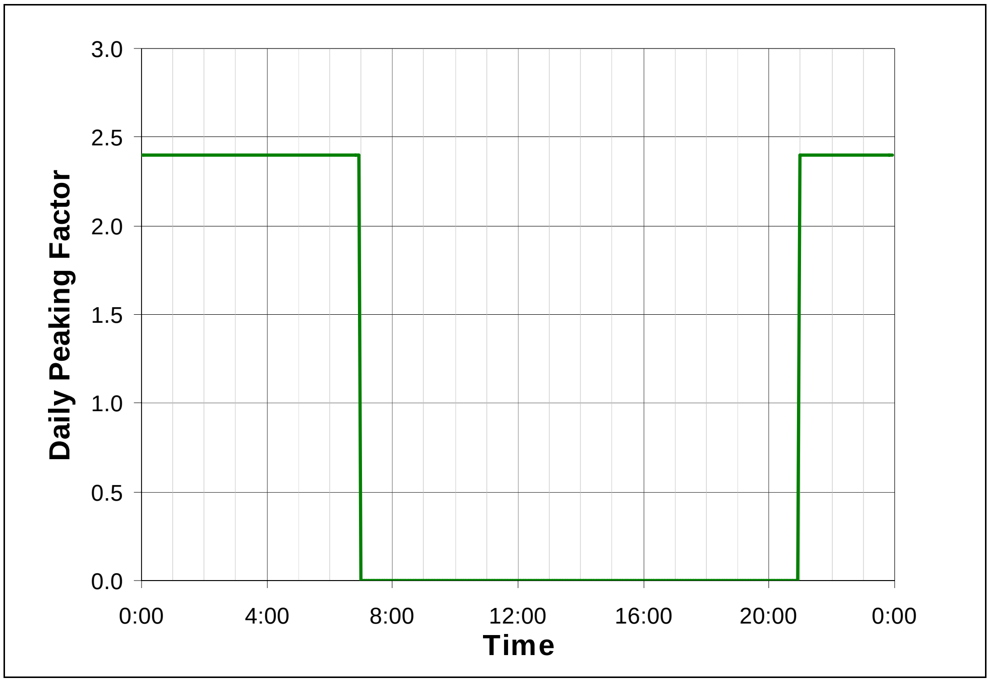


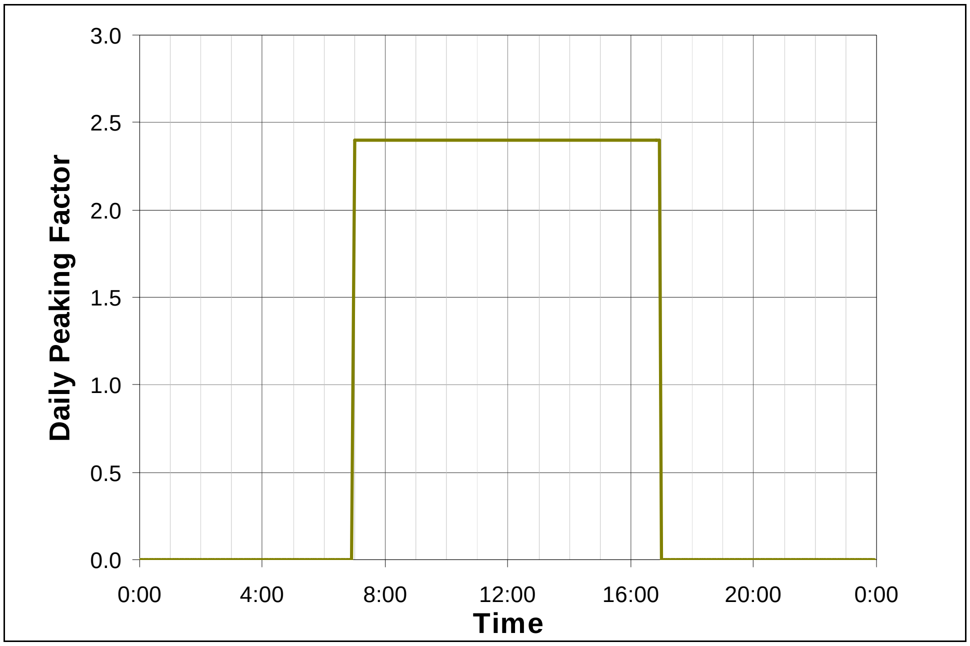
Figure 3.9
Irrigation (Greenbelt) Diurnal Curve



The irrigation demand patterns shown on Figure 3.8 and Figure 3.9 were developed based on observations of cycles in the calibration data. In Los Angeles County, irrigation customers are generally required to limit irrigation to the hours of 10 pm through 6 am (LACRWAC 2005) on sites open to the public. Existing usage patterns observed for golf courses, schools, and parks generally seemed to operate for about 4 hours starting around 9 pm. However, West Basin is planning to work with customers in the future to extend the demand pattern to limit the significant peaking placed on the distribution system when irrigation is only conducted for 4 hours, which results in a peaking factor of 6.0. Figure 3.8 shows a demand pattern for 8 hours, starting around 9 pm and ending at 5 am, incorporating estimates for future usage patterns. Usage patterns observed for greenbelt customers (transportation landscaping) generally ran for longer periods of time, starting around 9 pm and ending around 7 am.

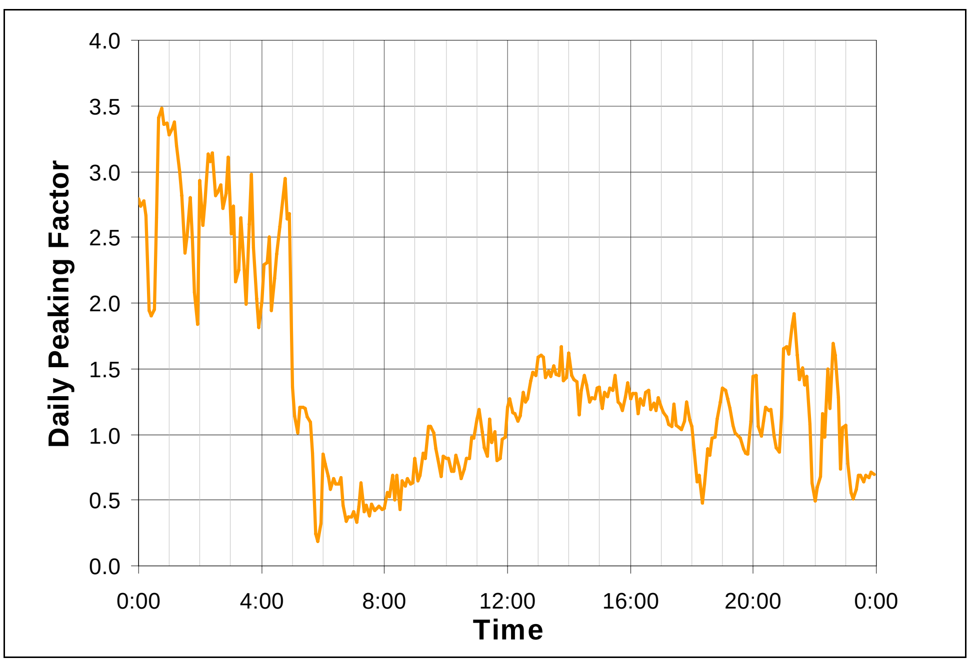
Other than the large refineries that were given user-specific demand patterns due to their size, only one existing user is classified as an industrial customer (Crenshaw Lumber). Based on typical operation of industrial customers, a generic demand pattern was developed that was assumed to begin at 7 am and run until 5 pm. This demand pattern is shown on Figure 3.10.

Figure 3.10
Industrial Diurnal Curve



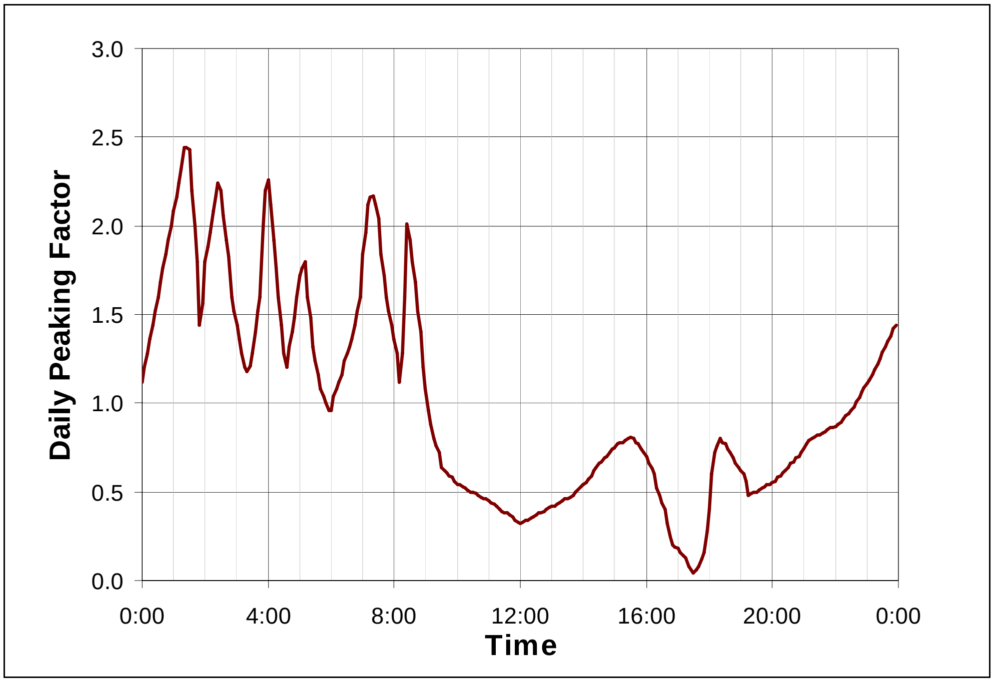
Based upon the demand pattern at Toyota, a separate generic diurnal curve was developed for the Mixed Use (MU) customers, who use recycled for multiple purposes including irrigation, dual plumbing, and cooling towers, based upon the demand pattern at Toyota. This demand pattern is shown on Figure 3.11.

Figure 3.11
Mixed Use Diurnal Curve



The “other” demand pattern, shown on Figure 3.12, was developed from a mass balance of the flow entering the system during the calibration period. The resulting pattern was adjusted to represent a relatively consistent use period reflecting the demands for the calibration day. This pattern is intended to represent all customers that do not fall into any of the other specific categories.

Figure 3.12
Other Diurnal Curve



3.5 FUTURE DEMAND ESTIMATES

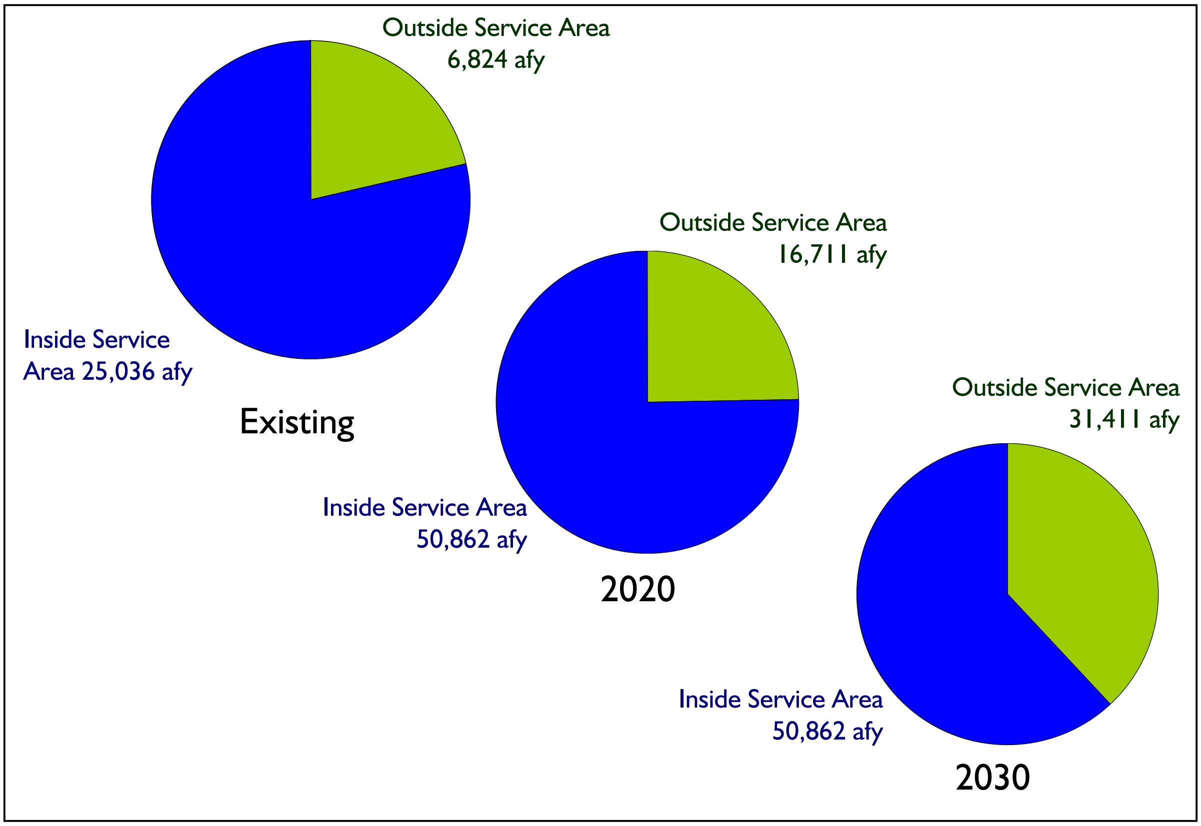
To project the development of future demands, the anticipated phasing of potential customers was forecasted in collaboration with West Basin staff. The “Anticipated Year of Service” listed in Table 3.4 was used to summarize the potential demands by planning period in Table 3.9.

Table 3.9 Phasing of Potential Demand Capital Implementation Master Plan West Basin Municipal Water District			
	Demand (afy))		
Planning Period	**Inside Service Area**	**Outside Service Area**	**Total**
Existing	25,036	6,824	31,860
FY2008/10	1,273	118	1,391
FY2010/15	22,575	9,583	32,158
FY2015/20	1,978	186	2,164
FY2020/25		2,000	2,000
FY2025/30		12,700	12,700
Total Potential (FY2008/10 – FY2025-30)	25,826	24,587	50,413
Total Ultimate Demand (Existing and Potential)	**50,862**	**31,411**	**82,273**

As listed in Table 3.9, the recycled water demands are projected to increase from 31,860 afy to 82,273 afy. This equates to an average demand increase of about 4.4 percent per year through 2030. As stated earlier, this projection assumes that all existing customers maintain their current usage and all potential customers will be connected to future system expansions of the recycled water system and use the estimated amounts of recycled water. When the likelihood of service as listed in Table 3.9 is taken into consideration for the potential customers only, the projected demand (including both existing and potential users) will be reduced from 82,273 afy to 64,231 afy, a 3.3 percent per year growth rate. A few very large potential customers with a low likelihood of service primarily cause this significant demand reduction. These customers are LADWP Harbor (5,700 afy with 10% likelihood), LADWP Westside (4,000 afy with 30% likelihood), and the Dominguez Gap Barrier (3,500 afy with 30%). Due to the low likelihood, these customers are all phased in the period 2020-2030.

As shown in Table 3.9, the majority of West Basin's demand growth is anticipated to occur within West Basin's service area. Figure 3.13 presents a projected breakdown of West Basin's demands with respect to West Basin's service area boundary under the existing system, at the year 2020, and at the planning horizon of 2030.

Figure 3.13
Demand Breakdown by Location



As shown in Figure 3.13, the demand portion from customers located outside West Basin's service area is anticipated to increase from 21 percent to 38 percent of the total demand.

The projected AAD and MDD for the primary planning years are summarized in Table 3.10. The numbers presented in this table assume that all potential customers will be connected, and the likelihood of service is not taken in to consideration.

As shown in Table 3.10, the total potential future demand of all existing and potential customers listed in Table 3.2 and Table 3.10 is 82,273 afy. When the seasonal peaking factors for each of the usage types are applied, the MDD is estimated at 105 mgd.

Table 3.10 Potential Future Recycled Water Demand Capital Implementation Master Plan West Basin Municipal Water District

Usage Type	2008		2010		2020		2030	
	AAD (afy)	MMD (mgd)	AAD (afy)	MMD (mgd)	AAD (afy)	MMD (mgd)	AAD (afy)	MMD (mgd)
Irrigation	3,257	7.6	4,178	9.1	6,766	14.8	12,266	27.1
Industrial	17,018	20.2	17,488	20.7	43,522	51.4	49,222	58.6
Mixed Use	205	0.4	205	0.4	305	0.6	305	0.6
Barrier	11,380	10.2	11,380	10.2	16,980	15.2	20,480	18.3
Total	**31,860**	**38.4**	**33,251**	**40.4**	**67,573**	**82.0**	**82,273**	**104.5**

Note:
(1) MMD is calculated by applying the peaking factor for each individual customer, as detailed in the customer database presented in Appendix C.

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CAPITAL IMPROVEMENT PROGRAM

This chapter presents the recommended capital improvement program (CIP) for the West Basin Municipal Water District's (West Basin) distribution systems. The CIP summarizes the recommended improvements, cost estimates, and the allocation of project cost for the recommended improvements to the distribution systems, and establishes phasing of projects through the planning horizon. The purpose of this CIP is to provide West Basin with a guideline for the planning and budgeting of future improvements to its distribution systems and facilities. The CIP is based on the evaluation of the West Basin's distribution systems, and on the recommended projects described in previous chapters.

This chapter is divided into three subsections. First, the recommended projects are summarized for each of the ten distribution systems and the five treatment plants (four existing and one proposed). Secondly, the phasing of recommendation is presented by planning period from fiscal year (FY) 2008/2009 through FY 2029/2030 (FY29/30). This chapter is concluded with a summary of the entire CIP by presenting summaries of the estimated project improvement cost by planning year and facility type. It should be noted that all cost presented in this chapter are based on 2009 dollars, with the exception of the escalated CIP at the end of this chapter.

The reasons for replacements, upgrades, and/or new facilities and other details for each of the projects recommended in this CIP can be found in Chapters 7 and 8.

Where applicable, it is assumed that West Basin projects will be designed for certification in accordance with the Leadership in Energy and Environmental Design (LEED) Green Building Rating System. However, specific decisions on incorporation of green building technology will need to be made and refined at the preliminary design level.

9.1 PROJECT SUMMARY BY SYSTEM/FACILITY

This section summarizes the recommended projects discussed in Chapter 7 (Existing System Analysis) and Chapter 8 (Future System Analysis) for each of the ten distribution systems and the five treatment plants. The ten distribution systems, in the order presented, are:

- Hyperion Secondary Effluent Pumping Station (HSEPS) System
- Title 22 Distribution System
- West Coast Barrier System
- Chevron High Pressure Boiler Feed (CHPBF) System
- Chevron Low Pressure Boiler Feed (CLPBF) System

- Chevron Nitrified Water System
- ELWRF Brine Line
- bp Reverse Osmosis System (bp-RO)
- bp Nitrified Water System (bp-N)
- CRWRF Brine Line

The five treatment plants, including four existing and one proposed plant, are:

- Edward L. Little Water Reclamation Facility (ELWRF)
- Carson Regional Water Reclamation Facility (CRWRF)
- ExxonMobil Water Reclamation Facility (EMWRF)
- Chevron Nitrified Facility (CNF)
- New Treatment Plant (NTP)

As discussed in Chapter 8, this NTP would treat secondary effluent from the Los Angeles County Sanitation District's Joint Water Pollution Control Plant (JWPCP).

In addition, there are three types of recurring projects that are related to ongoing improvements at the treatment plants, such as membrane replacements, electrical upgrades, mechanical equipment, etc. These three types of recurring projects are:

- Replacement and rehabilitation projects identified in the Condition Assessment TM (Carollo 2009)
- Membrane replacements, assumed to take place every five years, as detailed in Section 8.4.2.
- Recapitalization projects identified by United Water (United Water 2009).

In this section, these recurring projects have been organized by treatment plant (Sections 9.1.13 through 9.1.17) and are phased as "mult", meaning multiple planning phases. In Section 9.2, the costs of these projects are organized by planning phase. The cost breakdown by treatment plant and planning phases can be found in the master CIP list presented at the end of this chapter (Table 9.37).

9.1.1 Hyperion Secondary Effluent Pumping System

Table 9.1 presents the list of recommended improvements to the HSEPS facility and distribution system.

As presented in Table 9.1, the total anticipated cost for improvements at the HSEPS is approximately $83.3 million (M). The most costly improvements are additional pumping capacity to support future demands and the pipeline to parallel the Hyperion Secondary Effluent Force Main (HSEFM) for Scenario 7 demands.

Table 9.1 Project Summary for HSEPS
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
HPS-01	FY10/11	Add 23 mgd of additional pumping capacity, to bring firm capacity to 74 mgd of firm capacity. (Phase I of II; total project assumes 7 pumps, 7,000 hp total)	$14,700,000
HPS-03	FY10/11	Secondary Power Connection for Backup Power	$2,520,000
HPS-04	FY10/11	PS Building	$560,000
HPS-05	FY11/12	Add 23 mgd of additional pumping capacity, to bring firm capacity to 97 mgd of firm capacity. (Phase II of II; total project assumes 7 pumps, 7,000 hp total)	$14,700,000
HPS-06	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$725,000
HPS-07	FY20-25	Add 38 mgd of additional firm pumping capacity, to bring total firm capacity to 135 mgd. (For LADWP Westside, Kenneth Hahn, LADWP Harbor Expansion) (Assumes 3 pumps, 3,000 hp increase)	$27,300,000
HPS-08	FY20-25	Parallel HSEFM w/ 36"	$22,815,000
Total			**$83,320,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

The additional pumping capacity is split into two initial phases to supply Scenario 5B demands through 2020 and a single post-2020 phase, to accommodate supplies to meet the additional demands for customers of Scenario 7B. Further details on HSEPS capacity requirements can be found in Chapter 4 and Chapter 8.

Consistent with the *HSEPS Expansion Study* (CDM 2004), a secondary power connection is recommended due to limited space and nearby connection availability.

The rehabilitation and replacement project is an aggregation of expected remaining life of existing equipment at the HSEPS as determined by the condition assessment. More information about the condition assessment can be found in the Condition Assessment Technical Memorandum (Carollo 2009), which can be found in Appendix F.

9.1.2 Title 22 Distribution System

Table 9.2 presents the list of recommended improvements to the Title 22 distribution system.

Table 9.2 Project Summary for Title 22 Distribution System Capital Implementation Master Plan West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
T22-01	FY12/13	Caltrans Inglewood Lateral	$260,000
T22-02	FY11/12	El Segundo Lateral (Boeing, Kilroy Airport)	$1,500,000
T22-02A	FY09/10	Mariposa Lateral (Mattel, Hilton, Marriot)	$750,000
T22-04	FY10/11	Virco-Torrance Lateral	$340,000
T22-06	FY09/10	Carson Mall Lateral(2)	$2,500,000
T22-07	FY11/12	Redondo Beach Lateral (Pete's Nursery)	$660,000
T22-08	FY11/12	Mills Park Lateral	$245,000
T22-09	FY09/10	Anza Lateral Phase II(2)	$3,500,000
T22-10	FY09/10	Anza PS (4-500 gpm pumps)(2)	$2,000,000
T22-11	FY12/13	Chlorination Stations (Phase I)	$1,960,000
T22-12	FY13/14	Main Street Carson Lateral	$17,075,000
T22-13	FY10/11	Dominguez Street Lateral(2)	$4,500,000
T22-14	FY14/15	Caltrans Gardena Lateral	$985,000
T22-15	FY15-20	Palos Verdes - Lateral 6B	$27,290,000
T22-16	FY15-20	Palos Verdes PS (4-1,250 gpm pumps)	$4,900,000
T22-17	FY15-20	Increase Title 22 product water storage by 5.0 MG	$10,500,000
T22-18A	FY15-20	Gardena Lateral - Normandie Ave	$3,635,000
T22-18B	FY15-20	Gardena Lateral - Normandie and Vermont	$6,170,000
T22-18C	FY15-20	Gardena Lateral - Van Ness	$4,480,000
T22-19	FY09/10	Dyehouse Lateral(2)	$3,000,000
T22-20	FY09/10	Dyehouse PS (3-250 gpm pumps)(2)	$1,500,000
T22-21	FY15-20	Chlorination Stations (Phase II)	$1,960,000
T22-22	FY15-20	Hawthorne Lateral (Solec)	$1,595,000
T22-23	FY15-20	Title-22 PS Discharge Pipeline Modification	$465,000
T22-24	FY20-25	Anza Lateral Break Tank	$4,200,000
T22-25	FY25-30	LA Westside Lateral	$40,005,000
T22-26	FY25-30	Inglewood/LA Westside PS (assumes 4-8,500 gpm pumps)	$28,025,000
Total			**$174,000,000**

Notes:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.
(2) Cost estimates provided by West Basin staff from preliminary design estimates.

Improvements related to treatment of Title 22 product water are included in the summaries of recommendations for ELWRF and NTP. Figure 9.1 shows each of the recommended distribution system improvements, with IDs corresponding to the IDs shown in Table 9.2. As presented in Table 9.2, the recommended improvements for the Title 22 distribution system are approximately $174.0M.

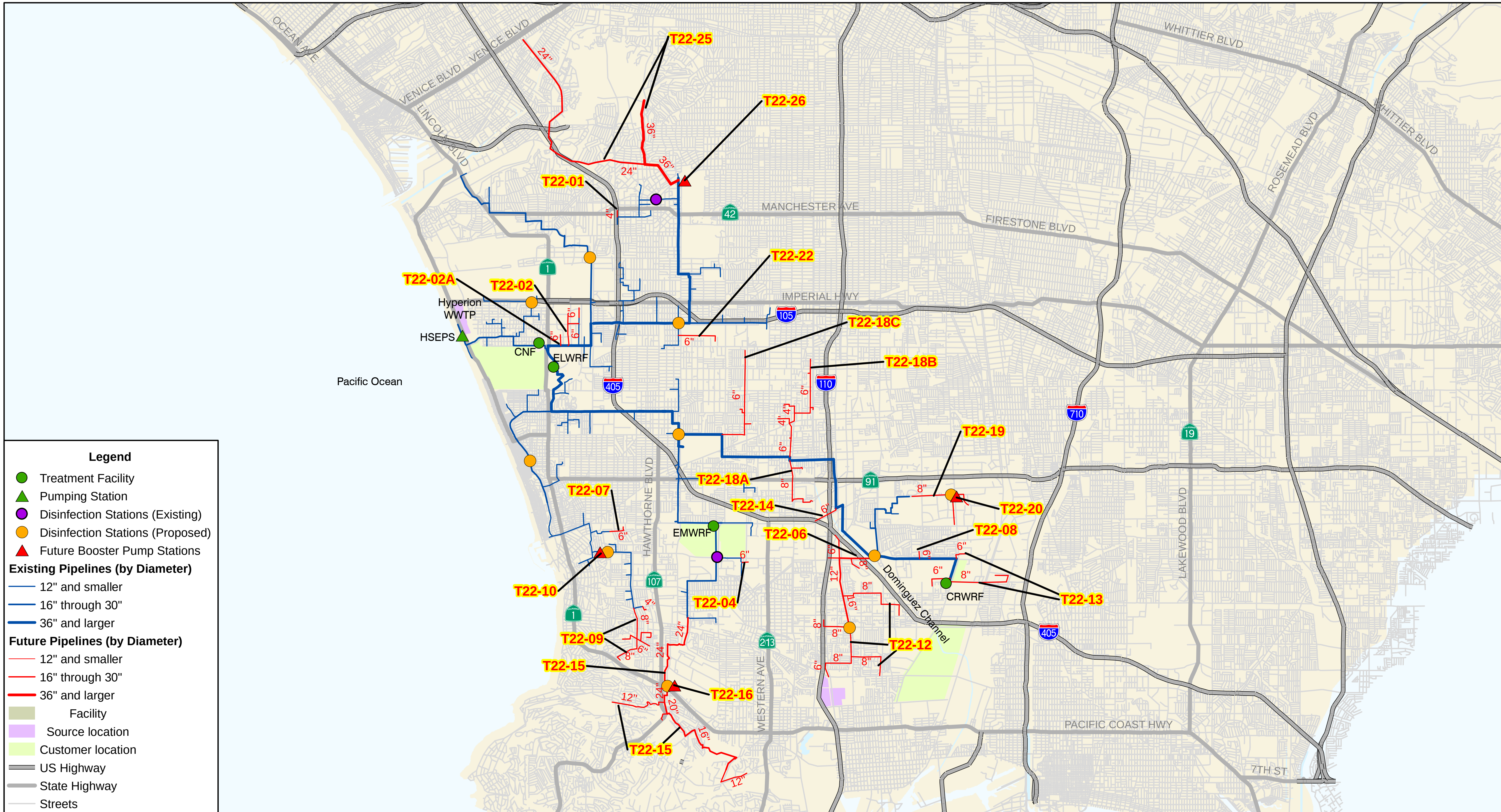

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Figure 9.1
Title 22 CIP Projects

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

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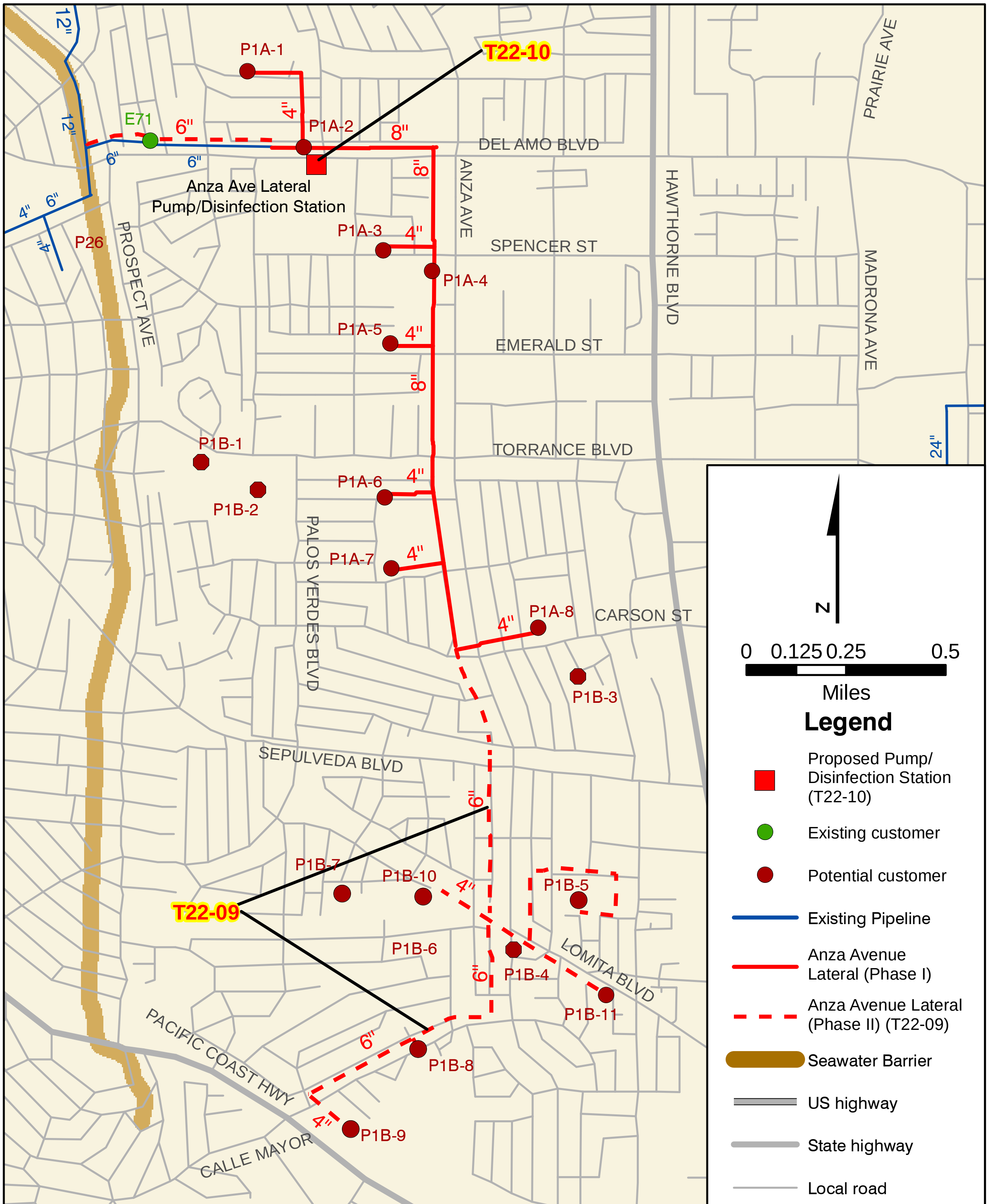


carollo
in association with
AKM SPI

Figure 9.1A
Anza Avenue Lateral

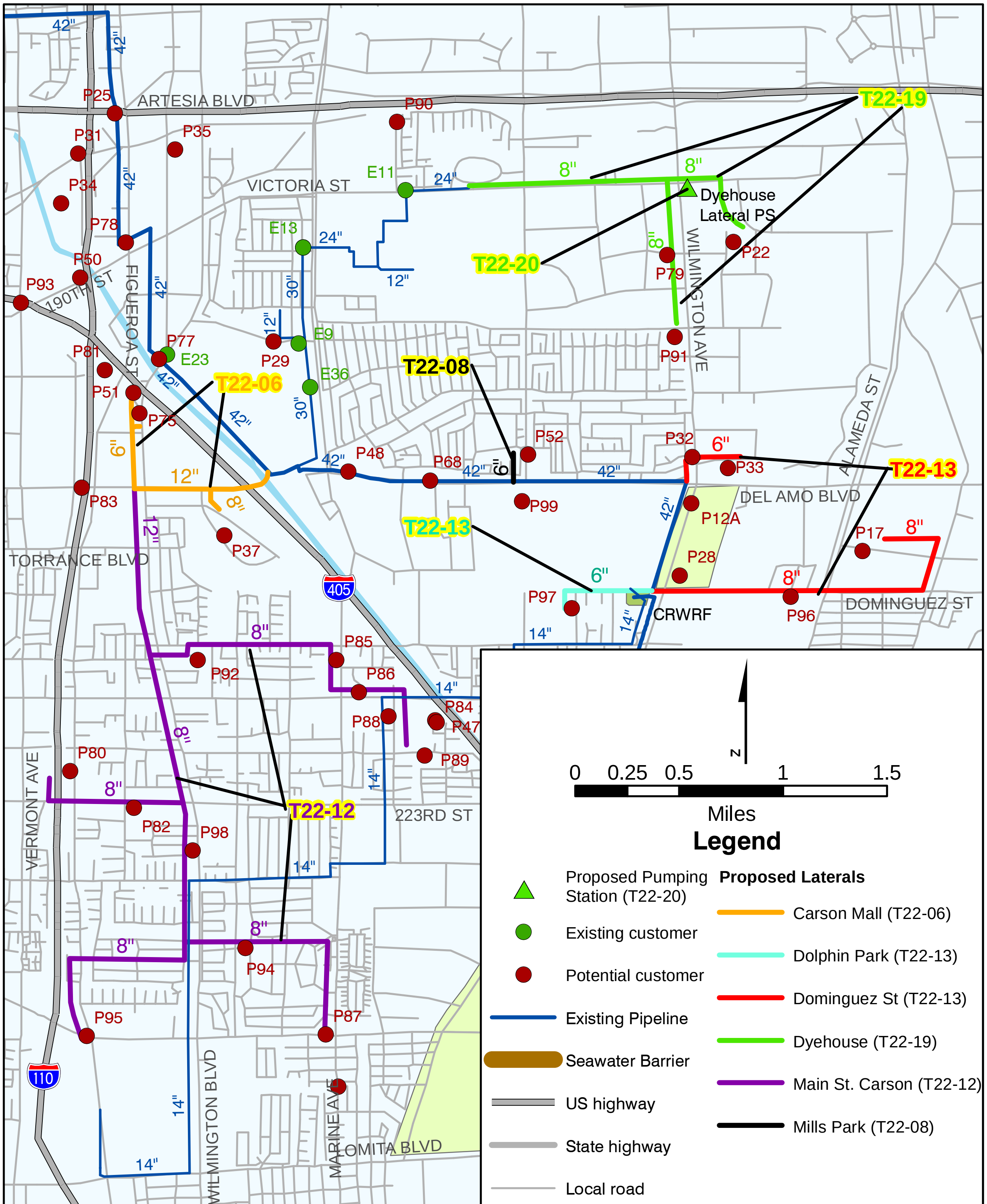
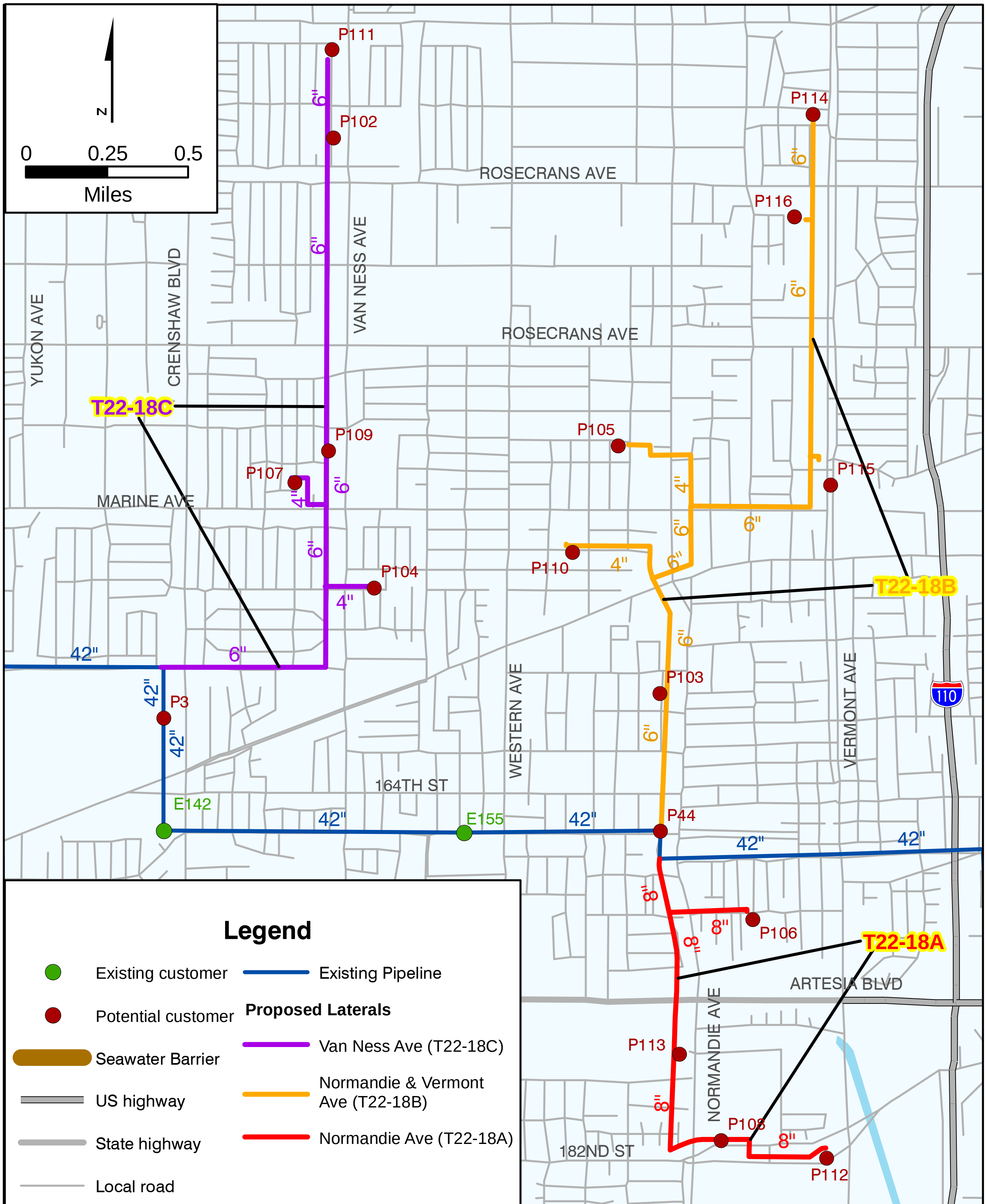


Figure 9.1B
City of Carson - Potential Recycled Water Customer Sites

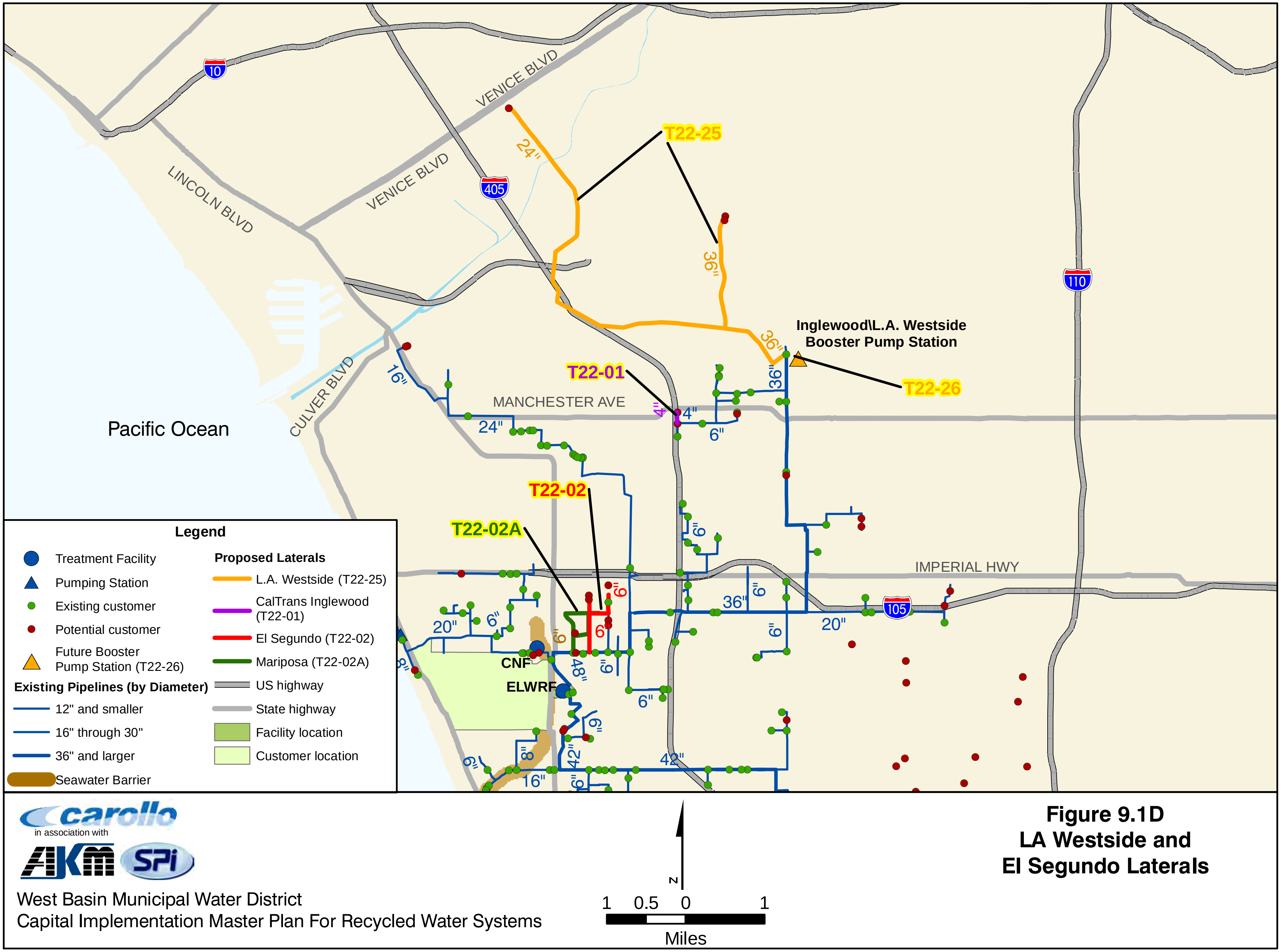
West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems



carollo
in association with

Figure 9.1C
City of Gardena -
Potential Recycled
Water Customer Sites

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems



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West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

Figure 9.1D
LA Westside and
El Segundo Laterals

For all pipeline alignments, it is recommended that West Basin evaluate alternative alignments during preliminary design. As indicated in Table 9.2, cost estimates for several projects were provided by West Basin based on preliminary design and funding of specific laterals and were not estimated as a part of this study.

Special construction markups were applied to several of the Title 22 distribution system pipelines, as detailed in Table 9.4. The special construction markups were applied utilizing GIS layers for railroad, freeway, and arterial streets to determine which pipeline segments were anticipated to carry a larger cost of construction than anticipated by the developed unit costs. For railroad and freeway crossings, the markups account for assumed jack and bore construction techniques, while for arterial streets, higher markups account for increased cost of temporary traffic control. Where pipeline segments were not easily delineated into segments applicable for application of special construction markups, 500 feet was assumed for the construction markup (i.e., if the pipeline segment is 5,000 feet long, but crosses a freeway, the construction markup is applied to 500 feet of the segment length rather than the entire pipeline length).

It should be noted that the locations of the ten proposed disinfection stations shown on Figure 9.1 need to be verified and further evaluated based on water quality data obtained from field measurements. For budgetary purposes the ten recommended stations were divided into two groups, Phase I (T22-11) and Phase II (T22-21). The prioritization of these stations would need to be evaluated by comparing field measurements of existing and historical chlorine residual levels. It is also recommended that a study be conducted to evaluate if the installation of pig-launching and retrieval ports at strategic locations in the distribution system could replace and/or increase the effectiveness of these proposed disinfection stations. This study is included in the list of recommended studies found in Table 9.35.

For each of the laterals recommended for the Title 22 distribution system, demands served by the lateral are presented in Table 9.3. The projected average annual demands reflect Scenarios 7A and 7B.

A detailed breakdown of pipeline sizes for each lateral is presented in Table 9.4. The lengths in Table 9.4 are grouped into individual projects listed in Table 9.2 and Table 9.37. Special construction considerations indicate portions of the project to which are apply additional markups to account for advanced construction techniques or additional traffic control.

Table 9.3	Demands Associated with Title 22 Laterals Capital Implementation Master Plan West Basin Municipal Water District	
ID	**Project Description**	**Average Annual Demand (afy)**
T22-01	Caltrans Inglewood Lateral	10.0
T22-02	El Segundo Lateral (Boeing, Kilroy Airport)	200.0
T22-02A	Mariposa Lateral (Mattel, Hilton, Marriot)	15.0
T22-04	Virco-Torrance Lateral	10.0
T22-06	Carson Mall Lateral	110.0
T22-07	Redondo Beach Lateral (Pete's Nursery)	25.0
T22-08	Mills Park Lateral	10.0
T22-09	Anza Lateral Phase II	80.0
T22-10	Anza PS (4-500 gpm pumps)	
T22-12	Main Street Carson Lateral	275.0
T22-13	Dominguez Street Lateral	260.0
T22-14	Caltrans Gardena Lateral	25.0
T22-15	Palos Verdes - Lateral 6B	670.0
T22-16	Palos Verdes PS (4-1,250 gpm pumps)	
T22-18A	Gardena Lateral - Normandie Ave	165.0
T22-18B	Gardena Lateral - Normandie and Vermont	70.0
T22-18C	Gardena Lateral - Van Ness	55.0
T22-19	Dyehouse Lateral	220.0
T22-20	Dyehouse PS (3-250 gpm pumps)	
T22-22	Hawthorne Lateral (Solec)	175.0
T22-25	LA Westside Lateral	5,500.0

Table 9.4	Details of Title 22 Laterals Capital Implementation Master Plan West Basin Municipal Water District			
ID	**Project Description**	**Diameter**	**Special Const[1]**	**Length[2] (ft)**
T22-14	Caltrans Gardena Lateral	8	-	215
		6		3,025
T22-01	Caltrans Inglewood Lateral	4	ART	771
T22-06	Carson Mall Lateral	6	-	1,259
		6	ART	1,623
		6	FWY	1,344
		16	-	1,555
		16	FWY	2,597
		8	-	1,508

Table 9.4 Details of Title 22 Laterals
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Project Description	Diameter	Special Const[1]	Length[2] (ft)
T22-19	Dyehouse Lateral	8	-	11,638
T22-02	El Segundo Lateral (Boeing, Kilroy Airport)	6	-	546
T22-02A	Mariposa Lateral (Mattel, Hilton, Marriot)	6	-	1,400
T22-02	El Segundo Lateral (Boeing, Kilroy Airport)	6	-	5,802
T22-22	Hawthorne Lateral (Solec)	6	-	5,055
T22-15	Palos Verdes - Lateral 6B	24	-	13,048
		20	-	1,417
		16	-	14,232
		12	-	13,642
T22-07	Redondo Beach Lateral (Pete's Nursery)	6	-	2,092
T22-04	Virco-Torrance Lateral	6	-	1,072
T22-08	Mills Park Lateral	6	-	864
T22-12	Main Street Carson Lateral	16	ART	8,452
		8	-	13,538
		8	ART	3,500
		6	-	9,156
		6	ART	2,195
T22-13	Dominguez Street Lateral	6	-	5,073
		8	-	5,887
		8	RR	3,322
T22-18B	Gardena Lateral - Normandie and Vermont	6	-	11,908
		6	ART	2,243
		4	-	5,072
T22-18A	Gardena Lateral - Normandie Ave	8	-	8,235
		8	ART	915
T22-18C	Gardena Lateral - Van Ness	6	-	12,784
		4	-	1,742
T22-25	LA Westside Lateral	24	-	25,802
		36	-	12,721
		36	FWY	1,000
		36	RR	500
T22-09	Anza Lateral Phase II	8	-	8,002
		6	-	7,167
		4	-	698
Total				**234,618**

Notes:

1. Special Construction Markup Abbreviations: ART – Arterial Street requiring extensive temporary traffic control or alternate construction hours (125% of unit cost for distance of crossing or distance along street); RR – Railroad Crossing requiring jack and bore or alternate trenchless construction techniques (200% of unit cost for distance of crossing).FWY – Freeway Crossing requiring jack and bore or alternate trenchless construction techniques (200% of unit cost for distance of crossing).
2. Totals may not line up with Table 9.37 due to rounding.

As shown in Table 9.4, the total length of new Title 22 laterals is estimated at 235,000 lineal feet or 44 miles.

9.1.3 West Coast Barrier System

Table 9.5 presents the list of recommended improvements to the West Coast Barrier distribution system and treatment processes.

Table 9.5 Project Summary for West Coast Barrier System
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost
BW-01	FY10/11	ELWRF Phase V Expansion - Increase treatment capacity of Barrier treatment by 5.0 mgd, from 12.5 mgd to 17.5 mgd.	$31,800,000
BW-02	FY10/11	Add VFDs to product water pumps	$700,000(1)
BW-04	FY10/11	Modify site piping at ELWRF, replacing 20-inch discharge piping and meter with 27-inch discharge piping and meter.	$175,000(1)
Total			**$32,675,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.5, the total anticipated cost for the recommended improvements for the West Coast Barrier System are approximately $32.7 M. The most costly project of the projects proposed for the West Coast Barrier Water System is the Phase V Treatment Expansion Project (BW-01).

For BW-01, the cost estimate shown is from the ELWRF Phase V Expansion Feasibility Study (HDR 2008) and was not estimated as a part of this study. Costs for expansion of the Barrier product water pump station are assumed to be included in the capital cost shown. This project is anticipated to be completed as a part of the ELWRF Phase V Expansion.

9.1.4 Chevron High Pressure Boiler Feed System

Table 9.6 presents the list of recommended improvements to the Chevron HPBF distribution system and treatment processes.

Table 9.6	Project Summary for CHPBF System Capital Implementation Master Plan West Basin Municipal Water District		
ID	**Phase**	**Project Description**	**Capital Cost**
CH-01	FY10/11	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO Ultra treatment for HPBF by 0.5 mgd, from 2.6 mgd to 3.1 mgd (to meet MMD of 2,153 gpm).	$2,650,000
CH-02	FY10/11	Replace existing pumps with 2-2,400 gpm pumps (to meet MDD of 2,395 gpm).	$700,000(1)
Total			**$3,350,000**

Note:

(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.6, the total anticipated cost for improvements for the CHPBF is approximately $3.4M. The most costly component is the additional treatment capacity. Phasing of these improvements is coordinated with the ELWRF Phase V Expansion.

The cost estimate for CH-01 was provided by West Basin staff and is based on cost estimates prepared during ELWRF Phase V Expansion Feasibility Study phase.

9.1.5 Chevron Low Pressure Boiler Feed System

Table 9.7 presents the list of recommended improvements to the Chevron LPBF distribution system and treatment processes, excluding improvements to the system for the addition of the El Segundo Power Plant, which are addressed in Section 9.1.6.

Table 9.7	Project Summary for CLPBF System Capital Implementation Master Plan West Basin Municipal Water District		
ID	**Phase**	**Project Description**	**Capital Cost**
CL-01	FY10/11	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO treatment for LPBF by 0.4 mgd, from 1.7 mgd to 2.1 mgd (to meet MMD of 1,218 gpm).	$1,050,000
CL-02	FY10/11	Replace existing pumps with 3-1,250 gpm pumps (to meet MDD of 2,039 gpm).	$1,050,000(1)
Total			**$2,100,000**

Note:

(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.7, the total anticipated cost for improvements at the CLPBF is approximately $2.1 M. The most costly component is the additional treatment capacity. Phasing of these improvements is coordinated with the ELWRF Phase V Expansion.

The cost estimate for CL-01 was provided by West Basin staff and is based on cost estimates prepared during ELWRF Phase V Expansion Feasibility Study phase.

Figure 9.2 shows locations of each of the recommended improvements from Table 9.7.

9.1.6 El Segundo Power Plant Boiler Feed System

Table 9.8 presents the list of recommended improvements to the El Segundo Power Plant Boiler Feed System distribution system. Pump station costs are included with upgrades to the Chevron Low Pressure Boiler Feed System, found in Table 9.7.

Table 9.8 Project Summary for ESPP System
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
ESPP-01	FY15-20	Add to treatment capacity of Industrial RO treatment for ESPP of 0.5 mgd (to meet MMD of 325 gpm).	$1,900,000
ESPP-02	FY15-20	El Segundo Power Plant Pipeline from Chevron to El Segundo Power Plant	$3,895,000
ESPP-03	FY15-20	PRV at Chevron	$80,000
Total			**$5,875,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.8, the total anticipated cost for improvements to serve El Segundo Power Plant is approximately $5.9 M. The most costly component is the pipeline from the CLPBF system to the El Segundo Power Plant.

For ESPP-01, the cost estimate shown is from the ELWRF Phase V Expansion Study and was not estimated as a part of this study. Figure 9.2 shows locations of each of the recommended improvements from Table 9.8.

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Figure 9.2
Chevron LPBF & ESPP
CIP Projects

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

9.1.7 Chevron Nitrified Water System

Table 9.9 presents the list of recommended improvements to the Chevron Nitrified Water distribution system. Recommended improvements for treatment, backup power, and replacement equipment for the Chevron Nitrification Facility are included in Table 9.18.

Table 9.9 Project Summary for Chevron Nitrified Water System
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
CN-01	FY10/11	Replace existing pumps with 4-1,800 gpm pumps (to meet peak demand of 5,164 gpm).	$1,575,000
Total			**$1,575,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.9, the total anticipated cost for improvements at the CNS is approximately $1.6M. The only recommendation for this distribution system is upgrade of the pump station. Phasing of this improvement is coordinated with the ELWRF Phase V Expansion. It should be noted that the improvements associated with the Chevron Nitrification Facility are listed in Section 9.1.16.

9.1.8 ELWRF Brine Line

Table 9.10 presents the list of recommended improvements to the ELWRF Brine Line system. Recommended improvements for treatment, backup power, and replacement equipment for this system are included in the ELWRF improvement list in Table 9.15.

Table 9.10 Project Summary for ELWRF Brine Line
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
EBRN-01	FY10/11	Install pinch valves/reducers	$630,000
EBRN-02	FY11/12	Install access ports for cleaning	$1,885,000
Total			**$2,515,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.10, the total anticipated cost for improvements in the ELWRF Brine Line system is approximately $2.5 M.

9.1.9 bp Reverse Osmosis System

Table 9.11 presents the list of recommended improvements to the bp RO system.

Table 9.11 Project Summary for bp Reverse Osmosis System
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
BPRO-01	FY11/12	Treat SE from JWPCP w/ MF/RO to serve growth in bp RO System	$73,080,000
BPRO-02	FY11/12	New Pipeline from NTP to bp for conveyance of Industrial RO Water.	$8,705,000
BPRO-03	FY11/12	New pump station at NTP to serve bp Industrial RO (assumes 4-2,100 gpm pumps, in PS w/ BPN-04)	$4,200,000
Total			**$85,985,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.11, the total anticipated cost for improvements in the bp RO system is approximately $86.0 M. The most costly component is the treatment associated with supplying Industrial RO water at the JWPCP. It is important to note that under supply alternative Option 1, discussed in Section 8.4, this cost would be partially encountered through expansion of the conventional Title 22 treatment processes at ELWRF, but the MF/RO treatment at JWPCP incorporates both SE treatment and Industrial RO treatment into one process. Phasing of these improvements are coordinated with the CRWRF Phase II Expansion.

9.1.10 bp Nitrified Water System

Table 9.12 presents the list of recommended improvements to the bp Nitrified water system.

As presented in Table 9.12, the total anticipated cost for improvements in the bp Nitrified system is approximately $48.0 M. The most costly component is the treatment associated with supplying MF water at the JWPCP to the Nitrification process. It is important to note that under supply alternative Option 1, discussed in Section 8.4, this cost would be partially encountered through expansion of the conventional Title 22 treatment processes at ELWRF. Phasing of these improvements are coordinated with the CRWRF Phase II Expansion.

Table 9.12 Project Summary for bp Nitrified Water System
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
BPN-01	FY11/12	Treat SE from JWPCP w/ MF to serve growth in bp Nitrified System	$16,800,000
BPN-02	FY11/12	Nitrified Treatment - treat MF treated SE (BPN-01) from JWPCP to serve growth in bp Nitrified System	$12,205,000
BPN-03	FY11/12	New 20" pipeline from NTP to bp for conveyance of Nitrified Water.	$9,535,000
BPN-03A	FY11/12	Parallel 14" pipeline from CRWRF to bp for conveyance of Nitrified Water.	$4,245,000
BPN-04	FY11/12	New pump station at NTP to serve bp Nitrified (assumes 4-1,500 gpm pumps, in PS w/ BPRO-03)	$3,150,000
BPN-05	FY11/12	Add a 1.0 MG storage reservoir to NTP to maintain current number of hours of backup for bp Nitrified system.	$2,100,000
Total			**$48,035,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

The 14-inch diameter parallel pipeline from CRWRF to Gate 7 at the bp Carson Refinery would provide redundancy to the current 12-inch diameter pipeline used for conveyance of Nitrified Water. The configuration of the projects listed in Table 9.12 will need to be established during preliminary design.

9.1.11 CRWRF Brine Line

Table 9.13 presents the list of recommended improvements to the CRWRF Brine Line system. Recommended improvements for treatment, backup power, and replacement equipment for this system are included in the CRWRF improvement list in Table 9.16.

As presented in Table 9.13, the total anticipated cost for improvements in the CRWRF Brine Line system is approximately $1.3M. Phasing of these improvements is coordinated with the CRWRF Phase II Expansion.

Table 9.13	Project Summary for CRWRF Brine Line Capital Implementation Master Plan West Basin Municipal Water District		
ID	**Phase**	**Project Description**	**Capital Cost(1)**
CBRN-01	FY11/12	Install access ports for cleaning	$1,260,000
Total			**$1,260,000**

Note:

(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As discussed in Chapter 8, sufficient pressure is available at the CRWRF RO process train to convey the additional flow anticipated for this system. Costs for reconfiguring the RO process train to provide additional head for this system are assumed minimal and thus not included in the CIP.

9.1.12 System-Wide Improvements

Table 9.14 presents a list of recommended improvements which apply to more than one West Basin facility.

Table 9.14	Project Summary for System-Wide Improvements Capital Implementation Master Plan West Basin Municipal Water District		
ID	**Phase**	**Project Description**	**Capital Cost**
SW-01	Mult	United Water Recapitalization Improvements (recurring)	$4,230,000
SW-02	FY09/10	UW Recap - Major Painting Projects	$150,000
SW-03	FY09/10	UW Recap - Purchase trailer for spill response	$5,000
SW-04	FY09/10	UW Recap - Asset Management Software, Implementation and Training	$300,000
SW-05	FY09/10	UW Recap - Replace all Biofor valves at CNF and EMWRF	$200,000
SW-06	Mult	United Water Recapitalization Improvements (recurring)	$4,230,000
Total			**$9,115,000**

As shown in Table 9.14, the costs for improvements associated with more than one facility total $9.1M. The system-wide improvements consist solely of recapitalization improvements, identified by United Water (UW), West Basin's system operator. These are improvements requested by United Water and are listed individually for FY0910. For conservative planning purposes, it is assumed a similar cost will occur approximately every five years through the planning horizon, in FY1415, FY15-20, FY20-25, and FY25-30. The total capital cost of the recurrence of these items is summarized in SW-01 and SW-06 (listed as two separate projects to separate the costs for FY1415 through FY1920 and FY2021 through FY2930). United Water projects are listed similarly for all treatment facilities. For a summary of these project costs by treatment facility and other recurring costs, see Section 9.3.4.

9.1.13 ELWRF

The recommended projects for ELWRF are listed in Table 9.15.

As presented in Table 9.15, the total anticipated cost for improvements for ELWRF is anticipated to be approximately $276.2 M. Phasing of improvements related to Phase V are coordinated with the ELWRF Phase V Expansion, and are included in the relevant subsystems (i.e., Sections 9.1.3, 9.1.4, 9.1.5, and 9.1.6). A summary of items included in the Phase V expansion are included in Section 9.3.3).

Table 9.15 does not include treatment expansions at ELWRF associated with subsystems, as detailed in Sections 9.1.3, 9.1.4, 9.1.5, and 9.1.6. The total cost of all projects physically located at ELWRF, including projects listed in detailed in Sections 9.1.3, 9.1.4, 9.1.5, and 9.1.6, is estimated to be $316.2 M (excluding the Title 22 pump station and storage).

Table 9.15 Project Summary for ELWRF
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
ELWRF-01	FY09/10	UW Recap - T-22 backwash pump total rebuilds (increase capacity of T22 backwash blower)	$100,000
ELWRF-03	FY10/11	ELWRF Phase V Expansion - Add redundant gravity thickener.	$1,960,000
ELWRF-04	FY10/11	ELWRF Phase V Expansion - Resolve underperformance of baskwash equalization basin.	$170,000
ELWRF-05	FY10/11	ELWRF Phase V Expansion - Redundant Sludge Conditioning Tank	$140,000
ELWRF-06	FY10/11	Increase Capacity of Title 22 Air Vacuum Release Valve for Product Water Storage Tanks	$100,000
ELWRF-07	FY12/13	Add Title 22 High Rate Clarifier and Title 22 Filters (to bring clarifier from 30.0 mgd to 50.0 mgd and filter capacity from 40.0 mgd to 50.0 mgd)	$12,600,000
ELWRF-09	FY15-20	Add 17.3 mgd of Title 22 Treatment, to increase Title 22 treatment capacity from 50.0 mgd to 67.3 mgd	$48,440,000

Table 9.15 Project Summary for ELWRF
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost[1]
ELWRF-10	FY15-20	Increase capacity of Title 22 Pump Station at ELWRF by 3,200 hp (from 4,800 hp to 8,000 hp) to serve Future Title 22 Customers	$14,340,000
ELWRF-11	FY15-20	Microfiltration - Replace existing Phase II and III MF System w/ Pressurized System	$16,800,000
ELWRF-12	FY15-20	Backup Power	$11,200,000
ELWRF-13	FY15-20	Dewatered Sludge Handling Transfer System	$2,800,000
ELWRF-15	FY15-20	Potable Water Connection to ELWRF	$280,000
ELWRF-16	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$21,860,000
ELWRF-17	Mult	Membrane Replacement (recurring)	$11,053,800
ELWRF-18	Mult	United Water Recapitalization Improvements (recurring)	$5,070,000
ELWRF-19	FY09/10	UW Recap - Pave area between T 22 filters and the holding basins	$8,800
ELWRF-20	FY09/10	UW Recap - Shelter/Overhead cover when CO2 tank is removed. To provide covered storage area for chemical totes. Include access for forklifts around dike area.	$100,000
ELWRF-21	FY09/10	UW Recap - Phase III Memcor and SCADA and PC	$5,000
ELWRF-22	FY09/10	UW Recap - No. 3 Sulfuric acid day tank replace	$30,000
ELWRF-23	FY09/10	UW Recap - Replace grating replacement in chemical area with chemical resistant grating	$40,000
ELWRF-24	FY09/10	UW Recap - Trench Drains at Decant Sump area	$30,000
ELWRF-25	FY09/10	UW Recap - Power receptacles for emergency generator hook up for Title 22	$20,000
ELWRF-26	FY09/10	UW Recap - Replace DCS back up power (48vac) generator	$45,000
ELWRF-27	FY09/10	UW Recap - Flow control valve and actuator for barrier product pump	$100,000
ELWRF-28	FY09/10	UW Recap - Replace or expand plant instrument air compressor system	$75,000
ELWRF-29	FY09/10	UW Recap - Replace phase II RO Membranes	$375,000
ELWRF-30	FY09/10	UW Recap - Data Parser to allow for direct entry of data from instrumentation into LIMS.	$25,000
ELWRF-31	FY09/10	UW Recap - Replace or repair lab wall to prevent water intrusion and mold	$25,000
ELWRF-32	FY20-25	Land Acquisition of 4.0 ac near ELWRF for Expansion of Title 22 Beyond 70.0 mgd	$9,600,000

Table 9.15	Project Summary for ELWRF Capital Implementation Master Plan West Basin Municipal Water District		
ID	**Phase**	**Project Description**	**Capital Cost[1]**
ELWRF-33	FY25-30	Increase capacity of Title 22 Pump Station at ELWRF by 4,000 hp (from 8,000 hp to 12,000 hp) to serve LADWP Harbor Expansion, Westside, and Kenneth Hahn	$16,800,000
ELWRF-34	FY25-30	Add 8.9 mgd of Additional Title 22 Treatment to Serve LADWP Harbor Expansion, increasing Title 22 Treatment Capacity from 67.3 mgd to 76.2 mgd	$24,945,000
ELWRF-35	FY25-30	Add 15.3 mgd of Additional Title 22 Treatment to Serve LADWP Westside and Kenneth Hahn Park, increasing Title 22 Treatment Capacity from 76.2 mgd to 91.5 mgd	$42,970,000
ELWRF-36	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$17,965,000
ELWRF-37	Mult	Membrane Replacement (recurring)	$11,055,000
ELWRF-38	Mult	United Water Recapitalization Improvements (recurring)	$5,070,000
Total			**$276,197,600**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

Recapitalization improvements requested by United Water are listed individually for FY09/10 (ELWRF-19 through ELWRF-31). For conservative planning purposes, it is assumed a similar cost will occur approximately every five years through the planning horizon, in FY14/15, FY15-20, FY20-25, and FY25-30. The total capital cost of the recurrence of these items is summarized in ELWRF-18 and ELWRF-38 (listed as two separate projects to separate the costs for FY14/15 through FY19/20 and FY20/21 through FY29/30). For detailed information on the development of recurring costs, see Section 9.3.4.

9.1.14 CRWRF

The recommended projects for CRWRF are listed in Table 9.16. As seen in Table 9.16, the total anticipated cost for improvements for CRWRF is anticipated to be approximately $126.1 M. The most costly recommendation for this distribution system is the Nitrified treatment for future Nitrified water demands served by CRWRF.

Table 9.15 does not include treatment expansions at the NTP, which are detailed in Sections 9.1.9 and 9.1.10. If the JWPCP secondary source is not utilized for service to bp and Dominguez Gap Barrier, most of the NTP projects would need to be redefined and included at CRWRF.

Figure 9.3 shows the proposed alignment of the pipeline required to convey recycled water to the boundary between the cities of Carson and Los Angeles to deliver the LADWP Harbor demand. This figure also shows the alignment of the pipeline to serve the bp Nitrification demands (listed in Table 9.12, with the bp Nitrified water distribution system) associated with the NTP. It should be noted that the actual locations of the NTP and the pipeline would need to be determined during preliminary design of these projects.

Table 9.16 Project Summary for CRWRF
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Year / Phase	Project Description	Capital Cost(1)
CRWRF-01	FY11/12	Pipeline for LADWP Harbor demands at Carson City bndy	$29,100,000
CRWRF-02	FY11/12	Nitrified Treatment of Title 22 Water (Nitrified Water for LADWP Harbor Demand and Rhodia)	$43,141,278
CRWRF-03	FY11/12	Add new 11.6 mgd pump station at CRWRF to serve LADWP Harbor Demand Phase II (5 pumps)	$5,250,000
CRWRF-04	FY11/12	Surge Protection – Modify MF Units with Break Tank and Pumps	$6,300,000
CRWRF-05	FY11/12	Raw Water Storage (1 hour)	$5,250,000
CRWRF-06	FY11/12	Repair Nitrified Product Water Storage Tank	$560,000
CRWRF-07	FY15-20	Backup Power	$2,520,000
CRWRF-08	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$6,375,000
CRWRF-09	Mult	Membrane Replacement (recurring)	$2,799,000
CRWRF-10	Mult	United Water Recapitalization Improvements (recurring)	$1,690,000
CRWRF-11	FY09/10	UW Recap - Construct paved access way from road to rear side of RO CIP tank.	$10,000
CRWRF-12A	FY20-25	Nitrified Treatment of Title 22 Water (Nitrified Water for LADWP Harbor Demand Phase II)	$10,480,000
CRWRF-12B	FY20-25	Add new 7.1 mgd pump station at CRWRF to serve LADWP Harbor Demand Phase II (5 pumps)	$4,200,000
CRWRF-13	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$3,895,000
CRWRF-14	Mult	Membrane Replacement (recurring)	$2,800,000
CRWRF-15	Mult	United Water Recapitalization Improvements (recurring)	$1,690,000
Total			**$126,060,278**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

Recapitalization improvements requested by United Water are listed individually for FY09/10 (CRWRF-11). For conservative planning purposes, it is assumed a similar cost will occur approximately every five years through the planning horizon, in FY14/15, FY15-20, FY20-25, and FY25-30. The total capital cost of the recurrence of these items is summarized in CRWRF-10 and CRWRF-15 (listed as two separate projects to separate the costs for FY14/15 through FY19/20 and FY20/21 through FY29/30). For detailed information on the development of recurring costs, see Section 9.3.4.

9.1.15 EMWRF

Table 9.17 presents the list of recommended improvements to EMWRF.

Table 9.17 Project Summary for EMWRF
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
EMWRF-01	FY11/12	Repair or Replace Bulk Chemical Storage Tank and Associated Equipment	$700,000
EMWRF-02	FY11/12	Inspect Nitrified Product Water Storage Tank Internal Condition	$85,000
EMWRF-03	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$6,980,000
EMWRF-04	FY15-20	Add 0.6 mgd of Industrial RO Treatment of Title 22 Water (half of 1,000 afy total w/ RO).(6)	$1,890,000
EMWRF-05	FY15-20	Add 0.5 mgd of Nitrified Treatment of Title 22 Water (half of 1,000 afy total w/ Nitrified).(6)	$735,000
EMWRF-06	FY15-20	Surge Protection - Modify MF Units with Break Tank and Pumps	$3,500,000
EMWRF-07	FY15-20	Backup Power for Product Water Pumps	$700,000
EMWRF-08	Mult	Membrane Replacement (recurring)	$1,650,000
EMWRF-09	Mult	United Water Recapitalization Improvements (recurring)	$850,000
EMWRF-10	FY09/10	UW Recap - Pavement of area between gated entrance and plant.	$20,000
EMWRF-11	FY09/10	UW Recap - Add an additional air compressor for the MF system	$30,000
EMWRF-12	FY09/10	UW Recap - RO Train 4 membrane change out	$160,000
EMWRF-13	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$3,265,000
EMWRF-14	Mult	Membrane Replacement (recurring)	$1,650,000
EMWRF-15	Mult	United Water Recapitalization Improvements (recurring)	$850,000
Total			**$23,065,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.17, the total anticipated cost for improvements for EMWRF is anticipated to be approximately $23.1 M. Projects EMWRF-04 and EMWRF-05 are included to accommodate potential expansion of the capacity of EMWRF. It should be noted that, as the projects due to growth or expansion anticipated at EMWRF are not associated with demands listed in the customer database, no analysis or hydraulic evaluation associated with the effects of these demands was conducted (these demands are not mentioned in Chapters 3, 4, or 8). All remaining projects are either replacement or rehabilitation of existing equipment, as planned by the condition assessment, reliability projects, or surge reduction projects to reduce surges to the Title 22 distribution system (i.e., EMWRF-06).

Recapitalization improvements requested by United Water are listed individually for FY09/10 (EMWRF-10 through EMWRF-12). For conservative planning purposes, it is assumed a similar cost will occur approximately every five years through the planning horizon, in FY14/15, FY15-20, FY20-25, and FY25-30. The total capital cost of the recurrence of these items is summarized in EMWRF-09 and EMWRF-15 (listed as two separate projects to separate the costs for FY14/15 through FY19/20 and FY20/21 through FY29/30). For detailed information on the development of recurring costs, see Section 9.3.4.

9.1.16 CNF

Table 9.18 presents the list of recommended improvements to CNF.

As presented in Table 9.17, the total anticipated cost for improvements for CNF is anticipated to be approximately $11.5 M. The vast majority of this cost is in replacement of existing equipment, as planned by the condition assessment. However, the costs for expansion of Nitrified treatment capacity are also significant. These improvements are described as the ELWRF Phase Va Expansion.

It should be noted that costs associated with the Chevron Nitrified Water system (consisting solely of expansion of the Nitrified water product water pump station) are included in Section 9.1.7, even though they are geographically located at the CNF. Since the Chevron Nitrified Water system costs total $1.7 M, the total cost of all improvements anticipated at the CNF is estimated to be $13.1 M.

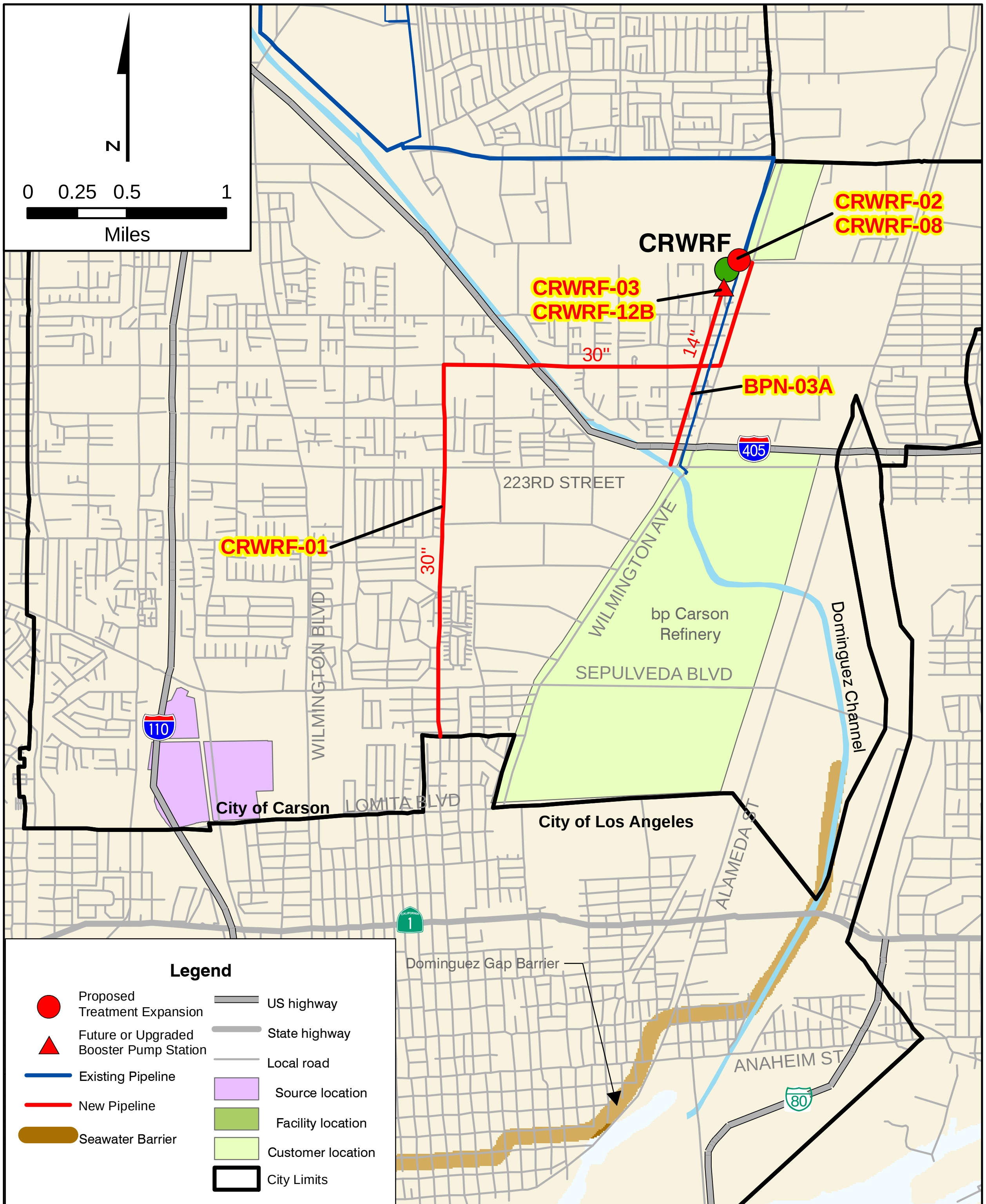

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Figure 9.3
Carson Regional Water Recycling Facility (CRWRF) Area CIP

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

Table 9.18 Project Summary for CNF
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
CNF-01	FY15-20	ELWRF Phase Va Expansion - Increase treatment capacity of Nitrified by 2.1, from 4.9 mgd to 7.0 mgd. (Two Biofor Units)	$3,090,000
CNF-02	FY15-20	ELWRF Phase Va Expansion - Backup Power to Product Water Pumps	$700,000
CNF-03	FY10/11	ELWRF Phase Va Expansion - Replace Turbine	$700,000
CNF-04	FY15-20	ELWRF Phase Va Expansion - Potable Water Backup Supply	$350,000
CNF-05	FY11/12	ELWRF Phase Va Expansion - Inspect Nitrified Product Water Storage Tank Internal Condition	$85,000
CNF-06	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$4,520,000
CNF-07	Mult	United Water Recapitalization Improvements (recurring)	$850,000
CNF-08	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$350,000
CNF-09	Mult	United Water Recapitalization Improvements (recurring)	$850,000
Total			**$11,495,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

No recapitalization improvements requested by United Water are included for CNF. For conservative planning purposes, it is assumed United Water costs will be required in future years, similar to West Basin's other treatment facilities approximately every five years through the planning horizon, in FY14/15, FY15-20, FY20-25, and FY25-30. The total capital cost of the recurrence of these items is summarized in CNF-07 and CNF-09 (listed as two separate projects to separate the costs for FY14/15 through FY19/20 and FY20/21 through FY29/30). For detailed information on the development of recurring costs, see Section 9.3.4.

9.1.17 New Treatment Plant System

A new treatment plant (NTP) is needed to cost-effectively meet expanded advanced treatment demands in the south-east portion of West Basin's service area. As discussed in Chapter 8, it was determined that it would be most beneficial to add additional treatment on the south-east side to the West Basin recycled water system by treating secondary effluent from the Los Angeles County Sanitation District's JWPCP. This would provide cost savings and increase the overall system reliability. Sizing of the NTP is discussed in Section 8.4.1. The major recommended components for this treatment plant and associated distribution system are listed in Table 9.19. Treatment, pump station, and pipeline improvements associated with specific distribution systems are included separately with those distribution systems (i.e., Sections 9.1.9 and 9.1.10).

Table 9.19 Project Summary for the New Treatment Plant
Capital Implementation Master Plan
West Basin Municipal Water District

ID	Phase	Project Description	Capital Cost(1)
NTP-01	FY11/12	Land Acquisition of 4.5 ac near JWPCP for NTP	$4,800,000
NTP-02	Mult	Membrane Replacement (recurring)	$8,525,000
NTP-03	FY20-25	Barrier Water Treatment - treat SE from JWPCP to serve Dominguez Gap (Phase I and II)	$34,125,000
NTP-04	FY20-25	Add new 3.1 mgd pump station at NTP to serve Dominguez Gap (Phase I + II)	$2,100,000
NTP-05	FY20-25	New Pipeline from NTP to Dominguez Gap Barrier Blending Station for conveyance of Barrier Water.	$9,640,000
NTP-06	Mult	Membrane Replacement (recurring)	$17,050,000
Total			**$76,240,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.19, the total anticipated cost for improvements for the NTP is approximately $76.2 M. The most costly recommendation listed in Table 9.19 is the treatment costs associated with the Dominguez Gap Barrier. However, treatment capacities for the bp Nitrified water system and bp RO system are listed separately in Sections 9.1.9 and 9.1.10 although they would be geographically located at the NTP.

The total cost of all improvements located at the NTP is estimated to be $187.8 M. It is important to note that under supply alternative Option 1, as discussed in Section 8.4, this cost would be partially encountered through expansion of the conventional Title 22 treatment processes at ELWRF. Phasing of these improvements is coordinated with the CRWRF Phase II Expansion.

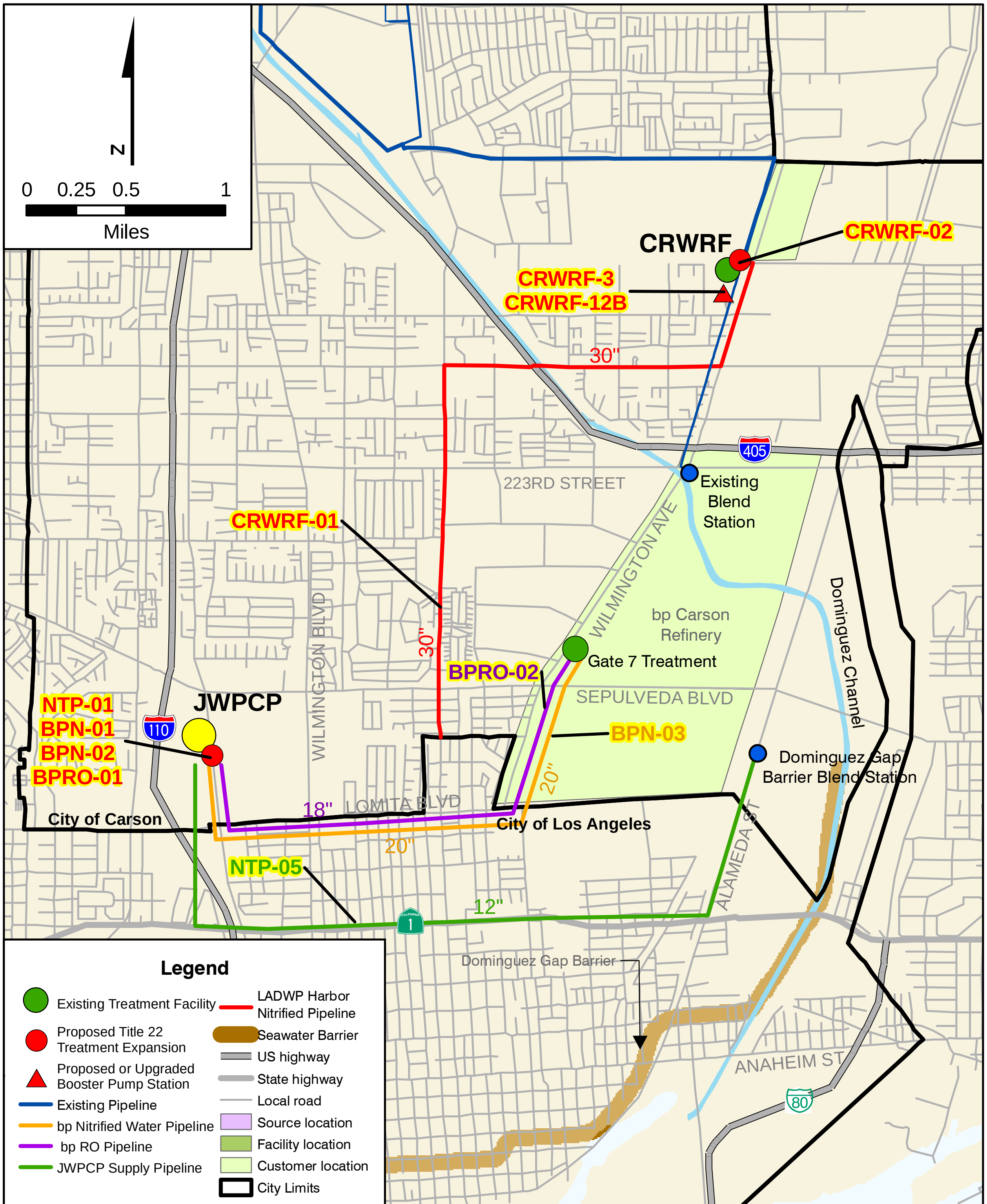

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Figure 9.4
New Treatment Plant
(NTP) Area CIP

West Basin Municipal Water District
Capital Implementation Master Plan For Recycled Water Systems

Based on the modeling conducted with *OPTIMO*™, the major treatment process components that would need to be included in this NTP are:

- Microfiltration (MF)
- Reverse Osmosis (RO)
- MF Backwash Disposal
- RO Brine Disposal
- Disinfection

This NTP could be located at or in the vicinity of JWPCP, CRWRF, or along the transmission main alignment between the two plants. The preliminary locations of the facilities are shown on Figure 9.4. It should be noted that the actual locations of the NTP and the associated pipelines would need to be determined during preliminary design of these projects.

9.1.18 CIP Summary by System

The total estimated capital cost for the proposed projects of each of the systems described in Sections 9.1.1through 9.1.16 are summarized in Table 9.20.

Table 9.20 Project Summary by System
Capital Implementation Master Plan
West Basin Municipal Water District

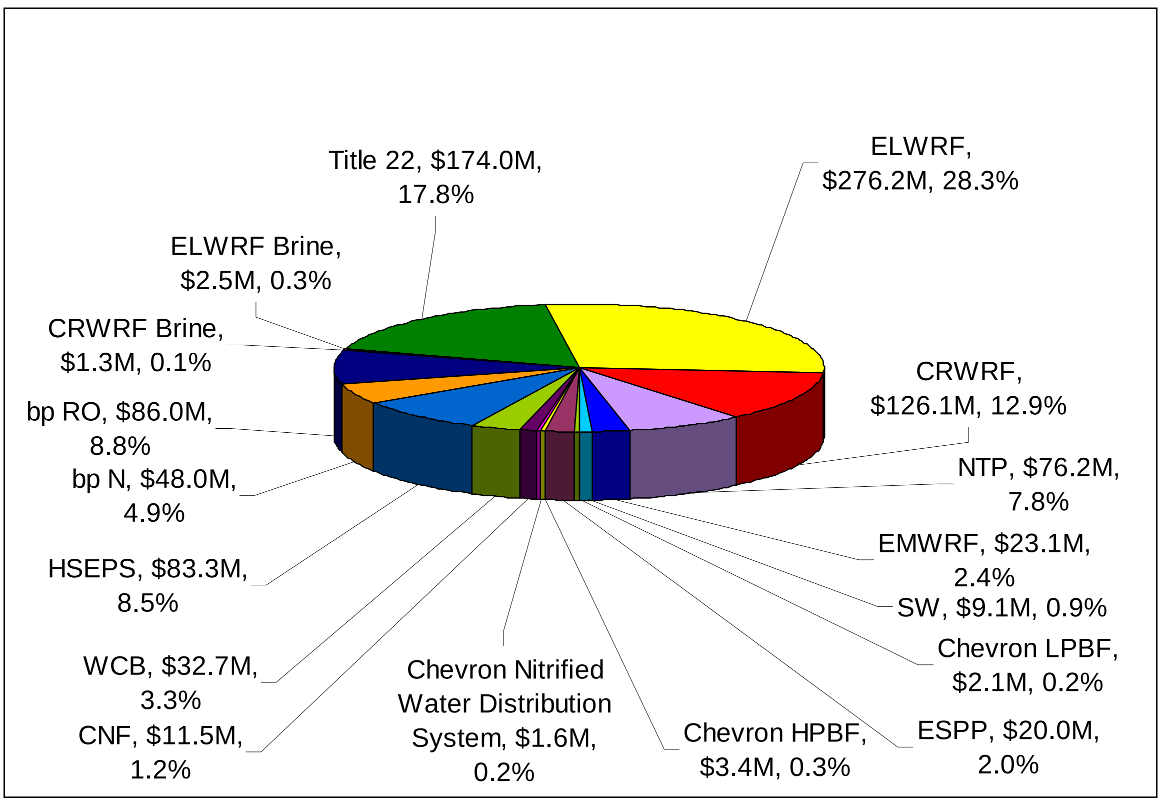
Facility ID	System/Treatment Plant Name	No. of Projects	Capital Cost(1)	Percentage of Total
HPS	Hyperion Secondary Effluent Pumping System	7	$83,320,000	8.6%
T22	Title 22 Distribution System	27	$174,000,000	18.1%
BW	West Coast Barrier Water System	3	$32,675,000	3.4%
CH	Chevron High Pressure Boiler Feed System	2	$3,350,000	0.3%
CL	Chevron Low Pressure Boiler Feed System	2	$2,100,000	0.2%
ESPP	El Segundo Power Plant System	3	$5,875,000	0.6%
CN	Chevron Nitrified Water System	1	$1,575,000	0.2%
EBRN	ELWRF Brine Line	2	$2,515,000	0.3%
BPRO	bp RO System	3	$85,985,000	8.9%
BPN	bp Nitrified Water System	6	$48,035,000	5.0%
CBRN	CRWRF Brine Line	1	$1,260,000	0.1%
SW	System Wide Improvements	6	$9,115,000	0.9%
ELWRF	Edward C. Little Water Recycling Facility	35	$276,197,600	28.7%
CRWRF	Carson Regional Water Recycling	16	$126,060,278	13.1%

Table 9.20	Project Summary by System Capital Implementation Master Plan West Basin Municipal Water District			
Facility ID	**System/Treatment Plant Name**	**No. of Projects**	**Capital Cost(1)**	**Percentage of Total**
	Facility			
EMWRF	ExxonMobil Water Recycling Facility	15	$23,065,000	2.4%
CNF	Chevron Nitrification Facility	9	$11,495,000	1.2%
NTP	New Treatment Plant	6	$76,240,000	7.9%
Total		**144**	**$962,862,878**	**100.0%**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.20, the total capital cost for all facilities is estimated at approximately $963.0 M. Figure 9.5 shows the distribution of these capital costs by system.

Figure 9.5
Distribution of Capital Costs by System



As shown in Figure 9.5, more than half of the total CIP costs are contributed by four of the fifteen systems, the Title 22 system, ELWRF, CRWRF, and the NTP.

9.2 PHASING OF RECOMMENDATIONS

This CIP is divided into six 1-year planning periods from Fiscal Year (FY) 2009/2010 through FY 2014/2015, and three 5-year planning periods from FY2015/2016 through FY 2025/2030. The phasing for a large number of projects is related to the phasing of the CRWRF Phase II Expansion project, for which the Carson Regional WRF Expansion Feasibility Study should be completed in April 2009. Project phasing is also based on the anticipated year that customers could be connected as determined in discussions with West Basin staff and as listed in Chapter 3.

This section presents a summary of the CIP projects by planning phase.

9.2.1 CIP Projects for FY09/10

Table 9.21 presents the CIP projects phased in FY2009/2010 (FY09/10).

Table 9.21 CIP Projects for FY09/10
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
T22-02A	T22	Mariposa Lateral (Mattel, Hilton, Marriot)	$750,000
T22-06	T22	Carson Mall Lateral	$2,500,000
T22-09	T22	Anza Lateral Phase II	$3,500,000
T22-10	T22	Anza PS (4-500 gpm pumps)	$2,000,000
T22-19	T22	Dyehouse Lateral	$3,000,000
T22-20	T22	Dyehouse PS (3-250 gpm pumps)	$1,500,000
Subtotal – Title 22 Distribution System			***$13,250,000***
ELWRF-01	ELWRF	UW Recap - T-22 backwash pump total rebuilds (increase capacity of T22 backwash blower)	$100,000
ELWRF-19	ELWRF	UW Recap - Pave area between T 22 filters and the holding basins	$8,800
ELWRF-20	ELWRF	UW Recap - Shelter/Overhead cover when CO2 tank is removed. To provide covered storage area for chemical totes. Include access for forklifts around dike area.	$100,000
ELWRF-21	ELWRF	UW Recap - Phase III Memcor and SCADA and PC	$5,000
ELWRF-22	ELWRF	UW Recap - No. 3 Sulfuric acid day tank replace	$30,000
ELWRF-23	ELWRF	UW Recap - Replace grating replacement in chemical area with chemical resistant grating	$40,000
ELWRF-24	ELWRF	UW Recap - Trench Drains at Decant	$30,000

Table 9.21 CIP Projects for FY09/10 Capital Implementation Master Plan West Basin Municipal Water District			
ID	**System**	**Project Description**	**Capital Cost[1]**
		Sump area	
ELWRF-25	ELWRF	UW Recap - Power receptacles for emergency generator hook up for Title 22	$20,000
ELWRF-26	ELWRF	UW Recap - Replace DCS back up power (48vac) generator	$45,000
ELWRF-27	ELWRF	UW Recap - Flow control valve and actuator for barrier product pump	$100,000
ELWRF-28	ELWRF	UW Recap - Replace or expand plant instrument air compressor system	$75,000
ELWRF-29	ELWRF	UW Recap - Replace phase II RO Membranes	$375,000
ELWRF-30	ELWRF	UW Recap - Data Parser to allow for direct entry of data from instrumentation into LIMS.	$25,000
ELWRF-31	ELWRF	UW Recap - Replace or repair lab wall to prevent water intrusion and mold	$25,000
CRWRF-11	CRWRF	UW Recap - Construct paved access way from road to rear side of RO CIP tank.	$10,000
EMWRF-10	EMWRF	UW Recap - Pavement of area between gated entrance and plant.	$20,000
EMWRF-11	EMWRF	UW Recap - Add an additional air compressor for the MF system	$30,000
EMWRF-12	EMWRF	UW Recap - RO Train 4 membrane change out	$160,000
SW-02	SW	UW Recap - Major Painting Projects	$150,000
SW-03	SW	UW Recap - Purchase trailer for spill response	$5,000
SW-04	SW	UW Recap - Asset Management Software, Implementation and Training	$300,000
SW-05	SW	UW Recap - Replace all Biofor valves at CNF and EMWRF	$200,000
Subtotal – United Water Recapitalization Improvements			***$1,853,800***
Total			**$15,103,800**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As shown in Table 9.21, projects currently anticipated in FY09/10 include only rehabilitation and recapitalization projects. These projects total $15.1M. The projects listed for FY09/10 are either Title 22 distribution system improvements or United Water recapitalization improvements.

9.2.2 CIP Projects for FY10/11

Table 9.22 presents the CIP projects phased in FY2010/2011 (FY10/11).

Table 9.22 CIP Projects for FY10/11
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost(1)
CL-01	CL	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO treatment for LPBF by 0.4 mgd, from 1.7 mgd to 2.1 mgd (to meet MMD of 1,218 gpm).	$1,050,000
CL-02	CL	Replace existing pumps with 3-1,250 gpm pumps (to meet MDD of 2,039 gpm).	$1,050,000
CH-01	CH	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO Ultra treatment for HPBF by 0.5 mgd, from 2.6 mgd to 3.1 mgd (to meet MMD of 2,153 gpm).	$2,650,000
CH-02	CH	Replace existing pumps with 2-2,400 gpm pumps (to meet MDD of 2,395 gpm).	$700,000
CN-01	CN	ELWRF Phase Va Expansion - Replace existing pumps with 4-1,800 gpm pumps (to meet peak demand of 5,164 gpm).	$1,575,000
CNF-03	CNF	ELWRF Phase Va Expansion - Replace Turbine	$700,000
BW-01	BW	ELWRF Phase V Expansion - Increase treatment capacity of Barrier treatment by 5.0 mgd, from 12.5 mgd to 17.5 mgd.	$31,800,000
BW-02	BW	Add VFDs to product water pumps	$700,000
BW-04	BW	Modify site piping at ELWRF, replacing 20-inch discharge piping and meter with 27-inch discharge piping and meter.	$175,000
HPS-01	HPS	Add 23 mgd of additional pumping capacity, to bring firm capacity to 74 mgd of firm capacity. (Phase I of II; total project assumes 7 pumps, 7,000 hp total)	$14,700,000
HPS-03	HPS	Secondary Power Connection for Backup Power	$2,520,000
HPS-04	HPS	PS Building	$560,000
EBRN-01	EBRN	Install pinch valves/reducers	$630,000
T22-04	T22	Virco-Torrance Lateral	$340,000
T22-13	T22	Dominguez Street Lateral	$4,500,000
ELWRF-03	ELWRF	ELWRF Phase V Expansion - Add redundant gravity thickener.	$1,960,000
ELWRF-04	ELWRF	ELWRF Phase V Expansion - Resolve underperformance of backwash equalization basin.	$170,000

Table 9.22	CIP Projects for FY10/11 Capital Implementation Master Plan West Basin Municipal Water District		
ID	**System**	**Project Description**	**Capital Cost(1)**
ELWRF-05	ELWRF	ELWRF Phase V Expansion - Redundant Sludge Conditioning Tank	$140,000
ELWRF-06	ELWRF	Increase Capacity of Title 22 Air Vacuum Release Valve for Product Water Storage Tanks	$100,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$1,340,000
Mult	Mult	Membrane Replacement (recurring)	$1,550,280
Total			**$68,910,280**

Notes:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.
(2) Recurrence for United Water improvements is assumed to be every five years.

As presented in Table 9.22, the total anticipated cost for the project recommended for phase FY10/11 are approximately $68.9 M. The most costly projects proposed for this phase are associated with the ELWRF Phase V Expansion.

9.2.3 CIP Projects for FY11/12

Table 9.23 presents the CIP projects phased in FY2011/2012 (FY11/12).

As presented in Table 9.23, the total anticipated cost for the project recommended for phase FY11/12 are approximately $251.9 M. The most costly projects proposed for this phase are associated with the bp / CRWRF expansion.

9.2.4 CIP Projects for FY12/13

Table 9.24 presents the rehabilitation and recapitalization projects anticipated in FY2012/2013 (FY12/13).

Table 9.23 CIP Projects for FY11/12
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost(1)
CNF-05	CNF	ELWRF Phase Va Expansion - Inspect Nitrified Product Water Storage Tank Internal Condition	$85,000
HPS-05	HPS	Add 23 mgd of additional pumping capacity, to bring firm capacity to 97 mgd of firm capacity. (Phase II of II; total project assumes 7 pumps, 7,000 hp total)	$14,700,000
BPN-01	BPN	Treat SE from JWPCP w/ MF to serve growth in bp Nitrified System	$16,800,000
BPN-02	BPN	Nitrified Treatment - treat MF treated SE (BPN-01) from JWPCP to serve growth in bp Nitrified System	$12,205,000
BPN-03	BPN	New 20" pipeline from NTP to bp for conveyance of Nitrified Water.	$9,535,000
BPN-03A	BPN	Parallel 14" pipeline from CRWRF to bp for conveyance of Nitrified Water.	$4,245,000
BPN-04	BPN	New pump station at NTP to serve bp Nitrified (assumes 4-1,500 gpm pumps, in PS w/ BPRO-03)	$3,150,000
BPN-05	BPN	Add a 1.0 MG storage reservoir to NTP to maintain current number of hours of backup for bp Nitrified system.	$2,100,000
BPRO-01	BPRO	Treat SE from JWPCP w/ MF/RO to serve growth in bp RO System	$73,080,000
BPRO-02	BPRO	New Pipeline from NTP to bp for conveyance of Industrial RO Water.	$8,705,000
BPRO-03	BPRO	New pump station at NTP to serve bp Industrial RO (assumes 4-2,100 gpm pumps, in PS w/ BPN-04)	$4,200,000
CBRN-01	CBRN	Install access ports for cleaning	$1,260,000
EBRN-02	EBRN	Install access ports for cleaning	$1,885,000
T22-02	T22	El Segundo Lateral (Boeing, Kilroy Airport)	$1,500,000
T22-07	T22	Redondo Beach Lateral (Pete's Nursery)	$660,000
T22-08	T22	Mills Park Lateral	$245,000
CRWRF-01	CRWRF	Pipeline for LADWP Harbor demands at Carson City bndy	$29,100,000
CRWRF-02	CRWRF	Nitrified Treatment of Title 22 Water (Nitrified Water for LADWP Harbor Demand and Rhodia)	$43,141,278
CRWRF-03	CRWRF	Add new 11.6 mgd pump station at CRWRF to serve LADWP Harbor Demand Phase II (5 pumps)	$5,250,000

Table 9.23 CIP Projects for FY11/12
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
CRWRF-04	CRWRF	Surge Protection - Modify MF Units with Break Tank and Pumps	$6,300,000
CRWRF-05	CRWRF	Raw Water Storage (1 hour)	$5,250,000
CRWRF-06	CRWRF	Repair Nitrified Product Water Storage Tank	$560,000
NTP-01	NTP	Land Acquisition of 4.5 ac near JWPCP for NTP	$4,800,000
EMWRF-01	EMWRF	Repair or Replace Bulk Chemical Storage Tank and Associated Equipment	$700,000
EMWRF-02	EMWRF	Inspect Nitrified Product Water Storage Tank Internal Condition	$85,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$775,000
Mult	Mult	Membrane Replacement (recurring)	$1,550,280
Total			**$251,866,558**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

Table 9.24 CIP Projects for FY12/13
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
T22-01	T22	Caltrans Inglewood Lateral	$260,000
T22-11	T22	Chlorination Stations (Phase I)	$1,960,000
ELWRF-07	ELWRF	Add Title 22 High Rate Clarifier and Title 22 Filters (to bring clarifier from 30.0 mgd to 50.0 mgd and filter capacity from 40.0 mgd to 50.0 mgd)	$12,600,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$345,000
Mult	Mult	Membrane Replacement (recurring)	$1,550,280
Total			**$16,715,280**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As shown in Table 9.24, the total anticipated cost for the projects recommended for phase FY12/13 is approximately $16.7 M. Recommendations in this planning year consist primarily of improvements to the Title 22 distribution system and treatment processes. Project ELWRF-07, the Title 22 High Rate Clarifier is triggered by growth in Title 22 demand, with the total Title 22 demand exceeding 30.0 mgd in this planning year.

9.2.5 CIP Projects for FY13/14

Table 9.25 presents the rehabilitation and recapitalization projects anticipated in FY2013/2014 (FY13/14).

Table 9.25 CIP Projects for FY13/14
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
T22-12	T22	Main Street Carson Lateral	$17,075,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$6,895,000
Mult	Mult	Membrane Replacement (recurring)	$1,550,280
Total			**$25,520,280**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As shown in Table 9.25, the total anticipated cost for the projects recommended for phase FY13/14 is approximately $25.5M. Recommendations for this planning period consist of the Main Street Carson Lateral, and equipment rehabilitation and replacement estimates and ongoing membrane replacement.

9.2.6 CIP Projects for FY14/15

Table 9.25 presents the rehabilitation and recapitalization projects anticipated in FY2014/2015 (FY14/15).

Table 9.26 CIP Projects for FY14/15
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
T22-14	T22	Caltrans Gardena Lateral	$985,000
Mult	Mult	United Water Recapitalization Improvements (recurring)	$6,345,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$1,110,000
Mult	Mult	Membrane Replacement (recurring)	$1,550,280
Total			**$9,990,280**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As shown in Table 9.25, the total anticipated cost for the projects recommended for phase FY14/15 is approximately $10.0 M. Recommendations for this planning period consist of a Title 22 lateral, triggered by individual customers estimated date of connection (as detailed in the customer database), and equipment rehabilitation and replacement estimates. United Water recapitalization recurrences also occur in this year, as they are assumed to recur every five years.

9.2.7 CIP Projects for FY15/20

Table 9.27 presents the CIP projects phased in FY2015/2020 (FY15/20).

Table 9.27 CIP Projects for FY15/20
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
ESPP-01	ESPP	Add to treatment capacity of Industrial RO treatment for ESPP of 0.5 mgd (to meet MMD of 325 gpm).	$1,900,000
ESPP-02	ESPP	El Segundo Power Plant Pipeline from Chevron to El Segundo Power Plant	$3,895,000
ESPP-03	ESPP	PRV at Chevron	$80,000
CNF-01	CNF	ELWRF Phase Va Expansion - Increase treatment capacity of Nitrified by 2.1, from 4.9 mgd to 7.0 mgd. (Two Biofor Units)	$3,090,000
CNF-02	CNF	ELWRF Phase Va Expansion - Backup Power to Product Water Pumps	$700,000
CNF-04	CNF	ELWRF Phase Va Expansion - Potable Water Backup Supply	$350,000
T22-15	T22	Palos Verdes - Lateral 6B	$27,290,000
T22-16	T22	Palos Verdes PS (4-1,250 gpm pumps)	$4,900,000
T22-17	T22	Increase Title 22 product water storage by 5.0 MG	$10,500,000
T22-18A	T22	Gardena Lateral - Normandie Ave	$3,635,000
T22-18B	T22	Gardena Lateral - Normandie and Vermont	$6,170,000
T22-18C	T22	Gardena Lateral - Van Ness	$4,480,000
T22-21	T22	Chlorination Stations (Phase II)	$1,960,000
T22-22	T22	Hawthorne Lateral (Solec)	$1,595,000
T22-23	T22	Title-22 PS Discharge Pipeline Modification	$465,000
ELWRF-09	ELWRF	Add 17.3 mgd of Title 22 Treatment, to increase Title 22 treatment capacity from 50.0 mgd to 67.3 mgd	$48,440,000

Table 9.27 CIP Projects for FY15/20
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost(1)
ELWRF-10	ELWRF	Increase capacity of Title 22 Pump Station at ELWRF by 3,200 hp (from 4,800 hp to 8,000 hp) to serve Future Title 22 Customers	$14,340,000
ELWRF-11	ELWRF	Microfiltration - Replace existing Phase II and III MF System w/ Pressurized System	$16,800,000
ELWRF-12	ELWRF	Backup Power	$11,200,000
ELWRF-13	ELWRF	Dewatered Sludge Handling Transfer System	$2,800,000
ELWRF-15	ELWRF	Potable Water Connection to ELWRF	$280,000
CRWRF-07	CRWRF	Backup Power	$2,520,000
EMWRF-04	EMWRF	Add 0.6 mgd of Industrial RO Treatment of Title 22 Water (half of 1,000 afy total w/ RO).(6)	$1,890,000
EMWRF-05	EMWRF	Add 0.5 mgd of Nitrified Treatment of Title 22 Water (half of 1,000 afy total w/ Nitrified).(6)	$735,000
EMWRF-06	EMWRF	Surge Protection - Modify MF Units with Break Tank and Pumps	$3,500,000
EMWRF-07	EMWRF	Backup Power for Product Water Pumps	$700,000
Mult	Mult	United Water Recapitalization Improvements (recurring)	$6,345,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$29,995,000
Mult	Mult	Membrane Replacement (recurring)	$16,276,400
Total			**$226,831,400**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.27, the total anticipated cost for the project recommended for phase FY15/20 are approximately $226.8 M. The most costly projects proposed for this phase are related to increasing Title 22 treatment capacity at ELWRF.

It should be noted that improvements required to serve all customers included in Scenario 5, as discussed in Section 8.1 are incorporated by the end of this planning phase. Remaining planning phases include improvements required to serve customers in Scenario 6 and 7 and recurring rehabilitation or replacement projects associated with equipment useful life.

9.2.8 CIP Projects for FY20/25

Table 9.28 presents the CIP projects phased in FY2020/25 (FY20/25).

Table 9.28 CIP Projects for FY20/25
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
HPS-07	HPS	Add 38 mgd of additional firm pumping capacity, to bring total firm capacity to 135 mgd. (For LADWP Westside, Kenneth Hahn, LADWP Harbor Expansion) (Assumes 3 pumps, 3,000 hp increase)	$27,300,000
HPS-08	HPS	Parallel HSEFM w/ 36"	$22,815,000
T22-24	T22	Anza Lateral Break Tank	$4,200,000
ELWRF-32	ELWRF	Land Acquisition of 4.0 ac near ELWRF for Expansion of Title 22 Beyond 70.0 mgd	$9,600,000
CRWRF-11	CRWRF	Nitrified Treatment of Title 22 Water (Nitrified Water for LADWP Harbor Demand Phase II)	$10,480,000
CRWRF-12	CRWRF	Add new 7.1 mgd pump station at CRWRF to serve LADWP Harbor Demand Phase II (5 pumps)	$4,200,000
NTP-03	NTP	Barrier Water Treatment - treat SE from JWPCP to serve Dominguez Gap (Phase I and II)	$34,125,000
NTP-04	NTP	Add new 3.1 mgd pump station at NTP to serve Dominguez Gap (Phase I + II)	$2,100,000
NTP-05	NTP	New Pipeline from NTP to Dominguez Gap Barrier Blending Station for conveyance of Barrier Water.	$9,640,000
Mult	Mult	United Water Recapitalization Improvements (recurring)	$6,345,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$16,245,000
Mult	Mult	Membrane Replacement (recurring)	$16,277,500
Total			**$163,327,500**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.28, the total anticipated cost for the project recommended for phase FY20/25 are approximately $163.3 M. The most costly projects proposed for this phase are treatment costs at the NTP related to service of the Dominguez Gap and HSEPS and HSEFM expansions associated with serving future demands from Hyperion.

9.2.9 CIP Projects for FY25/30

Table 9.29 presents the CIP projects phased in FY2025/30 (FY25/30).

Table 9.29 CIP Projects for FY25/30
Capital Implementation Master Plan
West Basin Municipal Water District

ID	System	Project Description	Capital Cost[1]
T22-25	T22	LA Westside Lateral	$40,005,000
T22-26	T22	Inglewood/LA Westside PS (assumes 4-8,500 gpm pumps)	$28,025,000
ELWRF-33	ELWRF	Increase capacity of Title 22 Pump Station at ELWRF by 4,000 hp (from 8,000 hp to 12,000 hp) to serve LADWP Harbor Expansion, Westside, and Kenneth Hahn	$16,800,000
ELWRF-34	ELWRF	Add 8.9 mgd of Additional Title 22 Treatment to Serve LADWP Harbor Expansion, increasing Title 22 Treatment Capacity from 67.3 mgd to 76.2 mgd	$24,945,000
ELWRF-35	ELWRF	Add 15.3 mgd of Additional Title 22 Treatment to Serve LADWP Westside and Kenneth Hahn Park, increasing Title 22 Treatment Capacity from 76.2 mgd to 91.5 mgd	$42,970,000
Mult	Mult	United Water Recapitalization Improvements (recurring)	$6,345,000
Mult	Mult	Rehabilitation and Replacement from Condition Assessment (recurring)	$9,230,000
Mult	Mult	Membrane Replacement (recurring)	$16,277,500
Total			**$184,597,500**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.29, the total anticipated cost for the project recommended for phase FY25/30 are approximately $184.6 M. The most costly projects proposed for this phase are related to service of the LADWP Westside Title 22 demands.

9.3 CIP SUMMARIES

This section presents the following summaries of the CIP:

- CIP by Phase
- CIP by Facility Type
- Recurring Projects by Treatment Plant Facility

- Summary of ELWRF Phase V Projects
- Summary of Recommended Studies
- Escalated CIP Cost by Phase

In addition, a detailed list of all CIP projects is presented at the end of this chapter in Table 9.37.

9.3.1 CIP Summary by Phase

The project phasing presented in Section 9.2 is summarized in Table 9.30.

Table 9.30 Summary of Project Phasing
Capital Implementation Master Plan
West Basin Municipal Water District

Planning Phase	Planning Year	Capital Cost(1)	Percentage of Total Capital Cost
FY09/15	FY09/10	$15,103,800	1.6%
	FY10/11	$68,910,280	7.2%
	FY11/12	$251,866,558	26.2%
	FY12/13	$16,715,280	1.7%
	FY13/14	$25,520,280	2.7%
	FY14/15	$9,990,280	1.0%
	FY09/15	***$388,106,478***	***40.3%***
FY15/20		$226,831,400	23.6%
Subtotal	***FY09-20***	***$614,937,878***	
FY20/25		$163,327,500	17.0%
FY25/30		$184,597,500	19.2%
Total		**$962,862,878**	**100.0%**

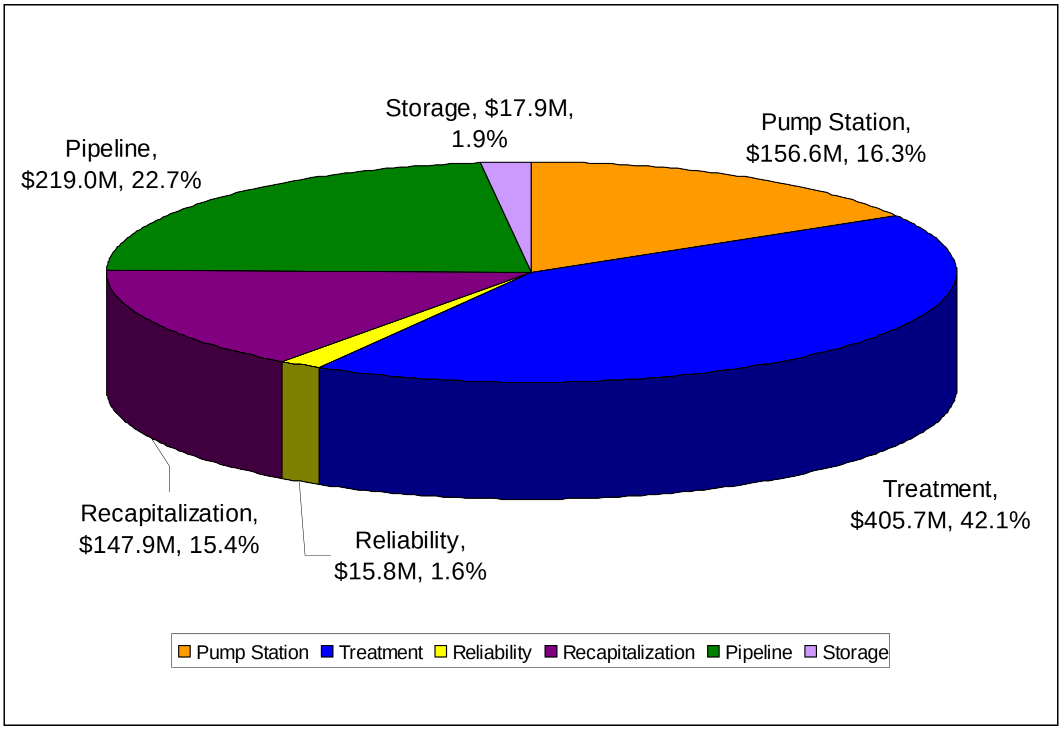
Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

As presented in Table 9.30, the total estimated capital cost of all projects recommended in Chapters 7 and 8, combined with rehabilitation and recapitalization projects, is about $962.9M. As shown, the phase with the largest contribution to the overall CIP cost is FY11/12 with $251.9 M. The total estimated cost through FY19/20 is $615 M.

9.3.2 CIP Summary by Facility Type

The CIP cost distribution of by project type is depicted on Figure 9.6. As shown in this figure, the majority of costs are related to water treatment, contributing to $406M or 42 percent of the total CIP. The second largest category is pipelines with a combined estimated capital cost of $219M or 23 percent of the total CIP.

Figure 9.6
Distribution of Capital Costs by Facility Type



9.3.3 Summary of ELWRF Phase V Expansion Costs

The above projects, which are a part of the ELWRF Phase V Expansion Costs are summarized in Table 9.31.

As shown in Table 9.31, the total cost estimated for the ELWRF Phase V expansion is $58.8 M. The most costly portion of this expansion is the Barrier water treatment capacity expansion for the West Coast Barrier. Note that the cost estimates presented here are based on the ELWRF Phase V Expansion Study.

Table 9.31	Projects Included in ELWRF Phase IV Expansion Capital Implementation Master Plan West Basin Municipal Water District		
ID	**Phase**	**Project Description**	**Capital Cost(1)**
BW-01	FY1011	ELWRF Phase V Expansion - Increase treatment capacity of Barrier treatment by 5.0 mgd, from 12.5 mgd to 17.5 mgd.	$31,800,000
BW-02	FY1011	Add VFDs to product water pumps	$700,000
BW-04	FY1011	Modify site piping at ELWRF, replacing 20-inch discharge piping and meter with 27-inch discharge piping and meter.	$175,000
ELWRF-04	FY1011	ELWRF Phase V Expansion - Resolve underperformance of backwash equalization basin.	$170,000
ELWRF-05	FY1011	ELWRF Phase V Expansion - Redundant Sludge Conditioning Tank	$140,000
ELWRF-07	FY1213	Add Title 22 High Rate Clarifier and Title 22 Filters (to bring clarifier from 30.0 mgd to 50.0 mgd and filter capacity from 40.0 mgd to 50.0 mgd)	$12,600,000
ELWRF-03	FY1011	ELWRF Phase V Expansion - Add redundant gravity thickener.	$1,960,000
Subtotal - ELWRF Phase V Barrier System			***$47,545,000***
CH-01	FY1011	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO Ultra treatment for HPBF by 0.5 mgd, from 2.6 mgd to 3.1 mgd (to meet MMD of 2,153 gpm).	$2,650,000
CH-02	FY1011	Replace existing pumps with 2-2,400 gpm pumps (to meet MDD of 2,395 gpm).	$700,000
CL-01	FY1011	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO treatment for LPBF by 0.4 mgd, from 1.7 mgd to 2.1 mgd (to meet MMD of 1,218 gpm).	$1,050,000
CL-02	FY1011	Replace existing pumps with 3-1,250 gpm pumps (to meet MDD of 2,039 gpm).	$1,050,000
Subtotal - ELWRF Phase V Chevron Systems			***$5,450,000***
ESPP-01	FY15-20	Add to treatment capacity of Industrial RO treatment for ESPP of 0.5 mgd (to meet MMD of 325 gpm).	$1,900,000
ESPP-02	FY15-20	El Segundo Power Plant Pipeline from Chevron to El Segundo Power Plant	$3,895,000
ESPP-03	FY15-20	PRV at Chevron	$80,000
Subtotal - ELWRF Phase V ESPP Systems			***$5,875,000***
Total			**$58,870,000**

Note:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.

9.3.4 Recurring Improvements by Treatment Facility

Table 9.32 summarizes United Water improvements for each of West Basin's treatment facilities for each planning period.

Table 9.32 United Water Improvement Summary
Capital Implementation Master Plan
West Basin Municipal Water District

	Planning Year / Phase					Total Capital Cost[1]
Facility	**FY0910**	**FY1415**	**FY15-20**	**FY20-25**	**FY25-30**	
ELWRF	$978,800	$2,535,000	$2,535,000	$2,535,000	$2,535,000	$11.1 M
CRWRF	$10,000	$845,000	$845,000	$845,000	$845,000	$3.4 M
EMWRF	$210,000	$425,000	$425,000	$425,000	$425,000	$1.9 M
CNF	$0	$425,000	$425,000	$425,000	$425,000	$1.7 M
SW	$655,000	$2,115,000	$2,115,000	$2,115,000	$2,115,000	$9.1 M
Total	**$1,853,800**	**$6,345,000**	**$6,345,000**	**$6,345,000**	**$6,345,000**	**$27.2 M**

Note:
(1) Costs based on United Water estimates. Additional markups are applied to costs for FY1415 through FY25-30.

In addition to the United Water recommendations, the Rehabilitation and Replacement from the Condition Assessment and Membrane Replacement projects are listed as recurring and consist of summarized values of more detailed items for each treatment facility.

The Rehabilitation and Replacement from Condition Assessment items are estimates of the expected replacement costs based on the anticipated remaining life of various assets evaluated during the Condition Assessment portion of this project. The assumptions used for this cost estimate are described in Appendix F, the Condition Assessment TM.

The membrane replacement costs are costs to replace all of the existing membranes at West Basin's facilities on a continuous basis, assuming individual membrane life of 5 years. The estimated annual costs for the membrane replacement are detailed in Table 9.33.

Table 9.33 Membrane Replacement Costs
Capital Implementation Master Plan
West Basin Municipal Water District

Facility	Number of Membranes			Replacement Cost ($M / 5 yrs)	Annual Cost ($M / yr)
	RO	MF (Type I)	MF (Type II)		
Unit Replacement Cost	$500	$750	$900		
ELWRF	4,536	1,350	2,496	$5.5	$1.1
CRWRF	1,584	810	0	$1.4	$0.3
EMWRF	840	540	0	$0.8	$0.2
Total for Existing	**6,960**	**2,700**	**2,496**	$7.8	$1.6
NTP[2]				$8.5	$1.7
Total				$16.3	$3.3

Note:
(1) Membrane replacement cost based on typical costs for type of membrane.
(2) Membrane replacement costs for future facilities were based on total flow and similar facilities rather than number of membranes.

As discussed in Chapter 8, several alternatives were evaluated for reducing surges in the Title 22 distribution system through modifications to the membrane systems at EMWRF and CRWRF. Alternatives were also evaluated for replacing the Phase II and III microfiltration units at ELWRF (to improve performance). A summary of the costs for each alternative discussed in Chapter 7 and 8 is presented in Table 9.34. The costing details for these alternatives are provided at the end of Appendix F. Within Chapter 7, it was recommended that further study be conducted before selecting an alternative. Within the CIP, it was assumed that the second option be implemented in each facility—a break tank and pumps at EMWRF and CRWRF, and pressurized MF units at ELWRF.

9.3.5 Summary of Recommended Studies

Within this report, several studies were considered beyond the scope of this report but recommended for further investigation. Table 9.35 lists each of the recommended studies mentioned within this report. If applicable, the CIP IDs of the related projects are indicated in brackets. Several of the studies listed in Table 9.35 could be incorporated into larger projects, such as the ELWRF Phase V Expansion.

Table 9.34 Alternatives for Resolving Microfiltration Surges Capital Implementation Master Plan West Basin Municipal Water District			
	Alternatives		
Facility	**Dedicated Flush System**	**Break Tank and Pumps**	**Alternate MF Units (Submerged)**
EMWRF	$659,000	$2,058,000	$10,129,000
CRWRF	$887,000	$6,907,000	$15,409,000
	Retrofit Existing MF Units	**Replace with Pressurized MF Units**	**Replace with Submerged MF Units**
ELWRF	$12,254,190	$14,893,970	$19,737,510

Notes:
(1) Cost estimate details are included in Appendix F (following the Condition Assessment TM).
(2) Cost estimates shown in this table vary from the estimates used in the CIP (Table 9.37) due to adjustments made to the contingency and markups (as discussed in Chapter 5).

Table 9.35 Recommended Studies Capital Implementation Master Plan West Basin Municipal Water District		
Study	**Description**	**Report Section**
Demand Pattern Revision for Chester Washington Golf Course	For Title 22 Customer Chester Washington Golf Course, review the existing golf course irrigation schedule with the customer to reduce their daily peak demands to a more reasonable level in order to extend life of lateral.	7.1.1.3
CMF Unit Surge Study	Detailed Study to determine the most feasible method for reducing the magnitude of the observed pressure surges. [CRWRF-02, EMWRF-01, ELWRF-03]	7.1.1.3.1
Title 22 Pump Station Control Study	Detailed Study to develop an efficient pumping system that allows operation of the pumps within the preferred operating ranges	7.1.1.3.2
Title 22 Pipe Cleaning Test Program	Study to evaluate whether pipe cleaning test program increases chlorine residual in distribution system, possibly including installation of pig launching and retrieval stations. [T22-11]	7.1.1.3.3
Barrier Product Water Pump Station Operational Efficiency Study	Detailed analysis to evaluate the pump station to resolve energy loss and establish a more efficient method of operation of the Barrier Product Water Pump Station.	7.1.2.3
Hyperion Secondary Effluent Pump	Detailed analysis to optimize system controls, to eliminate the need for manual control of VFD.	7.1.3.3

Table 9.35 Recommended Studies
Capital Implementation Master Plan
West Basin Municipal Water District

Study	Description	Report Section
Station Control Automation and Optimization		
Chevron Nitrified Water Product Pump Station Firm Capacity Study	Detailed analysis to maintain firm capacity of the pump station.	7.1.6.3
CRWRF Brine Line Inspection Program	Evaluate inspection of brine line and establish routine inspection program. [CBRN-01]	7.1.7.3
ELWRF Brine Line Inspection Program	Evaluate inspection of brine line and establish routine inspection program. [EBRN-01]	7.1.8.3
ELWRF Brine Line Velocity Reduction Study	Detailed analysis to mitigate high velocities, possibly installing pinch valves or pipe restrictions.[EBRN-02]	7.1.8.3
ELWRF Brine Line	Inspection program and taps for pipeline calibration	8.2.8.3
Title 22 Pump Station Pressure Increase Evaluation	A detailed study of the existing and future water demand patterns, including phased development, should be conducted in selecting the pumps and increase the discharge pressure to 105 psi.	8.2.1.3.3
Title 22 Surge Analysis	Surge analysis of the Title 22 distribution system following modifications made to EMWRF and CRWRF to reduce surge effects.	8.2.1.3.4
Title 22 Pump Station Operation Evaluation	A detailed study of the demands on the Title 22 pump station, including phased development, should be conducted in selecting the pumps and increase the discharge pressure to 105 psi.	8.2.1.3.5
Title 22 Distribution System Water Quality Analysis	Following incorporation of existing system water quality recommendations, water quality of the distribution system should be reevaluated.	8.2.1.3.6
West Coast Barrier Pump Station Operational Evaluation	Field testing to determine the firm capacity of the pump station. Result should be used to determine improvements to the pump station. [BW-02]	8.2.2.3
Hyperion Secondary Effluent Pump Station Design Study	Detailed design study to review the existing pump station modification for incorporation into the future facility. Increase the capacity of the pump station to meet future supply requirements (add a 9,000 hp PS for Scenario 5A, and a 12,000 hp PS for Scenario 7A).	8.2.3.3

Table 9.35 Recommended Studies
Capital Implementation Master Plan
West Basin Municipal Water District

Study	Description	Report Section
Hyperion Secondary Effluent Pump Station Reliability Study	Detailed design study of the system to formulate the most feasible means of meeting the demand criteria and providing supply reliability	8.2.3.3
Hyperion Secondary Effluent Pumping System Surge Evaluation	Update surge study for future system design conditions.	8.2.3.3
Chevron Nitrified Water System Pump Station Design	Preliminary design to add 1,564 gpm of pump station capacity. To make the maximum use out of the existing facility the future facility should have three identical duty and one standby pump, all operated by VFDs..	8.2.6.3
Chevron Nitrified Water System Hydrogenerator Feasibility Study	Investigate feasibility of placing the hydro generator in service.	8.2.6.3
CRWRF RO Discharge Pressure Adjustment	Evaluate how to effectively increase discharge pressure of RO Trains at CRWRF.	8.2.7.3
CRWRF Brine Line Permit	Apply for revised brine line permit accommodating increased flows[1]	8.2.7.3
CRWRF Power	Investigate power problems at this site.	Condition Assessment

Note:
1. This is not necessary under Scenario 5B and 7B, but will be required wherever the potential bp demands are treated.

The studies listed in Table 9.35 are not included within the CIP, but may affect costs for several of the projects included in the CIP.

9.3.6 Escalated CIP Cost

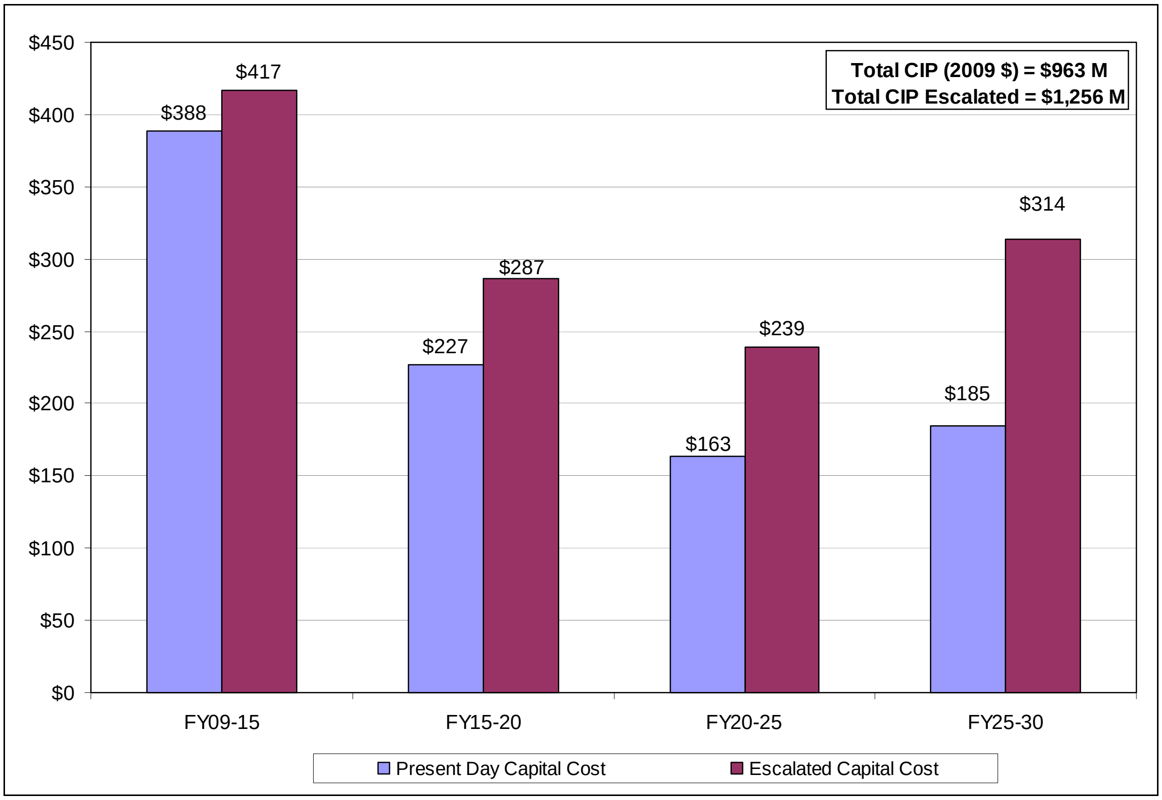
The CIP cost presented in the Master Plan are all based on 2009 dollars and an ENR index for the greater Los Angeles area of 9811 published in January 2009. However, as most projects will be implemented in the future, the actual CIP cost in dollars will be higher based on the phasing of each project. The CIP presented in Table 9.36 shows the escalated CIP cost for each project phase based on an annual inflation rate of 3 percent.

Table 9.36	**Escalated CIP Cost Summary by Phase Capital Implementation Master Plan West Basin Municipal Water District**		
Planning Phase	**Planning Year**	**Capital Cost In 2009 Dollars(1)**	**Escalated Capital Cost(2)**
FY09-15	FY09/10	$15,103,800	$15,300,000
	FY10/11	$68,910,280	$71,860,000
	FY11/12	$251,866,558	$270,520,000
	FY12/13	$16,715,280	$18,500,000
	FY13/14	$25,520,280	$29,080,000
	FY14/15	$9,990,280	$11,730,000
	FY09-15	**$388,106,478**	**$416,990,000**
FY15-20	FY15-20	$226,831,400	$286,640,000
Subtotal	***FY09/10 – FY19/20***		***$703,630,000***
FY20-25	FY20-25	$163,327,500	$239,270,000
FY25-30	FY25-30	$184,597,500	$313,500,000
Total		**$962,862,878**	**$1,256,400,000**

Notes:
(1) Includes markups, contingency, and construction costs. See Table 5.5 for detailed cost breakdown and Table 9.37 for construction costs.
(2) Escalated from January 2009 to the mid-point of each planning period using an annual inflation rate of 3.0% (rounded to $10,000).

As presented in Table 9.36, the escalated cost of the $963M CIP (2009 Dollars) is estimated at $1,256M. The phasing of cost by phase, with and without escalation, is also depicted on Figure 9.7.

Figure 9.7
Breakdown of Capital Costs by Phase including Escalation



West Basin Municipal Water District
Capital Implementation Master Plan for Recycled Water Systems
Detailed CIP List w/ Project Breakdown

WB Project ID	Project ID	System Name	Project Type	Project Description	Year	Size	Unit	Capacity	Unit	Unit Cost	Unit	Construction Cost (w/o Spcl Cond)	Special Construction	Spcl Cnst	Construction Cost	Project Location (for TTC)	Contingency	Capital Cost	Other Payer	Cost to Other Party	Cost to West Basin	FY0910	FY10-15	FY15-20	FY20-25	FY25-30
1	BW-01	BW	Treatment	ELWRF Phase V Expansion - Increase treatment capacity of Barrier treatment by 5.0 mgd, from 12.5 mgd to 17.5 mgd.	FY1011	5.0	mgd			$ -	lumpsum(3)	$ -	1.00	-	$ 14,672,833	-	217%	$ 31,800,000	WRD	$ 31,800,000	$ -	-	$ 31,800,000	-	$ -	$ -
1	BW-02	BW	PS	Add VFDs to product water pumps	FY1011					$ 500,000	lumpsum(1)	$ 500,000	1.00	-	$ 500,000	IF	140%	$ 700,000	None	$ -	$ 700,000	-	$ 700,000	-	$ -	$ -
1	BW-04	BW	Pipeline	Modify site piping at ELWRF, replacing 20-inch discharge piping and meter with 27-inch discharge piping and meter.	FY1011	1	site			$ 125,000	lumpsum(1)	$ 125,000	1.00	-	$ 125,000	IF	140%	$ 175,000	None	$ -	$ 175,000	-	$ 175,000	-	$ -	$ -
1	ELWRF-04	ELWRF	Recapitalization	ELWRF Phase V Expansion - Resolve underperformance of backwash equalization basin.	FY1011	1	system			$ 120,000	lumpsum(5)	$ 120,000	1.00	-	$ 120,000	IF	140%	$ 170,000	None	$ -	$ 170,000	-	$ 170,000	-	$ -	$ -
1	ELWRF-05	ELWRF	Recapitalization	ELWRF Phase V Expansion - Redundant Sludge Conditioning Tank	FY1011	2	tanks	25,000	gallon	$ 2.00	per gallon	$ 100,000	1.00	-	$ 100,000	IF	140%	$ 140,000	None	$ -	$ 140,000	-	$ 140,000	-	$ -	$ -
1	ELWRF-07	ELWRF	Treatment	Add Title 22 High Rate Clarifier and Title 22 Filters (to bring clarifier from 30.0 mgd to 50.0 mgd and filter capacity from 40.0 mgd to 50.0 mgd)	FY1213	1	system			$ 9,000,000	lumpsum(1)	$ 9,000,000	1.00	-	$ 9,000,000	IF	140%	$ 12,600,000	None	$ -	$ 12,600,000	-	$ 12,600,000	-	$ -	$ -
1	ELWRF-03	ELWRF	Recapitalization	ELWRF Phase V Expansion - Add redundant gravity thickener.	FY1011	1	system			$ 1,400,000	system(5)	$ 1,400,000	1.00	0	$ 1,400,000	IF	140%	$ 1,960,000	None	$ -	$ 1,960,000	-	$ 1,960,000	-	$ -	$ -
Subtotal	ECLWRF Phase V Expansion - Barrier System											$ 11,245,000			$ 25,917,833			$ 47,545,000		$ 31,800,000	$ 15,745,000	$ -	$ 47,545,000	$ -	$ -	$ -
2	CH-01	CH	Treatment	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO Ultra treatment for HPBF by 0.5 mgd, from 2.6 mgd to 3.1 mgd (to meet MMD of 2,153 gpm).	FY1011	0.5	mgd			$ -	lumpsum(5)	$ -	0.00	0.00	$ -		0%	$ 2,650,000	Chev	$ 2,650,000	$ -	-	$ 2,650,000	-	$ -	$ -
2	CH-02	CH	PS	Replace existing pumps with 2-2,400 gpm pumps (to meet MDD of 2,395 gpm).	FY1011	4,600	gpm	200	hp	$ 2,500	per hp	$ 500,000	1.00	-	$ 500,000	IF	140%	$ 700,000	Chev	$ 700,000	$ -	-	$ 700,000	-	$ -	$ -
2	CL-01	CL	Treatment	ELWRF Phase V Expansion - Increase treatment capacity of Industrial RO treatment for LPBF by 0.4 mgd, from 1.7 mgd to 2.1 mgd (to meet MMD of 1,218 gpm).	FY1011	0.4	mgd			$ -	lumpsum(5)	$ -	0.00	0.00	$ -		0%	$ 1,050,000	Chev	$ 1,050,000	$ -	-	$ 1,050,000	-	$ -	$ -
2	CL-02	CL	PS	Replace existing pumps with 3-1,250 gpm pumps (to meet MDD of 2,039 gpm).	FY1011	3,750	gpm	300	hp	$ 2,500	per hp	$ 750,000	1.00	-	$ 750,000	IF	140%	$ 1,050,000	Chev	$ 1,050,000	$ -	-	$ 1,050,000	-	$ -	$ -
Subtotal	ECLWRF Phase V Expansion - Chevron Boilerfeed											$ 1,250,000			$ 1,250,000			$ 5,450,000		$ 5,450,000	$ -	$ -	$ 5,450,000	$ -	$ -	$ -
3	ESPP-01	ESPP	Treatment	Add to treatment capacity of Industrial RO treatment for ESPP of 0.5 mgd (to meet MMD of 325 gpm).	FY15-20	0.7	mgd			$ -	lumpsum(7)	$ 1,355,000	1.00	-	$ 1,355,000	IF	140%	$ 1,900,000	ESPP	$ 1,900,000	$ -	-	$ -	$ 1,900,000	$ -	$ -
3	ESPP-02	ESPP	Pipeline	El Segundo Power Plant Pipeline from Chevron to El Segundo Power Plant	FY15-20	8,000	lineal ft	12	inches	$ 310	per ft	$ 2,480,000	1.00	-	$ 2,480,000	OF	157%	$ 3,895,000	ESPP	$ 3,895,000	$ -	-	$ -	$ 3,895,000	$ -	$ -
3	ESPP-03	ESPP	Pipeline	PRV at Chevron	FY15-20	1	PRV	8	inches	$ 50,000	per PRV	$ 50,000	1.00	-	$ 50,000	OF	157%	$ 80,000	ESPP	$ 80,000	$ -	-	$ -	$ 80,000	$ -	$ -
Subtotal	ECLWRF Phase V Expansion - El Segundo Power Plant											$ 3,885,000			$ 3,885,000			$ 5,875,000		$ 5,875,000	$ -	$ -	$ -	$ 5,875,000	$ -	$ -
4	CN-01	CN	PS	ELWRF Phase Va Expansion - Replace existing pumps with 4-1,800 gpm pumps (to meet peak demand of 5,164 gpm).	FY1011	7,200	gpm	500	hp	$ 2,250	per hp	$ 1,125,000	1.00	-	$ 1,125,000	IF	140%	$ 1,575,000	Chev	$ 1,575,000	$ -	-	$ 1,575,000	-	$ -	$ -
4	CNF-01	CNF	Treatment	ELWRF Phase Va Expansion - Increase treatment capacity of Nitrified by 2.1, from 4.9 mgd to 7.0 mgd. (Two Biofor Units)	FY15-20	2.1	mgd			$ 1.05	per gal	$ 2,205,000	1.00	-	$ 2,205,000	IF	140%	$ 3,090,000	Chev	$ 3,090,000	$ -	-	$ -	$ 3,090,000	$ -	$ -
4	CNF-03	CNF	Recapitalization	ELWRF Phase Va Expansion - Replace Turbine	FY1011	1	site			$ 500,000	lumpsum(1)	$ 500,000	1.00	-	$ 500,000	IF	140%	$ 700,000	Chev	$ 700,000	$ -	-	$ 700,000	-	$ -	$ -
4	CNF-02	CNF	Reliability	ELWRF Phase Va Expansion - Backup Power to Product Water Pumps	FY15-20	1	system			$ 500,000	lumpsum(1)	$ 500,000	1.00	-	$ 500,000	IF	140%	$ 700,000	Chev	$ 700,000	$ -	-	$ -	$ 700,000	$ -	$ -
4	CNF-04	CNF	Reliability	ELWRF Phase Va Expansion - Potable Water Backup Supply	FY15-20	1	site			$ 250,000	per site	$ 250,000	1.00	-	$ 250,000	IF	140%	$ 350,000	Chev	$ 350,000	$ -	-	$ -	$ 350,000	$ -	$ -
Subtotal	Chevron Nitrification Facility - Nitrified System Expansion											$ 4,580,000			$ 4,580,000			$ 6,415,000		$ 6,415,000	$ -	$ -	$ 2,275,000	$ 4,140,000	$ -	$ -
5	BPN-01	BPN	Treatment	Treat SE from JWPCP w/ MF to serve growth in bp Nitrified System	FY1112	8.7	mgd			$ 12,000,000	lumpsum(1)	$ 12,000,000	1.00	-	$ 12,000,000	IF	140%	$ 16,800,000	bp	$ 16,800,000	$ -	-	$ 16,800,000	-	$ -	$ -
5	BPN-02	BPN	Treatment	Nitrified Treatment - treat MF treated SE (BPN-01) from JWPCP to serve growth in bp Nitrified System	FY1112	8.3	mgd			$ 1.05	per gpd	$ 8,715,000	1.00	-	$ 8,715,000	IF	140%	$ 12,205,000	bp	$ 12,205,000	$ -	-	$ 12,205,000	-	$ -	$ -
5	BPN-03	BPN	Pipeline	New 20" pipeline from NTP to bp for conveyance of Nitrified Water.	FY1112	10,560	lineal ft	20	inches	$ 460	per lineal ft	$ 4,857,600	1.25	A	$ 6,072,000	OF	157%	$ 9,535,000	bp	$ 9,535,000	$ -	-	$ 9,535,000	-	$ -	$ -
5	BPN-03A	BPN	Pipeline	Parallel 14" pipeline from CRWRF to bp for conveyance of Nitrified Water.	FY1112	6,178	lineal ft	14	inches	$ 350	per lineal ft	$ 2,162,160	1.25	A	$ 2,702,700	OF	157%	$ 4,245,000	bp	$ 4,245,000	$ -	-	$ 4,245,000	-	$ -	$ -
5	BPN-04	BPN	PS	New pump station at NTP to serve bp Nitrified (assumes 4-1,500 gpm pumps, in PS w/ BPRO-03)	FY1112	6,000	gpm	300	hp	$ 7,500	per hp	$ 2,250,000	1.00	-	$ 2,250,000	IF	140%	$ 3,150,000	bp	$ 3,150,000	$ -	-	$ 3,150,000	-	$ -	$ -
5	BPN-05	BPN	Storage	Add a 1.0 MG storage reservoir to NTP to maintain current number of hours of backup for bp Nitrified system.	FY1112	1.0	MG			$ 1.50	per gallon	$ 1,500,000	1.00	-	$ 1,500,000	IF	140%	$ 2,100,000	bp	$ 2,100,000	$ -	-	$ 2,100,000	-	$ -	$ -
5	BPRO-01	BPRO	Treatment	Treat SE from JWPCP w/ MF/RO to serve growth in bp RO System	FY1112	8.7	mgd			$ 6.00	per gal	$ 52,200,000	1.00	-	$ 52,200,000	IF	140%	$ 73,080,000	bp	$ 73,080,000	$ -	-	$ 73,080,000	-	$ -	$ -
5	BPRO-02	BPRO	Pipeline	New Pipeline from NTP to bp for conveyance of Industrial RO Water.	FY1112	10,560	lineal ft	18	inches	$ 420	per lineal ft	$ 4,435,200	1.25	A	$ 5,544,000	OF	157%	$ 8,705,000	bp	$ 8,705,000	$ -	-	$ 8,705,000	-	$ -	$ -
5	BPRO-03	BPRO	PS	New pump station at NTP to serve bp Industrial RO (assumes 4-2,100 gpm pumps, in PS w/ BPN-04)	FY1112	8,400	gpm	400	hp	$ 7,500	per hp	$ 3,000,000	1.00	-	$ 3,000,000	IF	140%	$ 4,200,000	bp	$ 4,200,000	$ -	-	$ 4,200,000	-	$ -	$ -
5	CRWRF-04	CRWRF	Treatment	Surge Protection - Modify MF Units with Break Tank and Pumps	FY1112			lump sum		$ 4,500,000	lumpsum(2)	$ 4,500,000	1.00	-	$ 4,500,000	IF	140%	$ 6,300,000	None	$ -	$ 6,300,000	-	$ 6,300,000	-	$ -	$ -
5	CRWRF-05	CRWRF	Storage	Raw Water Storage (1 hour)	FY1112	2.5	MG			$ 1.50	per gallon	$ 3,750,000	1.00	-	$ 3,750,000	IF	140%	$ 5,250,000	None	$ -	$ 5,250,000	-	$ 5,250,000	-	$ -	$ -
5	NTP-01	NTP	Treatment	Land Acquisition of 4.5 ac near JWPCP for NTP	FY1112	21.3	mgd	4.0	ac	$ 1,000,000	per acre(1)	$ 4,000,000	1.00	-	$ 4,000,000	LA	120%	$ 4,800,000	None	$ -	$ 4,800,000	-	$ 4,800,000	-	$ -	$ -
Subtotal	bp Refinery Capacity Expansion Project											$ 103,369,960			$ 106,233,700			$ 150,370,000		$ 134,020,000	$ 16,350,000	$ -	$ 150,370,000	$ -	$ -	$ -
6	CRWRF-01	CRWRF	Pipeline	Pipeline for LADWP Harbor demands at Carson City bndy	FY1112	20,200	lineal ft	30	inches	$ -	lumpsum(7)	$ 18,535,000	1.00	-	$ 18,535,000	OF	157%	$ 29,100,000	Other	$ 29,100,000	$ -	-	$ 29,100,000	-	$ -	$ -
6	CRWRF-02	CRWRF	Treatment	Nitrified Treatment of Title 22 Water (Nitrified Water for LADWP Harbor Demand and Rhodia)	FY1112	12.3	mgd			$ -	lumpsum(7)	$ 30,815,000	1.00	-	$ 30,815,000	IF	140%	$ 43,141,278	None	$ -	$ 43,141,278	-	$ 43,141,278	-	$ -	$ -
6	CRWRF-03	CRWRF	PS	Add new 11.6 mgd pump station at CRWRF to serve LADWP Harbor Demand Phase II (5 pumps)	FY1112	9,667	gpm	500	hp	$ 7,500	per hp	$ 3,750,000	1.00	-	$ 3,750,000	IF	140%	$ 5,250,000	None	$ -	$ 5,250,000	-	$ 5,250,000	-	$ -	$ -
Subtotal	Los Angeles Harbor Area Expansion Project											$ 53,100,000			$ 53,100,000			$ 77,491,278		$ 29,100,000	$ 48,391,278	$ -	$ 77,491,278	$ -	$ -	$ -

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WB Project ID	Project ID	System Name	Project Type	Project Description	Year	Size	Unit	Capacity	Unit	Unit Cost	Unit	Construction Cost (w/o Spcl Cond)	Special Construction	Spcl Cnst	Construction Cost	Project Location (for TTC)	Contingency	Capital Cost	Other Payer	Cost to Other Party	Cost to West Basin	FY0910	FY10-15	FY15-20	FY20-25	FY25-30
7	ELWRF-09	ELWRF	Treatment	Add 17.3 mgd of Title 22 Treatment, to increase Title 22 treatment capacity from 50.0 mgd to 67.3 mgd	FY15-20	17.3	mgd			$ 2.00	per gpd	$ 34,600,000	1.00	-	$ 34,600,000	IF	140%	$ 48,440,000	None	$ -	$ 48,440,000	-	$ -	$ 48,440,000	$ -	$ -
7	ELWRF-10	ELWRF	PS	Increase capacity of Title 22 Pump Station at ELWRF by 3,200 hp (from 4,800 hp to 8,000 hp) to serve Future Title 22 Customers	FY15-20			3,200	hp	$ 3,200	per hp	$ 10,240,000	1.00	-	$ 10,240,000	IF	140%	$ 14,340,000	None	$ -	$ 14,340,000	-	$ -	$ 14,340,000	$ -	$ -
7	ELWRF-11	ELWRF	Treatment	Microfiltration - Replace existing Phase II MF System w/ Pressurized System	FY15-20	8.4	mgd			$ 12,000,000	lumpsum(1)	$ 12,000,000	1.00	-	$ 12,000,000	IF	140%	$ 16,800,000	None	$ -	$ 16,800,000	-	$ -	$ 16,800,000	$ -	$ -
7	ELWRF-12	ELWRF	Reliability	Backup Power	FY15-20	1	system			$ 8,000,000	lumpsum(1)	$ 8,000,000	1.00	-	$ 8,000,000	IF	140%	$ 11,200,000	None	$ -	$ 11,200,000	-	$ -	$ 11,200,000	$ -	$ -
7	ELWRF-13	ELWRF	Treatment	Dewatered Sludge Handling Transfer System	FY15-20	1	system			$ 2,000,000	lumpsum(1)	$ 2,000,000	1.00	-	$ 2,000,000	IF	140%	$ 2,800,000	None	$ -	$ 2,800,000	-	$ -	$ 2,800,000	$ -	$ -
7	ELWRF-15	ELWRF	Reliability	Potable Water Connection to ELWRF	FY15-20					$ 200,000	per site(1)	$ 200,000	1.00	-	$ 200,000	IF	140%	$ 280,000	None	$ -	$ 280,000	-	$ -	$ 280,000	$ -	$ -
7	EMWRF-07	EMWRF	Reliability	Backup Power for Product Water Pumps	FY15-20	1	system			$ 500,000	lumpsum(1)	$ 500,000	1.00	-	$ 500,000	IF	140%	$ 700,000	None	$ -	$ 700,000	-	$ -	$ 700,000	$ -	$ -
7	T22-17	T22	Storage	Increase Title 22 product water storage by 5.0 MG	FY15-20	5	MG			$ 1.50	per gallon	$ 7,500,000	1.00	-	$ 7,500,000	IF	140%	$ 10,500,000	None	$ -	$ 10,500,000	-	$ -	$ 10,500,000	$ -	$ -
7	T22-23	T22	Pipeline	Title-22 PS Discharge Pipeline Modification	FY15-20	300	lineal ft	54	inches	$ 1,100	per lineal ft	$ 330,000	1.00	-	$ 330,000	IF	140%	$ 465,000	None	$ -	$ 465,000	-	$ -	$ 465,000	$ -	$ -
Subtotal	ELWRF Phase VI - Future Plant Expansions											$ 75,370,000			$ 75,370,000			$ 105,525,000		$ -	$ 105,525,000	$ -	$ -	$ 105,525,000	$ -	$ -
13	HPS-01	HPS	PS	Add 23 mgd of additional pumping capacity, to bring firm capacity to 74 mgd of firm capacity. (Phase I of II; total project assumes 7 pumps, 7,000 hp total)	FY1011			7,000	hp	$ 3,000	per hp	$ 10,500,000	1.00	-	$ 10,500,000	IF	140%	$ 14,700,000	None	$ -	$ 14,700,000	-	$ 14,700,000	-	$ -	$ -
13	HPS-04	HPS	PS	PS Building	FY1011	1	building					$ 400,000	1.00	-	$ 400,000	IF	140%	$ 560,000	None	$ -	$ 560,000	-	$ 560,000	-	$ -	$ -
13	HPS-05	HPS	PS	Add 23 mgd of additional pumping capacity, to bring firm capacity to 97 mgd of firm capacity. (Phase II of II; total project assumes 7 pumps, 7,000 hp total)	FY1112			7,000	hp	$ 3,000	per hp	$ 10,500,000	1.00	-	$ 10,500,000	IF	140%	$ 14,700,000	None	$ -	$ 14,700,000	-	$ 14,700,000	-	$ -	$ -
Subtotal	Hyperion Secondary Effluent Pump Station Expansion											$ 21,400,000			$ 21,400,000			$ 29,960,000		$ -	$ 29,960,000	$ -	$ 29,960,000	$ -	$ -	$ -
14	HPS-03	HPS	PS	Secondary Power Connection for Backup Power	FY1011	1	system			$ 1,800,000	lumpsum(1)	$ 1,800,000	1.00	-	$ 1,800,000	IF	140%	$ 2,520,000	None	$ -	$ 2,520,000	-	$ 2,520,000	-	$ -	$ -
Subtotal	Hyperion Secondary Effluent Pump Station Secondary Feed											$ 1,800,000			$ 1,800,000			$ 2,520,000		$ -	$ 2,520,000	$ -	$ 2,520,000	$ -	$ -	$ -
15	T22-11	T22	Pipeline	Chlorination Stations (Phase I)	FY1213	5	stations			$ 280,000	per station	$ 1,400,000	1.00	-	$ 1,400,000	IF	140%	$ 1,960,000	None	$ -	$ 1,960,000	-	$ 1,960,000	-	$ -	$ -
15	T22-21	T22	Pipeline	Chlorination Stations (Phase II)	FY15-20	5	stations			$ 280,000	per station	$ 1,400,000	1.00	-	$ 1,400,000	IF	140%	$ 1,960,000	None	$ -	$ 1,960,000	-	$ -	$ 1,960,000	$ -	$ -
Subtotal	Water Quality Facility Improvements											$ 2,800,000			$ 2,800,000			$ 3,920,000		$ -	$ 3,920,000	$ -	$ 1,960,000	$ 1,960,000	$ -	$ -
16	T22-02	T22	Pipeline	El Segundo Lateral (Boeing, Kilroy Airport)	FY1112	6,300	lineal ft	6	inches		see detail	$ 955,000	1.00	-	$ 955,000	OF	157%	$ 1,500,000	Fed	$ 1,031,250	$ 468,750	-	$ 1,500,000	-	$ -	$ -
16	T22-02A	T22	Pipeline	Mariposa Lateral (Mattel, Hilton, Marriot)	FY0910	1,700	lineal ft	6	inches		see detail	$ 475,000	1.00	-	$ 475,000	OF	157%	$ 750,000	Fed	$ 515,625	$ 234,375	$ 750,000	$ -	-	$ -	$ -
16	T22-06	T22	Pipeline	Carson Mall Lateral	FY0910	10,000	lineal ft	6 - 16	inches		lumpsum(7)	$ 1,070,000	1.48	A,F	$ 1,590,000	OF	157%	$ 2,500,000	Fed	$ 1,718,750	$ 781,250	$ 2,500,000	$ -	-	$ -	$ -
16	T22-08	T22	Pipeline	Mills Park Lateral	FY1112	1,000	lineal ft	6	inches		see detail	$ 175,000	1.00	-	$ 175,000	IF	140%	$ 245,000	Fed	$ 168,438	$ 76,563	-	$ 245,000	-	$ -	$ -
16	T22-09	T22	Pipeline	Anza Lateral Phase II	FY0910	12,000	lineal ft	4 - 8	inches		lumpsum(8)	$ -	0.00	0.00	$ -	-	0%	$ 3,500,000	Fed	$ 2,406,250	$ 1,093,750	$ 3,500,000	$ -	-	$ -	$ -
16	T22-10	T22	PS	Anza PS (4-500 gpm pumps)	FY0910	2,000	gpm	200	hp		lumpsum(4)	$ -	0.00	0.00	$ -	-	0%	$ 2,000,000	Fed	$ 1,375,000	$ 625,000	$ 2,000,000	$ -	-	$ -	$ -
16	T22-13	T22	Pipeline	Dominguez Street Lateral	FY1011	14,500	lineal ft	6 - 8	inches		lumpsum(4)	$ -	0.00	0.00	$ -	-	0%	$ 4,500,000	Fed	$ 3,093,750	$ 1,406,250	-	$ 4,500,000	-	$ -	$ -
16	T22-19	T22	Pipeline	Dyehouse Lateral	FY0910	12,000	lineal ft	8	inches		lumpsum(4)	$ -	0.00	0.00	$ -	-	0%	$ 3,000,000	Fed	$ 2,062,500	$ 937,500	$ 3,000,000	$ -	-	$ -	$ -
16	T22-20	T22	PS	Dyehouse PS (3-250 gpm pumps)	FY0910	600	gpm	40	hp		lumpsum(4)	$ -	0.00	0.00	$ -	-	0%	$ 1,500,000	Fed	$ 1,031,250	$ 468,750	$ 1,500,000	$ -	-	$ -	$ -
Subtotal	Harbor / South Bay Project Laterals - US ARMY CORPS											$ 2,675,000			$ 3,195,000			$ 19,495,000		$ 13,402,813	$ 6,092,188	$ 13,250,000	$ 6,245,000	$ -	$ -	$ -
17	T22-01	T22	Pipeline	Caltrans Inglewood Lateral	FY1213	1,000	lineal ft	4	inches		see detail	$ 130,000	1.25	A	$ 165,000	OF	157%	$ 260,000	Fed	$ 178,750	$ 81,250	-	$ 260,000	-	$ -	$ -
17	T22-04	T22	Pipeline	Virco-Torrance Lateral	FY1011	1,500	lineal ft	6	inches		see detail	$ 215,000	1.00	-	$ 215,000	OF	157%	$ 340,000	None	$ -	$ 340,000	-	$ 340,000	-	$ -	$ -
17	T22-07	T22	Pipeline	Redondo Beach Lateral (Pete's Nursery)	FY1112	2,500	lineal ft	6	inches		see detail	$ 420,000	1.00	-	$ 420,000	OF	157%	$ 660,000	None	$ -	$ 660,000	-	$ 660,000	-	$ -	$ -
17	T22-12	T22	Pipeline	Main Street Carson Lateral	FY1314	37,000	lineal ft	6 - 16	inches		see detail	$ 9,715,000	1.12	A	$ 10,875,000	OF	157%	$ 17,075,000	None	$ -	$ 17,075,000	-	$ 17,075,000	-	$ -	$ -
17	T22-14	T22	Pipeline	Caltrans Gardena Lateral	FY1415	3,500	lineal ft	6 - 8	inches		see detail	$ 625,000	1.00	-	$ 625,000	OF	157%	$ 985,000	None	$ -	$ 985,000	-	$ 985,000	-	$ -	$ -
17	T22-15	T22	Pipeline	Palos Verdes - Lateral 6B	FY15-20	42,500	lineal ft	12 - 24	inches		see detail	$ 17,380,000	1.00	-	$ 17,380,000	OF	157%	$ 27,290,000	Fed	$ 18,761,875	$ 8,528,125	-	$ -	$ 27,290,000	$ -	$ -
17	T22-16	T22	PS	Palos Verdes PS (4-1,250 gpm pumps)	FY15-20	5,000	gpm	375	hp		lumpsum(1)	$ 3,500,000	1.00	-	$ 3,500,000	IF	140%	$ 4,900,000	None	$ -	$ 4,900,000	-	$ -	$ 4,900,000	$ -	$ -
17	T22-18A	T22	Pipeline	Gardena Lateral - Normandie Ave	FY15-20	9,500	lineal ft	8	inches		see detail	$ 2,260,000	1.02	A	$ 2,315,000	OF	157%	$ 3,635,000	None	$ -	$ 3,635,000	-	$ -	$ 3,635,000	$ -	$ -
17	T22-18B	T22	Pipeline	Gardena Lateral - Normandie and Vermont	FY15-20	19,500	lineal ft	4 - 6	inches		see detail	$ 3,815,000	1.03	A	$ 3,930,000	OF	157%	$ 6,170,000	None	$ -	$ 6,170,000	-	$ -	$ 6,170,000	$ -	$ -
17	T22-18C	T22	Pipeline	Gardena Lateral - Van Ness	FY15-20	15,000	lineal ft	4 - 6	inches		see detail	$ 2,855,000	1.00	A	$ 2,855,000	OF	157%	$ 4,480,000	None	$ -	$ 4,480,000	-	$ -	$ 4,480,000	$ -	$ -
17	T22-22	T22	Pipeline	Hawthorne Lateral (Solec)	FY15-20	5,500	lineal ft	6	inches		see detail	$ 1,015,000	1.00	-	$ 1,015,000	OF	157%	$ 1,595,000	Fed	$ 1,096,563	$ 498,438	-	$ -	$ 1,595,000	$ -	$ -
Subtotal	Harbor / South Bay Project Laterals - DISTRICT											$ 41,930,000			$ 43,295,000			$ 67,390,000		$ 20,037,188	$ 47,352,813	$ -	$ 19,320,000	$ 48,070,000	$ -	$ -
18	CRWRF-07	CRWRF	Reliability	Backup Power	FY15-20	1	system			$ 1,800,000	lumpsum	$ 1,800,000	1.00	-	$ 1,800,000	IF	140%	$ 2,520,000	None	$ -	$ 2,520,000	-	$ -	$ 2,520,000	$ -	$ -
Subtotal	Backup Power and Water Supply											$ 1,800,000			$ 1,800,000			$ 2,520,000		$ -	$ 2,520,000	$ -	$ -	$ 2,520,000	$ -	$ -
30	CNF-05	CNF	Recapitalization	ELWRF Phase Va Expansion - Inspect Nitrified Product Water Storage Tank Internal Condition	FY1112	1	site			$ 60,000	lumpsum(1)	$ 60,000	1.00	-	$ 60,000	IF	140%	$ 85,000	Chev	$ 85,000	$ -	-	$ 85,000	-	$ -	$ -
30	CNF-06	CNF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 3,765,000	1.00	-	$ 3,765,000	CA	120%	$ 4,520,000	Chev	$ 4,520,000	$ -	$ -	$ 2,740,000	$ 1,780,000	$ -	$ -
30	CNF-07	CNF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 500,000	1.00	-	$ 500,000	IF	140%	$ 850,000	Chev	$ 850,000	$ -	$ -	$ 425,000	$ 425,000	$ -	$ -
30	HPS-06	HPS	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 600,000	1.00	-	$ 600,000	CA	120%	$ 725,000	None	$ -	$ 725,000	$ -	$ 350,000	$ 375,000	$ -	$ -
Subtotal	Treatment Facility Repair, Replacement, and Improvements											$ 4,925,000			$ 4,925,000			$ 6,180,000		$ 5,455,000	$ 725,000	$ -	$ 3,600,000	$ 2,580,000	$ -	$ -
	EMWRF-04	EMWRF	Treatment	Add 0.6 mgd of Industrial RO Treatment of Title 22 Water (half of 1,000 afy total w/ RO).(6)	FY15-20						per gpd	$ 1,350,000	1.00	-	$ 1,350,000	IF	140%	$ 1,890,000	EMWRF	$ 1,890,000	$ -	-	$ -	$ 1,890,000	$ -	$ -
	EMWRF-05	EMWRF	Treatment	Add 0.5 mgd of Nitrified Treatment of Title 22 Water (half of 1,000 afy total w/ Nitrified).(6)	FY15-20	0.5	mgd			$ 1	per gpd	$ 525,000	1.00	-	$ 525,000	IF	140%	$ 735,000	EMWRF	$ 735,000	$ -	-	$ -	$ 735,000	$ -	$ -
Subtotal	EMWRF Expansion											$ 1,875,000			$ 1,875,000			$ 2,625,000		$ 2,625,000	$ -	$ -	$ -	$ 2,625,000	$ -	$ -
31	CBRN-01	CBRN	Pipeline	Install access ports for cleaning	FY1112	8	ports			$ 100,000	per port	$ 800,000	1.00	-	$ 800,000	OF	157%	$ 1,260,000	None	$ -	$ 1,260,000	-	$ 1,260,000	-	$ -	$ -
31	CRWRF-06	CRWRF	Recapitalization	Repair Nitrified Product Water Storage Tank	FY1112	0.2	MG			$ 2.00	per gallon	$ 400,000	1.00	-	$ 400,000	IF	140%	$ 560,000	None	$ -	$ 560,000	-	$ 560,000	-	$ -	$ -
31	CRWRF-08	CRWRF	PS	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 5,310,000	1.00	-	$ 5,310,000	CA	120%	$ 6,375,000	None	$ -	$ 6,375,000	$ -	$ 1,125,000	$ 5,250,000	$ -	$ -
31	CRWRF-09	CRWRF	Recapitalization	Membrane Replacement (recurring)	Mult					$ 279,900	per year	$ 2,795,000	1.00	-	$ 2,795,000	MR	100%	$ 2,799,000	None	$ -	$ 2,799,000	-	$ 1,399,500	$ 1,399,500	$ -	$ -
31	CRWRF-10	CRWRF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 1,205,000	1.00	-	$ 1,205,000	IF	140%	$ 1,690,000	None	$ -	$ 1,690,000	$ -	$ 845,000	$ 845,000	$ -	$ -
31	CRWRF-11	CRWRF	Recapitalization	UW Recap - Construct paved access way from road to rear side of RO CIP tank.	FY0910							$ 10,000	1.00	-	$ 10,000	UW	100%	$ 10,000	None	$ -	$ 10,000	$ 10,000	$ -	-	$ -	$ -
31	EBRN-01	EBRN	Pipeline	Install pinch valves/reducers	FY1011	10	reducers			$ 40,000	per valve(1)	$ 400,000	1.00	-	$ 400,000	OF	157%	$ 630,000	None	$ -	$ 630,000	-	$ 630,000	-	$ -	$ -
31	EBRN-02	EBRN	Pipeline	Install access ports for cleaning	FY1112	12	ports			$ 100,000	per port	$ 1,200,000	1.00	-	$ 1,200,000	OF	157%	$ 1,885,000	None	$ -	$ 1,885,000	-	$ 1,885,000	-	$ -	$ -
31	ELWRF-01	ELWRF	Recapitalization	UW Recap - T-22 backwash pump total rebuilds (increase capacity of T22 backwash blower)	FY0910					$ 100,000	lumpsum(9)	$ 100,000	1.00	-	$ 100,000	UW	100%	$ 100,000	None	$ -	$ 100,000	$ 100,000	$ -	-	$ -	$ -
31	ELWRF-06	ELWRF	Recapitalization	Increase Capacity of Title 22 Air Vacuum Release Valve for Product Water Storage Tanks	FY1011	1	valve			$ 70,000	lumpsum(1)	$ 70,000	1.00	-	$ 70,000	IF	140%	$ 100,000	None	$ -	$ 100,000	-	$ 100,000	-	$ -	$ -

Tabe 9.37

West Basin Municipal Water District
Capital Implementation Master Plan for Recycled Water Systems
Detailed CIP List w/ Project Breakdown

WB Project ID	Project ID	System Name	Project Type	Project Description	Year	Size	Unit	Capacity	Unit	Unit Cost	Unit	Construction Cost (w/o Spcl Cond)	Special Construction	Spcl Cnst	Construction Cost	Project Location (for TTC)	Contingency	Capital Cost	Other Payer	Cost to Other Party	Cost to West Basin	FY0910	FY10-15	FY15-20	FY20-25	FY25-30
31	ELWRF-16	ELWRF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 18,215,000	1.00	-	$ 18,215,000	CA	120%	$ 21,860,000	None	$ -	$ 21,860,000	$ -	$ 4,660,000	$ 17,200,000	$ -	$ -
31	ELWRF-17	ELWRF	Recapitalization	Membrane Replacement (recurring)	Mult					$ 1,105,380	per year	$ 11,050,000	1.00	-	$ 11,050,000	MR	100%	$ 11,053,800	None	$ -	$ 11,053,800	-	$ 5,526,900	$ 5,526,900	$ -	$ -
31	ELWRF-18	ELWRF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 3,620,000	1.00	-	$ 3,620,000	IF	140%	$ 5,070,000	None	$ -	$ 5,070,000	$ -	$ 2,535,000	$ 2,535,000	$ -	$ -
31	ELWRF-19	ELWRF	Recapitalization	UW Recap - Pave area between T 22 filters and the holding basins	FY0910							$ 8,800	1.00	-	$ 8,800	UW	100%	$ 8,800	None	$ -	$ 8,800	$ 8,800	$ -	-	$ -	$ -
31	ELWRF-20	ELWRF	Recapitalization	UW Recap - Shelter/Overhead cover when CO2 tank is removed. To provide covered storage area for chemical totes. Include access for forklifts around dike area.	FY0910							$ 100,000	1.00	-	$ 100,000	UW	100%	$ 100,000	None	$ -	$ 100,000	$ 100,000	$ -	-	$ -	$ -
31	ELWRF-21	ELWRF	Recapitalization	UW Recap - Phase III Memcor and SCADA and PC	FY0910							$ 5,000	1.00	-	$ 5,000	UW	100%	$ 5,000	None	$ -	$ 5,000	$ 5,000	$ -	-	$ -	$ -
31	ELWRF-22	ELWRF	Recapitalization	UW Recap - No. 3 Sulfuric acid day tank replace	FY0910							$ 30,000	1.00	-	$ 30,000	UW	100%	$ 30,000	None	$ -	$ 30,000	$ 30,000	$ -	-	$ -	$ -
31	ELWRF-23	ELWRF	Recapitalization	UW Recap - Replace grating replacement in chemical area with chemical resistant grating	FY0910							$ 40,000	1.00	-	$ 40,000	UW	100%	$ 40,000	None	$ -	$ 40,000	$ 40,000	$ -	-	$ -	$ -
31	ELWRF-24	ELWRF	Recapitalization	UW Recap - Trench Drains at Decant Sump area	FY0910							$ 30,000	1.00	-	$ 30,000	UW	100%	$ 30,000	None	$ -	$ 30,000	$ 30,000	$ -	-	$ -	$ -
31	ELWRF-25	ELWRF	Recapitalization	UW Recap - Power receptacles for emergency generator hook up for Title 22	FY0910							$ 20,000	1.00	-	$ 20,000	UW	100%	$ 20,000	None	$ -	$ 20,000	$ 20,000	$ -	-	$ -	$ -
31	ELWRF-26	ELWRF	Recapitalization	UW Recap - Replace DCS back up power (48vac) generator	FY0910							$ 45,000	1.00	-	$ 45,000	UW	100%	$ 45,000	None	$ -	$ 45,000	$ 45,000	$ -	-	$ -	$ -
31	ELWRF-27	ELWRF	Recapitalization	UW Recap - Flow control valve and actuator for barrier product pump	FY0910							$ 100,000	1.00	-	$ 100,000	UW	100%	$ 100,000	None	$ -	$ 100,000	$ 100,000	$ -	-	$ -	$ -
31	ELWRF-28	ELWRF	Recapitalization	UW Recap - Replace or expand plant instrument air compressor system	FY0910							$ 75,000	1.00	-	$ 75,000	UW	100%	$ 75,000	None	$ -	$ 75,000	$ 75,000	$ -	-	$ -	$ -
31	ELWRF-29	ELWRF	Recapitalization	UW Recap - Replace phase II RO Membranes	FY0910							$ 375,000	1.00	-	$ 375,000	UW	100%	$ 375,000	None	$ -	$ 375,000	$ 375,000	$ -	-	$ -	$ -
31	ELWRF-30	ELWRF	Recapitalization	UW Recap - Data Parser to allow for direct entry of data from instrumentation into LIMS.	FY0910							$ 25,000	1.00	-	$ 25,000	UW	100%	$ 25,000	None	$ -	$ 25,000	$ 25,000	$ -	-	$ -	$ -
31	ELWRF-31	ELWRF	Recapitalization	UW Recap - Replace or repair lab wall to prevent water intrusion and mold	FY0910							$ 25,000	1.00	-	$ 25,000	UW	100%	$ 25,000	None	$ -	$ 25,000	$ 25,000	$ -	-	$ -	$ -
31	EMWRF-01	EMWRF	Recapitalization	Repair or Replace Bulk Chemical Storage Tank and Associated Equipment	FY1112		1 system			$ 500,000	lumpsum(1)	$ 500,000	1.00	-	$ 500,000	IF	140%	$ 700,000	None	$ -	$ 700,000	-	$ 700,000	-	$ -	$ -
31	EMWRF-02	EMWRF	Recapitalization	Inspect Nitrified Product Water Storage Tank Internal Condition	FY1112		1 site			$ 60,000	lumpsum(1)	$ 60,000	1.00	-	$ 60,000	IF	140%	$ 85,000	None	$ -	$ 85,000	-	$ 85,000	-	$ -	$ -
31	EMWRF-03	EMWRF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult						lumpsum(1)	$ 5,815,000	1.00	-	$ 5,815,000	CA	120%	$ 6,980,000	None	$ -	$ 6,980,000	$ -	$ 1,590,000	$ 5,390,000	$ -	$ -
31	EMWRF-06	EMWRF	Treatment	Surge Protection - Modify MF Units with Break Tank and Pumps	FY15-20		1 system	lump sum for alternatives		$ 2,500,000	lumpsum(2)	$ 2,500,000	1.00	-	$ 2,500,000	IF	140%	$ 3,500,000	None	$ -	$ 3,500,000	-	$ -	$ 3,500,000	$ -	$ -
31	EMWRF-08	EMWRF	Recapitalization	Membrane Replacement (recurring)	Mult					$ 165,000	per year	$ 1,650,000	1.00	-	$ 1,650,000	MR	100%	$ 1,650,000	None	$ -	$ 1,650,000	-	$ 825,000	$ 825,000	$ -	$ -
31	EMWRF-09	EMWRF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 605,000	1.00	-	$ 605,000	IF	140%	$ 850,000	None	$ -	$ 850,000	$ -	$ 425,000	$ 425,000	$ -	$ -
31	EMWRF-10	EMWRF	Recapitalization	UW Recap - Pavement of area between gated entrance and plant.	FY0910							$ 20,000	1.00	-	$ 20,000	UW	100%	$ 20,000	None	$ -	$ 20,000	$ 20,000	$ -	-	$ -	$ -
31	EMWRF-11	EMWRF	Recapitalization	UW Recap - Add an additional air compressor for the MF system	FY0910							$ 30,000	1.00	-	$ 30,000	UW	100%	$ 30,000	None	$ -	$ 30,000	$ 30,000	$ -	-	$ -	$ -
31	EMWRF-12	EMWRF	Recapitalization	UW Recap - RO Train 4 membrane change out	FY0910							$ 160,000	1.00	-	$ 160,000	UW	100%	$ 160,000	None	$ -	$ 160,000	$ 160,000	$ -	-	$ -	$ -
31	NTP-02	NTP	Recapitalization	Membrane Replacement (recurring)	Mult					$ 1,705,000	per year	$ 5,040,000	1.00	-	$ 5,040,000	MR	100%	$ 8,525,000	None	$ -	$ 8,525,000	-	$ -	$ 8,525,000	$ -	$ -
31	SW-01	SW	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 3,020,000	1.00	-	$ 3,020,000	IF	140%	$ 4,230,000	None	$ -	$ 4,230,000	$ -	$ 2,115,000	$ 2,115,000	$ -	$ -
31	SW-02	SW	Recapitalization	UW Recap - Major Painting Projects	FY0910							$ 150,000	1.00	-	$ 150,000	UW	100%	$ 150,000	None	$ -	$ 150,000	$ 150,000	$ -	-	$ -	$ -
31	SW-03	SW	Recapitalization	UW Recap - Purchase trailer for spill response	FY0910							$ 5,000	1.00	-	$ 5,000	UW	100%	$ 5,000	None	$ -	$ 5,000	$ 5,000	$ -	$ -	$ -	$ -
31	SW-04	SW	Recapitalization	UW Recap - Asset Management Software, Implementation and Training	FY0910							$ 300,000	1.00	-	$ 300,000	UW	100%	$ 300,000	None	$ -	$ 300,000	$ 300,000	$ -	-	$ -	$ -
31	SW-05	SW	Recapitalization	UW Recap - Replace all Biofor valves at CNF and EMWRF	FY0910							$ 200,000	1.00	-	$ 200,000	UW	100%	$ 200,000	None	$ -	$ 200,000	$ 200,000	$ -	-	$ -	$ -
Subtotal	Conveyance Facility Repair, Replacement, and Improvements											$ 66,108,800			$ 66,108,800			$ 81,656,600		$ -	$ 81,656,600	$ 1,853,800	$ 26,266,400	$ 53,536,400	$ -	$ -
											Total	**$ 398,113,760**	**$ -**	**$ -**	**$ 417,535,333**	**-**	**$ -**	**$ 614,937,878**	**$ -**	**$ 254,180,000**	**$ 360,757,878**	**$ 15,103,800**	**$ 373,002,678**	**$ 226,831,400**	**$ -**	**$ -**

Notes:

1) Cost estimated based on considerations specific to the site, application, or project, rather than through utilization of unit costs.
2) Withfor this report, multiple alternatives were proposed. For conservative planning purposes, the more expensive option is included here. Decisions regarding alternatives will need to be made during preliminary design. See Chapters 7 and 8 for more details.
3) Cost estimate obtained from ELWRF Phase V Expansion Feasibility Study (HDR April 2008). Cost estimate does not reflect unit costs or markups developed for this report.
4) Budget for project prepared by West Basin as a part of preliminary design. Cost estimate does not reflect unit costs or markups developed for this report.
5) Cost based on recent discussions with West Basin staff. Cost estimate does not reflect unit costs or markups developed for this report.
6) Expansion of the EMWRF Facility and assosciated increase in Title 22 water are not included in the Customer Database or System Analysis portions of this report.
7) Cost provided by West Basin staff. Based on recent customer revisions.
8) Length reduced from 16,000 lf to 12,000 lf based on discussions with West Basin staff.
9) Cost provided by United Water cost estimate.

Post 2020 Projects

Project ID	System Name (Lookup)	Project Type	Project Description	Year	Size	Unit	Capacity	Unit	Unit Cost	Unit	Construction Cost (w/o Spcl Cond)	Special Construction	Spcl Cnst	Construction Cost	Project Location (for TTC)	Contingency	Capital Cost	Other Payer	Cost to Other Party	Cost to West Basin	FY0910	FY10-15	FY15-20	FY20-25	FY25-30
CNF-08	CNF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 290,000	1.00	-	$ 290,000	CA	120%	$ 350,000	None	$ -	$ 350,000	$ -	$ -	$ -	$ 170,000	$ 180,000
CNF-09	CNF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 500,000	1.00	-	$ 500,000	IF	140%	$ 850,000	None	$ -	$ 850,000	$ -	$ -	$ -	$ 425,000	$ 425,000
HPS-07	HPS	PS	Add 38 mgd of additional firm pumping capacity, to bring total firm capacity to 135 mgd. (For LADWP Westside, Kenneth Hahn, LADWP Harbor Expansion) (Assumes 3 pumps, 3,000 hp increase)	FY20-25	46	mgd	3,000	hp	$ 6,500	per hp	$ 19,500,000	1.00	-	$ 19,500,000	IF	140%	$ 27,300,000	None	$ -	$ 27,300,000	-	$ -	$ -	$ 27,300,000	-
HPS-08	HPS	Pipeline	Parallel HSEFM w/ 36"	FY20-25	15,500	lineal ft	36	inches	$ 750	per lineal ft	$ 11,625,000	1.25	A	$ 14,531,250	OF	157%	$ 22,815,000	None	$ -	$ 22,815,000	-	$ -	$ -	$ 22,815,000	-
T22-24	T22	Pipeline	Anza Lateral Break Tank	FY20-25					0	lumpsum	$ 3,000,000	1.00	-	$ 3,000,000	IF	140%	$ 4,200,000	None	$ -	$ 4,200,000	-	$ -	$ -	$ 4,200,000	-
T22-25	T22	Pipeline	LA Westside Lateral	FY25-30	40,500	lineal ft	24 - 36	inches	0	see detail	$ 24,355,000	1.05	F,R	$ 25,480,000	OF	157%	$ 40,005,000	None	$ -	$ 40,005,000	-	$ -	$ -	-	$ 40,005,000
T22-26	T22	PS	Inglewood/LA Westside PS (assumes 4-8,500 gpm pumps)	FY25-30	34,000	gpm	5,950	hp	$ 3,000	per hp	$ 17,850,000	1.00	-	$ 17,850,000	OF	157%	$ 28,025,000	None	$ -	$ 28,025,000	-	$ -	$ -	-	$ 28,025,000
ELWRF-32	ELWRF	Treatment	Land Acquisition of 4.0 ac near ELWRF for Expansion of Title 22 Beyond 70.0 mgd	FY20-25	21.5	mgd	4.0	ac	$ 2,000,000	per acre	$ 8,000,000	1.00	-	$ 8,000,000	LA	120%	$ 9,600,000	None	$ -	$ 9,600,000	-	$ -	$ -	$ 9,600,000	-
ELWRF-33	ELWRF	PS	Increase capacity of Title 22 Pump Station at ELWRF by 4,000 hp (from 8,000 hp to 12,000 hp) to serve LADWP Harbor Expansion, Westside, and Kenneth Hahn	FY25-30			4,000	hp	$ 3,000	per hp	$ 12,000,000	1.00	-	$ 12,000,000	IF	140%	$ 16,800,000	None	$ -	$ 16,800,000	-	$ -	$ -	-	$ 16,800,000
ELWRF-34	ELWRF	Treatment	Add 8.9 mgd of Additional Title 22 Treatment to Serve LADWP Harbor Expansion, increasing Title 22 Treatment Capacity from 67.3 mgd to 76.2 mgd	FY25-30	8.9	mgd			$ 2.00	per gal	$ 17,815,000	1.00	-	$ 17,815,000	IF	140%	$ 24,945,000	None	$ -	$ 24,945,000	-	$ -	$ -	-	$ 24,945,000
ELWRF-35	ELWRF	Treatment	Add 15.3 mgd of Additional Title 22 Treatment to Serve LADWP Westside and Kenneth Hahn Park, increasing Title 22 Treatment Capacity from 76.2 mgd to 91.5 mgd	FY25-30	15.3	mgd			$ 2.00	per gal	$ 30,690,000	1.00	-	$ 30,690,000	IF	140%	$ 42,970,000	None	$ -	$ 42,970,000	-	$ -	$ -	-	$ 42,970,000
ELWRF-36	ELWRF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 14,970,000	1.00	-	$ 14,970,000	CA	120%	$ 17,965,000	None	$ -	$ 17,965,000	$ -	$ -	$ -	$ 11,040,000	$ 6,925,000
ELWRF-37	ELWRF	Recapitalization	Membrane Replacement (recurring)	Mult					$ 1,105,380	per year	$ 11,055,000	1.00	-	$ 11,055,000	MR	100%	$ 11,055,000	None	$ -	$ 11,055,000	$ -	$ -	$ -	$ 5,527,500	$ 5,527,500
ELWRF-38	ELWRF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 3,620,000	1.00	-	$ 3,620,000	IF	140%	$ 5,070,000	None	$ -	$ 5,070,000	$ -	$ -	$ -	$ 2,535,000	$ 2,535,000
CRWRF-12A	CRWRF	Treatment	Nitrified Treatment of Title 22 Water (Nitrified Water for LADWP Harbor Demand Phase II)	FY20-25	7.1	mgd			$ 1.05	per gpd	$ 7,485,000	1.00	-	$ 7,485,000	IF	140%	$ 10,480,000	None	$ -	$ 10,480,000	-	$ -	$ -	$ 10,480,000	-
CRWRF-12B	CRWRF	PS	Add new 7.1 mgd pump station at CRWRF to serve LADWP Harbor Demand Phase II (5 pumps)	FY20-25	5,917	gpm	300	hp	$ 10,000	per hp	$ 3,000,000	1.00	-	$ 3,000,000	IF	140%	$ 4,200,000	None	$ -	$ 4,200,000	-	$ -	$ -	$ 4,200,000	-
CRWRF-13	CRWRF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 3,245,000	1.00	-	$ 3,245,000	CA	120%	$ 3,895,000	None	$ -	$ 3,895,000	$ -	$ -	$ -	$ 2,595,000	$ 1,300,000
CRWRF-14	CRWRF	Recapitalization	Membrane Replacement (recurring)	Mult					$ 279,900	per year	$ 2,800,000	1.00	-	$ 2,800,000	MR	100%	$ 2,800,000	None	$ -	$ 2,800,000	$ -	$ -	$ -	$ 1,400,000	$ 1,400,000
CRWRF-15	CRWRF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 1,205,000	1.00	-	$ 1,205,000	IF	140%	$ 1,690,000	None	$ -	$ 1,690,000	$ -	$ -	$ -	$ 845,000	$ 845,000
NTP-03	NTP	Treatment	Barrier Water Treatment - treat SE from JWPCP to serve Dominguez Gap (Phase I and II)	FY20-25	3.9	mgd			$ 6.25	per gal	$ 24,375,000	1.00	-	$ 24,375,000	IF	140%	$ 34,125,000	None	$ -	$ 34,125,000	-	$ -	$ -	$ 34,125,000	-
NTP-04	NTP	PS	Add new 3.1 mgd pump station at NTP to serve Dominguez Gap (Phase I + II)	FY20-25	2,583	gpm	150	hp	$ 10,000	per hp	$ 1,500,000	1.00	-	$ 1,500,000	IF	140%	$ 2,100,000	None	$ -	$ 2,100,000	-	$ -	$ -	$ 2,100,000	-
NTP-05	NTP	Pipeline	New Pipeline from NTP to Dominguez Gap Barrier Blending Station for conveyance of Barrier Water.	FY20-25	15,840	lineal ft	12	inches	$ 310	per ft	$ 4,910,400	1.25	A	$ 6,138,000	OF	157%	$ 9,640,000	None	$ -	$ 9,640,000	-	$ -	$ -	$ 9,640,000	-
NTP-06	NTP	Recapitalization	Membrane Replacement (recurring)	Mult					$ 1,705,000	per year	$ 10,085,000	1.00	-	$ 10,085,000	MR	100%	$ 17,050,000	None	$ -	$ 17,050,000	$ -	$ -	$ -	$ 8,525,000	$ 8,525,000
EMWRF-13	EMWRF	Recapitalization	Rehabilitation and Replacement from Condition Assessment (recurring)	Mult							$ 2,720,000	1.00	-	$ 2,720,000	CA	120%	$ 3,265,000	None	$ -	$ 3,265,000	$ -	$ -	$ -	$ 2,440,000	$ 825,000
EMWRF-14	EMWRF	Recapitalization	Membrane Replacement (recurring)	Mult					$ 165,000	per year	$ 1,650,000	1.00	-	$ 1,650,000	MR	100%	$ 1,650,000	None	$ -	$ 1,650,000	$ -	$ -	$ -	$ 825,000	$ 825,000
EMWRF-15	EMWRF	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 605,000	1.00	-	$ 605,000	IF	140%	$ 850,000	None	$ -	$ 850,000	$ -	$ -	$ -	$ 425,000	$ 425,000
SW-06	SW	Recapitalization	United Water Recapitalization Improvements (recurring)	Mult							$ 3,020,000	1.00	-	$ 3,020,000	IF	140%	$ 4,230,000	None	$ -	$ 4,230,000	$ -	$ -	$ -	$ 2,115,000	$ 2,115,000
										Total	**$ 241,870,400**	**$ -**	**$ -**	**$ 247,129,250**	**-**	**$ -**	**$ 347,925,000**	**$ -**	**$ -**	**$ 347,925,000**	**$ -**	**$ -**	**$ -**	**$ 163,327,500**	**$ 184,597,500**
										Grand Total	**$ 639,984,160**	**$ -**	**$ -**	**$ 664,664,583**	**-**	**$ -**	**$ 962,862,878**	**$ -**	**$ 254,180,000**	**$ 708,682,878**	**$ 15,103,800**	**$ 373,002,678**	**$ 226,831,400**	**$ 163,327,500**	**$ 184,597,500**

West Basin Municipal Water District

Urban Water Management Plan

2010

MESSAGE FROM THE BOARD OF DIRECTORS

Since its formation in 1947, West Basin has remained steadfast in its commitment to ensure a safe and reliable water supply for the region. Through the years, West Basin has grown and transformed seeking innovative and viable solutions to meet the changing needs of its communities. All of us at West Basin continue to expand our efforts to meet the growing water demand while preserving our limited and precious water resources. Through our Water Reliability 2020 Program, including recycling, conservation and desalination, West Basin will continue to diversify its local water supplies to ensure a reliable supply of water for future generations.

We are proud to submit this 2010 Urban Water Management Plan to the State Department of Water Resources. The Plan reports all current and projected water supplies and demands within West Basin's service area, demonstrates water reliability for the next 25 years and provides a comprehensive overview of West Basin's various programs.

Value Statement:
"Through various programs and projects, West Basin ensures that its customer agencies have a safe and reliable supply of water to provide to the residents, businesses and industries within its service area."

Directors

Division 1 (Director Ronald C. (Ron) Smith): Cities of Carson, Palos Verdes Estates, Rancho Palos Verdes, Rolling Hills Estates, Rolling Hills and portions of San Pedro ;

Division 2 (Director Gloria D. Gray): Cities of Inglewood, South Ladera Heights, a portion of Lennox and Athens, Howard and Ross-Sexton;

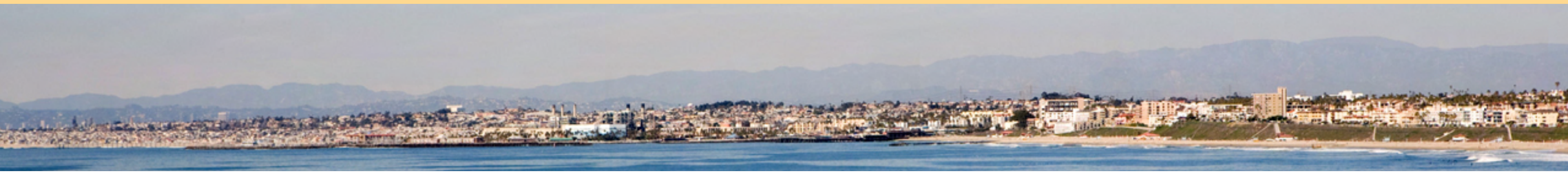
Division 3 (Director Carol W. Kwan): Cities of Hermosa Beach, Lomita, Manhattan Beach, Redondo Beach and a portion of Torrance;

Division 4 (Director Edward C. Little): Cities of Culver City, El Segundo, Malibu, and West Hollywood, Lennox, North Ladera Heights, Del Aire, Topanga, View Park and Windsor Hills; and

Division 5 (Director Donald L. Dear): Cities of Gardena, Hawthorne, Lawndale and portions of El Camino Village.

Mission Statement

"To provide a safe and reliable supply of high-quality water to the communities we serve."



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West Basin Municipal Water District
2010 Urban Water Management Plan

Prepared by:

RMC
Water and Environment

May 2011

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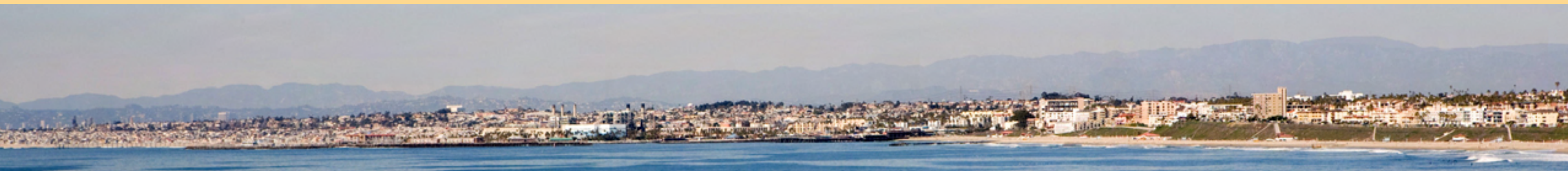

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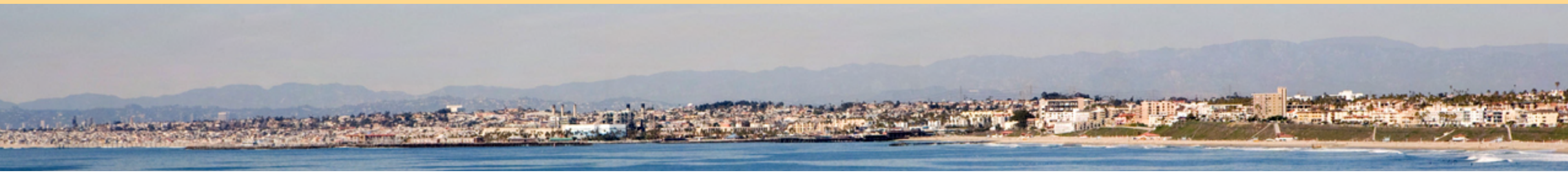

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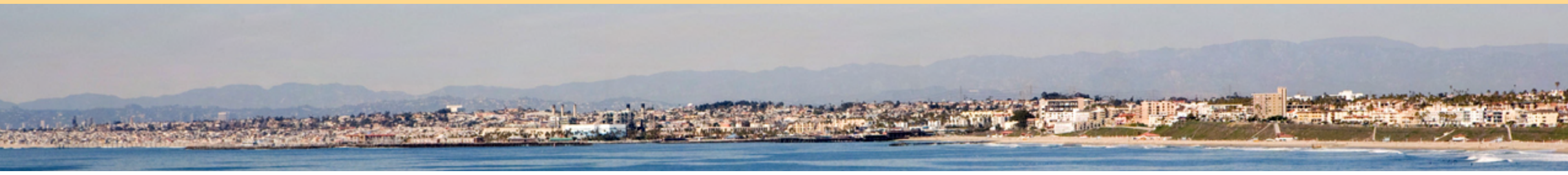

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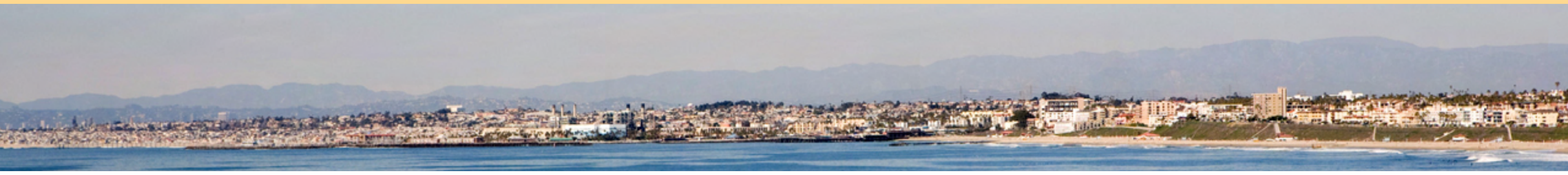

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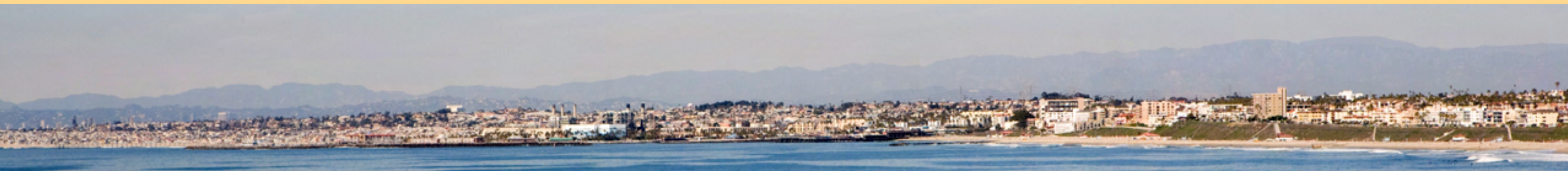

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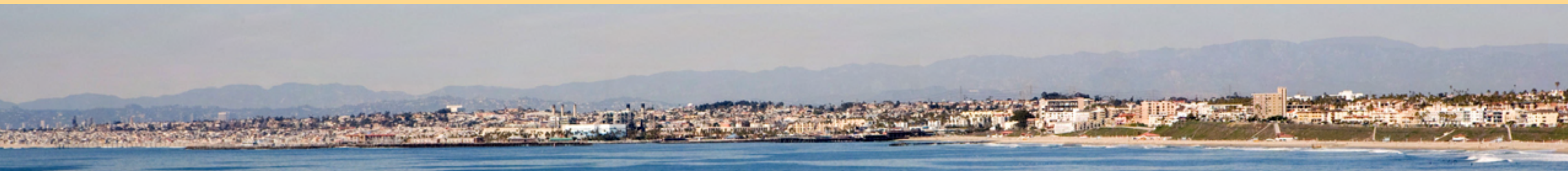

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Executive Summary

2010

Executive Summary

EXECUTIVE SUMMARY

1 West Basin's Mission

West Basin Municipal Water District (West Basin) was established in 1947 to help mitigate the over pumping of groundwater by providing imported water from the Metropolitan Water District of Southern California (MWD) as replenishment supplies. Today, this imported water is also provided to supplement local supplies including groundwater, desalination, and recycled supplies developed by West Basin or by retailer agencies operating within West Basin's service area. In addition, a combination of recycled water and imported water is introduced into local aquifers through the West Coast Seawater Barrier to both protect the groundwater supplies from seawater contamination and replace, or replenish, what is pumped.

In January 2008, the West Basin Board adopted a Strategic Business Plan to address water supply issues that plague Southern California by focusing on producing new sources of local water, improving its environmentally-sound and innovative technologies, and emphasizing customer service and satisfaction. With a goal to decrease its service area's dependence on imported water by 50 percent between now and 2020, West Basin is expanding its recycled water customer base, exploring the feasibility of taking its ocean-water desalination project to the next level, and broadening its water use efficiency programs and outreach. Through various programs and projects, West Basin ensures that its customer agencies have a safe and reliable supply of water to provide to the residents, businesses and industries within its service area.

2 West Basin's 2010 Urban Water Management Plan

West Basin's 2010 Urban Water Management Plan (UWMP) revises the 2005 UWMP prepared by West Basin and incorporates changes enacted by legislation since 2005. Since 2005, several amendments have been added to the Urban Water Management Act. The most significant being the requirements mandated through the passing of Senate Bill (SB) X7-7 that seeks a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020 and for agencies to calculate individual water use reduction targets to help achieve this goal.

As a water wholesaler, West Basin is not required to provide these targets. However, given its' role as a regional water provider, West Basin has elected, in cooperation with a portion of its customer agencies, to use its 2010 UWMP as a regional alliance UWMP. Although each of West Basin's customer agencies must prepare individual 2010 UWMPs, West Basin's 2010 UWMP provides a regional target that will allow these retailers and West Basin to collaborate on the most effective and efficient programs that will ensure the targeted reductions in demand can be met.

3 West Basin Service Area Demands

While demand in the West Basin service area has historically increased due to increased population growth, recent years have shown a decrease in overall system demand. This decrease has been attributed to aggressive conservation program implementation due to drought conditions in 2007-8, an economic downturn resulting in less consumption beginning in 2009, and subsequent wet seasons in 2009 and 2010.

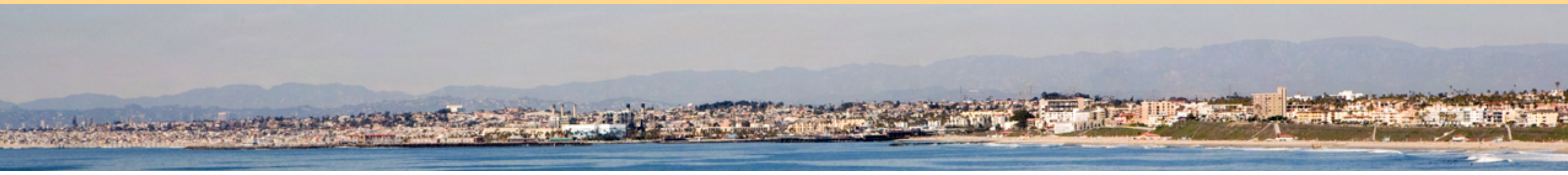


Table ES-1 and indicates that although West Basin's service area population is projected to increase, the overall potable demand in acre-feet per year (AFY) is expected to decrease given further water use efficiency and recycled water program implementation.

Table ES-1: Projected West Basin Service Area Demand (AFY)

Year	2010	2015	2020	2025	2030	2035
Baseline Demand[1]	170,527	192,134	198,218	197,408	197,451	197,275
Planned Conservation[2]	14,000	15,119	21,039	21,640	22,971	23,632
Final Total Retail Demand	**156,527**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**
Recycled Water Demand[3]	14,182	16,368	33,882	33,882	37,382	37,382
Final Potable Demand	**142,345**	**160,647**	**143,297**	**141,886**	**137,098**	**136,261**

[1] Projections based on Water Demand Forecasting Model, 2010
[2] Water Use Efficiency Plan, Alliance for Water Efficiency Model, 2010
[3] Projections based on the Capital Implementation Master Plan, 2009

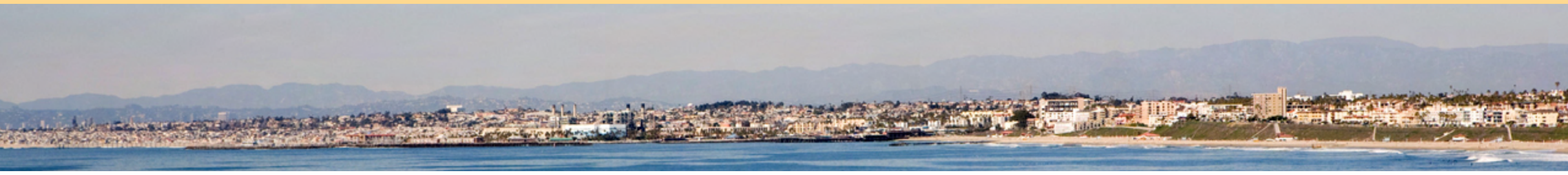
In terms of per capita use (in gallons per capita day (gpcd)), the West Basin Regional Alliance baseline and targeted water use for 2015 and 2020 are shown in table ES-2.

TableES-2: Regional Alliance 2015 Interim and 2020 Targets (gpcd)

Member	10-Year Base Water Use	Calculated Water Use Targets		Maximum Allowable Target	Final Targets	
		Method	Target		2015	2020
California Water Service Company Hawthorne	96.5	3	141.6	N/A	119.0	141.6
City of El Segundo	220.6	1	176.5	182.2	198.6	176.5
City of Inglewood	105.3	3	141.6	N/A	123.4	141.6
City of Lomita	123.4	3	141.6	116.2	119.8	116.2
City of Manhattan Beach	175.7	3	141.6	144.9	158.6	141.6
Los Angeles County Waterworks District #29	319.4	1	255.5	298.2	287.5	255.5
Regional Alliance	**227.7**	**1**	**182.2**	**160.5**	**194.1**	**160.5**

4 Reducing Demand through Water Use Efficiency Planning

Since the severe drought of the early 1990s, West Basin has been a leader implementing aggressive water conservation programs to help limit water demand within its service area. West Basin programs have included a strong emphasis on education and the distribution of rebate incentives and plumbing retrofit hardware. The results of these programs, in conjunction with passive conservation measures such as modifications to city ordinances, have resulted in significant reductions in retail water use within

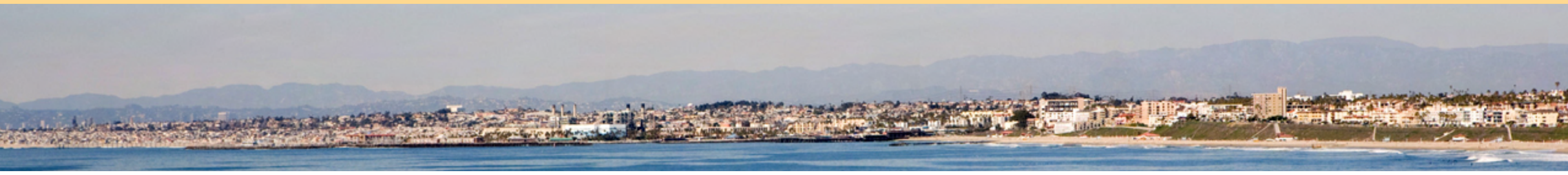


West Basin's service area. By current estimates, demand management from West Basin's active and passive conservation efforts have saved over 3 billion gallons of imported water (10,000 AF) since 1991, which is equivalent to the average annual water use of almost 20,000 households.

In order further increase conservation and meet the 2020 and interim 2015 water use targets, West Basin has recently collaborated with its Regional Alliance agencies to develop and implement the future water use efficiency measures shown in Table ES-3.

Table ES-3: West Basin and Retailer Program Participation

Programs	West Basin	Los Angeles County Water-works District #29	City of El Segundo	City of Manhattan Beach	City of Hawthorne	City of Lomita	City of Inglewood
MWD							
Residential Rebate Program	X	X	X	X	X	X	X
Save A Buck Rebate Program	X	X	X	X	X	X	X
West Basin							
High-Efficiency Toilet (HET) Distribution Events	X	X	X	X	X	X	X
Green Living for Apartments and Condos (Direct HET Installations)	X	X	X	X	X	X	X
Ocean Friendly Landscape Program	X	X	X	X	X	X	X
Complete Restroom Retrofit Program	X	X	X	X	X	X	X
Recirc & Save Program	X	X	X	X	X	X	X
Cash for Kitchens	X	X	X	X	X	X	X
Education Programs	X	X	X	X	X	X	X
West Basin Programs (Funding Pending)							
High-Efficiency Nozzle Program	X	X	X	X	X	X	X
Water Star Schools Pilot Program	X	X	X	X	X	X	X
Water & Energy Efficiency in the Motel/Hotel and Schools Sectors	X	X	X	X	X	X	X
Other Water Retailer							
Turf Removal Program	N/A	X	-	-	-	-	-
HET Rebates (CII)	N/A	X	-	-	-	-	-
Landscape Surveys	N/A	X	-	-	-	-	-
Education Programs	N/A	X					
Landscape Incentives	N/A	X	-	-	-	-	-



5 West Basin Service Area Supplies

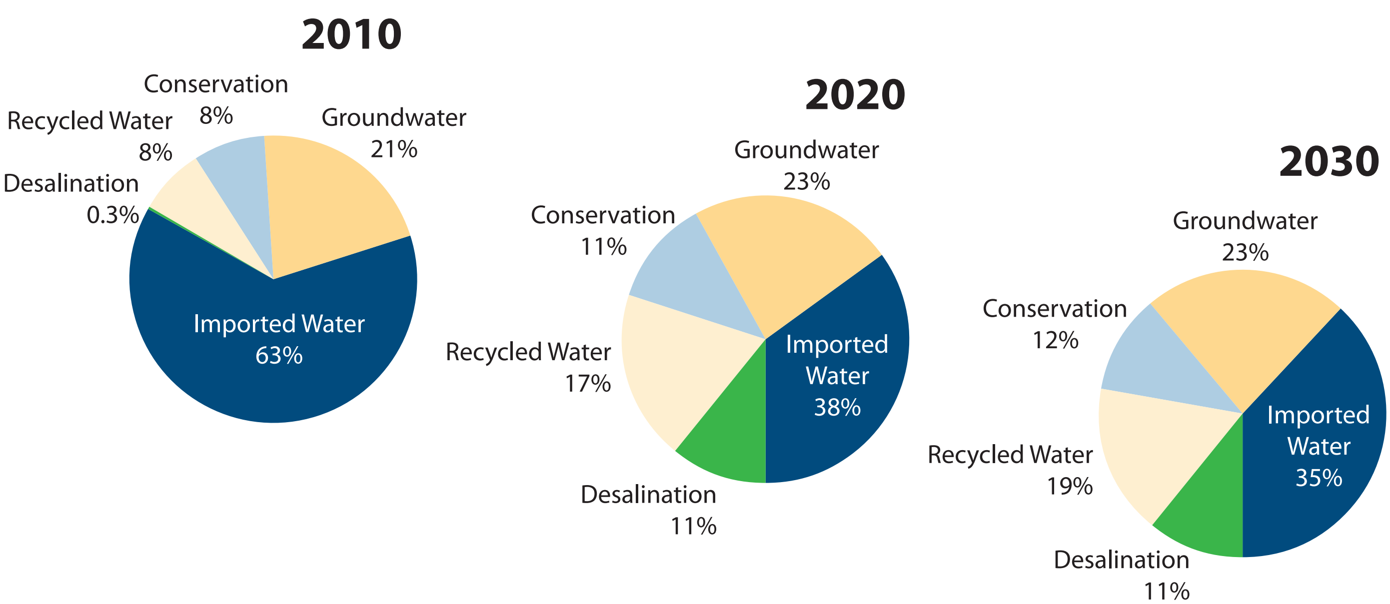
West Basin has been able to support the diversification of supplies available to its customer agencies by providing access to imported water supplies from MWD as well as through the development of recycled water supplies. These supplies are served directly to its customer agencies and indirectly as the replenishment supplies necessary to maximize groundwater production. Table ES-4 shows, West Basin is projecting to more than double current recycled water supplies as well as invest in over 20,000 AFY of ocean-water desalination supply. Coupled with an additional doubling of conserved supply through water use efficiency programs, the overall imported water use is expected to be cut nearly in half by 2035 as shown in Figure ES-1.

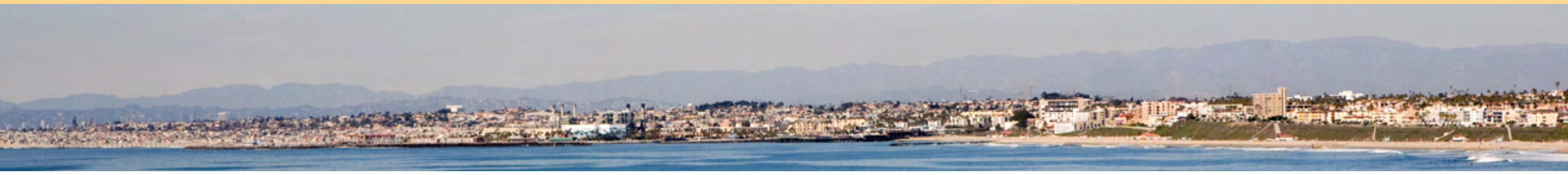
Table ES-4 West Basin's Service Area Projected Water Supply (AFY)

Supplies	2010	2015	2020	2025	2030	2035
Groundwater[1]	36,360	45,000	45,000	45,000	45,000	45,000
Imported Water[2]	104,985	114,647	76,797	75,386	70,598	69,761
Recycled Water[3]	14,182	16,368	33,882	33,882	37,382	37,382
Desalination[4]	500	1,000	21,500	21,500	21,500	21,500
Total	**156,027**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**
Conservation[5]	14,000	15,119	21,039	21,640	22,971	23,632
Total	**170,027**	**192,134**	**198,218**	**197,408**	**197,451**	**197,275**

[1] Groundwater production within West Basin service area only.
[2] Imported retail use only; does not include replenishment deliveries (i.e. Barrier).
[3] Recycled water does not include replenishment deliveries (i.e. Barrier).and deliveries outside the service area.
[4] Desalination includes both brackish and ocean-water.
[5] Conservation consists of Active and Passive savings according to West Basin's projected estimates.

Figure ES-1: West Basin Service Area Projected Water Supplies





6 **Recycled Water Development**

Since planning and constructing its recycled water system in the early 1990s, West Basin has become an industry leader in water reuse. West Basin's recycled water supply is sold to customers for non-potable applications such as landscape irrigation, commercial and industrial processes, and indirect potable uses through groundwater replenishment. While serving to offset imported water supplies, recycled water use also results in less ocean discharge of lesser-treated wastewater into the Santa Monica Bay.

In fiscal year 2009-10, West Basin delivered about 30,400 AF of recycled water to sites inside and outside its service area, saving enough potable water to serve roughly 61,000 households. Within West Basin's service area, municipal and industrial recycled water use totaled about 15,500 AF and seawater barrier about 7,796 AF, which is about 13 percent of the District's current total water supplies. It is projected that recycled water sales could represent 19 percent of total water supplies by 2035.

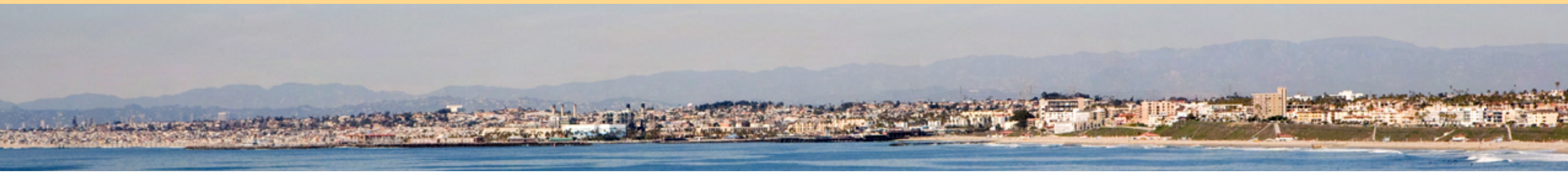
7 **Ocean-Water Desalination Development**

In early 2011, West Basin dedicated its Ocean-Water Desalination Demonstration Facility and Water Education Center. West Basin used the data acquired from the pilot project in the planning and development of the demonstration facility that produces 50,000 gallons per day of drinking water. This Ocean-Water Desalination Demonstration Facility will test the viability of a future, full-scale Ocean-Water Desalination Facility capable of providing up to 20,000 AFY, or enough to supply 40,000 families for a year, in the initial phase.

West Basin will perform a Desalination Program Master Plan in 2011 that will evaluate potential siting opportunities within West Basin's service area that could accommodate a full-scale facility. Pending the findings from the demonstration facility, the Master Plan, and subsequent environmental review process, West Basin anticipates permitting, financing, and constructing a full-scale facility by 2017.

8 **Maintaining the Quality of Water Supplies**

Compliance with water quality regulations is a regional water management priority and a shared responsibility. West Basin is responsible for the quality of the desalination and recycled water supplies generated at the C. Marvin Brewer Desalter and Edward C. Little Water Recycling Facility (ECLWRF) and its satellite facilities: Carson Water Recycling Facility, Chevron Nitrification Plant and Exxon-Mobil Nitrification Plant. MWD is responsible for complying with State and Federal drinking water regulations on its imported potable water sold to West Basin. West Basin's retail customer agencies are responsible for ensuring compliance in their individual distribution systems and at the customer tap.



West Basin has a dedicated program and budget to constantly engage in research projects that evaluate water quality, efficient operations and new pollution prevention technology and methods. Research projects close the environmental loop by addressing both final product water as well as source control issues to prevent pollution and the need for cleanup technology. West Basin leverages its research dollars by participating on the Boards of water industry research organizations such as WateReuse, American Water Works Associations, National Water Research Institute, Salinity Management Coalition as well as participating with academic institutions in water quality research.

9 Water Rates and Charges

As a water wholesale agency, West Basin does not directly charge residential and other end-use customers for supplies. Instead, West Basin's customer agencies purchase water from West Basin and then combine it with other supplies to deliver to their retail customers at a variety of rates.

West Basin's current potable water rates are primarily based upon the costs of imported supplies purchased from MWD. Imported water purchased by West Basin from MWD carries not only the cost of acquiring, importing, treating and distributing the water throughout the region, but also these costs associated with maintaining MWD reliability and "readiness to serve". The total West Basin rate structure must include the value-added costs associated with distributing to customer agencies the MWD and locally-produced recycled and desalinated groundwater supplies.

SECTION ONE

Plan Preparation

2010

SECTION 1 Plan Preparation

An Urban Water Management Plan (UWMP) is prepared by a water purveyor to ensure an appropriate level of water service reliability sufficient to meet the needs of its customers during normal, single dry or multiple dry years. 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.

In describing the importance of the Act, the legislature declared that waters of the State are a limited and renewable resource, subject to ever increasing demands as well as the following tenants:

- That the conservation and efficient use of urban water supplies are of statewide concern;
- That successful implementation of plans is best accomplished at the local level;
- That conservation and efficient use of water shall be actively pursued to protect both the people of the State and their water resources;
- That conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions; and
- That urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

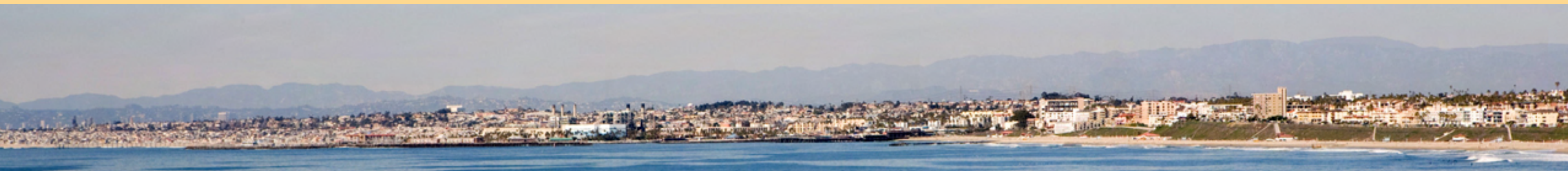
West Basin Municipal Water District's (West Basin) 2010 UWMP has been prepared in compliance with the requirements of the Act, as amended to 2009 (Appendix A), and includes the following:

- West Basin's Service Area
- Water Demand
- Water Supply
- Water Reliability
- Water Quality
- Water Use Efficiency
- Water Rates & Charges
- Water Recycling
- Desalination

1.1 Urban Water Management Planning Requirements

West Basin's 2010 UWMP revises the 2005 UWMP prepared by West Basin and incorporates changes enacted by legislation since 2005. The UWMP also incorporates water use efficiency efforts West Basin has implemented or is considering implementing pursuant to the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU)[1]. West Basin was one of the first agencies to became signatory to the MOU in September 1991.

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



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 for the required information, however, differs slightly in order to present information in a manner reflecting the unique characteristics of West Basin. The most recent version of the Department of Water Resources' (DWR) UWMP Checklist has been completed, which identifies the location of Act requirements in this UWMP and is included as Appendix B.

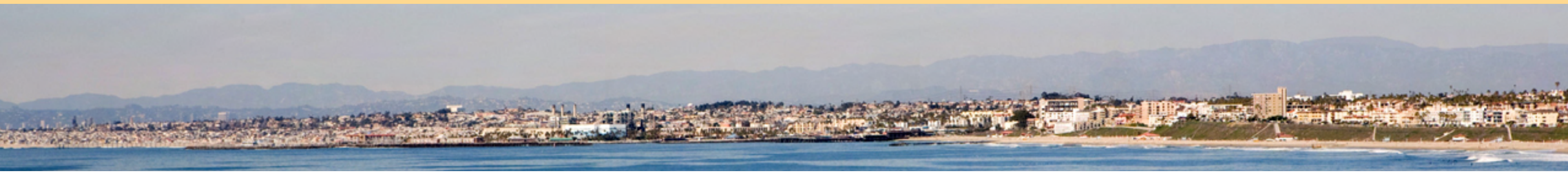
Since 2005, several amendments have been added to the Urban Water Management Act. The major changes to the Act impacting preparation of the 2010 UWMPs include the following:

- Requirement of at least 60 days advance public notice to city or county prior to public hearing on UWMP;
- Requirement that the UWMP includes water use projects for single-family and multi-family residential housing needed for low income and affordable households (retailers only); and
- Requirement that "indirect potable reuse" of recycled water be described and quantified in the UWMP, including a determination with regard to the technical and economic feasibility of serving those uses.

The most significant impact on 2010 UWMPs was the requirements mandated through the passing of Senate Bill (SB) X7-7. On November 10, 2009, the state legislature passed SB X7-7 (or the Water Conservation Bill of 2009) as a water conservation component to the Delta legislative package that seeks a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. SB X7-7 requires that each retail agency preparing a 2010 UWMP must calculate a baseline water use as well as an interim (for 2015) and final (for 2020) water use reduction target. The methodologies used to calculate both the baseline and targets were outlined in the Draft and Final UWMP guidelines published by DWR in December 2010 and March 2011. Since final guidelines were not released until March 2011, the deadline for retailer UWMP adoption and submittal has been extended to July 1, 2011. In September 2010, SB 1478 was signed by the Governor of California to extend the 2010 UWMP deadline to July 1, 2011 for wholesale agencies as well as retailers.

1.2 Regional Alliance UWMP

As a water wholesaler, West Basin is not required to provide SB X7-7 water use reduction targets. However, given its role as a regional water provider, West Basin has elected, in cooperation with a portion of its customer agencies, to use its 2010 UWMP as a regional alliance UWMP. According to DWR's 2010 UWMP guidelines, a regional demand reduction target can be developed by a regional alliance of multiple agencies to show compliance with SB X7-7. Although each of West Basin's customer agencies must prepare individual 2010 UWMPs with individual baseline and target calculations, West Basin's 2010 UWMP provides a regional target that will allow these



retailers and West Basin to collaborate on the most effective and efficient programs that will ensure that the targeted reductions in demand can be met. Additional information is described in Section 2: Water Demand.

1.3 Plan Adoption

The draft 2010 UWMP was completed in April 2011 and available for a 45 day-public review. The draft UWMP was available at local libraries and on West Basin's web site to facilitate the involvement of various social, cultural and economic elements of the population. Once finalized, the UWMP was adopted by a Resolution of the West Basin Board of Directors in May 2011, following a public hearing. The UWMP was then submitted to DWR within 30 days of Board approval. Copies of the Notice of Public Hearing and the Resolution of Plan Adoption are included in Appendices C and D, respectively.

The UWMP is intended to serve as a general, flexible, and open-ended document that periodically can be updated to reflect changes in the region's water supply trends, and conservation and water use efficiency policies. This UWMP, along with West Basin's other planning documents, will be used by West Basin staff to guide it's service area's water use and management efforts through the year 2015, when the UWMP is required to be updated next.

1.4 Agency Coordination

To facilitate the preparation of the draft UWMP, West Basin concurrently developed the West Basin Water Demand Forecasting Model as well as a Water Use Efficiency Master Plan for use by West Basin as well as its customer agencies. During this process, West Basin staff met with all of its customer agencies to discuss the demand model, calculation of SB X7-7 baseline and targets and the 2010 UWMP and offered to provide assistance when requested. West Basin also hosted a stakeholder workshop during the draft UWMP public review period. At the workshop, West Basin provided its customer agencies with consistent information for use in the development of their 2010 UWMPs.

West Basin is a water wholesaler and is fully dependent on the Metropolitan Water District of Southern California (MWD) for its imported water supplies. Therefore, West Basin provided comments and information during development of MWD's Draft Regional Urban Water Management Plan (RUWMP) which was distributed on June 4, 2010. West Basin staff also attended a June 2010 information meeting for stakeholders and the public from within MWD's service area.

As a summary of West Basin's agency coordination, Table 1-1 describes the coordination among West Basin, its customer agencies, the County of Los Angeles and MWD during the review of the draft UWMP.

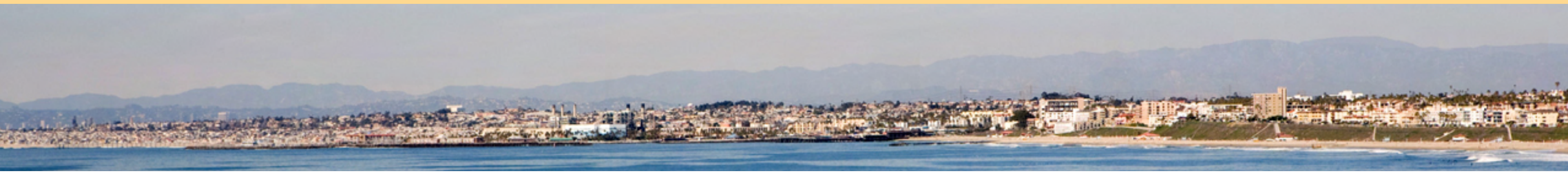


Table 1-1: Coordination with Appropriate Agencies

Agency	Participation in Regional Alliance	Received Copy of Draft	Attended Customer Workshop	Commented on Draft	Sent Notice of Intention to Adopt
County of Los Angeles - Water Resources		X			X
Metropolitan Water District of Southern California		X		X	X
California American Water Company		X	X		X
California Water Service Company		X			X
City of El Segundo	X	X	X		X
City of Inglewood	X	X			X
City of Lomita	X	X			X
City of Manhattan Beach	X	X	X		X
Golden State Water Company		X	X		X
LA County Waterworks District #29	X	X	X	X	X
Water Replenishment District of Southern California		X			X

SECTION TWO

Service Area

2010

SECTION 2 West Basin's Service Area

Today, West Basin's service area covers approximately 185-square miles and wholesale potable water is distributed to 17 cities, investor-owned utilities and water districts in Los Angeles County.

In addition, West Basin supplies recycled water to over 300 customer sites for municipal, commercial and industrial use as well as for injection into the West Coast Basin Seawater Barrier to halt seawater intrusion and replenish the aquifers.

These facilities and West Basin's service are shown in Figure 2-1. Several of West Basin's customer agencies also pump groundwater supplies from the underlying West Coast Groundwater Basin to help meet their demands. A small amount of water is also used in the California Water Service Company's service area from West Basin's C. Marvin Brewer Desalter, which treats brackish groundwater from the West Coast Groundwater Basin for drinking water use.

Approximately 1 million people are served within West Basin's service area which is governed by a five member elected Board of Directors. The Board of Directors guides the mission and policy of West Basin and each director serves a four-year term once elected.

2.1 West Basin's Regional Relationship

West Basin was established by a vote of the people in 1947 to help mitigate the over pumping in the West Coast Groundwater Basin (WCGB). West Basin's founders realized they would have to curtail the use of groundwater by providing the growing region with imported water. Therefore, West Basin also became a member agency of the MWD in 1947 to purchase, on a wholesale level, potable water imported from the Colorado River and the State Water Project to sell to local municipalities, investor-owned utilities and smaller water districts.

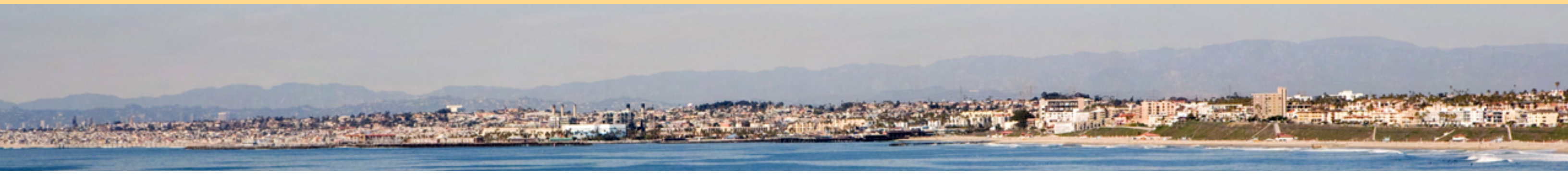
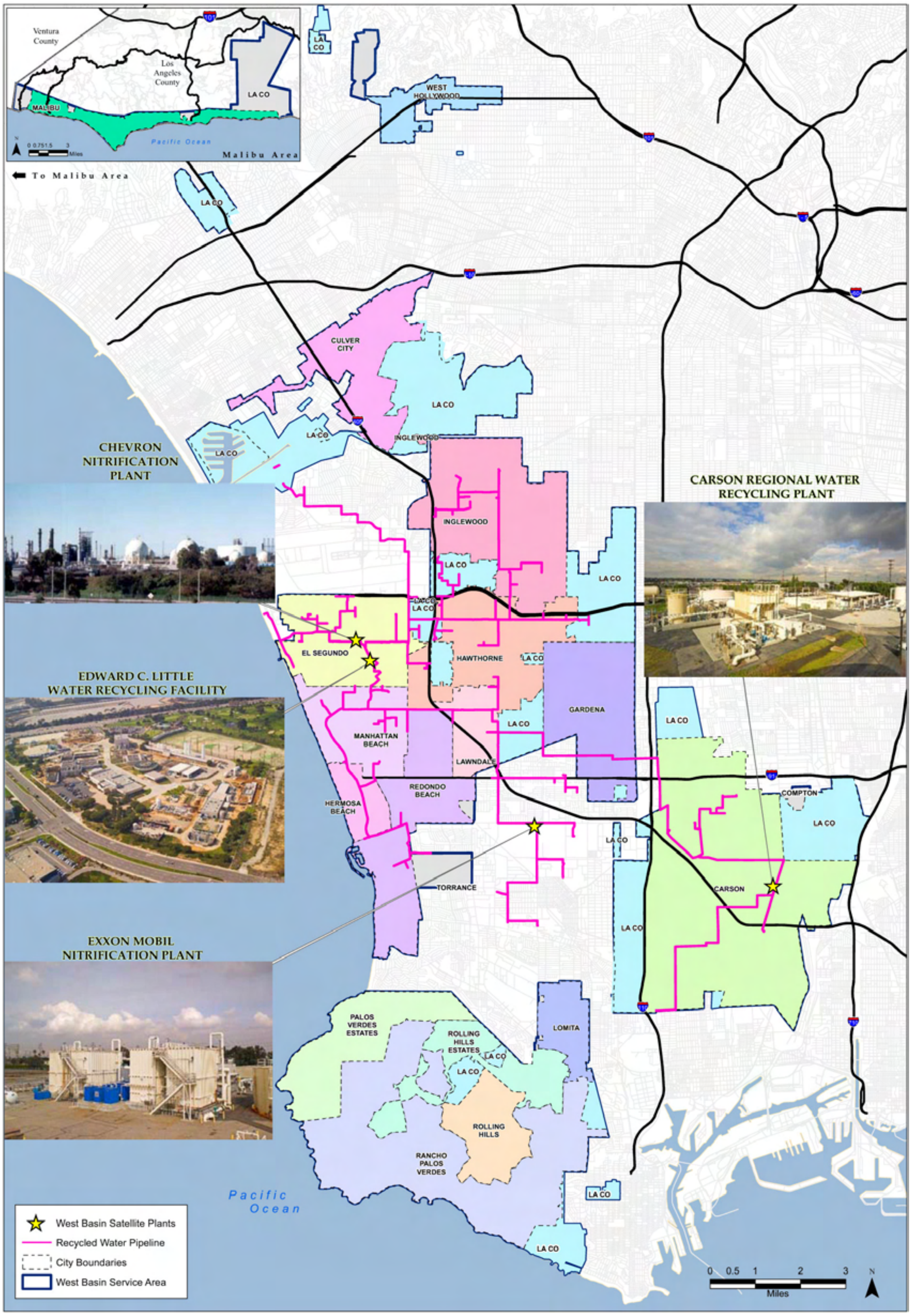
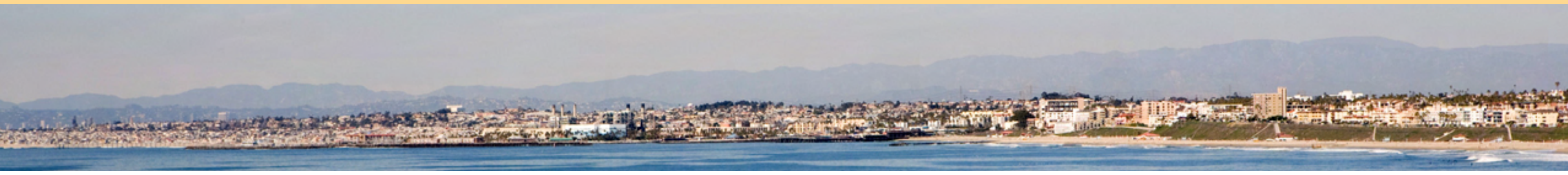


Figure 2-1: West Basin Service Area and Recycled Water Facilities





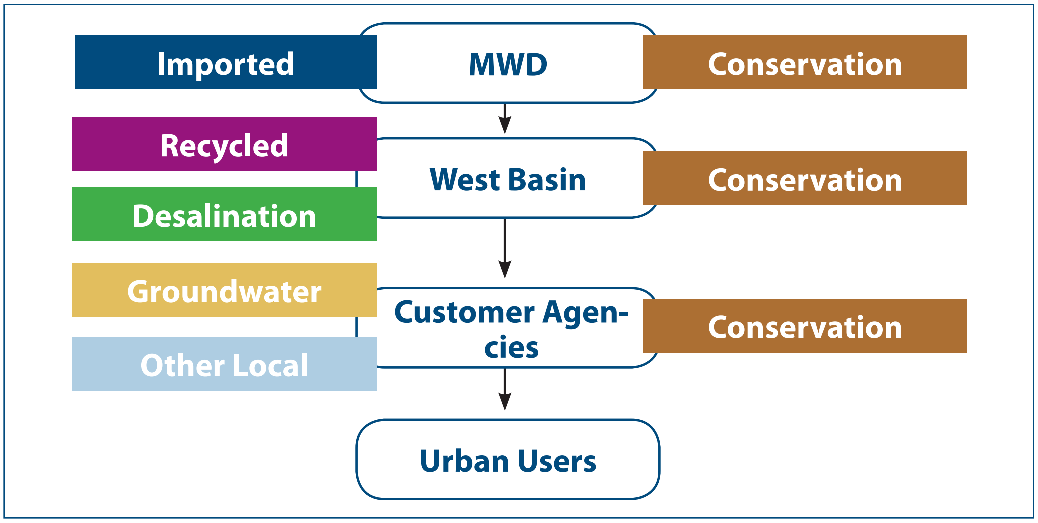
Today, West Basin imports water to supplement local supplies including groundwater, brackish desalination, and recycled water developed by both West Basin and its retail agencies operating within West Basin's service area. In addition, a blend of recycled and imported water is injected into the West Coast Basin Seawater Barrier to both protect the groundwater supplies from seawater contamination and replenish the aquifers. West Basin remains one of the largest member agencies in MWD's family of water agencies and representation on the MWD Board is critical to making West Basin's customer's voices heard at MWD to shape favorable outcomes on regional water issues. West Basin's Board of Directors appoints two representatives to serve on the 37-member MWD Board of Directors.

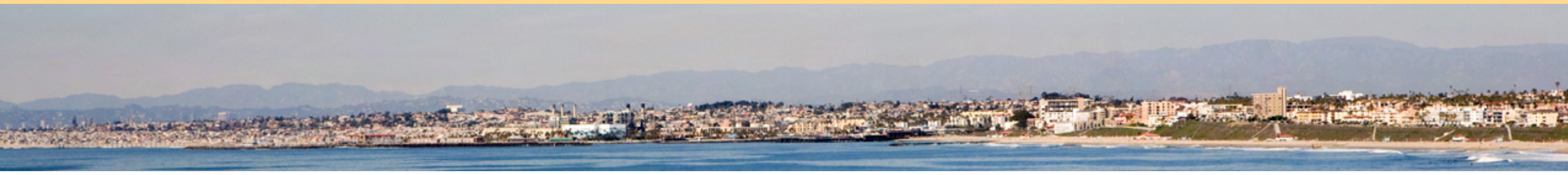
In January 2008, the West Basin Board adopted a Strategic Business Plan to address water supply issues that plague Southern California by focusing on producing new sources of local water, improving its environmentally-sound and innovative technologies, and emphasizing customer service and satisfaction. West Basin affirmed this new vision as an independent agency after concluding its joint operating agreement with Central Basin Municipal Water District, allowing West Basin to focus on the unique needs of its service area.

With a goal to decrease its service area's dependence on imported water by 50 percent between now and 2020, West Basin is implementing a Water Reliability 2020 Program (WR 2020) that will double its recycled water customer base, explore the feasibility of taking its ocean-water desalination demonstration project to the next level, and double its water use efficiency programs and outreach. Through WR 2020, West Basin ensures that its customer agencies have a safe and reliable supply of water to provide to the residents, businesses and industries within its service area.

Figure 2-2 illustrates the relationship West Basin has between MWD and its customer agencies to provide the region with diversified and integrated water supplies.

Figure 2-2: West Basin Service Area Water Supplies





2.2 Climate Characteristics

West Basin's service area lies in the heart of Southern California's coastal plain. The climate is Mediterranean, characterized by typically warm, dry summers and wet, cool winters with an average precipitation level of approximately 12.23 inches per year. The combination of mild climate and low rainfall makes the area a popular residential destination, which creates challenges for water agencies to provide for increased water demands with a tight water supply.

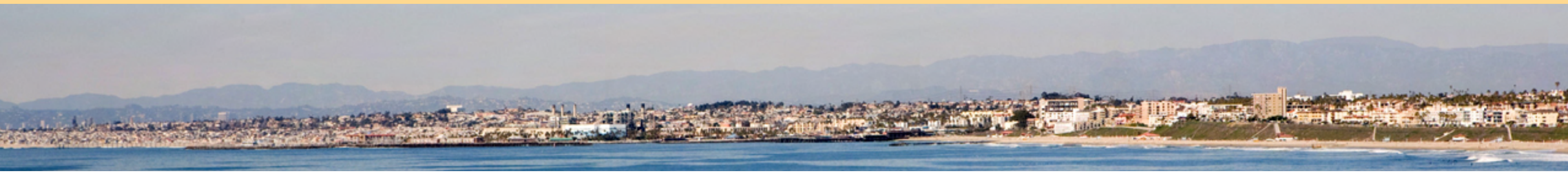
Areas with low precipitation, such as Southern California, are typically vulnerable to droughts. Historically, West Basin has experienced patterns of multiple dry years that have resulted in severe drought periods as was experienced in 1977-78, 1989-92, 1999-2004, and most recently 2007-2009. Excessively dry conditions increase the local demand given that less natural precipitation is available to meet landscaping irrigation needs. Drought conditions typically result in shortages given that this increase in demand is coupled with a decrease in natural supply.

Table 2-1 illustrates the historical average climate conditions for the overall Los Angeles and West Basin region. The potential for changes to the local climate and the resulting impacts are further discussed in Section 4: Water Supply.

Table 2-1: West Basin Average Climate Characteristics

	Standard Monthly Average Eto (inches)	Average Rainfall (inches)	Average Temperature (Fahrenheit)
January	1.83	2.72	65.1
February	2.03	2.75	65.4
March	3.48	1.93	65.2
April	4.21	0.78	67.5
May	4.62	0.17	69.2
June	4.54	0.05	72
July	5.37	0.02	75.2
August	5.06	0.08	76.4
September	4.21	0.16	76.1
October	2.94	0.37	73.6
November	1.83	1.46	70.3
December	1.46	1.74	66.1
Annual	3.47	12.23	70.2

Sources: Temperature and Precipitation: Western Climate Center's web site at the Los Angeles WSO Airport Station between 1/1/1914 and 12/31/2005 http://wrcc.dri.edu/cgi-bin/cliMAIN.pl?calosa. Eto data: California Irrigation Management Information System (CIMIS) at the Long Beach Station for the Los Angeles Region between 1/1/2000 and 12/31/2010. http://wwwcimis.water.ca.gov/cimis/welcome.jsp



2.3 Demographics

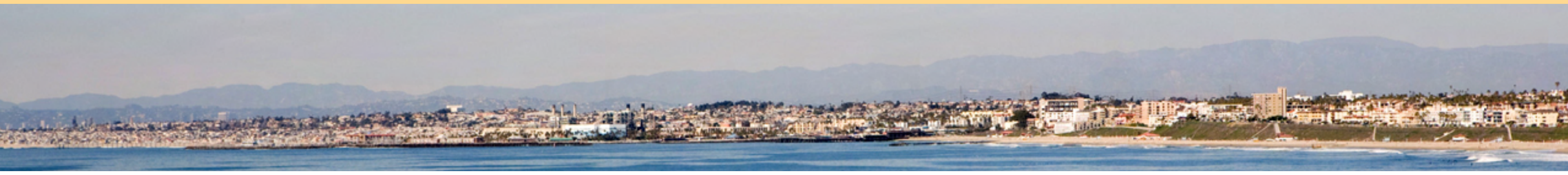
West Basin's service area encompasses 185 square miles in southwest Los Angeles County and includes 17 cities and several unincorporated areas. Given the dense urban nature of West Basin's service area, population has and was expected to rise over time. However, current projections show that population is expected to increase minimally through 2035.

Table 2-2 displays the current and projected population within West Basin's service area over the next 25 years. This population projection shows a more conservative increase in population relative to the projection provided in West Basin's 2005 UWMP.

Table 2-2: West Basin Service Area Current and Projected Population

Year (FY)	2010	2015	2020	2025	2030	2035
Total Population (# of persons)	**853,377**	**874,219**	**892,116**	**909,498**	**926,592**	**942,893**
Single Family (# of households)	169,843	172,738	175,181	176,760	178,248	179,274
Multi-Family (# of households)	117,020	121,023	124,544	127,360	130,222	132,678
Total Household	286,863	293,761	299,725	304,120	308,470	311,952
Persons Per Household	2.95	2.95	2.95	2.96	2.97	2.99
Employment	386,070	392,203	396,123	400,471	405,666	410,341

Source: Population data from the Department of Finance and Southern California Association of Governments (SCAG) and West Basin Demand Forecasting Model, 2010



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SECTION THREE

Water Demand

2010

SECTION 3 Water Demand

With an estimated current population of approximately 850,000 as well as dense commercial and industrial areas, the total retail water demand within West Basin's service area is currently about 157,000 AFY. West Basin is responsible for meeting both the direct retail demand from its customer agencies through imported (potable) and recycled water, as well as groundwater replenishment / seawater intrusion barrier demand from the Water Replenishment District of Southern California (WRD).

While demand in the West Basin service area has historically increased due to increased population growth, recent years have shown a decrease in overall system demand. West Basins' 2005 UWMP projected a 2010 demand of nearly 40,000 AFY more than what was experienced this past year. This decrease has been attributed to aggressive conservation program implementation due to drought conditions in 2007-09, an economic downturn resulting in less consumption beginning in 2009, and subsequent wet seasons in 2009 and 2010.

These decreases have been experienced throughout Southern California and have come at a time when California has implemented new legislation calling for an overall 20 percent decrease in per capita water use by the year 2020. West Basin's 2010 UWMP provides a regional alliance target for per capita water use reductions by 2020 with an interim target for 2015 that is in compliance with the State's Water Conservation Bill of 2009.

This section will explore in greater detail West Basin's historical, current and projected water demands. As a water wholesaler in the region, West Basin will also provide a regional baseline and demand reduction targets for its customer agencies that are part of the regional alliance.

3.1 Historical Water Demands

Total water use within West Basin's service area includes retail demand for potable and recycled water, and groundwater replenishment. Retail demand is defined as a population's direct consumption - or all municipal (residential, firefighting, parks, etc.) and industrial uses. Replenishment demand is the supply needed to maintain the groundwater operations in the basin and are not used directly by residences, municipalities or industries.

3.1.1 Historical Retail Demand

Historically, within the West Basin service area, increases in population have not resulted in increases in overall water demand as shown in Figure 3-1. In fact, within the last five years, demand has decreased relative to population increases. This is because other factors such as climate, economics/water rates and conservation programming also impact demand. Water use efficiency is more aggressive in drought years and resulting in decreases in demand during those periods. Once severe droughts have passed, demand will often begin to slightly rise again. While these patterns may represent a fluctuation in per capita usage, the fact that total demand has not risen along with the overall population indicates increases in water use efficiency in average or wet years.

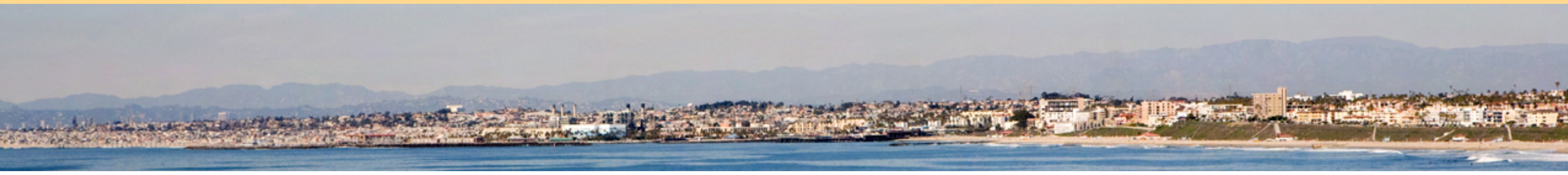
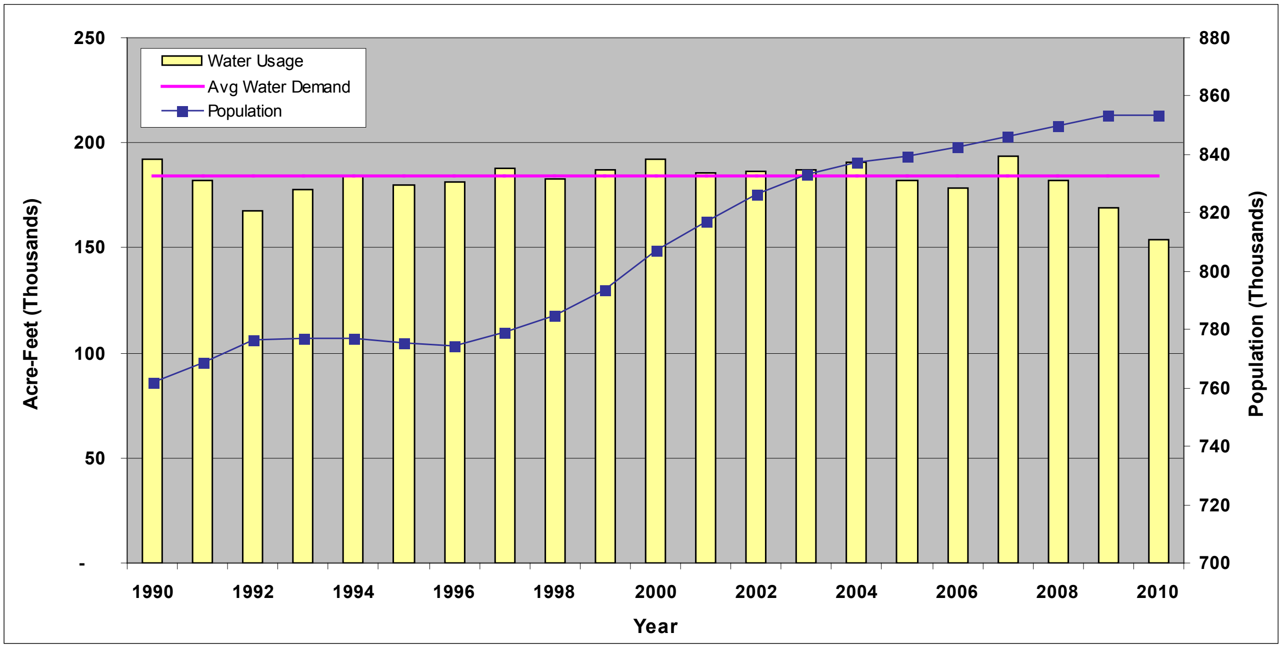


Figure 3-1: West Basin Service Area Historical Retail Water Demand vs. Population



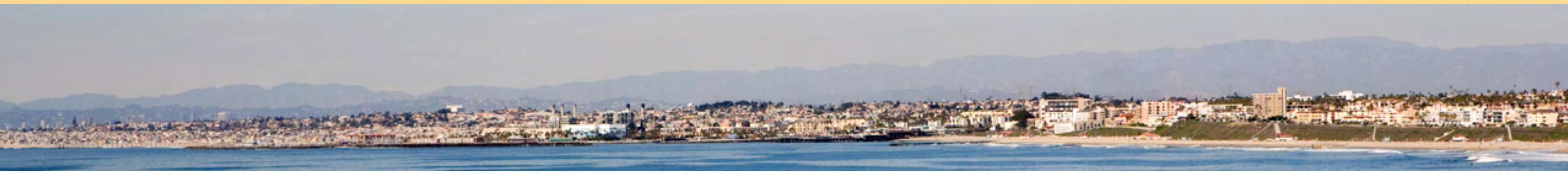
Source: Population data from the Department of Finance and Southern California Association of Governments (SCAG). Water usage data from actual water sales.

Table 3-1 shows the historical demand of each of West Basin's retail agencies as reported to West Basin by those agencies. Although some agencies have seen some dramatic shifts in water demand, there is an overall decrease of retail agency demand by 3 percent in the last five years relative to 2001-2005.

Table 3-1: Historical Water Demand per West Basin Customer Agency

Retail Agency	2001-2005	2006-2010	% Change
California American Water Co.	3,601	4,063	13%
Cal Water Service Co.- Dominguez	36,636	38,167	4%
Cal Water Service Co. - Hermosa/Redondo	16,022	14,450	-10%
Cal Water Service Co.- Palos Verdes	20,536	21,524	5%
Cal Water Service Co.- Hawthorne	5,216	4,616	-12%
City of El Segundo	17,354	17,577	1%
City of Inglewood	11,899	11,496	-3%
City of Lomita	2,729	2,459	-10%
City of Manhattan Beach	8,547	6,188	-28%
L.A. County Waterworks District #29	11,924	9,738	-18%
Golden State Water	35,657	34,185	-4%
Total	**170,121**	**164,463**	**-3%**

Source: Based upon actual water use sales.
Note: California American Water Co. and California Water Service Co - Dominguez include pumping from the Central Groundwater Basin into the West Basin service area.



3.1.2 Historical Replenishment Demand

The West Coast Groundwater Basin is reliant upon replenishment supplies to not only meet demand but also to maintain water quality levels. Groundwater in this basin is annually extracted beyond the natural level of replenishment, and as a result, seawater begins to intrude into the basin along the coast. The current method in preventing seawater from contaminating the groundwater basin is by injecting freshwater supplies into the West Coast and Dominguez Gap Seawater Intrusion Barriers.

While the Los Angeles County Department of Public Works (LACDPW) maintains these barriers, WRD is responsible for acquiring the supply necessary to meet the protection and replenishment demands. As the wholesaler in the region, West Basin sells treated imported and recycled water to WRD to inject into the seawater barriers. As Table 3-2 shows, WRD's demands over the last five years average about 19,000 annually from West Basin. Water demands at the barriers usually do not shift dramatically due to the limited groundwater production each customer is allowed annually. The LACDPW determines the quantity of injection based on the need to maintain protective elevations along the barrier system. Generally however, less groundwater production from the aquifers translates into less demand for barrier injection.

Table 3-2: Historical Replenishment Demand (AFY)

Retailer	2001-2005	2006-2010
Water Replenishment District	22,295	19,011

Source: Based upon actual water use sales.

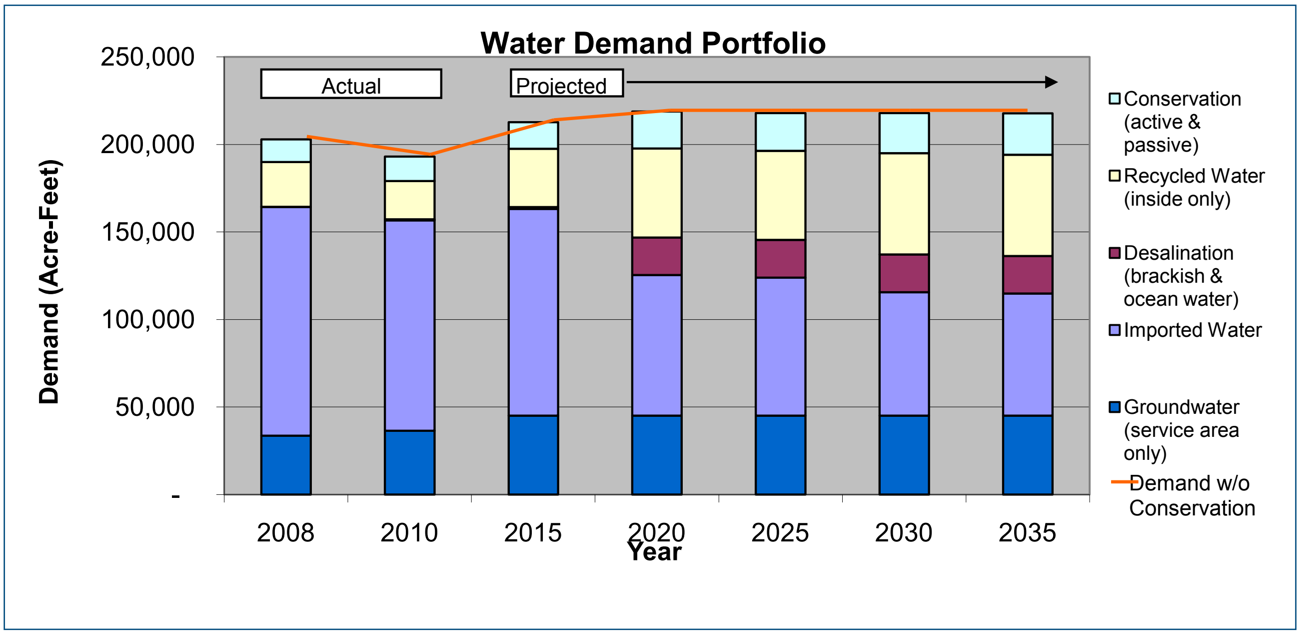
3.2 Current and Projected Water Demands

One of the objectives of this plan is to provide some insight into West Basin's expected water demands for the next 25 years. The predictability of water usage is an important element in planning future water supplies. In 2010, West Basin completed the Water Demand Forecasting Model that was used to project demand through 2035 for West Basin's entire service area. The water demand forecasting model produces various scenarios depending on the level of conservation activities anticipated, change in the cost of water, economic recovery and weather changes. These scenarios can be adjusted to determine different projected demand outcomes based on the change in conditions described above.

For example, the model was also used to show the anticipated decrease in demand that could be achieved as a result of the implementation of planned conservation programs by both West Basin and its retail customer agencies. West Basin then used the Alliance for Water Efficiency tracking tool to calculate the gallons per capita per day baseline usage and conservation targets. This per capita analysis for the regional alliance members follows the guidelines for the Water Conservation Bill of 2009 compliance.

Figure 3-2 provides an overview of the anticipated demands divided into supply sources (including conservation as a means to meet the anticipated demand). This figure also reflects the recent decrease in demand since 2008 and the anticipated future increase in natural demand as the economy improves. However, given planned conservation activities as described at the close of this section, conserved supply will actually offset this demand, maintaining a static level of overall demand of less than 200,000 AFY from 2015 through 2035.

Figure 3-2: Historical and Projected West Basin Demands for Each Supply Resource (AFY)



3.2.1 Current and Projected Retail Demand

Table 3-3 provides the projected total retail demand and potable retail demands net recycled water within West Basin's service area. This table reflects both the baseline demand anticipated if no additional conservation were implemented as well as the final total demand after planned conservation is implemented. A final potable demand is provided that removes the portion of the total demand that is to be met with recycled water supplies as planned and described in Section 4.

Table 3-3 does not include groundwater basin replenishment demands so as not to double count groundwater extraction by West Basin customer agencies. These replenishment demands are captured in Table 3-5. The demand projections shown in Table 3-3 and Table 3-4 include projected water use for lower income single-family and multifamily residential housing within West Basin's service area. As these household demands are served through West Basin's retail customer agencies, the details about those demands are contained within the individual customer agency UWMPs.

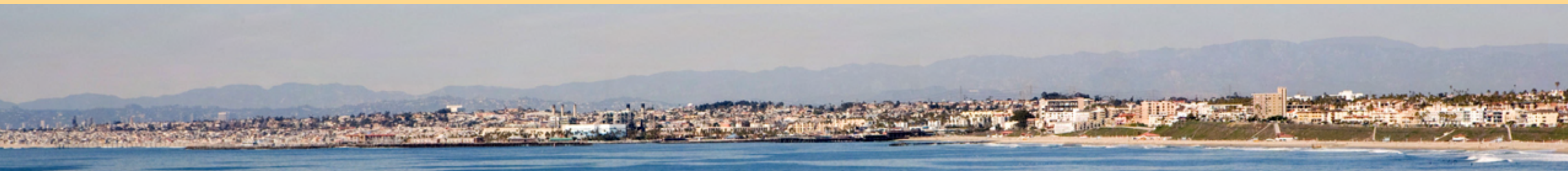


Table 3-3: Projected West Basin Service Area Demand (AFY)

Year	2010	2015	2020	2025	2030	2035
Baseline Demand[1]	170,527	192,134	198,218	197,408	197,451	197,275
Planned Conservation[2]	14,000	15,119	21,039	21,640	22,971	23,632
Final Total Retail Demand	**156,527**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**
Recycled Water Demand[3]	14,182	16,368	33,882	33,882	37,382	37,382
Final Potable Demand	**142,345**	**160,647**	**143,297**	**141,886**	**137,098**	**136,261**

[1] Projections based on Water Demand Forecasting Model, 2010 [2] Water Use Efficiency Master Plan, Alliance for Water Efficiency Model, 2010 [3] Projections based on the Capital Implementation Master Plan, 2009

Table 3-4 lists the water use projections for each of West Basin's retail customer agencies net of conservation. These projected demands were estimated by analyzing historical water use for each customer agency and then pro-rated for each projected total demand for their service areas. They may not coincide with the individual retail agency UWMPs.

Table 3-4: Projected Retail Water Demand by West Basin Customer Agency (AFY)

Retail Agency	2010	2015	2020	2025	2030	2035
California American Water Co.	3,737	4,226	4,230	4,196	4,165	4,145
Cal Water Service Co.- Dominguez	35,372	40,002	40,039	39,720	39,429	39,240
Cal Water Service Co.- Hawthorne	4,539	5,134	5,138	5,097	5,060	5,036
Cal Water Service Co. - Hermosa/Redondo	14,188	16,045	16,059	15,932	15,815	15,739
Cal Water Service Co.- Palos Verdes	20,681	23,388	23,410	23,223	23,053	22,942
City of El Segundo	16,739	18,930	18,948	18,797	18,659	18,569
City of Inglewood	10,853	12,273	12,285	12,187	12,097	12,039
City of Lomita	2,411	2,727	2,729	2,707	2,688	2,675
City of Manhattan Beach	6,083	6,879	6,885	6,831	6,781	6,748
L.A. County Waterworks District #29[2]	8,289	11,293	11,220	11,922	12,608	13,266
Golden State Water Company	32,515	36,770	36,805	36,511	36,244	36,070
Total[1]	**156,527**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**

[1] Total projects based on water demand forecasting model [2] Provided by L.A. County Waterworks District #29

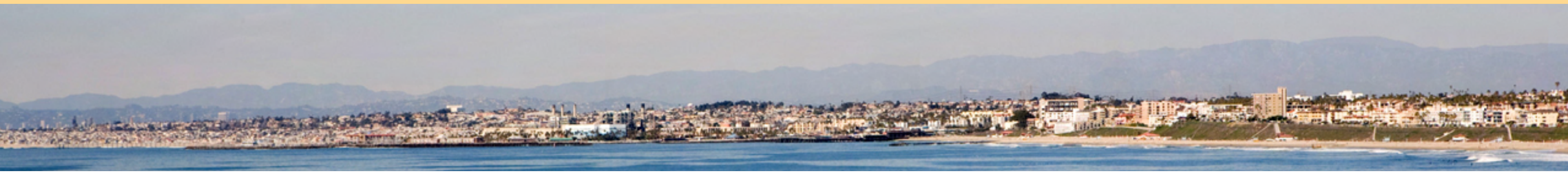
3.2.2 Current and Projected Additional Water Uses and Losses

West Basin's replenishment demands (the same as seawater intrusion barrier demands) are captured in Table 3-5. Water system losses and other factors are not included in West Basin's UWMP but are instead described by the retail customer agencies.

Table 3-5: West Basin Additional Water Uses: Replenishment (AFY)

	2010	2015	2020	2025	2030	2035
Imported Water	15,274	3,500	3,500	3,500	-	-
Recycled Water	7,706	16,980	16,980	16,980	20,480	20,480
Total	**22,980**	**20,480**	**20,480**	**20,480**	**20,480**	**20,480**

Source: Projections based on the Capital Implementation Master Plan, 2009.



3.2.3 Projected Sales to Other Agencies

West Basin also sells recycled water supplies to agencies outside of its service area to meet external non-potable demands. These demands are summarized in Table 3-6.

Table 3-6: West Basin Water Sales to External Agencies (AFY)

	2010	2015	2020	2025	2030	2035
City of Los Angeles	719	6,650	6,650	6,650	6,650	6,650
City of Torrance	6,248	10,700	10,700	10,700	10,700	10,700
Total	**6,967**	**17,350**	**17,350**	**17,350**	**17,350**	**17,350**

Source: West Basin Water Demand Forecasting Model, 2010
Note: Sales are only recycled water

3.3 Regional Alliance Baseline and Target Demands

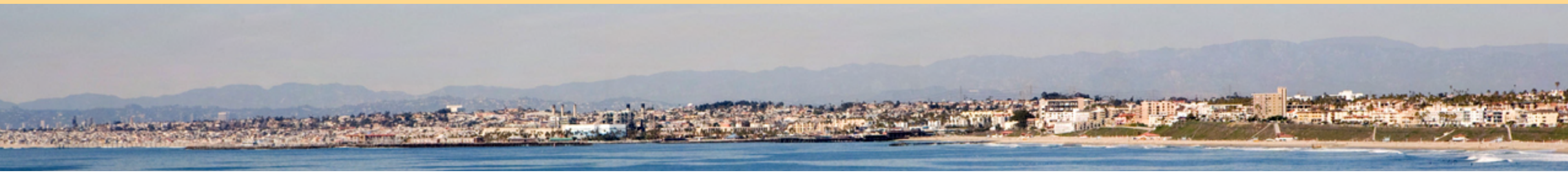
The Water Conservation Bill of 2009 (often referred to as SB X7-7 legislation) requires individual retail water suppliers to set water conservation targets for 2015 and 2020 to support an overall state goal of reducing urban potable per capita water use by 20 percent by 2020. Individual supplier conservation targets must be determined using one of four methods that are based upon a baseline of use that is calculated using the specific guidelines described in DWR's Guidebook to Assist Water Suppliers to Prepare a 2010 Urban Water Management Plan (DWR Guidebook).

As a regional water supply wholesale agency, West Basin is not required to report baseline or target demands in keeping with the Water Conservation Act of 2009. However, as a regional supplier, West Basin has elected to use its 2010 UWMP as the reporting mechanism for a regional alliance formed by some of its retail customer agencies to meet the per capita baseline and target reporting requirements of the Water Conservation Bill of 2009. Since not all of West Basin's retail agencies elected to participate in the regional alliance, the overall historical and projected demand within West Basin's service area described in Section 3.1 and 3.2 will be greater than the regional alliance per capita baseline described in this Section 3.3.

The decision for the investor-owned companies (California American Water Company, California Water Service Company, and Golden State Water Company) to not participate in the regional alliance is because much of their jurisdictions are outside West Basin's service area. Therefore, they each elected to comply as their own agency including their respective service areas across the State.

3.3.1 Regional Alliance Membership

The West Basin regional alliance members include the following West Basin retail customer agencies:



- California Water Service Company (Hawthorne region)
- City of El Segundo
- City of Inglewood
- City of Lomita
- City of Manhattan Beach
- Los Angeles County Waterworks District #29

As a regional alliance, these agencies worked with West Basin to establish a regional baseline of water use and conservation targets for 2015 and 2020. They will also collaborate on implementing the recycled water and conservation programs and projects that will be required to meet these targets.

3.3.2 Regional Alliance Base Use

The regional alliance members used the step by step process called out in the DWR Guidebook to determine the base daily water use for each member. That process and the resulting calculations are described in this section.

Step 1: Determine Supplier Base Period Year Ranges

Table 3-7 provides the recycled water deliveries in 2008 for each member of the regional alliance. The resulting analysis shows that the cities of El Segundo, Inglewood and Manhattan Beach meet over 10 percent of their demand through recycled water deliveries. Therefore these cities are allowed to use a range of 10 to 15 years from which to calculate their baseline water use. Since California Water Service Company (Hawthorne), City of Lomita and Los Angeles County Waterworks District #29 have less than 10 percent of their supply met with recycled water deliveries; they can only use a 10 year range to calculate their baseline use.

Table 3-7: Regional Alliance Recycled Water Deliveries (2008)

Regional Alliance Members	Total Water Deliveries	Total Recycled Water Deliveries	% Recycled Water Deliveries
California Water Service Company - Hawthorne	4,682	94	2%
City of El Segundo	12,765	8,986	70%
City of Inglewood	11,716	2,621	22%
City of Lomita	2,501	7	0%
City of Manhattan Beach	6,697	848	13%
Los Angeles County Waterworks District #29	10,310	0	0%
Regional Alliance Total	**57,394**	**12,556**	**22%**

Table 3-8 shows the resulting 10- to 15-year base period and Table 3-9 shows the five-year base period that will be used for each regional alliance member. The base periods were selected by determining the most appropriate set of years to represent each regional alliance member's baseline use given the methodologies available through DWR.

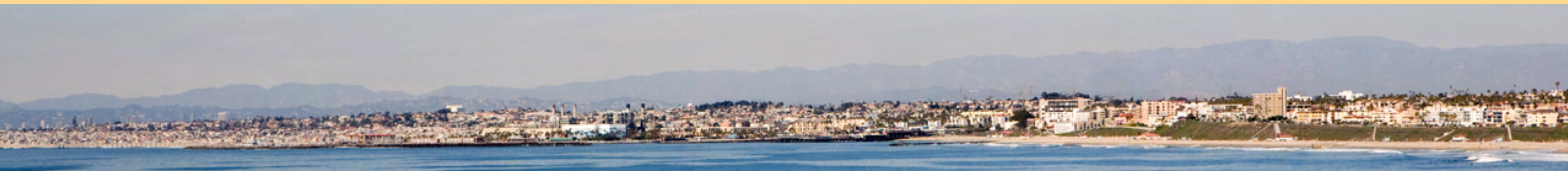


Table 3-8: Regional Alliance 10- to 15-Year Base Periods

Regional Alliance Members	Number of Years in Base Period	Beginning Year	Ending Year
California Water Service Company - Hawthorne	10	1995	2004
City of El Segundo	10	1995	2004
City of Inglewood	10	1995	2004
City of Lomita	10	1998	2007
City of Manhattan Beach	10	1995	2004
Los Angeles County Waterworks District #29	10	1999	2008

Table 3-9: Regional Alliance 5-Year Base Period

Regional Alliance Members	Number of Years in Base Period	Beginning Year	Ending Year
California Water Service Company - Hawthorne	5	2003	2007
City of El Segundo	5	2005	2009
City of Inglewood	5	2003	2007
City of Lomita	5	2003	2007
City of Manhattan Beach	5	2003	2007
Los Angeles County Waterworks District #29	5	2005	2009

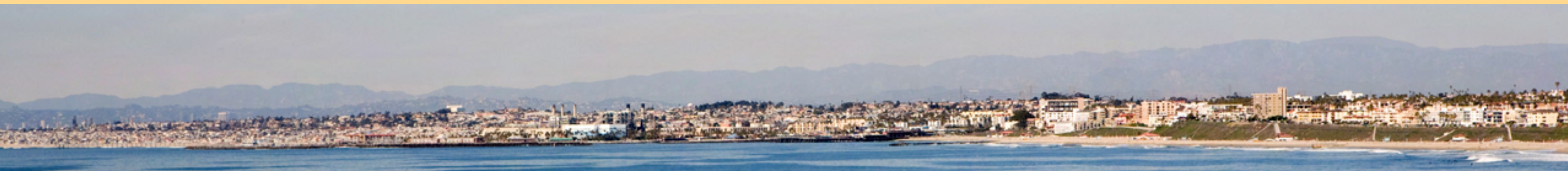
Step 2: Estimate Distribution System Area and Population

The composition of the regional alliance member distribution system boundaries does not match the West Basin service area. Therefore, the distribution service area descriptions and maps for each member of the regional alliance are provided as part of their individual agency 2010 UWMPs and not within West Basin's 2010 UWMP.

The service area population for each agency was determined independently as part of the demand forecasting model development. The service area populations used came from the Southern California Association of Government and Department of Finance projections based upon 2000 census data and predicted economic growth. The population for each regional alliance member for each of the base years is provided in Table 3-10 through Table 3-17.

Step 3: Calculate Gross Water Use

Gross water use for each year within the base year range was provided by each agency. The gross water use for each alliance member was calculated using DWR's Methodology 1 and is described in more detail within each of the alliance member 2010 UWMPs.



Step 4: Calculate Base Per Capita Demand

An annual per capita use was determined by dividing the actual potable water produced for each regional alliance member by the corresponding service area populations that were determined in Step 3 for each of the base year ranges. A final base gross water use is calculated by taking the average per capita use for all years within the selected 10-year range. These calculations are shown in Table 3-10 through Table 3-17.

The five-year base range was used to calculate average gross water use more recently to determine if any regional alliance members are already below the DWR 100 gpcd threshold. Those members with use lower than 100 gpcd, would not be required to meet any further demand reductions.

Table 3-10: California Water Service Company (Hawthorne) Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd*)	Per Capita Use (gpcd**)
1	1995	42,503	4.2	99.9
2	1996	42,784	4.1	95.4
3	1997	43,065	4.4	101.6
4	1998	42,980	4.3	99.4
5	1999	42,957	4.1	96.0
6	2000	43,088	4.3	98.9
7	2001	46,217	4.2	91.2
8	2002	46,175	4.2	91.4
9	2003	45,147	4.3	95.4
10	2004	46,175	4.4	95.7
10 Year Base Daily Per Capita Use				**96.5**
1	2003	45,147	4.3	96.0
2	2004	46,175	4.6	98.9
3	2005	46,190	4.2	91.2
4	2006	46,174	4.2	91.4
5	2007	46,199	4.4	95.4
5 Year Base Daily Per Capita Use				**94.6**

* mgd = millions of gallons per day
** gpcd = gallons per capita per day

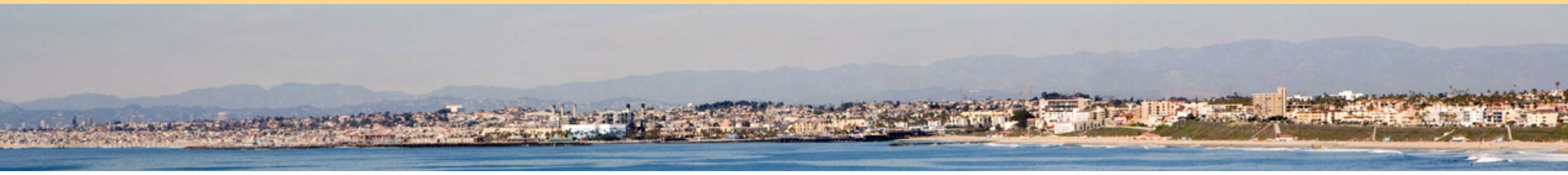


Table 3-11: City of El Segundo -Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd)	Per Capita Use (gpcd)
1	1995	15,525	3.8	241.9
2	1996	15,497	3.7	238.0
3	1997	15,543	3.8	241.5
4	1998	15,636	3.7	236.0
5	1999	15,766	3.7	233.9
6	2000	16,033	3.7	228.3
7	2001	16,292	3.4	209.2
8	2002	16,475	3.2	195.6
9	2003	16,663	3.2	191.5
10	2004	16,810	3.2	190.5
10 Year Base Daily Per Capita Use				**220.6**
1	2005	16,904	3.0	178.5
2	2006	16,901	3.1	186.2
3	2007	16,912	3.2	188.4
4	2008	16,877	3.4	199.9
5	2009	16,937	3.5	206.3
5 Year Base Daily Per Capita Use				**191.8**

Table 3-12: City of Inglewood - Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd)	Per Capita Use (gpcd)
1	1995	89,156	11.1	124.8
2	1996	89,432	10.2	114.0
3	1997	89,709	10.1	112.2
4	1998	89,987	8.3	92.0
5	1999	90,266	8.6	95.7
6	2000	90,545	9.4	103.6
7	2001	90,545	8.8	97.1
8	2002	90,545	9.1	100.2
9	2003	90,545	9.6	106.4
10	2004	90,545	9.7	106.7
10 Year Base Daily Per Capita Use				**105.3**
1	2003	90,545	9.6	106.4
2	2004	90,545	9.7	106.7
3	2005	94,212	9.4	100.2
4	2006	94,704	9.0	94.7
5	2007	95,199	8.2	86.2
5 Year Base Daily Per Capita Use				**98.8**

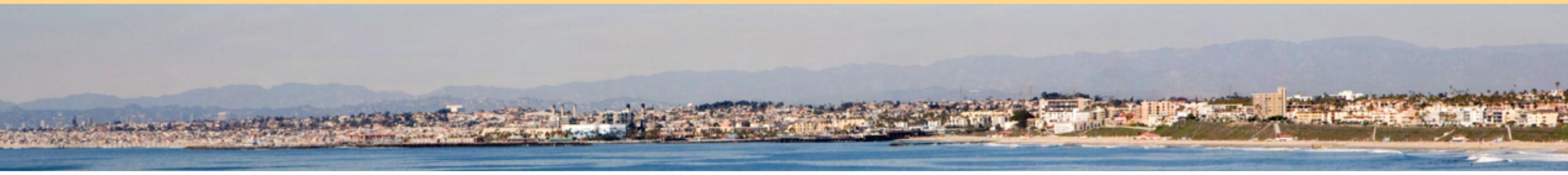


Table 3-13: City of Lomita - Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd)	Per Capita Use (gpcd)
1	1998	19,416	2.3	119.0
2	1999	19,477	2.4	125.7
3	2000	19,538	2.5	126.5
4	2001	19,538	2.4	122.5
5	2002	19,538	2.5	129.2
6	2003	19,538	2.5	128.1
7	2004	19,538	2.5	127.5
8	2005	19,830	2.4	119.0
9	2006	19,867	2.3	116.6
10	2007	19,905	2.4	120.3
10 Year Base Daily Per Capita Use				**123.4**
1	2003	19,538	2.5	128.1
2	2004	19,538	2.5	127.5
3	2005	19,830	2.4	119.0
4	2006	19,867	2.3	116.6
5	2007	19,905	2.4	120.3
5 Year Base Daily Per Capita Use				122.3

Table 3-14: City of Manhattan Beach - Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd)	Per Capita Use (gpcd)
1	1995	32,516	5.7	175.6
2	1996	32,399	7.6	233.1
3	1997	32,656	5.9	179.6
4	1998	32,806	5.5	166.9
5	1999	32,981	5.9	179.1
6	2000	33,852	5.8	172.3
7	2001	34,557	5.6	163.2
8	2002	35,427	5.8	163.1
9	2003	36,198	5.8	160.0
10	2004	36,464	6.0	164.2
10 Year Base Daily Per Capita Use				**175.7**
1	2003	36,198	5.8	160.0
2	2004	36,464	6.0	164.2
3	2005	36,581	5.5	151.5
4	2006	36,364	5.3	144.6
5	2007	36,240	5.2	142.1
5 Year Base Daily Per Capita Use				**152.5**

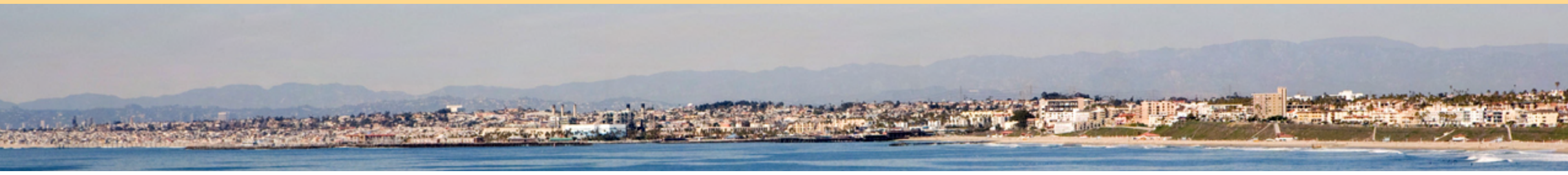
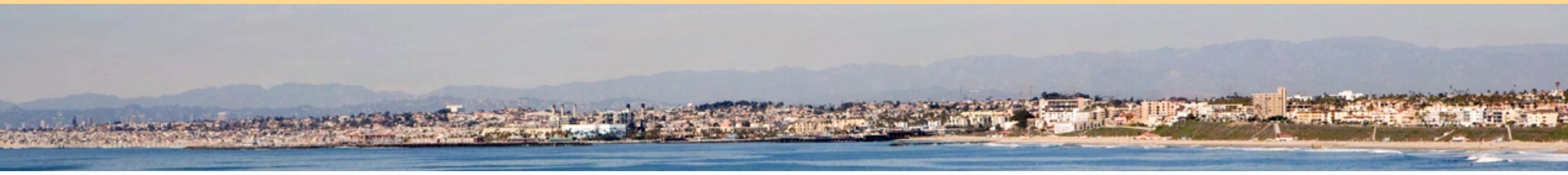


Table 3-15: Los Angeles County Waterworks District #29 - Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd)	Per Capita Use (gpcd)
1	1999	27,200	8.3	306.6
2	2000	27,473	8.4	307.1
3	2001	27,473	8.2	298.3
4	2002	27,473	9.0	327.4
5	2003	27,473	9.0	328.3
6	2004	27,473	9.4	341.4
7	2005	27,650	8.6	310.5
8	2006	28,056	8.8	315.1
9	2007	28,467	9.7	340.8
10	2008	28,885	9.2	318.6
10 Year Base Daily Per Capita Use				**319.4**
1	2005	27,650	8.6	310.5
2	2006	28,056	8.8	315.1
3	2007	28,467	9.7	340.8
4	2008	28,885	9.2	318.6
5	2009	29,308	8.3	284.7
5 Year Base Daily Per Capita Use				**313.9**

Table 3-16: Combined West Basin Regional Alliance - Base Daily Per Capita Water Use

Year	Calendar Year	Population	Gross Water Use (mgd)	Per Capita Use (gpcd)
1	1995	225,069	56.2	249.6
2	1996	225,804	59.7	264.5
3	1997	226,990	57.1	251.5
4	1998	227,755	53.8	236.4
5	1999	228,647	54.8	239.6
6	2000	230,529	54.0	234.2
7	2001	234,622	51.1	217.7
8	2002	235,633	49.9	211.8
9	2003	235,564	43.2	183.5
10	2004	237,005	44.6	188.2
10 Year Base Daily Per Capita Use				**227.7**
1	2003	235,564	43.2	183.5
2	2004	237,005	44.6	188.2
3	2005	241,367	43.0	178.3
4	2006	242,067	41.7	172.2
5	2007	242,923	42.5	175.1
5 Year Base Daily Per Capita Use				**179.5**



3.3.3 Regional Alliance Water Use Targets

The regional alliance water use targets were calculated by first determining which of the four allowable target calculation methods would be used for each member of the regional alliance. These methods are:

- Method 1: 80 percent of ten-year baseline per capita use
- Method 2: Applying performance standards
- Method 3: 95 percent of the DWR South Coast Region target of 149
- Method 4: Applying savings by water sector

These selected methods were applied to the 10-year base per capita water use calculated in Tables 3-10 through 3-16 to determine a target per capita water use level for 2020. Once these targets were determined, they were confirmed by comparing them against DWR's maximum allowable target. The maximum allowable target is equivalent to 95 percent of each alliance member's five-year base per capita use calculated in Tables 3-10 through Table 3-16.

If the five-year base per capita use was less than 100 gpcd, then there is no maximum target for that supplier since they would be considered by DWR to be sufficiently efficient in water use. If the 2020 calculated target is greater than the maximum allowable target, then the maximum allowable target must be used instead of the calculated 10-year base targets.

Table 3-17 provides the final per capita targets for each member of the Regional Alliance as well as the overall targets for the combined Regional Alliance. Cells highlighted in gold indicate whether the calculated or maximum allowable target was used to determine the final 2020 target. Once the final 2020 water use target has been calculated, then an interim target is created by calculating the median between the 10-year base per capita use and the final 2020 target.

Table 3-17: Regional Alliance 2015 Interim and 2020 Targets (gpcd)

Member	10-Year Base Water Use	Calculated Water Use Targets		Maximum Allowable Target	Final Targets	
		Method	Target		2015	2020
California Water Service Company Hawthorne	96.5	3	141.6	N/A	119.0	141.6
City of El Segundo	220.6	1	176.5	182.2	198.6	176.5
City of Inglewood	105.3	3	141.6	N/A	123.4	141.6
City of Lomita	123.4	3	141.6	116.2	119.8	116.2
City of Manhattan Beach	175.7	3	141.6	144.9	158.6	141.6
Los Angeles County Waterworks District #29	319.4	1	255.5	298.2	287.5	255.5
Regional Alliance	**227.7**	**1**	**182.2**	**160.5**	**194.1**	**160.5**

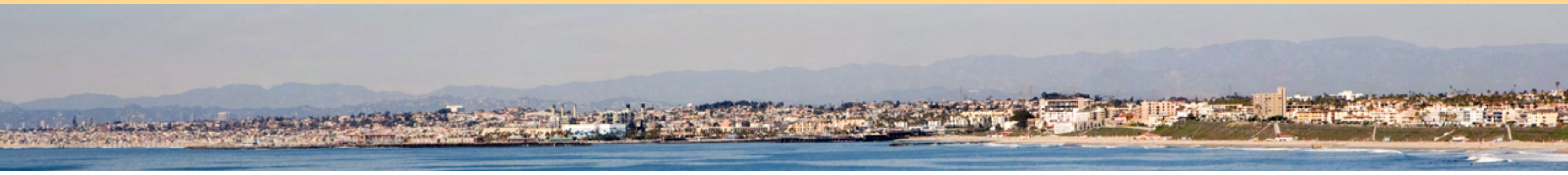
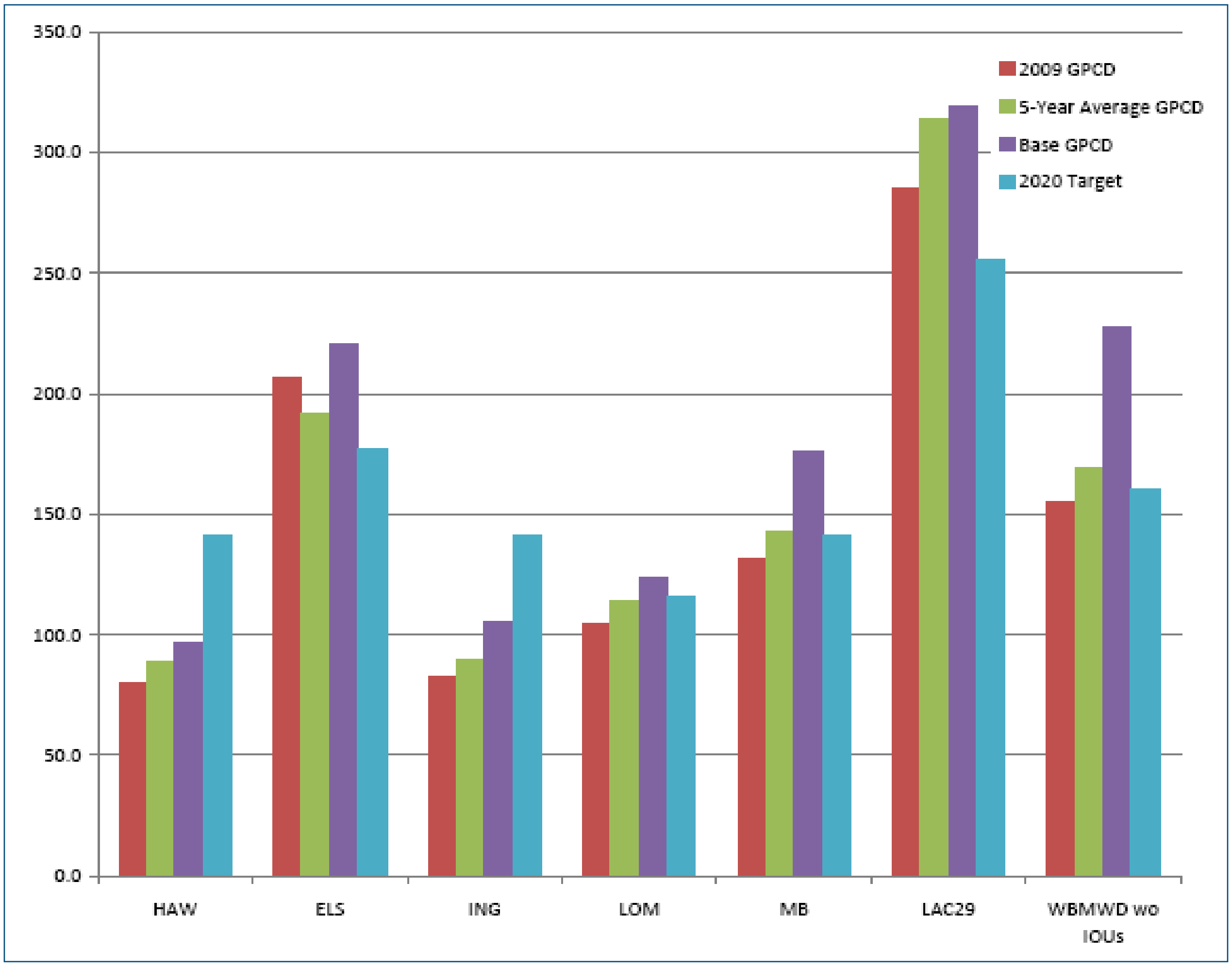


Figure 3-3 represents a comparison of the 2009, 5-year base, 10-year base and 2020 target water use for each regional alliance member.

Figure 3-3: Regional Alliance Base and Target Use Summary



3.4 Water Use Reduction Plan

In order to meet the 2020 and interim 2015 water use targets calculated in Table 3-17, West Basin has collaborated with its regional alliance agencies to develop individual Water Use Efficiency Master Plans. These plans are anticipated to be completed in May 2011. Table 3-18 identifies several key programs already identified for implementation that will help the regional alliance achieve or even go beyond the required water use targets.

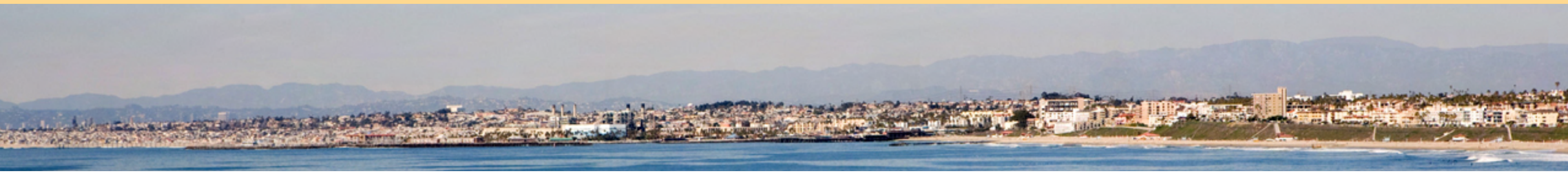
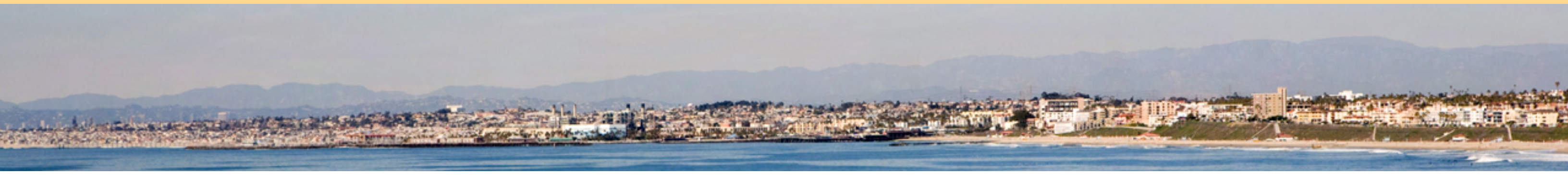


Table 3-18: West Basin and Retailer Conservation Program Participation

Programs	West Basin	Los Angeles County Waterworks District #29	City of El Segundo	City of Manhattan Beach	City of Hawthorne	City of Lomita	City of Inglewood
MWD							
Residential Rebate Program	X	X	X	X	X	X	X
Save A Buck Rebate Program	X	X	X	X	X	X	X
West Basin							
High-Efficiency Toilet (HET) Distribution Events	X	X	X	X	X	X	X
Green Living for Apartments and Condos (Direct HET Installations)	X	X	X	X	X	X	X
Ocean Friendly Landscape Program	X	X	X	X	X	X	X
Complete Restroom Retrofit Program	X	X	X	X	X	X	X
Recirc & Save Program	X	X	X	X	X	X	X
Cash for Kitchens	X	X	X	X	X	X	X
Education Programs	X	X	X	X	X	X	X
West Basin Programs (Funding Pending)							
High-Efficiency Nozzle Program	X	X	X	X	X	X	X
Water Star Schools Pilot Program	X	X	X	X	X	X	X
Water & Energy Efficiency in the Motel/Hotel and Schools Sectors	X	X	X	X	X	X	X
Other Water Retailer							
Turf Removal Program	N/A	X	-	-	-	-	-
HET Rebates (CII)	N/A	X	-	-	-	-	-
Landscape Surveys	N/A	X	-	-	-	-	-
Education Programs	N/A	X	-	-	-	-	-
Landscape Incentives	N/A	X	-	-	-	-	-



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SECTION FOUR

Water Supply

2010

SECTION 4 Water Supply

It is West Basin's mission to ensure a safe, adequate and reliable supply of water for the communities it serves. An increasing population and recent restrictions on imported supplies, have challenged West Basin to continue to diversify its supply portfolio to meet new demands through expanded recycled water production and distribution, new ocean-water desalination supply development, and increased conservation programming through its WR 2020 Program.

This section provides an overview of the current and future water supplies needed to meet the expected demands within the West Basin service area. Although West Basin does not provide all of the supplies needed to meet these demands, this 2010 UWMP provides a complete picture of all of the historical and projected supplies to be used by its customer agencies to meet the overall demand within West Basin's service area.

While this section provides a discussion of the more traditional imported and groundwater supplies, alternative supplies such as recycled water and desalination are discussed within Sections 9 and 10 respectively. Water quality for all supplies is discussed in Section 6.

4.1 West Basin Service Area Water Supply Portfolio

Since its formation in 1947, West Basin has fulfilled its responsibility of providing its customer agencies with supplemental imported and recycled water supplies to meet increasing regional demands. Prior to West Basin, the average customer agency operating within the area relied completely on groundwater.

Today, these agencies rely on an increasingly diverse mix of water resources: 22% groundwater, 62% imported, 8% non-potable recycled water, and 8% conserved supply through water use efficiency measures. It is projected that by 2030, the resource mix on average will be 23% groundwater, 36% imported, 19% non-potable recycled water, 10% ocean water desalination and 12% conservation as shown in Figure 4-1.

Table 4-1 provides West Basin's historical annual water supply in its service area from 2005 to 2009.

Table 4-1: West Basin Service Area Historical Retail Water Supply (AFY)

Supplies	2005	2006	2007	2008	2009
Groundwater[1]	34,304	31,469	31,773	33,849	38,307
Imported Water[2]	130,782	129,060	132,209	122,520	108,145
Recycled Water[3]	16,971	17,859	28,956	25,651	21,897
Desalination[4]	0	89	461	158	620
Total	**182,057**	**178,477**	**193,399**	**182,178**	**168,969**

[1] Groundwater production within West Basin service area only (includes West Coast Groundwater Basin and pumping from the Central Groundwater Basin into the West basin service area). [2] Imported retail use only; does not include replenishment deliveries (i.e. Barrier). [3] Recycled water does not include replenishment deliveries (i.e. Barrier) [4] Desalination includes brackish only.

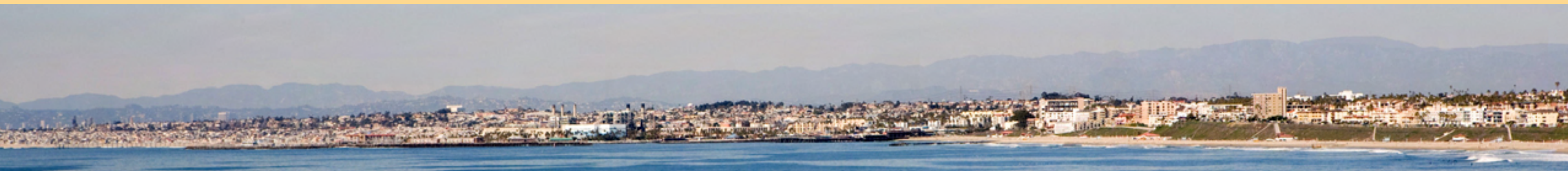
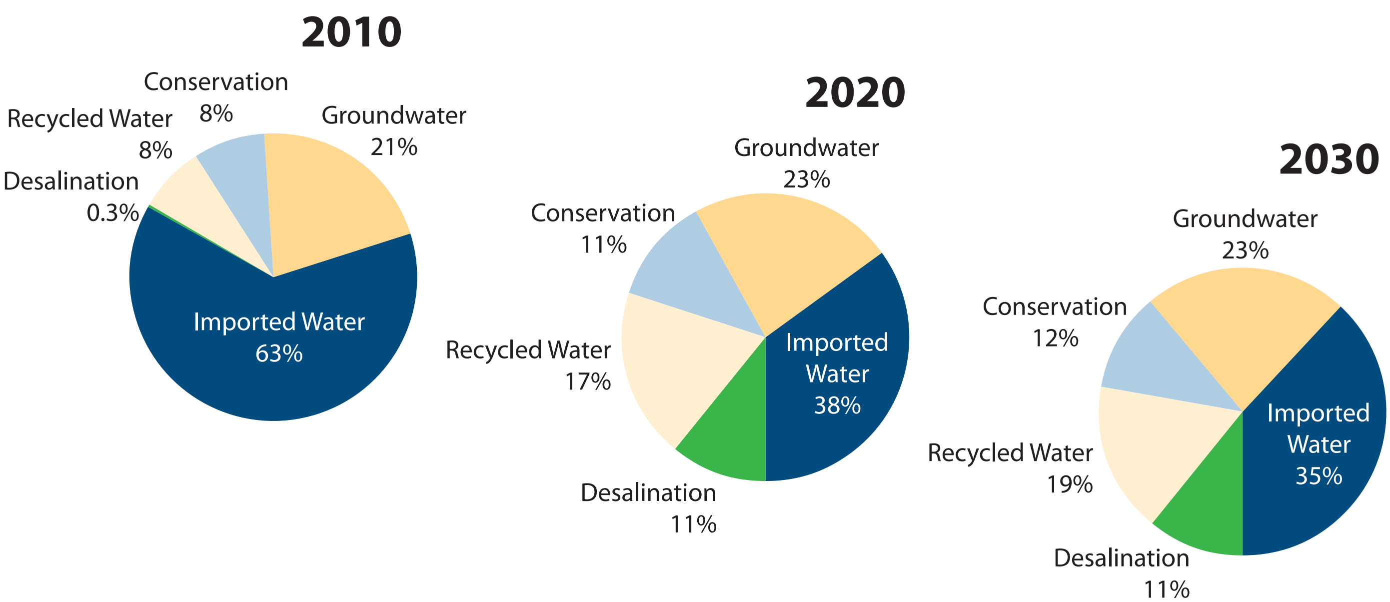


Figure 4-1: West Basin Service Area Projected Water Supplies



West Basin has been able to support the diversification of supplies available to its customer agencies by providing access to imported water supplies from MWD as well as through the development of recycled and conserved water supplies. These supplies are served directly to its customer agencies and indirectly as the replenishment supplies necessary to maximize groundwater production. Historically, West Basin's primary supply source was imported water from MWD. However, given recent concerns over future reliability of these imported supplies, West Basin has been increasing its development of local supplies.

As Table 4-2 shows, West Basin is projecting to more than double current recycled water supplies as well as invest in over 20,000 AFY of ocean-water desalination supply. Coupled with an additional doubling of conserved supply through water use efficiency programs, the overall imported water use is expected to be cut nearly in half from the start of West Basin's WR 2020 Program in 2008, by 2020.

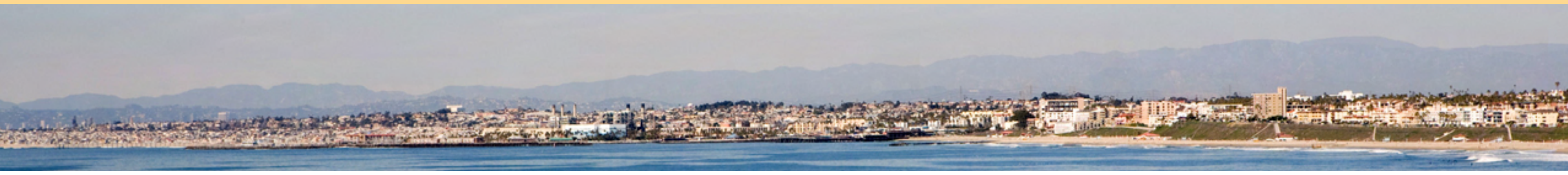


Table 4-2 West Basin's Service Area Projected Water Supply (AFY)

Supplies	2010	2015	2020	2025	2030	2035
Groundwater[1]	36,360	45,000	45,000	45,000	45,000	45,000
Imported Water[2]	104,985	114,647	76,797	75,386	70,598	69,761
Recycled Water[3]	14,182	16,368	33,882	33,882	37,382	37,382
Desalination[4]	500	1,000	21,500	21,500	21,500	21,500
Total	**156,027**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**
Conservation[5]	14,000	15,119	21,039	21,640	22,971	23,632
Total	**170,027**	**192,134**	**198,218**	**197,408**	**197,451**	**197,275**

[1] Groundwater production within West Basin service area only.
[2] Imported retail use only; does not include replenishment deliveries (i.e. Barrier).
[3] Recycled water does not include replenishment deliveries (i.e. Barrier).and deliveries outside the service area.
[4] Desalination includes both brackish and ocean-water.
[5] Conservation consists of Active and Passive savings according to West Basin's projected estimates.

4.2 Imported Water Supply

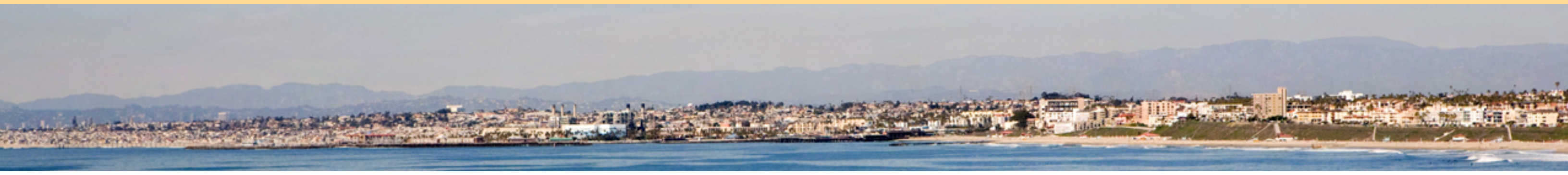
West Basin has historically relied on approximately 150,000 AFY of imported water from MWD to meet customer demand. MWD supplies originate from the Colorado River and State Water Project (SWP) to meet West Basin's retail and replenishment demands. In recent years, MWD's imported supplies have become increasingly restricted given protracted droughts and recent environmental rulings and restrictions that limited the amount of SWP water available for use.

These restrictions have resulted in partial allotments for West Basin and the unavailability of lower cost surplus water for in-lieu basin replenishment use. As a result, West Basin has been challenged to maximize the efficient use of this supply as well as explore ways to develop alternative supplies. This challenge has resulted in West Basin's goal of reducing its projected need for imported water supplies in half by 2020 through the development of local and conserved supplies.

4.2.1 Colorado River Resources

MWD owns and operates the Colorado River Aqueduct (CRA), which connects the Colorado River to MWD's regional distribution system. The CRA has a capacity of 1.25 Million AFY (MAF) to transport MWD's current contracted entitlement of 550 Thousand AFY (TAF) of Colorado River water. MWD also holds a priority for an additional 662 TAF and 180 TAF when surplus flows are available.

MWD and the State of California have acknowledged that they could obtain less water from the Colorado River in the future. The U.S. Secretary of Interior asserted that California had to limit its use of Colorado River supplies to 4.4 MAF per year, plus any available surplus water. California's Colorado River Water Use Plan characterizes how California would develop a combination of programs to meet this limit as well as how to use any available surplus water. In 2003, the Quantification Settlement Agreement



Lake Mead

(QSA) among California agencies with Colorado River rights established the baseline water use for each of the agencies and facilitates the transfer of water from agricultural agencies to urban uses. The QSA is currently ruled as invalid due to multiple legal proceedings that have taken place over the past eight years. MWD has filed appeals that will stay the ruling until the outcome of the appeal. If the ruling stands, it could delay and potentially increase the cost of the QSA's supply development programs.

An extended drought from 2000-2007 within the Colorado River Basin has also decreased supply reserves to 50 percent capacity. Even in light of these challenges, according to MWD's 2010 Draft Regional Urban Water Management Plan, MWD intends to maximize the use of the California Aqueduct by obtaining a full 1.25 MAFY through the use of exchanging water rights purchases from agricultural and other holders.

Colorado River Aqueduct

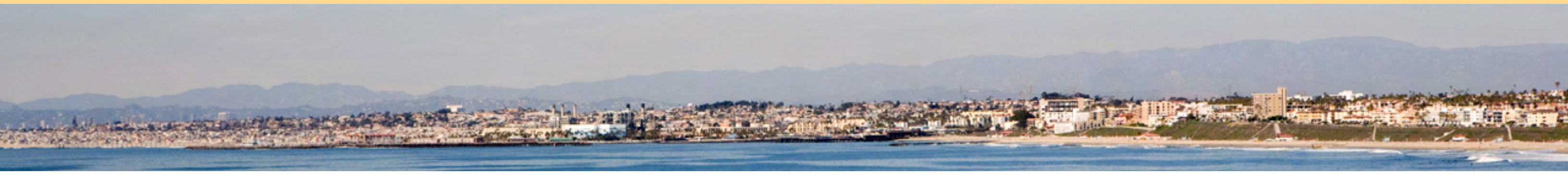
4.2.2 State Water Project Resources

California's SWP is MWD's second main source of imported water and is the nation's largest state-built water and power development and conveyance system. It includes facilities, such as pumping and power plants; reservoirs, lakes, and storage tanks; and canals, tunnels, and pipelines, that capture, store, and convey water from Northern California to 29 water agencies in Central and Southern California.

Operated and maintained by DWR, the SWP provides water supplies for 25 million Californians and for 750,000 acres of irrigated farmland. The original State Water Contract called for an ultimate delivery capacity of 4.2 MAF, with MWD holding a contract for 1.9 MAF. Since that time there have been significant challenges to meeting those delivery goals.

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

Most recently, the State experienced a critically dry period from 2008 to 2009 (including the driest ever spring in 2008) that produced some of the lowest reservoir levels recorded for SWP facilities. During this drought period, a biological opinion regarding the dwindling populations of Bay-Delta Smelt (2008) and salmonid species (2009) resulted in legal rulings that have been estimated to reduce average SWP deliveries from approximately 3.3 MAF to 2.3 MAF. DWR released a Water Allocation Analysis in 2010 that has resulted in an MWD estimated reduction in SWP supplies of 150 – 200 TAF for 2010 MWD UWMP 2010.



Although challenges to the SWP exist, MWD has developed plans to meet imported water needs for West Basin and other member agencies though the implementation of several exchange and storage programs as well as working towards a project that will fix the Bay-Delta issues and resume normal deliveries. These supply development programs will be implemented in concert with MWD's ongoing collaboration with member agencies to more efficiently use the supplies to meet increasing demands and potential climate change impacts.

State Water Project System

4.2.3 Types of MWD Supply

MWD offers different types of imported water to its member agencies depending on the ultimate use. Among them, West Basin has delivered Non-Interruptible Water (treated full-service) and Seasonal Treated Replenishment Water (in-lieu replenishment).

Non-Interruptible Water is the treated firm supply that is available all year and not subject to interruption. Historically, West Basin has delivered an average of about 150,000 AFY of non-interruptible water. It is used as the main supplemental supply to cities and water agencies, and the Dominguez Gap Seawater Barrier and 25% of the supply for the West Coast Basin Seawater Barrier.

Seasonal Treated Replenishment Water, when available, is delivered to customer agencies that are eligible to offset groundwater production with imported water. This program incentivizes customer agencies to take imported surplus water when available, which indirectly replenishes the groundwater basin. This surplus water is purchased at a discount rate in exchange for leaving groundwater in the basin for no less than a year so that it can be used subsequently during dry years.

4.3 Groundwater Supply

West Basin does not supply groundwater to retail agencies. However, retail agencies operating within West Basin's service area rely on groundwater production to meet just over 20 percent of retail demand and this is expected to continue through 2035. There are, however, a few jurisdictions within the West Basin's service area that rely exclusively on imported water to meet all their current water needs.

West Basin overlies nearly all of the adjudicated WCGB. In the early 1940s, extensive over pumping of the WCGB had led to critically low groundwater levels, which resulted in seawater intrusion along the coast. This situation precipitated an adjudication that limits the allowable extraction that could occur in any given year and assigned water rights to basin pumpers. The adjudicated water rights (as shown in Table 4-3) that were developed are, however, in excess of the safe operating basin yield.

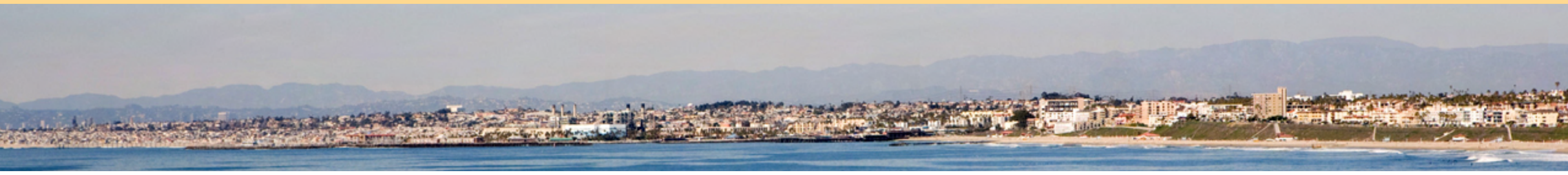


Table 4-3: West Coast Groundwater Basin Pumping Rights (AFY)

Retail Agencies	2009-2010 Pumping Rights
Cal Water Service Co. (Dominguez)	10,417
Cal Water Service Co. (Hawthorne)	1,882
Cal Water Service Co.(Hermosa/Redondo)	4,070
City of Inglewood	4,450
City of El Segundo	953
City of Lomita	1,352
City of Manhattan Beach	1,131
Golden State Water Company	7,502
Non-Retail Water Pumpers[1]	32,711
Total	**64,468**

Source: West Basin Watermaster Report, DWR: 2009-2010
[1] Water right holders that are not water retail agencies: i.e. Nurseries, Cemeteries, Industries, and Refineries

To allow full WCGB rights to be pumped while limiting seawater intrusion, WRD purchases non-interruptible imported and recycled water supplies from West Basin for injection by the Los Angeles County Department of Public Works at the West Coast and Dominguez Gap Seawater Intrusion Barriers. WRD is the entity responsible for maintaining and replenishing the WCGB. WRD is a special district created by the State and governed by a 5-member elected body to replenish and protect the groundwater basin with imported water and recycled water.

Two of West Basin's customer retailers also import groundwater from outside the West Basin service area from the adjacent Central Groundwater Basin to meet their demand (California American Water Co. and California Water Service Co. – Dominguez). Although rights have been bought, sold, exchanged, or transferred through the years, the total amount of groundwater projected to be extracted over the next 25 years will be fairly consistent due to the adjudication of both the West Coast and Central basins. The financial costs to pump groundwater have been and are projected to remain less than the cost to purchase imported water so it can safely be assumed that water retailers will continue to maximize their groundwater rights.

Table 4-4 shows the historical amounts of Central Basin Groundwater Basin groundwater supplies that were purchased by West Basin's retail customer agencies.

Table 4-4: Historical Central Basin Groundwater Retail Imported Supply (AF)

Retail Agency	2005	2006	2007	2008	2009
California American Water Co.	3,042	2,708	1,977	1,787	3,537
Cal Water Service (Dominguez)	1,242	2,374	2,815	2,344	1,647
Total	**4,284**	**5,082**	**4,792**	**4,131**	**5,184**

Source: DWR Watermaster Reports, 2004-2009

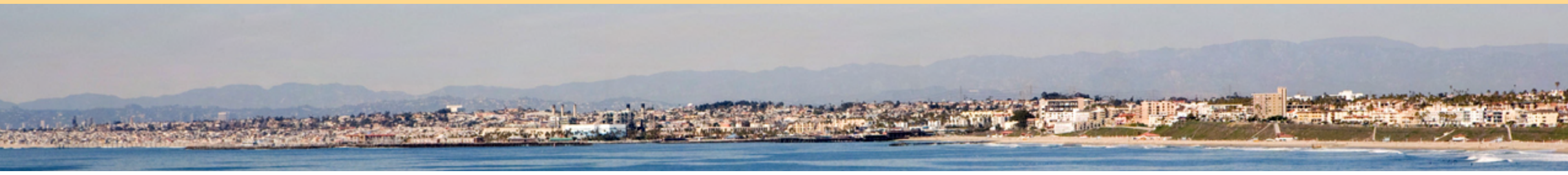


Table 4-5 shows the historical groundwater supplies for West Basin's retail customer agencies (not including the non-retail or private rights holders) from both basins.

Table 4-5: Historical Groundwater Retail Supply (AF)

Basin name(s)	2005	2006	2007	2008	2009
West Coast Basin	30,020	26,387	26,981	29,717	33,123
Central Basin	4,284	5,082	4,792	4,132	5,184
Total	**34,304**	**31,469**	**31,773**	**33,849**	**38,307**

Source: DWR Watermaster Reports, 2004-2009

Table 4-6 shows the historical groundwater replenishment supplies for the West Coast and Dominguez Gap Barriers.

Table 4-6: Historical Groundwater Replenishment Supply

	2005	2006	2007	2008	2009
West Coast Barrier Supplies	8,555	6,035	4,228	3,978	4,231
Dominguez Gap Barrier Supplies	5,327	5,828	4,027	4,049	7,927
Total	**13,882**	**11,863**	**8,255**	**8,027**	**12,158**

Source: DWR Watermaster Reports, 2004-2009

Table 4-7 shows the projected retail groundwater production to meet West Basin service demands through 2035.

Table 4-7: Current and Projected Retail Groundwater Supply (AF)

Basin name(s)	2010	2015	2020	2025	2030	2035
West Coast Basin	28,993	40,000	40,000	40,000	40,000	40,000
Central Basin	5,256	5,000	5,000	5,000	5,000	5,000
Total	**34,249**	**45,000**	**45,000**	**45,000**	**45,000**	**45,000**

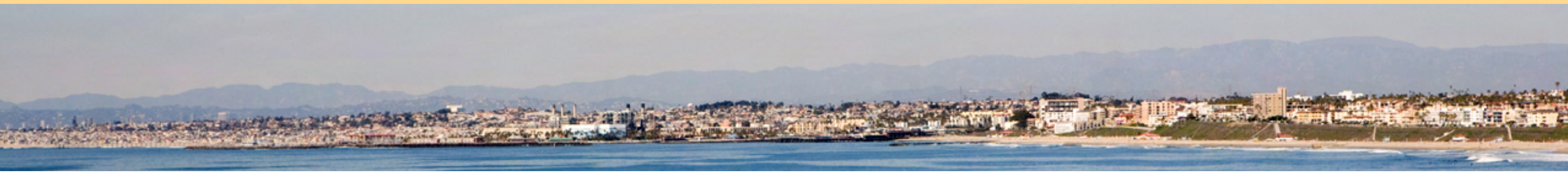
Source: [1] Based upon actual water use sales.

Table 4-8 shows the projected replenishment (or seawater intrusion barrier) supplies to be met by West Basin's retail agencies through 2035.

Table 4-8: Current and Projected Replenishment Groundwater Supply

	2010	2015	2020	2025	2030	2035
Imported Water	15,274	3,500	3,500	3,500	-	-
Recycled Water	7,706	16,980	16,980	16,980	20,480	20,480
Total	**22,980**	**20,480**	**20,480**	**20,480**	**20,480**	**20,480**

[1] Barrier water deliveries to both the West Coast and Dominguez Gap Barriers



4.4 Water Transfers and Exchanges

Water transfers and exchanges are management tools to address increased water needs in areas of limited supply. Although transfers and exchanges of water do not generate new supply, these management tools distribute water where it is abundant to where it is limited.

MWD has played an active role statewide in securing water transfers and exchanges as part of their planning goals. Although West Basin is a member of MWD, there has not been a compelling reason or opportunity to pursue transfers directly.

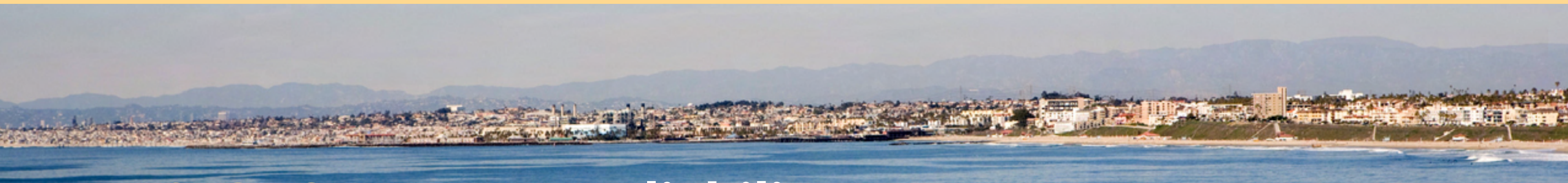
4.5 Alternative Sources of Supply

As shown in Figure 4-1, West Basin is planning on increasing the diversity of its water supply portfolio through the further development of alternatives to the more traditional imported water and groundwater supplies. This 2010 UWMP has dedicated entire sections to discuss the planned projects and programs to develop alternative supplies such as Recycled Water (Section 9) and Desalination (Section 10) as well as the increased water use efficiency programs discussed in Section 7. West Basin is pursuing these alternative supplies as part of its WR2020 initiative.

SECTION FIVE

Water Reliability

2010



SECTION 5 Water Reliability

West Basin's supply reliability can be greatly impacted by many factors including changes in the availability of supplies due to climatic or infrastructure changes as well as the ability to use those supplies more efficiently in both average and dry periods. These factors can result in immediate (facility failures), near-term (SWP limitations), or long-term (climate change) impacts to reliability and must therefore be considered in future planning.

The impacts of these factors on reliability increase under single dry and multiple dry year hydrologic patterns. Historically, dry years result in increases in demands as well as decreases in surface supplies that result in shortages if not managed effectively. Although not all shortages can be prevented, West Basin's WR 2020 goal to expand and further diversify its supply portfolio is the most important step toward improving the immediate, near- and long-term reliability of supplies. If shortages do occur, West Basin has completed comprehensive water shortage contingency planning to provide reliability during these situations.

5.1 Potential Impacts to Reliability

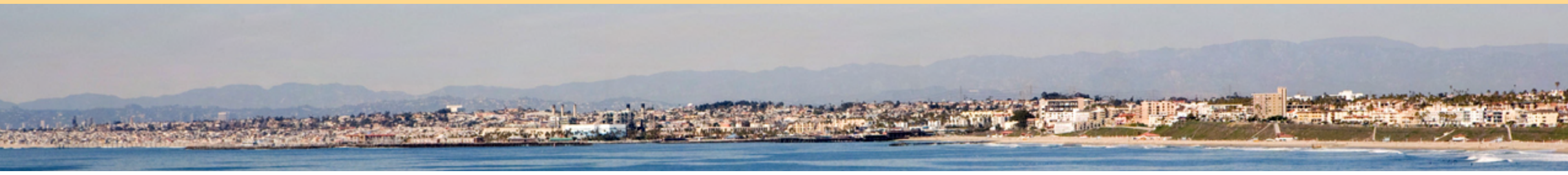
Reliability within the West Basin service area is a composite of the reliability of each source of supply. Table 5-1 summarizes the factors that impact each resource's supply reliability. Of all of the supplies shown in Table 5-1, imported supply has the greatest number of factors that will impact its reliability. It is because of this, that West Basin is moving forward with its plans to expand water use efficiency, further develop recycled water and add ocean-desalination supplies. Further explanation of each impact category on reliability is described in the subsections below.

Table 5-1: Factors Resulting in Impacts to Reliability

Water Sources	Legal	Environmental	Water Quality	Climatic
Imported Water	X	X	X	X
Groundwater	X		X	X
Recycled Water			X	
Ocean Water Desalination			X	

5.1.1 Imported Water Reliability

As discussed in Section 4, MWD has and will continue to contend with considerable challenges to maintaining a reliable source of imported supply for its member agencies. After learning from the droughts of 1977-78 and 1989-92, MWD instituted a resources planning process that has resulted in the following documents:

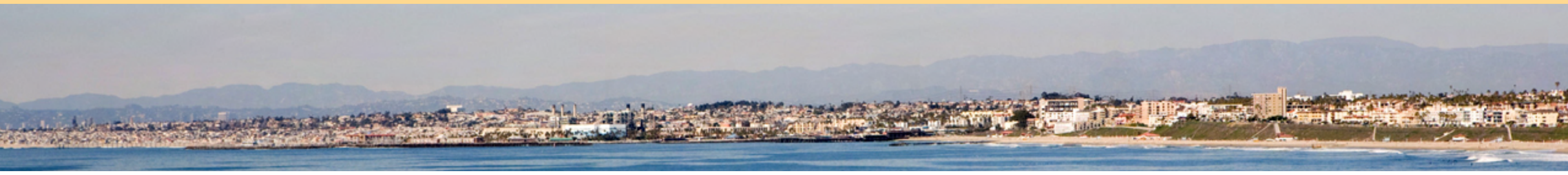


- **1996, 2004 and 2010 Integrated Resources Plans (IRP):** MWD's IRP process assessed potential future regional demand projections based upon anticipated population and economic growth as well as conservation potential. The IRP also includes regional supply strategies and implementation plans to better manage resources, meet anticipated demand, and increase overall system reliability.
- **1999 Water Surplus and Drought Management Plan (WSDM):** The WSDM provides the policy guidance to manage the region's water supplies to achieve the reliability goals of the IRP. This is achieved by integrating the operating activities of surplus and shortage supplies through a series of stages and principles.
- **2008 Water Supply Allocation Plan (WSAP):** The WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering the allocation. The need for the WSAP arose after the 2008 Bay-Delta biological opinions and rulings that limited SWP supplies to its contractors including MWD. The WSAP formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of MWD supplies up to 50%.

Since the 2008 Bay-Delta reductions, MWD has been using the WSAP formulas to contend with the reduction in available imported supplies. Although it is anticipated that the WSAP will continue to be in effect in the near–term, MWD states in its 2010 Draft UWMP that there will be sufficient supply to meet member agency demands in single and multiple dry years from 2015 through 2035. This is assuming that MWD storage levels are at or above average levels prior to those cycles.

MWD also is planning as part of the 2010 IRP to further support member agency local resource development as well as investigate potentially generating its own local resources for distribution to member agencies. The development of local resources as well as furthering existing conservation goals to meet the Water Conservation Act of 2009 targets are anticipated to provide a supply buffer for member agencies to rely upon in times of drought and longer-term climatic changes.

The factors affecting reliability for imported water supplies include legal, environmental, water quality and climactic. The legal factor includes policies and contracts on the SWP with the Department of Water Resources and on the Colorado River system with the Department of the Interior and other Colorado River basin states. Legal actions can impact supplies from these two sources in various ways as experienced recently with a federal district court decision limiting SWP supplies due to perceived impacts on specific fish in the Delta estuary. This example also shows how environmental factors such as endangered species, their habitat, and other related concerns must be taken into account in decisions that can curtail supplies. Likewise, the quality of these imported source waters can impact availability of supplies due to treatment, remediation or otherwise to ensure drinking water standards are fully met. In terms of impacts from climatic factors, imported water supplies rely heavily on runoff from rainfall and



snowpack in the State Water Project and Colorado River watersheds. If the amount of snowpack and rainfall changes significantly in these two water supply systems, the quantity of water in any given year is subject to fluctuations. With the uncertainty of the impacts from long-term climate changes, imported water supplies may become more or less reliable in the future, depending on the availability of storage.

5.1.2 Groundwater Reliability

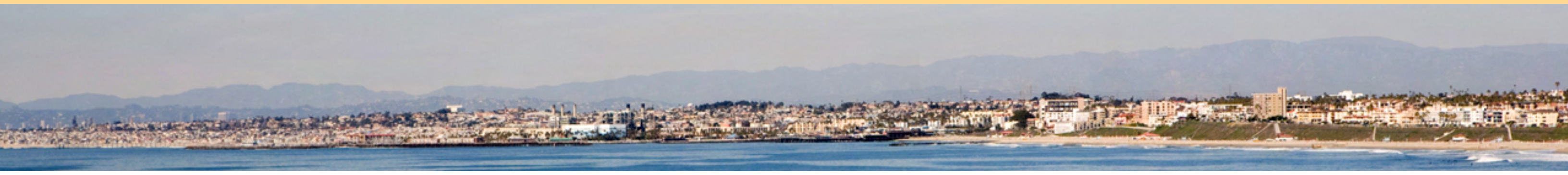
The reliability of groundwater supplies dictates how much supplemental supply West Basin will need to provide its customer agencies to meet their demands. Groundwater is traditionally considered a highly reliable supply since it is not immediately susceptible to changes in climate and surface flows. However, the two main factors that impact the reliability of groundwater supplies are legal and water quality.

Because the WCGB is an adjudicated basin, pumping rights are established for particular entities. However, changes to basin operation including allocation of pumping rights, opportunities to utilize the basin in other ways including storage, remediation of contaminated plumes, and pumping expansion for further extraction, are all considered legal impacts because it would require addressing the existing court-ordered judgment.

The LACDPW owns and maintains the seawater barrier system. They also monitor and work with WRD to determine how much barrier injection water is required in order to maintain protective levels to protect the aquifer from seawater intrusion. WRD also determines how much water is needed to replenish the WCGB to support pumping and orders this amount of water from West Basin who then delivers a combination of recycled and imported water.

The water quality of groundwater supplies is a factor in its reliability because the water needs to meet drinking water standards and sometimes requires expensive treatment at each pumping location.

During the time in which groundwater pumping was exceeding recharge and replenishment, seawater intruded into the WCGB. Once the intrusion barriers were brought on-line, the intrusion was stopped, but a large plume of saline water has remained trapped within the basin. The groundwater supply projections have already considered the presence of the plume and therefore anticipate no change in supply reliability as a result of its existence. The saline plume and the methods being employed by West Basin and its customer and neighboring agencies to manage the plume are further discussed in Section 6: Water Quality.



5.1.3 Recycled Water and Ocean-Water Desalination Reliability

Edward C. Little Water Recycling Facility

Recycled water is often considered as having one of the highest reliabilities of any supply given that there is a consistent source of supply for treatment. Ocean-water desalination is a newer form of supply in California but is also considered highly reliable given the abundance of ocean-water adjacent to West Basin's service area. West Basin has completed a pilot study and is now operating a demonstration facility to further determine environmental safeguards, energy and cost savings possible prior to a full scale program slated for completion by 2017. The planned recycled water and ocean-water desalination projects that West Basin is intending to use to meet future demand are further detailed in Sections 9 and 10 respectively.

5.1.4 Climate Change

Climate change adds its own new uncertainties to the challenges of planning. As a MWD member agency, West Basin is contributing to MWD's activities to better understand and plan for potential long-term climate change impacts.

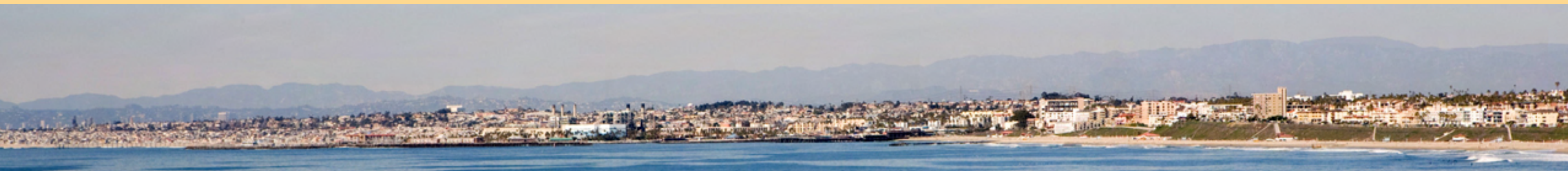
According to the MWD RUWMP, MWD uses historical hydrological data to forecast both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. However, weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere. MWD is committed to performing its due diligence with respect to climate change.

While uncertainties remain regarding the exact timing, magnitude, and regional impacts of these temperature and precipitation changes, researchers have identified several areas of concern for California water planners. These include:

- Reduction in Sierra Nevada snowpack
- Increased intensity and frequency of extreme weather events
- Rising sea levels resulting in:
    - Increased risk of damage from storms, high-tide events, and the erosion of levees
    - Potential pumping cutbacks on the SWP and Central Valley Project
    - Increased threats to coastal groundwater basins

Other important issues of concern due to global climate change include:

- Changes in urban and agricultural demand levels and patterns
- Impacts to human health from water-borne pathogens and water quality degradation
- Declines in ecosystem health and function
- Alterations to power generation and pumping regimes



In March 2002, the MWD Board adopted policy principles on global climate change as related to water resource planning. The Principles stated in part that MWD supports further research into the potential water resource and quality effects of global climate change, and supports flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts. To date MWD has completed the following actions to meet these Principles:

- Membership in the Water Utility Climate Alliance that has resulted in completion of several activities including:
  - Letter of support for Western Water Assessment's continued funding as a Regional Integrated Sciences and Assessments team under the National Oceanic and Atmospheric Administration (NOAA)
  - Letter of support for the 2009 Kerry-Boxer Water Utilities Mitigation and Adaptation Partnerships congressional bill addendum
  - Regular communication and consultations with federal agencies on the U.S. Environmental Protection Agency's Climate Ready Water Utility Working Group
  - NOAA Climate Service and January 2010 International Climate Change Forum
  - Released "Options for Improving Climate Modeling to Assist Water Utility Planning for Climate Change"
- Working with local water supply agencies, state and federal agencies and non-governmental organizations to collaborate on climate change related planning issues.
- Using MWD's IRP process to incorporate climate change science into regional plans by providing adaptive management strategies, creating buffer supplies, and encouraging the more efficient use of existing supplies.

5.2 Projected Supply Reliability

West Basin has experienced several examples of single dry and multiple dry year cycles within its historical hydrologic record. For the purposes of this UWMP, West Basin will use the years called out in Table 5-2 as the best representative examples of the single and multiple dry years. Table 5-3 provides an estimate of current (2010) water supply reliability from all four of West Basin's water sources. The table estimates supply reliability for 2011 if it were a single dry year and through a multiple dry period from 2011 to 2013. The average year supply projections shown in Table 5-4 are the average of all years within the 100 year hydrologic record and were previously reported in Section 4: Water Supply.

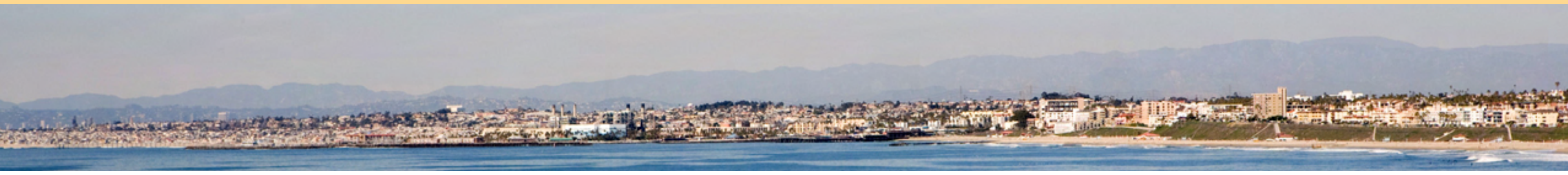


Table 5-2: Basis of Water Years and Historic Conditions

	Single Dry Water Year	Normal Water Year	Multiple Dry Water Years		
	Year 1		Year 1	Year 2	Year 3
	2001	1999	2001	2002	2003
Percent of Normal Year	4%	0%	4%	4.5%	5.0%

Table 5-3: Supply Reliability- Current Water Sources

Water Supply Sources[1]	Average/Normal Water Year Supply (2010)	Single Dry Water Year Supply (2011)	Multiple Dry Water Years Supply		
			2011	2012	2013
Groundwater	36,360	36,360	38,088	39,816	41,544
Imported Water	104,985	111,246	113,342	116,262	119,223
Recycled Water	14,182	14,182	14,619	15,056	15,494
Desalination	1,000	1,000	1,000	1,000	1,000
Total Supply	156,527	162,788	167,050	172,135	177,261
Percent of Normal Year	0%	4%	4%	4.5%	5%

[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries.

Table 5-4: Projected Average Year Supply and Demand

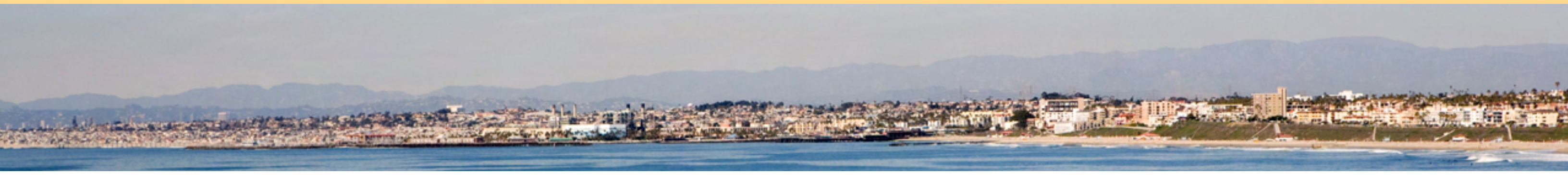
Supplies[1]	2010	2015	2020	2025	2030	2035
Groundwater[1]	36,360	45,000	45,000	45,000	45,000	45,000
Imported Water[2]	104,985	114,647	76,797	75,386	70,598	69,761
Recycled Water[3]	14,182	16,368	33,882	33,882	37,382	37,382
Desalination[4]	1,000	1,000	21,500	21,500	21,500	21,500
Total Supply	**156,527**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**
Total Demand	**156,527**	**177,015**	**177,179**	**175,768**	**174,480**	**173,643**
Surplus/(Shortage)	0	0	0	0	0	0

[1] Groundwater production within West Basin service area only.
[2] Imported retail use only; does not include replenishment deliveries (i.e. Barrier).
[3] Recycled water does not include replenishment deliveries (i.e. Barrier) and deliveries outside the service area.
[4] Desalination includes both brackish and ocean-water.

5.2.1 Single Dry Year

Table 5-5 shows the projected reliability of water supplies under single dry year conditions for five year increments between 2010 and 2035.

The overall demand is estimated to increase by 4 percent over average year to account for increases in irrigation needs. The scenario selected in the demand forecasting model projects that demands will increase by 4 percent in a single dry year based on the following set of assumptions:



- Economic cycle and restrictions (4-year rebound)
- Growth in connections (normal)
- Population (normal)
- Effects of price of water (MWD projected increases)
- Long-term climate change conditions (normal)
- Water use efficiency (doubling current efforts)
- Short-term weather changes (hot and dry)

The extra demand can readily be met with slight increase to imported water purchases given that West Basin is gradually reducing its dependence on imported supplies in average year and therefore should have imported water allocations available to meet these slight increases in demand.

Table 5-5: Projected Single-Dry Year Supply and Demand (AF)

Supplies[1]	2010	2015	2020	2025	2030	2035
Groundwater	36,360	45,000	45,000	45,000	45,000	45,000
Imported Water	111,246	121,728	83,884	82,417	77,577	76,707
Recycled Water	14,182	16,368	33,882	33,882	37,382	37,382
Desalination	1,000	1,000	21,500	21,500	21,500	21,500
Total Supply	**162,788**	**184,096**	**184,266**	**182,799**	**181,459**	**180,589**
Total Demand[2]	**162,788**	**184,096**	**184,266**	**182,799**	**181,459**	**180,589**
Surplus/(Shortage)	0	0	0	0	0	0

[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries
[2] Reflects demand after planned conservation and assumes a 4% increase in demand from average year

5.2.2 Multiple Dry Years

Table 5-6 through 5-10 show the projected reliability of supplies under multiple (three-year) dry year conditions for five year increments between 2010 and 2035. It was assumed in all tables that demand will increase by 5 percent over the average year in the third year of multiple dry year conditions. This projected increase was determined through the assumptions used in the demand forecasting model process and in previous dry-year conditions.

As under single dry year conditions, imported supplies will be purchased to meet any annual increase in demand. As a result, there are no anticipated shortages under any multiple dry year scenarios. Any shortfall in supplies will be met through imported water so long as MWD manages its supply and demand balance through its Water Surplus and Drought Management Plan, which includes specific actions such as storage withdrawals and implications of their WSAP. This is discussed in further detail in section 5.3.1.

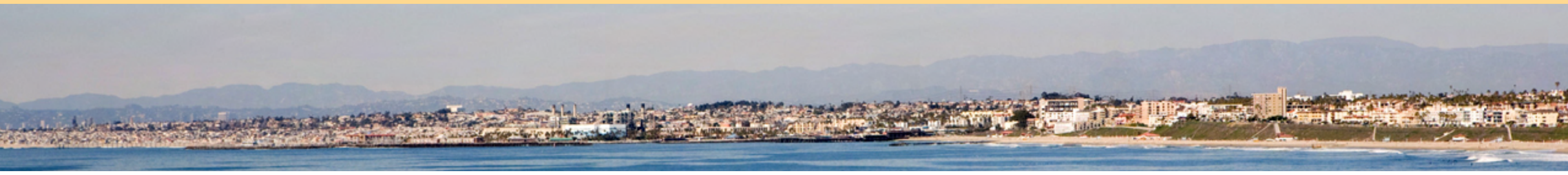


Table 5-6: Projected Multiple Dry-Year (2013-2015) Water Supply and Demand (AF)

Supplies	2013	2014	2015
Groundwater	40,700	42,850	45,000
Imported Water	117,501	115,788	114,078
Recycled Water	15,494	15,931	16,368
Desalination	1,000	1,000	1,000
Total Supply[1]	**174,695**	**175,569**	**176,446**
Total Demand[2]	**174,695**	**175,569**	**176,446**
Surplus/(Shortage)	0	0	0

[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries.
[2] Reflects demand after conservation and assumes a 5% increase from average to dry year 3.

Table 5-7: Projected Water Multiple Dry-Year (2018-2020) Supply and Demand (AF)

Supplies	2018	2019	2020
Groundwater	45,000	45,000	45,000
Imported Water	99,022	92,340	85,662
Recycled Water	26,876	30,379	33,882
Desalination	13,300	17,400	21,500
Total Supply[1]	**184,198**	**185,119**	**186,044**
Total Demand[2]	**184,198**	**185,119**	**186,044**
Surplus/(Shortage)	0	0	0

[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries.
[2] Reflects demand after conservation and assumes a 5% increase from average to dry year 3.

Table 5-8: Projected Water Multiple Dry-Year (2023-2025) Supply and Demand (AF)

Supplies	2023	2024	2025
Groundwater	45,000	45,000	45,000
Imported Water	83,003	83,920	84,842
Recycled Water	33,882	33,882	33,882
Desalination	21,500	21,500	21,500
Total Supply[1]	**183,385**	**184,302**	**185,224**
Total Demand[2]	**183,385**	**184,302**	**185,224**
Surplus/(Shortage)	0	0	0

[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries.
[2] Reflects demand after conservation and assumes a 5% increase from average to dry year 3.

Table 5-9: Projected Water Multiple Dry-Year (2028-2030) Supply and Demand (AF)

Supplies	2028	2029	2030
Groundwater	45,000	45,000	45,000
Imported Water	79,513	79,723	79,937
Recycled Water	35,982	36,682	37,382
Desalination	21,500	21,500	21,500
Total Supply[1]	**181,995**	**182,905**	**183,819**
Total Demand[2]	**181,995**	**182,905**	**183,819**
Surplus/(Shortage)	0	0	0

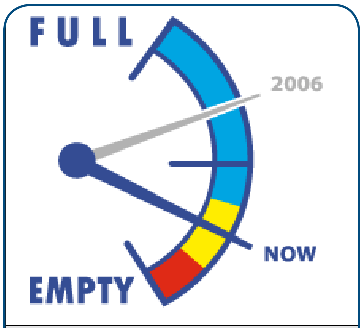
[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries.
[2] Reflects demand after conservation and assumes a 5% increase from average to dry year 3.

Table 5-10: Projected Water Multiple Dry-Year (2033-2035) Supply and Demand (AF)

Supplies	2033	2034	2035
Groundwater	45,000	45,000	45,000
Imported Water	77,055	77,960	78,869
Recycled Water	37,382	37,382	37,382
Desalination	21,500	21,500	21,500
Total Supply[1]	**180,937**	**181,842**	**182,751**
Total Demand[2]	**180,937**	**181,842**	**182,751**
Surplus/(Shortage)	0	0	0

[1]Supply reliability covers only retail water demand; does not include replenishment/barrier deliveries.
[2] Reflects demand after conservation and assumes a 5% increase from average to dry year 3.

5.3 Water Shortage Contingency Plan



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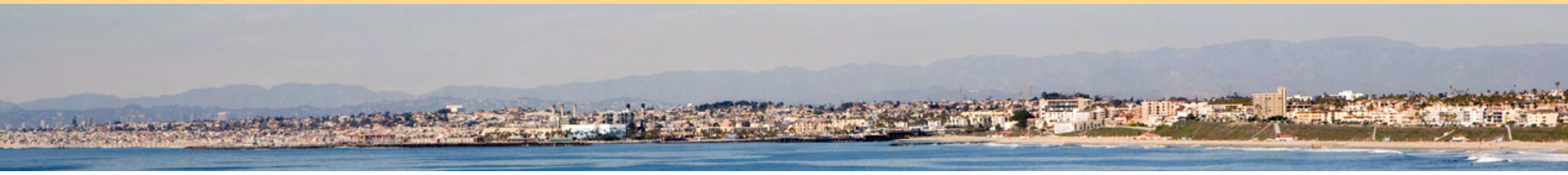
The Metropolitan Water District
of Southern California

DWR requires that each urban water supplier provide a water shortage contingency analysis within its UWMP. West Basin completed its WSAP in 2008 as a result of MWD's WSAP. West Basin's WSAP is only implemented after MWD reaches the appropriate stage. MWD has captured this planning in its WSDM Plan which guides MWD's planning and operations during both shortage and surplus conditions. Furthermore, MWD developed their WSAP which provides a standardized methodology for allocating supplies during times of shortage.

5.3.1 MWD Water Surplus and Drought Management Plan

In April 1999, MWD's Board adopted the WSDM Plan. It provides policy guidance for managing regional water supplies to achieve the reliability goals of the IRP and identifies the expected sequence of resource management actions that MWD will execute during surpluses and shortages to minimize the probability of severe shortages and reduce the possibility of extreme shortages and shortage allocations. Unlike MWD's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational actions with respect to both conditions.



WSDM Plan Implementation

Each year, MWD evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage. Each stage is associated with specific resource management actions designed to (1) avoid an Extreme Shortage to the maximum extent possible and (2) minimize adverse impacts to retail customers if an Extreme Shortage occurs. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of MWD's existing and expected resource mix.

Surplus Stages

MWD's supply situation under the WSDM Plan is considered to be in surplus as long as net annual deliveries can be made to water storage programs. The WSDM Plan further defines five surplus management stages that guide the storage of surplus supplies in MWD's storage portfolio. Deliveries for storage in the Diamond Valley Lake and in the State Water Project terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from Diamond Valley Lake for regulatory purposes or to meet seasonal demands may occur in any stage. Deliveries to other storage facilities may be interrupted, depending on the amount of the surplus.

Shortage Stages

The WSDM Plan distinguishes between Shortages, Severe Shortages, and Extreme Shortages. Within the WSDM Plan, these terms have specific meaning relating to Metropolitan's ability to deliver water to its customers.

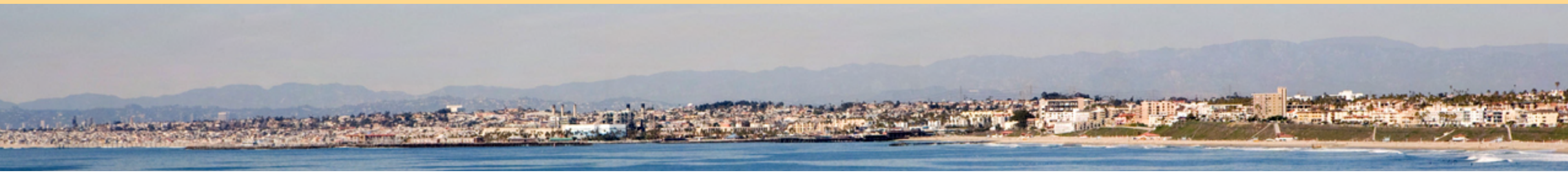
***Shortage*:** MWD can meet full-service demands and partially meet or fully meet interruptible demands, using stored water or water transfers as necessary.

***Severe Shortage*:** MWD 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 deliveries.

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

The WSDM Plan also defines seven shortage management stages to guide resource management activities. These stages are not defined merely by shortfalls in imported water supply, but also by the water balances in MWD's storage programs. Thus, a ten percent shortfall in imported supplies could be a stage one shortage if storage levels are high. If storage levels are already depleted, the same shortfall in imported supplies could potentially be defined as a more severe shortage.

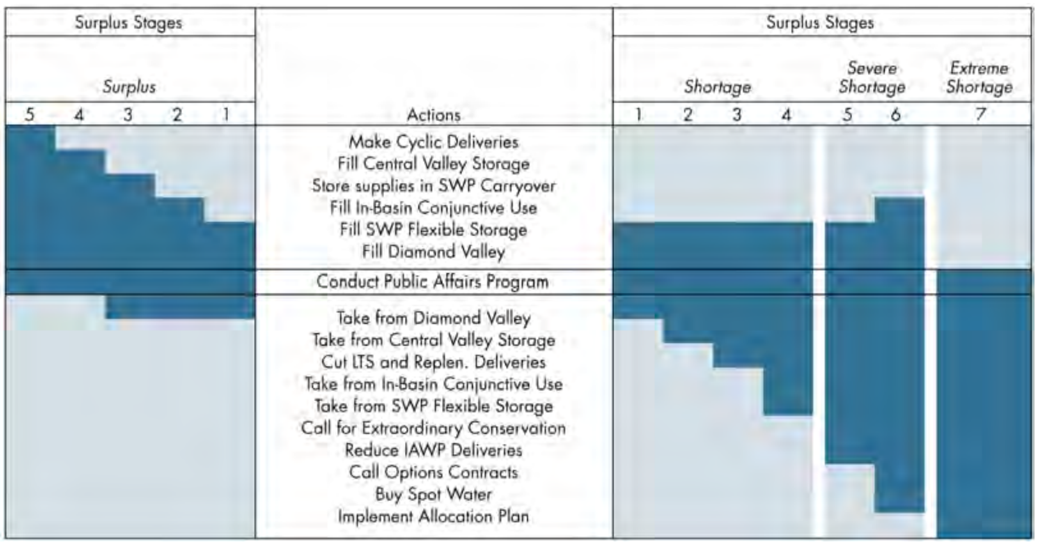
When MWD must make net withdrawals from storage to meet demands, it is considered to be in a shortage condition. Under most of these stages, it is still able to meet all end-use demands for water. For shortage stages 1 through 4, MWD will meet demands by withdrawing water from storage. At shortage stages 5 through 7, MWD may undertake additional shortage management steps, including issuing public calls



for extraordinary conservation, considering curtailment of Interim Agricultural Water Program deliveries in accordance with their discounted rates, exercising water transfer options, or purchasing water on the open market.

Figure 5-1 shows the actions under surplus and shortage stages when a Water Supply Allocation Plan would be necessary to enforce mandatory cutbacks. The overriding goal of the WSDM Plan is to never reach Shortage Stage 7, an Extreme Shortage. At shortage stage 7 MWD will implement its Water Supply Allocation Plan to allocate available supply fairly and efficiently to full-service customers.

Figure 5-1: MWD Surplus and Shortage Stages



5.3.2 Drought Management Plan

When MWD is operating under a shortage stage, West Basin would take the following stages of action:

***Stage 1*:** West Basin would request for a voluntary effort among its customers to reduce imported water deliveries. In addition, West Basin would pursue an aggressive Public Awareness Campaign to encourage residents and industries to reduce their usage of water.

Stage 2: In addition to the stage above, West Basin would work with its customer agencies to review and update as needed water waste prohibitions and ordinances to discourage unnecessary water usage.

***Stage 3*:** In addition to all the stages above, West Basin would implement its adopted Water Shortage Allocation Plan which calls for a curtailment of imported water for each of its customer agencies. This plan includes an adopted allocation methodology and is enforced by a penalty structure. A draft resolution is included in Appendix F.

5.3.3 West Basin's Water Shortage Allocation Plan

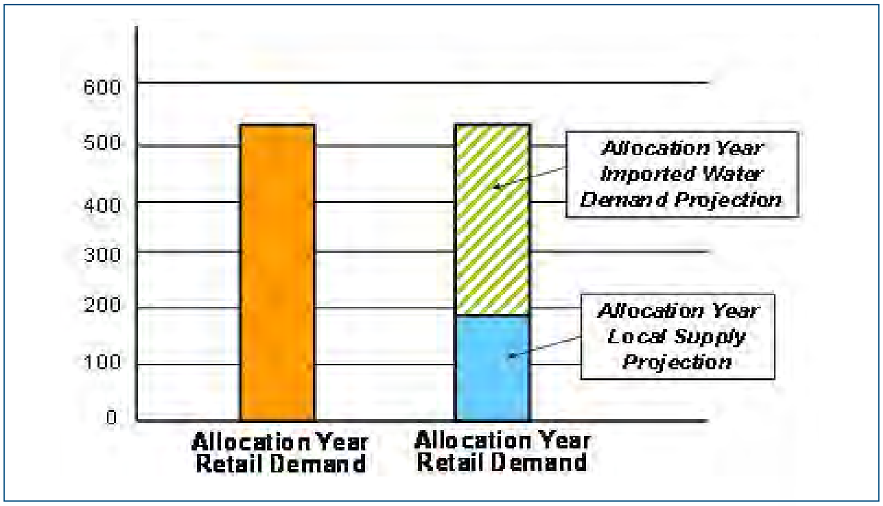
The purpose of West Basins' WSAP is to provide a method for determining allocations for its member agencies relative to the amount of supplies available when MWD has implemented its WSAP to determine West Basin's imported supply allocation. Like MWD, West Basin is a regional wholesaler and can't enforce end user restrictions – it can only impose allocations relative to its supply. Each of West Basin's member agencies must then determine how to meets its WSAP allocation of imported water to avoid over-use penalties.

This section provides an overview of West Basins' allocation formula and the requirements contained within its 2010 WSAP. The full 2010 WSAP is attached as Appendix B.

Establishing Retail Customer Agency Allocations

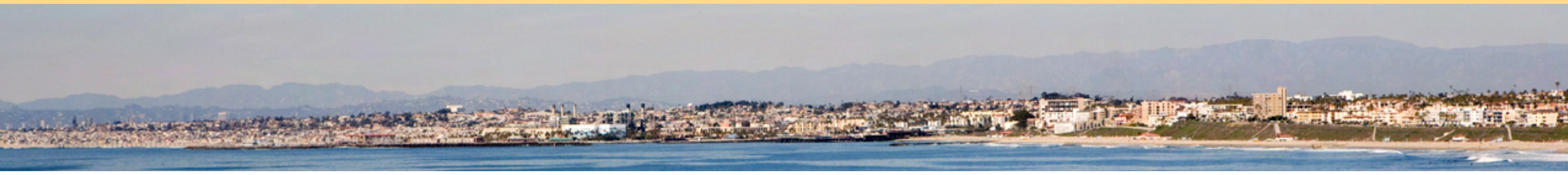
West Basin first calculates each customer agencies' baseline use by taking the average of total supply use (including both local and imported supplies) over a longer period of 1997-2007 (prior to the implementation of the Plan). The baseline is then projected forward to reflect changes in demand from population trends. This becomes the agency's allocation year demand and is shown in Figure 5-2.

Figure 5-2: Example of Allocation Year Imported Water Demand Projection



As shown in Table 5-11 and Figure 5-3, the projected imported water demand is what is allocated according to the declared MWD regional shortage level (Level 2 for the FY 2010-11 Allocation). The following concepts help explain the allocation further:

- **Regional Shortage Levels:** Each level from one to ten represents a five percent increment of Regional Shortage Percentage from 5 to 50 percent.
- **Regional Shortage Percentage:** The percentage difference between available supplies and allocation year demands, in 5 percent increments from 5 to 50.

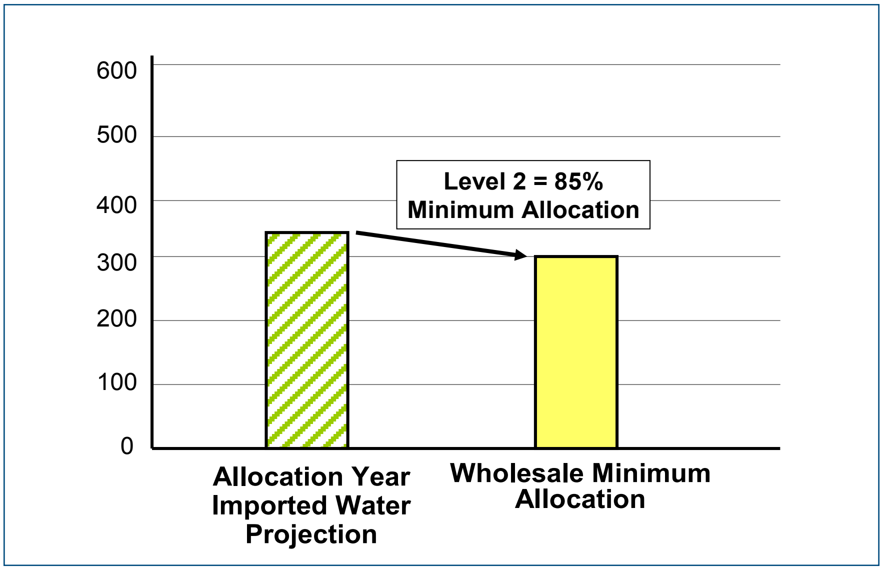


- **Wholesale Minimum Allocation:** ensures that customer agencies will not experience shortages on the wholesale level (from West Basin) that are greater than one-and-a-half times the Regional Shortage Percentage, according to Table 5-11.

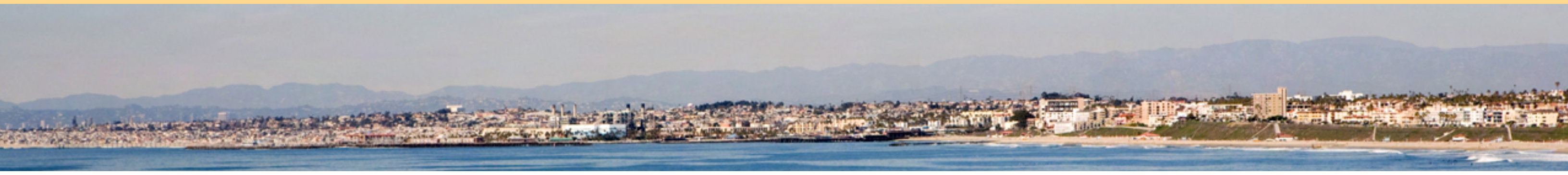
Table 5-11: Example of Initial Minimum Allocation

Regional Shortage Level	Regional Shortage Percentage	Wholesale Minimum Allocation
1	5%	92.5%
2	10%	85.0%
3	15%	77.5%
4	20%	70.0%
5	25%	62.5%
6	30%	55.0%
7	35%	47.5%
8	40%	40.0%
9	45%	32.5%
10	50%	25.0%

Figure 5-3: Example of Initial Minimum Allocation



Unequal impacts of an across-the-board allocation at the retail level can be dramatic depending primarily on the amount of local supplies, if any, held by each customer agency. That is why the allocation methodology assigns additional water supplies based on the following adjustments and credits:



- **Retail Impact Adjustment:** Previously used only in Regional Shortage Level 3 and above, the addition of this adjustment to Levels 1 and 2 was made, to ensure that customer agencies with a high level of dependence on imported water do not experience disparate shortages at the retail level compared to other agencies. Agencies that are 100% dependent on imported water, for example, are allocated at the Regional Shortage Percentage instead of the Wholesale Minimum Percentage.
- **Conservation:** Based on each customer agency's pro-rated share of MWD's modeled estimate of West Basin's conservation in 2006, including active, passive and avoided system losses. It is preferable to use the most recent year, rather than a three-year average, for demand hardening considerations.
- **Qualifying Conservation Rate Structure:** Additional credit added to those customer agencies that have a conservation rate structure. To qualify, a retail customer agency's rate structure must have at least two tiers of volumetric rates, with a price differential between the top and bottom tiers of at least 10 percent. Upon verification of the retail rate structures by MWD, West Basin is given a credit of 0.5% for the total volume subject to these rate structures.

As a member agency of MWD, West Basin is provided the opportunity to request changes to its allocation through an appeals process. Likewise, customer agencies of West Basin are provided the opportunity to appeal to their individual allocations from West Basin based on new or corrected information. Grounds for requesting a change can include, but are not limited to:

- Errors in historical data used in base period calculations
- Unforeseen losses or gains in local supplies
- Extraordinary increases in local supplies
- Adjustments in credits for conservation, including qualifying conservation water rates

In some cases, West Basin has no flexibility to change a customer agency's allocation unless it results in a change to West Basin's total allocation with MWD. West Basin staff will, however, work with customer agencies to determine whether appeals to MWD are warranted, and if so, to prepare an appeal for review by MWD.

Allocation Penalty Rates

West Basin will enforce customer agency allocations through a penalty rate structure similar to what West Basin is subject to in MWD's allocation plan. Penalty rates will only be assessed to the extent that an agency's total annual usage exceeds its total annual allocation. No billing or assessment of penalty rates will take place until the end of the twelve-month allocation period. Penalty rates are in addition to the base rate of the water purchased. The most recent change to the fiscal year 2010-11 WSAP is that there are two penalty rate scenarios.

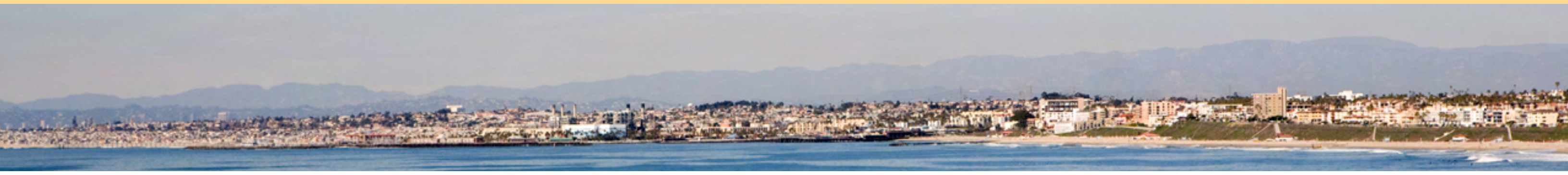


Table 5-12 demonstrates the two penalty rate structure scenarios. If West Basin is under its MWD allocation but a customer agency is over its individual allocation, it will be assessed the penalty structure reflected in Column B. However, if West Basin is over its allocation to MWD, West Basin will assess penalties reflected in Column C to those customer agencies that exceed their individual allocation.

Table 5-12: West Basin Allocation Penalty Rates

A	B	C
	Customer Agency Penalties*	
	West Basin Under Allocation to MWD	**West Basin Over Allocation to MWD**
Customer Agency up to 15% above allocation	1 x Tier 2	1 x Tier 2
Customer Agency over 15% above allocation	1 x Tier 2	3 x Tier 2

* The Tier 2 penalty rate excludes the Treatment Surcharge ("Full Service Untreated Tier 2 Rate")

The actual penalty rates shall be based on the official MWD Untreated Tier 2 water rate in effect the last day in June of the twelve-month allocation period.

Use of Penalty Revenues

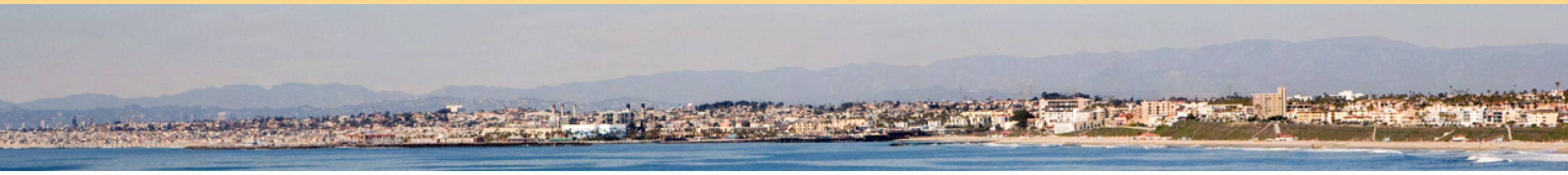
According to the WSAP policy adopted by the West Basin Board, any penalty funds collected by West Basin from customer agencies will first be applied to any penalty owed to MWD. Any "net penalty revenues" remaining can then be applied towards investments in water reliability projects and programs that benefit the West Basin service area as a whole, as approved by the board.

5.3.4 Catastrophic Supply Interruption

In the event imported water supplies are interrupted from a catastrophic event, West Basin, through coordination with MWD, can respond at both a regional and a local level.

In the event that an emergency such as an earthquake, system failure, or regional power outage, etc. affected the entire southern California region, MWD would take the lead and activate its Emergency Operation Center (EOC). The EOC coordinates MWD's and West Basin's responses to the emergency and concentrate efforts to ensure the system can begin distributing potable water in a timely manner.

If circumstances render the Southern California's aqueducts to be out of service, MWD's Diamond Valley Lake can provide emergency storage supplies for its entire service area's firm demand for up to six months. With few exceptions, MWD can deliver this emergency supply throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted. Furthermore, should additional



supplies be needed, MWD also has surface reservoirs and groundwater conjunctive use storage accounts that can be drawn upon to meet additional demands. The WSDM plan guides MWD's management of available supplies and resources during an emergency to minimize the impacts of a catastrophic event.

Locally, the District has the Member Agency Response System (MARS) to immediately contact its customer agencies and MWD during an emergency about potential interruption of services and the coordination of critical resources to respond to the emergency, also known as mutual aid. The MARS is a radio communication system developed by MWD and its member agencies to provide an alternative means of communication in extreme circumstances. The District is currently in the process of enhancing its communication system in order to provide a more rapid response. Additionally, a contingency plan has been developed for both planned and unplanned electrical outages which includes back-up generation for all water treatment plants, transporting mobile generators to key locations, and maintaining water supply through gravity feed in regional reservoirs (i.e. Lake Mathews, Castaic Lake, and Silverwood Lake).

SECTION SIX

Water Quality

2010

SECTION 6 Water Quality

Providing a safe drinking water supply to consumers is a task of paramount importance to West Basin. All prudent actions are taken to ensure that water delivered throughout its service area meets or surpasses drinking water standards set by the California Department of Public Health (CDPH).

Compliance with water quality regulations is a regional water management priority and a shared responsibility. West Basin is responsible for the quality of the desalination and recycled water supplies generated at the C. Marvin Brewer Desalter and Edward C. Little Water Recycling Facility (ECLWRF) and its satellite facilities: Carson Water Recycling Facility, Chevron Nitrification Plant and Exxon-Mobil Nitrification Plant. MWD is responsible for complying with State and Federal drinking water regulations on its imported potable water sold to West Basin. West Basin's retail customer agencies are responsible for ensuring compliance in their individual distribution systems and at the customer tap. As a result of these measures, there are no anticipated water quality impacts that will decrease the supply available for use.

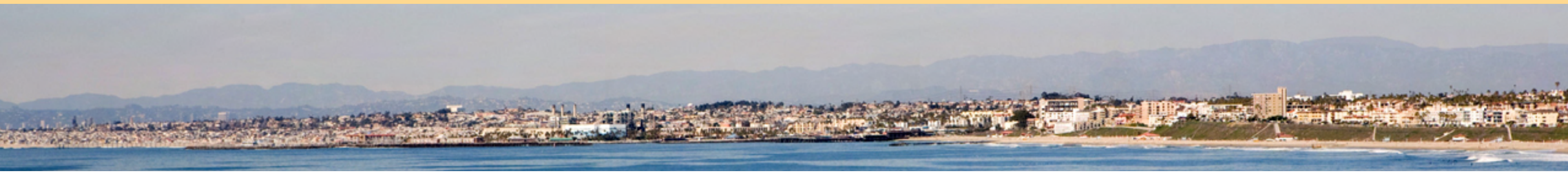
6.1 Imported Water

West Basin's imported water comes from the SWP and Colorado River via MWD pipelines and aqueducts. MWD is proactive in its water quality efforts, protecting its water quality interests through active participation in the regulatory arena and in treatment processes that provide the highest water quality from both sources. MWD has one of the most advanced laboratories in the country where water quality staff can examine the efficacy of existing treatment by performing tests and reviewing results as well as researching new treatment technologies. MWD tests its water for microbial, organic, inorganic, and radioactive contaminants as well as pesticides, herbicides and emerging contaminants of concern. Although not required, MWD also monitors for constituents that are not yet regulated but have captured scientific and/or public interest.

MWD has a strong record of identifying water quality issues early on and developing the water management strategies to minimize their impact on water supplies through their involvement in the following programs as described in MWD's 2010 Regional UWMP.

6.1.1 Source Water Protection

Source water protection is the first step in a multi-barrier approach to provide safe and reliable drinking water. In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, CDPH requires large utilities delivering surface water to complete a Watershed Sanitary Survey every five years to identify possible sources of drinking water contamination, evaluate source and treated water quality, and recommend watershed management activities that will protect and improve source water quality. The most recent sanitary surveys for MWD's water sources were completed in 2005 and 2006.



The next Sanitary Surveys for the watersheds of the Colorado River and the SWP will report on water quality issues and monitoring data through 2010. MWD has an active source water protection program and continues to advocate on behalf of numerous SWP and Colorado River water quality protection issues.

6.1.2 DWR SWP Water Quality Programs

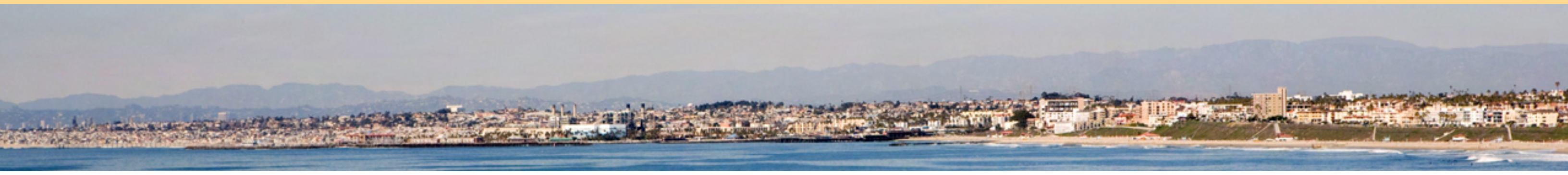
MWD supports DWR's policies and programs aimed at maintaining or improving the quality of SWP water delivered to MWD. In particular, MWD supported the DWR policy to govern the quality of non-project water conveyed by the California Aqueduct. In addition, MWD has supported the expansion of DWR's Municipal Water Quality Investigations Program beyond its Bay-Delta core water quality monitoring and studies to include enhanced water quality monitoring and forecasting of the Delta and SWP. These programs are designed to provide early warning of water quality changes that will affect treatment plant operations both in the short-term (hours to weeks) as well as seasonally. The forecasting model is currently suitable for use in a planning mode. It is expected that with experience and model refinement, it will be suitable to use as a tool in operational decision making.

6.1.3 Water Quality Exchanges

MWD has implemented selective withdrawals from the Arvin-Edison storage program and exchanges with the Kern Water Bank to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may be withdrawn at times of lower water quality, thus diluting SWP water deliveries. Although elevated arsenic levels have been a particular concern in one groundwater banking program, there are also short-term water quality benefits that can be realized through other storage programs, such as groundwater pump-ins into the California Aqueduct with lower total organic carbon (TOC) levels, as well as lower bromide and total dissolved solids (TDS), in some programs.

6.1.4 Water Supply Security

Changes in national and international security have led to increased concerns about protecting the nation's water supply. In coordination with its member agencies, MWD 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 (MWD now conducts over 300,000 analytical tests on samples collected within its service area and source waters), as well as the development of contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.



6.2 Groundwater

Although West Basin does not serve traditional groundwater supplies, it works to support its customer agencies and WRD to protect and promote the quality of groundwater supplies within its service area.

6.2.1 West Basin and Customer Retail Agency Programs

As part of West Basin's customer service, the Water Quality Department works closely with regulatory agencies to assist retail agencies in meeting State and Federal drinking water regulations through the *Cooperative Basin-Wide Title 22 Groundwater Quality Monitoring Program*. Title 22 refers to the section of the California Code of Regulations pertaining to both domestic drinking water and recycled water standards.

This voluntary program offers water quality testing to customer agencies and is funded through an annual assessment. Three agencies in West Basin's service area participate in the monitoring program. West Basin's water quality staff coordinates wellhead and reservoir water quality testing at approximately eight groundwater wells in the service area to ensure high quality of the local supply of drinking water. Under the program, a contract laboratory provides sampling as well as analytical and reporting services. Laboratory results are reported to West Basin, retail agencies, and the CDPH. The program helps retail agencies save time and expense while providing a valuable service for public health.

Another service provided under the program is the production of an annual Customer Water Quality report if requested by a customer agency. The Customer Water Quality Report is required by State and Federal law and West Basin's water quality staff has prepared them for several agencies for over 15 years.

6.2.2 Water Replenishment District Programs

As the regional groundwater management agency for the Central and West Coast Groundwater Basins, WRD has several active programs to monitor, evaluate and mitigate water quality issues.

Groundwater Quality Program: WRD continually evaluates current and proposed water quality compliance in agency production wells, monitoring wells, and recharge/injection waters of the groundwater basins. If non-compliance is identified, WRD staff develops a recommended course of action and associated cost estimates to address the problem and to achieve compliance. WRD also monitors and evaluates the impacts of pending drinking water regulations and proposed legislation.

Regional Groundwater Monitoring Program: This program has a network of over 250 WRD and USGS-installed monitoring wells at nearly 50 locations throughout West Basin's service area. Monitoring well data is supplemented with information from production wells to capture the most accurate information available. WRD staff, comprised of certified hydrogeologists and registered engineers, provides the in-house capability to collect, analyze and report groundwater data. This information is stored in WRD's GIS database and provides the basis to better understand the characteristics of the Central and WCGB.

Safe Drinking Water Program: This program is intended to promote the cleanup of groundwater resources at specific well locations. Through the installation of wellhead treatment facilities at existing production wells, WRD hopes to remove contaminants from the underground supply and deliver the extracted water for potable purposes. Projects implemented through the program are accomplished through direct input and coordination with well owners. The current program focuses on the removal of volatile organic compounds (VOCs) and offers financial assistance for the design and equipment of the selected treatment facility.

WRD provides extensive information on groundwater quality in its Engineering and Survey Reports as well as Regional Groundwater Monitoring Reports. Both reports have a section devoted solely to groundwater quality management, and can be accessed through WRD's website, www.wrd.org.

6.3 Brackish Desalination

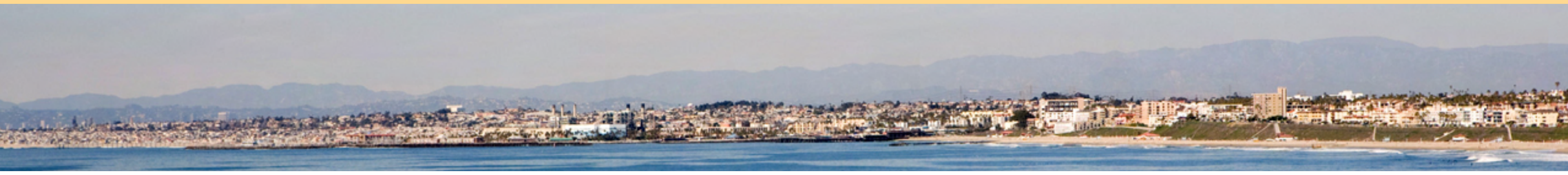
Although construction of seawater barriers was effective in halting the intrusion of seawater into the WCGB, historic plumes of brackish water still remain in the WCGB behind the barriers. In the early 1990s, West Basin completed the C. Marvin Brewer Desalter facility as a demonstration project for removing and treating the brackish water using two existing drinking water wells that were impacted by the seawater intrusion. In 2005, enhancements were made to the desalter program that replaced the two wells with a new, more productive well. This well has the capability to pump 1,600 to 2,400 AFY of brackish ground water to be treated at the desalting facility for use by West Basin's customers.

Since 2002, WRD has also been operating the Robert W. Goldsworthy Desalter, located adjacent to West Basin's desalter. Product water from the Goldsworthy Desalter is delivered for potable use to the City of Torrance's water distribution system.

6.4 Recycled Water

West Basin's ECLWRF, located in El Segundo, has been in continuous operation since 1995 and has conserved over 120 billion gallons of imported water by serving reliable supplies of recycled water for a wide variety of non-potable uses. A full description of West Basin's recycled water program is provided in the Water Recycling section of this report.

West Basin is committed to monitoring and maintaining the high quality of recycled water produced for injection at the West Coast Seawater Barrier and the surrounding groundwater from migrating contamination sources. In addition, groundwater quality



within the aquifer is monitored through more than a dozen monitoring wells inland of the Barrier. These wells represent the quality of the groundwater down-gradient of the Barrier, are essential in providing critical water quality data for the surrounding groundwater. Annual water quality data reports and groundwater modeling are submitted to both the CDPH and the Los Angeles Regional Water Quality Control Board to ensure compliance and security.

6.5 Ocean-Water Desalination

West Basin has been actively researching the feasibility of an ocean water desalination program as part of the drinking water supply. From 2002 to 2009, West Basin operated the Desalination Pilot Project, which marked the first use of microfiltration as a pretreatment to reverse osmosis for ocean-water desalination.

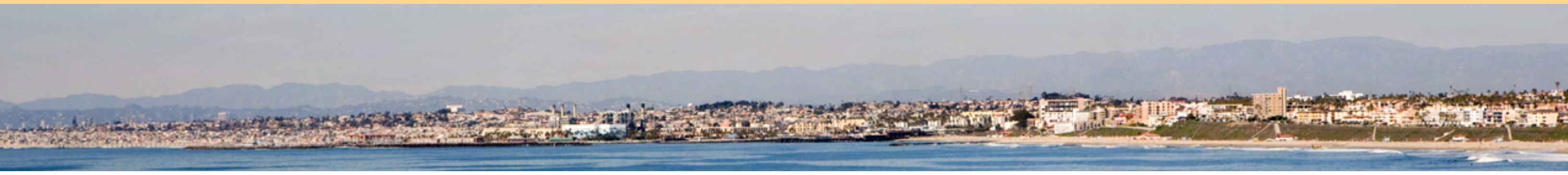
To ensure that this process was effectively treating the ocean water, West Basin performed extensive water quality research at the pilot plant. The water produced at the pilot project consisted of approximately 350 parts per million (ppm) of salt, lower than typical tap water in southern California. The pilot project's analytical test results indicated that the quality of the desalinated ocean water meets current State and Federal drinking water standards set by CDPH and the Environmental Protection Agency (EPA). Along with 500 analytical tests that were performed monthly, additional water quality studies were completed under the auspices of the American Water Works Association Research Foundation.

The research and testing conducted at the Pilot Project informed the design of the Ocean-Water Desalination Demonstration Facility, dedicated in November 2010. The Demonstration Facility will be operational for a minimum of two years while West Basin evaluates the feasibility of permitting and siting of a full-scale desalination plant capable of providing 20,000 AFY of potable water, enough to supply 40,000 families for a year.

While the Demonstration Facility is operational, West Basin will pursue a program master plan in partnership with MWD. The master plan effort will evaluate all water quality and other aspects necessary to develop a full-scale desalination facility with the option of integrating product water into the MWD distribution system. More information on West Basin's ocean-water desalination efforts is included in Section 10.

6.6 Research and Development

West Basin has a dedicated program and budget to constantly engage in research projects that evaluate water quality, efficient operations and new pollution prevention technology and methods. Research projects close the environmental loop by addressing both final product water as well as source control issues to prevent pollution and the need for cleanup technology. West Basin leverages its research dollars by participating on the Boards of water industry research organizations such as WateReuse, American Water Works Associations, National Water Research Institute, Salinity Management Coalition as well as participating with academic institutions in water quality research.



6.7 Effects on Water Management Strategies

Retail water agencies in densely populated southern California are acutely aware of the economic impact of water quality on a public water system. Management strategies must be developed to maintain a safe, reliable supply at reasonable cost without jeopardizing water quality and public health. Water quality, pressure, and supply are maintained through operational practices that can include wellhead treatment for contaminated groundwater sources, or blending down contaminated groundwater with purchased imported surface water from MWD or high quality groundwater from adjacent purveyors.

6.8 Effects on Supply Reliability

Poor water quality makes a water source unreliable, affects overall supply and increases the cost of serving water to the public. More importantly, it results in a loss of customer confidence, which can be very difficult to overcome, even after water quality is restored. A water source that fails drinking water regulations must be taken out of service. The source can be restored through treatment or other management strategies.

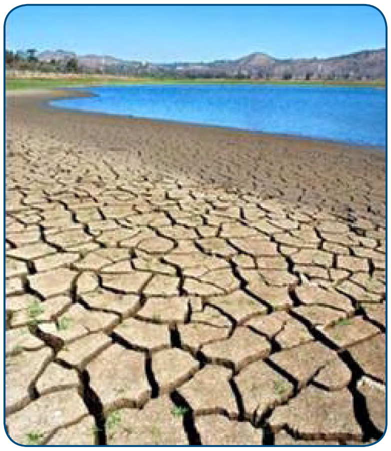
Groundwater can become impaired through leaching of contaminants into an aquifer, or by excessive concentrations of naturally-occurring constituents that impact quality, such as arsenic. Surface water sources become contaminated from human activities in the watershed or through deliberate contamination.

SECTION SEVEN

Water Use Efficiency

2010

SECTION 7 Water Use Efficiency



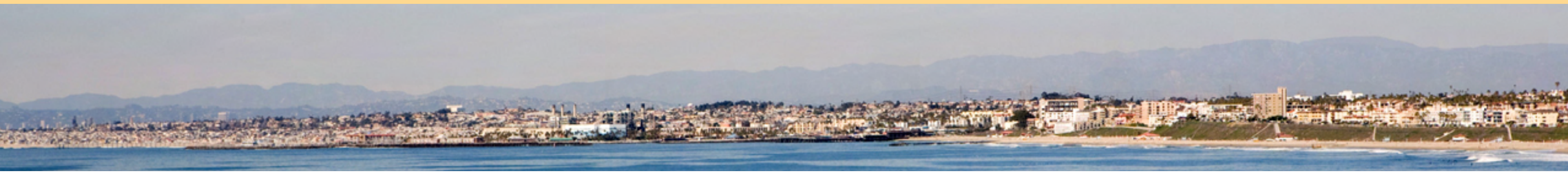
Water Use Efficiency (WUE), or conservation, continues to play an important role in West Basin's water supply portfolio. Between 2005 and 2010, there were several new key developments that occurred in the area of water use efficiency policy.

- In 2008, as a result of State Water Project supply limitations and multiple year drought conditions, MWD instituted water supply allocations (or imposed conservation) that sought to reduce member agencies' imported water demand.
- In 2008, the California Urban Water Conservation Council (CUWCC) began restructuring its 14 BMPs and reporting process.
- In 2009, AB 1420 came into effect requiring agencies to provide up-to-date information on CUWCC BMP compliance as part of grant or loan applications to the State DWR.
- In 2009, the Governor of the State of California signed into law SBX 7-7, which calls for a state-wide 20 percent reduction in per capita water use by 2020. Individual agencies are required to provide water use reduction targets of gallons per capita per day as part of the 2010 UWMP update.
- In 2009, a key piece of water efficiency legislation called AB 1881 was entered into law that updated the Model Landscape Ordinance AB 325 of 1990. This new law stated that as of January 1, 2010, all local cities were required to adopt the new Model Landscape Ordinance or stricter versions of it. West Basin, along with other stakeholders, provided input to DWR for the development of the new ordinance.

At the local level, in 2008 West Basin launched a new program to help meet these challenges, called WR 2020 Program. The main goal of this program is to increase local water supplies by doubling recycled water production, doubling water conservation savings and by bringing responsible ocean-water desalination on-line.

7.1 Historical Water Conservation Efforts

Since the severe drought of the early 1990s, West Basin has been a leader implementing aggressive water conservation programs to help limit water demand within its service area. West Basin programs have included a strong emphasis on plumbing retrofit hardware, education and the distribution of rebate incentives. The results of these programs, in conjunction with passive conservation measures such as modifications to city ordinances, have resulted in significant reductions in retail water use within West Basin's service area. By current estimates, demand management from West Basin's active and passive conservation efforts have saved over 3 billion gallons of imported water (10,000 AF) since 1991, which is equivalent to the average annual water use of almost 20,000 households. This section will present the past and current water conservation efforts West Basin has undertaken since the last update to this plan in 2005.



West Basin's conservation efforts have been comprised of a wide array of cost-effective programs that contribute to conserving water, improving water quality, reducing imported water needs and increasing the region's water supply reliability.

West Basin prides itself in the partnerships it has created with Federal, State, and local entities to offer water efficiency programs. By developing integrated programs with its partners, West Basin has been able to leverage funding and resources to provide effective programs throughout its region. As a result, West Basin has been successful in obtaining more than $4 million in local, state and federal grant funds for conservation program implementation since 2005. Due to its successes with acquiring grants, West Basin has leveraged its funding and today provides $7 worth of programs to the public for every $1 it invests.

The effect of Water Conservation is defined by two main elements: *Active* and *Passive*. Below is a brief description of these two.

Active Conservation: Water savings produced from incentive based programs: rebates, giveaways, retrofits, etc.

Passive Conservation: Water savings produced from building and plumbing codes, consumer behavioral changes, and respones to price shifts.

West Basin's current conservation programs target water conservation efforts in the residential, commercial, industrial, institutional and large landscape areas. These programs were identified as part of the 2006 Conservation Master Plan and are available to residents, businesses, and institutional customers within West Basin's service area. Below is a list of the conservation programs that were launched over the last five years:

- Region-wide Residential Rebate Program
- Ocean Friendly Landscape Program
- Green Living for Apartments & Condos
- Green Garden Program
- Complete Restroom Retrofit Program
- Region Wide Commercial Rebates
- High-Efficiency Toilet Distribution Events
- Cash for Kitchens Program
- Recirc & Save Program
- School Kit Program
- Zero Run-off Street Median Program
- School Education Programs
- Public Outreach Program
- Water Star Program

It is estimated that West Basin has distributed and installed over 300,000 devices from 1990 to 2010. As a result, it is estimated that West Basin currently saves, from active and passive (code-based) conservation combined, over 10,000 AF (three billion gallons), or five percent annually, of West Basin's total water demand. Figure 7-1 shows the total Active and Passive Savings from 1990- to 2010 on an annual basis.

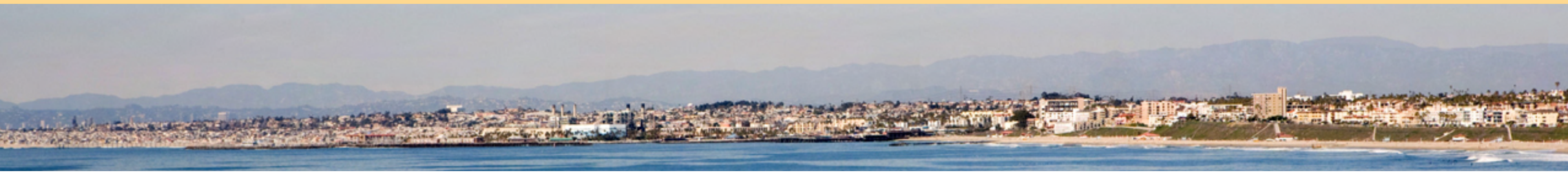
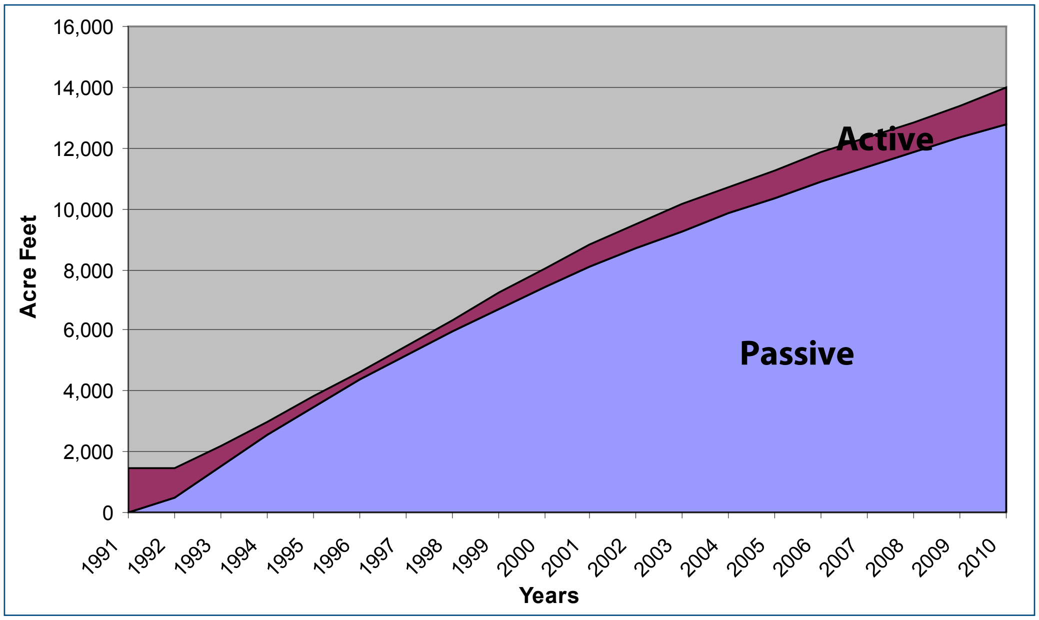


Figure 7-1: West Basin Conservation Water Savings (1990 – 2010)



Source: Estimated total active and passive water savings from West Basin's Alliance for Water Efficiency Tracking Tool, 2011.

Conservation savings can further be verified by comparing West Basin's water usage versus population. As shown in Figure 7-2, average water demand has remained relatively consistent while population has escalated by an annual average of 1%.

7.2 West Basin and Customer Agency Water Conservation Master Plans

In 2006, West Basin developed its first Conservation Master Plan (CMP). In developing the CMP, West Basin worked closely with its water retailers, local cities, environmental groups and others to develop meaningful programs that were targeted and effective. The CMP included a five year timeline for cost-effective program implementation. Since adoption of the CMP, West Basin has been successfully implementing programs described in this section below.

As the regional water wholesaler, West Basin spear-headed an effort to ensure the region is working together to meet the State's goal of a 20 percent reduction in water demand by the year 2020. Begun in 2009, it was a unique program that allowed West Basin to work with its local water retailers to update the water conservation master planning efforts that were completed in 2006. West Basin (on behalf of its retailers) applied for and was awarded a $100,000 grant by the USBR to develop eight Local Water Use Efficiency Plans and to update West Basin's 2006 CMP. In addition to the grant, the retailers and West Basin provided a cost-share of $130,000. In 2010, West Basin began this project with the intent to help the agencies develop water use baselines and conservation targets to help meet the SBX 7-7 targets in 2015 and 2020.

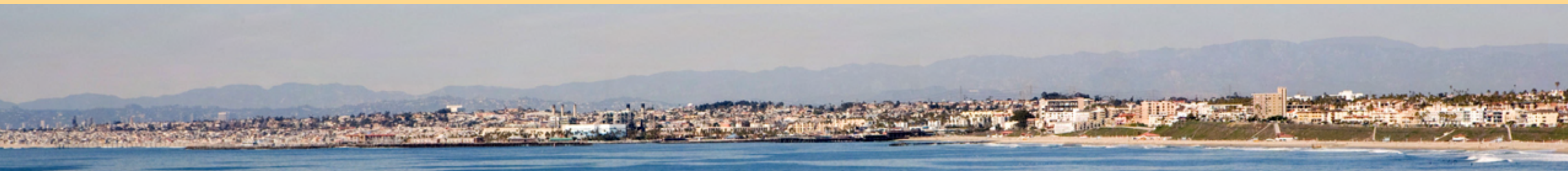
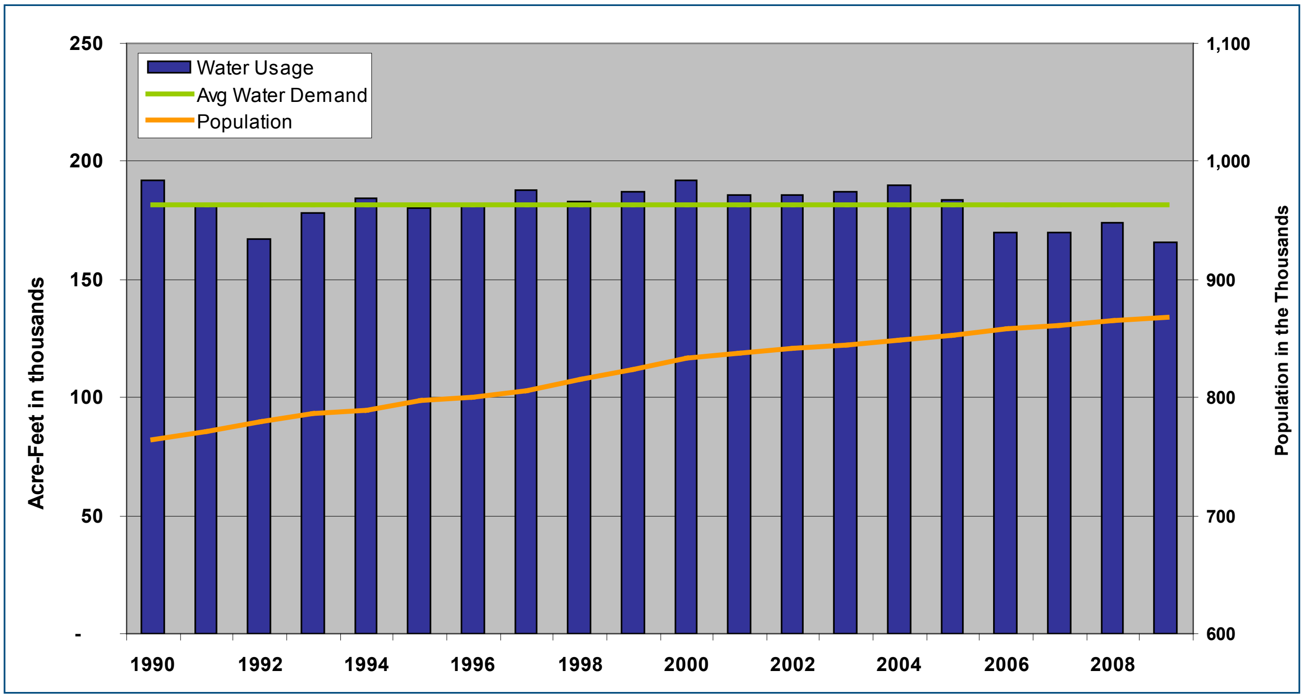


Figure 7-2: Total Retail Water Demand vs. Population Growth (1990 – 2010)



Source: Information based on MWD Demographic Data, 2005

Note: Total retail demand includes groundwater production but not replenishment demands for use at seawater barriers.

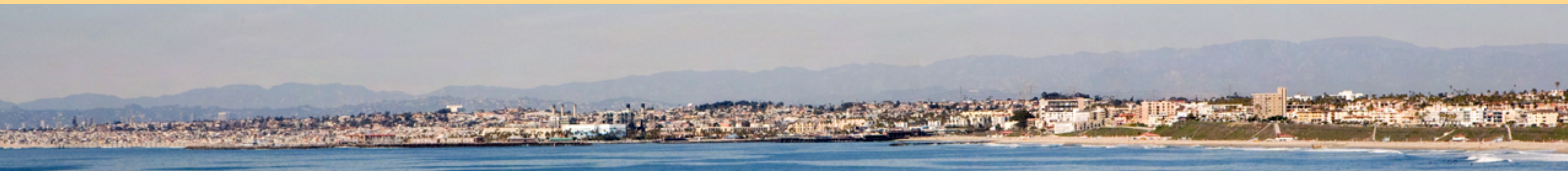
West Basin and its partners used a GPCD target calculator and the Alliance for Water Use Efficiency Water Conservation Tracking Tool to develop the information for the Conservation Master Plans. West Basin worked closely with each water retailer through bi-monthly meetings to collaborate, share ideas and discuss challenges. The plans will be completed by May 2011 and include a five year and a ten year timeline for implementation of various programs. The retailers will be able to use the information from their individual plans to report their conservation targets in their UWMPs.

7.3 External Agency Coordination

As a part of conservation planning and implementation, West Basin also works with other regional and statewide agencies and groups such as MWD, and the CUWCC.

7.3.1 Metropolitan Water District

In 2010, MWD adopted an updated Integrated Resources Plan (IRP) that includes a strong commitment to water conservation. MWD's 2010 IRP establishes water supply targets for Southern California through 2035, specifically a potable demand reduction of 1.7 MAF. This target represents MWD's goal of achieving a 20% reduction in per capita water use across its service area. MWD is currently developing a long-term conservation plan to implement the IRP conservation target. This plan focuses on conducting more research, providing device incentives and funding, assisting with market transformation and legislation and helping to support its member agencies with conservation efforts.



As a member agency of MWD, West Basin actively participated in both the IRP Working Group and the Long Term Conservation Plan development, and will benefit from the conservation implementation strategies outlined in the plan.

7.3.2 California Urban Water Conservation Council

In 1991, the CUWCC was created to increase water use efficiency by integrating urban water conservation BMPs into the planning and management of California water agencies. It is a partnership of agencies and organizations concerned with water supply and conservation of natural resources in California.

To encourage water use efficiency, the CUWCC asked water agencies and organizations to sign a MOU regarding urban water conservation in California, which committed participating urban water suppliers to use their "good faith efforts" to implement the CUWCC's 14 BMPs.

West Basin was one of the first urban water suppliers to become signatory to the CUWCC's MOU. Every two years, water agency signatories, including West Basin, must submit their BMP reports to the CUWCC. West Basin has submitted BMP Wholesaler Water Agency Reports to the CUWCC that detail West Basin's progress in implementing the 14 BMPs as currently specified in the MOU. In Appendix F, West Basin has attached its most recent 2007-08 CUWCC Report.

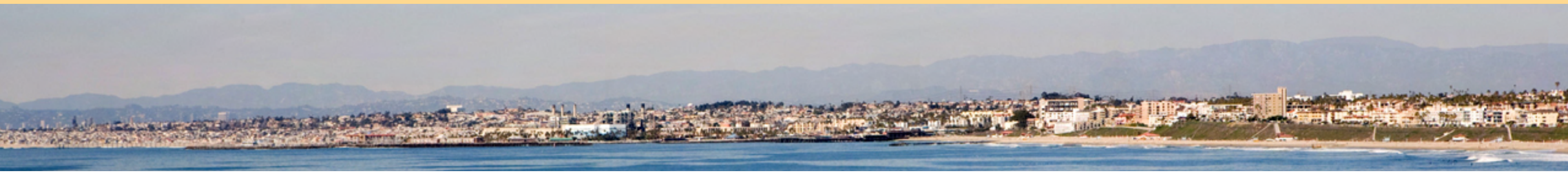
7.4 CUWCC – New BMPs and Reporting Options

In 2008/09, the CUWCC completed an ambitious project to revamp, streamline and improve the 14 BMPs and to develop several ways that an agency can report their water conservation targets and savings. Along with this process, the CUWCC created a new reporting database that agencies can use to report their achievements. Agencies must report to the CUWCC every two years, and the next reporting period will take place in 2011, when the new reporting database has been completed.

The CUWCC 14 BMPs are now organized into five categories. Two of the categories, Utility Operations and Education, are called Foundational BMPs because they are essential water conservation activities for any utility and therefore must be adopted by all signatories to the CUWCC MOU. The Residential, Commercial, Industrial, and Institutional (CII), and Landscape BMP categories are now called Programmatic BMPs.

Foundational

- Utility Operations
  - **BMP 3 System Water Audits:** Unaccounted for water calculated annually, and distribution system audits as required
  - **BMP 4 Metering with Commodity Rates:** Metering of consumption and billing by volume



  - **BMP 10 Wholesale Agency Assistance:** Support by wholesalers for conservation programs of retail water suppliers
  - **BMP 11 Conservation Pricing:** Uniform or increasing block rate structure, volume related water charges, and service cost recovery
  - **BMP 12 Conservation Coordinator:** Designation of staff coordination of agency conservation programs
  - **BMP 13 Water Waste Prohibition:** Enforced prohibition of wasteful use of water
- Education
  - **BMP 7 Public Information:** Public information to promote water conservation
  - **BMP 8 School Education:** Provision of education materials and services to schools

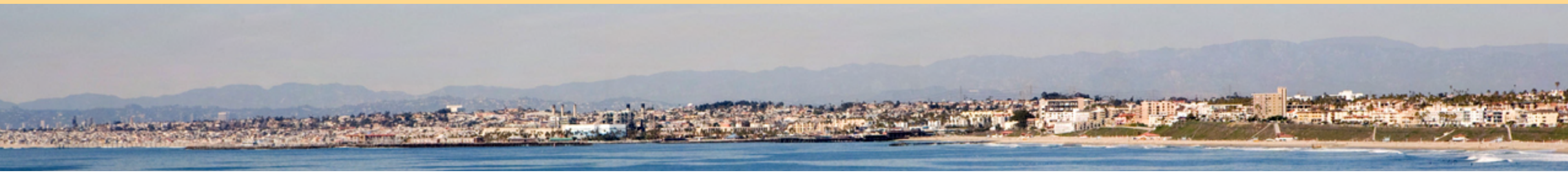
Programmatic

- Residential
  - **BMP 1 Residential Water Surveys:** Indoor and outdoor audits of residential water use and distribution of water-saving devices
  - **BMP 2 Residential Plumbing Retrofits:** Distribution or installation of water-saving devices in pre-1992 residences
  - **BMP 6 High Efficiency Clothes Washers:** Rebates for efficient washing machines
  - **BMP 14 Residential Ultra-Low Flush Toilet Replacement:** Programs promoting replacement of high-water-using toilets with ultra-low flush toilets
- Landscape
  - **BMP 5 Large-Landscape Conservation:** ET-based water budget for large landscape irrigators
- Commercial, Industrial, and Institutional
  - **BMP 9 Commercial, Industrial, and Institutional Conservation:** Programs to increase water use efficiency in CII sectors

7.5 Current Water Conservation Programs

As the water wholesaler for 8 water retail agencies and one groundwater agency, West Basin has collaborated with many important stakeholders and leveraged funding to develop and implement cost-effective programs that conserve water and energy, reduce runoff and provide other important environmental benefits.

All of these programs combined are being used to help West Basin and its retailers meet the 14 BMPs. West Basin has provided programs and activities that have assisted its retailers to help meet the BMPs listed here.



7.5.1 BMP #1 - Water Survey Programs for Single-Family Residential and Multi-Family Customers

Water surveys provide residents with valuable information about their water use. Trained conservation professionals test the water flow rates using devices inside the home, such as showerheads, toilets, and sink aerators to make sure they are water efficient. They also check for leaks and teach the resident how to read the water meter correctly. A comprehensive evaluation is conducted on the outdoor landscape to identify inefficiencies and recommend ways the resident can save water outdoors.

Several of West Basin's water retailers have hired companies to provide this service to their customers. As the regional water wholesaler, West Basin supports these efforts and provides further resources as necessary.

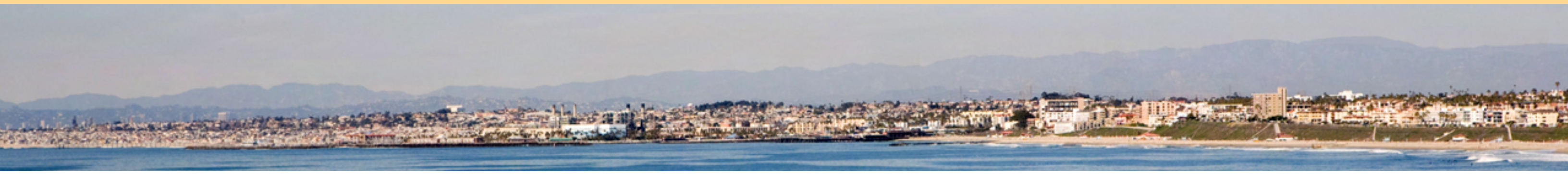
In 2007, West Basin designed a residential landscape program called the Green Garden Program and received a grant for $231,000 from USBR. In addition, West Basin received local funding through a partnership with MWD and several of its local retail water agencies. The Green Garden Program focused on providing qualified residents with free landscape surveys, "smart" irrigation controllers and rotating sprinkler nozzles. The program contained three steps:

- **Step 1:** Residents first contacted West Basin's Program vendor to pre-qualify.
- **Step 2:** West Basin's vendor provided a free landscape survey and if the resident had an older, inefficient irrigation controller, they were invited to a free sprinkler controller exchange event.
- **Step 3:** Residents brought their old irrigation controllers to the exchange event, and at the event the resident would be provided with a "smart" irrigation controller and rotating sprinkler nozzles. They would also receive one hour of training on how to install and program the controller.

Upon completion of the program in September 2010, West Basin conducted a water use study to compare the pre-controller installation water use with the post-installation water use and found an overall water savings of 14 percent. This percentage translates to about 47 gallons saved per day. Table 7-1 shows the total conserved savings from the Green Garden Program.

Table 7-1: Green Garden Program

	Number Completed	Water Use Saved (AF)
Landscape Surveys	958	N/A
Controllers Distributed	580	30
Rotating Sprinkler Nozzles	4,845	32
Total	**6,383**	**62**



7.5.2 BMP #2 - Residential Plumbing Retrofit

This BMP recommends the distribution and retrofit of low-flow showerheads, toilet displacement devices, and faucet aerators, as well as the adoption of enforceable ordinances. As Table 7-2 shows, it is estimated that since 1990, West Basin has distributed over 2,000 faucet aerators and over 220,000 low-flow showerheads.

In mid 2000, several of West Basin's retail water agencies began working with a company called Resource Action Program. This company developed a water and energy conservation kit geared for elementary school kids. As a way to provide local support and increase the program, West Basin partnered with several local water agencies and was awarded a DWR grant of $261,000 to be used for the purchase and implementation of 20,000 school kits. Through the use of these kits, a total of 588 acre-feet of water and 62 million kilowatts of electricity will be saved.

Table 7-2: Residential Plumbing Retrofits

Devices	1990-2000		2000-2005		2005-2010		Total	
	# of Units	AF Saved	# of Units	AF Saved	# of Units	AF Saved	# of Units	AF Saved
Faucet Aerators	954	3	0	0	1,133	3	2,087	6
Low-Flow Showerheads	215,563	1,014	7,500	35	152	.68	223,215	1,049

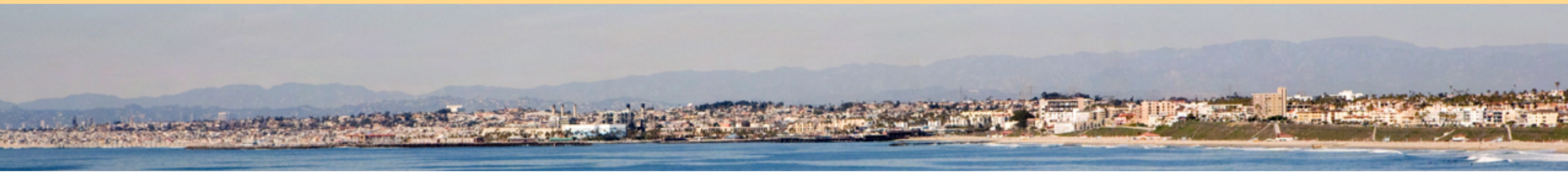
7.5.3 BMP #3 - System Water Audits, Leak Detection, and Repair

In May 2009, the American Water Works Association published the 3rd Edition *M36: Manual Water Audits and Loss Control Programs*. Included, was a new BMP 1.2 to replace the old BMP 3 and incorporated new water loss management procedures as they apply to California.

As a result, retail water agencies are expected to use the AWWA Free Water Audit Software to complete their standard water audit and water balance. Implementation shall consist of actions such as standard water audit and water balance, validation, and economic values, among others. While West Basin is required to comply with BMP 3 as a wholesale water agency, the agency is exempt due to the fact that the agency neither owns nor operates a potable water distribution system.

7.5.4 BMP #4 - Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections

Since West Basin is a water wholesaler, this BMP does not directly apply. However, every water agency within West Basin's service area bills their retail customers according to meter consumption. By encouraging the installation of dedicated landscape meters, agencies will be able to recommend the appropriate irrigation schedules through future landscape programs.



This BMP requires that agencies identify barriers that make it difficult to retrofit commercial accounts with dedicated landscape meters as well as incentives to encourage such retrofits.

7.5.5 BMP #5 - Large Landscape Conservation Programs and Incentives

This BMP requires that agencies provide non-residential customers with support and incentives to improve their landscape water efficiency. Several of the local water retailers provide free large landscape surveys and MWD provides incentives for devices such as smart irrigation controllers and rotating sprinkler nozzles.

The large landscape sector was identified in West Basin's 2006 Conservation Master Plan as an area where a considerable amount of water could be saved. Recent data shows that irrigation system and landscape inefficiencies can be as high as 50 percent. Many landscapes are poorly maintained and overwatered, therefore additional training, education and resources are needed to reduce water use. As a result, West Basin and its water retailers partnered to develop several programs with grant funds.

Ocean Friendly Landscape Program

In 2005, West Basin formed a partnership with the Surfrider Foundation to develop the Ocean Friendly Landscape Program. This program contained several water conservation and education components including:

- Facilitation of 40 Ocean Friendly Garden workshops
- Distribution of 1,350 residential "smart" irrigation controller rebates
- Distribution of 1,117 large landscape irrigation controllers,
- Development of 10 Ocean Friendly demonstration gardens
- Implementation of a study that would test the success of the irrigation controllers at reducing dry-weather runoff.

As part of the Greater Los Angeles County Region Integrated Regional Water Management Program, Proposition 50 Implementation Grant Application, this program was awarded a $1.2 million grant. Since the implementation of this program began in 2010, West Basin has been working with cities, parks, school districts, Homeowner Associations, and other qualified sites to install "smart" controllers. Table 7-3 shows the estimated conserved savings to date of this program. Once all 1,117 controllers are installed by the end of the year 2012, the total annual water savings is estimated to be 332 AF per year.

Due to the State bond freeze in 2008 and 2009, the residential rebate and demonstration garden components of the program were put on hold. They both resumed implementation in late 2010.

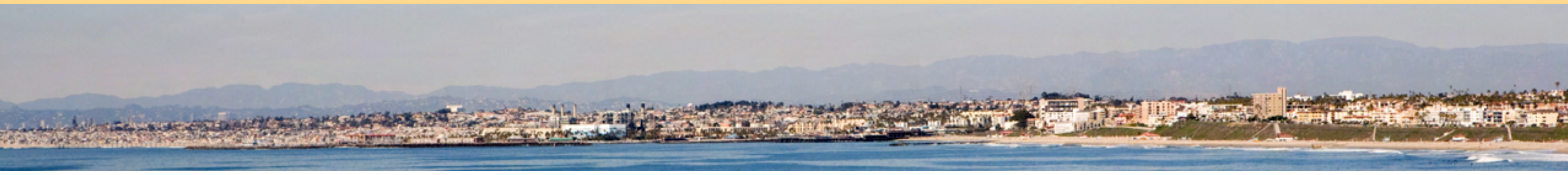


Table 7-3: Ocean-Friendly Landscape Program since Inception

Program Component	Units Completed	Annual Savings (AF)
Irrigation Controllers Installed	100	30
Classes Conducted	19	N/A
Residential Rebates Provided	5	.26
Demonstration Gardens Installed	0	N/A

Comprehensive Landscape Survey Program

In 2006, West Basin developed a Large Landscape Survey Program and was awarded funding through MWD's Enhanced Conservation Program. This program provided the services of a qualified landscape surveyor to conduct comprehensive surveys on large landscapes and provide a detailed audit report along with recommendations. Fifteen sites were audited with a resulting 55.6 percent of average irrigation efficiency due to broken and mismatched sprinkler heads, over-watering, no hydro-zoning, puddling of water, dry spots, incorrect water scheduling and various other problems.

Figure 7-3: Example Audit Report

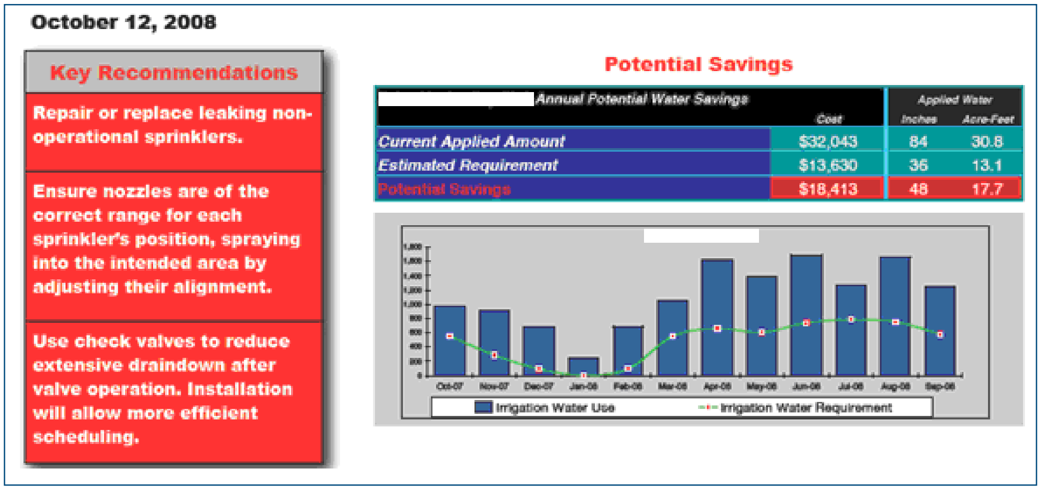
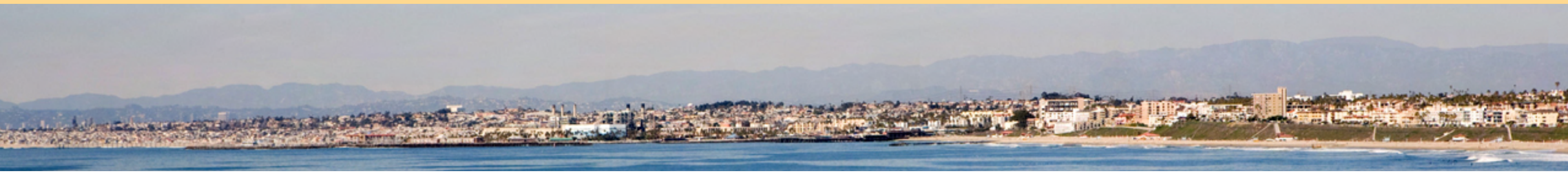


Table 7-4 is an example of the front cover of the audit report. Within the report, the water usage was analyzed and compared to the recommended water usage using the local weather or evapotranspiration potential. Key recommendations were also provided to the customer.

Table 7-4: Comprehensive Landscape Survey Program Savings

Number of Site Surveys	Annual Savings (AF)
15	51



Landscape Training to Professional Landscapers

In order to better educate the landscape community about water conservation practices, West Basin held a workshop in 2009 in the City of Malibu. West Basin partnered with the City of Malibu, Los Angeles County Waterworks District #29 (the local water retailer) and a professional landscape company to conduct a training session. The class was taught in Spanish and provided information about water-efficiency practices, the local ordinance requirements, and overall best management practices.

Model Landscape Ordinance Compliance

The landscape programs mentioned above will help West Basin and its retailers abide by the requirements of the new State's Model Landscape Ordinance. For example the ordinance contains the following requirements and provisions:

- Encouragement of the use of recycled water
- Landscape water budget component
- Provision to minimize landscape irrigation overspray and runoff
- Provisions for appropriate use and groupings of plants
- Provisions for use of automatic irrigation systems and irrigation schedules based on climate conditions

West Basin's programs are aligned with the new ordinance. For example, West Basin continues to identify and connect new customers to its water recycling system. West Basin also encourages the use of water budgets as mentioned above in the Comprehensive Landscape Program. During the last few years, several of West Basin's water retailers have developed new tiered rates and developed water budgets. Through its Ocean Friendly Garden Classes, West Basin teaches residents how to develop a water efficient and sustainable garden. Some of the topics covered include: reducing turf, installing native plants, installing drip irrigation and using weather-based irrigation controllers, all of which are mentioned in the state's new ordinance.

7.5.6 BMP #6 - High-Efficiency Washing Machine Rebate Programs

Since 2005, the MWD has provided rebates for high-efficiency clothes washers to its member agencies. MWD has branded the term BeWaterWise to develop market recognition. During the 2006–10 period, MWD conducted many radio and television commercials to promote the rebates as well as promoted the program on its *www.bewaterwise.com* website.

MWD testing found that many of the high-efficiency machines had a Water Factor of 6.0 or less. In order to motivate the public to purchase the most efficient washers possible, MWD develops a rebate that allowed only washers with a Water Factor of 4.0 or less to qualify for a $100 washer rebate. The washer rebate incentive continues to be an effective tool to achieve water conservation. Table 7-5 shows the annual water savings within West Basin's service area as a result of the use of higher efficient machines.

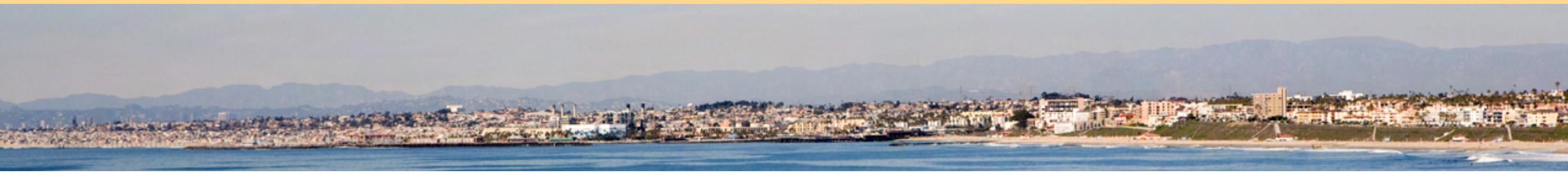


Table 7-5: High-Efficiency Washing Machine Rebate Program Savings (2003-2010)

Number of Rebates	Annual Savings (AF)
2,821	44

7.5.7 BMP #7 - Public Information Programs

West Basin uses many strategies to help promote its programs to the public. It coordinates with local and regional agencies to promote water conservation messaging as well as developing its own public information programs. Community support for WR2020 is strong based on letters of support received from City Councils, Chambers of Commerce, community groups and more than 4,000 individual supporters.

In 2009, West Basin developed and launched its WR2020 Program. The goal of this program is to communicate to the public West Basin's goal of increasing local water reliability by doubling recycled water production, doubling its water conservation efforts and introducing ocean-water desalination to its water portfolio. All of West Basin's supply development programs fall under the umbrella of the WR2020 Program. As part of WR2020, West Basin offers the specific conservation related programs described below.

WR2020 Program – Speakers Bureau

West Basin staff provides presentations on its WR2020 Program. In 2009/10, West Basin conducted over 100 presentations to local community groups that included city councils, service clubs, chambers of commerce and others. The presentations provided information on current water supply challenges and the programs that West Basin launched to help meet those challenges. Through outreach efforts more than 3,500 local residents and 100 cities/community groups pledged their support for the WR2020 Program.

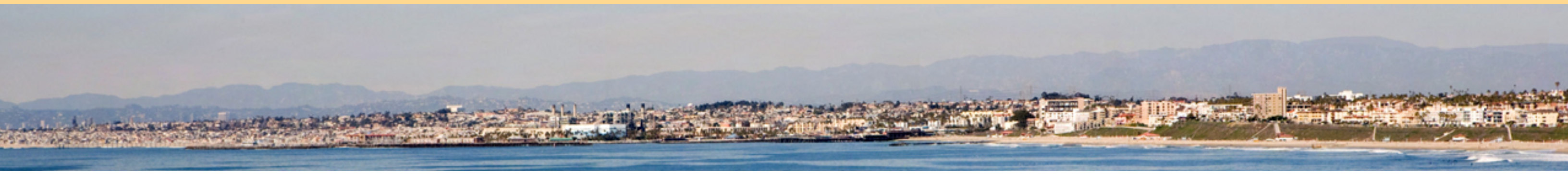
Imported Water Supply Tours

West Basin, in cooperation with MWD, also provides inspection tours of the Colorado River Aqueduct and the State Water Project to legislators, local elected officials, retail agency staff, and the general public at various times throughout the year. The purpose of the three-day trips is to give local decision-makers a better understanding and appreciation of the water supply issues impacting the region.

Water Harvest Festival

Water Harvest Festival

In October 1999, West Basin began its first annual Water Harvest Festival located at the ECLWRF in El Segundo. West Basin invites the public to participate in a variety of games, shows, tours and contests to learn from informational stations about water recycling and conservation. In 2010, West Basin conducted its 12th annual Water Harvest Event that had over 3,000 people



in attendance. The event features local agencies and water conservation product vendors that provide the public with information about water conserving devices, rebates and programs. West Basin also provides free tours of its facility and demonstrates to the public how waste water is turned into usable recycled water.

Smart Landscape Expo

There has been an increased desire by the public recently to learn more about native plants, drip irrigation and other landscape conservation devices and measures. In response, West Basin developed the Smart Landscape Expo, where the public can visit irrigation vendors and purchase native plants from local nurseries. At the initial expo, conducted in 2009, West Basin provided free 30-minute workshops taught by landscape designers. West Basin filmed several outdoor landscape demonstrations and placed the clips on its web site for the public to view. For the second annual Expo, West Basin will incorporate energy efficiency awareness into the event to give the public a more holistic view of green living both outdoors and indoors. It will be renamed the Water and Energy Smart Expo.

Water Recycling and Ocean-Water Desalination Tours

Once a month, West Basin offers free tours of its ECLWRF to the public to share the WR2020 Program, educate visitors about water supply issues, and show how water is purified in 20 minutes. The ocean-water desalination facility will open to the public in May 2011, and will soon offer tours three days a week. Both facilities will also be open for school tours for grades 3-12.

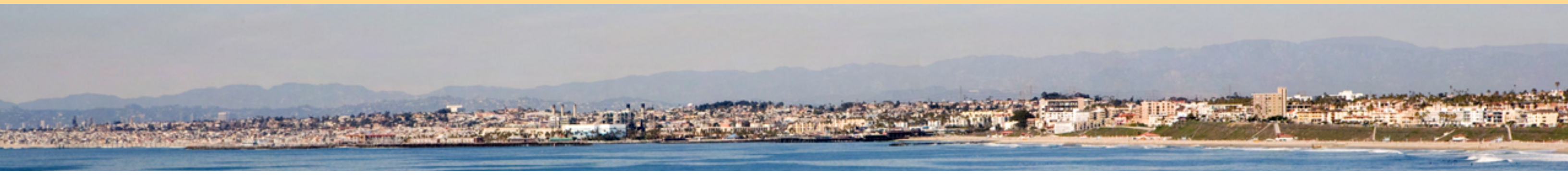
ECLWRF School Tours

Ocean Friendly Garden Classes

In 2008, West Basin began offering free Ocean Friendly Garden (OFG) Classes as part of its larger Ocean Friendly Landscape Program. In 2010, West Basin, in partnership with the Surfrider Foundation, conducted 19 classes throughout its service area. Classes are one-day, three-hour sessions that teach residents how to build an Ocean Friendly Garden of their own, reduce runoff, landscape with drought-tolerant plants, and keep water on their property. These classes were well attended with as many as 60 residents participating per class.

Zero Runoff Street Median Water Conservation Program

For this West Basin sponsored program, water efficient street medians and parkways were designed to reduce water use by at least 50 percent and water runoff by 100 percent. This program included projects that replaced existing street medians and parkways with a combination of artificial turf, porous cover, native and/or drought tolerant plants, drip irrigation, or Smart Irrigation Controllers. Several cities took advantage of this program and retrofitted street medians to reduce water use, reduce runoff and educate the public about water conservation.



Native Plant Demonstration Garden

New Native Plant Demonstration Gardens

In 2009, West Basin built a new Native Plant Demonstration Garden at ECLWRF in El Segundo. As a part of this project, West Basin held two hands-on workshops where the public assisted with the installation of the plants, drip irrigation and the permeable walkway. In 2010, West Basin also renovated the landscape at its headquarters in Carson with two hands-on workshops to install and maintain the native plants and a drip irrigation system.

California Water Awareness Campaign

West Basin is also active with the California Water Awareness Campaign (CWAC), which is an association formed several years ago to coordinate efforts throughout the State during its *May is Water Awareness Month* campaign. With this effort, water agencies throughout the State, large and small, can tap into a large pool of knowledge and materials to promote a water awareness message not only in May, but throughout the year.

Media Outreach

West Basin maintains a strong link with the local news media through press releases, one-on-one tours and talks, and small group briefings to share West basin's ongoing achievements in making water supply more reliable. Recently, West Basin conservation staff was included on the cover of a Palos Verdes gardening supplement highlighting native water efficiency plants.

7.5.8 BMP #8 - School Education Programs

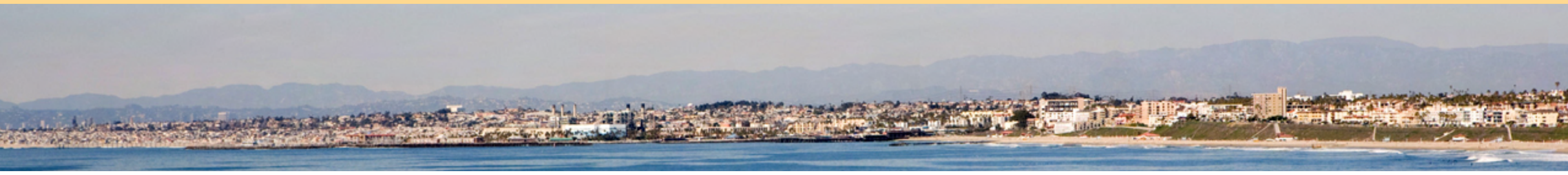
Water and environmental education continue to be critical components of West Basin's outreach strategy. Therefore, West Basin offers a variety of elementary through high school programs free of charge to all schools within its service area. Descriptions of each program can be found in Section 7.7.

7.5.9 BMP #9 - Conservation Programs for Commercial, Industrial, and Institutional (CII) Accounts

West Basin has increased its participation and involvement with the CII sector over the past few years. Since 2007, West Basin has implemented, designed and participated in a number of successful CII programs partnering with local water agencies and their purveyors as well as with governmental organizations for increased outreach opportunities, described further below.

Complete Restroom Retrofit Program

This program provides businesses using older restroom devices with high-efficiency toilets, urinals and sink faucets. This program was initially funded through a grant and has been ongoing since 2007. This program has been successful for both small businesses and larger businesses alike. Phase 2 of the program was implemented in 2010 and will focus more on larger commercial customers such as high-rise buildings and hotels.



Recirc and Save Program

This program incentivizes large commercial and industrial customers to implement water-use efficiency projects as identified by West Basin. Increased incentives are offered for cooling tower efficiency upgrades and process water efficiency improvements such as water supply recirculation and on-site treatment. This program also offers technical assistance and audits to assist these customers in making changes to their processes that will result in water use reductions.

Cash for Kitchens Program

During its pilot phase in 2009, this program initially targeted large (greater than 1,000 square feet) commercial kitchens but has now been expanded to also include smaller restaurants. Food service facilities can benefit greatly from the use of efficient devices as well as through behavioral changes. In order to address both, the program includes a quick audit, a session with the facility's management as well as device replacements for qualifying equipment.

Public Sector Program

This program was designed and implemented by MWD to assist public and institutional facilities in making water-efficiency upgrades. It was offered as a limited-time only program providing up-front funding for these public sites to make changes to their indoor and outdoor water-using systems.

Save Water, Save a Buck

In 2005, West Basin entered into a 10-year agreement with MWD to help support the on-going regional marketing efforts of this CII rebate program. As a way to increase the success of this program, West Basin offers its cities and water purveyors an opportunity to contribute additional funding to Save Water, Save a Buck to increase the rebate amounts available to their commercial customers. Over the years, agencies have partnered to provide higher rebate amounts in an effort to increase conservation participation from their customers. Rebates are offered for commercial clothes washers, water brooms, cooling tower conductivity controllers, pre-rinse spray nozzles, x-ray machine recirculating devices and commercial toilets and urinals.

7.5.10 BMP #10 - Wholesale Agency Programs

The programs provided by West Basin as a regional wholesaler are done in partnership with its retail agencies to benefit the 17 cities that are located within West Basin's service area as shown in Table 7-7.

Since 2005, West Basin has acquired more than $4 million from State, Federal and local grant funding sources for program development and implementation. Furthermore, West Basin markets, designs and implements a majority of the BMPs within its service area. West Basin has also invested over $2 million over the last five years to provide conservation and education programs that help increase water supply reliability for the region.

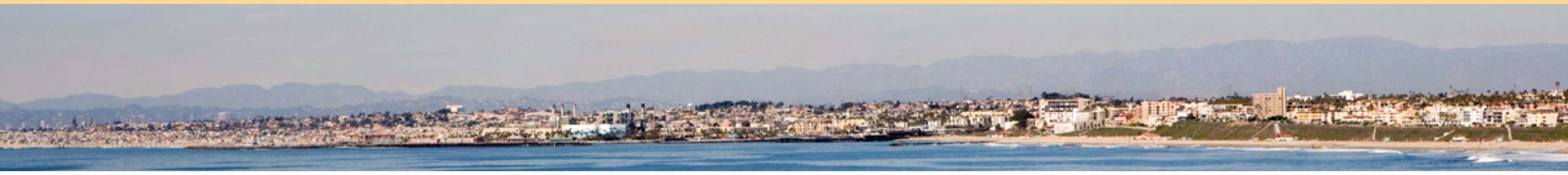


Table 7-6: Summary of CII Programs

Program	Devices Distributed	Number of Units	AF Savings*	Agency Partnerships
Complete Restroom Retrofit	High-Efficiency Toilets, Zero-Water and Ultra-Low Flush Urinals, Self-Closing Sensor Faucets	1,164	804	California Water Service Company and Golden State Water Company, Metropolitan Water District, Department of Water Resources, Water Replenishment District
Recirc and Save	pH Conductivity Controllers, Various process improve-ments	3	29	California Water Service Company and Golden State Water Company, Metropolitan Water District, Department of Water Resources, United States Bureau of Reclamation
Cash for Kitchens	Faucet Aerators, Flow Restrictors, Pre-Rinse Spray Valves, Waterbrooms	162	14.7	California Water Service Company, Golden State Water Company, Water Replenishment District, Metropolitan Water District
Public Sector Program	High-Efficiency Toilets, Zero-Water and Ultra-Low Flush Urinals, Waterbrooms, Centralized Irrigation Controllers, Synthetic Turf	265	978	Metropolitan Water District
Save Water, Save a Buck	Various	11,320	12,857	Metropolitan Water District, California Water Service Company, and Golden State Water Company
TOTAL		**12,914**	**14,683**	

*Over the Lifetime of the Devices

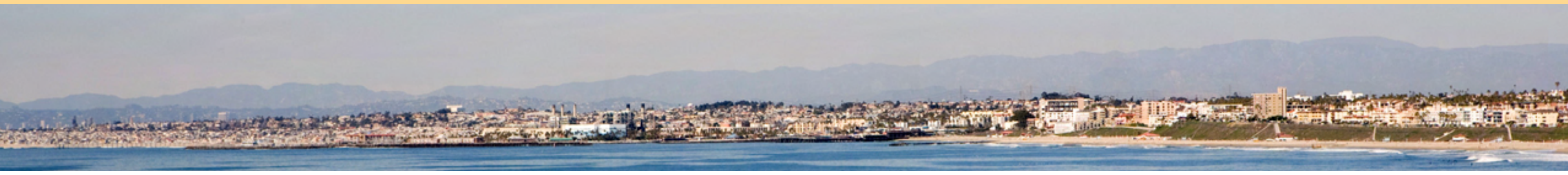


Table 7-7 West Basin Wholesale Agency Program Support

Retail Agencies that West Basin Supports	BMPs that West Basin Supports
California American Water Company California Water Service Company City of El Segundo City of Inglewood City of Lomita Los Angeles County Waterworks District #29 City of Manhattan Beach Golden State Water Company	BMP #3 - System Audits BMP #5 - Landscape Programs BMP #6 - Washing Machines BMP #7 - Public Information BMP #8 - School Education BMP #9 - CII Rebates and Programs BMP #10 - Wholesaler Incentives BMP #12 - Water Conservation Coordinator BMP #14 - ULFT Replacement

As part of West Basin's WR2020 Program, conservation programs will be further enhanced to provide even greater support to city and water retailer conservation program efforts.

7.5.11 BMP #11 - Conservation Pricing

In 2003, West Basin passed-through MWD's two-tiered rate structure to its customer agencies to promote water conservation and regional water supply reliability. This rate structure called for customer agencies, in coordination with West Basin, to develop a reasonable budget for their Tier 1 annual maximum limit for imported water. Through voluntary purchase agreements, these customers will pay a higher price (Tier 2) for purchases that exceed their Tier 1 allotment. To assist them in not exceeding their Tier 1 allocation limits, West Basin works with agencies to enhance conservation, education and expand recycled water use.

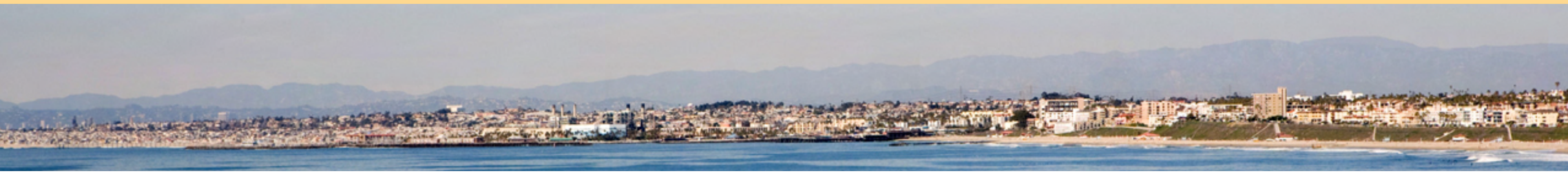
7.5.12 BMP #12 - Water Conservation Coordinator

In 2007, West Basin added an additional full time employee, which was identified in the 2006 Conservation Master Plan, to assist with the development of West Basin CII Programs. West Basin's Conservation Department now employs both a Senior Water Use Efficiency Specialist and a CII Specialist.

7.5.13 BMP #13 - Water Waste Prohibition

West Basin helped to promote MWD's *Its Time to Get Serious* media campaign by developing a campaign to increase our cities' awareness of the current water situation by requesting that they adopt a resolution. The resolution stated that the city would be willing to review their current ordinances and policies as they related to water conservation. With West Basin's effort, many cities adopted the resolution and seven cities actually passed stricter water efficiency ordinances.

In 2008/09, MWD launched the Public Sector Program. This program provided upfront incentives to motivate the public including cities, counties, agencies, schools, and others, to purchase and install water-use efficiency devices. In order to participate in this program, MWD required each city to pass a Water Waste Prohibition Ordinance.



These ordinances feature provisions regarding water waste ranging from outdoor watering restrictions and requirements for water features and pools to requiring eating establishments to provide drinking water upon request only and requiring new car washes be equipped with recirculation systems. To date, the cities within West Basin's service territory that have passed these ordinances include: Rolling Hills Estates, West Hollywood, Lomita, Manhattan Beach, Culver City, El Segundo, and Malibu. Each city's ordinance may differ slightly.

7.5.14 BMP #14 - Residential Ultra-Low-Flush Toilet (ULFT) Replacement Programs

Since early 2000, MWD, West Basin and its local water retailers have been providing the public with ULFT rebates and programs. These successful programs have evolved through the steps listed below to provide the increasing water savings shown in Table 7-8.

- 2000 – 2010: MWD, West Basin, and local retailers provided rebates
- 2000 – 2010: West Basin provided free ULFTs and High-Efficiency Toilet (HET) to the public through its one-day toilet distributions
- 2008: West Basin received a grant from MWD to directly install HETs in the multi-family sector
- 2010: MWD, due to high ULFT saturation levels (in specific areas of its region), stopped providing residential toilet rebates

Table 7-8: ULFT / HET Rebate Program

	2000-2004	2005-2010	Total
$ per Rebate	$100	$50	N/A
# of Rebates	2,822	1,271	4,093
Water Savings (AF)	113	51	164

Over the last five years, there have been several new technological advancements with the ULFTs. In 2006-07, the 1.28 gallon per flush HET was introduced and began gaining greater acceptance in the market.

In 2009, MWD conducted a region-wide saturation study, as part of its *SoCalWaterSmart* Program and found a water efficient saturation level of over 70 percent. Therefore, in 2010, MWD phased-out the rebate for the HET. In 2004, West Basin had estimated a 40% saturation level and in 2009, estimated 60% saturation. West Basin's portion of MWD's service area has older communities and opportunities still remain for replacement of older 3 - 5 gallon toilets. Since opportunities still exist in West Basin's service area, West Basin along with several of its retail water agencies has continued conducting its free one-day HET distribution events. The results of this program are shown in Table 7-9.

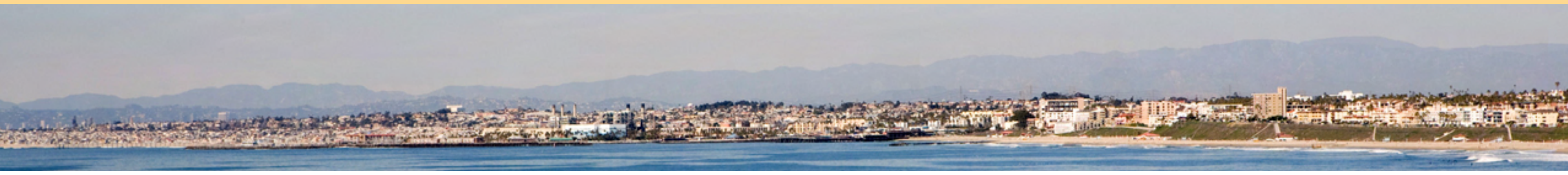


Table 7-9: One Day Free HET Replacement Program Savings

	2000-2004	2005	2006*	2007*	2008	2009	Total
# of Devices	13,172	2,742	0	0	2,593	1,500	20,007
Water Savings (AF)	381	110	0	0	104	60	655

*Temporary stop in program

In 2006, West Basin and its sister agency Central Basin Municipal Water District separated and became two distinct agencies so there was a halt of this program from 2006 -2007. Also during this time period, West Basin's toilet vendor went out of business but was able to restart toilet distributions in 2008.

Multi-Family Program

In 2008, West Basin developed a unique water/energy direct installation program called Green Living for Apartments & Condos. In collaboration with Southern California Edison (Edison) and the Southern California Gas Company (Gas Company), West Basin received a MWD grant to provide apartment and condominium owners with free installations of HETs, showerheads, bathroom aerators and compact fluorescent light bulbs. A total of 2,000 HETs were installed, conserving an estimated 80 AF per year. During this period, West Basin also provided an additional 1,000 toilets to the Multi-family sector, for a total of 3,000 toilets.

Table 7-10: Multi-Family Residential Device Replacements

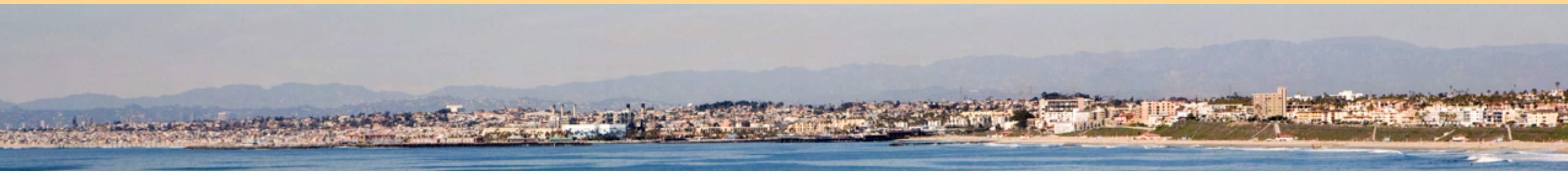
	2008	2009	Total	Annual Savings (AF)
HETs	2,500	1,500	4,000	161
Showerheads	214	214	428	3
Aerators	230	230	460	1.2
CFLs	500	500	1,000	N/A
Water Savings (AF)	104	60	655	165

7.5.15 Additional Conservation Programs

West Basin is very active in working with MWD to develop new conservation programs that are included in the CUWCC BMPs. In 2005, MWD implemented two new programs that are described below.

Water and Energy Implementation Program (WEIP)

West Basin is designing the WEIP to lay out both near-term and long-term goals working toward program integration between ourselves, Edison, the Gas Company and the water purveyors. Potential integration includes coordinated visits with the Gas Company for the *Cash for Kitchens* program, to acknowledge the strong connection between kitchens and natural gas use, and coordinated efforts to market and



implement water-efficiency programs along with Edison's well established Small Business Direct Install programs.

Community Partnering Program

MWD, in cooperation with its member agencies, accepts applications from non-profit organizations and public agencies that promote discussions and educational activities for regional water quality, conservation and reliability issues. This program provides support for the following types of activities:

- After-school water education
- Community water festivals
- Watershed education outreach
- Environmental museum exhibits
- Library water resources education book drives
- Public policy water conferences
- Other projects that directly support water conservation or water quality education

7.6 Current and Future Education Programs

West Basin is particularly dedicated to working with MWD and its customer agencies to provide water conservation educational opportunities for the communities they serve. West Basin manages and supports several programs and has also developed new program ideas for future implementation.

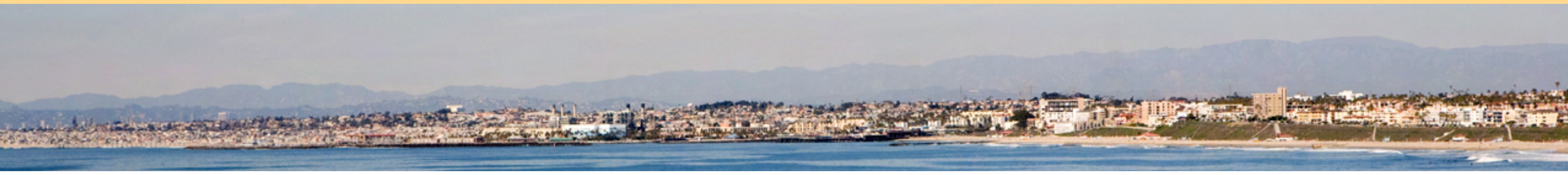
Solar Cup

7.6.1 Current Programs

Solar Cup

Solar Cup is an annual solar-power boat building and racing competition held for high school students in Southern California. The goal of the 7-month program is to encourage students to learn about science, mathematics, water quality issues, conservation, and alternative energy and fuel sources. This year, MWD, the lead sponsor of the program, allowed member agencies, including West Basin, to sponsor up to four teams. In 2010, the West Basin sponsored teams were divided into veteran and rookie teams.

- Veteran Teams
  - Palos Verdes Peninsula High School, Rolling Hills Estates
  - City Honors High School, Inglewood
- Rookie Teams
  - Environmental Charter High School, Lawndale
  - West High School, Torrance



Water is Life Student Art Contest

This program encourages 3rd -12th grade students to learn about their water supply and design a water conservation slogan illustrated with original artwork. Grand prize winners in the elementary, middle and high school categories receive a MacBook laptop through the generous support of United Water Services and the Law Offices of Lemieux and O'Neill.

Board of Directors Scholarship Program

The West Basin Board offers an annual Scholarship Award of up to $1,000 per qualified student with an interest in pursuing studies or a career in the water industry. Commencing in 2009, this program awarded eight scholarships to graduating high school seniors in West Basin's service area who have been accepted to a college, university or trade school. In 2010, this program awarded seven scholarships.

Water Educators Newsletter

West Basin keeps in touch with educators and administrators regarding our programs through our quarterly newsletter *Waterworks*.

Water Educators Newsletter

Water Explorations School Tours

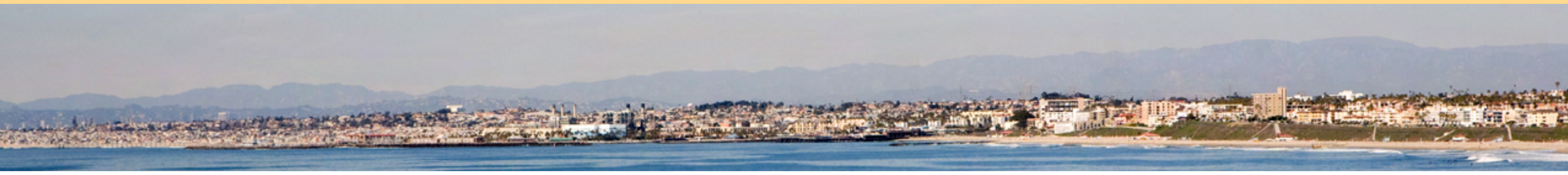
West Basin offers a free field trip experience for 3rd – 12th grade students (including a complimentary school bus) to visit the ECLWRF in El Segundo. During the field trip, students interact with a conservation exhibit that teaches the students about how changing their behavior can save water. The students are then taken to visit the SEA Lab aquarium to learn about local marine life. Also located at the SEA Lab facility is West Basin's new Water Education Center where students again get to experience another interactive conservation exhibit and learn about ocean-water desalination.

Table 7-11: School Tours at ELCWRP

Grade Level	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10	Total
Grades K-3rd	475	958	1,012	1,939	1,033	5,417
Grades 4th-6th	590	1,061	1,534	2,893	2,467	8,545
Grades 7th-8th	35	332	150	542	196	1,255
High School	0	25	145	344	167	681
Total	**1,100**	**2,376**	**2,841**	**5,718**	**3,863**	**15,898**

Water Star Program

West Basin's new WR 2020 Water Star Program encourages elementary aged school children to sign up to save 20 gallons a day, reducing our dependence on imported water and reducing runoff to the ocean. Children receive a water star conservation kit



Water Star Program

complete with fix-it tickets, a water star badge, shower timer, faucet aerator, and other water-saving reminders. More than 700 students pledged to save 20 gallons per day during the 2010 pilot program.

Surfrider Foundation Teach and Test Program

The Surfrider Foundation South Bay Chapter's Teach and Test Program is an exciting project pairing high school students with graduate students from Loyola Marymount University to study the water quality of our South Bay beaches. West Basin sponsors this on-going effort to improve the water quality of Santa Monica Bay and introduce youth to water quality research and careers.

Teams volunteer to collect water samples from 12 local beaches to then analyze and publish their results in an on-going database. Students have participated from several schools within West Basin's service area including Chadwick School, Westchester, El Segundo, Redondo Union, and South high schools.

Splash Science

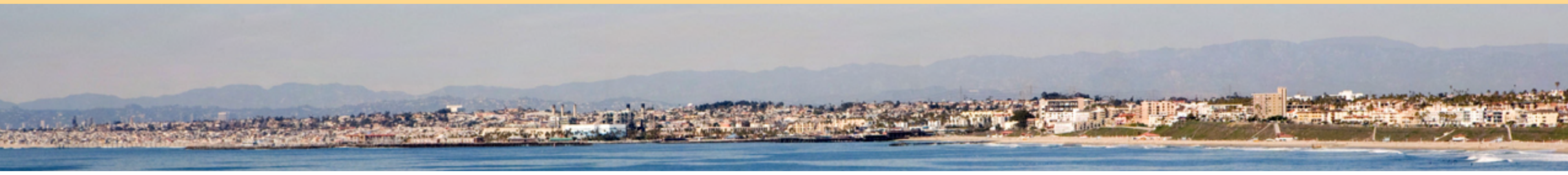
In 2011, Splash Science will be morphed into a program to bring students to the Ocean-Desalination Demonstration Facility.

Career Training Programs

Every February, West Basin partners with United Water Services, Inc. to participate in the Inglewood/Airport Chamber of Commerce's Annual Youth Business and Industry Job Shadow Day. West Basin serves as a business host and conducts a 5-hour water careers program and facility tour that accommodates 10 students. Students are introduced to West Basin's mission, water sustainability projects, agency organization and variety of job positions. Students then go on a tour of the ECLWRF to see the result of the public/private partnership with United Water. Students are exposed to a wide range of careers in chemistry, biology, engineering, human resources, finance, water resource planning, public affairs, operations and maintenance. West Basin also hosts high school summer internships in partnership with the South Bay Workforce Investment Board.

7.6.2 Future Programs

In addition to the programs listed above, in 2010 West Basin will be completing an Education Master Plan that outlines the programs best suited for the students within our service area. These programs will be considered for implementation over the next five years.



7.7 Conservation Program Partnerships

By partnering with various entities, West Basin is able to leverage its funding and resources in order to develop targeted programs that have been identified in its CMP.

Over the last five years, West Basin has partnered with local, state and federal agencies and has received several grants. These grants have allowed West Basin to develop and offer the public free water conservation programs. For every $1 that West Basin invests, it provides $6 worth of programs to the public. West Basin's funding partners have included the following:

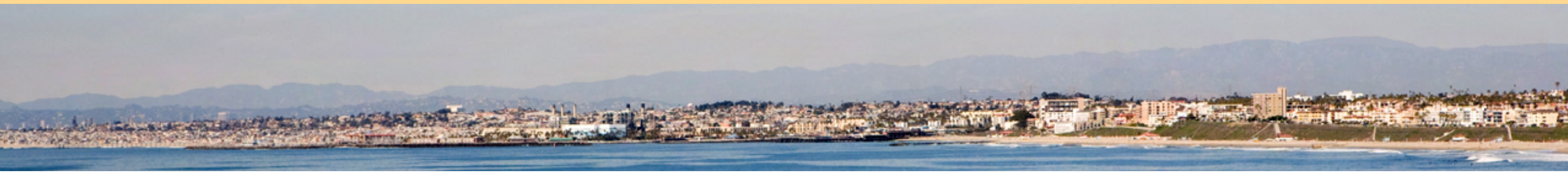
- United States Bureau of Reclamation (USBR)
- California Department of Water Resources
- Metropolitan Water District
- Retail Water Agencies
- Southern California Edison
- Southern California Gas Company

Over the last several years, West Basin has also developed new and important partnerships that help expand West Basin's conservation programs and messages including:

- **South Bay Environmental Services Center (South Bay Center):** In 2006, West Basin formed a partnership with the South Bay Center. The South Bay Center is a program of the South Bay Cities Council of Governments (South Bay COG) that promotes programs provided by Edison, the Gas Company, Los Angeles County Sanitation District and LA Metro as well as West Basin's water conservation programs throughout 16 cities in the South Bay.

- **Surfrider Foundation:** In 2006, West Basin formed a partnership with Surfrider for the purpose of creating the Ocean Friendly Landscape Program. Since that time, West Basin has also helped to sponsor Surfrider's Teach & Test Program. Surfrider works with high school students to teach them about water runoff issues and pollution to the ocean.

- **Southern California Edison and Southern California Gas Company:** Efforts to work more closely with the energy utilities have been made through West Basin's partnership with the South Bay Environmental Services Center. Residents and businesses interested in saving energy are more likely to be interested in saving water as well. Leveraging the efforts of the energy utilities allows for more cost-effective programs as well as enhanced offering for residential and business customers alike. Successful integration of water-use efficiency and energy efficiency programs is happening on a small scale with the real possibility of further and larger scale integration in the near future.



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SECTION EIGHT

Rates and Charges

2010

SECTION 8 Water Rates & Charges

West Basin Water Purchases

As a water wholesale agency, West Basin does not directly charge residential and other end-use customers for supplies. Instead, West Basin's customer agencies purchase water from West Basin and then combine it with other supplies to deliver to their retail customers at a variety of rates.

West Basin's current potable water rates are primarily based upon the costs of imported supplies purchased from MWD. Imported water purchased by West Basin from MWD carries not only the cost of acquiring, importing, treating and distributing the water throughout the region, but also these costs associated with maintaining MWD reliability and "readiness to serve'. The total West Basin rate structure must include the value-added costs associated with representing customer agencies at MWD, and distributing locally-produced recycled and desalinated groundwater supplies.

8.1 MWD Rate Structure

In 2002, the MWD Board adopted a new rate structure to support its strategic planning vision to encourage the development of local supplies like recycled water and conservation, and ensure a reliable supply of imported water. To achieve these objectives, MWD called for voluntary purchase orders from its member agencies, unbundled its water rates, established a tiered supply rate system, and added a capacity charge. The new rate structure components provide a better opportunity for MWD and its member agencies to manage their water supplies and proactively plan for future demands.

8.1.1 Purchase Orders

The Purchase Order is an agreement between MWD and a member agency, whereby the member agency agrees to purchase a minimum amount of non-interruptible water over a ten-year Purchase period. The Annual Maximum is the amount of lower cost (Tier 1) non-interruptible water that a member agency is entitled to purchase annually as a result of that Purchase Order.

Table 8-1 shows how both the current annual maximum and purchase commitment were calculated for West Basin. West Basin's highest delivery of non-Order interruptible water was 174,304 AF in 1990. Therefore, West Basin's Tier 1 annual maximum is calculated as 90 percent of 174,304 AF – or 156,874 AF. The total purchase commitment is 60 percent of 174,304 AF multiplied by the 10 year Purchase Order period - or 1,045,824 AF to be purchased by the end of 2013. Since signing a Purchase Order with MWD in 2002 West Basin has remained below its Tier 1 annual maximum and has been on track to meet its Purchase Commitment by the year 2012.

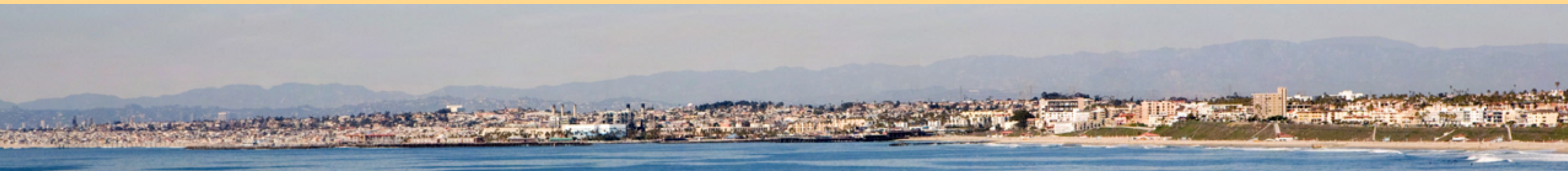


Table 8-1: West Basin Purchase Order Terms

Initial Base Allocation (AF)	Tier 1 Annual Maximum (90% of Base) (AF)	Purchase Order (60% of Base x 10) (AF)
174,304	156,874	1,045,825

8.1.2 Unbundled Rates and Tier 1& 2

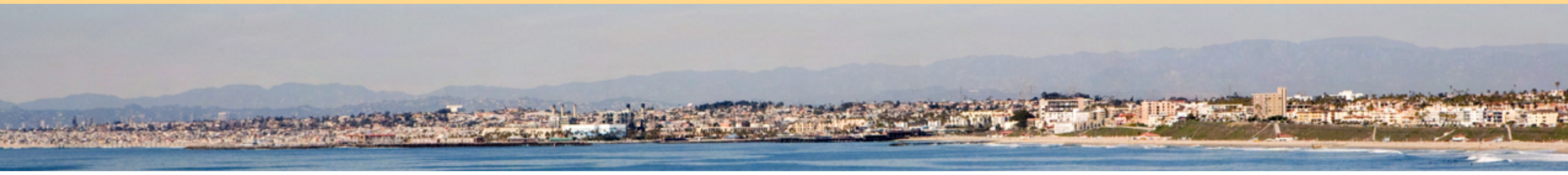
To justify the different components of the costs of water on a per acre foot basis, MWD rates are comprised of the following components:

- **Supply Rate Tier 1:** Reflects the average supply cost of water from the Colorado River and State Water Project.
- **Supply Rate Tier 2:** Reflects the MWD costs associated with developing new supplies, which is assessed when an agency exceeds its Tier 1 limit of firm deliveries.
- **System Access Rate:** Recovers a portion of the costs associated with the conveyance and distribution system, including capital and operating and maintenance costs.
- **Water Stewardship Rate:** Recovers MWD's cost of providing incentives to member agencies for conservation, water recycling, groundwater recovery, and other water management programs approved by the MWD Board.
- **Delta Supply Surcharge:** Reflects the additional supply costs that Metropolitan faces along with other costs due to the pumping restrictions on the State Water Project. The Delta Supply Surcharge replaced the Water Supply Surcharge effective with the FY 2009/10 rates.
- **System Power Rate:** Recovers MWD's electricity-related costs, such as the pumping of water through the conveyance and distribution system.
- **Treatment Surcharge:** Recovers the treatment cost and is assessed only for treated water deliveries, whether firm or non-firm.

The MWD water rates for calendar year 2011 are displayed in Table 8-2.

Table 8-2: MWD Rates Adopted for 2011

Category of Water	$/AF
Supply Rate Tier 1	$104
Supply Rate Tier 2	$280
System Access Rate	$204
Water Stewardship Rate	$41
Water Supply Surcharge	$0
Delta Supply Surcharge	$51
Power Rate	$127
Treatment Rate	$217
Total Tier 1 Treated Rate	**$744**
Total Tier 2 Treated Rate	**$869**



8.1.3 Replenishment Service

Although the great majority of the MWD water supplies are sold as uninterruptible Tier 1 or Tier 2 supply, there are times when excess supply is available for storage replenishment purposes. Since these excess supplies are only as available (or interruptible), they are typically bought at a discounted rate by agencies to recharge groundwater supplies or fill surface storage. This Replenishment Service Water is offered by MWD as either untreated or treated (that can be used as "in-lieu," where a retail agency will curtail pumping and instead take direct deliveries from MWD). Replenishment Service Water rates are not tied to the uninterruptible rate structure illustrated in Table 8-2 These rates are established by MWD to provide the best incentive to replenish the groundwater basins. Replenishment Service rates effective January 1, 2011 are shown in Table 8-3.

Table 8-3: MWD Replenishment Service Rate Adopted for 2011

Category of Water	$/AF
Replenishment Water Rate Untreated	$409
Treated Replenishment Water Rate	$601

8.1.4 MWD Capacity Charge

The MWD capacity charge was developed to recover the costs of providing distribution capacity use during peak summer demands. The aim of this charge is to encourage member agencies to reduce peak day demands during the summer months (May 1 thru September 30) and shift usages to the winter months (October 1 thru April 30), which will result in more efficient utilization of MWD's existing infrastructure and defers capacity expansion costs. Currently, MWD's capacity charge for FY 2010 and 2011 are set at $7,200/cubic feet per second (cfs).

The capacity charge is applied to an agency's maximum usage rate, which is the highest daily average usage (per cfs) for the past three summer periods. Table 8-4 shows the maximum usage rate for West Basin.

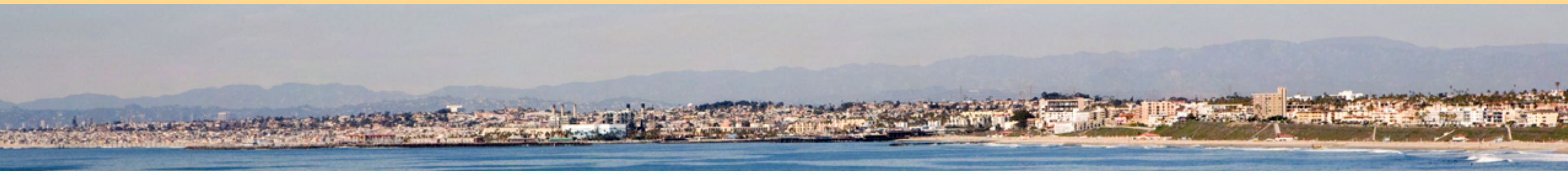
Table 8-4: Metropolitan Water District Capacity Charge for 2010

Peak Flow 2007 (cfs)	Peak Flow 2008 (cfs)	Peak Flow 2009 (cfs)	3-Year Max (cfs)	Capacity Charge
262	243	221	262	$1,663,700

Note: These peak flows are based upon West Basin's coincident peak of all its MWD connections.

8.1.5 Readiness-to-Serve Charge

MWD's readiness-to-serve charge recovers a portion of MWD's debt service costs associated with regional infrastructure improvements and is determined by the member agencies' firm imported deliveries for the past ten years. West Basin meets this obligation through its commodity rates.



8.2 West Basin's Imported Water Rates

To deliver water from MWD to its customer agencies, West Basin must pass along the MWD costs as well as an additional administrative surcharge. Described below are elements of the rate structure that West Basin applies to the delivery of imported water for its customer agencies.

8.2.1 Purchase Agreements

In order to meet the Purchase Order commitment with MWD, West Basin established its own purchase contract policy with its customer agencies. West Basin's Imported Water Purchase Agreement also calculates an annual maximum and total purchase commitment, but offers more flexibility to the customer. West Basin requires only a five-year commitment, as opposed to the ten-year MWD term. Furthermore, customer agencies have the option to adjust their annual maximum and purchase commitment amounts annually by offsetting imported water demand with recycled water purchased from West Basin. For purchases above the Tier 1 limit, or in the absence of a Purchase Agreement, the customer agency pays the Tier 2 rate.

8.2.2 Reliability Service Charge

One of the main revenue sources for West Basin is the reliability service charge applied to all imported water sold. Revenue from this charge recovers West Basin's administrative costs including planning, outreach and education, and conservation efforts, as well as a portion of the recycled water system operating costs. As of July 1, 2010, West Basin's reliability service charge is at $66/AF.

8.2.3 Readiness-to-Serve Surcharge

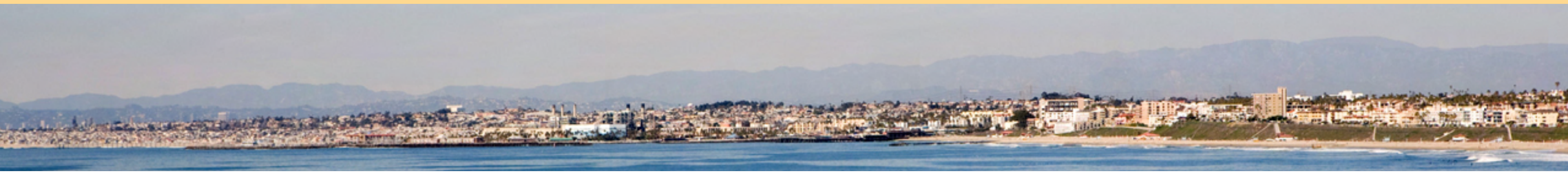
West Basin passes along MWD's readiness-to-serve charge within its commodity rates for non-interruptible and Barrier water supplies to cover this charge. As of January 1, 2011, West Basin's surcharge will be $125/AF.

8.2.4 Water Service Charge

Water utility revenue structures benefit from a mix of fixed and variable sources. West Basin's water service charge recovers a portion of the agency's fixed administrative costs, but is a relatively small portion of its overall revenue from water rates. As of July 1, 2010, the water service charge is $34/cfs of a customer agency's meter capacity for imported water meters.

8.2.5 West Basin's Capacity Charge

MWD's capacity charge is intended to encourage customers to reduce peak day demands during the summer months, which will result in more efficient utilization of MWD's existing infrastructure. West Basin has passed through MWD's capacity charge to its customer agencies based upon their highest daily average usage (per cfs) for the past three summer periods. The capacity charge that West Basin is assessed by MWD is $6,350/cfs for FY 2011.



8.2.6 Desalter Water Charges

West Basin also sells water produced by the Brewer Desalter at the effective MWD rate. This includes the MWD non-interruptible base rate and an acre-foot equivalent for the Capacity Charge. Currently, the rate for Desalter water is $767/AF as of January 2011.

8.3 Recycled Water Rates

West Basin's ECLWRF provides five different qualities of water to meet the needs of landscape irrigation, cooling towers, refineries, and industries within and outside its service area. Since 1995, West Basin has encouraged the maximum use of recycled water by providing an economic incentive through specialized rates and charges.

Recycled water use for irrigation

8.3.1 Recycled Water Rates

West Basin uses seven different rates for recycled water to account for differing treatment quality, power requirements, and customer location. All rates are assessed to include the operation and maintenance costs, and labor and power costs associated with the delivery of recycled water. A majority of these rates are set up in a declining tiered structure to further encourage the use of recycled water, while the others are set up to service one or more customers at a uniform rate. Most of the recycled water rates are set lower than potable water rates except for highly treated recycled water for use by refineries. Fiscal year 2010 – 2011 rates are shown in Table 8-5.

Table 8-5: 2010-2011 Recycled Water Rates

	Within West Basin Service Area					Torrance/ LADWP Service Area	Palos Verdes Zone
AF	**Basic**	**West Coast Barrier**	**Indus-trial R/O**	**AF**	**Basic**	**West Coast Barrier**	**Indus-trial R/O**
0-25	$686/AF	$540/AF	$914/AF	0-25	$686/AF	$540/AF	$914/AF
25-50	$676/AF	$540AF	$914/AF	25-50	$676/AF	$540AF	$914/AF
50-100	$666/AF	$540/AF	$914/AF	50-100	$666/AF	$540/AF	$914/AF
100-200	$656/AF	$540/AF	$914/AF	100-200	$656/AF	$540/AF	$914/AF
200+	$646/AF	$540/AF	$914/AF	200+	$646/AF	$540/AF	$914/AF

Customers outside of West Basin's service area boundaries pay an additional $42/AF per tier. This additional charge is applied to make up for the recycled water standby charge that is not levied on their parcels.

8.3.2 Recycled Water Standby Charge

The recycled water standby charge is levied by West Basin to each parcel within the service area. A rate of $24 per parcel (up to one acre for residential) is administered by West Basin to provide a source of non-potable water completely independent of drought-sensitive supplies. The revenue collected from this charge is used to pay the debt service obligations on the West Basin water recycling facilities. Each year West Basin holds a public hearing where they adopt West Basin's Engineer's Report and Resolution to assess this charge.

8.4 Future Water Rate Projections

As the demand for water increases in southern California so does the cost to administer, treat, and distribute imported and recycled water. However, West Basin has worked diligently to ensure that stable and predictable rates are managed for the future. This section discusses projections of imported and recycled water rate trends for the next ten years.

8.4.1 Imported Water Rate Projections

In 2004, the MWD Board adopted its Long Range Financial Plan. This plan was developed to forecast future costs and revenues necessary to support its operations and capital investments. Furthermore, it lays out the financial policy MWD will pursue over the next ten years. According to projected MWD sales, with investments into local resources, MWD estimates imported water rates will increase 4-6 percent annually. As a result, West Basin's water reliability service charge is projected to increase at an annual average rate of 7 percent. This increase is determined by West Basin's own Long Range Financial analysis and revenue requirements.

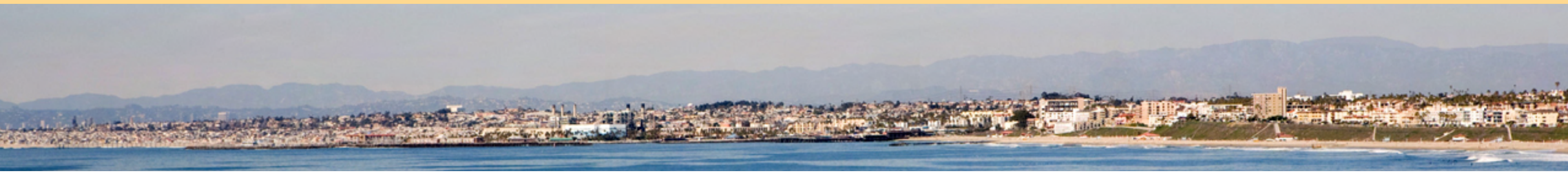
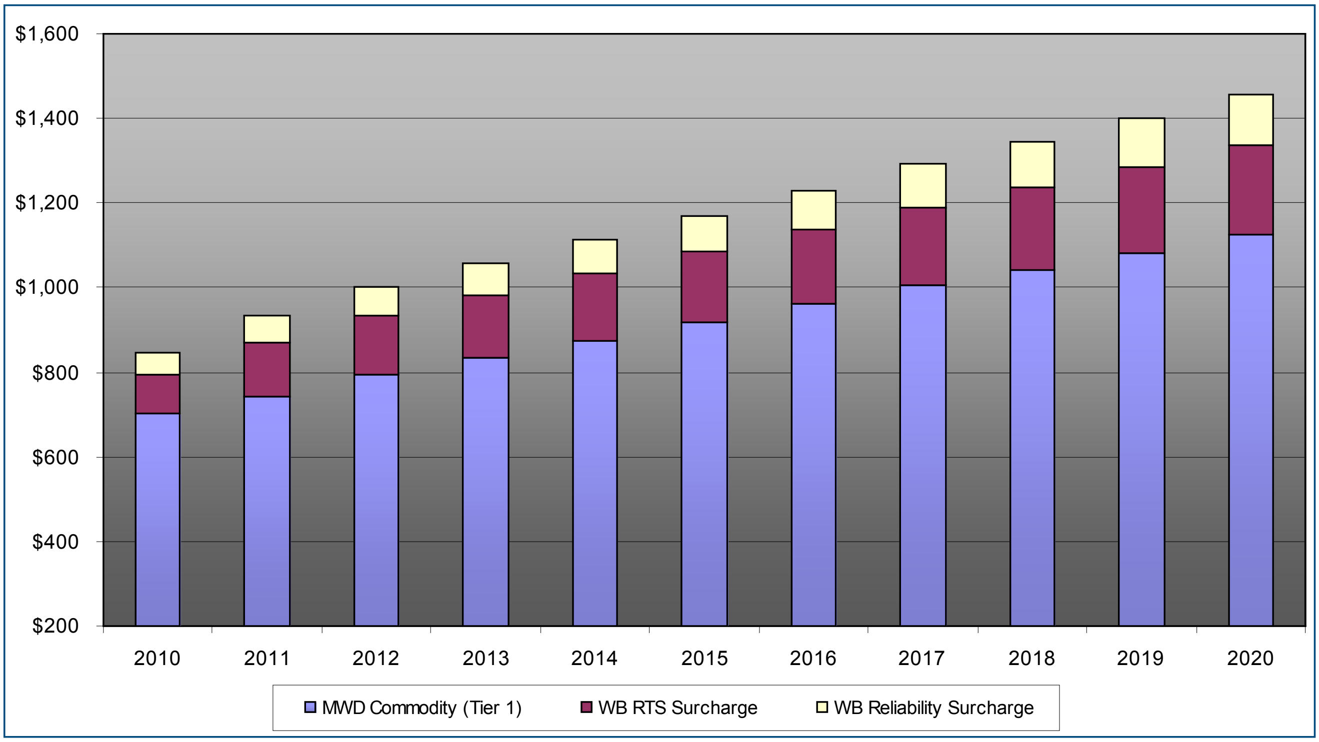


Figure 8-1: Projected Imported Water Rates displays West Basin's imported water rate projections for the next ten years.

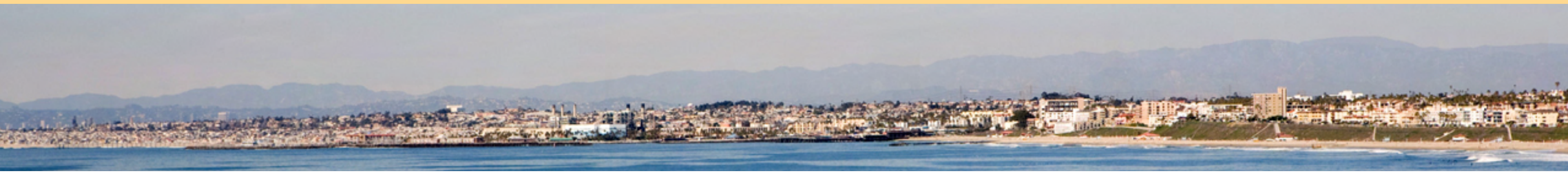
Figure 8-1: Projected Imported Water Rates



Source: MWD Long Range Financial Plan & West Basin's Financial Plan.

8.4.2 Recycled Water Rate Projections

Similar to imported water rates, recycled water rates are expected to increase due to higher treatment, maintenance, and power costs. However, West Basin believes in setting recycled water rates at a competitive level to help offset the use of imported water. To achieve this economic incentive, recycled water rates have been projected to increase at a slightly lower level than imported water. Rates are projected to increase for all types of recycled water, by an average of 5 percent annually. However, these rates may vary depending upon energy and chemical costs.



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SECTION NINE

Recycled Water

2010

Section 9
Recycled Water

SECTION 9 Recycled Water

Recycled water is the cornerstone of West Basin's efforts to increase water reliability by augmenting local supplies and reducing dependence on imported water. Since planning and constructing its recycled water system in the early 1990s, West Basin has become an industry leader in water reuse. West Basin's recycled water supply is sold to customers for non-potable applications such as landscape irrigation, commercial and industrial processes, and indirect potable uses through groundwater replenishment. While serving to offset imported water supplies, recycled water use also results in less ocean discharge of lesser-treated wastewater into the Santa Monica Bay.

In FY 2009-10, West Basin delivered about 30,400 AF of recycled water to sites inside and outside its service area, saving enough potable water to serve roughly 61,000 households. Within West Basin's service area, municipal and industrial recycled water use totaled about 15,500 AF and seawater barrier about 7,796 AF, which is about 13 percent of West Basin's current total water supplies. It is projected that recycled water sales could represent 27 percent of total water supplies by 2035.

9.1 Recycled Water Supply and Treatment

West Basin's recycled water source of supply is treated wastewater effluent from the City of Los Angeles's Hyperion Wastewater Treatment Plant (Hyperion). The City of Los Angeles has operated Hyperion, located adjacent to West Basin's service area, since 1894. Initially built as a raw sewage discharge plant into the Santa Monica Bay, Hyperion has been upgraded over the years to secondary and full secondary treatment. Hyperion's full treatment capacity is 450-850 mgd and secondary treatment capacity is 450 mgd.

Although the City of Los Angeles strives to provide West Basin with a consistent quality of secondary treated wastewater, the ECLWRF has to accommodate inevitable fluctuations in influent quality. Table 9-1 illustrates the amount of historical, current and projected wastewater collected and treated at Hyperion and the amount of recycled water that West Basin treats to at least tertiary recycled water standards.

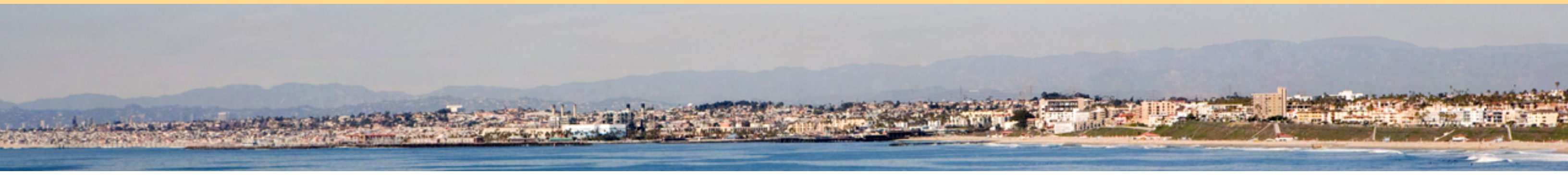


Table 9-1: Hyperion Wastewater Collected and Treated (AFY)

	2005	2010	2015	2020	2025	2030	2035
Wastewater collected & treated in Los Angeles' service area[1]	390,000	425,000	465,000	500,000	535,000	570,000	605,000
Quantity treated to meet recycled water standard[2]	24,160	30,000	58,100	62,000	66,000	70,000	70,000

[1] Data supplied by the Hyperion Wastewater Treatment Plant.
[2] Data supplied by West Basin.

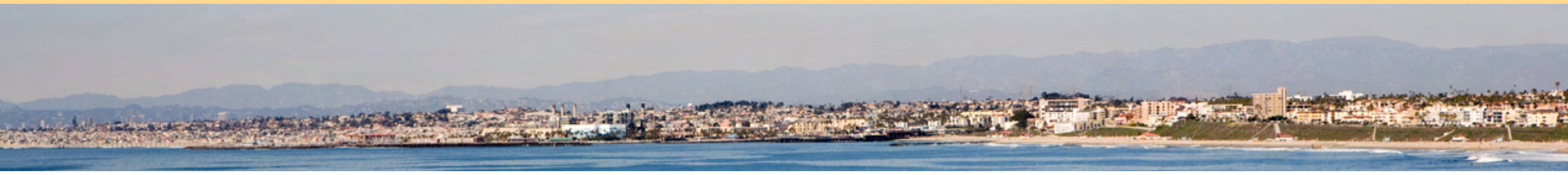
West Basin purchases approximately 37,600 AF, or roughly 9 percent of Hyperion's secondary effluent for treatment at the ECLWRF. West Basin opened ECLWRF in 1995, which is still one of the largest recycled water plants of its kind in the nation. This facility has a current capacity of 62,700 AF with its fourth expansion expected to be complete in 2012.

Most of West Basin's recycled water is treated to meet California Code of Regulations Title 22 (Title 22) tertiary standards. Title 22 addresses specific treatment requirements for recycled water and lists approved uses. Approximately 2,000 tests are performed monthly at the West Basin ECLWRF to ensure water quality meets or exceed all State and Federal requirements.

In 2002, West Basin's ECLWRF was recognized by the National Water Research Institute as one of the six National Centers for Water Treatment Technologies in the country. West Basin's recycled water program is unique in that it provides a variety of recycled water qualities beyond basic tertiary Title 22 levels. These five different water products, including Tertiary, are developed to meet specific customer specifications and are as follows:

- **Tertiary Water:** Secondary treated wastewater meeting Title 22 regulations is produced for non-potable irrigation through a conventional treatment process of coagulation, flocculation, clarification, filtration and disinfection.
- **Nitrified Water:** Tertiary water that is nitrified to remove ammonia is produced for use in refinery cooling towers.
- **Reverse Osmosis Water:** Secondary treated wastewater pretreated by microfiltration followed by reverse osmosis (RO), disinfection with ultra-violet and peroxide treatment for groundwater recharge.
- **Pure Reverse Osmosis Water:** Secondary treated wastewater that has undergone micro-filtration and RO for low-pressure boiler feed water.
- **Ultra-Pure Reverse Osmosis Water:** Secondary treated water that has undergone micro-filtration and two passes through RO for high-pressure boiler feed water.

In addition to providing recycled water for commercial and industrial uses, the reverse osmosis water produced by West Basin is purchased by the WRD and blended with potable water for injection into the West Coast Basin Seawater Barrier. This injected



water has the dual benefit of not only preventing seawater intrusion into the aquifers of the West Coast Groundwater Basin, but also providing replenishment to replace the water that is extracted by drinking water wells.

Seawater barriers are a series of injection wells that form a barrier to ensure that the groundwater level near the ocean stays high enough to keep seawater from seeping into a basin. Currently, the West Coast Basin Barrier receives approximatelty 75 percent RO recycled water mixed with 25 percent potable water. In April 2009, West Basin and WRD signed an agreement to increase the amount of RO recycled water supplied to the barrier to 100 percent by 2012 — saving 5.5 billion gallons of potable imported water a year.

In order to supply the variety of recycled water products to large customers that are often a long distance from the ECLWRF, West Basin also operates three satellite facilities that provide further treatment to tertiary water after passing through the ECLWRF.

Figure 9-1 shows the location of the ECLWRF, in the City of El Segundo, as well as these satellite treatment facilities including the Exxon-Mobil Nitrification Plant in Torrance, the Chevron Nitrification Plant in El Segundo and the Carson Regional Water Recycling Plant in Carson.

9.2 Recycled Water Use

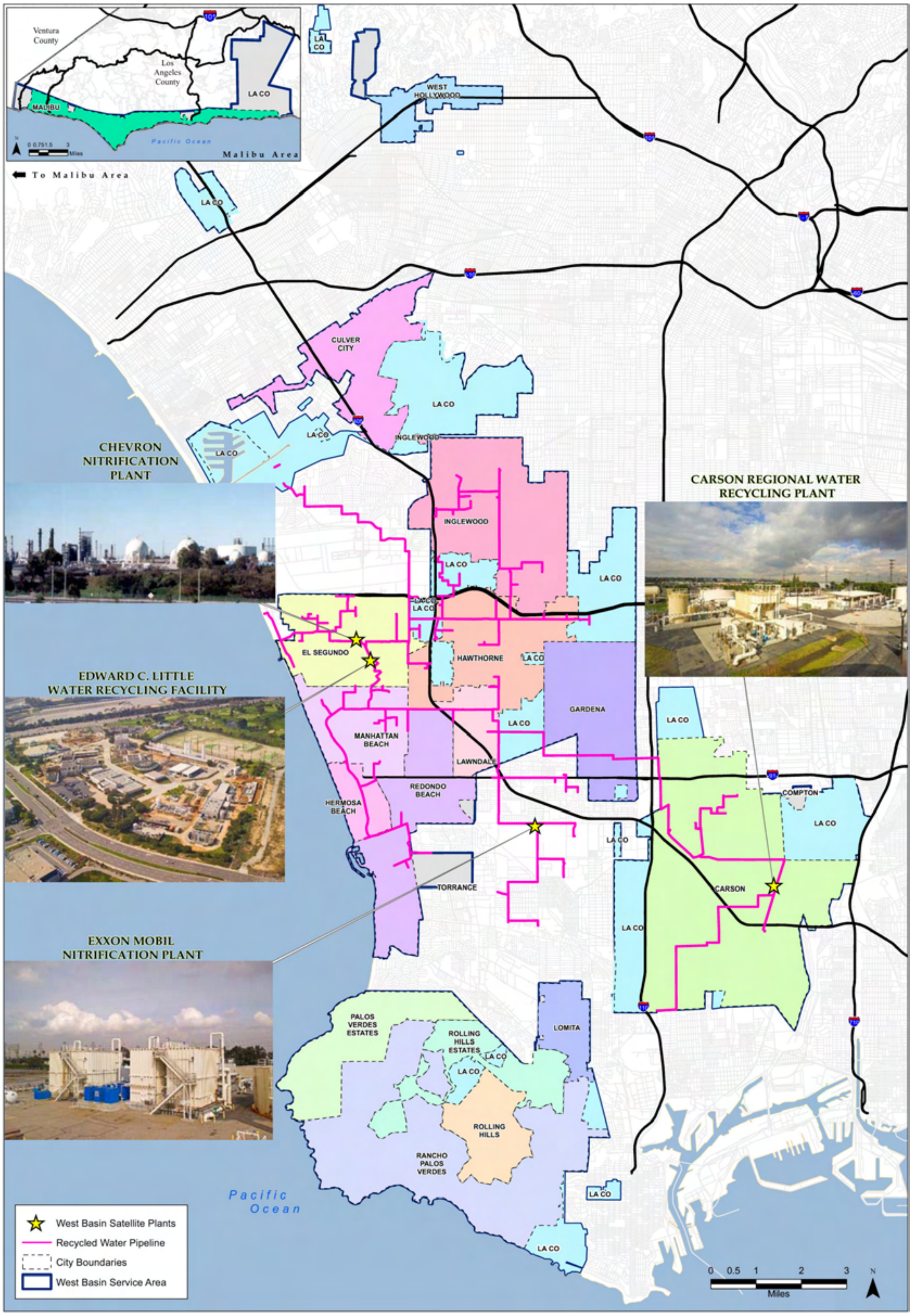
9.2.1 Existing System

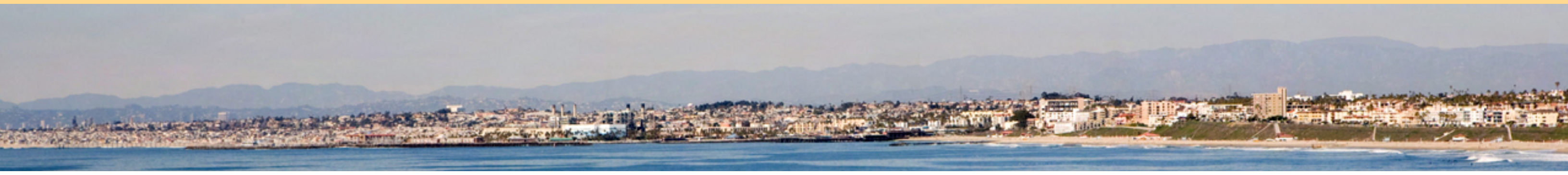
To date, West Basin has saved over 100 billion gallons of potable water imported from Northern California and the Colorado River which would have otherwise been used for non-potable applications. All recycled water is produced initially at the ECLWRF where it is distributed to either end-use sites or one of several satellite facilities. In all, more than 350 sites currently use more than 9.7 billion gallons annually.

As Figure 9-1 shows, West Basin's recycled water system serves the cities of Carson, El Segundo, Gardena, Hawthorne, Hermosa Beach, Inglewood, Manhattan Beach, Lawndale, Redondo Beach, and unincorporated areas of Los Angeles County within its service area, as well as the cities of Torrance and Los Angeles, which are outside of its service area.

The recycled water distribution infrastructure is separate from the potable drinking water system. All pipes, pumps and other equipment used to transport recycled water are clearly identified as recycled water to distinguish them from the potable drinking water system.

Figure 9-1: West Basin's Water Recycling Facilities



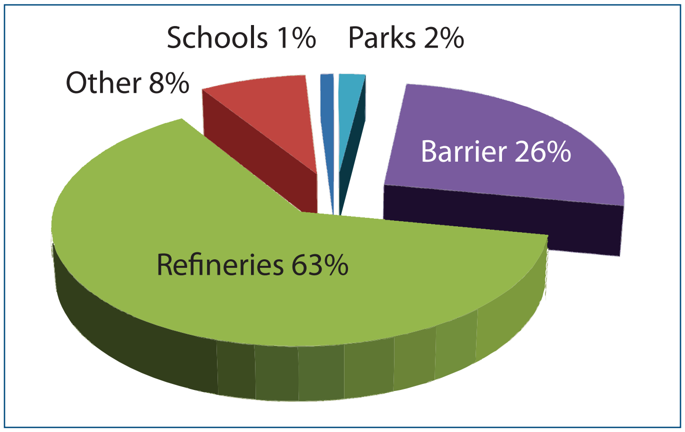


9.2.2 Recycled Water Use by Type

West Basin supplies recycled water for a wide-variety of customer uses such as:

- Seawater barriers
- Construction
- Industrial: Multi-Use
- Industrial: Nitrified
- Street Sweeping
- Irrigation: Cal-Trans
- Irrigation: Cemetery
- Irrigation: College
- Golf Course
- Irrigation: Landscape
- Irrigation: Medians
- Irrigation: Multi-Use
- Irrigation: Park
- Irrigation: School

Figure 9-2: Recycled Water Use by Type



9.2.3 Historical and Current Sales

West Basin's recycled water sales over the past ten years are illustrated in Figure 9-3. Sales increased until 2002-03, then declined due to a change in the source water from Hyperion. Sales have increased slightly in subsequent years and have remained steady at around 30,000 AF for the past two years. Table 9-3 provides a more detailed breakdown of historical sales by showing each retail customer agency's annual purchases for the past ten years.

West Basin has been able to deliver over 270, 500 AF over the last ten years to customers both inside and outside of its service area. This recycled water use has replaced enough potable water to supply the needs of approximately 135,250 families of four for an entire year. West Basin anticipates recycled water production and use to increase in the future due to system expansions, new applications, increasing public acceptance and economic incentives.

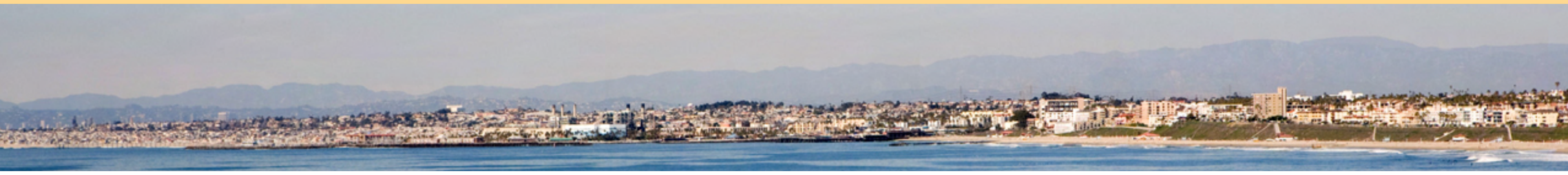
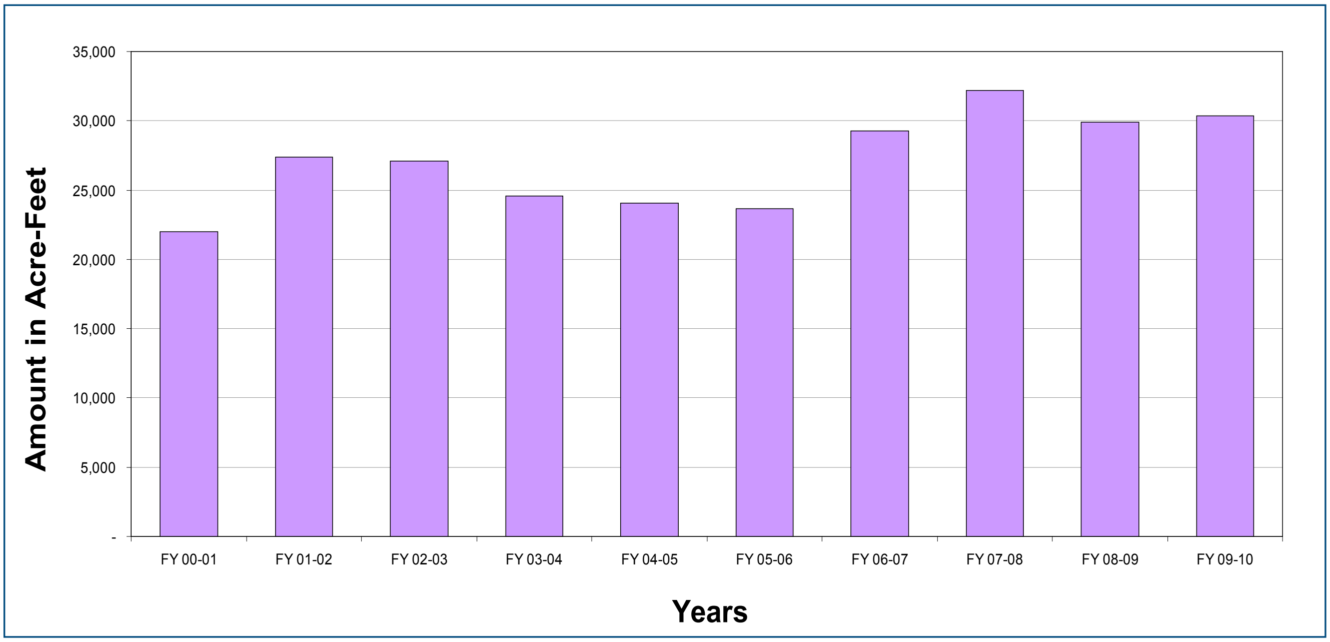


Figure 9-3: Historical Recycled Water Sales (FY 2000-2010)

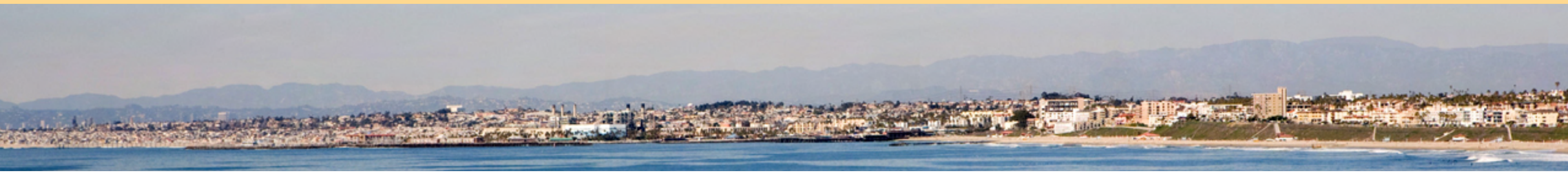


West Basin's recycled water system also services the Cities of Torrance and Los Angeles, which are located outside of the District's boundaries. Therefore, although the total usage within West Basin's service area was 23,331 AF in 2009-2010, the total amount of recycled water delivered by West Basin was 30,384 AF

According to West Basin's 2005 UWMP, deliveries of recycled water within the service area were projected to reach over 39,000 by 2010. As shown in Table 9-2, actual sales in 2009/2010 fell significantly below this target. This was mainly due to setbacks in expanding the recycled water program in the southern portion of West Basin's service area which resulted in many large industrial customers not connecting to the system. In addition, water quality problems at Hyperion impacted deliveries to the West Coast Seawater Barrier significantly.

Table 9-2: Comparison of Recycled Water Use Project

Type of Use	2005 Projection for 2010	2009/2010 Actual Use
Irrigation/Industrial	21,848	22,588
West Coast Barrier	17,500	7,797
Total	**39,348**	**30,384**



9.2.4 Projected System Expansions

In 2009, West Basin completed a Capital Implementation Master Program (CIMP). The CIMP includes all of the planned projects for recycled water and desalination through the year 2030. The major recycled water capital projects are explained in further detail below.

ECLWRF Phase V Expansion: With the completion of the ECLWRF Phase V Expansion in 2012, West Basin is looking toward increasing its ability to provide enough recycled water to meet 100 percent of the West Coast Seawater Barrier's needs. The Phase V Expansion Project will increase barrier water production at the ECLWRF by up to an additional 5 mgd and serve the El Segundo Energy Center with 0.5 mgd of single-pass RO water. The Phase V Expansion will also expand ECLWRF's tertiary treatment system by an additional 10 mgd.

Edward C Little Water Recycling Facility

Hyperion Secondary Effluent Pump Station Expansion: As West Basin's recycled water production continues to increase, the demand for Hyperion's effluent will eventually exceed the capacity of the Hyperion Secondary Effluent Pump Station. A pump station expansion would be able provide a capacity of up to 70 mgd for ECLWRF. West Basin is working closely with Los Angeles Department of Water & Power, the provider of electrical power to the pump station, to also construct a second electrical feeder to the pump station that will also increase the reliability of the pumping facilities.

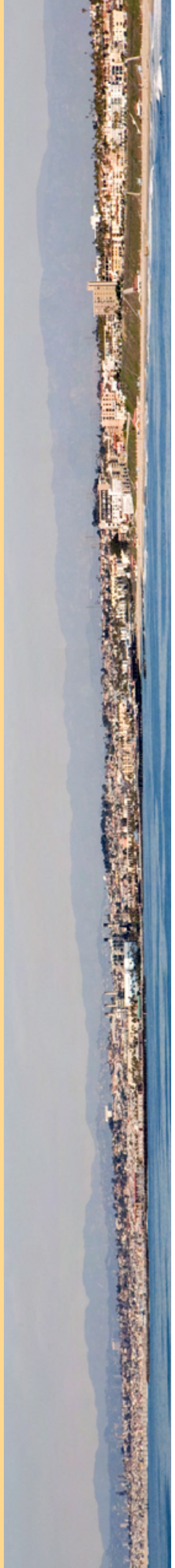
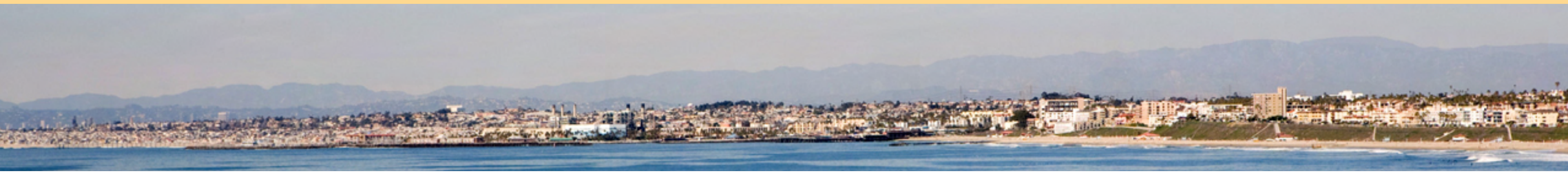


Table 9-3: West Basin Recycled Water Sales FY 2000-2010 (AFY)

West Basin	2000-01	2001-02	2002-03	2003-04	2004-05	2005-06	2006-07	2007-08	2008-09	2009-10	Total
California Water Service Co. Dominguez	3,297	3,165	3,101	3,639	3,616	3,665	3,610	4,690	5,293	4,959	39,035
California Water Service Co. Hawthorne	90	116	101	112	111	111	118	85	99	90	1,032
California Water Service Co. Hermosa/ Redondo	133	130	130	144	107	119	141	145	163	150	1,361
City of El Segundo	3,542	7,632	8,103	8,310	7,868	7,405	8,201	7,865	8,978	9,035	76,937
City of Inglewood	622	707	577	638	595	568	797	650	680	621	6,455
City of Manhattan Beach	272	307	254	301	274	249	316	288	251	264	2,777
Inglewood Unified School District	24	31	30	67	60	57	68	56	62	56	510
Golden State Water Company	237	282	315	432	435	429	523	552	410	360	3,975
M&I	8,216	12,371	12,610	13,643	13,064	12,604	13,774	14,330	15,936	15,535	132,082
WRD (Barrier)	6,753	7,290	6,754	3,935	3,799	4,383	9,104	11,129	7,652	7,797	68,596
Within Service Area	**14,969**	**19,660**	**19,364**	**17,578**	**16,863**	**16,987**	**22,878**	**25,459**	**23,588**	**23,331**	**200,677**
City of Torrance	91	117	144	196	186	253	285	311	277	272	2,134
City of Torrance - Mobil	6,558	7,212	7,328	6,385	6,735	6,156	5,774	6,078	5,599	6,173	63,998
LA DWP	357	398	277	394	283	257	313	360	444	608	3,692
Outside of Service Area	**7,006**	**7,727**	**7,750**	**6,975**	**7,205**	**6,666**	**6,372**	**6,750**	**6,320**	**7,053**	**69,823**
TOTAL	**21,974**	**27,387**	**27,113**	**24,552**	**24,067**	**23,652**	**29,250**	**32,208**	**29,908**	**30,384**	**270,500**



Harbor-South Bay Recycled Water Expansion Project: The Harbor-South Bay Recycled Water Expansion Project is a partnership between West Basin and the United States Army Corps of Engineers (USACE) to both expand West Basin's current recycled water distribution system as well as to provide an improvement in overall system reliability. This expansion will be able to bring additional recycled water supplies to the cities of Carson, Torrance, Palos Verdes, Gardena, and unincorporated areas of Los Angeles County.

Treatment/Conveyance Facility Repair, Replacement, and Improvements: Multiple improvements are under consideration for West Basin's treatment and conveyance system facilities. These improvements will enhance the safety, operability and efficiency of both the distribution system and treatment facilities. Some improvements will be made to comply with safety, water quality or other regulatory requirements or will be done to lower operating costs or improve equipment life.

Conveyance Facility Corrosion Protection Improvements: As a result of a study completed by West Basin, various cathodic protection improvements were identified that would ensure the integrity of West Basin's recycled water facilities. These improvements will be implemented periodically to ensure system integrity over the duration of the system's useful service life.

9.2.5 Projected Recycled Water Use

The 2009 CIMP identified and prioritized areas where recycled water has the potential to expand based upon potential future customers. Converting fabric and carpet dying industrial users to recycled water use are examples of significant opportunities for increased use.

The CIMP projects described in Section 9.2.4 are expected to result in at least an additional 40,900 AF of use within West Basin's service area by 2035. West Basin is also projecting to expand its export of recycled water within the City of Los Angeles' service area. Oil refineries within the harbor area of Los Angeles are proximal to West Basin's existing system and represent a large untapped potential for high-quality recycled water sales. West Basin will continue to pursue new cost-effective projects both within and outside its service area.

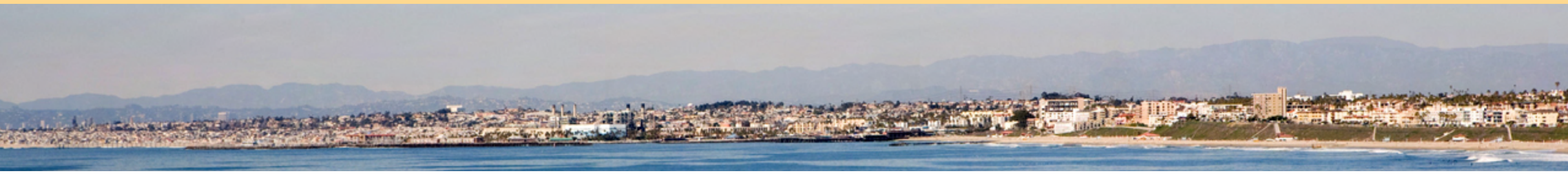


Table 9-4 illustrates the projected increase of recycled water over the next 25 years.

Table 9-4: Projected Recycled Water Use (AFY)

	2015	2020	2025	2030	2035
Industrial & Irrigation	16,368	33,882	33,882	37,382	37,382
Indirect Potable Reuse	16,980	16,980	16,980	20,480	20,480
Within Service Area	**33,348**	**50,862**	**50,862**	**57,862**	**57,862**
City Torrance	6,650	6,650	6,650	6,650	6,650
City of Los Angeles	10,700	10,700	10,700	10,700	10,700
Outside of Service Area	**17,350**	**17,350**	**17,350**	**17,350**	**17,350**
Total	**50,698**	**68,212**	**68,212**	**75,212**	**75,212**

9.2.6 Encouraging Recycled Water Use

West Basin generates interest in recycled water by contacting potential customers and cities with sites that are located near an existing main pipeline, have a high water use potential in which a line can be constructed, are mandated to use recycled water, and/or express interest. For commercial and industrial customers, West Basin emphasizes the benefit of recycled water as a tool for profitability for businesses that goes beyond the benefits of water conservation. West Basin markets recycled water as a resource that:

- Is less expensive than potable water;
- Is more reliable than imported water in a drought; and
- Is consistent with statewide goals for water supply and ecosystem improvement on both the State Water Project and Colorado River systems.

The target customer is expanding from traditional irrigation users such as golf courses and parks to unconventional commercial and industrial users. Through innovative marketing, recycled water is now being used by oil refineries and for cooling towers. In addition, West Basin is investigating recycled water use in fabric dye houses, co-generating plants, and commercial laundries.

In addition to West Basin wholesaling recycled water at a rate lower than potable water, other financial incentives are used to encourage recycled water use. Some potential recycled water customers do not have the financial capability to pay for the onsite plumbing retrofits necessary to accept recycled water. Therefore, West Basin advances funds for retrofit expenses, which can later be reimbursed through the water bills. Table 9-5 illustrates West Basin's coordinated effort with key stakeholders during the development of the CIMP.

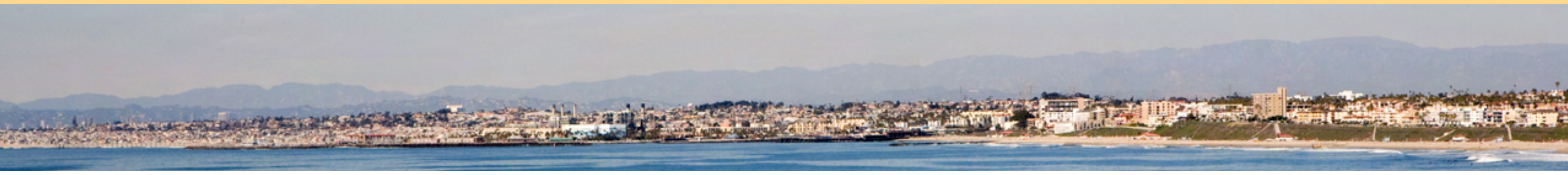


Table 9-5: CIMP Coordination

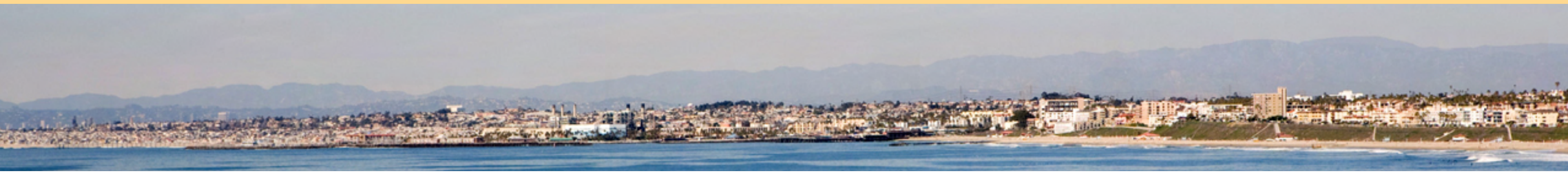
Participating Agencies	Role in Plan Development
Water Purveyors	Customer Development, Facilities, Impacts, Rates
Wastewater Agencies	Recycled Water Supply, Water Quality, Reliability
Groundwater Agencies	Rates and Customer Involvement
Planning Agencies	Economic Analysis, Rates, Data Assessment, Customer Assessment, Rates, Community Impacts, Customer Involvement, Conceptual Pipeline Routes, Cost Estimates

Funding

Capital costs for projects planned over the next five years have been budgeted to average approximately $30 million a year. These costs will be covered by the sources identified here and other sources as they become available.

MWD Local Resources Program Incentive: To qualify, proposed recycled water projects by member agencies must cost more than projected MWD treated non-interruptible water rates and reduce potable water needs. As a member agency of MWD, West Basin is eligible to receive an incentive for up to $250/AF of produced recycled water. It is competitive and requires an application and review process by MWD in coordination with West Basin staff.

Grant Funding: West Basin often applies for Federal and State grant funding for recycled water projects including through the USACE, which affords qualified programs 75 percent project funding. West Basin has utilized this funding arrangement for several of our previous water recycling projects.



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SECTION TEN
Desalination

2010

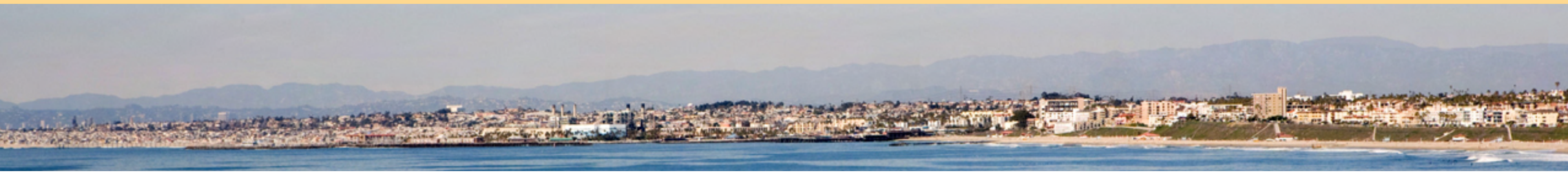
SECTION 10 Desalination

West Basin's experience in recycled water treatment includes substantial knowledge on methods used for the removal of salt from water supplies. This experience has proved useful to West Basin in pursuing both groundwater and ocean-water desalination programs to further develop local water supplies. Since 1993, West Basin has operated the C. Marvin Brewer Desalter Facility to treat brackish groundwater that remains on the inland side of the West Coast Seawater Barrier. In 2001 West Basin also began a multi-phase program to explore the systematic development of a full scale ocean-water desalination facility. This multi-phase approach has been based on deliberate scientific research and testing, beginning with a small pilot facility to test the basic treatment technology, and followed by West Basin's recently dedicated Ocean Water Desalination Demonstration Facility and Water Education Center in order to evaluate and demonstrate ocean protection, energy recovery and cost reduction technologies. These facilities have been developed to ensure a full scale ocean water desalination facility will be done in a cost and energy efficient manner and with a goal to protect the ocean. Research results from the Demonstration Facility will be shared throughout the water industry worldwide via the web site.

10.1 Ocean Desalting Process

Desalination or desalting is the process of converting highly salty, or brackish, water into a drinkable supply. Today's ocean-water desalting process removes salt, minerals and impurities from ocean water with cutting edge membrane technologies such as ultrafiltration or microfiltration and reverse osmosis. Using these methods, raw ocean water first passes through an ultrafiltration or microfiltration membrane which has thousands of hollow strands with pores on the walls that are 5,000 times smaller than a pinhole. The water then continues on to reverse osmosis membranes for the final purification process. Reverse osmosis is a pressure driven process whereby water passes through the molecular structure of a thin membrane that filters out salts, minerals, and impurities. Figure 10-1 shows a diagram of the typical desalting process.

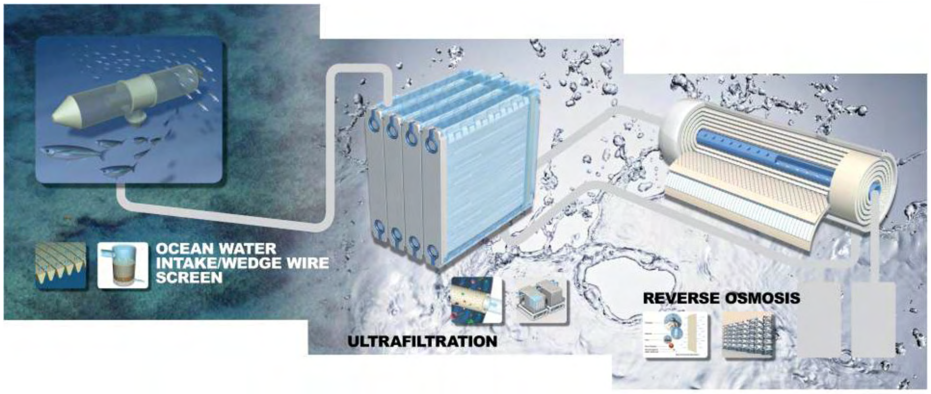
Traditionally, ocean-water desalination has been considered too expensive for a large-scale project, and for many years it was cost prohibitive compared to other sources of potable water in the West Basin service area. However, due to recent advancements in membrane technologies and energy recovery systems, and the increasing cost of existing sources of water, ocean-water desalination is now a financially viable new water source that is cost competitive with other sources of drinking water.



10.2 West Basin's Ocean Water Desalination Pilot Project

In May 2002, West Basin initiated piloting efforts to desalinate ocean water and evaluate the potential for developing a viable, new future drinking water supply for the region. This pilot project was located at the El Segundo Power Plant in the City of El Segundo and marked the first use of microfiltration pretreatment and reverse osmosis as a treatment process for ocean-water desalination. The pilot project was in operation for over seven years, and desalted approximately 20 gallons per minute (gpm) of raw ocean-water. The goal of the project was two-fold: 1) identify optimal performance conditions and 2) evaluate the water quality characteristics. The research findings are being shared among industry partners.

Figure 10-1: Desalting Process

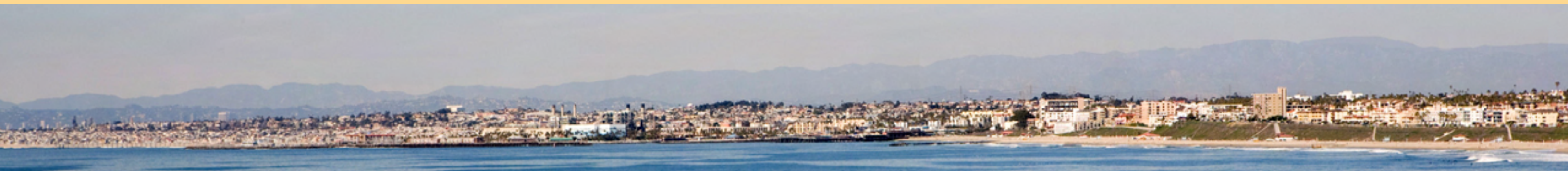


The process combination of microfiltration pretreatment and reverse osmosis treatment was to evaluate whether this process was effectively treating ocean-water and so West Basin performed extensive water quality research. Tens of thousands of water quality test results indicated that the treatment approach of utilizing microfiltration pretreatment and reverse osmosis treatment provides a reliable and consistent water quality that meets all State and Federal drinking water standards. The water produced at the pilot project consisted of approximately 300 parts per million (ppm) of total dissolved solids, lower than typical tap water in southern California. Figure 10-2 shows the microfiltration and reverse osmosis membranes used in the pilot demonstration project.

Figure 10-2: Treatment Technologies Used at West Basin's Pilot Plant

Example of Reverse Osmosis Units

Microfiltration Unit



West Basin's ocean-water desalination pilot project was designed to be a regional and national asset, and it was an open, collaborative effort that has benefited the entire water industry. To fund the $7 million combined cost of the pilot project, West Basin partnered with major agencies within and related to the water industry, including the American Water Works Association Research Foundation, California Avocado Commission, City of Tampa Bay, DWR, East Bay Municipal Utility District, Long Beach Water Department, Los Angeles Department of Water and Power, MWD, National Water Research Institute, San Diego County Water Authority, South Florida Water Management District, and United States Bureau of Reclamation.

10.3 Ocean Water Desalination Demonstration Facility Projects

Following in the pilot project, West Basin's next objective was to evaluate several critical components of the ocean-water desalination process through a small full-scale desalination demonstration project. In early 2009, West Basin received all necessary permits to proceed with the construction of the West Basin Ocean Water Desalination Demonstration Facility and Water Education Center. West Basin used the data acquired from the pilot project in the planning and development of the demonstration facility that is co-located at the SEA Lab Marine Educational Facility in Redondo Beach, California.

The Demonstration Facility draws in 500,000 gallons of seawater a day to perform various research and testing activities. Of the total intake volume, 100,000 gal/day is treated to produce 50,000 gal/day of drinking water (although the product water meets all drinking water standards, that is by permit required to re-combine the water and return it to the ocean). This process will develop a basis of design for a future full-scale desalination plant by accomplishing the following goals:

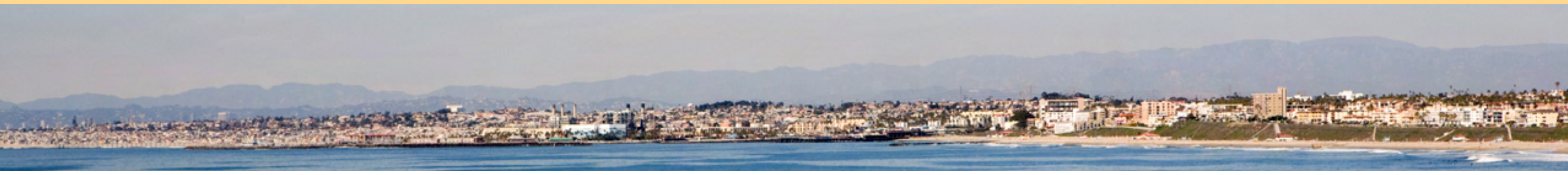
- Evaluating environmentally safe intake and concentrate discharge technologies and impacts
- Optimizing operation and maintenance procedures using full-scale elements
- Optimizing performance of energy recovery devices
- Analyzing water quality (as a continuation of the pilot plant testing)
- Providing opportunities for public and stakeholder education

Figure 10-3 shows the construction of the Demonstration Facility and Water Education Center within the facility.

10.4 Future Ocean Water Desalination Projects

10.4.1 Ocean Water Desalination Full-Scale Facility

This Ocean Water Desalination Demonstration Facility will test the viability of a future, full-scale Ocean Water Desalination Facility capable of providing up to 20,000 AFY, or enough to supply 40,000 families for a year, in the initial phase. Pending the findings



from the demonstration facility and the environmental review process, West Basin anticipates permitting, financing, and constructing a full-scale facility by 2017. West Basin will perform a Desalination Program Master Plan in 2011 that will evaluate potential siting opportunities within West Basin's service area that could accommodate a full-scale facility. Potable water produced by the future ocean water desalination facility will be supplied to local and/or regional drinking water distribution systems.

Figure 10-3: West Basin's New Desalination Demonstration Facility

Construction of Demonstration Facility

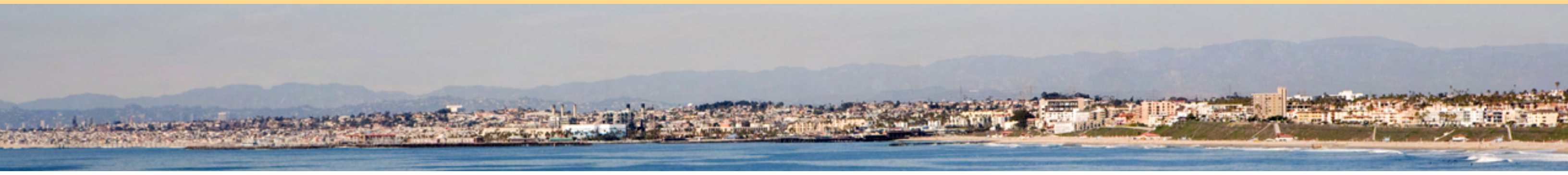
Water Education Center

Water Education Center

Water Education Center

Table 10-1: Opportunities for Desalinated Water

Sources of Water	Yield AFY	Start Date	Type of Use
Ocean Water	20,000	June 2015	Potable



10.5 Brewer Desalter Treatment Facility

West Basin owns the C. Marvin Brewer Desalter Facility which began operating in July 1993. The Desalter was built on a site owned by California Water Service Company (CWSC) in the City of Torrance where it removes chloride from groundwater impacted by seawater intrusion in the WCGB. The Desalter was initially conceived as a five-year pilot program to see if brackish water could be economically treated to drinking water standards.

The Desalter originally used two wells to pump brackish water from a saline plume remaining within the WCGB. It treats the water using cartridge filters and reverse osmosis, and the treated water is then blended with other potable water. CWSC stores the treated water blend on-site in a 5-million gallon storage reservoir, and ultimately delivers it to consumers through their distribution system. Under the terms of an agreement with CWSC, West Basin reimburses CWSC to operate and maintain the Desalter.

In 2005, enhancements were made to the Desalter program that replaced the two wells with a new, more productive well. This well has the capability to pump 1,600 to 2,400 AFY of brackish groundwater to be treated at the Desalter.

Figure 10-4: Brewer Desalter Facility Equipment

Brewer Extraction Well Site

Brewer Desalter RO Treatment

Appendices



2010

Appendices

APPENDIX A

Urban Water Management Planning Act

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

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

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

WATER CODE
SECTION 10610-10610.4

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10611-10617

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10620-10621

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10630-10634

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

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

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

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

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

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

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

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

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

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

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

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

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

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

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

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

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

(B) Residential plumbing retrofit.

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

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

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

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

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(i) Compliance on an individual basis.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10635

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

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

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

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

WATER CODE
SECTION 10640-10645

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10650-10656

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

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

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

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

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

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

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

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

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

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

APPENDIX B

2010 Urban Water Management Plan Checklist

Table I-2 Urban Water Management Plan checklist, organized by subject

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
PLAN PREPARATION				
4	Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)		Section 1.1.4
6	Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments.	10621(b)		Section 1.1.1
7	Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq.	10621(c)		N/A
54	Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan.	10635(b)		Appendix E
55	Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642		Section 1.1.3
56	Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area.	10642		Appendix C
57	Provide supporting documentation that the plan has been adopted as prepared or modified.	10642		Appendix D
58	Provide supporting documentation as to how the water supplier plans to implement its plan.	10643		Throughout All Sections of Document

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
59	Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes.	10644(a)		Appendix D
60	Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours	10645		Appendix D
SYSTEM DESCRIPTION				
8	Describe the water supplier service area.	10631(a)		Section 2
9	Describe the climate and other demographic factors of the service area of the supplier	10631(a)		Section 2.2
10	Indicate the current population of the service area	10631(a)	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Section 2.3
11	Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections.	10631(a)	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Section 2.3
12	Describe other demographic factors affecting the supplier's water management planning.	10631(a)		Section 2.3
SYSTEM DEMANDS				
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)		Section 3.3
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	Retailers and wholesalers have slightly different requirements	Section 3.4

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
3	Report progress in meeting urban water use targets using the standardized form.	10608.40		N/A
25	Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture.	10631(e)(1)	Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	N/A
33	Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types	10631(k)	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Section 1.4
34	Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)		N/A
SYSTEM SUPPLIES				
13	Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030.	10631(b)	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided.	Section 4.1
14	Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column.	10631(b)	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Section
15	Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)		N/A
16	Describe the groundwater basin.	10631(b)(2)		N/A
17	Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree.	10631(b)(2)		N/A

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
18	Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		Section 4.3
19	For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column.	10631(b)(2)		N/A
20	Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years	10631(b)(3)		Section 4.3
21	Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped.	10631(b)(4)	Provide projections for 2015, 2020, 2025, and 2030.	Section 4.3
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)		Section 4.4
30	Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project.	10631(h)		Section 4.5
31	Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater.	10631(i)		Section 10
44	Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area.	10633		Section 9
45	Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)		Section 9.2

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
46	Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)		Section 9.2
47	Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)		Section 9.3
48	Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)		Section 9.3.2
49	The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected.	10633(e)		Section 9.3.4
50	Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)		Section 9.3.7
51	Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)		Section 9.3.6
WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b]				
5	Describe water management tools and options to maximize resources and minimize the need to import water from other regions.	10620(f)		Throughout All Sections of Document
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years.	10631(c)(1)		Section 5.2
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)		Section 5.1
35	Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage	10632(a)		Section 5.3

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)		Section 5.2
37	Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)		Section 5.3.6
38	Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)		Section 5.3.1
39	Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)		Section 5.3.2
40	Indicated penalties or charges for excessive use, where applicable.	10632(f)		Section 5.3.4
41	Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)		Section 5.3.3-5.3.5
42	Provide a draft water shortage contingency resolution or ordinance.	10632(h)		Appendix C
43	Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)		Section 5.3.1
52	Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability	10634	For years 2010, 2015, 2020, 2025, and 2030	Section 6

No.	UWMP requirement [a]	Calif. Water Code reference	Additional clarification	UWMP location
53	Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)		Section 5.2
DEMAND MANAGEMENT MEASURES				
26	Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided.	10631(f)(1)	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Section 7.6
27	Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP.	10631(f)(3)		Section 7.6
28	Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand.	10631(f)(4)		Section 7.2
29	Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work.	10631(g)	See 10631(g) for additional wording.	Section 7.6
32	Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Appendix G

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

APPENDIX C

Notice of Public Hearing

APPENDIX D

Resolution of Urban Water Management Plan Adoption

APPENDIX E

Notice of Urban Water Management Plan Preparation

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Garry Hofer
Operations Manager
California American Water Company
8657 Grand Ave.
Rosemead, CA 91770

Dear Mr. Hofer:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

A workshop for West Basin's retail water agencies will be held in early April at the West Basin headquarters to provide a summary of the draft UWMP including water supply and demand projections. The Public Hearing on the final 2010 UWMP will take place at the West Basin Board of Directors Meeting on May 23, 2011 at 1:00 p.m. Subsequent to the Public Hearing, the Board will consider adoption of the UWMP. West Basin will send a CD of the adopted UWMP in June 2011 to your agency.

If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Henry Wind
District Manager
California Water Service Company
2632 West 237th Street
Torrance, CA 90505

Dear Mr. Wind:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

James Turner
Water Supervisor
City of El Segundo
350 Main St.
El Segundo, CA 90245

Dear Mr. Turner:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Glen Kau
Public Works Director
City of Inglewood
One Manchester Blvd.
Inglewood, CA 90301

Dear Mr. Kau:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Vince DeMarco
Interim Director of Public Works
City of Lomita
P.O. Box 340
Lomita, CA 90717

Dear Mr. DeMarco:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Jim Arndt
Director of Public Works
City of Manhattan Beach
3621 Bell Avenue
Manhattan Beach, CA 90266

Dear Mr. Arndt:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Shad Rezai
Central District Manager
Golden State Water Company
1600 W. Redondo Beach Blvd, #101
Gardena, CA 90247-3226

Dear Mr. Rezai:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

David Rydman
Water Resources Manager
LA County Waterworks District #29
900 S. Freemont Ave.
Alhambra, CA 91803

Dear Mr. Rydman:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Robb Whitaker
General Manager
Water Replenishment District
4040 Paramount Blvd.
Lakewood, CA 90712

Dear Mr. Whitaker:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Tom Erb
Water Resources Manager
Los Angeles Department of Water and Power
P.O. Box 51111, Rm. 1315
Los Angeles, CA 90051

Dear Mr. Erb:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Rob Beste
Public Works Director
City of Torrance
20500 Madronna Ave.
Torrance, CA 90503

Dear Mr. Beste:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jk

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Grace Chan
Metropolitan Water District of Southern California
P.O. Box 54153
Los Angeles, CA 90054

Dear Ms. Chan:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

17140 S. Avalon Blvd., Suite 210, Carson CA 90746 310-217-2411 www.westbasin.org

March 16, 2011

Water Resources Department
Los Angeles County Department of Public Works
900 S. Fremont Ave
Alhambra, CA 91803

Dear Water Resources Department:

Notice of Preparation
West Basin 2010 Urban Water Management Plan

West Basin Municipal Water District (West Basin) is currently preparing the 2010 Urban Water Management Plan (UWMP) for its service area as required by the Urban Water Management Planning Act (Act) in California Water Code section 10610. The final draft of the 2010 UWMP will be available for review on West Basin's website at www.westbasin.org and will be sent to your agency in hard copy form at the end of March 2011. This final draft UWMP will include information that is required under the Act and will meet all of the requirements in the 2011 Guidebook issued by the California Department of Water Resources.

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If you have any concerns, please contact Fernando Paludi, Water Policy and Resources Development Manager at (310) 660-6214.

Sincerely,

Rich Nagel
General Manager

LK:jks

APPENDIX F

Water Shortage Contingency Resolution

RESOLUTION NO. 4-09-902

**A RESOLUTION OF THE BOARD OF DIRECTORS OF
WEST BASIN MUNICIPAL WATER DISTRICT
ESTABLISHING A WATER SHORTAGE ALLOCATION
PLAN FOR CONSERVATION PURPOSES**

BE IT RESOLVED BY THE BOARD OF DIRECTORS OF WEST BASIN MUNICIPAL WATER DISTRICT as follows:

WHEREAS, the State of California is now in its third consecutive year of drought, with the annual rainfall and the water content in the Sierra Nevada Snowpack being significantly below the amounts needed to fill California's storage reservoir system; and

WHEREAS, local rainfall levels for the 2008-2009 water year are 66% of average as of the April 1, 2009, measurement; and

WHEREAS, storage in the State's reservoir system is at below normal levels; and

WHEREAS, recent legal decisions issued to protect delta smelt and other species have further reduced water supplies available for delivery from the State Water Project; and

WHEREAS, Governor Schwarzenegger issued water emergency proclamations on June 12, 2008, and February 27, 2009, both ordering his administration begin taking action to address the water shortage; and

WHEREAS, the State Department of Water Resources' allocation of State Water Project water available to Southern California State Water Contractors is only 20% of the contracted supply amount; and

WHEREAS, on April 14, 2009, the Metropolitan Water District of Southern California declared that a regional shortage exists and implemented its Water Supply Allocation Plan at a Regional Shortage Level 2, including allocation penalty rates for water use in excess of a member agency's annual allocation; and

NOW, THEREFORE, THE BOARD OF DIRECTORS OF THE WEST BASIN MUNICIPAL WATER DISTRICT DOES HEREBY RESOLVE, DETERMINE AND ORDER AS FOLLOWS:

1. The West Basin Municipal Water District Board of Directors declare that there currently is a regional water shortage in the West Basin service area; and

2. The West Basin Water Shortage Allocation Plan, adopted by the West Basin Board on October 27, 2008 shall be implemented by the District's General Manager, effective July 1, 2009 through June 30, 2010, at Level 2 – the level equivalent to the Regional Shortage Level declared by the Metropolitan Water District; and

3. The West Basin Municipal Water District General Manager is hereby authorized and directed to take all necessary action to implement the West Basin Water Shortage Allocation Plan, consistent with its terms.

PASSED, APPROVED AND ADOPTED on ________________, 2009.

____
President

I hereby certify that the foregoing is a full, true and correct copy of the Resolution adopted by the Board of Directors of the West Basin Municipal Water District at its meeting held on April ___, 2009.

ATTEST:

____
Secretary

[SEAL]

w:\westbasinboard\resos\wb902

APPENDIX G

Demand Management Measures Annual Reports

Prepared by:
West Basin Municipal Water District
17140 South Avalon Boulevard, Suite 210
Carson, CA 90746
www.westbasin.org







Los Angeles Department of Water & Power

URBAN WATER
MANAGEMENT PLAN

2010

RESOLUTION NO. 011 268

WHEREAS, the California Urban Water Management Planning Act requires California water suppliers to prepare and adopt an Urban Water Management Plan every five years that describes their historical and future efforts in the area of water resources; and

WHEREAS, the Los Angeles Department of Water and Power (LADWP) has prepared a five-year update to the City of Los Angeles ' Urban Water Management Plan (UWMP) pursuant to applicable provisions of Sections 10610 through 10656 of the California Water Code; and

WHEREAS, the UWMP is required as a condition of application for various water system grant and loan funding opportunities administered by the State of California; and

WHEREAS, LADWP has selected Method 3 of the four methods developed by the California Department of Water Resources for calculating the 2020 water use target and 2015 interim target in the UWMP as required in the California Water Conservation Act of 2009, SBX7-7; and

WHEREAS, LADWP's current water rate structure includes funding for water conservation, water recycling, and stormwater capture programs; and

WHEREAS, the development of the UWMP involved public meeting notices, public involvement, and incorporated oral and written public comments prior to final adoption; and

WHEREAS, the final UWMP must be adopted by LADWP's Board of Water and Power Commissioners and submitted to the California Department of Water Resources by July 1, 2011.

NOW, THEREFORE, BE IT RESOLVED, that the City of Los Angeles Department of Water and Power 2010 Urban Water Management Plan is hereby adopted; and

BE IT FURTHER RESOLVED that the President or Vice President of the Board, or the General Manager or such person as he shall designate in writing as his designee, and the Secretary, Assistant Secretary, or the Acting Secretary of the Board be and they are hereby authorized, empowered, and directed to approve said UWMP for and on behalf of LADWP.

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of a Resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held MAY 03 2011

APPROVED AS TO FORM AND LEGALITY
CARMEN A. TRUTANICH, CITY ATTORNEY

APR 11 2011

BY [signature]
JANNA SIDLEY
DEPUTY CITY ATTORNEY

Barbara E. Moschos
Secretary

Urban Water Management Plan

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Note: The 2010 Urban Water Management Plan for the Los Angeles Department of Water and Power is available to the public at Los Angeles City Public Library, County of Los Angeles Public Library, West Hollywood Library, Culver City Julian Dixon Library, California State Library, and LADWP website at www.ladwp.com.

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Urban Water Management Plan

Glossary of Abbreviations and Terms

Agencies

AVEK	Antelope Valley-East Kern Water Agency
BOE	City of Los Angeles Department of Public Works, Bureau of Engineering
BOS	City of Los Angeles Department of Public Works, Bureau of Sanitation
Caltrans	California Department of Transportation
CDPH	California Department of Public Health
CDTSC	California Department of Toxic Substance Control
CITY	City of Los Angeles
CUWCC	California Urban Water Conservation Council
CVWD	Coachella Valley Water District
DWR	California Department of Water Resources
IAPMO	International Association of Plumbing and Mechanical Officials
IID	Imperial Irrigation District
KERN-DELTA	Kern Delta Water District
LACDPH	Los Angeles County Department of Public Health
LACDPW	Los Angeles County Department of Public Works
LACFCD	Los Angeles County Flood Control District
LADBS	Los Angeles Department of Building and Safety
LADWP	Los Angeles Department of Water and Power
LARWQCB	Los Angeles Regional Water Quality Control Board
LASGRWC	Los Angeles and San Gabriel Rivers Watershed Council
LBWD	Long Beach Water Department
MWD	Metropolitan Water District of Southern California
NWRI	National Water Research Institute
PVID	Palo Verde Irrigation District
RWAG	Recycled Water Advisory Group
RWQCB	Regional Water Quality Control Board
SBMWD	San Bernardino Municipal Water District
SCAG	Southern California Association of Governments
SWRCB	State Water Resources Control Board
USBR	United States Bureau of Reclamation
USEPA	United States Environmental Protection Agency
WBMWD	West Basin Municipal Water District
WRD	Water Replenishment District

Facilities and Locations

AWTF	Advanced Water Treatment Facility
BAY-DELTA	San Francisco Bay and Sacramento-San Joaquin River Delta
CRA	Colorado River Aqueduct
DCT	Donald C. Tillman Water Reclamation Plant
ECLWRF	Edward C. Little Water Recycling Facility
EOC	Emergency Operations Center
HTP	Hyperion Treatment Plant
JWPCP	Joint Water Pollution Control Plant
LAA	Los Angeles Aqueducts (First and Second)
LAAFP	Los Angeles Aqueduct Filtration Plant
LAG	Los Angeles/Glendale Water Reclamation Plant
LVMWD	Las Virgenes Municipal Water District
NTPS	Neenach Temporary Pumping Station
RWMP	Recycled Water Master Plan
SFB	San Fernando Basin
SWP	State Water Project
TIWRP	Terminal Island Water Reclamation Plant
ULARA	Upper Los Angeles River Area

Measurements and Miscellaneous

ACT	Urban Water Management Planning Act
AF	Acre-Feet
AFY	Acre-Feet Per Year
BACM	Best Available Control Measures
BDCP	Bay Delta Conservation Plan
BMP	Best Management Practices
CBO	Community-Based Organizations
CEQA	California Environmental Quality Act
CFS	Cubic Feet Per Second
CII	Commercial/Industrial/Institutional
CIP	Capital Improvement Program
CVP	Central Valley Project
EIR	Environmental Impact Report
ERP	Emergency Response Plan
FY	Fiscal Year
FYE	Fiscal Year Ending
GAC	Granular Activated Carbon
GCM	Global Climate Models
GHG	Greenhouse Gases
GPCD	Gallons Per Capita Per Day
GPD	Gallons Per Day
GPF	Gallons Per Flush
GPM	Gallons Per Minute
GSIS	Groundwater System Improvement Study
GWR	Groundwater Replenishment
HET	High Efficiency Toilets
IAP	Independent Advisory Panel
IRP	Integrated Resources Plan
IAWP	Interim Agricultural Water Program

IRWMP	Integrated Regional Water Management Plan
KWh/AF	Kilowatt-Hour per Acre-Foot
LID	Low Impact Development
LRP	Long-Range Finance Plan
M&I	Municipal and Industrial
MAF	Million Acre-Feet
MCL	Maximum Contaminant Level
MF/RO	Microfiltration/Reverse Osmosis
MGD	Million Gallons Per Day
MOA	Memorandum of Agreement
MOU	Memorandum of Understanding
NDMA	N-nitrosodimethlamine
NdN	Nitrification/Denitrification
NPR	Non-Potable Water Reuse
PCE	Perchloroethylene
PPB	Parts Per Billion
PPCPs	Pharmaceuticals and Personal Care Products
PPM	Parts Per Million
QSA	Quantification Settlement Agreement
RI	Remedial Investigation
ROD	Record of Decision
RTP	Southern California Association of Governments Regional Transportation Plan
RWMP	Recycled Water Master Plan
RUWMP	Regional Urban Water Management Plan (Prepared by MWD)
SB	Senate Bills
SOC	Synthetic Organic Compounds
SUSMP	Standard Urban Stormwater Mitigation Plan
STORMWATER PLAN	Stormwater Capture Master Plan
SWAT	Irrigation Association Smart Water Application Technologies
SWE	Snow Water Equivalent
TAF	Thousand Acre-Feet
TAP	Technical Assistance Program
TCE	Trichloroethylene
TDMLs	Total Maximum Daily Loads
TOC	Total Organic Carbon
ULF	Ultra-Low Flush
UWMP	Urban Water Management Plan
VOCs	Volatile Organic Compounds
WAS	Los Angeles Basin Water Augmentation Study
WBICs	Weather-Based Irrigation Controllers
WQCMPUR	Water Quality Compliance Master Plan for Urban Runoff
WRR	Water Recycling Requirements
WSA	Water Supply Assessment
WSAP	Metropolitan Water District's Water Supply Allocation Plan
WSDM Plan	Water Surplus and Drought Management Plan
20x2020	Reduce Per Capita Water Use by 20 Percent by 2020; Senate Bill x7-7

Executive Summary

ES-1 Overview and Purpose of Plan

In 1902, the City created a municipal water system by acquiring title to all properties of a private water company. In 1925, the Los Angeles Department of Water and Power (LADWP) was established by a new city charter. The availability of water has significantly contributed towards the economic development of the City of Los Angeles (City). It has supported the City's need for water resources as it has developed from a town with a population of approximately 146,000 residents in 1902, into the nation's second largest city with over 4 million residents, encompassing a 473 square mile area. As the largest municipal utility in the nation, LADWP delivers safe and reliable water and electricity supplies at an affordable price to the residents and businesses of Los Angeles.

Overview of Water Issues

LADWP, along with all other water agencies in Southern California, is faced with the challenge of providing a reliable and high quality water supply to meet current and future needs. In the past five years, water supplies in California and locally have become scarcer due to multi-year dry weather and regulatory restrictions affecting water supplies originating in the Sacramento-San Joaquin Delta (Bay Delta) and Colorado River Basin. It is projected that imported and local water supplies will be adversely affected by global climate change. Finally, contamination of local groundwater has resulted in reduced groundwater supplies for the City.

To address these issues, LADWP will take the following water management actions in order to meet the City's water needs while maximizing local resources and minimizing the need to import water:

- Significantly enhance water conservation, stormwater capture and recycling projects to increase supply reliability.
- Implement treatment for San Fernando Basin groundwater supplies.
- Ensure continued reliability of the water supplies from the Metropolitan Water District of Southern California (MWD) through active representation of City interests on the MWD Board.
- Maintain the operational integrity of the Los Angeles Aqueduct (LAA) and in-City water distribution systems.
- Meet or exceed all Federal and State standards for drinking water quality.

Purpose of Plan

The California Urban Water Management Planning Act (first effective on January 1, 1984) requires that every urban water supplier prepare and adopt an Urban Water Management Plan (UWMP) every five years. Since its original enactment, there have been several amendments added to the Act. The main goal of the UWMP is to forecast future water demands and water supplies under average and dry year conditions, identify future water supply projects such as recycled water, provide a summary of water conservation best management practices (BMPs), and provide a single and multi-dry year management strategy.

LADWP's 2010 UWMP serves two purposes: (1) achieve full compliance with requirements of California's Urban Water Management Planning Act; and (2) serve as a master plan for water supply and resources management consistent with the City's goals and policy objectives.

Changes Since 2005 UWMP

A number of important changes have occurred since LADWP prepared its 2005 UWMP. First, LADWP released its Water Supply Action Plan (Action Plan) in 2008 to address the water reliability issues associated with the lowest snowpack on record in the Sierra Nevada (in 2007), the driest year on record for the Los Angeles Basin (in 2007), increased water for environmental mitigation and enhancement in the Owens Valley, San Fernando Groundwater Basin contamination, and reduced imported water from the Bay-Delta due to a prolonged water shortage and environmental restrictions on Delta exports. Second, a number of new requirements were added to the Urban Water Management Planning Act, such as addressing California's new mandate of reducing per capita water use by 20 percent by the year 2020. And third, LADWP developed a new water demand forecast based on a more rigorous analysis of water use trends and measurement of achieved water conservation.

As a result of these changes, the implementation plan and schedule in the 2005 UWMP have been revised as follows:

- The Water Supply Action Plan provided more focused strategies as described in Section 1.1.2 with more conservation and recycled water than the amounts planned in the 2005 UWMP.
- Owens Lake Dust Mitigation water use exceeded the 55,000 AFY estimated in 2005 UWMP and resulted in reduced LAA deliveries.
- Groundwater production decreased due to expanded San Fernando Groundwater Basin contamination impacts.

- Seawater desalination was removed from planned water supplies due to concerns over high cost and environmental impacts.

- The schedule for water transfers was postponed because the California Aqueduct interconnection with the Los Angeles Aqueduct has not yet been constructed.

ES-2 Existing Water Supplies

Primary sources of water for the LADWP service area are the Los Angeles Aqueducts (LAA), local groundwater, and purchased imported water from MWD (see Exhibit ES-A). An additional fourth source, recycled water, is increasingly becoming a larger source in the overall supply portfolio. Two of the supply sources, LAA and water purchased from MWD, are classified as imported as they are obtained from outside LADWP's service area. MWD is the regional wholesale water agency, importing water from the Bay-Delta via the State Water Project (SWP) and from the Colorado River via the Colorado River Aqueduct (CRA). Groundwater is local and is obtained within the service area. Historical supply sources are increasingly under multiple constraints including potential impacts of climate change, groundwater contamination, and reallocation of water for environmental concerns. To mitigate these impacts on supply sources, LADWP is modifying its water supply portfolio through increased water use efficiency programs, water recycling, and stormwater capture.

The challenge of water management in California is the year-to-year variability in availability of surface water due to hydrologic conditions from wet and dry years. Also, environmental regulations can result in temporary or permanent restrictions in certain water supplies. For example, recent pumping restrictions in the Bay-Delta resulted in MWD restricting the availability of imported water to LADWP. The LAA supply has also seen reductions in availability due to dry years and environmental mitigation and enhancement needs. Exhibit ES-B shows LADWP's historical water supplies from fiscal year (FY) 1980/81 to 2009/10. The supplies in FY 2009/10 are much lower due to the mandatory water use restrictions LADWP imposed on its customers in response to the prolonged statewide supply shortage and environmental regulations reducing pumping from the Bay-Delta.

ES-A L.A. Water Supplies

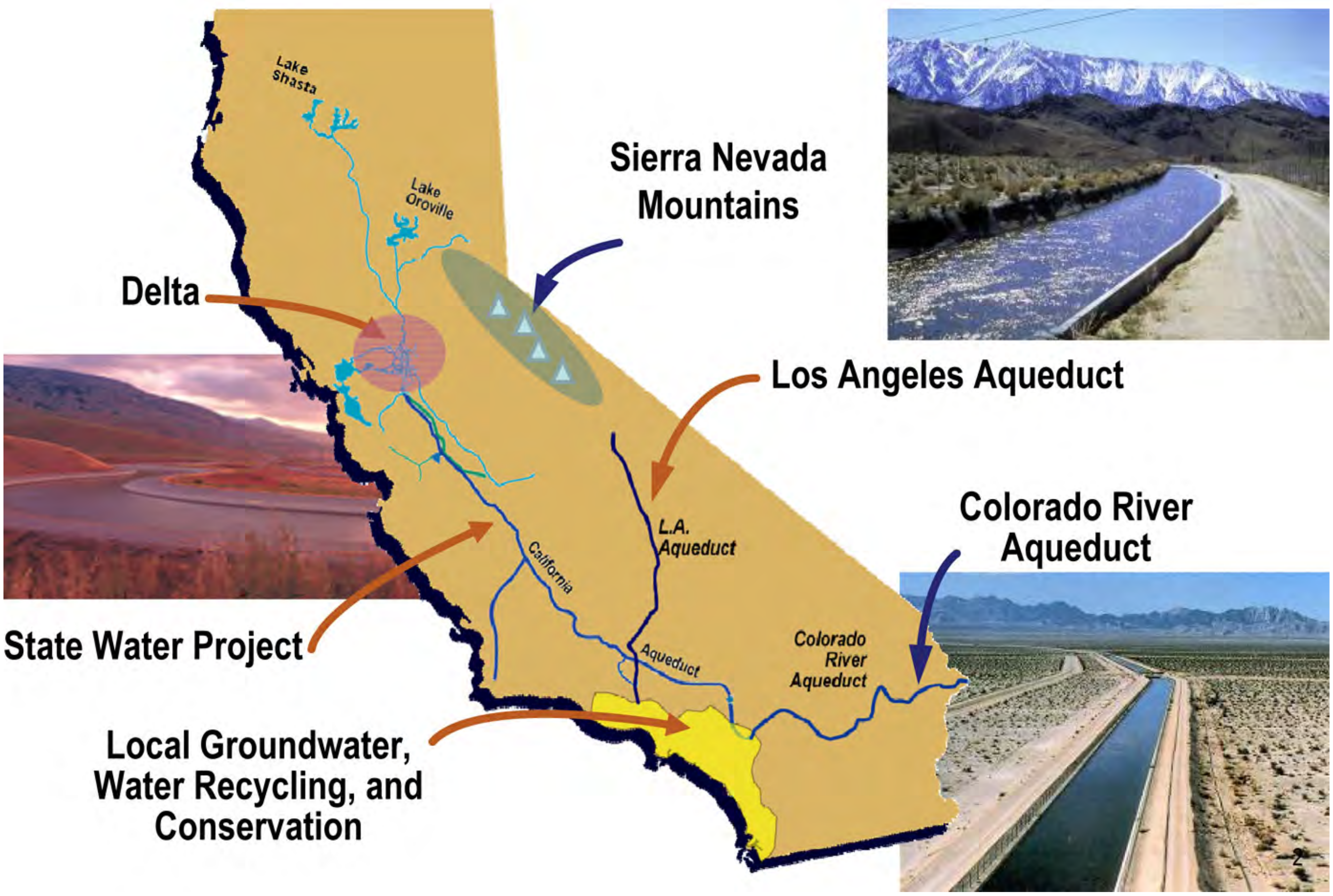
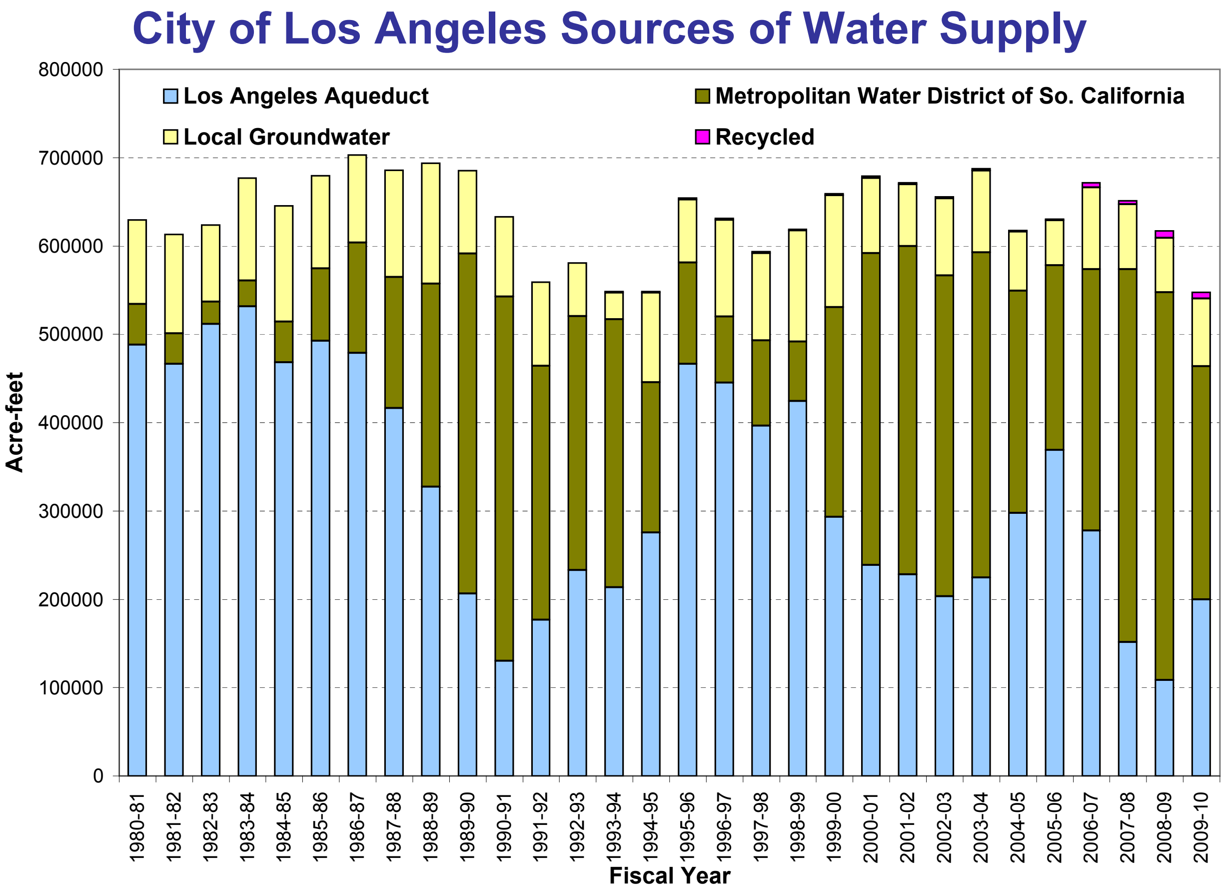


Exhibit ES-B
LADWP Historical Water Supply Sources 1980-2010



Recycled Water

In 1979, LADWP began delivering recycled water to the Department of Recreation and Parks for irrigation of areas in Griffith Park. This service was later expanded to include Griffith Park's golf courses. In 1984, freeway landscaping adjacent to the park was also irrigated with recycled water. In addition, the Japanese Garden, Balboa Lake and Wildlife Lake in the Sepulveda Basin now utilize recycled water for environmentally beneficial reuse purposes. The Greenbelt Project, which carries recycled water from the Los Angeles-Glendale Water Reclamation Plant to Forest Lawn Memorial Park, Mount Sinai Memorial Park, Lakeside Golf Club of Hollywood and Universal Studios, began operating in 1992, and represents LADWP's first project to supply recycled water to non-governmental customers. In 2009 phase 1 of the Playa Vista development began receiving recycled water. Playa Vista is the first planned development in the City that uses recycled water to meet all landscape needs. Future recycled water projects will continue to build on the success of these prior projects making recycled water a more prominent component of the City's water supply portfolio. LADWP expects to increase the use of recycled water to 59,000 AFY by 2035.

Los Angeles Aqueduct

Since its construction in the early 1900's, the Los Angeles Aqueduct historically provided the vast majority of water for the City. It remains as a significant water supply source, providing an average of 36 percent of total water supplies from FY 2005/06 to 2009/10. In the last decade environmental considerations have required that the City reallocate approximately one-half of the Los Angeles Aqueduct (LAA) water supply to environmental mitigation and enhancement projects. As a result, approximately 205,800 AF of water supplies for environmental mitigation and enhancement in the Owens Valley and Mono Basin regions were used in 2010, which is in addition to the almost 107,300 acre-ft per year (AFY) supplied for agricultural, stockwater, and Native American Reservations. Reducing water deliveries to the City from the LAA has led to increased dependence on imported water supply from MWD. This need for purchased water has reinforced LADWP's plans to focus on developing local supplies.

Local Groundwater

A key resource that the City has relied upon as the major component of its local supply portfolio is local groundwater. Over the last ten years local groundwater has provided approximately 12 percent of the total water supply for Los Angeles, and historically has provided nearly 30 percent of the City's total supply during droughts when imported supplies become unreliable. In recent years, contamination issues have impacted LADWP's ability to fully utilize its local groundwater entitlements. Additionally, reduction of natural infiltration due to expanding urban hardscape and channelization of stormwater runoff has resulted in declining groundwater elevations. In response to contamination issues and declining groundwater levels, LADWP is working to clean up the San Fernando Basin's groundwater, and is making investments to recharge local groundwater basins through stormwater recharge projects, while at the same time collaborating on rehabilitation of aging stormwater capture and spreading facilities. The San Fernando Basin is a fully adjudicated basin with an active Watermaster and Administrative Committee.

MWD Supply

As a wholesaler, MWD sells water to all of its 26 member agencies. LADWP is exclusively a retailer and has historically purchased MWD water to make up the deficit between demand and other City supplies. As a percentage of the City's total water supply, purchases of MWD water have historically varied from 4 percent in FY 1983/84 to 71 percent in FY 2008/09, with a 5-year average of 52 percent between FY 2005/06 and FY 2009/10. The City relies on MWD water even more in dry years and has increased its dependence in recent years as LAA supply has been reduced. Although the City plans to reduce its reliance on MWD supply, it has made significant investments in MWD anticipating that the City will continue to rely on the wholesaler to meet its current and future supplemental water needs.

ES-3 Water Demands

Water demands are driven by a number of factors: demographics (population, housing and employment); implementation of water conservation programs; behavioral practices of water users; and weather. For the development of LADWP's 2010 UWMP, a new water demand forecast was prepared using: (1) the latest trends in water use; (2) econometric-derived elasticities for estimating the impacts of weather, price of water, income, and family size on per household and per employee water use; and (3) more accurate estimates of the effectiveness of water conservation in the City.

Demographics and Climate

Over 4 million people reside in the LADWP service area which is slightly larger than the legal boundary of the City of Los Angeles. LADWP provides water service outside the City's boundary to portions of West Hollywood, Culver City, Universal City, and small parts of the County of Los Angeles. The population within LADWP's service area increased from 2.97 million in 1980 to 4.1 million in 2009, representing an average annual growth rate of 1.3 percent. The total number of housing units increased from 1.10 million in 1980 to 1.38 million in 2009, representing an average annual growth rate of 0.9 percent.

During this time, average household size increased from 2.7 persons in 1980 to 2.9 persons in 2009. Employment grew by about 1.0 percent annually from 1980 to 1990, but declined from 1990 to 2000 as a result of an economic recession that started in 1991. Another decline in employment began in 2008 reflecting the recent economic recession. Overall, employment increased by about 0.3 percent annually from 1990 to 2009.

Demographic projections for LADWP's service area are based on the 2008 forecast generated by the Southern California Association of Governments (SCAG). Exhibit ES-C summarizes these demographic projections for the LADWP service area. Service area population is expected to increase at a rate of 0.4 annually over the next 25 years. While this growth is substantially less than the historical 1.3 percent annual growth rate from 1980 to 2009, it will still lead to approximately 367,300 new residents over the next 25 years.

Weather in Los Angeles is considered mild with blue skies, and sunshine throughout most of the year. Favorable weather is a popular attribute that attracts businesses, residents, and tourists to the City. Because of its relative dryness, Los Angeles' climate has been characterized as Mediterranean. Exhibit ES-D provides a summary of average monthly rainfall, maximum temperatures, and evapotranspiration readings.

Exhibit ES-C Demographic Projections for LADWP Service Area

Demographic	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Population	4,100,260	4,172,760	4,250,861	4,326,012	4,398,408	4,467,560
Housing						
Single-Family	627,395	646,067	665,261	678,956	691,703	701,101
Multi-Family	764,402	804,013	846,257	880,580	914,125	942,846
Total Housing	1,391,797	1,450,080	1,511,518	1,559,536	1,605,828	1,643,947
Persons per Household	2.88	2.81	2.75	2.71	2.67	2.65
Employment						
Commercial	1,674,032	1,724,106	1,754,998	1,790,798	1,828,765	1,865,156
Industrial	163,382	157,652	155,012	152,426	150,009	147,508
Total Employment	1,837,415	1,881,758	1,910,010	1,943,224	1,978,773	2,012,664

Source: SCAG Regional Transportation Plan (2008), modified using MWD's land use planning to represent LADWP's service area.

Exhibit ES-D Average Climate Data for Los Angeles 1990-2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temperature (°F)[1]	68	68	70	73	75	78	83	85	83	79	73	68	75
Average Precipitation (inches)[1]	3.62	4.46	2.28	0.75	0.34	0.12	0.01	0	0.07	0.68	0.72	2.53	15.58
Average Eto (inches)[2,3]	1.98	2.26	3.66	4.96	5.46	6.08	6.46	6.31	4.87	3.63	2.56	2.03	50.26

1. 1990-2010, Los Angeles Downtown USC Weather Station ID 5115

2. Average of Hollywood Hills (Station Id. 73), Glendale (Station Id. 133), and Long Beach (Station Id. 174)

3. www.cimis.water.ca.gov

Exhibit ES-E
Historical Total Water Demand in LADWP's Service Area

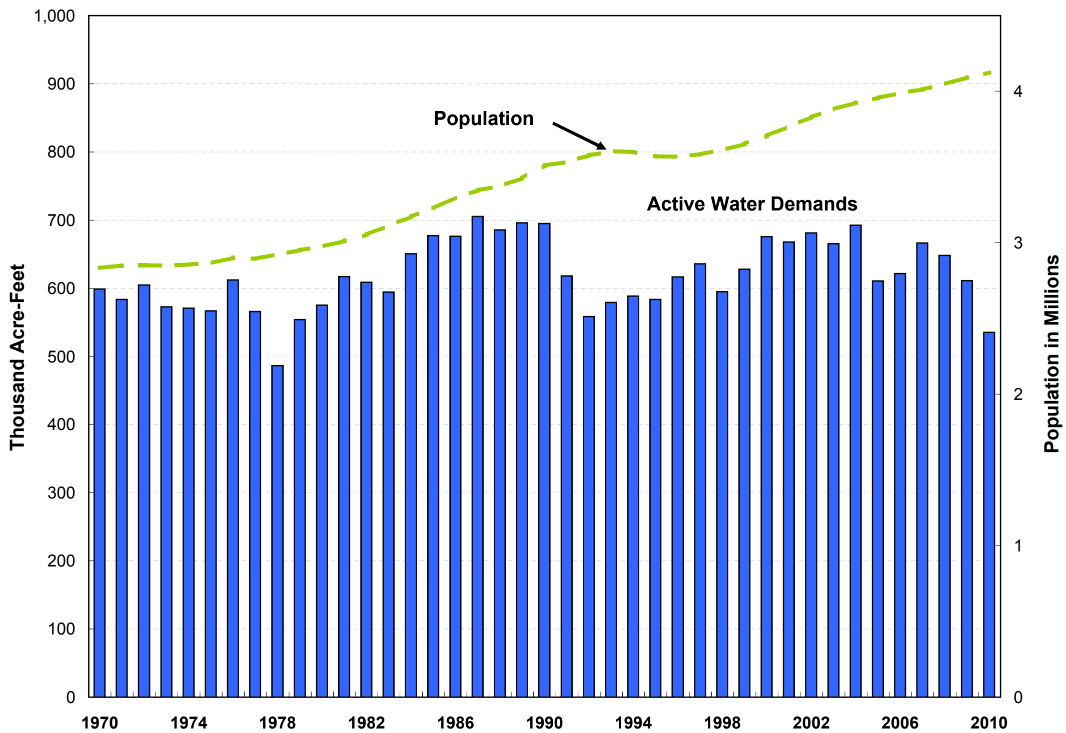


Exhibit ES-F
Breakdown in Historical Water Demand for LADWP's Service Area

Fiscal Year	Single-Family		Multifamily		Commercial		Industrial		Government		Non-Revenue		Total
Ending	AF	%	AF	%	AF	%	AF	%	AF	%	AF	%	AF
1986-90 Avg	238,248	35%	197,312	29%	123,324	18%	30,502	4%	43,378	6%	52,830	8%	685,594
1991-95 Avg	197,322	35%	177,104	31%	110,724	19%	21,313	4%	38,600	7%	24,100	4%	569,164
1996-00 Avg	222,748	35%	191,819	30%	111,051	18%	23,560	4%	39,830	6%	43,617	7%	632,626
2001-05 Avg	239,754	36%	190,646	29%	109,685	17%	21,931	3%	41,888	6%	58,299	9%	662,203
2005-10 Avg	236,154	38%	180,279	29%	106,955	17%	23,201	4%	42,940	7%	31,929	5%	621,458
25-yr Avg	226,845	36%	187,432	29%	112,348	18%	24,101	4%	41,327	6%	42,155	7%	634,209

Historical Water Use

Exhibit ES-E presents the historical water demand for LADWP. In 2009, an economic recession and a water supply shortage required LADWP to impose mandatory conservation. In 2010 mandatory conservation continued as the economic recession became more severe, resulting in a 19 percent decrease in water use.

Prior to 1990, population growth in Los Angeles was a good indicator of total demands. From 1980 to 1990, population in the City grew at 1.7 percent annually. Water demands during this same ten year period also grew at 1.7 percent annually. However, after 1991, LADWP began implementing water conservation measures and water use efficiency programs which prevented water demands from returning to pre-1990 levels. Average water demands in the last five years from FY 2004/05 to 2009/10 are about the same as they were in FY1980/81 despite the fact that over 1.1 million additional people now live in Los Angeles.

Exhibit ES-F shows the breakdown in average total water use between LADWP's major billing categories and non-revenue water in five-year intervals for the past

25 years. Non-revenue water, which is the difference between total water use and billed water use, includes water for fire fighting, reservoir evaporation, mainline flushing, leakage from pipelines, meter error, and theft. Single-family residential water use comprises the largest category of demand in LADWP's service area, representing about 36 percent of the total. Multifamily residential water use is the next largest category of demand, representing about 29 percent of the total. Industrial use is the smallest category, representing only 4 percent of the total demand. Although total water use has varied substantially from year to year, the breakdown between the major billing categories of use has not.

In order to assess the potential for water use efficiency and target conservation programs, LADWP conducted an analysis to determine indoor and outdoor water uses for its major billing categories. The analysis concluded that the City's total outdoor water use was approximately 39 percent of the total water use during the study period from 2004 to 2007. (see Exhibit ES-G).

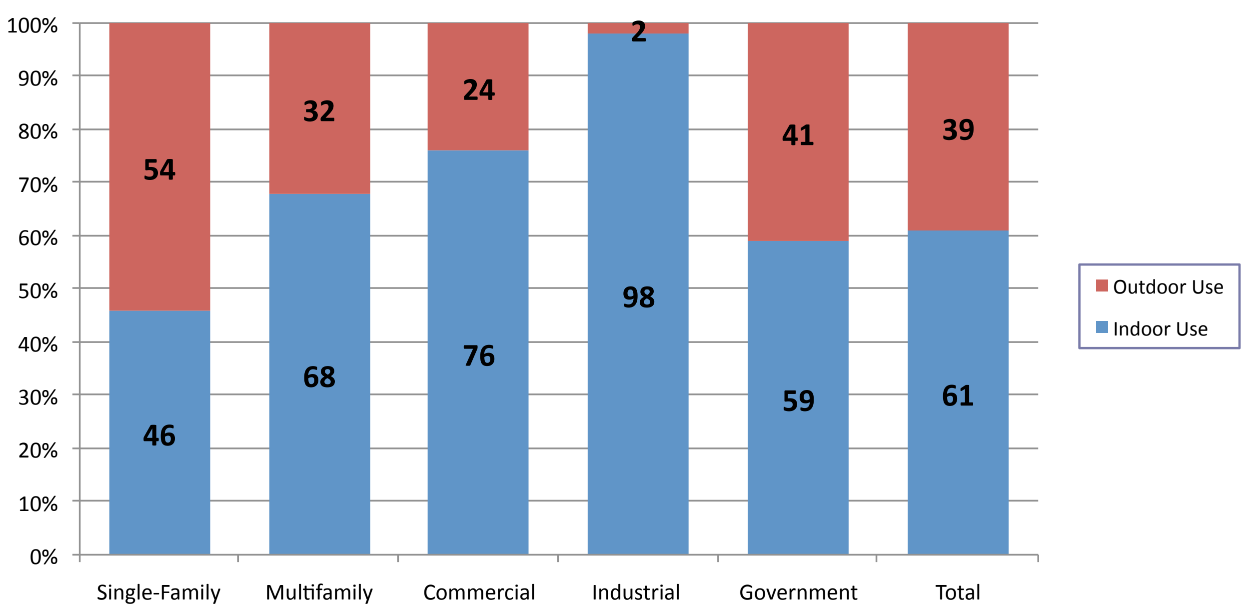
Water Demand Forecast

Using an econometric water demand forecasting approach, LADWP projected water demands by major category and under different weather conditions. Exhibit ES-H presents the water demand forecast with and without future active water conservation programs.

Categorically, conservation can be grouped into two main types; active and passive conservation. Passive conservation accounts for the improved water use efficiency of retrofitted and new residential homes and commercial buildings due to plumbing code changes. The passive conservation due to the 1991 and 2010 plumbing code changes is hardwired into the 2010 water demand forecast model. Therefore, both cases of demand forecast on Exhibit ES-H are presented with the built-in passive conservation.

Examples of active conservation include installation of low-flush toilets and low flow plumbing fixtures, replacing turf with drought resistant landscaping, and programs which promote water use efficiency in industrial processes. The demand forecast model can present the

Exhibit ES-G
Indoor and Outdoor Water Use in LADWP's Service Area



Demand Forecast with Passive Water Conservation	2005	2010	2015	2020	2025	2030	2035
Single-Family		198,444	229,115	241,976	249,528	257,693	259,904
Multifamily		167,299	179,653	194,724	205,136	216,054	221,912
Commercial/Gov		135,000	143,081	149,597	153,791	158,628	160,049
Industrial		20,298	20,524	20,726	20,532	20,408	19,852
Non-Revenue		33,515	42,421	44,989	46,617	48,380	49,042
Total		554,556	614,794	652,012	675,604	701,164	710,760
Demand Forecast with Passive & Active Water Conservation	**2005 Actual**	**2010 Actual**	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Family	233,192	196,500	225,699	236,094	241,180	246,879	247,655
Multifamily	185,536	166,810	178,782	193,220	202,999	213,284	218,762
Commercial/Gov	107,414	130,386	135,112	133,597	129,761	126,567	120,420
Industrial	62,418	19,166	18,600	16,852	14,708	12,634	10,513
Non-Revenue	26,786	32,909	41,370	42,969	43,627	44,421	44,272
Total	615,346	545,771	599,563	622,732	632,275	643,785	641,622
Aggregate Active Water Conservation Savings From	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Family		1,944	3,416	5,882	8,349	10,815	12,249
Multifamily		489	871	1,504	2,137	2,770	3,150
Commercial/Gov		4,614	7,969	16,000	24,030	32,061	39,629
Industrial		1,132	1,924	3,874	5,824	7,774	9,339
Non-Revenue		606	1,051	2,020	2,990	3,959	4,771
Total		8,785	15,231	29,280	43,329	57,379	69,138

* Non-revenue is the combination of unaccounted water and accounted non-revenue water. Unaccounted water is defined as system losses. In recent years, the City experienced no accounted non-revenue water. Thus, non-revenue water is considered system loss.

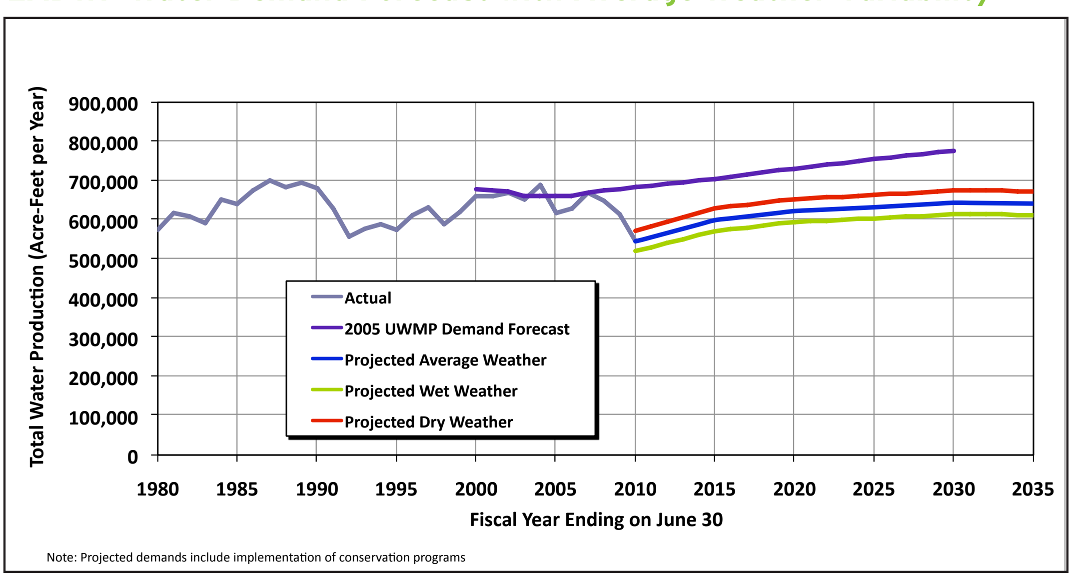
Exhibit ES-H Water Demand Forecast and Conservation Savings Under Average Weather Fiscal Year Ending June 30 (Acre-Feet)

results with or without the additional active conservation planned after 2008. The active conservation prior to 2008 is considered a permanent part of the newly established water demand factors for the 2010 water demand forecast model and is accounted for in the forecast.

The calculated active conservation savings include the planned active conservation savings and the additional savings as a result of the decrease in non-revenue water, which is proportional to the decrease of the total water demand.

Exhibit ES-I shows the projected water demands can vary by approximately ± 5 percent in any given year due to average historical weather variability. Historical water use from 1980 to 2010 is illustrated as actual water use. When comparing with the demands forecasted in the 2005 UWMP, the 2010 demand forecasts are about 15 percent lower.

Exhibit ES-I
LADWP Water Demand Forecast with Average Weather Variability



ES-4 Water Conservation

Los Angeles is a national leader in water use efficiency. This accomplishment has resulted from the City's sustained implementation of effective water conservation programs since the 1990s. One of LADWP's most effective conservation tools is its customer's water use efficiency ethic. During past water shortages, residents and businesses have aggressively implemented conservation to achieve demand reductions. During FY 2009/10, water use was below 1979 water use levels thanks to extraordinary conservation efforts by LADWP customers.

To measure conservation effectiveness, LADWP developed a statistical regression model that correlates total water use against population, weather, economic recession, and conservation. The model can predict what water use would be based on actual population, weather and economy in a given year, but without the conservation. The predicted water use is then compared to actual water use and the difference between the two is the annual total water conservation/savings as shown in Exhibit ES-J. The exhibit summarizes LADWP's historical water conservation since FY 1990. The table shows water savings from hardware programs, such as ultra-low-flow and high-efficiency toilet retrofits, cooling tower recirculation, high efficiency clothes washer machines, and other plumbing and efficiency measures. The table also shows water savings that occur from non-hardware programs that result from changes in water customer behavior, such as reduced watering, and taking shorter showers. These behavioral conservation savings occur as a result of public education and information programs, and increases in the price of water. As shown in the exhibit, hardware water savings have been steadily increasing since 1990 while non-hardware water savings peaked in FY 1991/92 and again in FY 2009/10. The peaks in non-hardware savings were due to City of Los Angeles' mandatory water use restrictions implemented in response to multi-year water shortages.

Exhibit ES-J
Historical Water Conservation in LADWP's Service Area

Fiscal Year	Additional Annual Hardware Installed Savings (AF)	Cumulative Annual Hardware Savings (AF)	Annual Non-Hardware Savings (AF)	Annual Total Savings (AF)
Prior to 1990/1991	31,825	31,825		
1990/1991	4,091	35,916	76,350	112,267
1991/1992	8,670	44,586	105,593	150,179
1992/1993	3,286	47,872	58,546	106,417
1993/1994	4,961	52,832	60,928	113,761
1994/1995	4,041	56,873	62,084	118,958
1995/1996	4,642	61,516	52,648	114,164
1996/1997	2,376	63,892	33,720	97,612
1997/1998	2,637	66,529	30,434	96,964
1998/1999	2,781	69,310	38,305	107,614
1999/2000	3,532	72,842	-6,262	66,580
2000/2001	3,078	75,920	-3,407	72,513
2001/2002	2,452	78,371	15,131	93,502
2002/2003	2,630	81,002	8,725	89,726
2003/2004	3,257	84,259	13,107	97,366
2004/2005	3,299	87,558	46,865	134,423
2005/2006	2,404	89,963	62,223	152,186
2006/2007	2,095	92,058	76,643	168,701
2007/2008	782	92,840	64,472	157,312
2008/2009	3,127	95,967	106,151	202,118
2009/2010	4,269	100,236	126,466	226,702

1. Negative non-hardware savings are due to overestimation in hardware savings due to years with extreme wet weather conditions.

Exhibit ES-K
Active Water Conservation Projections

Sector	Acre-feet per Fiscal Year				
	2014/2015	2019/2020	2024/2025	2029/2030	2034/2035
Single-Family Residential	3,416	5,882	8,349	10,815	12,249
Multi-Family Residential	871	1,504	2,137	2,770	3,150
Commercial/Government	7,969	16,000	24,030	32,061	39,629
Industrial	1,924	3,847	5,824	7,774	9,339
Total Active Conservation Projections	14,180	27,260	40,340	53,420	64,368

Water Conservation Goals

LADWP has set a water conservation goal to further reduce potable water demands an additional 64,000 AFY by 2035. This aggressive approach includes multiple strategies: investments in state-of-the-art technology; rebates and incentives promoting installation of weather-based irrigation controllers (WBICs), efficient clothes washers and urinals; expansion and enforcement of prohibited water use; reductions in outdoor water uses; and extending education and outreach efforts. Exhibit ES-K shows the projected water conservation by sector of use. Note that these projected savings are in addition to what has already occurred in the City since the 1990s.

The California Water Conservation Act of 2009, Senate Bill x7-7, requires water agencies to reduce per capita water use by 20 percent by the year 2020 (20x2020). This includes increasing recycled water use to offset potable water use. Water suppliers are required to set a water use target for 2020 and an interim target for 2015 using one of four methods. The 2020 urban water use target may be updated in a supplier's 2015 UWMP. The California Department of Water Resources (DWR) has developed four methods for measuring compliance with 20x2020.

LADWP has selected Method 3 to set its 2015 interim and 2020 water use targets. Method 3 requires setting the 2020 water use target to 95 percent of the applicable State hydrologic region target as provided in the State's Draft 20x2020 Water Conservation Plan. LADWP is within State hydrologic region 4, the South Coast region. LADWP was required to further adjust the calculated 2020 target to achieve a minimum reduction in water use. The per capita water use at 95 percent of the hydrologic region was 142 gallons per capita per day (gpcd), and using 95 percent of the five-year average base daily per capita water use was equal to 138 gpcd. Therefore, LADWP was required to set its 2020 target at the smaller of the two resultant values. LADWP's interim 2015 target is 145 gpcd and the 2020 target is 138 gpcd. Exhibit ES-L presents the calculations for LADWP's 20x2020 target. Also shown in this exhibit for reference is LADWP's 10-year and 5-year historical average per capita water use.

Exhibit ES-L
20x2020 Base and Target

20x2020 Required Data	Gallons Per Capita Per Day (GPCD)
Base Per Capita Daily Water Use	
10-Year Average[1]	152
5-Year Average[2]	145
2020 Target Using Method 3[3]	
95% of Hydrologic Region Target (149 gpcd)	142
95% OF Base Daily Capita Water Use 5-Year Average (145 gpcd)	138
Actual 2020 Target	**138**
2015 Interim Target	145

1. Ten-year average based on fiscal year 1995/96 to 2004/05

2. Five-year average based on fiscal year 2003/04 to 2007/08

3. Methodology requires smaller of two results to be actual water use target to satisfy minimum water use target.

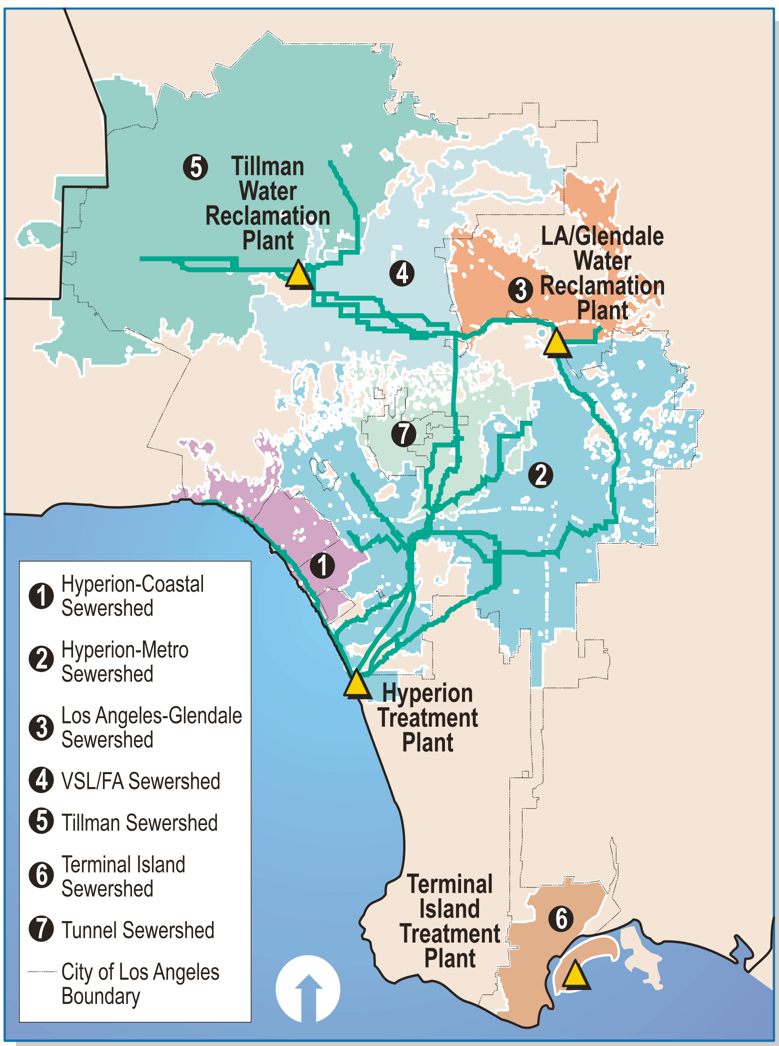
Exhibit ES-M
Water Conservation BMPs and Implementation Status

Category	Sub-category	Practices	Status
Foundational			
Utility Operations	Operations Practices	Maintain the position of a trained conservation coordinator	Implemented
		Prevent water waste – enact, enforce or support legislation, regulations, and ordinances	Implemented
		Wholesale agency assistance programs	Not applicable
	Water Loss Control	Conduct Standard Water Audit and Water Balance	Implemented
		Measure performance using AWWA software	Implemented
		Locate and Repair all leaks and breaks	Implemented
	Metering with Commodity Rates	100% of existing unmetered accounts to be metered and billed by volume of use	Implemented
	Conservation Pricing	Maintain a water conserving retail rate structure	Implemented
Education	Public Information Programs	Maintain active public information program to promote and educate customers about water conservation	Implemented
	School Education Programs	Maintain active program to educate students about water conservation and efficient water use	Implemented
Programmatic			
Residential		Residential Assistance – provide leak detection assistance	Implemented
		Landscape Water Surveys for residential accounts	Implemented
		High efficiency clothes washer incentive program	Implemented
		WaterSense Specification (WSS) for toilets	Implemented
Commercial/ Industrial/ Institutional (CII)		Implement unique conservation programs to meet annual water savings goals for CII customers	Implemented
Landscape		Implement Large Landscape custom programs	Implemented
		Offer technical assistance and surveys upon request	Implemented
		Implement and maintain incentive program(s) for irrigation equipment retrofits	Implemented

Water Conservation Best Management Practices (BMPs)

LADWP is one of the original signatories to the California Urban Water Conservation Council Memorandum of Understanding (MOU), and as such has to report its progress on achieving water conservation BMPs. Exhibit ES-M presents the checklist of BMPs that LADWP has implemented. LADWP is currently in compliance with all the BMP's contained in the MOU.

Exhibit ES-N
City Wastewater Plants and Sewersheds



ES-5 Future Water Supplies

As stated previously, the water management goal of LADWP is to implement cost-effective conservation, recycled water, and stormwater capture programs. In addition, LADWP is also pursuing water transfers in order to make up for its LAA water losses.

Water Recycling

LADWP is committed to significant expansion of recycled water in the City's water supply portfolio. Realizing multiple factors are decreasing the reliability of imported water supplies, LADWP released the City of Los Angeles Water Supply Action Plan (Plan), "Securing L.A.'s Water Supply" in May of 2008. The Plan established the goal of using 50,000 AFY of recycled water to offset demands on potable supplies. In order to meet this goal, LADWP, in conjunction with the Department of Public Works Bureau of Sanitation (BOS), are working together to develop a Recycled Water Master Plan (RWMP). Opportunities to expand the water recycling program are being studied through development of the RWMP. These include expanding the recycled water distribution system for Non-Potable Reuse (NPR) such as for irrigation and industrial use, along with replenishment of groundwater basins with highly purified recycled water. Beyond 50,000 AFY, LADWP expects to increase recycled water use by approximately 1,500 AFY annually, bringing the total to 59,000 AFY by 2035.

LADWP's water recycling program is dependent on the City's wastewater treatment infrastructure. Wastewater in the City of Los Angeles is collected and transported through some 6,500 miles of major interceptors and mainline sewers, more than 11,000 miles of house-sewer connections, 46 pumping plants, and four treatment plants. BOS is responsible for the planning and operation of the wastewater program. The City's wastewater system serves 515 square miles, of which 420 square miles are within the City. In addition to the City, service is provided to 29 non-City agencies through contract services. Exhibit ES-N shows the City's four wastewater treatment plants and seven sewersheds that feed those plants. A portion of the treated effluent from the wastewater plants is utilized by LADWP to meet recycled water demands.

In FY 2009/10, LADWP provided 31,872 AFY of recycled water for municipal & industrial purposes and environmental benefits.

The use of recycled water must meet California's regulatory requirements for safety. Non-potable water reuse (NPR) regulations in the City of Los Angeles are governed by the California Department of Public Health (CDPH), State Water Resources Control Board (SWRCB), Los Angeles Regional Water Quality Control Board (LARWQCB) and the Los Angeles County Department of Public Health (LACDPH). Criteria and guidelines for the production and use of recycled water were established by the CDPH in the California Code of Regulations, Title 22, Division 4, and Chapter 3 (Title 22). Title 22, also known as Water Recycling Criteria, establishes required wastewater treatment levels and recycled water quality levels dependent upon the end use of the recycled water. Title 22 additionally establishes recycled water reliability criteria to protect public health.

The regulations governing recharge of groundwater or groundwater replenishment (GWR) with recycled water are established by the CDPH and LARWQCB. For groundwater replenishment, LADWP will implement advanced treatment that includes reverse osmosis, microfiltration, and advanced oxidation. This level of treatment will address water quality concerns for the health of the basin along with emerging contaminants of concern.

Exhibit ES-O presents LADWP's projected recycled water use based on preliminary findings from the RWMP.

Stormwater Capture

The 2010 UWMP projects that the stormwater capture can potentially provide increased groundwater pumping rights in the San Fernando Basin of 15,000 AFY from groundwater recharge using captured stormwater, and 10,000 AFY of additional water conservation from

Exhibit ES-O
Recycled Water Use Projections

Category	Projected Use (AFY)[1]				
	2015	2020	2025	2030	2035
Municipal and Industrial Non-Potable Reuse	20,000	20,400	27,000	29,000	29,000
Indirect Potable Reuse (Groundwater Recharge)	0	0	15,000	22,500	30,000
Subtotal[2]	**20,000**	**20,400**	**42,000**	**51,500**	**59,000**
Environmental[3]	26,990	26,990	26,990	26,990	26,990
Seawater Intrusion Barrier (Dominguez Gap Barrier)	3,000	3,000	3,000	3,000	3,000
Total	**49,990**	**50,390**	**71,990**	**81,490**	**88,990**

1. Projected use by category is subject to change per completion of Recycled Water Master Plan, but overall total will not change. Does not include deliveries of 34,000 AFY of secondary treated water to WBMWD for further treatment to recycled water standards.

2. To offset potable use and included in supply reliability tables in Chapter 11.

3. Environmental use includes Wildlife Lake, Balboa Lake, and the Japanese Garden. Additional environmental benefits associated with recycled water discharges to the Los Angeles River are not included.

Exhibit ES-P Planned Centralized Stormwater Capture Programs

Project	Current Annual Recharge (AFY)	Increased Annual Capture/ Recharge (AFY)	Expected Annual Recharge (AFY)	Estimated Project Completion	Total Project Cost (millions)	LADWP Share (millions)
Sheldon-Arleta Gas Collection System	-	4,000 [1]	-	Completed Nov 2009	$8.2	$6.3
Big Tujunga Dam Rehabilitation [3]	-	4,500	-	July 2011	$105.7	$9.0
Hansen Spreading Grounds Upgrade	13,834	1,200	17,284 [2]	Dec 2011	$9.3	$4.8
Tujunga Spreading Grounds Upgrade	4,419	8,000	18,669 [4]	2015	$24.0	$24.0
Pacoima Spreading Grounds Upgrade	6,453	2,000	8,453	2015	$32.0	$16.0
Lopez Spreading Grounds Upgrade	527	750	1,277	2016	$8.0	$4.0
Strathern Wetlands Park	-	900	900 [5]	2016	$46.0	$4.0
Hansen Dam Water Conservation	-	3,400	3,400	2017	$5.0	$2.5
Valley Generating Station Stormwater Capture	-	700	700	2018	$9.7	$9.7
Branford Spreading Basin Upgrade	549	500	1,049	2018	$4.0	$2.0
Total Estimated Yield	**25,782**	**25,950**	**51,732**		**$251.9**	**$82.3**

1. This will allow increased collection of 4,000 AFY at Tujunga Spreading Grounds.
2. Includes 1/2 benefits from Big Tujunga Dam Rehabilitation Project.
3. No recharge occurs at the facility. All additional capture has been divided between Hansen & Tujunga Spreading Grounds.
4. Including benefits from Sheldon-Arleta Project and 1/2 benefits from Big Tujunga Dam Rehabilitation Project.
5. To be recharged at Sun Valley Park.

capture and reuse solutions such as rain barrels and cisterns, for a total of 25,000 AFY by FY 2034/35. A Stormwater Capture Master Plan is being prepared and will comprehensively evaluate stormwater capture potential within the City.

In January 2008, LADWP created the Watershed Management Group which is responsible for developing and managing the water system's involvement in emerging issues associated with local and regional stormwater capture. The Watershed Management Group coordinates activities with other agencies, departments, stakeholders and community groups for the purpose of planning and developing projects and initiatives to improve stormwater management within the City. The Group's primary goal is to increase stormwater capture by enhancing existing centralized stormwater capture facilities and promoting distributed stormwater infiltration systems to achieve the City's long-term strategy of enhancing local stormwater capture.

Watershed management provides additional important benefits to the City of Los Angeles, including surface water quality improvements, water conservation, open space enhancements, and flood control. Water quality improvements are necessary because stormwater runoff is a conveyance mechanism that transports pollutants from the watershed into waterways and ultimately the Pacific Ocean. Pollutants include, but are not limited to, bacteria, oils, grease, trash, and heavy metals. The City must comply with adopted Total Maximum Daily Loads (TMDLs) for pollutants. TMDLs set maximum limits for a specific pollutant that can be discharged to a water body without causing the water body to become impaired or limiting certain uses.

LADWP has already been implementing several watershed projects and has identified others for planned implementation. Exhibit ES-P summarizes the currently planned watershed projects.

The Stormwater Capture Master Plan (Stormwater Plan) is being prepared to investigate potential strategies for stormwater and watershed management in the City. The Stormwater Plan will be used to guide decision makers in the City when making decisions affecting how the City will develop both centralized and distributed stormwater capture goals. The Stormwater Plan will evaluate existing stormwater capture facilities and projects, quantify the maximum stormwater capture potential, develop feasible stormwater capture alternatives (i.e., projects, programs, potential policies, etc.), and provide strategies to increase stormwater capture. It will also evaluate the multi-beneficial aspects of increasing stormwater capture, including potential open space alternatives, improved downstream water quality, and peak flow attenuation in downstream channels, creeks, and streams such as the Los Angeles River.

Water Transfers

Water transfers involve the lease or sale of water or water rights between consenting parties. Water Code Section 470 (The Costa-Isenberg Water Transfer Act of 1986) states that voluntary water transfers between water users can result in a more efficient use of water, benefiting both the buyer and the seller. The State Legislature further declared that transfers of surplus water on an intermittent basis can help alleviate water shortages, save capital outlay development costs, and conserve water and energy. This section of the Water Code also obligates the California Department of Water Resources (DWR) to facilitate voluntary exchanges and transfers of water.

LADWP plans on acquiring water through transfers to replace a portion of LAA water used for environmental enhancements in the eastern Sierra Nevada. The City would purchase water when available and economically beneficial for storage or delivery to LADWP's transmission and distribution system. The City is seeking non-State Water Project water to replace the reallocation of LAA water supply for environmental enhancements. MWD holds an exclusive contractual right to deliver State Water Project entitlement water into its service territory, which includes the City of Los Angeles. Purchasing only non-State Water Project supplies will ensure the City's compliance with MWD's State Water Project contract.

To facilitate water transfers, LADWP is constructing an interconnection between the LAA and the State Water Project's California Aqueduct, located where the two aqueducts intersect in the Antelope Valley (Neenach, California). This interconnection, the Neenach Pumping Station will allow for water transfers from the East Branch of the State Water Project to the LAA System, as well as provide operational flexibility in the event of a disruption of flows along the LAA System. Construction of the Neenach Pumping Station required a four-way agreement between DWR, MWD, LADWP, and the Antelope Valley-East Kern Water Agency (AVEK). When completed, the Neenach Pumping Station facility will be owned by DWR but will be designated as an AVEK interconnection. The Neenach Pumping Station will be operated on behalf of the LADWP. MWD is involved in the agreement to provide consent for the transfer of water into its service territory.

LADWP's current goal is to transfer up to 40,000 AF per year once the Neenach Pumping Station facilities are in place. This will provide LADWP with the ability to replace some Los Angeles Aqueduct supplies reallocated to environmental enhancement projects. This will also provide increased operational flexibility and the ability to yield cost savings.

Other Water Supply Opportunities

Seawater Desalination
LADWP initiated efforts in 2002 to evaluate seawater desalination as a potential water supply source with the goals of improving reliability and increasing diversity in its water supply portfolio. These efforts led to the selection of the Scattergood Generating Station's unused tank farm as a potential site for a seawater desalination plant. For the City, seawater desalination is a potential resource that could also offset supplies that had been committed from the LAA for environmental restoration in the eastern Sierra Nevada. As an identified project in MWD's Seawater Desalination Program, the proposed full-scale project would have qualified for MWD's grant of $250 per acre-foot of water produced. However, in May 2008, LADWP decided to focus on water conservation and water recycling as primary strategies for creating a sustainable water supply due to concerns with cost and the environmental impacts associated with the implementation of desalination. While desalination may be explored further in the future, it currently represents only a supply alternative.

Graywater Systems
As defined by State regulations, graywater is untreated household wastewater which has not come into contact with toilet waste or unhealthy bodily wastes. It includes water sources from bathtubs, showers, bathroom wash basins, and water from clothes washing machines and laundry tubs. It specifically excludes water from kitchen sinks and dishwashers. Graywater is a drought-proof source of supply for subsurface landscape irrigation. Graywater regulations do not allow its application using spray irrigation. Graywater is also not allowed to pond or runoff, enter a storm drain system or surface water body, or irrigate root crops or edible food crops that are directly in contact with the surrounding soil.

The Graywater Systems for Single Family Residences Act of 1992 legally incorporated the use of graywater as part of the California Plumbing Code. In September 1994, the City approved an ordinance that permitted the installation of graywater systems in residential homes. However, installing graywater systems under the Act was costly in terms of both installation and maintenance. To address the current water shortage and reduce water demands, emergency graywater regulations added Chapter 16A (Part I) "Non-potable Water Reuse Systems" to the 2007 California Plumbing Code. These regulations were approved by California Building Standards Commission in 2009 and became effective on August 4, 2009. Further revisions were made to the regulations and the regulations became permanent on January 12, 2010 with an effective date of January 20, 2010. These new code changes allow the use of certain types of untreated graywater systems as long as specific health requirements are met as defined by the authority having jurisdiction.

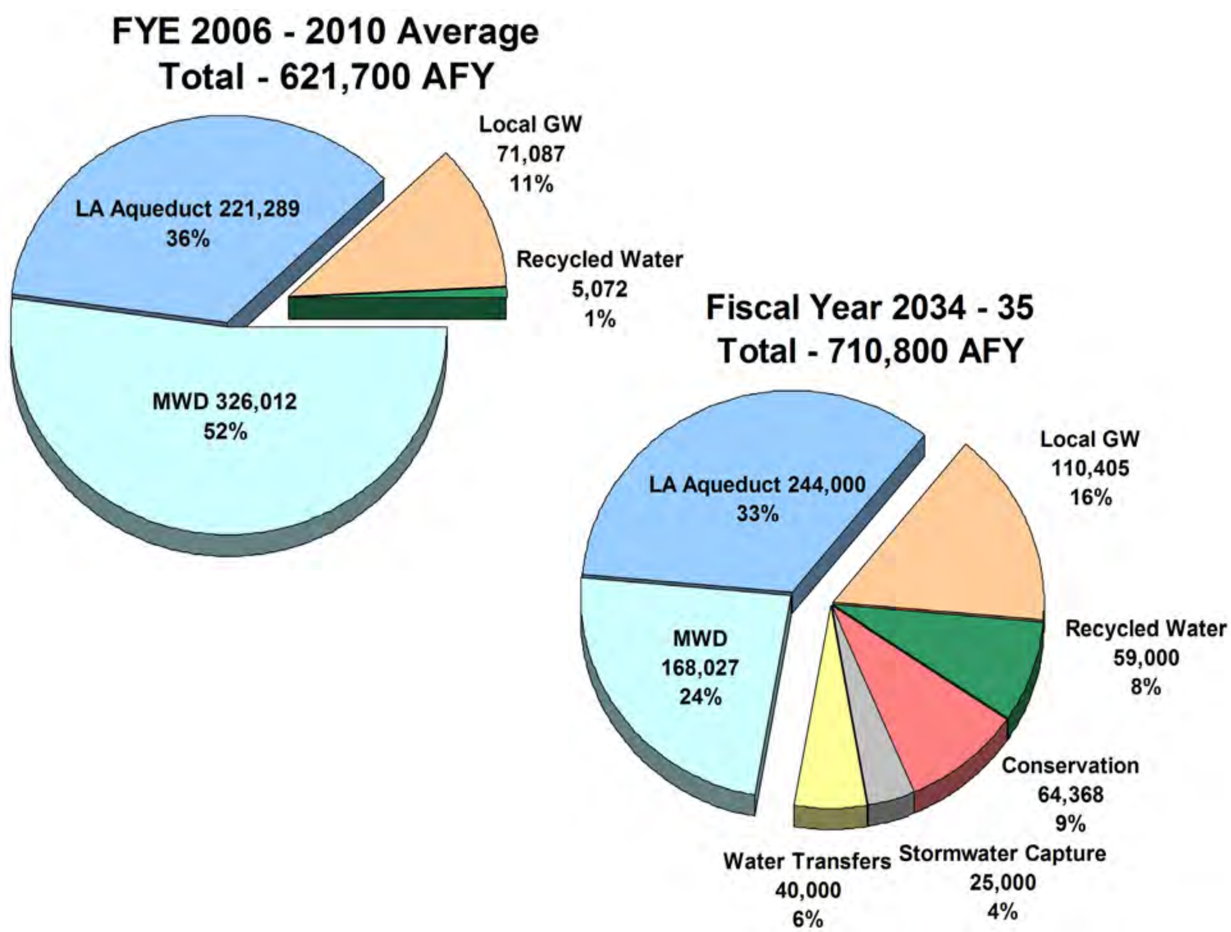
ES-6 Water Supply Reliability

With its current water supplies, planned future water conservation, and planned future water supplies, LADWP will be able to reliably provide water to its customers through the 25-year planning period covered by this UWMP. While there may be times in which severe water shortages require MWD to allocate its imported water in the future, LADWP's customers have shown that they can adapt and reduce consumption in those years. However, MWD's 2010 Regional UWMP currently shows that with its investments in storage, water transfers and improving the reliability of the Delta, water shortages are not expected to occur within the next 25 years.

Exhibit ES-Q shows the current and future mix of LADWP's water supply. As shown in this exhibit, local water supplies and new water conservation are projected to increase from the current 12 percent to 43 percent by 2035. This increased local supply mix will allow LADWP to reduce by half its MWD water supply purchases, effectively making LADWP less subject to cost increases on purchased water. The focus on local supplies also increases flexibility and overall reliability, particularly during periods of water shortage.

Exhibit ES-Q
Current and Projected Mix of LADWP's Water Supplies

Note: Charts do not reflect approximately 100,000 AF of existing conservation



Supply Reliability Assessment

To demonstrate LADWP's water supply reliability, Exhibit ES-R summarizes the water demands and supplies for an average weather year through 2035.

Exhibit ES-S presents the supply reliability for the driest three-year sequence from 2010 to 2013, as required by the UWMP guidelines.

Water Quality Issues

Water quality is an important and necessary consideration in all impact water management strategies and supply reliability. For example as shown in Footnote 2 of the Exhibit ES-R, the sustainability of the groundwater production is contingent on completing two groundwater treatment facilities for the San Fernando Basin groundwater. Similarly, the effectiveness of expanding

Exhibit ES-R Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	FY2009-10 Actual	**Average Weather Conditions (FY 1956/57 to 2005/06) Fiscal Year Ending on June 30**				
		2015	2020	2025	2030	2035
Total Demand	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**
Existing / Planned Supplies						
Los Angeles Aqueduct[1]	199,739	252,000	250,000	248,000	246,000	244,000
Groundwater[2]	76,982	40,500	96,300	111,500	111,500	110,405
Conservation	8,178	14,180	27,260	40,340	53,419	64,368
Recycled Water						
- Irrigation and Industrial Use	6,703	20,000	20,400	27,000	29,000	29,000
- Groundwater Replenishment	0	0	0	15,000	22,500	30,000
Water Transfers	0	40,000	40,000	40,000	40,000	40,000
Subtotal	291,602	366,680	433,960	481,840	502,419	517,773
MWD Water Purchases With Existing/Planned Supplies	263,875	248,120	218,040	193,760	198,781	193,027
Total Supplies	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**
Potential Supplies						
Stormwater Capture						
- Capture and Reuse (Harvesting)	0	2,000	4,000	6,000	8,000	10,000
- Increased Groundwater Production (Recharge)	0	0	2,000	4,000	8,000	15,000
Subtotal	0	2,000	6,000	10,000	16,000	25,000
MWD Water Purchases With Existing/Planned/Potential Supplies	263,875	246,120	212,040	183,760	182,781	168,027
Total Supplies	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impact.

[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected in operation in 2019-20. Tujunga Groundwater Treatment Plant is expected in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from 2014-15 to 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in 2030-31.

Exhibit ES-S
Driest Three-Year Water Supply Sequence

Demand and Supply Projections (in acre-feet)	FY2009-10 Actual	Followed by Repeat of Driest Three Consecutive Years FY 1958/59 to 1960/61 Hydrology Fiscal Year Ending on June 30		
		2011	2012	2013
Total Demand	**555,477**	**590,000**	**608,200**	**626,500**
Existing / Planned Supplies				
Los Angeles Aqueduct[1]	199,739	104,530	50,849	59,382
Groundwater[2]	76,982	61,090	53,660	46,260
Conservation	8,178	9,380	10,580	11,780
Recycled Water				
- Irrigation and Industrial Use	6,703	7,500	8,300	9,000
- Groundwater Replenishment	0	0	0	0
Water Transfers	0	0	0	0
Subtotal	291,602	182,500	123,389	126,422
MWD Water Purchases With Existing/Planned Supplies	263,875	407,500	484,811	500,078
Total Supplies	**555,477**	**590,000**	**608,200**	**626,500**

1. Driest three consecutive years on record in LAA watershed (FY1958-59 to FY1960-61) averaged 28 percent of normal runoff.
2. LAA deliveries reflect increased releases for environmental restoration in the Owens Valley and Mono Basin.
3. Dry year demands are 5 percent greater than normal year demands
4. MWD's Water Surplus and Drought Management Plan actions sufficient to meet LADWP demands.

the use of the San Fernando Basin groundwater from recycled water and captured stormwater also depends on implementation of treatment.

In the portions of the eastern San Fernando Basin, we have detected several industrial contaminants. These include trichloroethylene (TCE), perchloroethylene (PCE), hexavalent chromium, perchlorate and other volatile organic compounds (VOCs). These contaminants are a result of historical improper chemical disposal in the San Fernando Valley. Nitrates in the San Fernando Basin is an additional contaminant of concern which is the result of decades of agricultural activities. These contaminants threaten the overall reliability and sustainability of the City's groundwater supply. LADWP is determined to address the contamination in order to continue to provide high quality water. In this effort, LADWP is working with local, state and federal agencies such as the U.S. Environmental Protection Agency, the California Department of Public Health, the Los Angeles Regional Water Quality Control Board, and the California Department of Toxic Substances Control. LADWP has an ongoing extensive groundwater monitoring program to ensure that groundwater pumping occurs from the safer areas of the basin. LADWP has shutdown groundwater pumping from highly contaminated regions. This has resulted in a 40 percent reduction in pumping from the San Fernando Basin. LADWP has embarked on an ambitions and comprehensive undertaking to address this groundwater contamination. It has begun with a $19 million Groundwater System Improvement Study (GSIS) that will provide vital information to assist with developing both short and long-term projects to maximize the restore the City's historical groundwater usage from the San Fernando Basin. This includes installing additional monitoring wells to help identify contaminants and the best technologies to treat them. The pace of implementation of treatment will be subject to necessary approvals and availability of funding. Already some wellfield treatment projects are underway in partnership with the U.S. Environmental Protection Agency, Metropolitan Water District of Southern California and others.

LADWP closely monitors water quality issues regarding source water challenges and proposed regulations at the local, state and federal levels. LADWP also proactively researches and invests in advanced and emerging technologies to ensure continued safety and reliability of the City's water supplies. A recent example of LADWP's regulatory diligence is addressing the Stage 2 Disinfectants and Disinfection Byproduct Rule with the conversion from chlorine to chloramine as the City's secondary disinfectant. Studies have shown that chlorine tends to increase levels of disinfection byproducts such as trihalomethanes (THMs) and haloacetic acids (HAAs). While still protective, chloramine is significantly less reactive and forms lesser levels of THMs and HAAs. LADWP is planning to complete the conversion from chlorine to chloramine by April 2014.

Similarly, LADWP is closely monitoring level of naturally occurring arsenic in the LAA supply. Although the levels of arsenic in the water served is on average 3.3 parts per billion (ppb) and is well below the current federal and state drinking water standard of 50 ppb. LADWP is committed to continuing research to develop strategies to further reduce the levels of arsenic in its water supply.

LADWP continuously strives to surpass the water quality standards and requirements and do so in an effective and affordable way for our customers. By managing state-of-the-art water treatment process, maintaining and operating treatment facilities, and vigilantly monitoring and testing the water we serve, LADWP has been meeting or exceeding all health-based drinking water standards. The drinking water standards are set by the U.S. Environmental Protection Agency and the California Department of Public Health.

Global Climate Change

LADWP is considering impacts of climate change during development of its long-term water supply plan. Climate change is a global-scale concern, but is particularly important in the western United States where potential impacts on water resources can be significant to supplies for water agencies. Climate change can impact surface supplies from the LAA, imported supplies from MWD, and local demands. As a result, LADWP completed a study to analyze the operational and water supply impacts of potential shifts in the timing and quantity of runoff along the LAA system due to climate change in the 21st Century. Such potential shifts may require LADWP to develop, enhance, and modify management of local water resources. Projected changes in climate are expected to alter hydrologic patterns in the Eastern Sierra through changes in precipitation, snowmelt, relative ratios of rain and snow, and runoff.

To understand some of the key issues surrounding climate change impacts, it is important to put it into the context of LADWP's water supplies. California lies within multiple climate zones. Therefore, each region will experience unique impacts to climate change. Because LADWP relies on both local and imported water sources, it is necessary to consider the potential impacts climate change could have on the local watershed as well as the western and eastern Sierra Nevada watersheds where a portion of MWD's imported water originates and LADWP's imported LAA supplies originate, respectively, and the Colorado River Basin where the remainder of MWD's imported supplies originate. Generally speaking, any water supplies that are dependent on natural hydrology are vulnerable to climate change, especially if the water source originates from mountain snow pack. For LADWP, the most vulnerable water sources subject to climate change impacts are imported water supplies from MWD and the LAA. In addition to water supply impacts, changes in local temperature and precipitation are expected to alter water demand patterns.

The LAA is one of the major imported water sources delivering a reliable water supply to the City of Los Angeles. The LAA originates approximately 340 miles away from snowmelt runoff in the eastern Sierra Nevada; hence LAA is subject to hydrologic variability associated with climate change. Since the majority of precipitation occurs during winter in the eastern Sierra Nevada watershed, water is stored in natural reservoirs in the form of snowpacks, and is gradually released into streams that feed into the LAA during spring and summer. Higher concentrations of greenhouse gases in the atmosphere are often indications of pending climate change. These changes threaten the hydrologic stability of the eastern Sierra Nevada watershed through alterations in precipitation, snowmelt, relative ratios of rain and snow, winter storm patterns, and evapotranspiration, all of which have major potential impacts on the LAA water supply and deliveries.

LADWP's climate change study evaluated the potential impacts of climate change on the eastern Sierra Nevada watershed and the LAA water supply and deliveries. In this study, future climate conditions were predicted using a set of sixteen global climate models and two greenhouse gas emission scenarios. Results of the study show steady temperature increases throughout the 21st century and are consistent with other prior studies performed in the scientific community. Temperature is the main climate variable that is projected to rise significantly in the coming years and this rise in temperature directly affects several variables including:

- Whether precipitation falls as snow or rain.
- The ground-level temperature determines the timing and rate of snowmelt.
- The temperature profile that determines the rate of evapotranspiration.

Results have shown that future predictions for the early-21st century suggested a warming trend of 0.9 to 2.7 ˚F and almost no change in average precipitation. Mid-21st century projections suggested a warming trend of 3.6 to 5.4 ˚F and a small average decrease in precipitation, approximately 5 percent. This warming trend is expected to increase significantly by the end of 21st century, as the results suggest further warming of 4.5 to 8.1 ˚F and a decrease in precipitation of approximately 10 percent. Projected changes in temperature (warmer winters) will change precipitation patterns to rain with larger fractions than historically encountered. Consequently, peak Snow Water Equivalent (SWE) and runoff are projected to undergo a shift in timing to earlier dates.

Exhibit ES-T
Projected Runoff, Snow-Water Equivalent, and Rain-to-Snow Ratio for Eastern Sierra Nevada Watershed

	Runoff (MAF)	April 1 SWE (Inches)	Rain/Snow Ratio
Baseline (Second Half of 20th Century)	**0.6**	**15.0**	**0.2**
Early 21st-century (2010-2039)	0.5 - 0.85	10.6 - 19.0	0.24 - 0.33
Mid-century (2040-2069)	0.34 - 0.9	7.0 - 19.7	0.25 - 0.43
End-of-century (2070-2099)	0.35 – 1.1	5.0 - 16.0	0.28 - 0.54

Exhibit ES-T summarizes the projections for runoff, SWE, and rain-to-snow ratio for the 21st century. The projected temperature and precipitation dataset form the basis of the hydrologic model projections for runoff, snow-water equivalent (SWE), and rain-to-snow ratio. To compare the future projections of these variables, the trends that dominated the second half of the 20th century are considered baselines for future trends. The baseline values for runoff, SWE, and rain-to-snow ratio are 0.6 million acre-feet (MAF), 15 inches, and 0.2, respectively. By Early 21st century (2010 – 2039), results illustrate runoff is projected to undergo increases and decreases averaging between 0.5 to 0.85 MAF; SWE is projected to undergo decreases and increases ranging between 10.6 to 19.0 inches, and the rain-to-snow ratio is projected to increase between 0.24 to 0.33. By mid-century (2040 – 2069), the same trends are expected to dominate, with runoff ranging between 0.34 to 0.9 MAF, SWE ranging between 7.0 to 19.7 inches, and the rain-to-snow ratio increasing between 0.25 to 0.43. These trends are expected to govern until the end-of-century (2070 -2099) with runoff ranging between 0.35 to 1.1 MAF, SWE ranging between 5.0 to 16.0 inches, and rain-to-snow ratio increasing between 0.28 to 0.54.

It is important to acknowledge that the predictions of global climate models lack the desired precision due to the presence of uncertainties inherent in the analyses. The uncertainty to future emissions of greenhouse gases and the chaotic nature of the climate system leads to uncertain response of the global climate system to the increases in greenhouse gases. In addition, the science of climate change still lacks the complete understanding of regional manifestations that will result from global changes, thus restraining the projecting capacity of these models. However, these projections are consistent with the state of science today, and they help predict the manner of which hydrologic variables are likely to respond to a range of possible future climate conditions, and thus help to guide water managers in their planning and development efforts to ensure the reliability and sustainability of adequate water supply and delivery.

ES-7 Financing

The UWMP also addresses financing issues associated with providing a reliable water supply. To fund future water conservation, recycled water, and stormwater programs, LADWP will utilize the following funding sources:

- Water Rates – An existing component of water rates currently provide approximately $100 million annually for water conservation, water recycling, and stormwater capture programs. It is anticipated that the water conservation, water recycling, and stormwater capture goals of the UWMP can be met with current levels of expenditures. State and/or federal funding will offset LADWP revenues, or allow goals to be achieved sooner than projected. In order to accomplish the UWMP goals related to treatment of contaminated groundwater supplies it will be necessary to increase current levels of expenditure, which will require an increase in water rates.

- MWD – Currently provides funding up to $250 per AF for water recycling through their Local Resources Program. MWD also provides some water conservation incentive funding through rebates equal to $195 per AF of water saved or half the product cost whichever is less.

- State Funds – Funds for recycling, conservation, and stormwater capture have been available on a competitive basis though voter approved initiatives, such as Propositions 50 and 84. The proposed 2012 Water Bond also includes potential funding for groundwater cleanup. Occasionally low or zero-interest loans are also available though State Revolving Fund programs.

- Federal Funds – Federal funding for recycling is available through the U.S. Army Corps of Engineers, via periodic Water Resource Development Act legislation, and the U.S. Bureau of Reclamation's Title XVI program.

To fund its future water quality programs, including groundwater cleanup, LADWP will seek reimbursement from potential responsible parties to assist with cleanup program costs. However, it is anticipated that water rates will need to be increased to pay for these much needed capital projects in order to ensure our groundwater supply is maximized.

ES-8 Conclusion

LADWP's 2010 Urban Water Management Plan is not only designed to meet the current requirements of the UWMP Act, but also serves as the City's master plan for water supply and resource management. The UWMP provides the basic policy principles that guide LADWP's decision-making process to secure a sustainable water supply for Los Angeles in the next 25 years.

The 2010 UWMP projects a 15 percent lower water demand trend than what was projected in the 2005 UWMP. It lays out a detailed plan to develop a sustainable water supply portfolio that includes the increase of local water supplies and water conservation from the current 12 percent to 43 percent by 2035. This increased local supply mix will allow the City to reduce its reliance on the purchased MWD water supply by one-half. The focus on local supplies increases flexibility and overall water supply reliability.

Chapter One
Introduction

1.0 Overview

In 1902, the City of Los Angeles (City) had a population of approximately 146,000 residents and created a municipal water system by acquiring title to a private water company. In 1925, the Los Angeles Department of Water and Power (LADWP) was established by a new city charter. The availability of water has significantly contributed to the economic development of the City. LADWP met the City's need for water resources as Los Angeles developed into the nation's second largest city with over 4 million residents, encompassing a 473-square-mile area. As the largest municipal utility in the nation, LADWP delivers safe and reliable water and electricity services at an affordable price to the residents and businesses of Los Angeles.

With increasing demands for additional water supplies, LADWP and other water agencies in Southern California are faced with the challenge of providing a reliable water supply for a growing population.

LADWP plans to meet the City's water needs through the following actions:

- Significantly enhance water conservation, stormwater capture, and recycling projects to increase supply reliability.

- Implement treatment for San Fernando Basin groundwater supplies.

- Ensure continued reliability of the water supplies from the Metropolitan Water District of Southern California (MWD) through active representation of City interests on the MWD Board.

- Maintain the operational integrity of the Los Angeles Aqueduct and in-City water distribution systems.

- Meet or exceed all Federal and State standards for drinking water quality.

1.1 Purpose

The LADWP's 2010 Urban Water Management Plan (UWMP) serves two purposes: (1) compliance with the requirements of California's Urban Water Management Planning Act (Act), and (2) as a master plan for water supply and resources management consistent with the City's goals and policy objectives.

1.1.1 UWMP Requirements and Checklist

This 2010 UWMP complies with Sections 10610 and 10656 of the California Water Code, the Urban Water Management Planning Act (Act), and details how LADWP plans to meet all of the City's customer water needs. The Act became effective on January 1, 1984 and requires that every urban water supplier that provides municipal and industrial water to more than 3,000 customers (or supplies more than 3,000 acre-feet per year) prepare and adopt a UWMP every five years in accordance with prescribed requirements.

The Act was originally developed due to concerns about potential water supply shortages throughout California. Therefore, it required information that focused primarily on water supply reliability and water use efficiency measures. Since its original passage in 1983, there have been several amendments, the most recent adopted in 2009. Some of the recent amendments include: requirements to assess present and proposed future demands to achieve per capita water use reductions of 20 percent by 2020, project water use for low-income single family and multi-family residential housing, and add "indirect potable reuse" to the list of recycled water uses. A copy of the Act is provided in Appendix A. A checklist cross-referencing Act requirements to applicable pages in this UWMP is provided in Appendix B.

With the passage of Senate Bills (SB) 610 and 221 in 2001, UWMPs took on even more importance. SB 610 and 221 require counties and cities to consider the availability of adequate water supplies for certain new large developments and to have written verification of sufficient water supply to serve them. UWMPs are identified as key source documents for this verification. Based on these statutes the LADWP prepares individual Water Supply Assessments for these new large developments.

LADWP's 2010 UWMP not only meets the current requirements of the Act, but also serves as the City's master plan for water supply and resource management. The UWMP helps guide policy makers in the City and the Metropolitan Water District of Southern California (MWD) and provides information to the citizens of Los Angeles. The UWMP presents the basic policy principles that guide LADWP's decision-making process to secure a sustainable water supply for Los Angeles.

1.1.2 Water Supply Action Plan

LADWP has a long history of working to ensure that its customers have enough water. These efforts go back to the early 20th century with the building of the Los Angeles Aqueduct. Investments in water rights, aqueducts, reservoirs, conservation, and, more recently, recycled water and stormwater capture have allowed City residents to enjoy a reliable water supply. Sound planning and timely investments in water have played a critical role in meeting the water needs of the City despite the fact that Southern California is a semi-arid region.

In May of 2008, LADWP's Water Supply Action Plan (Plan), "Securing L.A.'s Water Supply", was released. It addressed a number of critical water supply reliability issues including: (1) the 2007 occurrence of the lowest snowpack on record in the

Eastern Sierras, which has historically provided Los Angeles with the greatest share of its water supply; (2) the 2007 occurrence of the driest year on record for the Los Angeles basin; (3) anticipated regional water allocations by MWD in response to dry year and regulatory reductions in imported water available from the San Francisco Bay Delta; (4) local groundwater contamination in the San Fernando Basin, restricting LADWP's ability to fully utilize this local resource; (5) Los Angeles Aqueduct delivery reductions due to environmental mitigation and enhancements in the Owens Valley and Mono Lake Basins, totaling nearly one-half of historic water supplies from the Eastern Sierra watershed; and (6) uncertain climate change impacts which threaten traditional water supply sources.

The convergence of these critical issues has far-reaching implications for the City of Los Angeles' water supply that require long-range planning to ensure a reliable supply of water to meet current and future demand. The Plan was a blueprint for creating sustainable water resources to serve the future needs of the City, and outlined responsible water management and long-term planning. By 2028, the Plan envisioned a six-fold increase in recycled water supplies to a total of 50,000 Acre-Feet per Year (AFY). Similarly, by 2030 an increase of 50,000 AFY was planned for conservation. As described in the Plan, this aggressive approach included investments in state-of-the-art technology; a combination of rebates and incentives; efficient clothes washers and urinals; and long-term measures such as expansion of water recycling and treatment of contaminated groundwater supplies. A multi-faceted approach to developing a locally sustainable water supply was developed incorporating the following key short-term and long-term strategies:

Short-Term Conservation Strategies

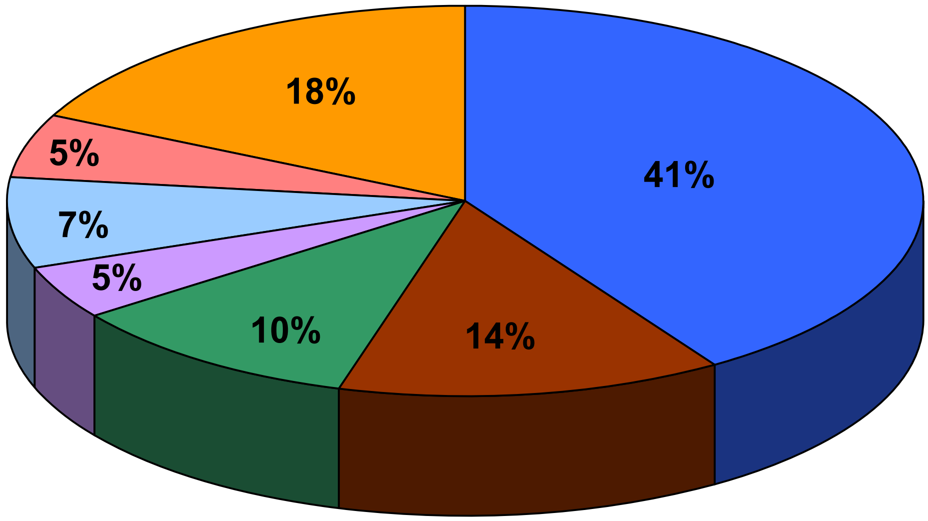
- Enforcing prohibited uses of water
- Expanding prohibited uses of water
- Extending outreach efforts
- Encouraging regional conservation measures

Long-Term Strategies

- Increasing water conservation through reduction of outdoor water use and new technology
- Maximizing water recycling
- Enhancing stormwater capture
- Accelerating groundwater basin treatment
- Expanding groundwater storage
- Green Building Initiatives (added subsequent to the release of the Plan)

The Water Supply Action Plan is an integral part of the UWMP, and is incorporated into the associated chapters. The UWMP outlines how the strategies contained in the Water Supply Action Plan will be implemented and how these strategies will increase the reliability of LADWP's water supplies through 2035.

Exhibit 1A
City of Los Angeles Land Uses



Land Use Type	Acres
Single-family Residential[1]	123,365
Open Space/Parks	41,317
Multi-family Residential	31,718
Commercial	13,632
Manufacturing	22,567
Public Facilities	16,314
Other[2]	53,731
Total	302,644

Source: Data aggregated from City of Los Angeles, Department of City Planning, November, 2009

Notes:

1. Includes agricultural use as defined by LA City Planning Department
2. Includes parking, hillside area, and other miscellaneous area

1.2 Service Area

In order to properly plan for water supply, it is important to understand the factors that influence water demands over time. These factors include land use, demographics, and climate.

1.2.1 Land Use

The City of Los Angeles is comprised of approximately 302,644 acres. Residential development constitutes over 51 percent of the total land use within the City. Within the residential land use category, single-family residential is the largest at approximately 123,000 acres or 41 percent of the total land use within the City. Multi-family residential is at approximately 32,000 acres or 10 percent of the total land use within the City. Open space/parks is the second largest land use within the City at approximately 14 percent. Commercial, public facilities and manufacturing land uses combined account for approximately 17 percent of the total. Public facilities include land uses such as libraries, public schools, and other government facilities. Exhibit 1A provides a breakdown of the land uses within the City of Los Angeles. The "Other" category includes specific plans, transportation, freeways, rights of way, hillsides, and other miscellaneous uses that are not zoned.

1.2.2 Demographics

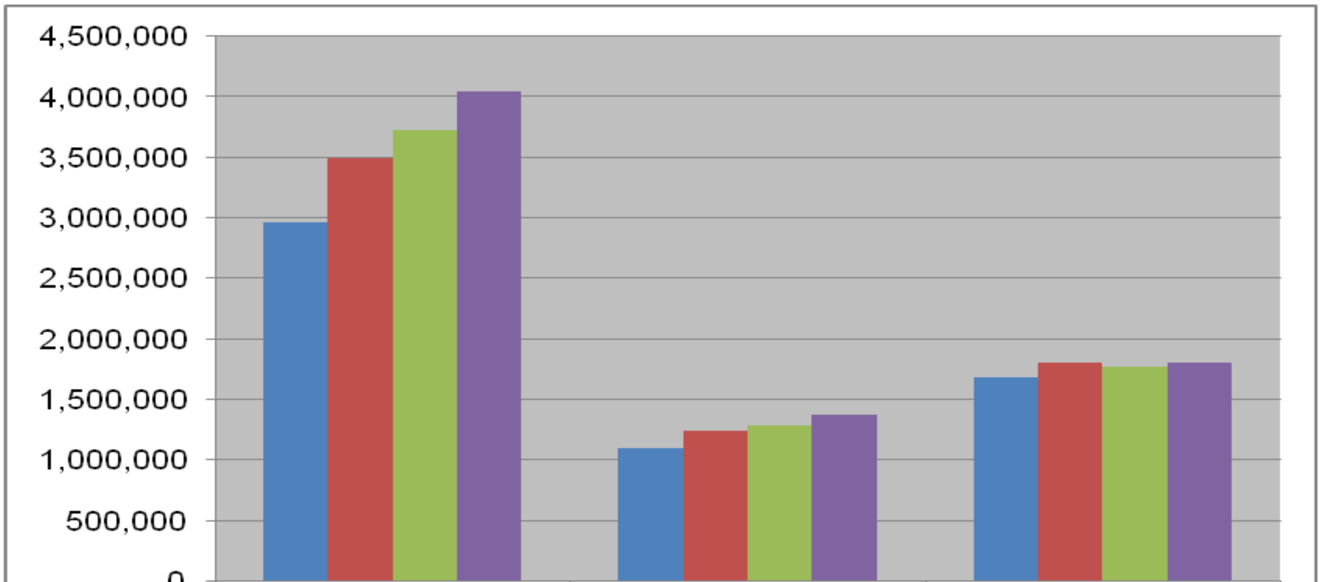
Over 4 million people reside in the LADWP service area, which is slightly larger than the legal boundary of the City of Los Angeles. In addition to the City, LADWP also provides water service to portions of West Hollywood, Culver City, Universal City, and small parts of the County of Los Angeles.

The population within LADWP's service area increased from 2.97 million in 1980 to 4.1 million in 2009, representing an average annual growth rate of 1.3 percent. The total number of housing units increased from 1.10 million in 1980 to 1.38 million in 2009, representing an average annual growth rate of 0.9 percent. During this time, average household size increased from 2.7 persons in 1980 to 2.9 persons in 2009. Employment grew by about 1.0 percent annually from 1980 to 1990, but declined from 1990 to 2000 as a result of an economic recession that started in 1991. Another decline began in 2008 reflecting the recent economic recession. Overall, employment increased by about 0.3 percent annually from 1990 to 2009. Exhibit 1B summarizes the historical demographics for the LADWP service area.

Demographic projections were obtained for the LADWP service area from the MWD. The MWD utilizes a land-use based planning tool that allocates projected demographic data from the Southern California Association of Governments (SCAG) into water service areas for each of MWD's member agencies. MWD's demographic projections use data reported in SCAG's 2008 Regional Transportation Plan (RTP). Exhibit 1C summarizes these demographic projections for the LADWP service area.

LADWP's service area population is expected to continue to grow over the next 25 years at a rate of 0.4 percent annually. While this is substantially less than the historical 1.3 percent annual growth rate from 1980 to 2009, it will still lead to approximately 367,300 new residents over the next 25 years. According to SCAG's 2008 RTP, housing is expected to grow faster than population over the next 25 years at 0.7 percent annual growth versus 0.4 percent annual growth for population,

Exhibit 1B Historical Demographics for LADWP Service Area



	Population	Housing	Employment
1980	2,970,000	1,100,000	1,692,000
1990	3,501,602	1,243,022	1,813,615
2000	3,732,579	1,290,440	1,773,895
2009	4,051,438	1,376,013	1,812,926

Exhibit 1C
Demographic Projections for LADWP Service Area

Demographic	2010	2015	2020	2025	2030	2035
Population	4,100,260	4,172,760	4,250,861	4,326,012	4,398,408	4,467,560
Housing						
Single-Family	627,395	646,067	665,261	678,956	691,703	701,101
Multi-Family	764,402	804,013	846,257	880,580	914,125	942,846
Total Housing	1,391,797	1,450,080	1,511,518	1,559,536	1,605,828	1,643,947
Persons per Household	2.88	2.81	2.75	2.71	2.67	2.65
Employment						
Commercial	1,674,032	1,724,106	1,754,998	1,790,798	1,828,765	1,865,156
Industrial	163,382	157,652	155,012	152,426	150,009	147,508
Total Employment	1,837,415	1,881,758	1,910,010	1,943,224	1,978,773	2,012,664

Source: SCAG Regional Transportation Plan (2008), modified using MWD's land use planning to represent LADWP's service area.

and it is anticipated that household size will continue to decline over the projection period.

The 2008 RTP projects that by 2035 the average household size will decrease to 2.65 persons per household. Throughout the projection period, multi-family housing units are expected to increase at slightly less than twice the rate of single-family housing units (0.93 percent annual growth vs. 0.47 percent annual growth).

Employment is expected to increase by 0.4 percent annually throughout the projection period. This growth is primarily driven by the current and long-term opportunities available from the economic base within the five-county metropolitan region of Southern California. The economic base is wide-ranging and includes services, wholesale and retail trade, manufacturing, government, financial service industries, transportation, utilities, construction, education, and tourism. Over the 25-year forecast period, industrial growth is expected to decline and experience a subtle annual negative growth of -0.4 percent, while commercial employment is expected to increase by about 0.5 percent annually.

The SCAG demographic projections for population, households, and employment included in their 2008 RTP and presented in LADWP's 2010 UWMP vary from what was presented in LADWP's 2005 UWMP. The demographic projections in the 2005 UWMP were based on SCAG's 2004 RTP. The current 2008 projections incorporate the latest population, households, and employment data from multiple local, state, and federal agencies. Projected 2008 RTP data reflect adjustments in future population growth related to declining fertility, mortality, labor force participation, and household headship rates; leveling in net migration; fluctuating net domestic migration in response to economic cycles; and an employment shift from the manufacturing

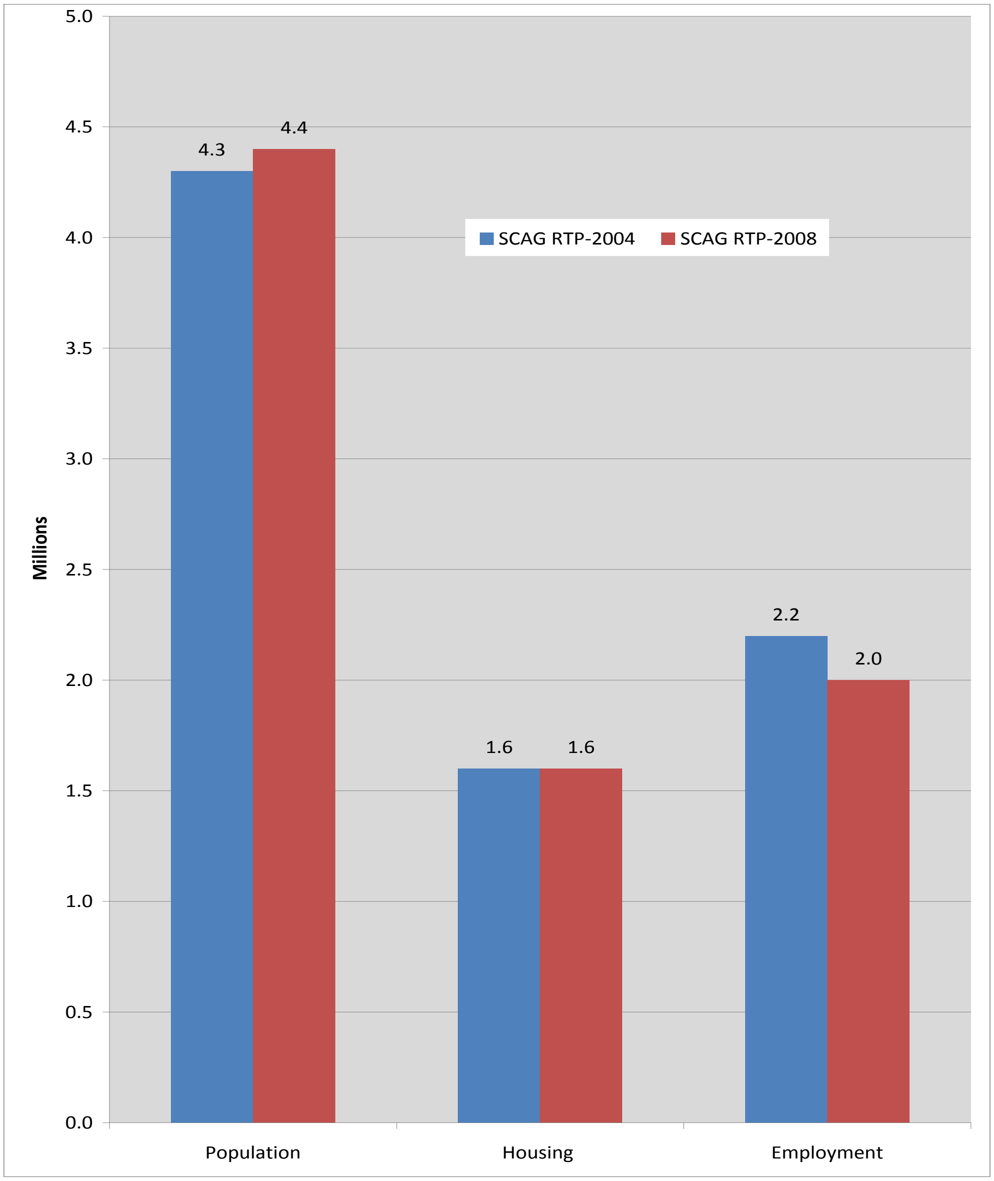


Exhibit 1D Comparison of SCAG Demographic Projections for LADWP Service Area Between 2004 and 2008 RTP Forecasts for Year 2030

sector to the service sector. The SCAG 2008 RTP was adopted in May 2008 prior to the recent recession beginning in 2008. Additionally, MWD has further adjusted the service area boundaries based on LADWP input. Exhibit 1D shows the differences between the SCAG demographic projections for the RTP in 2004 and 2008.

For the forecast year 2030, population was projected to be 4.30 million under the SCAG 2004 RTP and 4.40 million under the 2008 RTP, a difference of 100,000. Housing was projected to be 1.60 million in 2030 under SCAG 2004 RTP and slightly more under the SCAG 2008 RTP at 1.61 million.

Employment was forecast to be less in 2030 under the newest RTP. It is projected to be 2.20 million under the SCAG 2004 RTP versus 1.98 million with the 2008 RTP. It is important to recognize that projected total employment under both the 2004 RTP and 2008 RTP continue to increase from 2010 to 2035. The 2008 RTP simply projects a lower rate of increase compared to the 2004 RTP. Conversely, the rate at which the population increases is expected to be higher with the 2008 RTP as compared with the 2004 RTP.

1.2.3 Climate

Weather in Los Angeles is considered mild, which is a major attribute that attracts businesses, residents, and tourists to the City. Because of its relative dryness, Los Angeles' climate has been characterized as Mediterranean. Exhibit 1E provides a summary of average monthly rainfall, maximum temperatures, and evapotranspiration readings.

The City's average monthly maximum temperature is 75 degrees Fahrenheit based on the period of 1990-2010. This is based on data from the Los Angeles Downtown weather station. The standard annual average evapotranspiration rate (ETo) for the Los Angeles area is 50.26 inches per year. ETo measures the loss of water to the atmosphere by evaporation from soil and plant surfaces and transpiration from plants. ETo serves as an indicator of how much water plants need for healthy growth. Total precipitation averages 15.58 inches per year, with over 90 percent of this total amount typically falling during the period of November through April.

1.2.4 Water Demand and Supply Overview

LADWP maintains historical water use data separated into the following categories: single-family residential, multi-family residential, commercial, industrial, government, and non-revenue water. Single-family residential water use is the largest category of demand in LADWP's service area, representing about 36 percent of the total. Multifamily residential water use is the next largest category of demand, representing about 29 percent of the total. Industrial use is the smallest category, representing only 4 percent of the total demand. Non-revenue water is the difference between total water delivered to the city and total water sales and has averaged 7 percent in recent years. Chapter 2 – Water Demands provides an in-depth look at water demand trends and projections for the next 25 years.

Primary sources of water for the LADWP service area are the Los Angeles Aqueducts (LAA), local groundwater, and imported supplemental water purchased from MWD. An additional fourth source, recycled water, is becoming a larger part of the overall supply portfolio. Water from two of the supply sources, the LAA and MWD, is classified as imported because it

Exhibit 1E
Average Climate Data for Los Angeles

Average Climate Data for Los Angeles 1990-2010

	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Maximum Temperature (°F)[1]	68	68	70	73	75	78	83	85	83	79	73	68	75
Average Precipitation (inches)[1]	3.62	4.46	2.28	0.75	0.34	0.12	0.01	0	0.07	0.68	0.72	2.53	15.58
Average Eto (inches)[2,3]	1.98	2.26	3.66	4.96	5.46	6.08	6.46	6.31	4.87	3.63	2.56	2.03	50.26

1. 1990-2010, Los Angeles Downtown USC Weather Station ID 5115

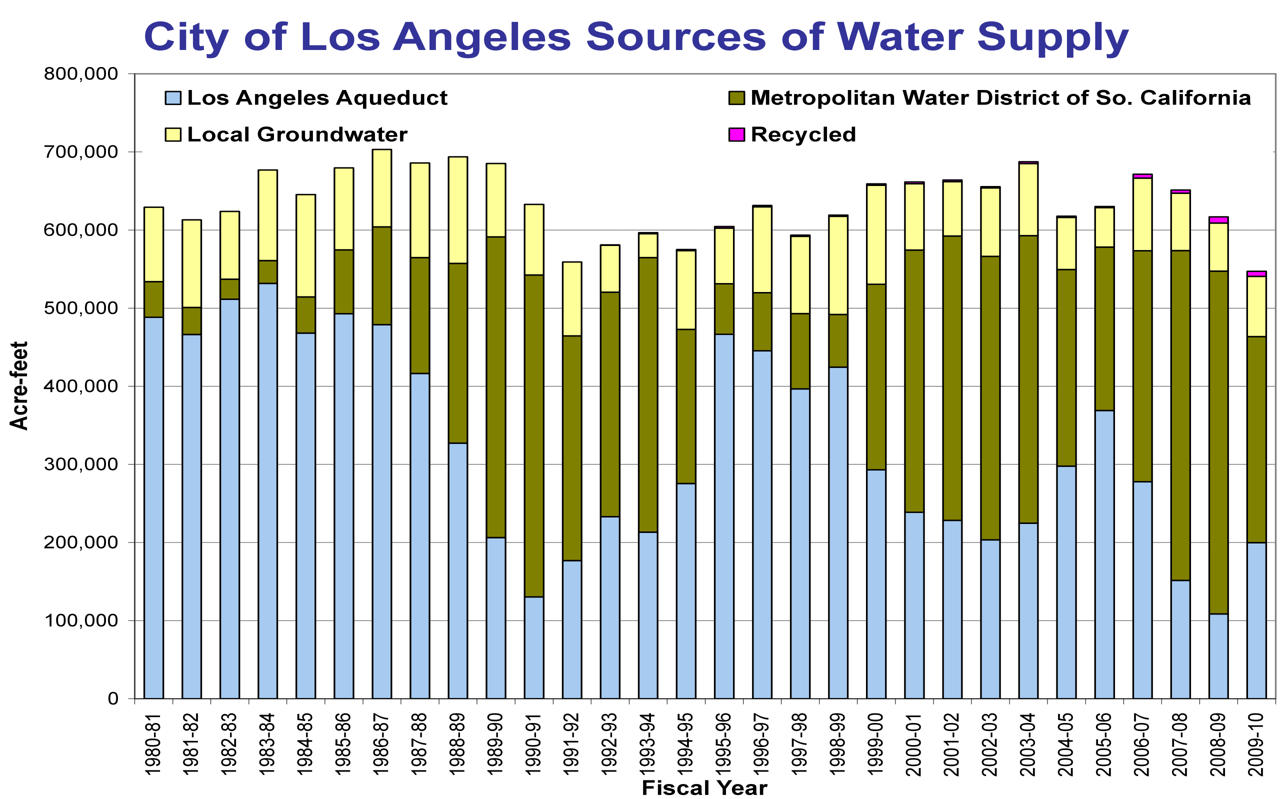
2. Average of Hollywood Hills (Station Id. 73), Glendale (Station Id. 133), and Long Beach (Station Id. 174)

3. www.cimis.water.ca.gov

is obtained from outside LADWP's service area. Groundwater is local and is obtained within the service area. Historical supply sources are increasingly under multiple constraints including potential impacts of climate change, groundwater contamination, and reallocation of water for environmental concerns. To mitigate these impacts on supply sources, LADWP is modifying its water supply portfolio through conservation, water recycling, and stormwater capture.

The primary water supply sources are vital to maintaining LADWP's water system reliability. Pressure on one resource, such as little snowfall in the eastern Sierra Nevada Mountains, will result in an increased reliance on another resource, such as MWD. Supplies available from each source are determined using computer models in an attempt to balance total projected supplies with projected demands. Exhibit 1F illustrates historical water supplies from 1980 to 2010. As a result of supply shortages, overall demands decreased by over 124,000 AFY in Fiscal Year (FY) 2009/10 as compared to FY 2006/07. In FY 2009/10, approximately 36 percent of the water supply was from the LAA, 14 percent from local groundwater, 48 percent from MWD, and 1 percent from recycled water. The five-year water supply averages (FY 2005/06 to FY 2009/10) were as follows: 36 percent from the LAA, 11 percent from local groundwater, 52 percent from MWD, and less than 1 percent from recycled water. The imported water (LAA water plus MWD water) supplied on average approximately 88 percent of the City's demands.

Exhibit 1F
LADWP Historical Water Supply Sources 1980-2010



Chapter Two

Water Demand

2.0 Overview

In order to properly plan for water supply, it is important to understand water demands and the factors that influence demands over time. LADWP maintains historical water use data separated into the following categories: single-family residential, multifamily residential, commercial, industrial, government, and non-revenue water. This categorization of demands allows better evaluation of trends in water use over time and more precise targeting of water conservation measures.

2.1 Historical Water Use

Exhibit 2A presents the historical water demand for LADWP. As seen in this exhibit, total water demand varies from year to year and is influenced by a number of factors such as population growth, weather, water conservation, drought, and economic activity. In 2009, a 3-year water supply shortage coinciding with an economic recession required LADWP to impose mandatory conservation. In 2010 mandatory conservation continued and the economic recession became more severe. This resulted in Fiscal Year (FY) 2009/10 water use decreasing by 19 percent from FY 2006/07 levels.

Exhibit 2A
Historical Total Water Demand in LADWP's Service Area

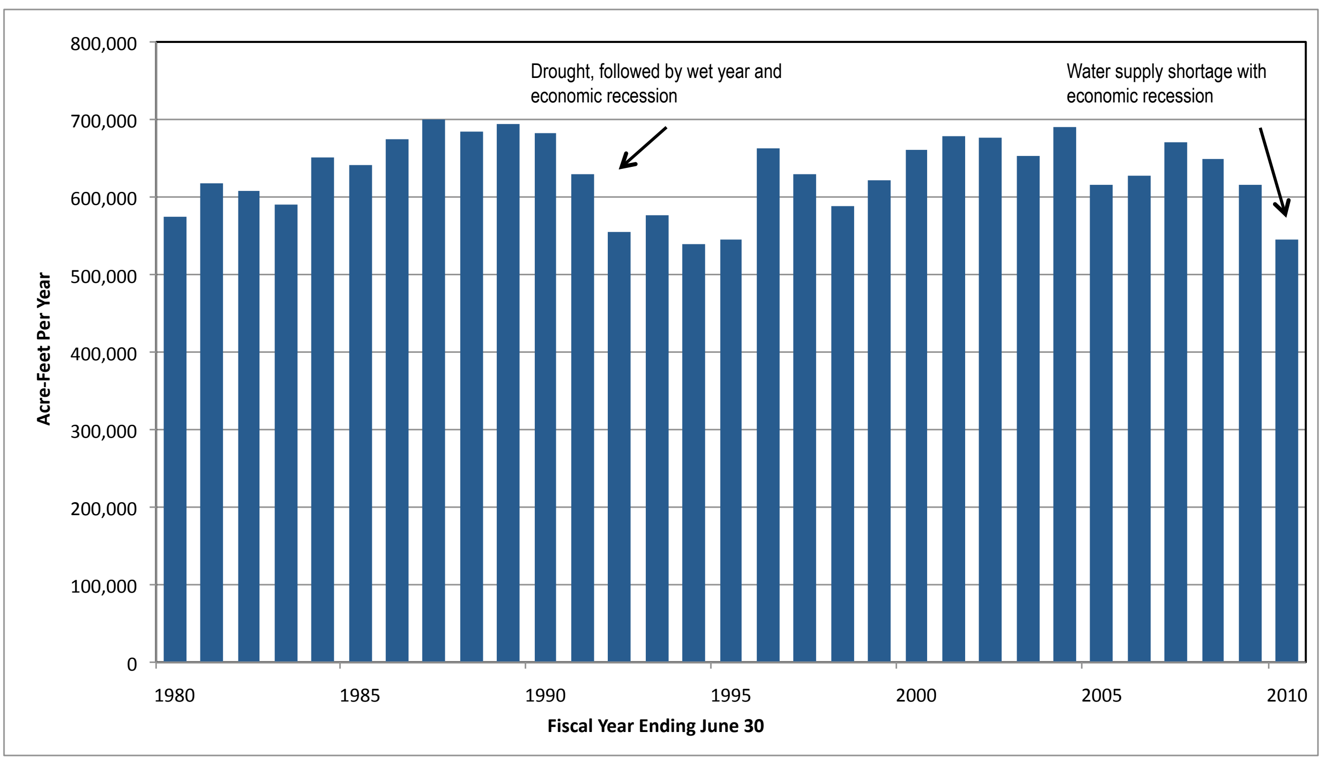
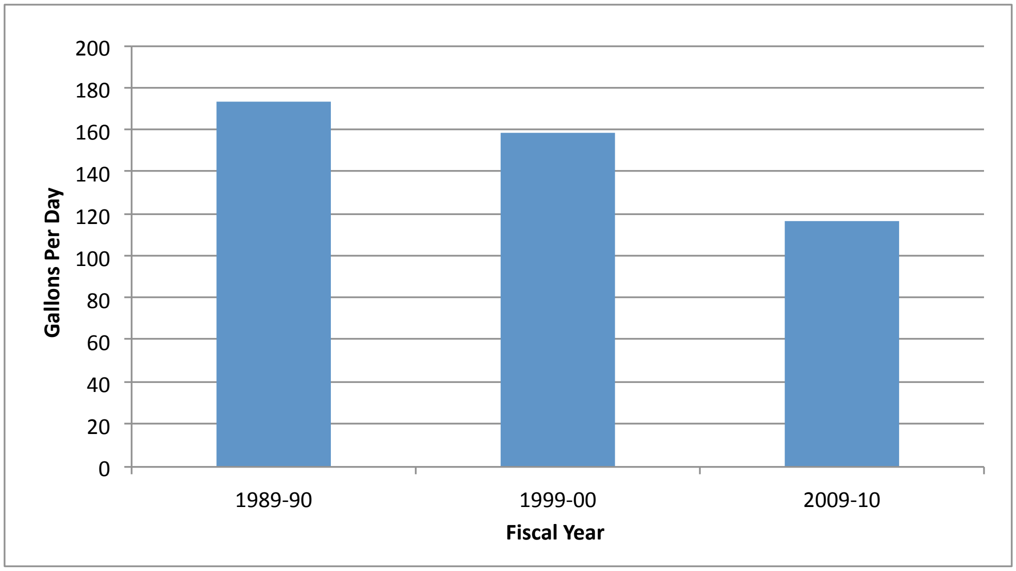


Exhibit 2B
Historical Per Capita Water Use in LADWP's Service Area



Prior to 1990, population growth in Los Angeles was a good indicator of total demands. From 1980 to 1990, population in the City grew at 1.7 percent annually. Water demands during this same ten year period also grew at 1.7 percent annually. However, after 1991, LADWP began implementing water conservation measures which prevented water demands from returning to pre-1990 levels. Average water demands in the last five years from FY 2005/06 to FY 2009/10 are about the same as they were in FY 1980/81 despite the fact that over 1.1 million additional people now live in Los Angeles. This is evidenced by examining per person (or per capita) water use since 1980 (see Exhibit 2B). In FY 1989/90, per capita water use was 173 gallons per day (gpd). By FY 1999/00, per capita water use fell to 159 gpd (or a 10 percent reduction from 1990). In FY 2009/10, per capita water use was estimated to be 117 gpd, but it is important to note that mandatory conservation and a severe economic recession were occurring at this time.

Water Use by Sector

Exhibit 2C shows the breakdown in average total water use between LADWP's major billing categories and non-revenue water in five-year intervals for the past 25 years. Non-revenue water consists of unaccounted water and accounted non-revenue water. Accounted non-revenue water usually refers to mainline flushing at dead-end water mains to improve water quality and is less than 0.005 percent of the total demand. Unaccounted water is the system loss which includes water for fire fighting, reservoir evaporation, leakage from pipelines, meter error, and theft. Single-family residential water use comprises the largest category of demand in LADWP's service area, representing about 36 percent of the total. Multifamily residential water use is the next largest category of demand, representing about 29 percent of the total. Industrial use is the smallest category, representing only 4 percent of the total demand. Although total water use has varied substantially from year to year, the breakdown in percentage of total demand between the major billing categories has not.

Non-revenue water has significantly decreased in recent years. Historically, non-revenue water has averaged 7 percent of total water demand. Since 2005, non-revenue water levels have averaged 5 percent. This may be attributed to a number of steps that LADWP has taken to improve its water system. In 2001, LADWP began replacing its large and intermediate meters, focusing on improving accuracy of the meters as well as their strategic placement. In addition, work to replace smaller customer meters was finally completed in FY 2009/10 which also contributed to water loss control. In FY 2007/08, an accelerated mainline replacement program was launched to repair and replace deteriorating pipelines. Furthermore, LADWP's ongoing program to remove or cover large open-air reservoirs reduces water loss due to evaporation and infiltration

Indoor and Outdoor Water Use

In order to assess the potential for water use efficiency and target conservation programs, it is important to characterize water use in terms of indoor and outdoor demands. As with most water utilities, LADWP does not have separate irrigation meters for most of its customers. Only a small fraction of LADWP's customers, mostly parks and golf courses, have designated irrigation meters. Therefore, measuring indoor vs. outdoor water demands involves the use of other data and assumptions.

There are two methods that LADWP uses to estimate total outdoor water use: (1) estimation of supplemental water needed for landscape irrigation in accordance with the California Model Water Efficient Landscape Ordinance; and (2) comparison of wastewater flows to total water consumption. The first method uses the following formula to estimate the water needed to supplement outdoor landscape irrigation beyond the effect of natural precipitation:

LW = (Eto –Eppt) x 0.62 x A x ETAF

Where:
LW = Estimated total supplemental water needed for landscape irrigation;
Eto = Reference evapotranspiration for the City of Los Angeles;
Eppt = Effective precipitation (25% of monthly precipitation);
0.62 = Conversion factor to gallons;
A = Total greenscape area; and
ETAF = Evapotranspiration (Et) adjustment factor

In 2007, an infrared analysis of the City was conducted as part of the City's Million Trees Program to determine tree canopy and landscape coverage. The infrared analysis methodology used two types of remotely sensed data, infrared imagery and aerial imagery to determine

Exhibit 2C
Breakdown in Historical Water Demand for LADWP's Service Area

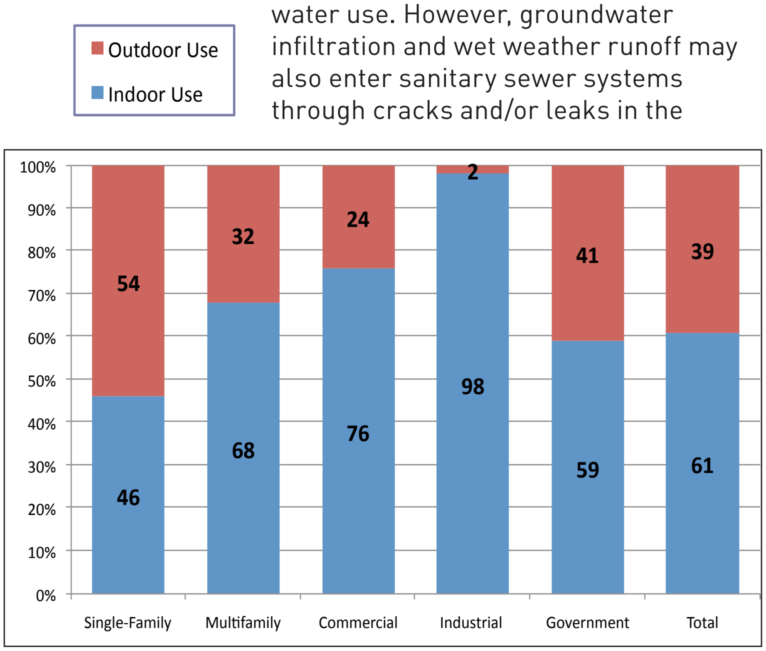
Fiscal Year Ending	Single-Family		Multifamily		Commercial		Industrial		Government		Non-Revenue		Total
	AF	%	AF	%	AF	%	AF	%	AF	%	AF	%	AF
1986-90 Avg	238,248	35%	197,312	29%	123,324	18%	30,502	4%	43,378	6%	52,830	8%	685,594
1991-95 Avg	197,322	35%	177,104	31%	110,724	19%	21,313	4%	38,600	7%	24,100	4%	569,164
1996-00 Avg	222,748	35%	191,819	30%	111,051	18%	23,560	4%	39,830	6%	43,617	7%	632,626
2001-05 Avg	239,754	36%	190,646	29%	109,685	17%	21,931	3%	41,888	6%	58,299	9%	662,203
2005-10 Avg	236,154	38%	180,279	29%	106,955	17%	23,201	4%	42,940	7%	31,929	5%	621,458
25-yr Avg	226,845	36%	187,432	29%	112,348	18%	24,101	4%	41,327	6%	42,155	7%	634,209

the total greenscape areas within the City. Results of this effort indicated that there is approximately 83,699 acres of greenscape in Los Angeles. The ETAF (or Et adjustment factor) of 0.8 for the City was derived from the types of plants to be irrigated and an assumed irrigation efficiency. It is consistent with the ETAF for non-rehabilitated landscapes as defined in the California Model Water Efficient Landscape Ordinance. The 2004-2007 average total water demand was selected as the basis for calculating outdoor water use percentage. This period was considered to be about average in terms of weather for Los Angeles and there were no irrigation restrictions in effect. Using the formula described previously, the supplemental water for outdoor landscaping in the City was estimated to be 249,000 AFY. During this same period, total water demand averaged 647,000 AFY. Therefore, it is estimated that the City's total outdoor water use represents approximately 39 percent of the total demand.

Comparing wastewater flows to total water consumption is another useful method to assess overall outdoor water use. Since wastewater flow represents indoor water use that flows into the sanitary sewer system, the difference between total water consumption and wastewater flows represents outdoor water use. However, groundwater infiltration and wet weather runoff may also enter sanitary sewer systems through cracks and/or leaks in the sanitary sewer pipes or manholes and results in overestimation of indoor water use. To minimize overestimation, only data from summer months were used to estimate average monthly wastewater attributable to indoor water use. In Los Angeles, the summer months typically have little or no measurable rainfall. Using the same pre-water restriction period of 2004-2007 selected in the first method, the average monthly wastewater flow (only the months of June through September) yields approximately 365 million gallons per day (MGD) or 403,000 AFY of estimated indoor water use. Subtracting this estimated indoor water use from the total water consumption of 647,000 AFY results in an estimated total outdoor demand of 244,000 AFY or 38 percent, which is similar to the 39 percent obtained with the landscape irrigation method. Therefore, two entirely different methods produced very similar results in estimating the total outdoor water use for the City.

To obtain an estimate of indoor vs. outdoor water use for each major billing category, a minimum-month method was used. Monthly water use for single-family, multifamily, commercial, industrial, and government was obtained for 2004-2007. The water use in the minimum month, usually one of the cool/wet winter months, is assumed to be mostly indoor use. The difference between any month and the minimum month is all attributed to outdoor water use. However, based on the two prior methods, a certain amount of outdoor water use occurs even in the minimum month. Therefore, estimates of the outdoor water use that occurs in the minimum month were developed for each major billing category. Then the outdoor use of each major billing category was summed up to compare with the total outdoor water use obtained from the previous two methods. Exhibit 2D presents the estimated indoor and outdoor water use for the City using all three methods.

Exhibit 2D Indoor vs. Outdoor Water Use in LADWP's Service Area



2.2 Quantification of Historical Water Conservation

LADWP has invested hundreds of millions of dollars in water conservation since 1990. These conservation investments include various active programs such as high efficiency toilet rebates, commercial/industrial water audits, education and public outreach, and much more. During periods of water shortage, public education and outreach are especially important and has contributed to significant reductions in water use. In an effort to quantify its water conservation efforts, LADWP developed a statistical Conservation Model that correlates total monthly water use in the City with population, weather, the presence of mandatory water conservation, and economic recessions. The model can be used to predict what the water demand would be under actual weather conditions, population growth and economy, but without active or drought water conservation in place. This modeled water consumption without conservation is then compared to actual water consumption—with the difference being attributed to water conservation. In order to assess the model's accuracy, the model was used to "back cast" the period from 1980 to 1990 when conservation was not implemented. In this case, the modeled water consumption was very close to the actual water consumption. After 1990, it was expected that the modeled water consumption will be greater than actual water consumption as LADWP has implemented increasing levels of water conservation measures. Exhibit 2E presents modeled and actual monthly water consumption from 1980 to 2009. As seen, the Conservation Model is performing as expected. The modeled water consumption (red line) is nearly identical to the actual water consumption (blue line) up until 1990. After 1990, the modeled water consumption is greater than actual water consumption.

Exhibit 2F summarizes the annual estimated water conservation using the Conservation Model. During periods of

Exhibit 2E
Modeled vs. Actual Monthly Water Consumption for LADWP

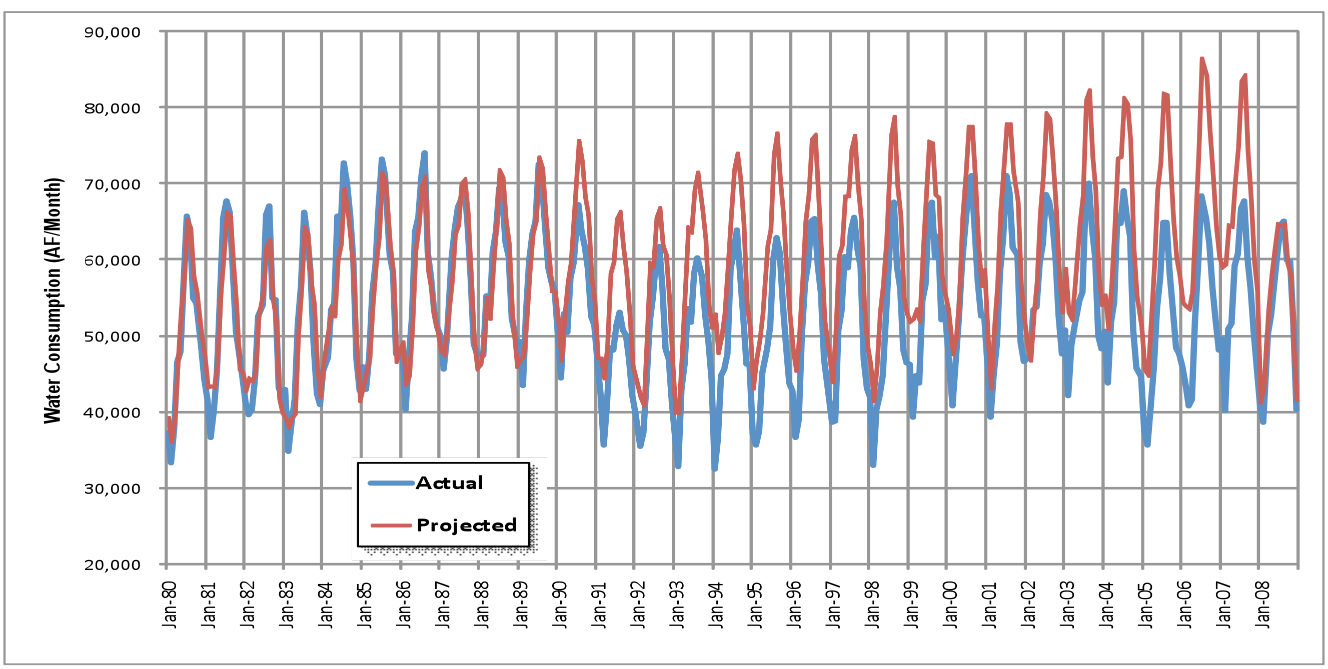
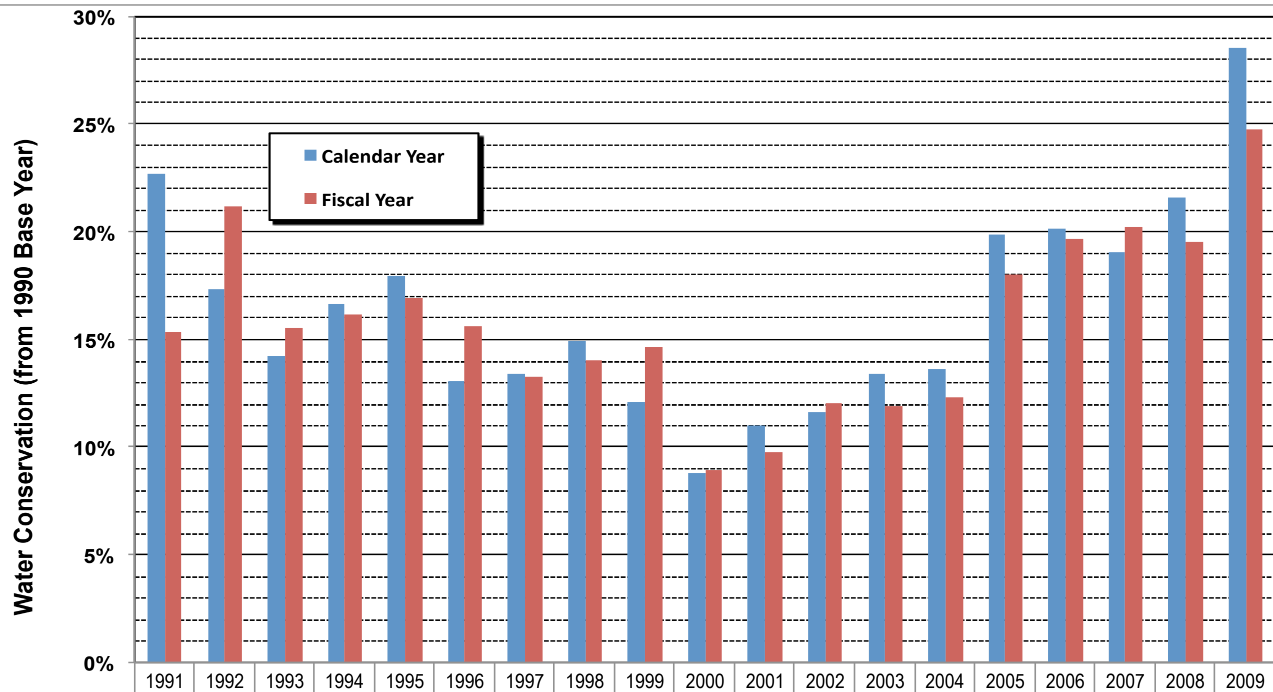


Exhibit 2F
Estimates of Total Water Conservation in LADWP's Service Area



	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009
Calendar Year	23%	17%	14%	17%	18%	13%	13%	15%	12%	9%	11%	12%	13%	14%	20%	20%	19%	22%	29%
Fiscal Year	15%	21%	16%	16%	17%	16%	13%	14%	15%	9%	10%	12%	12%	12%	18%	20%	20%	20%	25%

water shortage, even when mandatory water conservation is not in place, there is more conservation occurring due to extensive public education and outreach. Water conservation in 2009 represents the highest levels of conservation so far, which reflects a combination of active conservation programs, heightened public education and outreach, and mandatory conservation measures.

2.3 Water Demand Forecast

Demand Forecast Methodology

LADWP has developed a water demand forecast for each of its major categories of demand. This allows the City to better understand trends in water use and target conservation programs. The methodology used for the demand forecast is called a modified unit use approach. The following steps are used in this approach:

Step 1: Estimate baseline per unit water use – take each billed category of water demand (e.g., single-family, industrial, etc.) for a base (or starting) period and divide by associated demographic driver (e.g., number of single-family homes or number of industrial employees). This yields for instance, a baseline of 359 gallons used each day in a single-family residence.

Step 2: Modify the estimated baseline per unit water use to account for future changes in the following socioeconomic variables: price of water, personal income, family size, economy, drought conservation effect, and passive water conservation (which accounts for efficiencies in water use from state and local plumbing codes and ordinances).

Step 3: Multiply modified per unit water use for each category in Step 2 by the associated projected

Exhibit 2G
Projected Demographic Drivers
(Based on MWD allocated 2008 SCAG forecast data with corrected service area boundary, 5-17-2010)

Fiscal Year Ending	Single-Family (# Homes)	Multi-Family (# Homes)	Commercial/ Government (# Employees)	Industrial (# Employees)	Landscaping (# of MF Homes)	Non-Revenue Water* (%)
2010	627,395	764,402	1,674,032	163,382	764,402	6.9%
2015	646,067	804,013	1,724,106	157,652	804,013	6.9%
2020	665,261	846,257	1,754,998	155,012	846,257	6.9%
2025	678,956	880,580	1,790,798	152,426	880,580	6.9%
2030	691,703	914,125	1,828,765	150,009	914,125	6.9%
2035	701,101	942,846	1,865,156	147,508	942,846	6.9%

* Calculated from difference between historical production and billing data

demographic drivers (see Exhibit 2G) in order to obtain projected water demands by billed category that does not include active water conservation (which is defined as conservation achieved through LADWP incentives such as rebates and programs).

Step 4: Estimate non-revenue water (the difference between total water consumption and billed water use) by applying a non-revenue water use factor, and add non-revenue water to the billed category water demands in Step 3 in order to get a forecast of total water consumption without active water conservation.

Step 5: Subtract future projections of active water conservation from the total water consumption in Step 4 in order to determine the water demand forecast that is fully inclusive of both passive and active water conservation.

Applying the Methodology

In Step 1 of this method, historical water demands for single-family, multifamily, commercial/government, and industrial were averaged from 2005 to 2008 to determine the baseline. This period was used because on average, it represented normal weather conditions, and it was before mandatory outdoor water use restrictions were in effect. For each of these categories, the water demand was divided by a demographic driver that could be projected into the future. The result of this calculation is a water demand expressed as a unit water use rate. Exhibit 2H presents this unit use calculation for the baseline.

Step 2 in the methodology involves modifying these baseline unit use rates to account for changes in the following socioeconomic variables: price of water, personal income, family size, economy, drought conservation effect, and passive water conservation. MWD has developed an Econometric Water Demand Model as part of its 2010 Integrated Water Resources Plan that is able to account for the impact that personal income, family

Exhibit 2H
Baseline Unit Water Use Rates (2005-2008)
Source: California Department of Finance and Employment Development Department

Demand Category	Average Water Demand (AFY)	Average Demographic Driver *	Average Unit Use Rate (gal-lons/day/driver)
Single-Family	244,407	607,301 (homes)	359
Multifamily	184,428	734,461 (homes)	224
Commercial/Gov	153,199	1,631,896 (employees)	84
Industrial	23,613	160,328 (employees)	132

size, and price of water have on water demands. For each of these factors, a statistical coefficient or elasticity was estimated from MWD's Econometric Water Demand. The elasticity is generally interpreted as a percent change in water use resulting from a percent change in a specific socioeconomic variable. For example, a price elasticity of -0.131 would imply that a 10 percent increase in the real price of water would result in a 1.24 percent decrease in water demand (e.g. $1.24\% = 1-(1+10\%)^{-0.131}$). The following elasticities used in MWD's Econometric Water Demand Model were also used for LADWP's water demand forecast:

	Price of Water	Income	Family Size
Single-Family	-0.131	+0.270	+0.550
Multifamily	-0.109	+0.310	+0.450
Commercial/ Government	-0.107		
Industrial	-0.107		

Source: MWD 2010 Integrated Water Resources Plan Update Appendix A.2 Demand Projections

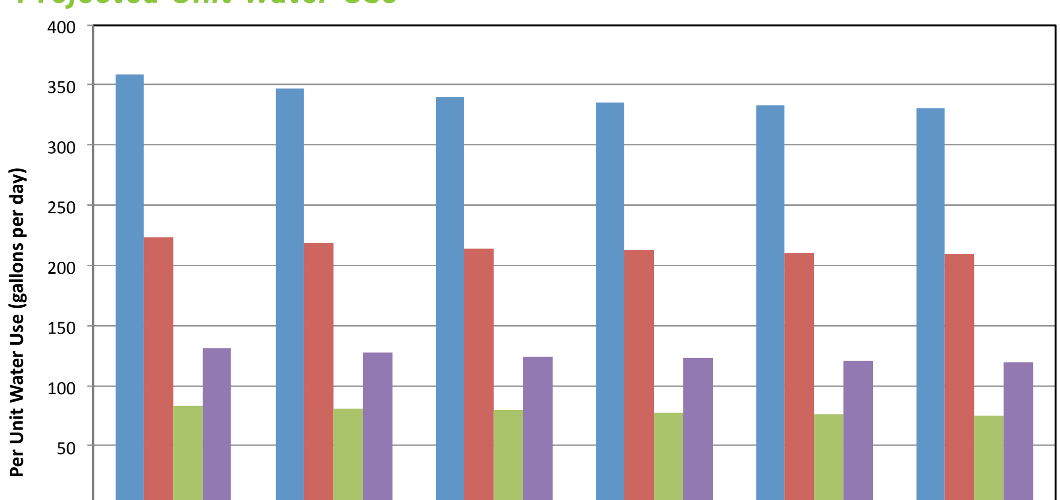
The price elasticities reflect a reduction of approximately 1/3 from those tabulated in MWD's 2010 IRP. However, MWD's 2010 IRP Appendix A.1 states that consumers respond to price increase by installing water-conserving fixtures and appliances. As more water efficient fixtures are installed, the impact of changing water-using behavior through rates is reduced. This is known as "demand hardening". Reducing price elasticity is done to avoid double-counting conservation savings and to account for demand hardening.

Exhibit 2I presents the modified per unit water use over time that incorporates future real increases in the price of water, personal income, and projected changes in family size. Also incorporated are the residual drought conservation effect from the significant public education and mandatory water use restrictions that occurred during the drought period of 2009 through 2010, and the effect of passive conservation due to mandated efficiencies from plumbing codes and ordinances.

Water Demand Forecast Results

Steps 3, 4, and 5 involve applying the modified per unit water use factors shown in Exhibit 2J to the projected demographics for LADWP (see Chapter 1), then adding non-revenue water, and subtracting projected active water conservation (that is summarized in Chapter 3). The result of these steps is the water demand forecast for each of the major categories of demand.

Exhibit 2I
Projected Unit Water Use



	Baseline	2015	2020	2025	2030	2035
Single-Family (per home)	359	348	340	336	333	331
Multifamily (per home)	224	219	215	213	211	210
Commercial (per employee)	84	81	80	78	77	76
Industrial (per employee)	132	128	125	123	121	120

Exhibit 2J
Water Demand Forecast and Conservation Savings Under Average Weather Fiscal Year Ending June 30 (Acre-Feet)

Demand Forecast with Passive Water Conservation	2005	2010	2015	2020	2025	2030	2035
Single-Family		198,444	229,115	241,976	249,528	257,693	259,904
Multifamily		167,299	179,653	194,724	205,136	216,054	221,912
Commercial/Gov		135,000	143,081	149,597	153,791	158,628	160,049
Industrial		20,298	20,524	20,726	20,532	20,408	19,852
Non-Revenue		33,515	42,421	44,989	46,617	48,380	49,042
Total		554,556	614,794	652,012	675,604	701,164	710,760
Demand Forecast with Passive & Active Water Conservation	**2005 Actual**	**2010 Actual**	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Family	233,192	196,500	225,699	236,094	241,180	246,879	247,655
Multifamily	185,536	166,810	178,782	193,220	202,999	213,284	218,762
Commercial/Gov	107,414	130,386	135,112	133,597	129,761	126,567	120,420
Industrial	62,418	19,166	18,600	16,852	14,708	12,634	10,513
Non-Revenue	26,786	32,909	41,370	42,969	43,627	44,421	44,272
Total	615,346	545,771	599,563	622,732	632,275	643,785	641,622
Aggregate Active Water Conservation Savings From Jul 07	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**
Single-Family		1,944	3,416	5,882	8,349	10,815	12,249
Multifamily		489	871	1,504	2,137	2,770	3,150
Commercial/Gov		4,614	7,969	16,000	24,030	32,061	39,629
Industrial		1,132	1,924	3,874	5,824	7,774	9,339
Non-Revenue		606	1,051	2,020	2,990	3,959	4,771
Total		**8,785**	**15,231**	**29,280**	**43,329**	**57,379**	**69,138**

* Non-revenue is the combination of unaccounted water and accounted non-revenue water. Unaccounted water is defined as system losses. In recent years, the City experienced no accounted non-revenue water. Thus, non-revenue water is considered system loss.

Water Demand Forecast with Average Weather Variability

Using the weather coefficients from the statistical water conservation model (see Exhibit 2E), annual weather adjustment factors can be derived to determine the range in forecasted water demands due to historical weather variability. This is accomplished by projecting water demands assuming long-term normal weather, and then comparing this normal-weather demand to actual demands. After adjusting for economy and drought conditions, projected water demands can vary by approximately ± 5 percent in any given year due to average historical weather variability. This means that water demands under cool/wet weather conditions could be as much as 5 percent lower than normal demands on average; while water demands under hot/dry

Exhibit 2K
Water Demand Forecast with Average Weather Variability

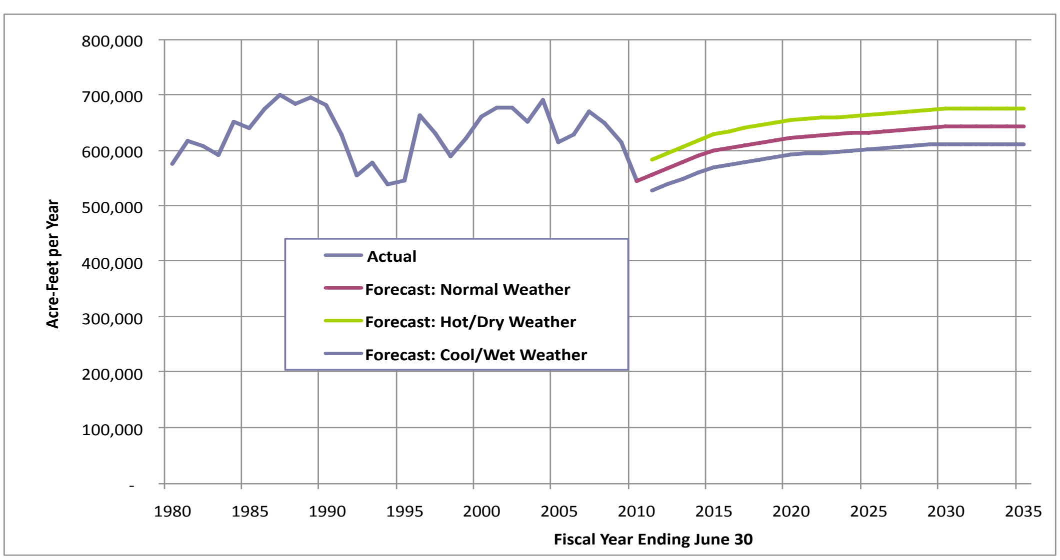


Exhibit 2L
Water Demand Forecast for Low-Income Residential Customers
Fiscal Year Ending June 30

Low-Income Single-Family Customers	**2015**	**2020**	**2025**	**2030**	**2035**
Number of Homes	42,640	43,907	44,811	45,652	46,273
Household Water Use (Gallons/Day)*	250	253	254	255	252
Demand Forecast (Acre-Feet/Year)	11,917	12,466	12,734	13,035	13,076
Low-Income Multifamily Customers	**2015**	**2020**	**2025**	**2030**	**2035**
Number of Homes	131,054	137,940	143,535	149,002	153,684
Household Water Use (Gallons/Day)*	159	163	165	167	166
Demand Forecast (Acre-Feet/Year)	23,313	25,196	26,471	27,812	28,527
Total Low-Income Residential Customers	**2015**	**2020**	**2025**	**2030**	**2035**
Demand Forecast (Acre-Feet/Year)	35,230	37,662	39,205	40,847	41,603

* Assumes same percent conservation as system for single-family and multifamily homes.

weather conditions could be as much as 5 percent higher than normal demands on average. Exhibit 2K presents LADWP's historical and forecasted total water demands with both passive and active conservation, under the full range of historical weather variability.

Low-Income Water Demand Projections

The requirements for the 2010 UWMP call for projections of water demands for low-income customers. For rate relief purposes, LADWP maintains records of low-income water customers. For the FY 2009/10, approximately 6.6 percent of the total number of single-family homes in the City was classified as low-income. On average, these customers used about 20 percent less water per household than overall single-family customers. To forecast low-income single-family water demand, the 6.6 percent ratio of low-income to total single-family homes was applied to determine the total number of low-income single family homes. The system wide per unit water use for single-family homes was reduced by 20 percent and multiplied by the total number of low-income single-family homes to determine low-income single-family water demand.

Because the water services of multifamily residential customers are typically not individually metered, a multifamily water account can represent upwards of 100 homes. Therefore, a different approach was used. LADWP's power system does individually meter multifamily homes and also classifies homes as low-income for rate relief purposes. Therefore, the ratio of current low-income to total multifamily homes in the City was applied to the total projection of multifamily homes in order to project the total number of low-income multifamily homes. For the FY 2009 /10, approximately 16.3 percent of the total number of multifamily homes in the City were classified as low-income. Assuming that low-income multifamily homes also use 20 percent less water than overall multifamily homes, an adjusted per unit water use for multifamily homes was multiplied by the projected number of low-income multifamily homes to determine low-income multifamily water demand. Exhibit 2L presents the water demand forecast for low-income residential water customers.

Chapter Three

Water Conservation

3.0 Overview

Multiple factors are increasingly restricting LADWP's traditional water supply sources. The City of Los Angeles has long recognized water conservation as the core of multiple strategies to improve overall water supply reliability. In May of 2008, LADWP's Water Supply Action Plan, "Securing L.A.'s Water Supply", was released in response to factors impacting LADWP's major water supply sources beginning in 2007. The Water Supply Action Plan calls for reducing potable water demands by an additional 50,000 AFY by 2030 through conservation, incorporating multiple conservation strategies to increase the sustainability of LADWP's water supply. Additional conservation efforts will increase this total to 64,368 AFY by 2035.

Los Angeles has historically taken a leadership role in managing its demand for water. Los Angeles consistently ranks among the lowest in per person water consumption when compared to California's largest cities. This significant accomplishment has resulted from the City's sustained implementation of effective water conservation programs since the 1980s.

One of LADWP's most effective conservation tools is the sustained conservation ethic of its customers. During past droughts and water shortages, residents and businesses have aggressively implemented additional conservation to achieve demand reductions. During FY 09/10, water use was below 1979 water use levels thanks to extraordinary conservation efforts by LADWP customers. Specifically, water use in FY 09/10 was almost 20 percent lower than water use in FY 06/07 with single-family residential water use 25 percent lower, multi-family water use 11 percent lower, commercial water use 16 percent lower, industrial water use 15 percent lower, and governmental water use 33 percent lower.

LADWP has continually invested in water conservation programs and measures targeting cost-effective reductions in water use. Looking forward, LADWP plans to continue to make investments in conservation programs and expand its focus on landscape water use efficiency and conservation opportunities in the commercial/industrial/institutional (CII) customer sectors. LADWP's conservation planning process includes working with other City departments to ensure that mutual needs are addressed and goals are achieved (e.g., landscape water use efficiency and dry weather runoff reduction).

The civic cultural ethic of water conservation in Los Angeles began with the installation of water meters on all services in the early 1900's. At that time, this foundational conservation measure resulted in a 30 percent reduction in water use. During the recurrence of periodic water shortages, LADWP customers have demonstrated concern and responsiveness to the need for additional conservation. When faced with significant supply shortages, City residents have responded with unprecedented reductions in their water use. Los Angeles was one of the first cities in southern California to invoke mandatory water rationing during the 1976 through 1977 drought. While severe, this two-year dry period resulted in only a temporary reduction in water use, as a subsequent series of wet years erased memories of the water shortage experienced during the brief dry period. However, it was the multiple dry years that followed the 1978 through 1986 wet cycle that would prove to be the turning point in Los Angeles' water use efficiency.

The dry years of 1987-1992 left a permanent imprint on Los Angeles water customers. In response to this water shortage, LADWP expanded its voluntary water conservation program. Prompted by an extensive public awareness program and education campaign, LADWP customers responded not only with water saving practices but also by installing conservation measures in their homes and businesses. Devices such as low-flow showerheads and ultra-low-flush (ULF) toilets replaced existing high water use devices. These hardware changes, coupled with more efficient use habits, have significantly reduced the amount of imported water that the City would need to buy as its population and commerce

Exhibit 3A
Historical City of Los Angeles Water Use

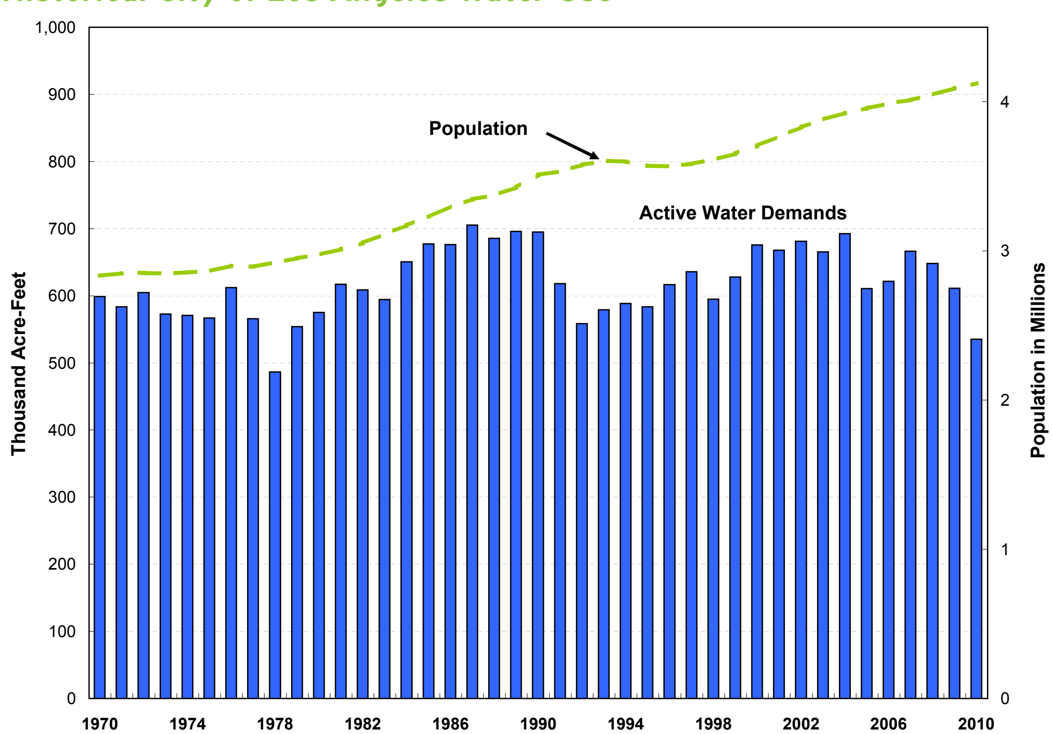


Exhibit 3B
Historical City of Los Angeles Conservation

Fiscal Year	Additional Annual Hardware Installed Savings (AF)	Cumulative Annual Hardware Savings (AF)	Annual Non-Hardware Savings (AF)[1]	Annual Total Savings (AF)
Prior to 1990/1991	31,825	31,825		
1990/1991	4,091	35,916	76,350	112,267
1991/1992	8,670	44,586	105,593	150,179
1992/1993	3,286	47,872	58,546	106,417
1993/1994	4,961	52,832	60,928	113,761
1994/1995	4,041	56,873	62,084	118,958
1995/1996	4,642	61,516	52,648	114,164
1996/1997	2,376	63,892	33,720	97,612
1997/1998	2,637	66,529	30,434	96,964
1998/1999	2,781	69,310	38,305	107,614
1999/2000	3,532	72,842	-6,262	66,580
2000/2001	3,078	75,920	-3,407	72,513
2001/2002	2,452	78,371	15,131	93,502
2002/2003	2,630	81,002	8,725	89,726
2003/2004	3,257	84,259	13,107	97,366
2004/2005	3,299	87,558	46,865	134,423
2005/2006	2,404	89,963	62,223	152,186
2006/2007	2,095	92,058	76,643	168,701
2007/2008	782	92,840	64,472	157,312
2008/2009	3,127	95,967	106,151	202,118
2009/2010	4,269	100,236	126,466	226,702

1. Negative non-hardware savings are due to overestimation in hardware savings due to years with extreme wet weather conditions.

continued to grow. In response to current water shortage conditions the City reinitiated its extensive public awareness campaigns, in addition to campaigns launched by MWD, to encourage water saving practices and installation of conservation devices in homes and businesses.

As a result of mandatory conservation and reduced deliveries of imported water from MWD, residential customers have attained conservation levels exceeding 20 percent during the period between 2007 and 2010. In response to the current water supply shortage, the City has updated its Emergency Water Conservation Plan Ordinance's enforceable water waste provisions and mandatory outdoor watering restrictions. In addition, the City has implemented water shortage year rates reducing Tier 1 water allotments for customers by 15 percent. As a direct result of conservation, imported water purchases from MWD are 23 percent below baseline allocations for FY 2009/10. In response to recently enacted State laws, LADWP has developed new water conservation goals which aim to reach approximately 64,000 AFY in hardware conservation savings by 2035.

Conservation has had a tremendous impact on Los Angeles' water use patterns and has become a permanent part of LADWP's water management philosophy. The City's water usage in 2010 was less than 1979 despite an increase in population of over 1,000,000 people (see Exhibit 3A). Exhibit 3B shows historical conservation savings from FY 1990/91 through FY 2009/10 based on installation of conservation devices subsidized through rebates and incentives. Cumulative annual hardware savings since the inception of LADWP's conservation program totals 100,236 AFY. Additional conservation was achieved through changes in customer behavior and lifestyle changes.

Conservation benefits the City by improving water supply reliability and reducing embedded energy use for water treatment and pumping. Conserving customers see a tangible benefit as well through monetary savings on their water bill. Another ancillary benefit of conserving water is that the need for costly sewer facility expansions is deferred as wastewater discharge into the sewer collection and treatment systems is reduced, thus increasing the lifespan of current sewer infrastructure. Water conservation also has the added benefits of reducing greenhouse gas emissions and energy use. Delivering water supplies to and within the LADWP service area and heating water for showers, dishwashing, etc. all require large amounts of energy. In the end, the primary beneficiaries of conservation are the water customers and the environment where the supplies originate. Furthermore, increased conservation results in decreased dry weather runoff which decreases the amount of pollutants flowing into local rivers and the Pacific Ocean.

Los Angeles has been implementing permanent conservation since the 1980's. In 1988, the City adopted a plumbing retrofit ordinance to mandate the installation of conservation devices in all properties and to require water-efficient landscaping in all new construction. The ordinance was amended in 1998, requiring the installation of ULF toilets and water saving showerheads in single-family and multi-family residences prior to resale. A new ordinance adopted in 2009, the Water Efficiency Requirements ordinance, establishes water efficiency requirements for new developments and renovations of existing buildings by requiring installation of high efficiency plumbing fixtures in all residential and commercial buildings. LADWP's past water conservation programs have assisted customers affected by the ordinances by offering free ULF toilets and showerheads, free installation of ULF toilets, showerheads and faucet aerators, as well as rebates for ULF toilets purchased and installed. Current water conservation programs co-sponsored by MWD through the SoCal Water$mart Program for residential customers and the Save Water Save a Buck Program for CII customers continue to assist customers in complying with ordinances and reducing overall water demands.

3.1 Water Conservation Goals

Water conservation reduces demand that typically rises over time with growth in population and commerce. By mitigating those increases in demand, water supply reliability is improved while costs are reduced. In the early 1990s, City residents responded with conservation levels exceeding 20 percent due to increasingly drier conditions and mandatory conservation. As normal water supply conditions returned and with continuation of LADWP's conservation program, conservation levels stabilized at approximately 15 percent. With the recent water shortage and reduced deliveries of imported water from MWD, residential customers have repeated conservation levels exceeding 20 percent in the period between 2007 and 2010 as a result of mandatory conservation. From July 2007 through February 2011, 90.6 billion gallons of water were saved through conservation. As a direct result of conservation, imported water purchases from MWD are 23 percent below baseline allocations for FY 2009/10. In response to the goals provided in the Plan and recently enacted State laws, LADWP has developed numerous water conservation programs.

3.1.1 Water Supply Action Plan Conservation Goal

To continue increased conservation levels once mandatory outdoor watering restrictions are lifted, LADWP has set a water conservation goal in the Water Supply Action Plan of reducing potable water demands by an additional 50,000 AFY by 2030. This conservation level will further lessen the City's reliance on imported water while providing a drought-proof resource that is not subject to weather conditions. This aggressive approach includes multiple strategies: investments in state-of-the-art technology; a combination of rebates and incentives promoting installation of weather-based irrigation controllers (WBICs), efficient clothes washers and urinals; expansion and enforcement of prohibited water uses; reductions in outdoor water use; extending education and outreach efforts; and encouraging regional conservation.

LADWP's commitment to conservation is a successful multi-faceted approach that includes tiered water pricing, education and awareness, financial incentives for the installation of a variety of conservation measures, free water saving showerheads, Technical Assistance Program (TAP) incentives for business and industry, and large landscape irrigation efficiency programs. Conservation is a foundational component of LADWP's water resource planning efforts and will continue to be over the long term.

3.1.2 Water Conservation Act of 2009

The Water Conservation Act of 2009, Senate Bill x7-7, requires water agencies to reduce per capita water use by 20 percent by 2020 (20x2020). This includes increasing recycled water use to offset potable water use. Water suppliers are required to set a water use target for 2020 and an interim target for 2015 using one of four methods. The 2020 urban water use target may be updated in a supplier's 2015 UWMP. Failure to meet adopted targets will result in the ineligibility of a water supplier to receive water grants or loans administered by the State unless one of two exceptions is met. Exception one states a water supplier may be eligible if they have submitted a schedule, financing plan, and budget to Department of Water Resources (DWR) for approval to achieve the per capita water use reductions. Exception two states a water supplier may be eligible if an entire water service area qualifies as a disadvantaged community.

Four methodologies are stipulated for calculating the water use target. Three of the methods are listed in Water Code § 10608.20(a)(1). The fourth method was developed by DWR. The four methodologies are:

- Method 1 – Eighty percent of the water supplier's baseline per capita water use.
- Method 2 – Per capita daily water use estimated using the sum of performance standards applied to indoor residential water use, landscape area water use, and commercial, industrial, and institutional water uses.
- Method 3 – Ninety-five percent of the applicable State hydrologic region target as stated in the State's *draft 20x2020 Water Conservation Plan*.
- Method 4 – Developed through public process. This method allows flexibility in its calculation to account for the highly diverse conditions of each agency's landscape, commercial, industrial, and institutional water needs and to give credit for past conservation efforts. For more information please go to: http://www.water.ca.gov/wateruseefficiency/sb7/committees/urban/u4/

Exhibit 3C 20x2020 Base and Target Data

20x2020 Required Data	Gallons Per Capita Per Day (GPCD)
Base Per Capita Daily Water Use	
10-Year Average[1]	152
5-Year Average[2]	145
2020 Target Using Method 3[3]	
95% of Hydrologic Region Target (149 gpcd)	142
95% Of Base Daily Capita Water Use 5-Year Average (145 gpcd)	138
Actual 2020 Target	138
2015 Interim Target	145

1. Ten-year average based on fiscal year 1995/96 to 2004/05
2. Five-year average based on fiscal year 2003/04 to 2007/08
3. Methodology requires smaller of two results to be actual water use target to satisfy minimum water use target.

In 2015, urban retail water suppliers will be required to report interim compliance followed by actual compliance in 2020. Interim compliance is halfway between the baseline water use and 2020 target. Baseline, target, and compliance-year water use estimates are required to be reported in gallons per capita per day (gpcd).

For consistent application of the Act, DWR produced Methodologies for Calculating Baseline and Compliance Urban Water Per Capita Use in October 2010. By following requirements provided in this document, LADWP has calculated its baseline per capita water use, its urban use target for 2020, and its interim water use target for 2015. Reporting compliance with daily per capita water use targets is not required until the 2015 UWMP cycle as it compares the interim target to actual water use in 2015. Exhibit 3C presents results of the calculations. Calculations and the technical bases for each calculation are presented in Appendix G. LADWP's baseline per capita water use is 152 gpcd using a ten-year average ending between December 31, 2004 and December 31, 2009 and 145 gpcd using a five-year average ending between December 31, 2007 and December 31, 2009.

LADWP has selected Method 3 to set its 2015 interim and 2020 water use targets. LADWP investigated all four methods and selected Method 3 because it is the most straightforward and reliable calculation method that adequately accounts for the City's past conservation investments.

Method 3 requires setting the 2020 water use target to 95 percent of the applicable State hydrologic region target as provided in the State's Draft 20x2020 Water Conservation Plan. LADWP is within State hydrologic region 4, the South Coast region. LADWP was required to further adjust the calculated 2020 target to achieve a minimum reduction in water use. The gpcd at 95 percent of the hydrologic region was 142 gpcd and using 95 percent of the five-year average base daily per capita water use was equal to 138 gpcd. Therefore, LADWP was required to set its 2020 target at the smaller of the two resultant values. LADWP's interim 2015 target is 145 gpcd and LADWP's 2020 target is 138 gpcd.

3.2 Existing Programs, Practices, and Technology to Achieve Water Conservation

LADWP has developed a number of progressive water conservation programs to address recently enacted State laws and to meet its goal of achieving an additional 50,000 AFY conservation by 2030. LADWP uses multiple programs, practices, and technologies in conjunction with enactment of State and local conservation ordinances and plumbing code modifications to achieve its current water conservation levels throughout its service area and customer classes.

3.2.1 State Laws and City Ordinances

State Laws

In addition to the Water Conservation Act of 2009 multiple legislative bills have been enacted in the past few years requiring water agencies to enact measures to increase water conservation, establishing new plumbing standards, and linking grants and loans to implementation of best management practices (BMPs).

The Water Conservation in Landscaping Act of 2006, Assembly Bill 1881, reduces outdoor water waste through improvements in irrigation efficiency and selection of plants requiring less water. The Act required an update to the existing Model Water Efficient Landscape Ordinance and adoption of this ordinance or an equivalent ordinance by local agencies no later than January 1, 2010. If any agency failed to adopt the ordinance or its equivalent, then the Model Water Efficient Landscape Ordinance was automatically mandated by statute. The ordinance requires development of water budgets for landscaping, reduction of erosion and irrigation related runoff, utilization of recycled water if available, irrigation audits, development of requirements for landscape and irrigation design, and scheduling of irrigation based on localized climate for new construction and redevelopment projects.

In 2009, Assembly Bill 1465, Urban Water Management Planning, was approved to include language in the UWMP Act requiring water suppliers that are members of the California Urban Water Conservation Council (CUWCC) and comply with its "Memorandum of Understanding Regarding Urban Water Conservation in California (MOU)" to describe their water demand management measures in their respective UWMPs. A more detailed discussion of the CUWCC and BMP compliance is provided in Section 3.2.3.

Assembly Bill 1420 links state funding for water management by urban water suppliers to implementation of water conservation measures. Urban water suppliers are required to be in compliance with the CUWCC MOU to be eligible for water management grants or loans. Senate Bill X7-7 further clarifies that the grant funding conditions required by AB 1420 will be repealed as of July 1, 2016 and replaced with eligibility determined by compliance with 20x2020 targets.

In the recent years, there have been numerous regulations approved that increase the water use efficiency requirements of plumbing devices, specifically, Assembly Bill 715 (2007), Senate Bill 407 (2009), and the CALGreen Building Standards. AB 716 requires that all toilet and urinal fixtures sold through retail or installed in existing and new residential and commercial building meet the high efficiency standards by January 1, 2014. SB 407 does not address the sale of plumbing fixtures but adds a requirement that beginning in January 1, 2017 all residential and commercial property sales must disclose all non-efficient plumbing fixtures. CALGreen has an effective date of January 1, 2011 and requires use of water efficient plumbing fixtures for all new construction and renovations of residential and commercial properties.

City Ordinances

Los Angeles has utilized ordinances as a tool to reduce water waste since 1988, beginning with the adoption of its first version of a plumbing retrofit ordinance. The ordinance mandated installation of conservation devices in all existing residential and commercial properties and installation of water-efficient landscaping in all new construction. Toilets were required to use less than 3.5 gallons per flush (gpf), urinals less than 1.5 gpf, and showerheads less than 2.5 gallons per minute (gpm). Customers with three acres or more of turf were required to reduce water consumption by 10 percent from 1986 levels or face a 100 percent surcharge on their water bills.

Exhibit 3D Water Efficiency Requirements Ordinance Summary

Device	Requirement
High Efficiency Toilets	1.28 gallons per flush
Urinals	0.125 gallons per flush
Faucets	
Indoor Faucets (Maximum)	2.2 gallons per minute
Private Lavatory Faucets	1.5 gallons per minute
Public Use Lavatory Faucets[1]	0.5 gallons per minute
Pre-rinse Spray Valve	1.6 gallons per minute
Showerheads	2.0 gallons per minute
Dishwashers	
Commercial Dishwashers	varies by type between 0.62 and 1.16 maximum gallons per rack
Domestic Dishwashers	5.8 gallons per cycle
Cooling Towers	5.5 cycles of concentration
Single-Pass Cooling Systems	Prohibited[2]

1. Metering faucets shall not deliver more than 0.25 gallons per cycle.
2. Single pass cooling systems are prohibited unless installed for health and safety purposes that cannot otherwise safely operate.

In 1998 the ordinance was amended, requiring the installation of ULF toilets and water saving showerheads in single-family and multi-family residences prior to the close of escrow. This progressive requirement is implemented with the help of local real estate professionals. LADWP has explored the expansion of the City's Retrofit on Resale Ordinance to include nonresidential properties.

Los Angeles further increased its water efficiency mandates in 2009 with adoption of the Water Efficiency Requirements Ordinance. This ordinance establishes water efficiency requirements for new developments and renovations of existing buildings by requiring installation of high efficiency plumbing fixtures in all residential and commercial buildings. Exhibit 3D summarizes the minimum requirements for new construction and replacement of fixtures in existing buildings.

In an effort to lead by example, LADWP has been retrofitting all its facilities with high efficiency plumbing fixtures since before the effective dates of the ordinance. As of early June 2010, LADWP is 57 percent complete in upgrading its 600 buildings to high efficiency faucets, toilets, urinals, showers, flexible hose connectors, angle valves, as well as correcting leaks and removing existing water damage.

In May 1996, the City's Landscape Ordinance (No. 170,978) became effective with an overarching goal to improve the efficient use of outdoor water. This ordinance was recently amended in 2009 to comply with the previously discussed Water Conservation in Landscaping Act of 2006 and the Model Water Efficient Landscape Ordinance.

LADWP first adopted an Emergency Water Conservation Plan Ordinance in the early 1990's in response to drought conditions. Subsequently in the current water shortage LADWP has adopted two amendments expanding prohibited uses, increasing penalties for violating the ordinance, and modifying water conservation requirements. Five phases of water conservation are incorporated into the plan with prohibitions and water conservation measures steadily increasing by phase. Regardless of water supply availability Phase I conservation requirements are in effect permanently unless a more stringent phase is in effect. In response to the ongoing water shortage conditions, LADWP implemented Phase III restrictions on June 1, 2009, restricting outdoor irrigation to two days per week. Following an ordinance amendment, Phase II implementation began on August 25, 2010 which allows outdoor watering three days per week. Exhibit 3E summarizes the five phases as defined in the latest amendment approved August 25, 2010.

Exhibit 3E
Emergency Water Conservation Plan Ordinance Restrictions by Phase

Phase	Restrictions
I	No use of a water hose to wash paved surfaces
	No use of water to clean, fill, or maintain levels in decorative fountains, ponds, lakes or similar structures used for aesthetic purposes unless a recirculating system is used
	No drinking water shall be served unless expressly requested in restaurants, hotels, cafes, cafeterias, or other public places where food is sold, served, or offered for sale
	No leaks from any pipes or fixtures on a customer's premises; failure or refusal to fix leak in a timely manner shall subject the customer penalties for a prohibited use of water
	No washing vehicles with a hose if the hose does not have a self-closing water shut-off device attached or the hose is allowed to run continuously while washing a vehicle
	No irrigation during rain
	No irrigation between 9am and 4pm, except for public and private golf courses and professional sports fields to maintain play areas and event schedules. System testing and repair is allowed if signage is displayed.
	All irrigation of landscape with potable water using spray head and bubblers shall be limited to no more than ten minutes per water day per station. All irrigation of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than 15 minutes per cycle and up to 2 cycles per water day per station. Exempt from these restrictions are irrigation systems using very low-flow drip-type irrigation when no emitter produces more than 4 gallons of water per hour and micro-sprinklers using less than 14 gallons per hour. This restriction does not apply to Schedule F water customers or water service that has been granted the General Provision M rate adjustment under the City's Water Rate Ordinance, subject to the customer having complied with best management practices for irrigation approved by LADWP.
	No watering or irrigation of any lawn, landscape, or other vegetated area shall occur in a manner that causes or allows excess or continuous water flow or runoff onto an adjoining sidewalk, driveway, street, gutter, or ditch.
	No installation of single-pass cooling systems shall be permitted in buildings requesting new water service.
	No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.
	Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily.
	No large landscape areas shall have irrigation systems without rain sensors that shut off the irrigation systems.
II	All prohibited uses in Phase 1 shall apply, except as provided.
	No landscape irrigation shall be permitted on any day other than Monday, Wednesday, or Friday for odd-numbered street address and Tuesday, Thursday, or Sunday for even-numbered street addresses. If a street address ends in 1/2 or any fraction it shall conform to the permitted uses for the last whole number in the address. For non-conserving nozzles (spray head sprinklers and bubblers) watering times shall be limited to no more than 8 minutes per watering day per station for a total of 24 minutes per week. For conserving nozzles (standard rotors and multi-stream rotary heads watering times shall be limited to no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 90 minutes per week.
	Irrigation of sports fields may deviate from non-watering days to maintain play areas and accommodate event schedules with written notice from LADWP. However, a customer must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners adopted degree of shortage plus an additional 5% from the customer baseline water usage within 30 days.
	If written notice is received from LADWP, large landscape areas may deviate from the non-watering days if the following requirements are met: 1) approved weather-based irrigation controllers registered with LADWP; 2) Must reduce overall monthly water use by LADWP's Board adopted degree of shortage plus and additional 5% from the customer baseline within 30 days; 3) Must use recycled water if available
	These restrictions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase II, except between the hours of 9am and 4pm.
III	All prohibited uses in Phases I and II shall apply, except as provided.
	No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street address and Tuesday for even-numbered street addresses. If a street address ends in 1/2 or any fraction it shall conform to the permitted use for the last whole number in the address.
	No washing of vehicles allowed except at commercial car washes.
	No filling of residential swimming pools and spas with potable water.
	Irrigation of sports fields may deviate from non-watering days and be granted one additional watering days for a total of two watering days with written notice from LADWP. However, a customer reduce overall monthly water use by LADWP's Board of Water and Power Commissioners adopted degree of shortage plus an additional 10% from the customer baseline water usage within 30 days.
	If written notice is received from LADWP, large landscape areas may deviate from the non-watering days and be granted one extra day of watering for a total of 2 watering days if the following requirements are met: 1) approved weather-based irrigation controllers registered with LADWP; 2) Must reduce overall monthly water use by LADWP's Board adopted degree of shortage plus and additional 10% from the customer baseline within 30 days; 3) Must use recycled water if available
	These restrictions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase III, except between the hours of 9am and 4pm.
IV	All prohibited uses in Phases I, II, and III shall apply, except as provided.
	No landscape irrigation is allowed.
V	All prohibited uses in Phases I, II, III, and IV shall apply, except as provided.
	The LADWP Board of Water and Power Commissioners is authorized to implement additional water prohibitions based on the water supply situation.

Specific procedures for determining the initiation of a phase and termination of a phase are provided in the Emergency Water Conservation Plan Ordinance. Phases are initiated through recommendations provided by LADWP to the Mayor and City Council (Council).

3.2.2 Conservation Pricing

In 1993, Los Angeles restructured its water rates to provide customers with a clear financial signal to use water more efficiently. It was the first time in LADWP's history that an ascending tiered rate structure was used. This conservation-based rate structure remains in use and applies a lower first tier rate for water used within a specified allocation, and a higher second tier rate for every billing unit (748 gallons) that exceeds the first tier allocation. A unique feature of the rate structure is that the first tier allocation considers factors that influence individual residential customer's water use patterns (i.e. lot size, climate zone, and family size).

The goals of LADWP's two-tiered water rate structure are to:

- Use price as a signal to encourage the efficient use of water
- Provide basic water needs at an affordable price
- Provide equity among customers
- Use price to stabilize water use during a shortage
- Generate adequate revenue for maintaining and upgrading the water system

In a period where increasing demands and reductions in water supply are becoming more commonplace, a rate structure that provides appropriate signals to encourage efficient water use has become a necessity for many areas, including Los Angeles.

The substantial investments required for water quality improvements, security, and supply development have significantly raised the cost of delivering water. As rates increase, water agencies have noticed a change in use patterns. Because there is a known correlation between price and use, agencies use rates to encourage conservation activities and to postpone the need to construct new facilities or purchase even larger quantities of imported water.

LADWP's tiered rate structure, first implemented in 1993 with assistance from a broad-based group of stakeholders, applies a lower tier block rate for responsible water use within an allocated block of water, and a much higher rate for every billing unit above this block. The higher block rate reflects the "marginal cost," or the projected cost for additional water that would be required to meet these needs.

To further emphasize the conservation message, water charges are based solely on water used. This eliminates the inclusion of all fixed charges thereby allowing customers who use no water during a during a billing cycle to receive a bill that includes no charge for water service. There are automatic adjustments triggered when a water shortage exists. In June 2009, shortage year rates went into effect reducing first tier allocations for all customers by 15 percent (see Appendix C). These adjustments are based on the actual water use patterns that occurred during the 1991 period of mandatory water rationing. The purpose of these adjustments is to use price to encourage additional conservation and to provide LADWP with the revenue necessary to operate the system efficiently during a shortage.

3.2.3 CUWCC Best Management Practices

The CUWCC is the voice of urban water conservation in California, and LADWP has been active in the CUWCC since its inception in 1991. Instrumental in the development of the CUWCC MOU, LADWP was also one of the original signatories to this MOU. The MOU identifies BMPs as proven conservation measures as determined by the CUWCC. The most recent amendment to the MOU was adopted on June 9, 2010 updating compliance alternatives with the adopted BMPs. A water agency can now comply with the MOU through one of three methodologies: BMP compliance, accomplishing water conservation through a set of measures equal or greater than the water savings provided by the BMPs (Flex Track Menu), or accomplishing water conservation goals as measured in gpcd. All Group One (water suppliers) signatories to the MOU are committed to implement the BMPs.

Over the last 19 years, LADWP has played a significant role in the governance and policy making at the CUWCC, holding a seat on the Board of Directors, Strategic Planning Committee, By-Laws Committee, Research and Evaluation Committee, CII Committee, co-chair of the Membership Committee, and chair of the Group 1 Representation Selection Committee. LADWP also has been actively involved in all of the revisions that the MOU has undergone to date.

One of the obligations as a signatory to the MOU is to submit a Best Management Practices Retail Water Agency Report to the CUWCC. Previously submitted annually, this report is now submitted biennially and details progress in implementing the foundational and programmatic BMPs as currently specified in the MOU. LADWP actively implements the BMPs and the CUWCC BMP reports are available for review through the internet by accessing CUWCC's website at www.cuwcc.org.

In the early 1990s, the State Water Resources Control Board identified urban water conservation as a major means for resolving problems in the Bay-Delta. Large water agencies, including LADWP, actively participated in work groups to develop conservation strategies. The result of this effort is in the aforementioned MOU.

The MOU commits signatory water suppliers to develop comprehensive conservation programs using sound economic criteria and to consider water conservation on an equal footing with other water management options. The MOU established the CUWCC to monitor implementation of the BMPs and to maintain the list of BMPs.

A BMP is defined as:

(a) An established and generally accepted practice among water suppliers resulting in more efficient use or conservation of water.

(b) A practice for which sufficient data are available from existing water conservation projects to indicate that significant conservation or conservation-related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water suppliers to carry out.

LADWP implements all of the BMP requirements in the MOU that are applicable to retail water agencies like LADWP. Foundational BMPs are considered as essential BMPs for any water utility and are ongoing practices not subject to time limitations. Programmatic BMPs are minimal activities required to be completed by each utility within the timeframe of the implementation schedules provide in the MOU. A listing of the BMPs is shown in Exhibit 3F.

Exhibit 3F
CUWCC BMPs and Implementation Status

Category	Sub-category	Practices	Status
Foundational			
Utility Operations	Operations Practices	Maintain the position of a trained conservation coordinator	Implemented
		Prevent water waste – enact, enforce or support legislation, regulations, and ordinances	Implemented
		Wholesale agency assistance programs	Not applicable
	Water Loss Control Metering with Commodity Rates	Conduct Standard Water Audit and Water Balance	Implemented
		Measure performance using AWWA software	Implemented
		Locate and Repair all leaks and breaks	Implemented
		100% of existing unmetered accounts to be metered and billed by volume of use	Implemented
	Conservation Pricing	Maintain a water conserving retail rate structure	Implemented
Education	Public Information Programs	Maintain active public information program to promote and educate customers about water conservation	Implemented
	School Education Programs	Maintain active program to educate students about water conservation and efficient water use	Implemented
Programmatic			
Residential		Residential Assistance – provide leak detection assistance	Implemented
		Landscape Water Surveys for residential accounts	Implemented
		High efficiency clothes washer incentive program	Implemented
		WaterSense Specification (WSS) for toilets	Implemented
Commercial/ Industrial/ Institutional (CII)		Implement unique conservation programs to meet annual water savings goals for CII customers	Implemented
Landscape		Implement Large Landscape custom programs	Implemented
		Offer technical assistance and surveys upon request	Implemented
		Implement and maintain incentive program(s) for irrigation equipment retrofits	Implemented

3.2.4 LADWP Conservation Programs

LADWP develops cost effective programs to achieve multiple goals of cost-effective demand reduction, customer service, environmental responsibility, and compliance with CUWCC BMPs. Conservation potential is considered in determining program approach and duration. Some types of conservation programs result in savings that are more easily measured than others. LADWP's programs include traditional demand-side management measures, as well as infrastructure improvement programs that contribute to water waste reductions. Demand-side management programs, like the rebate programs for water-saving toilets and high-efficiency washing machines, produce results that are measurable. Public information, education, and other general conservation awareness programs are intended to alter customers' behavioral patterns on water use and thus, are more difficult to quantify. It is such behavioral change in water use, however, that the City can point to as the primary reason for significant reduction in water consumption during water shortage periods. Combined with LADWP's conservation pricing structure discussed in Section 3.2.2, these programs increase system reliability and efficiency and will provide a secondary benefit of reducing runoff.

LADWP dedicates numerous staff in support of the Water Conservation Programs. Key personnel include the full-time water conservation coordinator who serves as LADWP's CUWCC representative, oversees conservation policies, and coordinates with other LADWP staff on the implementation of all the LADWP programs to ensure fulfillment with the annual water saving goals and CUWCC BMPs. Additional LADWP staff include the water conservation group that implement the various residential and commercial programs and the water conservation team (formerly known as the drought busters) that educate customers about the prohibited water uses, investigate claims of water waste and issue citations for water waste where warranted.

Specific conservation programs (past and present) associated with the CUWCC BMP categories are broken down in Exhibit 3G, and are fully discussed below. Appendix H contains the latest biennial reports provided to the CUWCC showing that LADWP has met all the BMP requirements.

Awareness/Support Measures

Awareness/support measures can be active or passive. Active components include full metering of water use, assessment of volumetric sewer charges, and a conservation rate structure. Passive components typically include providing educational materials for schools, community and customer presentations, maintaining a conservation hotline, and a wide range of information distributed through customer bills, advertising in public venues, LADWP's website, and direct mail. Passive awareness/support measures provide the foundation for the conservation movement to build upon by raising water use awareness, water conservation program visibility, and encouraging community involvement.

In 2008, LADWP entered into an MOU with the Los Angeles Unified School District to further improve our water conservation outreach program. In FY 2009/10 LADWP budgeted approximately $500,000 in funding for educational programs within area schools. Programs included:

- Los Angeles Times in Education – Provided newspapers to 50,000 students in grades 4-12 and lesson packages for teachers on supply sources and conservation.

- "Thirsty City" Live Performances – Play presented to more than 4,300 students introducing students to water supply sources, water supply challenges, and conservation.

- Renewable Energy and Conservation Curriculum – 660 teachers were trained in an extensive model conservation program reaching approximately 50,000 6th grade students.

- Renewable Energy and Conservation Center – Funding was provided for a science teacher position to set up and establish a Renewable Energy and Conservation Center with students to be bused to center for hands-on lessons focusing on conservation and renewable energy.

- Outdoor Education Multi-Day Environmental Experiences – Approximately 700 students in 20 classes in grades 4-12 attended two or three days of outdoor education experiences focusing on environmental measures, including lessons on energy and water.

- Eastern Sierra Institute – Training of 25 teachers over three days about the environment and geology of the Eastern Sierra.

- Teacher Fellowships – Ten math and science teachers from middle and high schools served in fellowships at LADWP for six weeks during the fall and summer of 2008 working in multiple offices with the intent of developing classroom lessons based on the experiences.

- Infrastructure Academy – 40 students from the Infrastructure Academy completed water conservation audits at 120 schools, including fixture

Exhibit 3G Current and Past Conservation Programs

CUWCC BMP Category	Conservation Measures	pre 1985	Year in Service
	Awareness/Support		
	Pricing		
Utility Operations – Water Waste Prohibition	Retrofit on Resale Ordinance		1998
Utility Operations - Pricing and Operations	Tiered Rate Structure		1993
Utility Operations – Water Waste Prohibition	Drought Buster Program		1990
Utility Operations – Water Waste Prohibition	Emergency Water Conservation Plan Ordinance		1990
Utility Operations –Conservation Coordinator	Full-time dedicated staff to conservation	x	
Utility Operations - Metering	Full Metering and Volumetric Pricing	x	
Utility Operations - Pricing	Sewer Charge using Volumetric Pricing	x	
Education - Public Information Programs	**Public Information**		
	Drought Response Outreach		2008
	Hotel & Restaurant Water Conservation Campaign		2008
	ULFT Customer Satisfaction Survey		1992
	Advertising	x	
	Bill Inserts	x	
	Brochures	x	
	Community Involvement Program	x	
	Exhibits	x	
	Hotline	x	
	Speakers Bureau	x	
	School Education		
	LAUSD MOU		2008
	High School in concert with the Environment - Student Home Water/Energy Survey		1994
	Lower Elementary	x	
	Upper Elementary	x	
	Junior High	x	
	Residential		
Residential	Residential Drought Resistant Landscape Incentive Program		2009
Residential	High Efficiency Clothes Washer Incentive Program		1998
Residential	Better Idea/Neighborhood Bill Reduction Service Program --Showerhead installation		1993
Residential	Community-Based Organization Toilet Distribution Centers, Direct Install		1992
Residential	High Efficiency Toilet Rebate		1990
Residential	Home Water Surveys		1990
Residential	Retrofit Kits Distribution		1988
	Commercial/Industrial/Government		
Commercial/Industrial/Institutional	Commercial/Industrial Drought Resistant Landscape Incentive Program		2009
Commercial/Industrial/Institutional	Water Efficiency Requirements Ordinance		2009
Commercial/Industrial/Institutional	General Services Dept. MOU to Retrofit Plumbing		2009
Commercial/Industrial/Institutional	Public Agency Plumbing Audit and Training Program		2009
Education - Public Information Programs	Targeted Literature Mailing		1993
Commercial/Industrial/Institutional	Commercial/Industrial Conservation Guidebook		1992
Commercial/Industrial/Institutional	Cooling Tower Manual and Workshops		1992
Commercial/Industrial/Institutional	Commercial Rebate Program		1991
Commercial/Industrial/Institutional	Interior Water Use Audits		1991
Commercial/Industrial/Institutional	Technical Assistance Program (TAP)		1991
Landscape; Commercial/Industrial/Institutional	Typical Audits		1991
	Landscape		
Landscape	Recreation and Parks MOU		2007
Landscape	Large Turf Irrigation Controller Pilot Program		2000
Landscape	Protector del Agua -- English and Spanish Language Workshops		1995
Landscape	Improving Irrigation Performance Manual & Workshop		1993
Landscape	Large Turf Audits and Audit Training		1993
Education - Public Information Programs	Lawn Water Guide Direct Mailing (as requested)		1989
Education - Public Information Programs	Demonstration Gardens		1988
Landscape	Ten Percent Large Turf Water Reduction Program		1988
	System Maintenance Measures		
Utility Operations - Water Loss Control	Large Meter Replacement Program		2001
Utility Operations - Water Loss Control	Fire Hydrant Shutoffs		1991
Utility Operations - Water Loss Control	Meter Replacement Program		1988
Utility Operations - Water Loss Control	Cement Mortar Lining of Pipelines	x	
Utility Operations - Water Loss Control	Corrosion/Cathodic Protection	x	
Utility Operations - Water Loss Control	Infrastructure Program	x	

counts, analysis of toilet makes and models, and analysis of irrigation controllers and field conditions.

Included within the short-term strategies of the City of Los Angeles' Water Supply Action Plan is a strategy to increase water conservation in the City through an aggressive $2.3 million conservation education campaign. LADWP Public Affairs Office implemented a media campaign that included radio, TV, and newspaper advertisements, billboards, outreach to Neighborhood Councils; and marketing of City rebates for water-efficiency.

Another aspect of awareness/support is that of advocacy. LADWP has been instrumental in the development of more stringent standards for toilets (e.g. Supplementary Purchase Specification for ULF toilets) that are in use within the City as well as by other water agencies in California and other areas. LADWP also assisted in the adoption of higher residential clothes washer efficiency standards by the California Energy Commission. Recognizing the importance of this activity, LADWP actively participates in advocating local and statewide conservation research and planning.

Residential Category

Multiple residential conservation programs were first developed and launched by LADWP during the drought of 1987 through 1992. In 1990, the ULF Toilet Rebate Program was initiated, followed two years later by the ULF Toilet Distribution Program. In 2003, a well-received free installation service component was added to the ULF Toilet Distribution Program that included free water-saving showerheads, faucet aerators and replacement toilet flapper valves. Today distribution of free faucet aerators and showerheads continues for all single-family, multi-family, and commercial customers.

In 2008 MWD initiated the region-wide SoCal Water$mart Program for residential water conservation. This program replaced previous LADWP rebate programs and rebate programs offered by individual water service providers throughout the MWD service area. This MWD sponsored program sets uniform rebate requirements across the MWD service area and provides a clearinghouse for processing rebates for all MWD member agency customers. Local agencies have the option of supplementing baseline rebate amounts to their customers through the program. LADWP has increased baseline rebates for several of the qualifying products. Eligible customers include residential customers residing in single-family and multi-family homes, even if multi-family residents do not receive a water bill.

Although the SoCal Water$mart Program has discontinued rebates for high efficiency toilets (HET), LADWP continues to provide local funding for rebates for its customers of $100 per HET which has proven to be highly successful with over 1,900 units installed in FY 2009/10 which equates to over 80 AFY in water savings.

Prior to initiation of the SoCal Water$mart Program, LADWP was assisted by community-based organizations (CBOs) to reach the milestone of more than 1.27 million toilets installed through December 31, 2006. CBOs were integral to LADWP's success, reaching into the communities they serve to convey the conservation message and directly undertake conservation activities. Benefits of this approach accrued to community participants through reduced water bills, to CBOs through employment opportunities and revenues earned, and to the City through significant water savings achieved. Prior to its discontinuation, the program was funded at more than $7 million annually. The toilets replaced through the program continue to produce estimated water savings of more than 44,000 AFY today.

LADWP initiated a High Efficiency Washer Rebate Program in 1998 promoting the purchase and installation of high efficiency washing machines saving both water and energy. As of January 2009, rebates have been paid for more than 66,100 machines purchased and installed throughout the City. The program's minimum efficiency requirements for rebate eligibility were increased in January 1, 2004, resulting in the promotion of higher efficiency models. Initial co-funding of the program was provided by the City's Department of Public Works Bureau of Sanitation and by the Southern California Gas Company.

In February of 2009 the High Efficiency Washer Rebate Program transferred from LADWP to the SoCal Water$mart Program with co-funding provided by MWD. Since the inception of the SoCal Water$mart Program and through June 2010, over 11,800 rebates for washing machines were issued to LADWP customers with a total annual savings of 368 AFY. Generally rebates are $300 per washing machine with a water factor (a measure of efficiency) of 4.0 or less. From April 22, 2010 through December 6, 2010, an additional $100 rebate was available through the California Cash for Appliances program for a total rebate of $400 per washing machine.

A sprinklerhead rotating nozzle retrofit rebate of $8 per nozzle is available through the SoCal Water$mart Program for a minimum of 25 nozzles. Replacing standard sprinkler heads with rotating nozzles can use up to 20 percent less water. Rotating nozzles are able to distribute water in a water-efficient manner more uniformly across a landscape than standard sprinklers. Spray from rotating nozzles is less likely to result in misting conditions, misdirection from winds, and reduces runoff onto pervious surfaces thus reducing dry-weather runoff. Between March 2009 and June 2010 2,878 rotating nozzle rebates were issued to LADWP customers saving approximately 12.7 AFY.

Rebates for installation of weather-based irrigation controllers are also available through the SoCal Water $mart Program. Rebates amounts are $200 per controller for landscape areas of less than one acre and $25 per station for landscape areas greater than one acre. Weather-based irrigation controllers provide customized irrigation schedules based on local site conditions and in response to weather changes. These smart controllers receive weather updates to automatically adjust the schedule and amount of water applied. Between March 2009 and June 2010 81 LADWP customers received rebates for installation of the controllers saving approximately 6.2 AFY.

Initially a synthetic turf rebate program was offered through the SoCal Water$mart Program, but has been discontinued as of June 1, 2010. The program provided rebates of $1.00 per square foot. Approximately 316,547 square feet of synthetic turf was installed by LADWP customers between February 2009 and June 2010 saving approximately 44.3 AFY.

LADWP through the SoCal Water$mart program is offering turf removal rebates of $1 per square foot up to $2,000 per residence. Not all MWD member agencies are participating in the turf removal program and participating agencies have additional requirements beyond MWD's requirements. Areas targeted for turf removal must currently be turf irrigated with potable water for a minimum of one year. All replacement materials must be permeable and either hand watered or irrigated with drip irrigation. A minimum of 250 square feet must be converted to be eligible for a rebate. No invasive plants are permitted and all exposed soil must be covered with mulch. Synthetic turf is an acceptable replacement if it is not used in right of ways or parkways. Applicants are required to maintain the converted area for ten years. The program commenced in December 2009, and as of FY 2009/10, over 280,000 square feet of turf area has been converted saving over 39 AFY. In conjunction with the turf removal program, LADWP is conducting a drip system pilot program and is offering free residential drip starter kits.

Water-saving showerheads and faucet aerators remain available to LADWP customers, free of charge, upon request. Approximately 12,124 showerheads and 14,792 faucet aerators were distributed between July 2007 and June 2010 saving approximately 241 AFY. During past water shortages, more than 1.5 million water conservation retrofit kits were distributed throughout Los Angeles; the kits included one-gallon toilet displacement bags, low-flow showerheads, and toilet leak detection tablets.

As part of past programs promoting residential water conservation measures, students conducted home water surveys through a resource efficiency education program implemented by LADWP in Los Angeles area high schools. Additionally, local community based organizations visited many Los Angeles residences throughout the year, assessing water conservation opportunities in the home and installing applicable measures to immediately capture water savings.

Another element of LADWP's past efforts was a toilet flapper valve replacement pilot program. Although long-term water savings from ULF toilets are predicated on timely replacement of leaking toilet flapper valves with appropriate replacement units, findings from the pilot program indicate a small incidence of leaking flapper valves in toilets rebated or distributed by LADWP. However, toilet leak testing and flapper valve replacement was added to the past ULF Toilet Distribution Program's installation service component for toilets not replaced through the program.

Commercial/Industrial/ Institutional (CII) Category

This category represents some of the largest volume water users in LADWP's customer base, and represents a great deal of conservation potential. LADWP, in partnership with MWD, developed and has implemented a commercial rebate program entitled the Save Water Save a Buck Program, designed specifically for customers in the CII sector and multi-family residences with five or more units represented by a homeowners association. In the CII sector, the program provides rebates for water saving plumbing fixtures, food service equipment, and landscaping equipment. Within the multi-family sector the program provides rebates for high efficiency washers, high efficiency toilets, and landscape equipment. In addition, packaged water use efficiency solutions are being developed for specific business sectors. Efforts are also underway to better promote the financial incentives

Exhibit 3H
CII Conservation Programs and Savings July 2007 through June 2010

Device Type	Rebate Amount	Devices Installed	Estimated Annual Savings (AFY)
	Retrofit		
Save Water Save a Buck Program			
Current Programs			
High Efficiency Toilets (1.28 gpf or less)	$150 each ($50 new construction)	58,432	2,408.60
Zero and Ultra Low Water Urinals	$500 each ($250 new construction)	6,063	630.9
Cooling Tower pH Conductivity Controller	$3000 each	41	79.7
Cooling Tower Conductivity Controller	$625 each	57	36.7
Air Cooled Ice Machine	$300 each	0	0
Connectionless Food Steamer	$600 compartment	23	5.8
Dry Vacuum Pump (maximum 2.0 horsepower)	$125 per 0.5 horsepower	8	0.7
Water Broom	$150 each	73	11.2
Weather Based Irrigation Controller	$50 per station	391	127.1
Central Computer Irrigation Controller	$50 per station	0	0
Rotating Nozzles for Pop-up Spray Heads (25 minimum)	$8 each	22,534	99.1
High Efficiency Spray Nozzles for Large Rotary Sprinklers	$13 per head	8,558	308.1
Past Programs			
High Efficiency Coin Clothes Washer	-	1,738	186.8
Pre-Rinse Sprayhead	-	5	0.8
Steam Sterilizer Retrofit	-	6	7.8
X-Ray Processor Recirculation System	-	1	3.2
Synthetic Turf (square feet)[1]	-	15,177	2.1
Subtotal Save a Buck Program	-		**3,908.70**
LADWP Inhouse Programs			
Commercial Showerheads	-	5,180	85.3
Commercial Faucet Aerators	-	20,844	96.5
Water Brooms	-	262	40.2
CII Landscape Program Turf Removal[2]	-	1,251,043	95.6
Technical Assistance Program[3]	-	-	2358.4
Subtotal LADWP In-house	-		**2676**
Total CII	-		**6584.8**

1. Synthetic Turf rebates as of June 1, 2010 are available through LADWPs Technical Assistance Program.

2. Rebate amount varies and is determined during pre-approval process.

3. Rebates for Technical Assistance Program are $1.75 per 1,000 gallons saved over a two year period with a cap not to exceed the actual cost of the project. Devices installed vary per project.

available that make water conservation retrofits more cost effective for business and industry. LADWP takes full advantage of regional programs offered through MWD for the CII sector and for many product rebates, provides supplemental funding to boost the base rebate provided by MWD.

The Save Water Save a Buck Program was launched in 2001 to provide menu-based rebates for water conserving measures applicable to many types of CII facilities. Categories of products eligible for rebates, rebate amounts, number of rebates for the LADWP service area, and estimated savings are provided in Exhibit 3H for the period July 2007 through June 2010. During this period, an estimated annual savings of 6,585 AFY was achieved, inclusive of LADWP in-house programs and the Technical Assistance Program (TAP). The program design provides for ease of participation and has been well-received by LADWP customers. The program has been so successful that the SoCal Water$mart Program for residential customers was modeled after it.

LADWP created the Technical Assistance Program (TAP) in 1992 to provide custom-type incentives for retrofitting water-intensive equipment. Different from the Save Water Save a Buck Program, the TAP encourages site-specific projects and TAP incentives are based on a given project's water savings. Financial incentives up to $250,000 are available for products demonstrating water savings. Incentives are calculated at the rate of $1.75 per 1,000 gallons saved over a two-year period with a cap not to exceed the actual cost of the installed product. Projects must save a minimum of 150,000 gallons over a two-year period and operate for a minimum of five years. Eligible customers are CII or multi-family residential customers. Past TAP projects include cooling tower controller upgrades and x-ray processor recirculation systems. The estimated unit cost for TAP overall is about $228 per acre-foot saved with an annual savings of 2,358.4 AFY based on projects installed between July 2007 and programs until June 2010.

Similar to the residential turf removal program, LADWP has a turf removal program for commercial properties. This program started in September 2009 and the rebate is $1.00 per square foot of turf with the total project rebate amount as defined in the pre-approval letter provided by LADWP. Areas targeted for conversion must have live healthy turf irrigated with potable water (recycled water is ineligible) via automatic sprinkler valves when a project approval letter is provided by LADWP. Converted areas must contain enough plants to create at least 30 percent landscape coverage at maturity. Converted areas may not contain turf or synthetic turf (synthetic turf rebates are available through the TAP). All replacement materials must be permeable and plants must be climate appropriate or California native plants. A minimum of 250 square feet must be converted to be eligible for a rebate. No invasive plants are permitted and all exposed soil must be covered with three inches of mulch. If an irrigation system is used it must be a low flow drip or bubbler system. Applicants are required to maintain the converted area for 15 years.

Water-saving showerheads and faucet aerators are available to LADWP commercial customers, free of charge, upon request. Bathroom faucet aerators are provided in 1.5, 1.0, or 0.5 gallons per minute (gpm), kitchen faucet aerators are provided in 1.5 gpm, and showerheads are provided in 2.0 gpm. Approximately 5,180 showerheads and 20,844 faucet aerators were distributed between July 2007 and June 2010 saving approximately 181.8 AFY combined. LADWP additionally offers an in-house water broom program in addition to the rebates offered through the Save Water Save a Buck Program.

Landscape Category

Recognizing that a substantial amount of water is used outdoors for irrigation, LADWP continues to invest in landscape irrigation efficiency programs and projects. In addition to the previously discussed landscape ordinances (Section 3.21.), LADWP has sponsored free

Drought-tolerant garden outside the LADWP John Ferraro Building.

training courses specifically targeting the City's large turf customers to help these customers comply with the landscape ordinance. To further assist this group, LADWP developed a guidebook, "Improving Irrigation Performance" to demonstrate ways for enhancing existing irrigation systems.

LADWP has also sponsored conservation and garden expos to highlight various aspects of efficient outdoor water use and planting practices, and emphasize native, drought-tolerant plants. Funding was provided for three demonstration gardens to showcase the use of drought-tolerant plants and flowers, including the landmark Lummis Home in Highland Park. Lawn watering guides were mailed to all single-family and duplex residences. Planting guides for native and drought-tolerant plants are also available upon request. Additionally, to demonstrate the beauty and appeal of a water-conserving landscape, LADWP's John Ferraro Building facility (below) has a drought-tolerant garden that is open to visitors year-round.

In addition to the Residential and Commercial Landscape Incentive Programs for turf removal, other types of landscape irrigation improvement projects are also funded through the TAP, with incentives calculated on the basis of a project's water savings. LADWP staff includes certified landscape auditors, and large landscape audits are available upon request.

LADWP is also investigating new programs using data obtained through pilot program efforts. A pilot program was conducted to determine the effectiveness of weather based irrigation controllers in large landscape applications. On the basis of the pilot program results showing water savings, financial incentives are available to LADWP customers for the purchase and installation of weather based irrigation controllers through the SoCal Water$mart and Save Water Save a Buck Programs. Additional efforts are being undertaken to make available a landscape irrigation education program for homeowner associations and other large landscape customers. This program would focus on common green areas in multi-unit complexes to improve irrigation efficiency, including irrigation system maintenance and repair, and plant selection.

LADWP has been implementing an internal program to retrofit outdoor landscaping at department-owned facilities to California-friendly and native plantings with efficient irrigation systems. Additionally, a joint effort between the Department of Recreation and Parks and LADWP is targeting public parks through the City Park Irrigation Efficiency Program. City parks with inefficient irrigation systems, leaks, and runoff problems are identified and upgraded with water efficient distribution systems and sprinkler heads, installation of smart irrigation controllers, and planting of California-friendly landscaping. Since the program began in 2007, seven parks have been completed and 4 new weather stations have been installed. An additional benefit of this program is the educational, trade training, and employment opportunity given to the youth of Los Angeles.

There is also potential for the use of non-potable water for irrigation, which can help extend the utility of the City's traditional water supplies. Through increased stormwater capture, groundwater recharge with captured storm and irrigation runoff, and recycled water, imported surface water and local groundwater used for landscape irrigation can be conserved. The potential to use such non-potable water supplies is further discussed in the Recycled Water and Watershed Management chapters (Chapters 4 and 7 respectively).

New Low Impact Development (LID) projects implemented within the City and innovative work by non-profit organizations demonstrate pioneering ways to conserve water for landscapes. As discussed in Chapter 7, LADWP's Watershed Management Group is proactively developing programs in conjunction with other departments to highlight water conservation through LID and implementing stormwater BMPs. A local non-profit, TreePeople, has partnered with various City departments, including LADWP on a number of stormwater capture projects.

For over a decade, TreePeople has demonstrated that rainwater is a viable local water resource. The Open Charter Elementary School Stormwater Project is one of several sustainable stormwater management systems that TreePeople installed in Los Angeles. Other examples include: the Center for Community Forestry which harvests rainwater from its entire hardscape into a 216,000 gallon underground cistern for landscape irrigation use; a retrofitted single-family residential home in South Los Angeles that captures a 100-year storm event on site; and a 7,600 square foot subsurface stormwater infiltration gallery on the Broadous Elementary School campus in Pacoima. Most recently, TreePeople partnered with the Los Angeles and San Gabriel Rivers Watershed Council, LADWP, and other state and federal agencies to retrofit an entire residential block on Elmer Avenue in Sun Valley. This project now intercepts stormwater from 40 acres upstream and infiltrates it back to the aquifer while also demonstrating effective distributed stormwater BMPs on residential homes.

In partnership with the Los Angeles County Department of Public Works, TreePeople was instrumental in developing the Sun Valley Watershed Management Plan: an alternative stormwater management plan that prioritizes green infrastructure and multi-benefit stormwater capture projects instead of stormdrains. Many projects have been completed, and more are scheduled for construction. These activities create the foundation that will lead to further landscape water conservation and stormwater capture to increase the water use efficiency of the City's limited water supplies.

CASE STUDY:
Los Angeles River Revitalization and the North Atwater Park Project

Background

The Los Angeles (LA) River flows 51 miles through some of the most diverse communities in Southern California—its first 32 miles are within the City of LA. The River has a year-round low flow due to contributions from upstream wastewater treatment plants, urban runoff, groundwater inflow, and natural springs, but can become a torrent of racing flows during the rainy season. The River is almost entirely concrete-lined except for a few reaches. Although the design of the River has served its flood control purpose, the River holds far greater potential to serve as a focal point for environmental restoration, economic growth, community revitalization, and recreation.

Realizing that the River should stand as a symbol of pride for the City of LA and its residents and that it should be a landmark for the public to enjoy and admire, the LA City Council established the Ad Hoc Committee on the River in 2002 and adopted the LA River Revitalization Master Plan (LARRMP) in 2007 (www.lariver.org). Led by the City's Bureau of Engineering and funded by the LA Department of Water and Power, the LARRMP was created through a collaboration of elected officials, city departments and agencies, residents, multi-disciplinary experts, and a wide variety of private and non-profit environmental and recreational groups. The LARRMP is a 25-to-50 year blueprint for transforming the City's stretch of the LA River into an extensive network of parks, walkways, bike paths, and diverse land uses that will ensure the growth and sustainability of healthy communities.

Key Features

In October 2010, the City celebrated the groundbreaking of the North Atwater Park Expansion and Creek Restoration project as the first project to emerge from the LARRMP, which is expected to be open to the public by December 2011. The project was undertaken in connection with the settlement of two Clean Water Act enforcement action, Santa Monica Baykeeper v. City of Los Angeles and United States, and State of California ex. Rel. California Regional Water Quality Control Board, Los Angeles Region v. City of Los Angeles and also funded in part by Proposition 50 through the California Resources Agency to improve River Parkways and the Integrated Resources Water Management. The project will use both structural and natural solutions to restore a degraded creek that is a tributary of the River while also expanding River-adjacent parkland with multiple recreational, wildlife habitat, and water quality benefits. The project will add nearly 3 acres to an existing 5-acre City park, connecting it to the River, where visitors will enjoy watching a wide variety of bird species that presently live in that soft-bottomed stretch of the River, framed by stunning views of Griffith Park in the distance. Some of the project's highlights include:

Outdoor Classroom

The project will encourage young children to explore nature via an educational gathering space near the LA River. This "outdoor classroom" will feature a nature-based art area for independent and guided activities—designed particularly for local students to learn about nature, native plants, and the opportunities and challenges associated with revitalizing the LA River.

Native Demonstration Garden

The park's central focus will be a demonstration garden, which will contain a variety of native plants that are used throughout the park, with interpretive displays to educate visitors about the plant species' characteristics, care, and relationship to water conservation. The park will only include native plants because they are considered "drought-tolerant" given their abilities to thrive in Southern California's climate, requiring much less water than other plants. The park's landscape design aims to set an example in the use of such plants, but also to educate the public on the merits of embracing native vegetation as an important component of solving the region's water crisis.

Creek Restoration

North Atwater Creek currently conveys polluted runoff to the River from an upstream stormdrain system that receives flow from a 40-acre urban area. The Creek will be restored and landscaped with native plants to prevent erosion and to naturally filter stormwater before it is discharged to the River, featuring a 1000-foot-long meandering streambed sustained by intermittent street runoff flows. Water quality improvements will include installation of a device at the entrance of the creek to intercept and capture trash and bacteria and special treatment of flows from adjacent equestrian facilities.

Accommodating Visitors

While the park's landscape design capitalizes on the opportunity to educate visitors about the many connections between urban life, nature, and water, its structural features do also. For example, the parking lot will be transformed by installing a gravel bioswale along the borders and replacing existing parking spaces with permeable surfaces. These changes will not only address surface water contamination, but also allow stormwater to infiltrate so that it will assist with groundwater augmentation.

Summary

The North Atwater Park project will utilize innovative Low Impact Development (LID) and Best Management Practice (BMP) technologies to simultaneously achieve a variety of benefits, including responsible water conservation, improved water quality, expanded wildlife habitat connectivity, co-located multi-generational recreation, and public education.

The park's goals recognize that, while it is important to transform the existing park into a beautiful, scenic landmark and natural resource, it is equally important to educate the public about the huge potential such achievements have in encouraging wiser water use practices. Fundamentally, the park is about water—respecting LA's water supply and celebrating the River—by simultaneously improving the survivability of our wildlife and human habitat. North Atwater Park is an example of what can happen when public agencies and residents tackle complicated problems with creative planning and successful collaboration.

"The LA River cause is reaching more and more people every day. We are incredibly encouraged by the USEPA's July 2010 decision regarding the River's federal protection status and particularly because of the context in which it was announced—President Obama's America's Great Outdoors initiative is exactly the kind of support we need now and the visit of so many distinguished Administration officials to the River reinforces the belief that the River is important to millions of people here and across the country."

Carol Armstrong, Ph.D., Environmental Supervisor, Project Manager, LA River Project Office

"The City's commitment to LA River revitalization has only gained in momentum over the years and we have now reached an important crossroads for answering the big questions—such as how to capture and reuse storm flows, how to expand our recycled water uses, how to ensure we have enough water to maintain critical wildlife habitat, and how much flood capacity can we add? The River is central to each and every one of the answers."

Larry Hsu, P.E., Senior Civil Engineer, Project Manager, LA River Project Office

System Maintenance Category

Maintaining system infrastructure reduces water waste and allows for greater water accountability. Infrastructure maintenance is a high priority for LADWP. As discussed in Chapter 2, LADWP non-revenue water has an impressive historical 25-year average of 7 percent of the total water demand. LADWP maintains a 24 hour, 7 days per week leak response operation and repairs major blowouts that impact public safety immediately and typical leaks within 72 hours. Ongoing programs such as pipeline replacement, pipeline corrosion control, and meter replacement preserve the operational integrity of City water facilities, and aims to reduce unaccounted water losses.

In recent years, the LADWP has ramped up its pipeline replacement program from 70,000 liner feet annually to 95,000 linear feet annually. Additionally, the LADWP Water System's Asset Management Group along with the Water Distribution Division are working to develop a predictive model that uses existing data relative to the factors which contribute to water main deterioration to determine a replacement priority for all pipe segments in the system. The results of this model along with criticality assessments and leak history can be used to focus replacement resources on pipe segments that are more likely to fail and disrupt service levels.

LADWP has also made significant progress in replacing and/or retrofitting water meters through its meter replacement program that started in 1988. As a result of extended flow or usage, the moving parts in a water meter can wear down and begin to under-register the actual water consumption. The meter replacement program has been valuable in ensuring the accuracy of the approximately 700,000 meters within the City. Recently, all of the large-sized meters (3-in and larger) in the system were replaced as part of a Large Meter Replacement Program, and the LADWP is also replacing 35,000 small meters annually.

As part of the new requirements of the CUWCC Water Loss Control BMP amended in September 2009, LADWP has completed training in the American Water Works Association water audit method and component analysis process offered by CUWCC. LADWP has also completed the standard water audit and balance using the American Water Works Association Water Loss software to determine the current volume of apparent and real water loss and the cost impact of these losses. As the final BMP condition, LADWP is on target to complete the required component analysis by July 2013. The goal of the component analysis is to identify volumes of water loss, the cause of the water loss and the value of the water loss for each component.

3.3 Future Programs, Practices, and Technology to Achieve Water Conservation

LADWP, on its own and in cooperation with other agencies, continues to investigate future programs, practices, and technology to improve water conservation.

3.3.1 Graywater

As defined by State regulations, graywater is untreated household wastewater that has not come into contact with toilet waste or unhealthy bodily wastes. It includes water sources from bathtubs, showers, bathroom wash basins, and water from clothes washing machines and laundry tubs. It specifically excludes water from kitchen sinks and dishwashers. Graywater is a drought-proof source of supply for subsurface landscape irrigation. Graywater regulations do not allow for its application using spray irrigation. Graywater is also not allowed to pond or runoff, discharge to or reach a storm drain system or surface water body, and is not permitted for irrigation of root crops or edible food crops that are directly in contact with the surrounding soil.

The Graywater Systems for Single Family Residences Act of 1992 legally incorporated the use of graywater as part of the California Plumbing Code. In September 1994, the City approved an ordinance that permitted the installation of graywater systems in residential homes. However, installing graywater systems under this act was costly in terms of both installation and maintenance. To address the current water shortage and reduce water demands, emergency graywater regulations added Chapter 16A (Part I) "Nonpotable Water Reuse Systems" to the 2007 California Plumbing Code. These regulations were approved by California Building Standards Commission in 2009 and became effective on August 4, 2009. Further revisions were made to the regulations and the regulations became permanent on January 12, 2010 with an effective date of January 20, 2010. These new code changes allow the use of certain types of untreated graywater systems as long as specific health requirements are met as defined by the authority having jurisdiction. The ordinance can be acquired from the City of Los Angeles Department of Building and Safety (LADBS) website at the following link.

http://ladbs.org/LADBSWeb/LADBS_Forms/InformationBulletins/IB-P-PC2008-012Graywater.pdf

Graywater systems in residential buildings are regulated by LADBS. LADBS requires a plumbing permit prior to construction, reconstruction, installation, relocation, or alteration of any graywater systems, treated or untreated. As of FY 2009/10, LADWP does not offer any rebates or incentives for graywater systems, but continues to assess the potential for this water conservation technology. LADWP is also reviewing the concept of assisting in the creation of ad hoc committees to develop a standard for graywater systems.

Untreated Graywater Systems

Untreated graywater systems are systems where graywater is collected from non-toilet and non-kitchen sources and is utilized without treatment, for uses such as landscape irrigation. According to a 1999 study prepared by the Soap and Detergent Association, the average untreated graywater system in the US uses 6.3 gallons per day. In a 2010 White Paper prepared by Bahman Sheikh, for the WateReuse Association, Water Environment Federation, and American Water Works Association the potential for graywater generation in 2030, adjusted for conservation devices, is estimated at approximately 75.5 gallons per household per day. Potentially 50 percent of indoor potable water use could be re-used as graywater. Multiple manufacturers have developed untreated graywater systems and many households have installed such systems. However, these systems are not typically monitored, thus health and safety risks associated with the products have not been determined.

Under the recently approved revisions to the graywater system regulation, LADBS does not require a permit for untreated graywater systems supplied by only a clothes washer in a one or two-family dwelling as long as the system does not require modification of existing plumbing. Multiple requirements must be met for a system to be exempt from a permit, including but not limited to:

- Discharge shall be released not less than two inches below the surface of rock, mulch, or soil.
- Designs shall incorporate a means to allow the user to divert flow to the disposal area or the building sewer.
- Design of the system shall not allow contact with humans or pets.
- Water from diapers or other similarly soiled or infectious garments shall be diverted to the building sewer.
- Hazardous chemicals from washing activities, such as soiled rags, shall be diverted to the building sewer.
- An operation and maintenance manual shall be provided and remain with the building.

CASE STUDY:
Single-Family Home Graywater System

As a community environmental leader, Janie Thompson is taking extraordinary steps in efficient use of water and conservation. With the help of her husband, her household has become an excellent example of a rainwater capture residence, catching rain in 18 separate rain barrels with 60 gallons each. To save even more water, the couple is installing an impressive graywater network, distributing water to the furthest extent of their large 14,850 square foot property.

"In June 2009, when the Mayor announced the ordinance limiting watering to two days per week, we freaked out, and originally thought most of our landscaping would die. With all of our conservation, rainwater capture, and use of graywater, our usage has dropped from 117 hcf to around 54 hcf per month in the summer months. We couldn't be happier. It just goes to show you how much most people in the City over water." – Janie Thompson

Their existing graywater system currently uses the drainage pump from the clothes washer to pump water slightly up grade to tree and flower areas of the backyard. Upon exiting the washer, a 3-way valve reserves the option to divert washer effluent to the sewer system. The graywater piping travels beneath their raised foundation home, into the subsoil, and onto the areas it serves. Once construction is complete, all piping (left) will be buried with existing soil or mulch.

When the stream is pumped to the highest point of the yard, it is sent to numerous subsoil infiltration chambers, through a distribution system of 1" HDPE (High-density polyethylene) pipe. The infiltration chambers are made from 1 gallon paint buckets turned upside down with holes cut in the bottoms (below). The chambers allow for unobstructed exit flow and appropriate soil surface area for infiltration. In addition, they provide a significant volume for water storage during the surge of a pumped load of laundry. Plant roots are attracted toward these water outlets, essentially feeding on nutrients and organics in the graywater. The tops of the chambers are cutout for frequent access, and covered with mulch or stepping stone. The pipe exits can be checked as necessary to ensure free flow.

The next steps in the construction are connection of the bathtub and bathroom sinks. Effluent from these water sources will enter a surge tank and float switch assembly. A graywater dedicated pump will then automatically push water to existing and newly installed infiltration chambers throughout the yard.

Graywater used from these indoor sources will provide two main benefits. It will displace water used for irrigation and prevent additional water from entering the sewer. This decreases the load on the City sewer system and lowers the overall cost of treatment for the Bureau of Sanitation.

The water savings are approximated in the following table. Please note that the clothes washer is a high-efficiency front loading model. Showers are estimated at 10 minutes long with a showerhead using 2.5 gallons per min.

Yearly Water Savings				
Washer	14 gal/use	10 uses/wk	140 gal/wk	7,280 gal/yr
Bathtub	40 gal/person/day	3 people	840 gal/wk	43,680 gal/yr
Bath Sink	2 gal/person/day	3 people	42 gal/wk	2,184 gal/yr
			Total	53,144 gal/yr

Treated Graywater Systems

Treated graywater systems treat water collected from non-kitchen and non-toilet sources for nonpotable reuse indoors and outdoors. Treated graywater systems for indoor use of graywater are not currently permitted by LADBS as there are no water quality standards nor mean to certify onsite treatment systems. Testing agencies are working to address safety concerns while manufacturers are working to improve the technology gap in the systems. Both manufacturers and testing agencies are working together to address gaps in standards to allow the future use of treated graywater for outdoor surface irrigation and for indoor uses in toilets and urinals.

The National Center for Disease Control and Prevention in conjunction with North Carolina State University is developing a program to examine the public health values and impacts associated with decentralized water reuse at eight project sites across the country. Under this program wastewater from homes would be treated to Title 22 standards as required by local health regulators. One of the proposed sites is located in Los Angeles County.

On the international level, treated graywater systems are used in both Europe and Australia. However, treated graywater systems in the United States are not common. A lack of accepted standards for graywater systems imposes a financial risk to companies manufacturing graywater systems. The International Association of Plumbing and Mechanical Officials (IAPMO) and NSF International are the two testing agencies working to develop standards for uniform treated graywater systems applicability in the US. LADWP is closely following the development of the NSF Standard 350 and IAPMO standards to ensure that once a set of standards have been approved by model codes and adopted by the Building Standards Commission, the citizens of Los Angeles can safely install treated graywater systems to maximize water reuse without any health and safety risks.

3.3.2 Demand Hardening

Although LADWP regularly assesses new water conservation opportunities, conservation programs may, at some point in time, diminish a customer's ability to further conserve water, in particular during short-term water supply shortages caused by droughts or other emergencies. This phenomenon is known as "demand hardening." The California Urban Water Agencies defines demand hardening as, "the diminished ability or willingness of a customer to reduce demand during a supply shortage as the result of having implemented long-term conservation measures." Long term conservation measures can include hardware conservation measures, such as the installation of high efficiency toilets and behavioral conservation, such as watering during specified periods of the day.

Demand hardening occurs when options available for reducing water use are limited as the customer base is saturated with hardware conversions causing efficient water usage patterns to prevail. During "dry" years, utility customers who have actively participated in water conservation programs can be disproportionately impacted by water reductions as there is a limited ability for further conservation. The impact of demand hardening would be most prevalent during water supply shortages where customers have already been implementing long-term water conservation measures. Proponents of demand hardening believe that implementation and saturation of new hardware-based conservation devices would generally not occur rapidly enough during a water supply shortage, such as a drought, to reduce short-term water use.

However, it can be argued that hardware-based conservation devices will continue to be developed, piloted and implemented, such as the previously discussed weather based irrigation controllers, thus improving the ability to further conserve in the future. During droughts, consumers will respond to the call for more conservation by behaviorally adjusting their water use through methods such as not leaving water running and taking shorter showers. Additionally, full saturation of current conservation devices has not occurred. For these reasons, others believe demand hardening is irrelevant and there is a continued need for aggressive conservation programs.

Full implementation of current conservation measures, including reducing leaks, has the potential to reduce per capita water demands even further. Past water conservation efforts have reduced water use within LADWP's service area even though the population has continued to expand as illustrated in Exhibit 3A. It is expected that future water conservation efforts will continue this trend as increased saturation of water saving hardware devices occurs and new hardware devices are developed.

Though not easily quantifiable, saturation of current water saving hardware devices and installation of future water saving hardware devices combined with potential demand hardening have the ability to impact demand forecasts. As a worst case scenario, demand hardening and its effects are considered in LADWP's water demand forecasts to ensure that the appropriate supply of water is planned for. However, LADWP will continue to maintain its aggressive water conservation program discussed within this section. In the future, LADWP's water demand forecasts will continue to be examined and adjusted accordingly to compensate for additional implementation of long-term water conservation measures as saturation increases and new technology results in new hardware devices.

3.3.3 Projected Water Conservation Savings

To assist in planning future water demands, meeting the Water Supply Action Plan goal, and complying with

Exhibit 3I
Active Conservation Projections by Sector

Sector	Acre-feet per Fiscal Year				
	2014/2015	2019/2020	2024/2025	2029/2030	2034/2035
Single-Family Residential	3,416	5,882	8,349	10,815	12,249
Multi-Family Residential	871	1,504	2,137	2,770	3,150
Commercial/Government	7,969	16,000	24,030	32,061	39,629
Industrial	1,924	3,847	5,824	7,774	9,339
Total Active Conservation Projections	14,180	27,260	40,340	53,420	64,368

20x2020 requirements, LADWP has taken numerous steps to project future water conservation savings by major customer classification for indoor and outdoor use.

Indoor and outdoor active conservation through 2035 has been estimated by major billing sectors as provided in Exhibit 3I. Values presented are cumulative year to year. The bulk of conservation is expected to occur in the indoor portion of the commercial/government sector followed by the industrial sector. Past conservation programs have heavily focused on residential conservation reflecting the smaller residential conservation projections. Residential conservation initially provided the greatest volume saved for the cost. Water use in the CII sector is varied and relatively more expensive to achieve than in the residential sector.

To determine potential conservation savings for indoor water use in the CII sector, LADWP conducted a high-level study to first estimate CII water use for each subsector (e.g. hospitals, refineries, schools, business parks, restaurants, etc.) and indoor end-use (e.g., toilets, showers, kitchen, laundry, food processing, cooling/heating, etc.), and second determine the potential for indoor water savings for each subsector and end-use. This study involved a sample of water use for approximately 150 of LADWP's largest CII customers to estimate total sector water use, along with employment data from Dunn & Bradstreet. Additional data sources listed below were used to determine indoor end-use estimates for each subsector, as well as the potential for water savings.

- *BMP 9: A Handbook for Implementing Commercial Industrial & Institutional Conservation Programs. (2001). California Urban Water Conservation Council.*
- *Commercial and Institutional End Uses of Water. (2000). American Water Works Association Research Foundation.*
- *Waste Not, Want Not: The Potential for Urban Water Conservation in California. (2003). Pacific Institute.*
- *Water Efficiency in the Commercial and Institutional Sector: Considerations for a WaterSense Program. (2009). U.S. Environmental Protection Agency.*
- *Watersmart Guidebook---A Water-Use Efficiency Plan-Review Guide for New Businesses. (2008). East Bay Municipal Utility District.*
- *Santa Clara Valley Water District Commercial Institutional Industrial Water Use & Conservation Baseline Study. (2008). CDM.*
- *Water and Energy Efficiency Program for Commercial, Industrial, and Institutional Customer Classes in Southern California. (2009). U.S. Bureau of Reclamation.*
- *Water Use Efficiency Comprehensive Evaluation. (2006). CALFED Bay-Delta Program.*

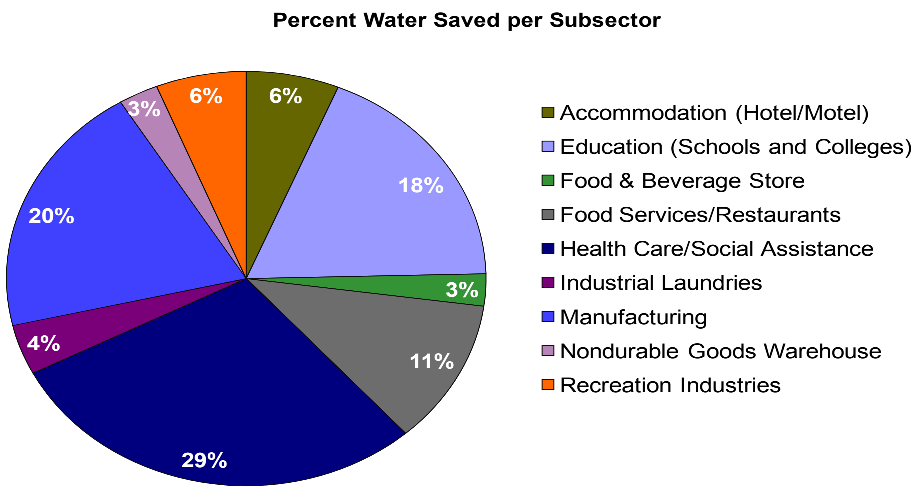
The study concluded that by targeting just the top 100 or so largest CII users, approximately 4,600 AFY of water could be saved (representing about 3 percent of total CII water use). The study also found that the subsectors that use the most water in the City are: health care (18%), education (14%), food services/drinking places (9%), accommodation (5%), fabricated metal product manufacturing (5%), textile mills (5%), amusement (4%), and food manufacturing (4%). The study also concluded that the potential for indoor water conservation was approximately 23,000 AFY or 15 percent of total CII water use. Exhibit 3J presents the breakdown of this potential indoor water conservation for subsectors and end-uses.

Outdoor water use as a percentage of total water use was approximated using three methodologies to determine the potential for outdoor water conservation savings. The methodologies and percent outdoor water use determined for each methodology are:

- Minimum-Maximum Methodology (outdoor water use is approximately 39.98 percent) – based on the premise that during wet months outdoor water use is minimal and during dry months outdoor water use is at its peak.

- Wastewater Treatment Plant Influent Methodology (outdoor water use is approximately 38.32 percent) – based on determining the average monthly influent flows to the City's four wastewater treatment plants during

Exhibit 3J
Breakdown of Estimated CII Indoor Water Conservation Potential of 23,000 AF



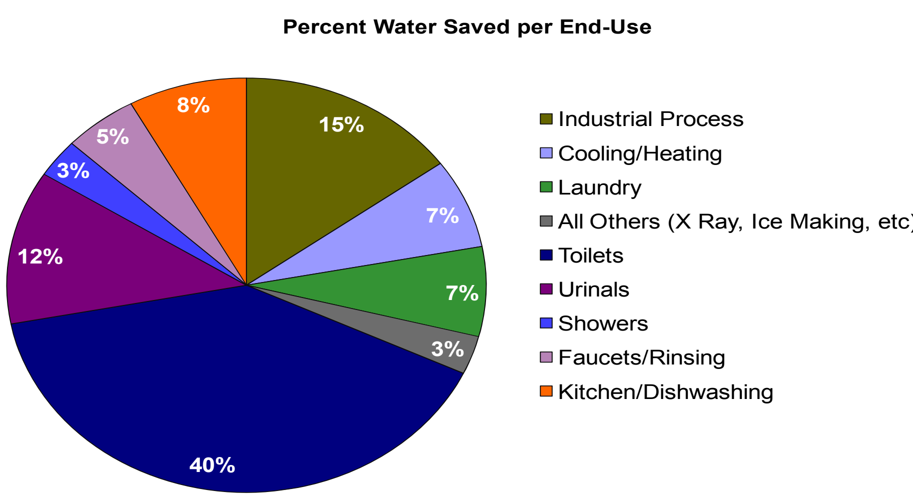


Exhibit 3K
Potential Outdoor Water Use Savings by Sector

Customer Sector	Scenario 1	Scenario 2	Scenario3
	(AFY)		
Single-Family Residential	13,246	42,464	100,901
Multi-family	5,956	19,095	45,371
Commercial	2,573	8,247	19,597
Total	**21,774**	**69,806**	**165,870**

the dry-weather months of June through September and adjusting for contract agency flows and dry-weather stormwater diversions.

- Infrared Analysis Methodology (outdoor water use is 39.67 percent) – based on an infrared analysis of the City to determine tree canopy and landscape coverages for use in estimating applicable water use requirements for greenscapes based on rainfall data, plant factors, evapotranspiration rates, and irrigation efficiencies.

The resultant range between the low and high outdoor water use percentage is approximately 1.35 percent. This narrow range resulting from the three methodologies confirms the methodologies are fairly accurate.

Greenscape areas related to commercial and residential land uses are the most likely areas to be targeted for outdoor water conservation. Rehabilitation of these areas to meet or exceed the evapotranspiration adjustment factor (ETAF) of 0.7 as required in the Model Water Efficient Landscape Ordinance would result in significant savings ranging from 21,774 to 165,870 AFY. Currently, these savings are not represented in the projected active conservation in Exhibit 3I. Exhibit 3K illustrates the potential savings under three scenarios by customer sectors. Scenario 1 represents an improvement in average irrigation efficiencies and/or installation of less water intensive vegetation to achieve and ETAF of 0.7. Scenario 2 represents an improvement in average irrigation efficiencies and/or replacement of high water use vegetation with less water intensive vegetation in the moderate to low water use range to achieve an ETAF of 0.49. Scenario 3 represents an improvement in average irrigation system efficiency and replacement of all vegetation with very low water use vegetation almost entirely dependent upon effective precipitation to achieve an ETAF of 0.07. This would require incentive programs, such as cash for grass programs. Other large greenscape area, including parks, cemeteries and golf courses, were not considered in the analysis as they would more than likely be preserved as turf or tree canopy areas to retain quality of life benefits. These areas are likely to be targets for recycled water use.

3.4 Cost & Funding

The cost range of conservation rebates, incentives, and hardware installation programs ranges from approximately $75/AF to $900/AF based on current LADWP conservation programs. More than $200 million has been invested in water conservation since 1991. Conservation is the cornerstone of LADWP's water demand management activities and ongoing investments will be made in viable programs, subject to funding availability and LADWP's ability to implement such programs. Outside sources of funding are sought to complement the City's resources. A stronger commitment is also being made to acquire outside grant funding for City conservation projects.

Currently, the funding sources for conservation are:

- Water Rates – Water conservation programs are primarily funded through water rates.

- MWD Conservation Credits Program - MWD offers both commercial and residential rebates to member agency customers that install specified conservation devices. The rebates equate to $195 per AF of water saved, or half the project cost whichever is less. In addition, MWD reimburses the LADWP for pre-approved projects when completed. In 2009 MWD reimbursed the Department $139,000 for a water broom distribution program. LADWP also expects to be reimbursed in 2011 through the MWD Member Agency Administered funding program for $968,000. The monies are reimbursement for 22.2 acres of turf reduction projects through the Department's Commercial/Industrial Drought Resistant Landscape Incentive Program.

- Outside Agency Co-Funding - Other agencies realizing benefits from conservation programs are solicited for co-funding of program costs.

- Grant Funding - LADWP has successfully received grant funding from the State under Proposition 13. A grant for $615,000 supplemented the rebate funding available for commercial ULF toilets and high efficiency clothes washers. LADWP expects to receive a final payment totaling $128,299 for the Commercial High Efficiency Clothes Washer and Ultra Low Flow Toilet Consolidated Water Use Efficiency grant. LADWP has already received $164,691 in support of 1,498 commercial high efficiency washer rebates. LADWP was awarded three grants in 2005 under Proposition 50, which are summarized below:

    - The Cooling Tower Conductivity Controller Replacement Program: Grant to improve the water efficiency of 100 cooling towers in the city of Los Angeles. Total grant amount up to $350,000. Expect completion in 2012.

    - The Los Angeles City Park Irrigation Efficiency Program: Grant to improve the irrigation efficiency at 15 City of Los Angeles municipal parks by installing Weather Based Irrigation Controllers and by upgrading irrigation piping and rotors. Total grant amount up to $362,000. Expect completion in 2011.

    - The Large Landscape "Smart Irrigation" Program: Grant to replace existing manually-adjusted irrigation controllers with "smart irrigation" Weather Based Irrigation Controllers at 75 large landscape customer sites. Total grant amount $131,000. Expect completion in 2011.

Chapter Four
Recycled Water

4.0 Overview

LADWP is committed to significant expansion of recycled water in the City's water supply portfolio. Recognizing the multiple factors that are decreasing the reliability of imported water supplies, LADWP released the City of Los Angeles Water Supply Action Plan (Plan), "Securing L.A.'s Water Supply" in May of 2008. The Plan established the goal of using 50,000 AFY of recycled water to offset demands on potable supplies. In order to meet this goal, LADWP, in conjunction with the Los Angeles Department of Public Works Bureau of Sanitation (BOS), are working together to develop a Recycled Water Master Plan (RWMP). Opportunities to expand the water recycling program are being studied through development of the RWMP. Opportunities include expanding the recycled water distribution system for Non-Potable Reuse (NPR) such as for irrigation and industrial use, and replenishment of groundwater basins with highly purified recycled water. Beyond 50,000 AFY, LADWP expects to increase recycled water use by approximately 1,500 AFY annually, bringing the total to 59,000 AFY by 2035.

LADWP's water recycling program is dependent on the City's wastewater treatment infrastructure. Wastewater in the City of Los Angeles is collected and transported through some 6,500 miles of major interceptors and mainline sewers, more than 11,000 miles of house sewer connections, 46 pumping plants, and four treatment plants. BOS is responsible for the planning and operation of the wastewater program. The City's wastewater system serves 515 square miles, 420 square miles of which are within the City. Service is also provided to 29 non-City agencies through contract services. Exhibit 4A shows the City's four wastewater treatment plants and seven sewersheds that feed those plants. A portion of the treated effluent from these four wastewater plants is utilized by LADWP to meet recycled water demands.

As early as 1960, the City recognized the potential for water recycling and invested in infrastructure that processed water to tertiary quality, a high treatment standard for wastewater. This resulted in the building of tertiary wastewater treatment plants upstream instead of enlarging the two existing terminus treatment plants. These system enhancements brought about the City's expanded recycled water projects, which now supplement local and imported water supplies. The original policy allowing the use of recycled water was adopted by the State Legislature in 1969.

In 1979, LADWP began delivering recycled water to the Department of Recreation and Parks for irrigation of areas in Griffith Park. This service was later expanded to include Griffith Park's golf courses.

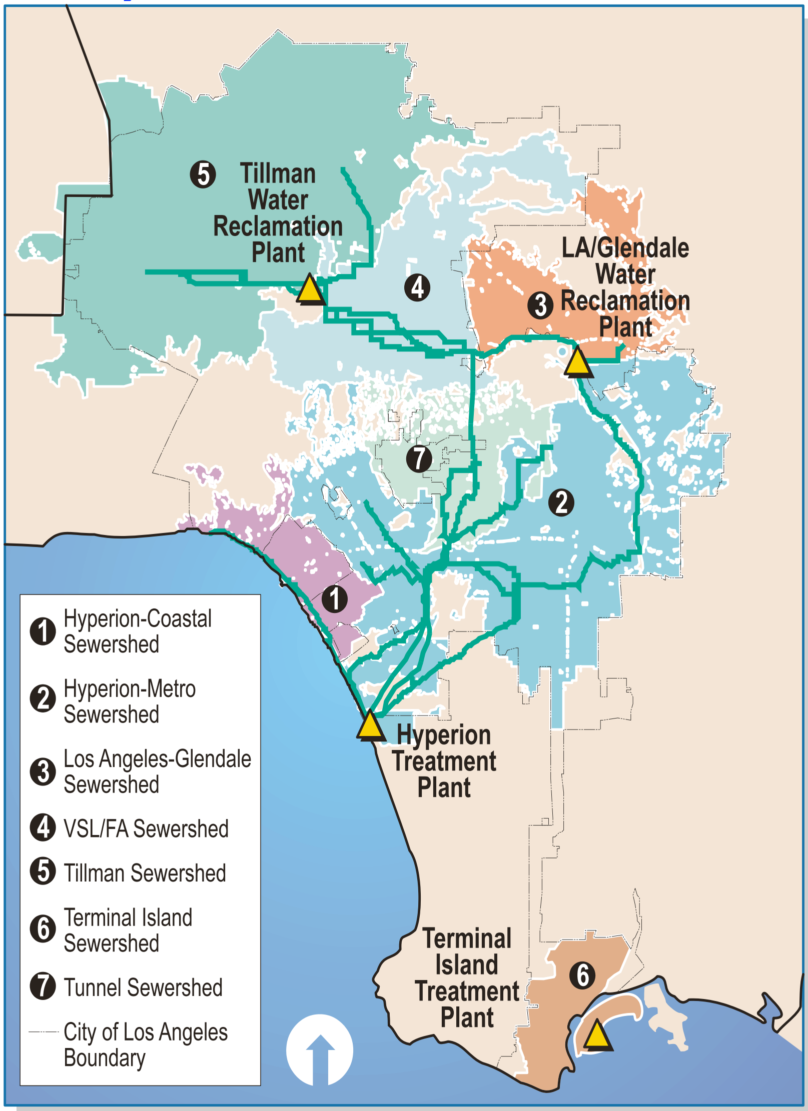


Exhibit 4A City Wastewater Treatment Plants and Sewersheds

In 1984, freeway landscaping adjacent to the park was also irrigated with recycled water. In addition, the Japanese Garden, Balboa Lake and Wildlife Lake in the Sepulveda Basin now utilize recycled water for environmentally beneficial reuse purposes. The Greenbelt Project, which carries recycled water from the Los Angeles-Glendale Water Reclamation Plant to Forest Lawn Memorial Park, Mount Sinai Memorial Park, Lakeside Golf Club of Hollywood and Universal Studios, began operating in 1992, and represents LADWP's first project to supply recycled water to non-governmental customers. LADWP continues to successfully implement the use of recycled water for various purposes. In 2009, phase 1 of the Playa Vista development began receiving recycled water. Playa Vista is the first planned development in the City that uses recycled water for all landscape needs. LADWP serves approximately 130 customers with recycled water for irrigation, industrial, and environmental beneficial uses. Future recycled water projects will continue to build on the success of these prior projects so that recycled water becomes a more prominent component of the City's water supply portfolio.

The City's water recycling projects seek to displace the use of potable water with recycled water for non-potable uses where infrastructure is available. In compliance with Chapters 7.0 and 7.5 of the California Water Code recycled water meets all of the following conditions:

- The source of recycled water is of adequate quality for these non-potable uses.
- The recycled water may be furnished for these uses at a reasonable cost to the user.
- The use of recycled water from the proposed source will not be detrimental to public health.
- The use of recycled water will not adversely affect downstream water rights or degrade water quality.

In addition, the California Water Code requires public agencies, such as the LADWP, to serve recycled water for non-potable uses if suitable recycled water is available.

LADWP is expanding irrigation and industrial/commercial uses of recycled water, and studying groundwater replenishment (GWR). Demand for recycled water is driven by customer acceptance of recycled water as a viable alternative to traditional potable supplies. Outreach efforts designed to educate the public on the viability of recycled water and its potential uses are an essential part of the process as the City's recycled water program expands.

4.1 Regulatory Requirements

Recycled water use is governed by regulations at the State and local levels. These regulations are based on multiple factors including the type of use and water quality. LADWP currently provides recycled water for non-potable reuse and is pursuing indirect potable reuse through GWR using advanced treated recycled water. Requirements for these two categories of recycled water use are different. This section provides a summary of the complex recycled water regulations. A more in-depth description of these regulations will be included as part of the RWMP.

4.1.1 Non-Potable Reuse Regulations

Non-potable water reuse regulations in the City of Los Angeles are governed by the California Department of Public Health (CDPH), State Water Resources Control Board (SWRCB), Los Angeles Regional Water Quality Control Board (LARWQCB) and the Los Angeles County Department of Public Health (LACDPH).

California Department of Public Health

Criteria and guidelines for the production and use of recycled water were established by the CDPH in the California Code of Regulations, Title 22, Division 4, and Chapter 3 (Title 22). Title 22, also known as Water Recycling Criteria, establishes required wastewater treatment levels and recycled water quality levels dependent upon the end use of the recycled water. Title 22 additionally establishes recycled water reliability criteria to protect public health.

Title 22 specifies recycled water use restrictions based on the potential degree of public exposure to the water and the distance of drinking water wells and edible crops from the area of intended use. Recycled water use applicability also depends on the different levels of treatment. A higher quality water will have a wider variety of applicable uses than a lower quality water. At a minimum, secondary treatment of wastewater is required for recycled water use. In the City of LA, however, all recycled water used is treated, at a minimum, to tertiary levels with additional disinfection. Wastewater treatment levels are discussed in detail in subsection 4.2 of this chapter. Title 22 allows for other treatment methods, subject to CDPH approval. The reliability of the treatment process and the quality of the product water must meet the Title 22 requirements specified for each allowable treatment level. Exhibit 4B provides a summary of the currently approved recycled water uses.

Areas where recycled water is used occur within defined boundaries. Title 22 stipulates use area requirements to protect public health. Use area regulations include requirements addressing recycled water application methods and runoff near domestic water supply wells, drinking fountains, and residential areas. Other requirements include posting signs notifying the public where recycled water is being used, utilization of quick couplers instead of hose bibs, and the prohibition against connecting recycled water systems with potable water systems. Dual-plumbed recycled water systems in buildings are also addressed. These systems must meet additional reporting and testing requirements.

To protect public health, Title 22 requires reliability mechanisms. During the design phase, a Title 22 Engineering Report is required to be submitted to CDPH and the local Regional Water Quality Control Board (RWQCB) for approval. Contents of the report include a description of the system and an explanation regarding how the system will comply with Title 22 requirements. Redundancy in treatment

Exhibit 4B Allowable Title 22 Recycled Water Uses

Irrigation Uses
Food crops where recycled water contacts the edible portion of the crop, including all root crops
Parks and playgrounds
School yards
Residential landscaping
Unrestricted access golf courses
Any other irrigation uses not prohibited by other provisions of the California Code of Regulations
Food crops, surface irrigated, above ground edible portion, and not contacted by recycled water
Cemeteries
Freeway landscaping
Restricted access golf course
Ornamental nursery stock and sod farms with unrestricted public access
Pasture for milk animals for human consumption
Non edible vegetation with access control to prevent use as park, playground or school yard
Orchards with no contact between edible portion and recycled water
Vineyards with no contact between edible portion and recycled water
Non food bearing trees, including Christmas trees not irrigated less than 14 days before harvest
Fodder and fiber crops and pasture for animals not producing milk for human consumption
Seed crops not eaten by humans
Food crops undergoing commercial pathogen destroying processing before consumption by humans
Supply for impoundment
Non restricted recreational impoundments, with supplemental monitoring for pathogenic organisms
Restricted recreational impoundments and publicly accessible fish hatcheries
Supply for Impoundment Uses
Non restricted recreational impoundments, with supplemental monitoring for pathogenic organisms
Restricted recreational impoundments and publicly accessible fish hatcheries
Landscape impoundments without decorative fountains
Supply for cooling or air conditioning
Industrial or commercial cooling or air conditioning involving cooling tower, evaporative condenser, or
spraying that creates a mist
Industrial or commercial cooling or air conditioning not involving cooling tower, evaporative
condenser, or spraying that creates a mist
Other Uses
Dual plumbing systems (flushing toilets and urinals)
Priming drain traps
Industrial process water that may contact workers
Structural fire fighting
Decorative fountains
Commercial laundries
Consolidation of backfill material around potable water pipelines
Artificial snow making for commercial outdoor uses
Commercial car washes, not heating the water, excluding the general public from washing process
Industrial process water that will not come into contact with workers
Industrial boiler feed
Nonstructural fire fighting
Backfill consolidation around non potable piping
Soil compaction
Mixing concrete
Dust control on road and streets
Cleaning roads, sidewalks and outdoor work areas
Flushing sanitary sewer
Groundwater replenishment

units or other means to treat, store, or dispose of recycled water are required in case the treatment unit is not operating within specified parameters. Alarms for operators are required to indicate treatment plant process failures or power failures. In case of power failures, either back-up power, automatically activated short-term or long-term recycled water storage, or a means of disposal is required. Furthermore, system performance must be monitored by water quality sampling and analyses.

As mentioned previously, cross-connections between the potable and recycled water systems are not permitted. The California Code of Regulations, Title 17, Division 1, Chapter 5, Group 4 prevents cross-connections between potable water supply systems and recycled water supply systems. Title 17 specifies that water suppliers must implement cross-connection control programs and backflow prevention systems.

In addition to Title 22 and Title 17 requirements, CDPH has additional regulations and guidance established in the following documents:

- Guidelines for the Preparation of an Engineering Report for the Production, Distribution, and Use of Recycled Water (2001)
- Guidance Memo No. 2003-02: Guidance for the Separation of Water Mains and Non-Potable Pipelines (2003)
- Treatment Technology Report for Recycled Water (2007)

State Water Resources Control Board and Los Angeles Regional Water Quality Control Board

In May 2009, the SWRCB adopted "Recycled Water Policy" developing uniform standards across all Regional Water Quality Control Boards for interpreting the "Anti-Degradation Policy". When planning and implementing recycled water projects the following must be taken into consideration:

- Mandate for recycled water use – encourages recycled water use and establishes targets to increase use.
- Salt/nutrient management plans –

requires submittal of salt/nutrient management plans by 2014.

- Landscape irrigation projects' control of incidental runoff and streamlined permitting – addresses controlling incidental runoff and streamlining permit processes for recycled water use in landscape areas.

- Groundwater replenishment – establishes requirements for groundwater replenishment projects.

- Anti-degradation – establishes that salt and nutrient management plans can address groundwater quality impacts.

- Chemicals of emerging concern – establishes a blue-ribbon advisory panel to develop a report on chemicals of emerging concern and update the report every five years.

Water recycling requirements for each of the City's applicable wastewater treatment plants engaged in water recycling are issued by the LARWQCB. These requirements specify end-users of recycled water and enforce treatment and use area requirements.

In July 2009, the SWRCB adopted a general landscape irrigation permit, "General Waste Discharge Requirements for Landscape Irrigation Uses of Municipal Recycled Water" (General Permit). The General Permit streamlines the regulatory approval for landscape irrigation using recycled water. Agencies with existing water recycling requirements, such as the City, are not required to apply for the General Landscape Irrigation Permit.

Earlier in April 2009, the LARWQCB adopted a general region-wide permit, "General Waste Discharge and Water Recycling Requirements for Non-Irrigation Uses over the Groundwater Basins Underlying the Coastal Watersheds of Los Angeles and Ventura Counties" for non-irrigation uses of recycled water. Similar to the General Permit, this permit streamlines the permitting process and specifies the application process for qualifying projects.

Los Angeles County Department of Public Health

Title 22 and Title 17 water use regulations are enforced by the LACDPH, Environmental Health Division. LACDPH has published "A Guide to Safe Recycled Water Use, Pipeline Construction and Installation" requiring compliance with Title 22, CDPH, and LARWQCB requirements. After CDPH has approved the plans and specifications and the City has an agreement to serve the customer, LACDPH reviews and approves all plans and specifications prior to construction. After construction LACDPH inspects the systems and conducts cross-connection, pressure, and back-flow prevention device tests. Recycled water use must occur in compliance with the Los Angeles County Recycled Water Advisory Committee's "Recycled Water Urban Irrigation User's Manual". Each site must also have a site supervisor responsible for recycled water use.

City of Los Angeles

Recycled water responsibilities of the City of Los Angeles include complying with all LARWQCB permits for the wastewater treatment plants and production of recycled water, approving recycled water use sites, conducting post-construction inspections, and periodically inspecting use areas and site supervisor records.

LADWP customers are permitted to use recycled water when service is available per LADWP Ordinance No. 170435 (subsequently amended by Ordinance No. 178902 in 2008). Users are responsible for the operation and maintenance of their recycled water systems up to the connection point with LADWP. Users are required to use recycled water in accordance with Titles 22 and 17 and the "Recycled Water Urban Irrigation User's Manual."

4.1.2 Groundwater Replenishment Regulatory Requirements

The regulations governing recharge of groundwater or groundwater replenishment (GWR) with recycled water are established by the CDPH and LARWQCB. The City's GWR project as described in section 4.4.3 will be subject to these regulations.

For GWR, LADWP will implement advanced treatment that includes reverse osmosis, microfiltration, and advanced oxidation. This level of treatment addresses water quality concerns for the health of the basin along with emerging contaminants of concern.

California Department of Public Health

Regulatory oversight of GWR projects is provided by the CDPH. CDPH regulates GWR projects under Title 22, making recommendations on a case-by-case basis after a public hearing. Requirements for replenishment are not provided in Title 22. Draft GWR Reuse Criteria, released in August 2008, are used by the CDPH to evaluate projects for approval or denial. The draft regulations are designed to protect public health by:

- Requiring recycled water to meet maximum contaminant levels (MCLs) established for drinking water.
- Establishing the volume of recycled water used based on Total Organic Carbon (TOC), dilution, and treatment levels.
- Requiring recycled water to be retained in a groundwater basin for six months before reaching a well used for drinking water with validation by a tracer study.
- Requiring quarterly monitoring for specified pollutants and chemicals and yearly monitoring of constituents indicating the presence of wastewater in produced recycled water and in downgradient monitoring wells.
- Implementing a source control program.
- Establishing additional requirements for projects with recycled water contributions greater than 50 percent, including a review by an Independent Advisory Panel.

As also required for non-potable reuse, project proponents must submit a Title 22 Engineering Report to the CDPH and LARWQCB for review. After completion of the report, the CDPH holds a public hearing followed by issuance of Findings of Fact and Conditions for submission to the LARWQCB.

Los Angeles Regional Water Quality Control Board

Prior to the issuance of a permit, the LARWQCB reviews CDPH's Findings of Fact and Conditions and considers provisions in the adopted Los Angeles Basin Plan (Basin Plan) for the LARWQCB region, applicable State policies (including the SWRCB Recycled Water Policy), and applicable federal regulations if recycled water is discharged to "Waters of the U.S." The Basin Plan establishes water quality objectives for surface water and groundwater to protect beneficial uses. The LARWQCB then holds a public hearing to consider the permit. Ultimately, if approved, permits are issued by the LARWQCB in the form of water reclamation requirements and waste discharge requirements.

4.2 Wastewater Treatment Plants

There are four wastewater treatment plants owned and operated by the BOS. City wastewater treatment consists of a series of processes that, at a minimum, remove solids to a level sufficient to meet regulatory water quality standards. During the preliminary, primary, secondary, and tertiary treatment processes, progressively finer solid particles are removed. Preliminary treatment removes grit and large particles through grit removal basins and screening. Primary treatment relies on sedimentation to remove smaller solids. With most of the grit, large particles, and solids already removed, secondary treatment converts organic matter into harmless by-products and removes more solids through biological treatment and further sedimentation. At the end of secondary treatment, most solids will have been removed from the water. Tertiary treatment follows secondary treatment to eliminate the remaining impurities through filtration and chemical disinfection. At this stage, sodium hypochlorite (the chemical contained in household bleach) provides disinfection. All recycled water used within the City undergoes, at a minimum, tertiary treatment and disinfection. In the Harbor Area, recycled water also undergoes advanced treatment with microfiltration/ reverse osmosis (MF/RO) and is injected into the Dominguez Gap Barrier to protect against seawater intrusion. MF/RO is a two-stage process using high-pressure membrane filters to remove microscopic impurities from the source water. Exhibit 4C summarizes the treatment levels, capacity, and average flows at the four plants.

Exhibit 4C Wastewater Treatment Plants Summary

WastewaterTreatment Plants	Treatment Level	Capacity (mgd)	Average Flows (mgd)[1]
Donald C. Tillman Water Reclamation Plant (DCT)	Tertiary to Title 22 standards with Nitrification/Denitrification	80	32
Los Angeles - Glendale Water Reclamation Plant (LAG)	Tertiary to Title 22 standards with Nitrification/Denitrification	20	17
Terminal Island Water Reclamation Plant (TIWRP)	Tertiary; Advanced treatment (MF/RO) of 5 mgd	30	16
Hyperion Treatment Plant (HTP)	Full secondary[2]	450	299

1. Average FY 2009/10.flows. Approximately 13 mgd is currently diverted from DCT to HTP.

2. 34 mgd of full secondary treated water delivered to West Basin Water Reclamation Plant operated by West Basin Municipal Water District. Water treated to Title 22 standards for recycled water use.

Source: City of Los Angeles, Bureau of Sanitation, Draft Recycled Water Use FY 2009/10.

4.2.1 Donald C. Tillman Water Reclamation Plant

In service since 1985, the Donald C. Tillman Water Reclamation Plant (DCT) has an average dry-weather flow capacity of 80 million gallons per day (mgd) and currently treats about 32 mgd. During wet weather, treatment is limited to 40 mgd to prevent downstream infiltration surcharges on the sewer system while utilizing the remaining capacity for limited wet weather storage. Currently, the Los Angeles Department of Public Works – Bureau of Engineering (BOE) is designing wet-weather storage basins to allow year round operation at 80 mgd. The current level of treatment is Title 22 (tertiary) with nitrogen removal (nitrification/denitrification (NdN)). DCT provides recycled water for the Japanese Garden, Wildlife Lake, Lake Balboa, treatment plant reuse, and irrigation and industrial uses. Irrigation uses in the adjacent areas include golf courses, parks, and a sports complex. Industrial uses include the Valley Generating Station. The remaining tertiary-treated water is discharged into the Los Angeles River. A GWR project is being planned that will purify DCT effluent, utilizing advanced treatment to recharge the San Fernando Groundwater Basin. The project will initially recharge 15,000 AFY with the eventual goal of achieving 30,000 AFY.

4.2.2 Los Angeles-Glendale Water Reclamation Plant

The Los Angeles-Glendale Water Reclamation Plant (LAG) is a joint project of the City of Los Angeles and City of Glendale. LAG began treating wastewater in 1976. Its average dry-weather flow design capacity is 20 mgd and it currently treats about 17 mgd. Each city is entitled to 50 percent of the plant's capacity. The City of Pasadena purchased rights to 60 percent of Glendale's capacity but has not yet exercised these rights. The current level of treatment is Title 22 (tertiary) with nitrogen removal (NdN). Recycled water from the LAG provides landscape irrigation to Griffith Park and the Los Angeles Greenbelt Project, including Forest Lawn Memorial Park, Mount Sinai Memorial Park, Universal Studios, and the Lakeside Golf Course. The City of Glendale retains the right to half of the recycled water produced at the plant and serves a number of customers in their service area. As with the DCT, the remaining tertiary-treated water from LAG is discharged into the Los Angeles River.

4.2.3 Terminal Island Water Reclamation Plant

Originally built in 1935, the Terminal Island Water Reclamation Plant (TIWRP) has been providing secondary treatment since the 1970s. Tertiary treatment systems were added in 1996. TIWRP has a current average dry-weather flow capacity of 30 mgd and treats about 16 mgd. The recently completed Advanced Wastewater Treatment Facility adds MF/RO treatment to a portion of the wastewater effluent to produce approximately 3.0 mgd of recycled water. Recycled water is supplied to the Dominguez Gap Seawater Intrusion Barrier to reduce seawater intrusion into drinking water aquifers, and to LADWP's Harbor Generating Station for landscape irrigation. The remaining TIWRP effluent is discharged to the Los Angeles Harbor. Future recycled water production is expected to increase to more fully supply the Dominguez Gap Seawater Intrusion Barrier along with other potential customers in the Harbor Area.

4.2.4 Hyperion Treatment Plant

Operating since 1894, the Hyperion Treatment Plant (HTP) is the oldest and largest of the City's wastewater treatment plants. Its $1.2 billion construction upgrade, completed in 1999, allows for full secondary treatment. The current average dry-weather flow capacity of HTP is 450 mgd, with an average wastewater flow of 299 mgd. A majority of the treated water is discharged through a 5-mile outfall into the Santa Monica Bay, and the rest, approximately 31 mgd, is delivered to the West Basin Water Reclamation Plant to meet recycled demands in the West Basin Municipal Water District (WBMWD) service area and parts of the City of Los Angeles. As of 2008, approximately 37,000 AFY of water from HTP Plant is sold to WBMWD for additional treatment. A portion of this water is bought back by LADWP to serve to customers in West Los Angeles, and the rest is then used to meet recycled water demands in WBMWD's service area. Customers in West Los Angeles include Loyola Marymount University and Playa Vista.

4.2.5 Projected Wastewater Volume

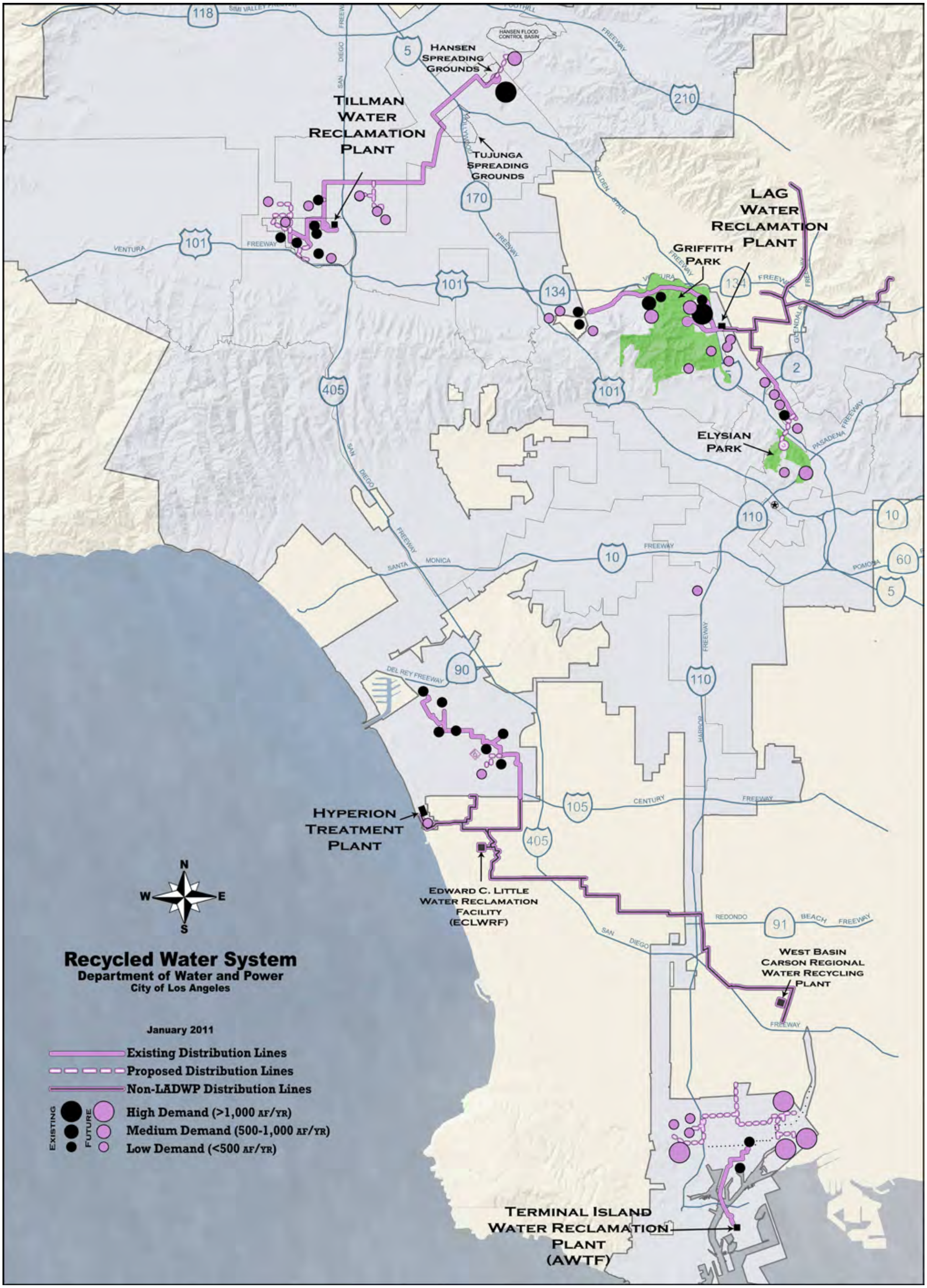
Average dry-weather wastewater influent projections for the City's wastewater treatment plants are expected to increase by approximately 20 percent over the next 25 years. Projections include flows from 29 agencies outside of the City with contracts for wastewater treatment. Wastewater effluent that is not recycled is discharged to either the Pacific Ocean via the Los Angeles River, or to outfalls leading directly to the Pacific Ocean. Wastewater treatment projections of average dry-weather flows through 2035, and associated disposal methods, are provided in Exhibit 4D.

Exhibit 4D Wastewater Treatment Plant Average Dry-Weather Flows, Reuse and Discharge Method

Wastewater Treatment Plants	Reuse and Discharge Method	Average Dry-Weather Flow Projections (AFY)					
		Actual 2010	2015	2020	2025	2030	2035
Donald C. Tillman Water Reclamation Plant	Recycling and Pacific Ocean via Los Angeles River	36,000	84,000	86,000	88,000	90,000	93,000
Los Angeles - Glendale Water Reclamation Plant	Recycling and Ocean via Los Angeles River	19,000	25,000	27,000	29,000	32,000	34,000
Terminal Island Water Reclamation Plant	Recycling and Outfall to Ocean	18,000	19,000	19,000	19,000	20,000	20,000
Hyperion Treatment Plant	Conveyance to WBMWD for Recycling and Ocean outfall	335,000	340,000	346,000	352,000	366,000	381,000
Total		408,000	468,000	478,000	488,000	508,000	528,000

Source: City of Los Angeles, Bureau of Sanitation, Draft Recycled Water Use FY 2009/10. 2015 – 2035 projections from Sanitation's "Project Flow Summary_consultants" file. Data is generated from "Mike Urban" sewer flow projection model, and represents sewershed flows.

Exhibit 4E
Recycled Water System



4.3 Existing Recycled Water Deliveries

The City has several recycled water projects currently providing recycled water for landscape irrigation, industrial, and commercial uses spread throughout four service areas:

- Harbor – located in the southern portion of the City and currently served by TIWRP.
- Central City (Metro) – located in the central/eastern portion of the City and served by LAG.
- San Fernando Valley – located in the northern portion of the City and served by DCT.
- Westside – located in the central/western portion of the City and served by HTP through the WBMWD Edward C. Little Water Recycling Facility (ECLWRF).

Locations of the service areas are depicted in Exhibit 4E. Recycled water service areas coincide with potable water service areas. Recycled water deliveries for 2009 were 38,000 AFY, inclusive of municipal and industrial, environmental, and in-plant reuse. Estimated annual average demands for online projects were 39,000 AFY.

4.3.1 Harbor Area

Recycled water in the Los Angeles Harbor Area is currently produced at the Advanced Water Treatment Facility (AWTF) located at the TIWRP. The AWTF began operating in 2002 with first deliveries to the Dominguez Gap Seawater Barrier in 2006. This project was developed jointly by LADWP, the Bureau of Sanitation (BOS), and BOE. Operation and maintenance is provided by BOS with funding from LADWP. Recycled water, treated using microfiltration and reverse osmosis, is currently used for landscape irrigation and groundwater injection with current demands of approximately 3,050 AFY. Treatment capacity of the AWTP is approximately 5,600 AFY. Excess recycled water is

Exhibit 4F Harbor Recycling

Program	Existing Annual Demand (AFY)
Irrigation	
Harbor Generating Station	50
Seawater Barrier	
Dominguez Gap Barrier (Water Replenishment District)	3,000
Total Harbor Water Recycling Project	**3,050**

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Tier 1 Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff

discharged into the Los Angeles Harbor. Exhibit 4F summarizes typical annual demands in the Harbor Area. Currently two customers are served: LADWP's Harbor Generating Station and the Water Replenishment District (WRD).

Water Replenishment District

The WRD's recycled water demands are approximately 3,000 AFY for groundwater injection for the Dominguez Gap Seawater Intrusion Barrier. 50 percent recycled water and 50 percent imported water is injected into the barrier to protect the West Coast Groundwater Basin from seawater intrusion.

LADWP is currently expanding recycled water infrastructure in the Harbor Area to serve large industrial and additional irrigation customers. This will increase recycled water usage by at least 9,300 AFY by FY 2014/15.

4.3.2 Metro Area

The Metro Recycled Water System has supplied the Metro Service Area with recycled water produced at LAG to irrigation customers since 1979. LAG provides recycled water treated to a tertiary level meeting Title 22 standards with nitrogen removal. As previously stated, recycled water produced at LAG is equally split between the cities of Los Angeles and Glendale. Current recycled water demands for the Metro Service Area are 1,930 AFY. Unused recycled water is discharged to the Los Angeles River. Exhibit 4G summarizes current demands for Metro Recycled Water System. Currently, eleven customers are served by the Metro Recycled Water System.

Griffith Park Project

Started in 1979, the Griffith Park project was the City's first recycled water project. Recycled water is used to irrigate two golf courses, parkland, and the Los Angeles Zoo parking lot. Current demands in the Griffith Park Project's service area are 1,120 AFY.

Greenbelt Project

Dedicated in 1992, the Los Angeles Greenbelt Project was the City's first commercial recycling project. Recycled water is used for landscape irrigation at Forest Lawn Memorial Park-Hollywood Hills, Mount Sinai Memorial Park, Lakeside Golf Course and Universal Studios. Current demands in the Greenbelt Project's service area are 720 AFY.

Taylor Yard Project

Rio de Los Angeles State Park was connected as the first Taylor Yard project in July 2009. Recycled water is used for landscape irrigation on the park. Current demands in the Taylor Yard Project's service area are 90 AFY.

Exhibit 4G Metro Recycling

Program	Existing Annual Demand (AFY)
Irrigation	
Greenbelt Project	1120
Griffith Park	720
Taylor Yard Project	90
Total Irrigation	**1,930**

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Tier 1 Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff

Exhibit 4H Valley Recycling

Program	Existing Annual Demand (AFY)
Irrigation	
Sepulveda Basin Project	1570
Van Nuys Area Project	14
Subtotal Irrigation	1,584
Industrial	
Hansen Area Project	
Valley Generating Station	2,100
DCT Reuse[1]	2,920
Subtotal Industrial	5,020
Environmental Use[2]	
Japanese Garden	4,590
Wildlife Lake	7,700
Balboa Lake	14,700
Subtotal Environmental Use	26,990
Total Valley Recycled Water System	**33,594**

1. Based on 2006-2008 actual use.
2. Does not include environmental benefits provided to Los Angeles River.
Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Tier 1 Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff

4.3.3 San Fernando Valley Area

The Valley Recycled Water System receives water from DCT to satisfy irrigation, environmental, and industrial demands. Recycled water is treated to a tertiary level meeting Title 22 standards with nitrogen removal. Current estimated recycled water demands for the San Fernando Valley Area are 33,594 AFY. Recycled water produced in excess of demand is discharged to the Los Angeles River providing added environmental benefits. Exhibit 4H summarizes current demands for the Valley Recycled Water System. The East Valley trunkline, a 54-inch-diameter pipeline, was previously constructed as the initial backbone of the Valley Recycled Water System's distribution system to deliver water throughout the San Fernando Valley for irrigation, commercial, and industrial use. Eleven customers are currently served by the Valley Recycled Water System, excluding DCT reuse and environmental use.

Sepulveda Basin Project

LADWP began serving recycled water to portions of the Sepulveda Basin area in 2007. The latest project was added in 2010. Current recycled water customers in the Sepulveda Basin recreation area include Woodley Golf Course, Balboa Golf Course, Encino Golf Course, Anthony C. Beilenson Park, Van Nuys Golf Course and the Balboa Sports Complex. Current demands in the recreation area are 1,570 AFY.

Van Nuys Area Project

The Van Nuys Area project currently provides recycled water for irrigation purposes to St. Elisabeth's Church, the First Foursquare Church of Van Nuys, Van Nuys High School, and LADWP's Power Distribution Station 81. Current Van Nuys Area Project demands are 14 AFY.

Hansen Area Project

The Hansen Area project currently provides recycled water for industrial purposes to LADWP's Valley Generating

Station. Recycled water service began in 2008 and demands are approximately 2,100 AFY. Recycled water is used in a cooling tower for one of the generation units at the power generating facility.

Donald C. Tillman Water Reclamation Plant Reuse

Recycled water is used at DCT for in-plant purposes. Demands vary from year to year based on needs. Between 2006 and 2008 an average of 2,920 AFY was used.

Environmental Use

Recycled water from DCT has provided environmental benefits since 1984, commencing with deliveries to the Japanese Garden and followed by deliveries to Balboa Lake in 1990 and Wildlife Lake in 1991. Approximate demands are 26,990 AFY. Overflows from these facilities are discharged to the Los Angeles River to provide additional environmental benefits in conjunction with unused recycled water discharges to the river.

Japanese Garden

The 6.5-acre Japanese Garden is located at the Sepulveda Dam Recreation Area. The Garden receives more than 10,000 visitors per year. DCT provides about 4,590 AFY of recycled water for the lake and landscaping at the Japanese Garden.

Wildlife Lake

Located in the Sepulveda Basin, the Wildlife Lake uses about 7,700 AFY of recycled water from DCT for wildlife habitat management.

Lake Balboa

Lake Balboa is the centerpiece of the Sepulveda Dam Recreation Area and is a popular recreational facility located in Anthony C. Beilenson Park. About 14,700 AF per year of recycled water is provided for this lake from DCT.

4.3.4 Westside Area

Recycled water supplied to the Westside Recycled Water System is provided by WBMWD via the Edward C. Little Water Recycling Facility (ECLWRF), located in the City of El Segundo, for irrigation and commercial (toilet flushing) demands. The ECLWRF further treats up to 40 mgd of secondary-treated effluent received from HTP to a tertiary level meeting Title 22 standards. Under an agreement between WBMWD and the City, WBMWD purchases secondary-treated effluent from HTP, and LADWP has a right to purchase up to 25,000 AFY of recycled water from the ECLWRF. Approximately 37,300 AF of secondary-treated effluent was purchased from HTP in 2008, and LADWP purchased 380 AF of recycled water to serve West Los Angeles. Recycled water not purchased by LADWP is sold to users within WBMWD's service area.

Deliveries of recycled water from the Westside Recycled Water System first began in 1996. To increase the use of recycled water in West Los Angeles, LADWP has constructed

Exhibit 4I
Westside Recycled Water System Existing Annual Demand

Program	Existing Annual Demand (AFY)
Playa Vista Phase 1 (95 customers)	205
Coldwell Banker	2
Cal Trans at Playa Vista	5
Los Angeles International Airport	158
Westchester Golf Course	62
Loyola Marymount University	64
Westchester Park	43
Scattergood Generating Station	31
Carl Nelson Youth Park	16
The Parking Spot	1
Street Medians	4
Hyperion Treatment Plant[1]	85
Total Westside Recycled Water System	676

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Tier 1 Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff

more than five miles of distribution trunk lines to serve the Westchester, Los Angeles International Airport, and Playa Vista development areas. Current estimated recycled water demands in West Los Angeles are 676 AFY as shown in Exhibit 4I. Currently, 106 customers are served by the system.

Playa Vista

Playa Vista is the first planned development in the City to use recycled water for the irrigation of all of its landscaping and for residential outdoor use. This project began receiving recycled water in 2009. Recycled water is required for outdoor use under the development's mitigation requirements established during the environmental review process. Recycled water is additionally used for toilet flushing in commercial buildings. Annual demands are approximately 200 AFY.

Los Angeles International Airport

Los Angeles International Airport began using recycled water in 1996 for landscape irrigation purposes along its boundaries. Current demands for the airport are 158 AFY.

Loyola Marymount University

Loyola Marymount University has been connected to the Westside system since 1996. Recycled water is used for landscape irrigation on a portion of the campus. Average annual demands are approximately 65 AFY.

Westchester Golf Course

Westchester Golf Course began using recycled water in 2009 for irrigation. Current demands for the golf course are 62 AFY.

Westchester Park and Carl Nelsen Youth Park

Westchester and Carl Nielsen Youth Parks both use recycled water for landscape irrigation. Both parks were connected to the system in 1996. Westchester Park demands are approximately 43 AFY and Carl Nielsen Youth Park demands are 16 AFY.

Scattergood Generating Station

Scattergood Generating Station operated by LADWP and located in El Segundo receives recycled water to meet irrigation demands. Average annual demand is approximately 31 AFY. The pipeline servicing the facility is oversized to potentially provide cooling water in the future.

Street Medians and The Parking Spot

Street medians on Manchester Avenue and The Parking Spot were connected to the recycled water system in 2008 and 2003, respectively. Recycled water is served to both facilities to meet irrigation demands. The Parking Spot is a commercially operated parking facility near Los Angeles International Airport. Demands for The Parking Spot are approximately 1 AFY and demands for the street medians are approximately 5 AFY.

Hyperion Treatment Plant

HTP uses recycled water for both landscape irrigation and toilet flushing within the administration building. HTP was connected to the system in 1996. About 65 AF of recycled water are provided to HTP per year.

4.3.5 Comparison of 2010 Projections Versus Actual Use

LADWP has made progress in increasing recycled water use in the interim period between completion of the 2005 and 2010 UWMPs. Municipal and industrial recycled water use between 2005 and 2010 increased from 1,500 AFY to 6,703 AFY. The 2005 UWMP projected municipal and industrial recycled water

Exhibit 4J
2005 UWMP Recycled Water Projections for 2010 versus Actual Use

Program	2005 Projection for 2010 (AFY)	09/10 Actual Use (AFY)
Municipal & Industrial Purposes[1]	16,950	6,703
Environmental Use[2]	26,990	25,008
Total	**43,940**	**31,711**

1. These recycled water supplies offset the demand for imported water within LADWP's service area, but do not include DCT reuse of 2,920 AFY and deliveries to WBMWD of 34,000 AFY.

2. Typical environmental use is 26,990 AFY, but was not included in 2005 UWMP projection. Water is ultimately discharged into the Los Angeles River, providing additional environmental benefit. 2005 UWMP projections for 2010 are based on average demands.

Sources: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Tier 1 Recycled Water Systems TM, December 14, 2009; 2005 Urban Water Management Plan for the Los Angeles Department of Water Power, and LADWP Water Recycling Staff

use in 2010 would be approximately 16,950 AF, however actual use was lower than projected, as shown in Exhibit 4J. Environmental use of recycled water fluctuates slightly year to year based on lake levels, but is typically 26,990 AFY. For 2010 actual environmental use was 25,008 AF, or approximately 7 percent less than typical use. Overall total recycled water use in 2010 was approximately 27 percent less than projected.

Although LADWP did not meet the 2010 recycled water projection, program progress has been made, including the completion of multiple projects since 2005 as described in Section 4.3.1 through 4.3.4. Additional projects that are proposed for construction in the near future are described in Section 4.4, Recycled Water Master Planning Documents. Additionally, LADWP in conjunction with the BOS is currently developing the City's Recycled Water Master Plan (RWMP) to guide future optimization of this supply source with the goal of increasing municipal and industrial use of recycled water to 50,000 AFY.

4.4 Recycled Water Master Planning Documents

LADWP, in partnership with BOS, is developing the RWMP to identify projects to offset 50,000 AFY of potable water supplies with recycled water and to maximize recycled water use into the future. As previously discussed, in the City of Los Angeles' Water Supply Plan, "Securing LA's Water Supply", LADWP established a goal of 50,000 AFY of recycled water use to reduce the need for potable water and diversify LADWP's available water supply options. Exhibit 4K summarizes LADWP's timeline to achieve the goal of recycling 50,000 AFY

Exhibit 4K
Recycled Water Master Planning Documents Implementation Timeline

Timeline	Reuse Volume[1] (AFY)	Description
Existing as of Fiscal Year 2009/2010	6,700	Existing demands already being served
Recycled Water Use by 2015	20,000	Near-Term projects already identified for implementation by 2015
Groundwater Replenishment by 2021	15,000	New groundwater replenishment opportunities as identified as part of the Groundwater Master Plan task
Non-Potable Reuse Recycled Water by 2029	Up to 15,000	New projects identified between 2015 and FY 2029 to serve existing potable customers as part of the non-potable reuse master plan

1. Volume to offset municipal and industrial potable water demands. Does not include environmental use, in-plant reuse, and sales to WBMWD.

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Tier 1 Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff.

by fiscal year (FY) 2029. This goal can be achieved sooner if additional funds are made available, such as State and Federal grants. The RWMP efforts were initiated in 2009 and are forecast for completion by the middle of 2011. To meet Near-Term challenges and plan for long-term recycled water the following major tasks were outlined for inclusion in the RWMP:

- Groundwater Replenishment Report
- Non-Potable Reuse Report
- Groundwater Replenishment Treatment Pilot Study
- Max Reuse Concept Report
- Satellite Feasibility Concept Report
- Existing System Reliability Concept Report

Within these tasks the RWMP will recommend where the recycled water system can be effectively expanded. A cost benefit analysis will be conducted to identify projects and potential customers based on location and projected use. A review of the wastewater treatment plants will be performed to determine how much recycled water can be supplied. The RWMP will also review available options for maximizing reuse through a combination of alternatives including expansion of non-potable irrigation/industrial uses, and groundwater replenishment (indirect potable reuse), with advanced treated recycled water.

The RWMP will include Near-Term recycled water projects (projects to be implemented through 2015 to achieve 20,000 AFY of recycled water use), expansion of the non-potable distribution system beyond 20,000 AFY, and groundwater replenishment with advanced treated recycled water. When combined with existing reuse, these options are expected to result in 50,000 AFY of reuse by FY 2029, exclusive of environmental reuse, in-plant reuse, and sales to WBMWD. Exhibit 4K provides a timeline for projects featured in the RWMP.

Recycled water projections in five year increments beginning in 2015 through 2035 are presented in Exhibit 4L. Total recycled water use is estimated to increase by approximately 39,000 AFY or 78 percent over the projection period. Environmental reuse and seawater intrusion barrier requirements are expected to remain constant at 26,990 AFY and 3,000 AFY, respectively. Municipal and industrial use, inclusive of in-plant reuse,

Exhibit 4L
Recycled Water Use Projections

Category	Projected Use (AFY)[1]				
	2015	2020	2025	2030	2035
Municipal and Industrial	20,000	20,400	27,000	29,000	29,000
Indirect Potable Reuse (Groundwater Replenishment)	0	0	15,000	22,500	30,000
Subtotal[2]	**20,000**	**20,400**	**42,000**	**51,500**	**59,000**
Environmental[3]	26,990	26,990	26,990	26,990	26,990
Seawater Intrusion Barrier (Dominguez Gap Barrier)	3,000	3,000	3,000	3,000	3,000
Total	**49,990**	**50,390**	**71,990**	**81,490**	**88,990**

1. Projected use by category is subject to change per completion of Recycled Water Master Plan, but overall total will not change. Does not include deliveries of 34,000 AFY of secondary treated water to WBMWD for further treatment to recycled water standards.

2. To offset potable use and included in supply reliability tables in Chapter 11.

3. Environmental use includes Wildlife Lake, Balboa Lake, and the Japanese Garden. Additional environmental benefits associated with recycled water discharges to the Los Angeles River are not included.

is expected to increase to 29,000 AFY or by approximately 45 percent. Indirect potable reuse (groundwater replenishment (GWR) with advanced treated recycled water is forecast to provide 15,000 AFY of GWR beginning in 2021. Recycled water use up to 2025 is inclusive of the Near-Term options under development in the RWMP. Projections for 2030 and 2035 assume that long-term options being developed as part of the RWMP will increase recycled water use by approximately 1,500 AFY annually beyond FY 2029. Once the alternatives for the RWMP are finalized, the allocation of recycled water use by the municipal, industrial, and GWR categories may change to achieve the RWMP's recycled water goal of 50,000 AFY by FY 2028/29.

Estimates of projected use and implementation timelines in the tables above, as well as the annual demands and service dates for individual customers in the following sections, may be affected by varying usage patterns of potential customers, timelines to reach agreements, potential financial constraints, and changing regulatory requirements.

4.4.1 Near-Term Projects through 2015

"Near-Term" projects are classified in the RWMP as projects that will result in recycled water service between July 1, 2009 and 2015 to achieve approximately 20,000 AFY of recycled water use to displace potable water use. All Near-Term projects are either in the planning, design, or construction stage. Near-Term project target customers have already been identified as potential recycled water users with a total demand of 15,021 AFY. Implementation of Near-Term projects will result in the connection of approximately 40 additional recycled water customers adding to the existing 130 customers. Full implementation of Near-Term projects with existing projects will result in annual recycled water deliveries of approximately 20,000 AFY, exclusive of both environmental use and DCT in-plant use (26,990 and 2,920 AFY, respectively). Near-Term projects fall primarily in the commercial/industrial sector, followed by the irrigation sector.

Harbor Area

Two projects are planned to meet Near-Term demands in the Harbor Area: the Harbor Refineries Water Recycling Project and the Port of LA Harry Bridges Development, for an estimated total demand of 9,461 AFY. Uses include industrial, irrigation, and toilet flushing in commercial facilities. Most of the recycled water, approximately 9,520 AFY, will be used for industrial purposes, including cooling towers and boiler make-up water for large industrial customers. Exhibit 4M summarizes Near-Term demands for the Harbor Area.

Meeting demands in the Harbor Area will require construction of additional

Exhibit 4M
Harbor Area Near-Term Estimated Demands

Type	Estimated AnnualDemand (AFY)	Estimated Service Date
Harbor Irrigation	300	2014
Port of LA Irrigation/Commercial/Industrial	220	2015
Harbor Commercial/Industrial	9,000	2014-2015
Total Harbor Area Near-Term Demands	**9,520**	

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Near-Term Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff infrastructure. Approximately 12 miles of 8- to 30-inch diameter pipeline and a 1 million gallon storage tank are proposed. All infrastructure to serve the Port of LA Harry Bridges Development will be constructed by the Los Angeles Harbor Department.

Through an agreement with WBMWD, LADWP will be supplied nitrified Title 22 water from the WBMWD Juanita Millender-McDonald Water Treatment Plant to supply recycled water to the Harbor Area.

Metro Area

Nine water recycling projects and three customer connections are planned in the Metro Area to add annual demands of approximately 1,813 AFY. Almost all recycled water customers propose to use recycled water for irrigation. Commercial uses of recycled water include street sweeping, vehicle washing, train washing, and laundry. LAG will continue to meet all recycled water demands in the Metro Area. Exhibit 4N summarizes Near-Term demands for the Metro Area.

Exhibit 4N
Metro Area Near-Term Estimated Demands

Type	Estimated Annual Demand (AFY)	Estimated Service Date
Irrigation	1,713	2010-2015
Commercial/ Industrial	100	2011-2013
Total Metro Area Near-Term Demands	**1,813**	

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Near-Term Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff

Multiple facilities are required in the Metro Area to meet Near-Term demands. Approximately five pump stations ranging in size from 600 to 1,800 gallons per minute are planned for construction. Three water tanks with a combined capacity 4.75 million gallons, including the conversion of an abandoned potable water tank in Griffith Park into a non-potable water storage tank, are necessary to meet demands. Pipeline construction will consist of 10 additional miles of pipeline ranging from 8- to 30-inch diameters, including conversion of an existing 16-inch pipeline to a 30-inch pipeline beneath Forest Lawn Road.

Valley Area

In the Valley Area DCT will provide the potential Near-Term annual demands approximating 769 AFY. Almost all Near-Term use, except for 75 AFY, will be for irrigation purposes. These users are all located within close proximity to the existing recycled water system. Exhibit 4O summarizes the potential Near-Term demands for the Valley Area.

Exhibit 4O
Valley Area Near-Term Estimated Demands

Type	Estimated Annual Demand (AFY)	Estimated Service Date
Irrigation	769	2010-2013
Commercial/ Industrial	75	2010-2013
Total Valley Area Near-Term Demands	**844**	

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Near-Term Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling staff

Only minor facilities will be required to connect Near-Term users to the existing system. Approximately 2 miles of pipeline ranging from 16- to 20-inch in diameter are proposed. Additionally, one storage tank between 1 to 1.5 million gallons, and a pump station, will be required to meet demands.

Westside Area

LADWP will continue to acquire recycled water from WBMWD to serve Near-Term demands of approximately 350 AFY in the Westside Area. Near-Term demands

Exhibit 4P
Westside Area Near-Term Estimated Demands

Project	Estimated Annual Demand (AFY)	Estimated Service Date
Irrigation		
Playa Vista Phase 2	100	2015
Westchester High School	10	2012
Subtotal Irrigation	100	
Commercial/Industrial		
LAX Cooling Towers	240	2015
Subtotal Commercial/Industrial	240	
Total Westside Area Near-Term Demands	**350**	

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Existing and Near-Term Recycled Water Systems TM, December 14, 2009 and LADWP Water Recycling Staff

include increasing use within the Playa Vista development, at LAX, and by adding five new customers. Approximately two-thirds of the water will be for irrigation purposes and one-third for commercial/industrial uses in cooling towers located at LAX. Exhibit 4P summarizes Near-Term demands for the Westside Area.

Serving Near-Term demands will require limited expansion of the existing recycled water system in the area as additional users connect to the existing system. Connection of the cooling towers at LAX will require construction of an additional 0.7 miles of 12-inch diameter pipeline.

4.4.2 Non-Potable Reuse Projects to be completed between 2015 - 2029

Non-potable reuse projects to be completed between 2015 and 2029 are being identified through the development of the RWMP. These projects will make up the balance of recycled water demand up to the 15,650 AFY non-potable reuse goal, which will contribute to achieving the overall city goal of 50,000 AFY of recycled water displacing potable water uses.

As presented in Exhibit 4Q, the project options would have a total demand of approximately 23,100 AFY, which is larger than the goal of up to 15,650 AFY. Ultimately, an implementation plan will be developed for the recommended project options with a target of beginning operations for all projects included in the implementation plan by FY 2029.

Exhibit 4Q
Project Option Demands by Service Area

Service Area	Total Demand[1] (AFY)
Harbor	3,300
Metro	6,100
Valley	10,100
Westside	3,600
Total	**23,100**

1. Includes customers with non-potable demand estimates greater than 5 AFY.

Source: City of Los Angeles Recycled Water Master Plan Technical Memorandum, Draft Tier 2 Non-Potable Reuse Project Options, February 26, 2010

Project Selection

An initial step for evaluating these projects involves identification of potential potable water customers that can utilize recycled water. These customers need to have sufficient demand and a viable use for recycled water. Irrigation-only customers were focused on first as they are generally easier to convert to recycled water use than commercial or industrial users. As described below, during development of the project options, potential additional recycled water customers were identified based on their non-potable water demands and distance from recycled water sources.

Next, recycled water project options were developed to meet the goal of maximizing recycled water use, while promoting cost efficiency, implementability and adaptability. Two primary steps were utilized to develop recycled water project options:

- Identification of project segments to serve each customer with non-potable demands in excess of 50 AFY.

- Identification of project options combining project segments that are linked and have similar unit costs.

The first step in the development of project options was to define general project areas based on customers with non-potable demands in excess of 50 AFY. In the project areas, transmission pipeline alignments (backbone alignments) and laterals were defined to connect customers with demands greater than 50 AFY to existing recycled water infrastructure. Alignments were then redefined to connect demand clusters of less than 50 AFY, but large enough for consideration as a large demand. Finally, distribution pipeline (laterals) alignments were determined to connect customers with demands less than 50 AFY to backbone alignments.

Initial project options and unit costs are being identified in the current phase of the RWMP. Options for non-potable reuse transmission (purple) pipelines are considered in conjunction with options developed for groundwater replenishment (see section 4.4.3). Additional information on recycled water unit cost is presented in section 4.4.5 – RWMP Cost and Funding.

Recycled Water Supply Sources

Recycled water availability varies by service area. Additional supplies may be required to meet longer term demands between 2015 – 2029 that may require a combination of expanding existing facilities, service connections to neighboring agencies outside the City, new facilities, and satellite treatment facilities. Satellite treatment facilities are being investigated in the Metro, Valley, and Westside service areas. The RWMP is investigating options to ensure adequate supplies are available for each service area. As part of the RWMP, LADWP met with neighboring agencies in 2009 to explore potential opportunities for regional development of recycled water reuse facilities. These agencies are listed in Exhibit 4T, in section 4.4.6, Stakeholder Process and Agency Coordination.

4.4.3 Groundwater Replenishment

As part of the RWMP, LADWP is pursuing a Groundwater Replenishment (GWR) Project, also known as indirect potable reuse, using highly purified advanced treated recycled water from DCT for spreading in existing spreading basins in the San Fernando Valley area. An advanced water treatment facility is necessary to further treat tertiary effluent from DCT to produce highly purified recycled water for recharge. A minimum GWR goal of 15,000 AFY by 2021 has been set for recharging the San Fernando Basin, a major potable water supply for LADWP. This project would recharge a minimum of 15,000 AFY of advanced treated water in the existing Hansen Spreading Grounds and possibly the

Pacoima Spreading Basins by allowing the water to percolate into the aquifer. The City anticipates having the ability to eventually deliver greater amounts of water up to 30,000 AFY to the GWR.

The RWMP includes a GWR plan outlining various operational and capital infrastructure improvements required to meet these goals. Infrastructure improvements required to implement the GWR program include an advanced water treatment facility and pipelines to convey the product water to the spreading basins. Pipelines to convey water to the Hansen Spreading Grounds are already in place and were constructed as a part of the previous recycled water initiatives for the East Valley Water Recycling Project. However, if the Pacoima Spreading Basins will also receive water for spreading, then additional pipeline infrastructure will be required.

Native stormwater recharge will continue to occur at the spreading grounds in conjunction with the project. Currently, LADWP and the Los Angeles County Department of Public Works use multiple spreading grounds located in the eastern portion of the San Fernando Basin to recharge the underlying San Fernando Basin with stormwater. A detailed discussion of the San Fernando Basin and existing recharge operations is provided in Chapter 6, Local Groundwater.

Goals for the advanced water treatment plant include as described in the RWMP are:

- Minimum capacity of 15,000 AFY with the potential to expand to 30,000 AFY.

- Initially in service by 2021.

- Utilization of proven technologies that have demonstrated effective removal of regulated chemicals, constituents of emerging concern, and microorganisms; additional removal of constituents of wastewater origin of interest to CDPH, including pharmaceuticals, personal care products, and endocrine disrupting compounds.

- Product water shall comply with requirements from the CDPH, RWQCB, and SWRCB and be suitable for indirect potable reuse.

To develop and implement the project expeditiously, the advanced wastewater treatment plant will be based on the recently permitted Orange County Water District Groundwater Replenishment System Project. This system provides product water for indirect potable reuse by recharging a groundwater basin used for potable water and preventing seawater intrusion. Proposed technologies include microfiltration or ultrafiltration, reverse osmosis, advanced oxidation using ultraviolet light with hydrogen peroxide, and post-treatment for product water stabilization. As a by-product of advanced water treatment, brine is created. Multiple brine disposal alternatives are presented in the RWMP, and a final alternative will be selected upon completion of the plan.

LADWP is working closely with BOS and regulatory agencies to expedite completion of the project by 2021. Current ongoing tasks include completion of the RWMP, public outreach, pilot testing of GWR treatment processes, and ongoing participation of an independent advisory panel. Environmental documentation is expected to be initiated in 2011 and completed in 2013. The RWMP also outlines the regulatory approval steps required. Regulatory requirements for GWR are discussed in sub-section 4.1.2, GWR Regulatory Requirements.

Independent Advisory Panel

GWR projects typically have the involvement of an independent third party with scientific and technical expertise to provide expert peer review of key aspects of the project, which can ensure the technical viability of the GWR and facilitate the regulatory process. To accomplish this, LADWP awarded a contract with the National Water Research Institute (NWRI) to form an Independent Advisory Panel (IAP) to provide expert peer review of the technical, scientific, regulatory, and policy aspects of the proposed GWR project, pilot project testing, and other potential groundwater replenishment projects to maximize reuse as part of the LADWP Recycled Master Planning Documents. The IAP process will provide a consistent, thorough, and transparent review of any proposed GWR projects and pilot testing during their critical formation phase, as well as during the long-term implementation phase.

NWRI has vast experience in the organization and administration of the IAP processes for other agencies such as the Orange County Water District Groundwater Replenishment System Project. NWRI will assist the IAP process by assembling the IAP members, developing a detailed scope and approach for the IAP's review, coordinating and facilitating meetings, and preparing IAP reports.

Some of the immediate activities that have been identified for the IAP to address during the initial participation include, but are not limited to review of the following:

- General approach for Recycled Water Master Planning
- Hydrogeology (in-basin groundwater blending)
- Treatment (barriers to replace the fifty-percent blend criteria)
- Reliability features of the Advanced Water Treatment Facility
- Source Control Evaluation for GWR
- Draft Engineering Report for GWR
- Response to technical concerns raised by regulators and the public

The "Independent Advisory Panel for the City of Los Angeles Groundwater Replenishment Project" consists of 13 members with scientific and/or professional expertise in issues related to the implementation of groundwater replenishment projects. The selection of members with different areas of expertise was based on the requirements of the California Department of Public Health Draft GWR Reuse Regulations dated August 2008, as well as the composition of panels used by the Orange County Water District and the City of San Diego for the implementation of similar groundwater replenishment projects.

NWRI convened the Independent Advisory Panel for the first time in October 2010 to receive introductory information about the recycled water program and groundwater replenishment project. The Panel is expected to be involved throughout the planning, permitting, design, environmental documentation, and implementation of the groundwater replenishment project.

4.4.4 Efforts Beyond 50,000 AFY

As part of the RWMP, LADWP is developing long-term alternatives to maximize recycled water use beyond 50,000 AFY. After 2029 and through 2035 LADWP expects to increase recycled water use by approximately 1,500 AFY annually. To maximize recycled water use LADWP is investigating the following options in its RWMP:

- Recycled water satellite treatment facilities.
- Expansion of recycled water systems.
- Increasing treatment levels at HTP to tertiary and advanced treatment.
- Reviewing opportunities for partnerships with agencies within and outside of the City.
- Treatment plant upgrades at DCT and LAG.
- Methods to increase reliability of the system.

Additionally, the RWMP will identify how the City can maximize recycled water usage into the future beyond the 50,000 AFY goal. The long-term recycled water alternatives analysis, as part of the RWMP, have not been completed. However, LADWP forecasts that in 2035, municipal and industrial recycled water deliveries along with groundwater replenishment will be approximately 59,000 AFY. In addition to this, 26,990 AFY will also be used for environmental beneficial reuse.

4.4.5 RWMP Cost and Funding

The capital cost of expanding the recycled water system to achieve the initial goal of displacing 50,000 AFY of potable water demand was initially estimated at approximately $1 billion. This cost is being refined as part of the RWMP and is expected to be updated by mid-August 2011.

Unit Cost

Non-potable reuse and GWR projects are diverse, and result in a wide range of costs to implement and sustain. Non-potable reuse projects present numerous challenges, including distance from treatment plant and the associated transmission pipeline construction costs. This is weighed against customer size and recycled water adaptability to a particular commercial site or process. Initial findings of the RWMP have determined the approximate range of cost for water recycling projects to be from $600 to $1,500 per acre-foot. This approximation includes capital, operation, and maintenance costs.

Funding

Capital costs for RWMP projects will be covered by the funding sources identified below, as well as other sources as they become available.

- Water Rates – LADWP water rates are the primary funding source for the recycled water program.
- Federal Funding – LADWP will pursue Federal funding as it becomes available. In the past LADWP has received funding for recycled water projects from the Federal Water Project Authorization and Adjustment Act of 1992, Public Law 102-575 (HR429), and the United States Bureau of Reclamation Title XVI Program.
- State Funding – LADWP will pursue State funding as it becomes available, through the SWRCB and DWR for recycled water projects. Propositions 13 and 50 had funds specifically marked for recycled water projects. Funding is available through Proposition 84, Integrated Regional Water Management, for implementation projects, including recycled water projects. Low-interest loans are available through the SWRCB for eligible projects.
- MWD Local Resources Program Incentive – The Local Resources Program provides funding for water recycling and groundwater recovery projects that prevent a new demand on MWD or displace an existing demand on MWD. Financial incentives up to $250 per acre-foot are available dependent upon MWD water rates and projects costs.

4.4.6 Outreach and Agency Coordination

Outreach with key stakeholders and the public, and coordination with agencies is necessary for the success of LADWP's recycled water program.

Stakeholder Process

To encourage input as recycled water strategies are developed over the next few years in conjunction with the RWMP, LADWP has initiated an extensive outreach process. LADWP has developed two formats for participation of key stakeholders in the Recycled Water Advisory Group (RWAG), and for public participation in the Recycled Water Forums.

The more than 200 stakeholders invited to participate in the RWAG represent broad interests across the City, including community groups, environmental groups, neighborhood councils, homeowners' associations, and others. Approximately 65 stakeholders are participating in the process. The RWAG first met in 2009 and will have approximately five workshops per year over the next few years. Through the RWAG, stakeholders are provided the opportunity to represent their respective organizations, share input with LADWP and BOS, and convey information back to their organizations. Two main roles of the RWAG are:

1. Allow stakeholders to provide input on recycled water options from technical, environmental, financial, and social viewpoints.

2. Consider key project issues and discuss implementation challenges and acceptability.

Recycled Water Forums provide the general public an opportunity to learn about the LADWP Recycled Water Program and submit comments that will be considered before the RWMP is adopted.

Agency Coordination

To maximize recycled water use and move forward with RWMP efforts, LADWP closely coordinated with agencies at the local and state levels. Coordination is necessary to ensure adequate funding, identification of end-users, adequate availability of supplies, permitting and regulatory approvals, and regional cooperation. If Federal funding opportunities become available, LADWP will also coordinate with the applicable Federal agencies. Exhibit 4R provides a summary list of agencies LADWP is currently coordinating with to maximize recycled water use.

Financial Incentives

LADWP also coordinates recycled water end use with potential customers by assisting with facility retrofits and public education. Recycled water is provided to customers at a cost less than potable water. LADWP is also considering implementing a new incentive program designed to assist with onsite retrofits to convert customers to the use of recycled water.

Exhibit 4R
Recycled Water Agency Coordination

Burbank Water and Power[1]	Los Angeles County Department of Public Works[1]
Central Basin Municipal Water District[1]	Metropolitan Water District of Southern California[1]
Glendale Water and Power[1]	Pasadena Water and Power[1]
Los Angeles County Sanitation Districts[1]	Water Replenishment District of Southern California[1]
Long Beach Water Department[1]	West Basin Municipal Water District[1]
Las Virgenes Municipal Water District[1]	Los Angeles Regional Water Quality Control Board
State Water Resources Control Board	Los Angeles County Department of Public Health
City of Los Angeles Department of Public Works, Bureau of Sanitation, Watershed Protection Division	City of Los Angeles Department of Public Works, Bureau of Sanitation
California Department of Public Health	

1. Met with agencies individually to discuss potential regional recycled water use.

4.4.7 Recycled Water Quality

All recycled water provided by LADWP meets, at minimum, Title 22 standards. Title 22, Chapter 4, of the California Code of Regulations establishes water quality standards and treatment reliability criteria for water recycling to ensure public safety as discussed in Section 4.1. Title 22 standards are achieved with tertiary treatment and disinfection.

Advanced wastewater treatment is currently provided for the Dominguez Gap Seawater Barrier at the TIWRP by the AWTF. The AWTF has advanced treatment that includes microfiltration and reverse osmosis, which removes many of the impurities remaining after tertiary treatment and disinfection. This treatment will be implemented for the planned groundwater replenishment project being developed through the RWMP. Purified DCT effluent used to recharge the San Fernando Basin will undergo additional treatment, including microfiltration, reverse osmosis, and advanced oxidation. Exhibit 4C, located in Section 4.2, summarizes the level of treatment provided by each of the City's water reclamation plants.

Chapter Five

Los Angeles Aqueduct System

5.0 Overview

Water has been an integral part of the City's history. The City's population and economy was initially supported through a combination of local surface flows primarily from the Los Angeles River, and groundwater pumping primarily from the San Fernando Basin. When it became apparent that much of the local groundwater supply and local surface flows were fully utilized, the citizens of Los Angeles under the leadership of William Mulholland, then Chief Engineer of the Los Angeles Water Bureau, approved by a 10 to 1 margin a $23 million bond measure to construct the First Los Angeles Aqueduct in 1913. This investment was equal to 12 percent of the entire City's assessed valuation at that time. Then in 1940, an additional $40 million was spent to extend the first aqueduct 40 miles north from the Owens River to streams that were tributaries to Mono Lake, see Exhibit 5A.

To meet the additional water needs of its population, the City decided to construct the second barrel of the Los Angeles Aqueduct in 1963, later to become known as the Second Los Angeles Aqueduct. Construction of the Second Los Angeles Aqueduct was completed in 1970. The second aqueduct increased the City's capacity to deliver water from the Mono Basin and the Owens Valley to Los Angeles from 485 cubic feet per second (cfs) to 775 cfs.

The value of the City's historical investment in the Los Angeles Aqueduct System is substantial. For nearly a century, the City has benefited from the delivery of high-quality, cost-effective water supplies from the eastern Sierra Nevada.

Exhibit 5A
Los Angeles Aqueduct System

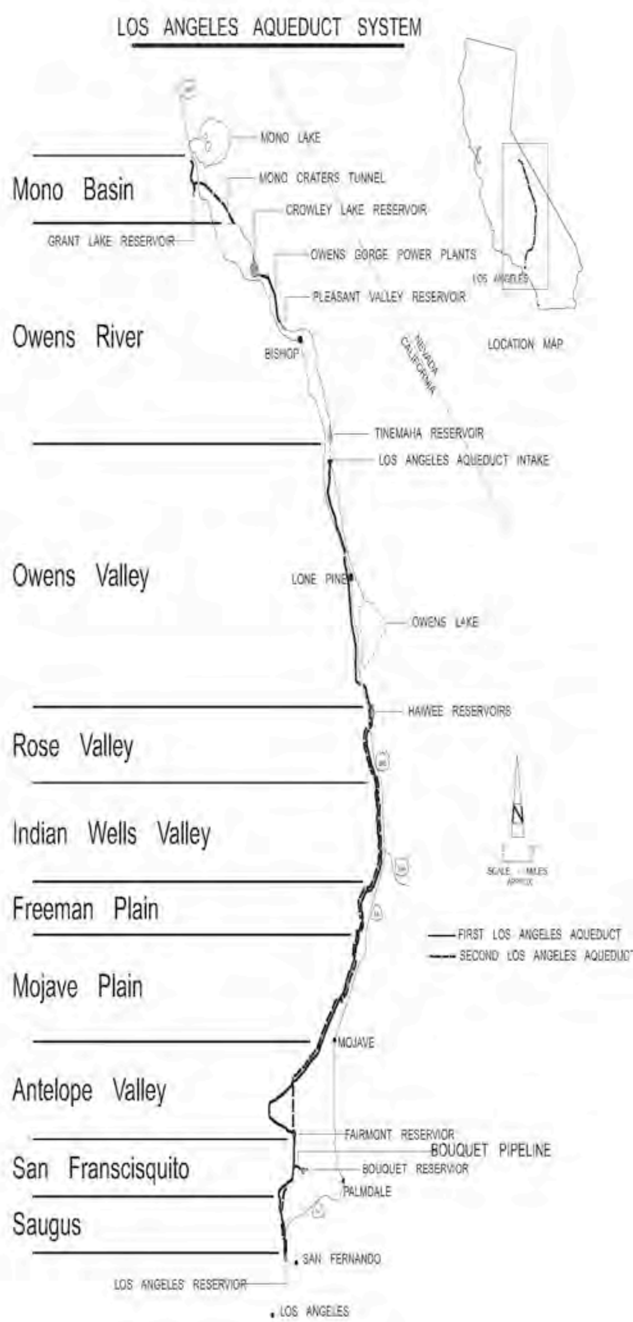
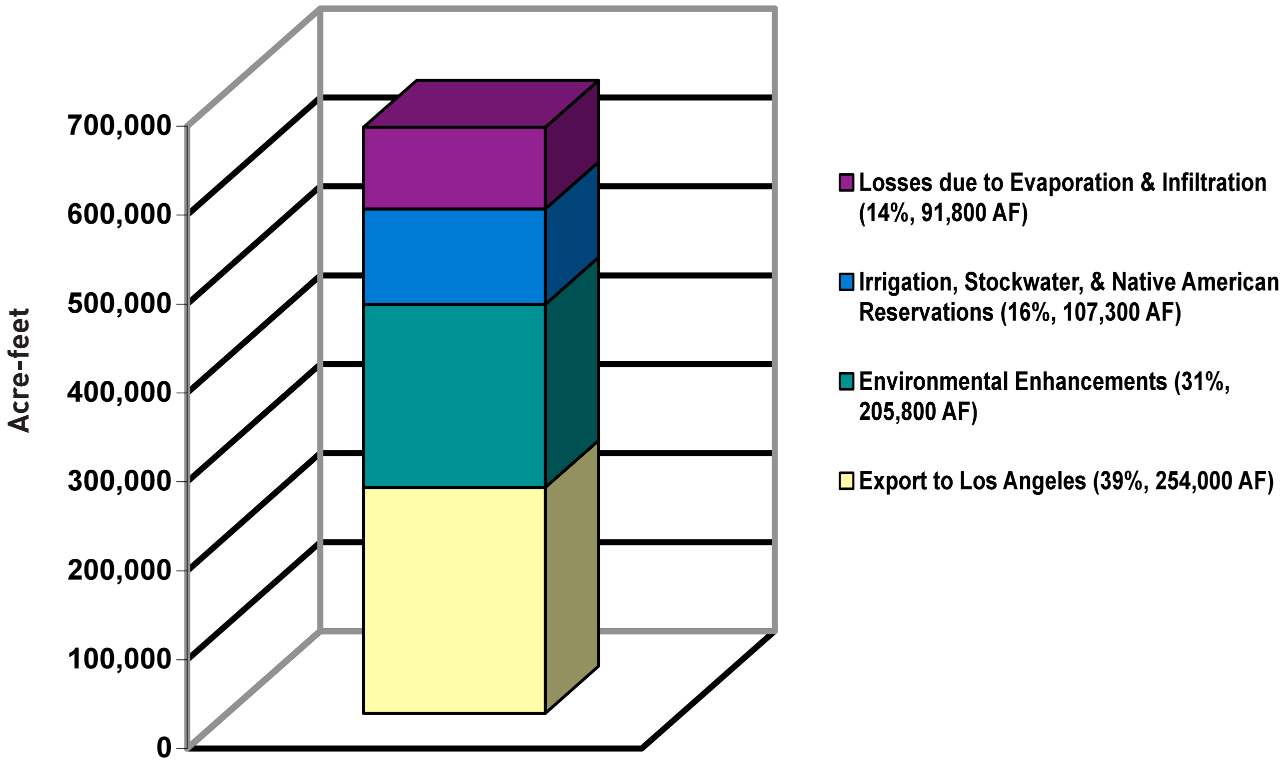


Exhibit 5B
Mono Basin and Owens Valley Water Use Allocations



Over time, environmental considerations have required that the City reallocate approximately one-half of the Los Angeles Aqueduct (LAA) water supply to environmental mitigation and enhancement projects. As a result, the City has used approximately 205,800 AF of water supplies for environmental mitigation and enhancement in the Owens Valley and Mono Basin regions in 2010, which is in addition to the almost 107,300 acre-feet per year (AFY) supplied for agricultural, stockwater, and Native American Reservations. Limiting water deliveries to the City from the LAA has directly led to increased dependence on imported water supply from the Metropolitan Water District of Southern California (MWD). LADWP's purchases of supplemental water from MWD in FY 2008/09 hit an all time high.

As indicated in Exhibit 5B, LAA deliveries comprise 39 percent of the total runoff in the eastern Sierra Nevada in an average year. The vast majority of water collected in the eastern Sierra Nevada stays in the Mono Basin, Owens River, and Owens Valley for ecosystem and other uses.

5.1 Historical Deliveries

Annual LAA deliveries are dependent on snowfall in the eastern Sierra Nevada. Years with abundant snowpack result in larger quantities of water deliveries from the LAA, and typically lower supplemental water purchases from MWD. Unfortunately, a given year's snowpack cannot be predicted with certainty, and thus, deliveries from the LAA system are subject to significant hydrologic variability.

The impact to LAA water supplies due to varying hydrology in the Mono Basin and Owens Valley is amplified by the requirements to release water for environmental restoration efforts in the eastern Sierra Nevada. Since 1989, when City water exports were significantly reduced to restore the Mono Basin's ecosystem, LAA deliveries from the Mono Basin and Owens Valley have ranged from 108,503 AF in FY 2008/09 to 466,584 AF in FY 1995/96. Average LAA deliveries since FY 1989/90 have been approximately 264,799 AF, about 42 percent of the City's total water needs.

The cyclical nature of hydrology is exhibited best by LAA deliveries over the last ten years. This general period was characterized by a series of wet years, followed by a series of dry years. From FY 2000/01 through 2009/10, LAA deliveries supplied an average of 36 percent of the City's water needs. The reliability impact of hydrologic cycles on LAA supplies is evident through historical deliveries. A broader look at how deliveries from the LAA have fluctuated from year to year is shown in Exhibit 5C.

A long term perspective of the general cycle of wet and dry years for the Owens Valley is evident in Exhibit 5D, particularly since the late 1960s. As illustrated, reliance solely on one water supply source is not practical. Therefore, the City relies on the LAA in combination with the Colorado River Aqueduct and the State Water Project as the City's primary imported water sources. These imported sources combined with local groundwater, recycled water, and conservation make up the City's total water supply portfolio. This portfolio of water resources is fundamental to LADWP's ability to deliver a reliable water supply to meet the needs of over 4 million residents of Los Angeles.

Exhibit 5C
Historical Los Angeles Aqueduct Deliveries

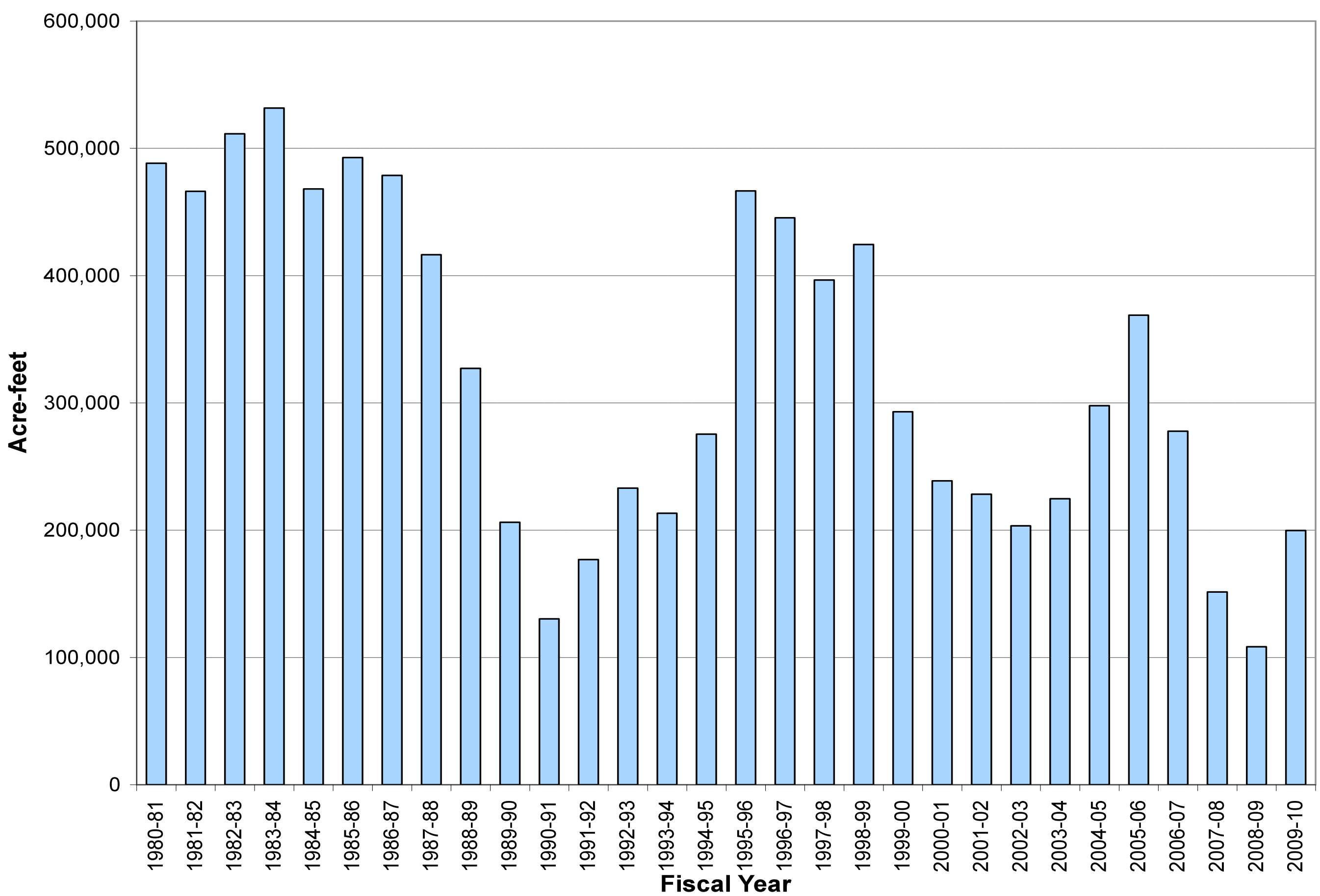
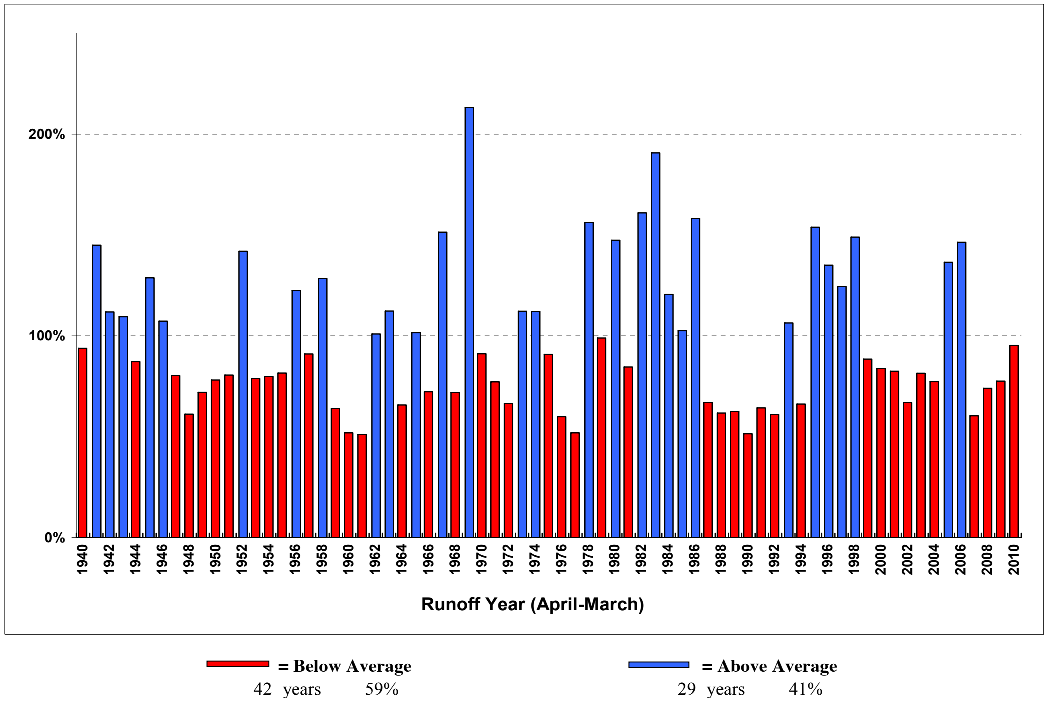


Exhibit 5D
Eastern Sierra Nevada Runoff Owens Valley - Percent of Normal



5.2 Mono Basin and Owens Valley Supplies

Surface runoff from snowmelt in the eastern Sierra Nevada Mountains is the primary source of supply for the LAA. The LAA extends approximately 340 miles from the Mono Basin to Los Angeles. Water is conveyed the entire distance by gravity alone. LADWP regulates system output through storage control at seven reservoirs, beginning with Grant Lake Reservoir to the north and ending with Bouquet Reservoir to the south. The total combined reservoir storage capacity of the system is 300,560 AF. Hydroelectric power is also generated from 12 power plants along the LAA. Combined maximum capability of the power generation facilities is 205 mega-watts. Water-gathering activities for the LAA have a junior priority to meeting the Owens Valley and Mono Basin water obligations for environmental, domestic, agricultural, and recreational water needs.

The LAA is fed by runoff from the eastern slope of the Sierra Nevada Mountains. Runoff from the eastern slope reaches its maximum in the late spring and summer, after most of the year's precipitation has already occurred. The snowpack in the eastern Sierra Nevada provides natural storage for the LAA system. This snowpack storage is necessary in light of the minimal primarily regulatory storage capacity along the LAA system.

Water Rights

The City's export of water from the eastern Sierra Nevada is based on 166 Pre-1914 and 16 Post-1914 water right diversion licenses on various streams in the Mono Basin and Owens Valley. The majority of the City's water rights were filed prior to 1914 with the Counties of Mono and Inyo Recorder's Office. All Post-1914 licenses were granted by the State Water Resources Control Board (SWRCB). The most significant basis for export of surface water from the eastern Sierra Nevada is an appropriation claim in 1905 to divert up to 50,000 miner's inches (1,250 cfs) from the Owens River at a location approximately 15 miles north of the town of Independence into the LAA for transport to Los Angeles. The City has since filed Supplemental Statements of Water Diversion and Use forms with the SWRCB for all LADWP diversions and licenses.

The City's water right licenses in the Mono Basin were amended by the SWRCB in 1994 through the Mono Lake Basin Water

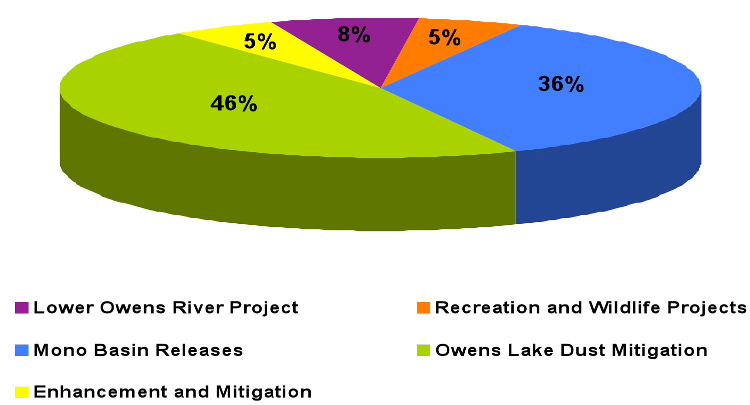
Right Decision 1631. Currently, water export from the Mono Basin is limited to 16,000 AFY based on a court order to raise the target elevation of Mono Lake and restore four streams that flow to Mono Lake.

The primary groundwater right through which Los Angeles has developed groundwater resources in the Owens Valley is based on ownership of a majority of the land (approximately 314,000 acres) and associated water rights in the Owens Valley. Management of the groundwater supply in the Owens Valley is according to a 1991 agreement between Inyo County and LADWP. The goal of this agreement is to avoid defined decreases and changes in vegetation, and to cause no significant effect on the environment which cannot be acceptably mitigated, while providing a reliable supply of water for export to Los Angeles and for use in Inyo County.

5.3 Environmental Issues and Mitigation

Over time an increasingly larger portion of the LAA water supply has been reallocated to the environment. As a result, the City's current supply for environmental enhancement in the Owens Valley and Mono Basin is approximately 205,800 AFY. To accommodate LAA delivery reductions due to these environmental enhancements, LADWP has funded conservation and water recycling programs to improve water use efficiency within the City. Exhibit 5E illustrates the breakdown of LAA water supply commitments by category for environmental enhancement and mitigation projects have been implemented as part of the City's commitment to meet the environmental water needs of the Owens Valley. Among these environmental projects, LADWP is diverting 10,700 AF of water from the LAA for Owens Valley enhancement and mitigation projects, 10,400 AF for recreation and wildlife projects, and 15,700 AF for the Lower Owens River Project (LORP). These annual environmental project diversions are in addition to water that provides environmental benefits in the Mono Basin and Owens Lake.

Exhibit 5E
Mono Basin and Owens River Environmental Enhancement Commitments



Environmental Enhancement Commitments	AFY
Lower Owens River Project	15,700
Recreation and Wildlife Projects	10,400
Mono Basin Releases	74,000
Owens Lake Dust Mitigation	95,000
Enhancement and Mitigation	10,700
Total	205,800

Mono Basin

Currently, Mono Basin exports will remain at no more than 16,000 AFY until Mono Lake reaches its target elevation of 6,391 feet above mean sea level. Exhibit 5F provides the maximum export levels from the Mono Basin under specified conditions as defined in the SWRCB Decision D1631 that was issued on September 28, 1994. Since the long-term average of Mono Basin exports before 1994 was approximately 90,000 AFY, the net reduction in water exports in the Mono Basin is estimated at 74,000 AFY of water mainly from Grant Lake Reservoir, Lee Vining Creek, Walker Creek, Parker Creek, and Rush Creek. As of January

Exhibit 5F
Mono Lake Elevations and Exports

Mono Lake Elevation (feet)		Exports (AFY)
Transition	< 6,377	0
	6,377 - 6,380	4,500
	6,380 - 6,391	16,000
	> 6,391	export all runoff less minimum stream flow requirements and stream restoration flows
Post-Transition	< 6,388	0
	6,388 - 6,391	10,000
	> 6,391	export all runoff less minimum stream flow requirements and stream restoration flows

Exhibit 5G
Lower Rush Creek Base and Peak Flow Requirements

Hydrologic Condition	Base Flow (cfs)							Peak Flows (cfs)
	Apr	May - Jul	Aug - Sep	Apr - Sep	Oct- Mar	May - Aug	Sep - Mar	
Dry (runoff < 83,665 AF)	N/A	N/A	N/A	31	36	N/A	N/A	None
Dry-Normal I (runoff 83,655 - 91,590 AF)	N/A	N/A	N/A	47	44	N/A	N/A	200 for 7 days
Dry-Normal II (runoff 91,590 - 100,750 AF)	N/A	N/A	N/A	47	44	N/A	N/A	250 for 5 days
Normal (runoff 100,750 - 130,670 AF)	N/A	N/A	N/A	47	44	N/A	N/A	380 for 5 days follows 300 for 7 days
Wet-Normal (130,760 - 166,700 AF)	N/A	N/A	N/A	47	44	N/A	N/A	400 for 5 days followed by 350 for 10 days
Wet (166,700 - 195,400 AF)	N/A	N/A	N/A	68	52	N/A	N/A	450 for 5 days followed by 400 for 10 days
Extreme Wet (runoff > 195,400 AF)	N/A	N/A	N/A	68	52	N/A	N/A	500 for 5 days followed 400 for 10 days

Source: Mono Basin Operations, Guidelines A-G

2011, Mono Lake is at elevation 6,382 feet. Extensive restoration and monitoring programs in the Mono Basin have improved the streams, riparian, fishery, and waterfowl habitats.

To effectively maintain continuous base and peak water flows to the ecosystem restoration area of Lower Rush Creek in the Mono Basin, LADWP completed construction of the Mono Gate One diversion facility upgrade in November 2009. Exhibit 5G summarizes the base and peak flow requirements for Lower Rush Creek. Base and peak flow requirements vary in relation to seven hydrologic conditions ranging from dry to extreme wet as identified by forecasted runoff for Mono Basin. Mono Gate One was originally constructed to release excess water from the LAA system during high flows by diverting water into Lower Rush Creek with a system of diversion boards. However, it had no monitoring or flow control capabilities and was not designed for precise flow metering or full-time diversion. Construction completed in the fall of 2009, the new Mono Gate has enabled LADWP to greatly improve measuring and flow capabilities, satisfying one of the operational requirements of the SWRCB.

Lower Owens River Project

Beginning December 2006, the LORP, depicted in Exhibit 5H, releases water from the LAA to create a warm water fishery along a 62-mile section of the Owens River. Water is released near the LAA intake facility and a pump back station is located downstream to return

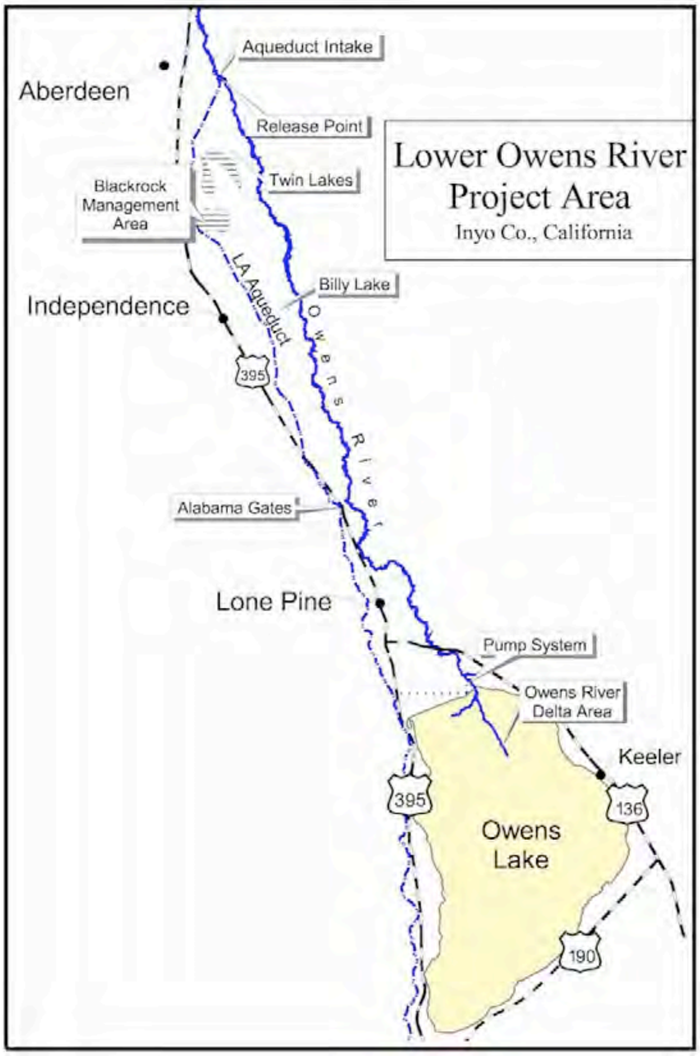


Exhibit 5H
Lower Owens River Project Area

Exhibit 5I
Lower Owens River Base and Peak Seasonal Habitat Flow Requirements

Hydrologic Condition Forecasted[1] (Percent of Average Runoff)	**Base Flow (cfs)**	**Peak Seasonal Habitat Flow[2] (cfs)**
50 percent or less	40	Base flow only
70 percent	40	100
100 percent or greater	40	200

1. Runoff forecast determined by LADWP's Runoff Forecast Model for Owens River Basin based on April 1st snow survey.

2. Peak season habitat flows are proportionately ramped up from 40 cfs to 200 cfs based on the percent of average runoff forecasted greater than 50 percent and less than 100 percent.

flows to the LAA or to Owens Lake for dust control measures. In accordance with the Memorandum of Understanding between LADWP and Inyo County and the approved Environmental Impact Report, annual monitoring reports are to be prepared to measure project success. The first LORP Annual Monitoring Report was prepared in 2008.

The Memorandum of Understanding prescribes requirements for LORP flows. Both base flows and seasonal habitat peak flows are required for the LORP. A flow schedule is provided in Exhibit 5I. Seasonal habitat peak flows vary between 40 cfs (zero additional flows beyond the base flow requirements) to 200 cfs. For below average runoff years, seasonal habitat flows may be incrementally lowered from the average runoff year requirements of 200 cfs to 40 cfs (base flow) in proportion to the forecasted runoff flows in the watershed. Base flows are constant at 40 cfs regardless of forecasted runoff flows. It is estimated that the long-term use and transit losses from the project will be approximately 15,700 AFY.

5.4 Owens Lake Dust Mitigation

Historically, the Owens River was the main source of water for Owens Lake. Diversion of water from the river, first by farmers in the Owens Valley and then by the City, resulted in the lake being reduced to a small brine pool. The exposed lakebed became a major source of windblown dust resulting in the United States Environmental Protection Agency (USEPA) classifying the southern Owens Valley as a serious non-attainment area for particulates (dust) also known as PM10 emissions in 1991. The PM standard includes Particulate Matter with a diameter of 10 micrometers or less (0.0004 inches or one-seventh the width of a human hair). USEPA's health-based national air quality standard for PM-10 is 50 microgram per cubic meter (measured as an annual mean) and 150 microgram per cubic meter (measured as a daily concentration).

As a result of PM10 emissions exceeding regulations, the USEPA required California to prepare a State Implementation Plan to bring the region into compliance with Federal air quality standards by 2006. In July 1998, LADWP entered into a Memorandum of Agreement with the Great Basin Unified Air Pollution Control District that: 1) delineated the dust producing areas on the lakebed that needed to be controlled; 2) specified what measures must be used to control the dust; and 3) outlined a timetable for implementation of the control measures. The Memorandum of Agreement was incorporated into a formal air quality control State Implementation Plan by the Great Basin Unified Air Pollution Control District. The plan was approved by the USEPA in October 1999.

LADWP's water use for Owens Lake Dust Mitigation has been gradually increased over the years. Exhibit 5J summarizes yearly water use for the Owens Lake Dust Control Project. Currently, up to 95,000 AF per year of water could be diverted from the LAA for dust mitigation at Owens Lake, greatly exceeding the 55,000 AFY anticipated in the 2005 UWMP. In August 2009, the Board of Water and Power Commissioners of the City of Los Angeles required LADWP to implement water conservation measures on Owens Lake to reduce LAA diversions to below the peak of 95,000 AFY for existing and future dust control projects.

Exhibit 5J
Yearly Water Use on Owens Lake (Fiscal Year)

Fiscal Year	Total AF
2002/03	23,937
2003/04	31,362
2004/05	29,494
2005/06	29,413
2006/07	54,849
2007/08	67,262
2008/09	59,187
2009/10	75,428
2010/11	95,000

* Fiscal year 2010/11 is projected

Since 2001, LADWP has diverted water from the LAA for the Owens Lake Dust Control Project. A combination of shallow flooding, managed vegetation, and a small amount of gravel are used at various lakebed locations as Best Available Control Measures for dust control mitigation on almost 40 square miles. Exhibit 5K provides a description of the Best Available Control Measures. LADWP has completed 9.2 square miles of shallow flooding, 0.5 square miles of modified shallow flooding, and 0.4 square miles of sand fence as part of the Phase 7 project in accordance with the 2008 State Implementation Plan. However, LADWP had proposed 3.1 square miles of a new waterless dust control measure called Moat and Row which was disallowed by the California State Lands Commission in April 2010. LADWP is working with the District to develop an alternative solution for the areas originally proposed for Moat and Row. LADWP has been ordered to complete an additional 2 square miles of dust control known as the Phase 8 project. LADWP is seeking a lease from the California State Lands Commission to construct Gravel Best Available Control Measures for Phase 8 as it does not require water for operation.

Exhibit 5K
Dust Control Mitigation Best Available Control Measures

Dust Control Measures		Description
Shallow Flooding	Sheet Flooding	Releases water from arrays of low-flow water outlets spaced at intervals of between 60 and 100 feet along pipelines laid along lake bed contours. Pipelines are spaced between 500 and 800 feet apart. This arrayed configuration of water delivery creates large, very shallow sheets of braided water channels. Water depths in sheet flooded areas are typically at most a few inches deep. The lower edge of sheet flooded areas has containment berms to capture and pond excess flows. The water slowly flows across the typically very flat lake bed surfaces downhill to tail-water ponds where pumps recirculate the water back to the outlets. To maximize project water use efficiency, flows to sheet flow areas are regulated at the outlets so that only sufficient water is released to keep the soil wet. Any water that does reach the lower end of the control area is collected and recirculated back through the water delivery system.
	Shallow Flooding (Pond Flooding)	Water containment berms that allow ponds to be formed that submerge the emissive lake bed areas. These ponds are up to four feet deep. The containment berms are typically rock-faced to protect them from delivery to the pond area until the pond reaches a size and depth sufficient to submerge the required amount of emissive water. Water delivery then ceases until evaporation reduces the pond size to a set minimum.
Managed Vegetation		Control measure consists of creating a farm-like environment from barren playa. The saline soil must first be reclaimed with the application of relatively fresh water and then planted with salt-tolerant plants that are native to the Owens Lake basin. Thereafter, soil fertility and moisture inputs must be managed to encourage rapid plant development and maintenance. Existing Managed Vegetation areas are irrigated with buried drip irrigation tubing and a complex network of buried drains to capture excess water for reuse on the Managed Vegetation area or in Shallow Flooding areas. Managed Vegetation is sustainable at Owens Lake only if salt from the naturally occurring shallow groundwater is prevented from rising back into the rooting zone.
Gravel Blanket		A four-inch layer of coarse gravel laid on the surface of the Owens Lake playa will prevent emissions by preventing the formation of efflorescent evaporate salt crusts, because the large pore spaces between the gravel particles disrupt the capillary movement of saline water to the surface where it can evaporate and deposit salts. The gravel also creates a surface that has a high threshold wind velocity so that direct movement of the large gravel particles is prevented and the finer particles of the underlying lake bed soils are protected. Gravel Blankets are effective on essentially any type of soil surface.

As part of an Interim Management Plan, LADWP and Inyo County have agreed to conduct a joint study to explore the feasibility of extracting and utilizing brine laden groundwater beneath Owens Lake to supplement the water supply necessary for dust mitigation activities. This feasibility study is scheduled for completion by November 2011. If groundwater pumping is considered feasible and acceptable, LADWP will first need to obtain required approval from Great Basin Unified Air Pollution Control District, California State Lands Commission, California Department of Fish and Game, and Inyo County.

5.5 Water Quality

As land owners of much of the Mono Basin and Owens River watersheds, LADWP has placed strict limits on the extent of development impacting the City-owned watersheds. Snowmelt from the eastern Sierra Nevada contains low total organic carbon (TOC), bromide concentrations, and other constituents that can form disinfectant byproducts during the water treatment process. LADWP conducts routine monitoring of all of its water supplies for over 170 constituents and contaminants. Ninety-eight of the constituents and contaminants have enforceable standards.

The LAA supply is the main source of arsenic in LADWP's water supply. Arsenic is collected as the Owens River flows volcanic formations in the vicinity of Hot Creek in Long Valley. Geothermal springs in these areas have arsenic concentrations of around 200 parts per billion (ppb). Concentrations are dramatically reduced as water in the area mixes with snow melt and other pristine water sources. Historic untreated LAA water arsenic concentrations have ranged from 10 to 74 ppb. During the latest 3-year routine compliance monitoring cycle from 2007 to 2009, the highest arsenic concentration after treatment was 8.1 ppb, while the average arsenic concentration within LADWP's water distribution system was 3.3 ppb, both well below the current Federal and State drinking water standard of 50 ppb. In light of potential, more stringent arsenic regulations, LADWP is taking a proactive approach in addressing this issue by investigating and planning enhanced coagulation treatment.

LADWP completed an evaluation and preliminary design report for enhanced coagulation at the Los Angeles Aqueduct Filtration Plant in December 2006 as a means of addressing future water quality regulations faced by LADWP, including arsenic. An enhanced coagulation facility using the process as outlined in the report is planned as part of the treatment process at the Los Angeles Aqueduct Filtration Plant by 2021.

To comply with the Stage 2 Disinfectants and Disinfection Byproducts Rule, another water quality improvement effort being implemented is the conversion from chlorine to chloramine residual disinfectant. This transition, which is expected to be completed by April 2014, will allow LADWP to maintain the same high level of disinfection in its water supply while freeing itself from other potential disinfection issues associated with the use of chlorine. The use of chloramines will provide additional operational flexibility by allowing the blending of purchased MWD water (which is chloraminated) into the LADWP distribution system without the problems associated with creating a chlorine/chloramines interface when blending the two supplies.

5.6 Projected Deliveries

Near-term water deliveries are forecasted for the LAA using two models, the Runoff Forecast Model and the Los Angeles Aqueduct Simulation Model (LAASM). These two models used accurately predict the amount of water available from this the LAA.

The Runoff Forecast Model is used to predict total Owens Valley and Mono Basin stream runoff. The model's estimating equations were developed using historic rainfall and snowfall, as well as streamflow data of each year. Model input consists of 6 months of antecedent rainfall and streamflow data, as well as the final snowpack levels on April 1st. The model's output is the forecasted runoff for the Owens Valley and Mono Basin during the twelve month period following April 1st, assuming that median rainfall occurs during those twelve months.

Runoff flows from the Owens Valley to the City of Los Angeles are modeled by the LAASM. LAASM uses the output of the Forecast Model as input, along with estimates of various uses within the Owens Valley. LAASM uses historically derived estimating equations to forecast various losses, including evaporation and infiltration, as well as other inflows such as unmetered springs. The final output from LAASM is the volume of LAA water projected to be delivered to the City of Los Angeles.

Taking the foreseeable factors discussed earlier in this chapter into consideration, the average annual long-term LAA delivery over the next 25 years, using the 50-year average hydrology from FY 1956/57 to 2005/06, is expected to be approximately 254,000 AFY and gradually decline to 244,000 AFY due to climate change impact. Deliveries for a series of dry years, using FY 1988/89 through 1992/93 hydrology, are expected to range from approximately 48,520 AFY to 105,770 AFY. A single dry year minimum of 48,520 AFY is expected with a repeat of the FY 1990/91 hydrology. Detailed projections of LAA deliveries by year are provided in Chapter 11, Water Service Reliability Assessment.

5.7 LAA Delivery Cost

The costs associated with the LAA water supply are primarily operation and maintenance costs. Therefore, the unit cost of importing water through the LAA to the City varies mainly with the quantity of water delivered, which is highly dependent on hydrological conditions. During dry years, the amount of water delivered to the City decreases, which results in an increase to the unit cost. Over the years, eastern Sierra Nevada environmental enhancement project have also contributed to rising overall LAA delivery cost. The Owens Lake Dust Mitigation and Lower Owens River Project are two examples. Exhibit 5L summarizes the historical unit cost of treated water from the LAA. The peaks occurred when LAA deliveries significantly decreased during FY 1990/91, 2002/03, and 2008/09 with the LAA delivering 130,300 AF at $499/AF; 203,400 AF at $419/AF; and 108,500 AF at $1,003/AF respectively.

Exhibit 5M shows the unit cost of LAA treated water from FY 2005/06 to 2009/10. The 5-year average was $563/AF. The sharp increase in FY 2008/09 was due to LAA deliveries being the lowest on record.

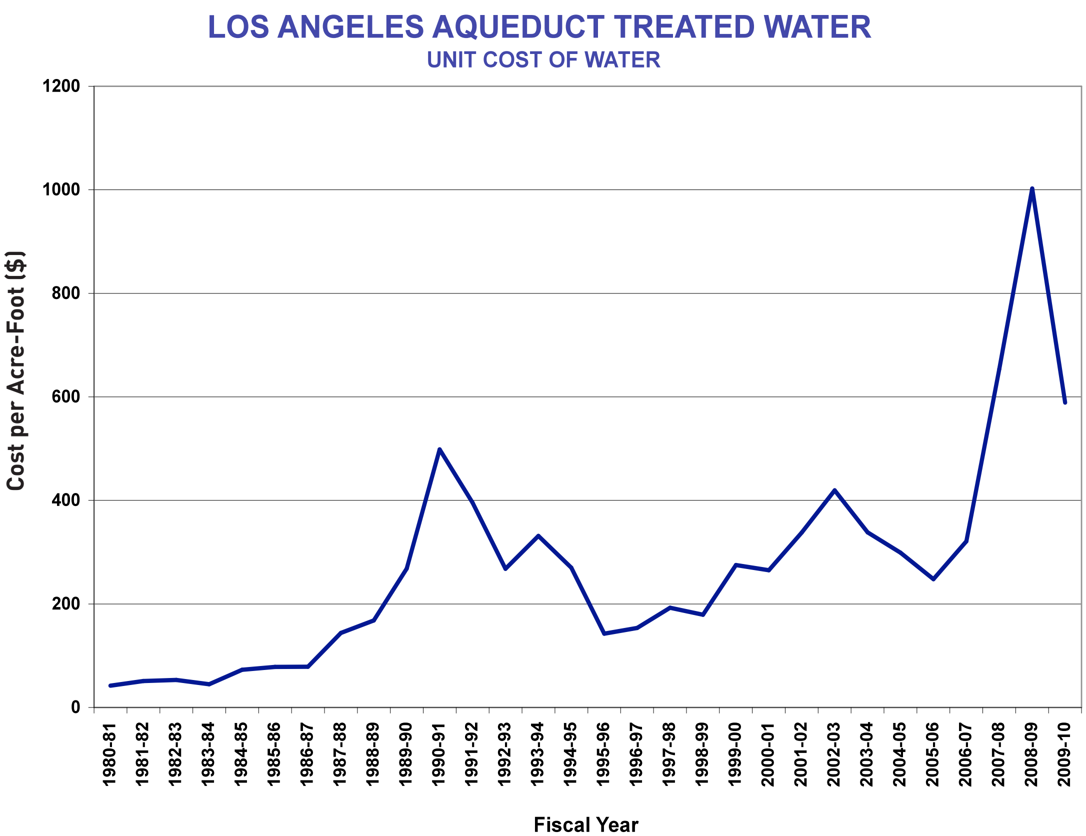


Exhibit 5L Historical Cost of LAA Treated Water

Fiscal Year	2005/06	2006/07	2007/08	2008/09	2009/10
Unit Cost	$248	$321	$654	$1,003	$589

Exhibit 5M Annual Unit Cost

Chapter Six
Local Groundwater

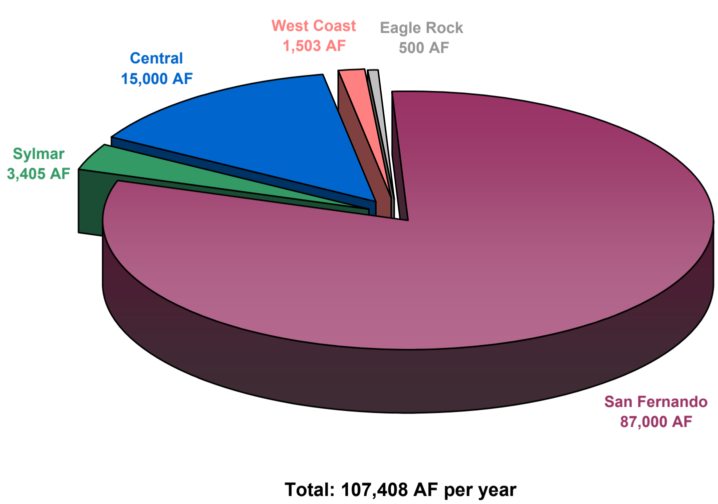
6.0 Overview

A key resource that the City has relied upon as the major component of its local supply portfolio is local groundwater. Over the last ten years local groundwater has provided approximately 12 percent of the total water supply for Los Angeles, and historically has provided nearly 30 percent of the City's total supply during droughts when imported supplies become less reliable. In recent years, contamination issues have impacted LADWP's ability to fully utilize its local groundwater entitlements. Additionally, reduction of natural infiltration due to expanding urban hardscape and channelization of stormwater runoff has resulted in declining groundwater elevations. In response to contamination issues and declining groundwater levels, LADWP is working on treatment for the San Fernando Basin's (SFB) groundwater and is making investments to recharge local groundwater basins through stormwater recharge projects, while at the same time replacing or rehabilitating old and deteriorating stormwater capture facilities. LADWP anticipates that groundwater treatment facilities in SFB will be in operation by Fiscal Year Ending (FYE) 2021 which will allow LADWP to pump its full groundwater entitlement. With the addition of utilizing stored water credits in the San Fernando Basin and Sylmar Basin, groundwater pumping will increase up to 111,500 Acre-Feet (AF) starting FYE 2021.

6.1 Groundwater Rights

The City owns water rights in the San Fernando, Sylmar, Eagle Rock, Central, and West Coast Basins. All of these basins are adjudicated by decree through Superior Court Judgments (Appendix F). The combined water rights in these

Exhibit 6A
Annual Local Groundwater Entitlement



basins total approximately 107,408 AFY. Water rights in the Upper Los Angeles River Area (ULARA), which comprises the San Fernando, Sylmar, and Eagle Rock basins, total approximately 90,905 AFY which translates into approximately 87,000 AFY in the SFB, 500 AFY in the Eagle Rock Basin, and 3,405 AFY in the Sylmar Basin. Water rights in the Central and West Coast Basins are 15,000 AFY and 1,503 AFY, respectively. However, LADWP does not exercise its pumping rights in Eagle Rock Basin and West Coast Basin at this time. Exhibit 6A summarizes the City's annual local groundwater entitlements by basin.

The ULARA Groundwater Basin Adjudication

The City's entitlements in the San Fernando, Sylmar, and Eagle Rock Basins were established in a Judgment by the Superior Court of the State of California for the County of Los Angeles in Case No. 650079, The City of Los Angeles, Plaintiff, vs. Cities of San Fernando, et. al., Defendants, dated January 26, 1979 (San Fernando Judgment) and the 1984 Sylmar Basin Stipulation (1984 Stipulation). Appendix F contains the Judgment and 1984 Stipulation. The Judgment was based on maintaining a safe yield operation for the basin, whereby groundwater extractions over the long-term will be maintained in a manner that does not create an overdraft condition in the basin. The Judgment and 1984 Stipulation limit groundwater extraction and establish a court-appointed Watermaster and an Administrative Committee made up of a representative from each of the five water supply agencies overlying the ULARA Basins. The five public agencies are the City of Los Angeles, the City of Glendale, the City of San Fernando, the City of Burbank, and the Crescenta Valley Water District.

The Watermaster assists the Court in administering and enforcing the provisions of the San Fernando Judgment and 1984 Stipulation. Among other duties, the Watermaster monitors groundwater levels, recharge operations, recycled water use, extractions, water imports and exports, and reports all significant water-related events in the Basin to the Court and to the parties of the Judgments. The activities of the Watermaster are key components for the effective management of the groundwater resources in the ULARA Basins. Key tasks of the Watermaster for the SFB include:

- To monitor radiological and synthetic organic compounds (SOCs) every three years.
- To continue to work with key regulators, such as the Los Angeles Regional Water Quality Control Board (LARWQCB), California Department of Public Health (CDPH), California Department of Toxic Substance Control (CDTSC), and the United States Environmental Protection Agency (USEPA), to expedite clean-up of groundwater at or near known contamination sites.
- To continue to support the ongoing activities of the City of Los Angeles and others to recharge the groundwater basin at existing spreading basins on the east side of the San Fernando Valley.
- To help determine the technical feasibility of using advanced treated recycled water to recharge the groundwater basin.
- To continue to work with the Los Angeles Department of Public Works, Bureau of Sanitation, Watershed Protection Division, to enhance groundwater recharge of local basins via the Standard Urban Stormwater Mitigation Plans (SUSMP) procedures for stormwater infiltration at new development and redevelopment project sites.
- To work with local purveyors in an effort to increase the quantity and quality of the groundwater database for the entire ULARA basin.

Exhibit 6B
Local Groundwater Basin Supply
Fiscal Year (July through June in AF)

Groundwater Basin	2005/06	2006/07	2007/08	2008/09	2009/10	Average	Percentage
San Fernando	35,486	75,640	57,060	49,106	62,218	55,902	79%
Sylmar	1,844	3,901	4,046	576	2,998	2,673	4%
Central	13,290	13,358	12,207	11,937	11,766	12,512	17%
Total	50,620	92,899	73,313	61,619	76,982	71,087	100%

Historical Groundwater Production

On average over the past five years, about 83 percent (58,575 AFY) of the City's local groundwater supply was extracted from ULARA groundwater basins, while the Central Basin provided 17 percent (12,512 AFY). Exhibit 6B summarizes the City's local groundwater production by basin over the last five years.

Historically, LADWP operates groundwater production by utilizing conjunctive use of surface water and groundwater to optimize the supply and demand balance. Through conjunctive use, the timing of groundwater extractions can be used to meet varying demands. In the past, LADWP prevented groundwater overdraft during multiple dry years through strategic pumping. When successive dry years occured, LADWP pumped at greater than average rates for the first few years of the drought, and then pumped at lower rates in subsequent years.

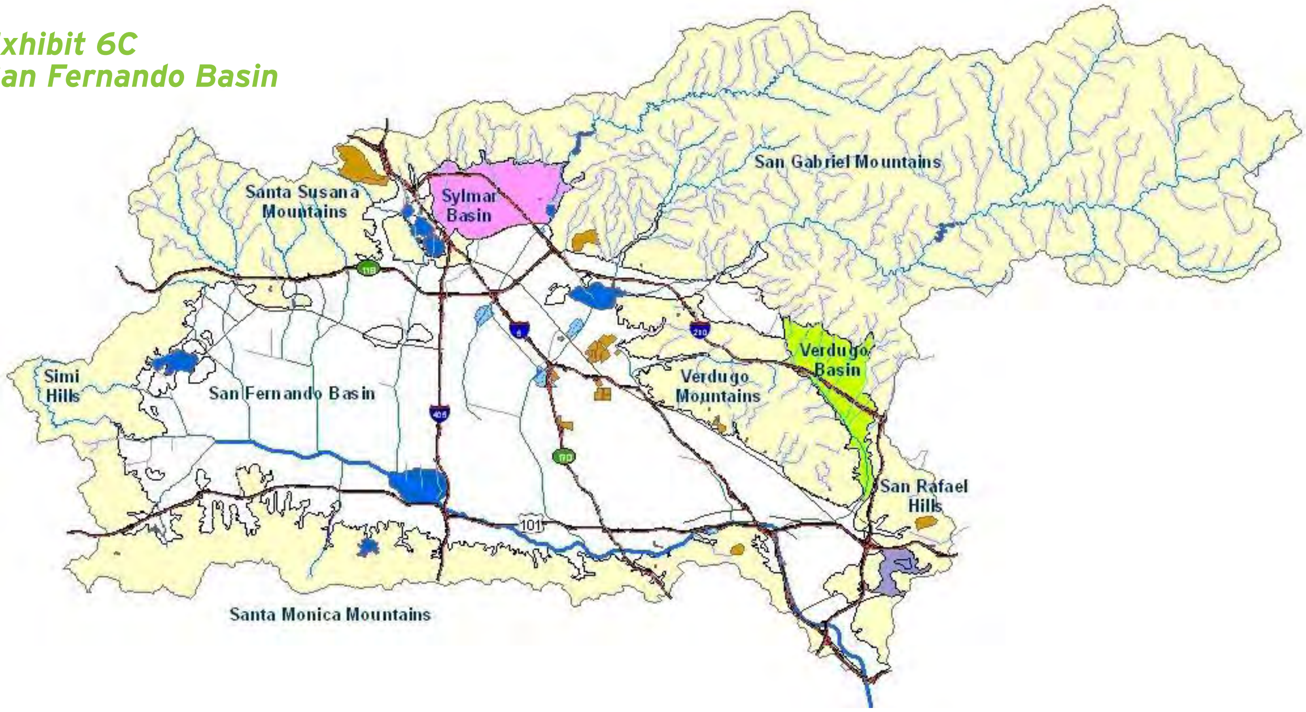
Since 2007, groundwater contamination issues in the SFB have greatly limited LADWP's ability to pump its full groundwater entitlement. As a result, LADWP has been pumping the maximum amount of water not impacted by contamination and therefore has not been able to utilize conjunctive use strategies for groundwater operations. When the clean-up of the SFB is complete, LADWP will be able to return to these strategic pumping strategies to ensure reliability and protect against groundwater overdraft in dry years.

6.2 San Fernando Basin

The primary source of local groundwater for the City is the SFB, which provided over 79 percent of the City's groundwater supply ranging from 35,486 AFY to 75,640 AFY during the period FY 2005/06 to FY 2009/10. The SFB is the largest of the four ULARA basins. The SFB consists of 112,000 acres and comprises 91.2 percent of the total area in ULARA. It is bounded on the east by the Verdugo Mountains; on the north by the Little Tujunga Syncline and the San Gabriel and Santa Susana Mountains; on west by the Simi Hills; and on the south by the Santa Monica Mountains. A map of the basin is shown in Exhibit 6C. (ULARA Watermaster Service Report, Water Year [October to September] 2008/09)

LADWP has ten major wellfields within the SFB containing 115 wells: the Crystal Springs, Headworks, Tujunga, Rinaldi-Toluca, North Hollywood, Erwin, Verdugo, Whitnall, Pollock, and North Hollywood Operable Unit Wellfields. Of the ten major wellfields, LADWP is currently not pumping only at Headworks. These wells were generally installed over a period spanning from 1924 to 1991, with the most recent installations being the Rinaldi-Toluca Wellfield in 1988 and the Tujunga Wellfield in 1991. Collectively these ten wellfields have the ability to pump and serve approximately 547 cubic feet per second (cfs) of water, of which the recent Rinaldi-Toluca and Tujunga wells comprise about 38 percent or 210 cfs.

Exhibit 6C
San Fernando Basin



Groundwater Rights

In accordance with the San Fernando Judgment, the City has the right to all native water within the SFB, based on its Pueblo Rights, and has the right to City water that is imported and returns through infiltration into the SFB. With the native safe yield being fixed at 43,660 AFY and the return of imported water averaging approximately 43,000 AFY, the combined total equates to an average SFB entitlement for the City of approximately 87,000 AFY. The return of imported water right for LADWP is based on 20.8 percent of all water delivered within the San Fernando Basin including recycled water. The Judgment provides for storage of water within the basin when the amount pumped is less than the annual entitlement, and a portion of these stored water credits can be pumped in future years to supplement the City's water supply. The direct spreading of both imported and recycled water receives 100 percent stored water credit. Increasing LADWP's groundwater pumping rights due to stormwater capture activities will require an amendment to the San Fernando Judgment based on a demonstrated increase in groundwater levels.

In September 2007, the Cities of Los Angeles, Glendale and Burbank entered into a ten-year Interim Agreement for the Preservation of the San Fernando Basin Water Supply (Interim Agreement). The Interim Agreement is intended to address the overall long-term decrease in stored groundwater within the basin. The Interim Agreement restricts withdrawal of stored water credits and incorporates basin losses into groundwater basin accounting.

Under the Interim Agreement, stored water credits will be reduced for each party by 1 percent annually to account for outflow from the basin. Additionally as described in the Interim Agreement, a proportion of stored water credits available for use during a water year (Available Credits) will be calculated each year, and that proportion not available for use during a given year (Reserve Credits) will be reserved for later use. As of October 1, 2009, the City had a stored water credit of nearly 406,313 AF in the SFB, however LADWP's Available Credit or maximum allowable withdrawal of stored water credits for the year beginning October 1, 2009 was 108,574 AF. LADWP's Reserve Credits total was 321,316 AF. Reserve Credits (stored water credits minus available stored water credits) will not be available until groundwater levels in the basin recover to a level that will allow for their safe withdrawal. Total Reserve Credits held by all parties in the basin were 376,433 AF as of October 1, 2009.

Water Quality

During well testing in the SFB, trace levels of the contaminants trichloroethylene (TCE), perchloroethylene (PCE), and other volatile organic compounds (VOCs) were detected in the past. The presence of these contaminants is due to improper chemical disposal practices historically conducted by numerous companies in the San Fernando Valley utilizing such materials. Additionally, in the 1990s, detectable amounts of hexavalent chromium and perchlorate were found in various wells within the SFB. Since the 1990s, SFB wells have also shown a trend of increasing nitrate levels. The source of nitrates is the result of decades of agricultural activity in the San Fernando Valley.

While LADWP is permitted to withdraw its allotted entitlement of 87,000 AFY from the SFB including a portion of its additional stored water, 2007 was the first year LADWP was unable to pump its allotted entitlement due to contamination impacts. LADWP has 115 wells in the SFB of which 57 wells have been inactivated due to contamination. These inactive wells represent a lost pumping capacity of approximately 236 cfs or 44 percent of LADWP's pumping capacity. Of the remaining 58 active wells, with a combined pumping capacity of approximately 304 cfs, 45 have recorded concentrations for various contaminants above the Maximum Contaminant Level (MCL). Most notable among these contaminants of concern are the VOCs (especially TCE, PCE, and carbon tetrachloride), nitrates, and perchlorate. The remaining 13 wells have recorded marginal levels of contamination, mostly due to VOCs. Hexavalent chromium threatens to be a significant future risk to LADWP's wells. Lastly, LADWP's two largest wellfields, Tujunga and Rinaldi-Toluca, which were the most recently-installed wells in an area believed to be outside the known contamination areas, are being significantly impacted by unknown contamination sources.

LADWP has developed programs to accelerate treatment for the SFB groundwater which includes a comprehensive Groundwater System Improvement Study, installing monitoring wells, interim wellhead treatment, and working with regulatory agencies and government officials to identify those responsible for the contamination.

Agency Cooperation of SFB Remediation

LADWP actively coordinates with the CDPH, LARWQCB, CDTSC, and USEPA to pursue protective and remedial measures for the SFB. The CDPH, LARWQCB, and CDTSC are the three regulatory agencies with enforcement responsibilities within the SFB. The LARRWQCB and the CDTSC issue enforcement directives for pollutant sites and guide the development of cleanup workplans and the cleanup of polluted groundwater sites. The CDPH oversees the quality of potable water from groundwater sources.

In 1987, LADWP entered into a Cooperative Agreement with the USEPA to conduct the "Remedial Investigation of Groundwater Contamination in the San Fernando Valley." Under this agreement, LADWP has received funds from the USEPA's Superfund Program to carry out: (1) construction, operation, and maintenance of the North Hollywood Operable Unit, which consists of a groundwater treatment facility and a system of eight production wells (construction completed in 1989); and (2) completion of the Remedial Investigation to characterize the SFB and the nature and extent of its groundwater contamination. The Remedial Investigation included: (a) the installation in 1992 of 88 shallow and clustered monitoring wells that were developed to monitor contamination plumes of TCE, PCE, and nitrates in the SFB; (b) the development of a groundwater flow model (Flow Model) and the preparation of the Remedial Investigation report that was completed for the USEPA in 1992; and (c) on-going monitoring for TCE, PCE, nitrates, and emerging contaminants.

The Flow Model is a three-dimensional computer simulated model of the SFB based on the MODFLOW model program code that was developed by the United States Geological Survey. It consists of four layers that represent the various depth zones of the SFB. Geologic and hydrogeologic data for the basin, which was generated through field investigation, was analyzed to develop the physical site characterization of the basin for the MODFLOW Flow Model. The Flow Model produced simulated groundwater levels, gradients, and their fluctuations as a function of time. Based on field monitoring and Flow Model simulations, groundwater production strategies are reviewed and adjusted monthly to balance the City's water supply need with SFB management.

San Fernando Basin Treatment

In coordination with other agencies, LADWP has completed or is planning various projects to maintain its rights to use the SFB as a reliable local water supply for the City. The following are some of LADWP's completed, current, and planned projects for the SFB. Recharge projects are discussed separately in Chapter 7, Watershed Management.

Groundwater System Improvement Study
LADWP is working on a 6-year, $19.0-million Groundwater System Improvement Study (GSIS) in the SFB that will provide vital information to assist in developing both short- and long-term projects to maximize the use of the SFB. The $11.5-million GSIS professional service contract was awarded in February 2009.

The GSIS will aim to cover the following main objectives:

- Provide an independent study to identify, characterize, and evaluate emerging water quality constituents for the San Fernando Basin.

- Provide an independent expert evaluation of LADWP's existing groundwater facilities and its current operational strategies to address current issues on water quality regulations and groundwater treatments. Provide expert advice on the need of refurbishing existing groundwater wells.

- Research and evaluate the need for the installation of new monitoring wells in the SFB to characterize the basin for the constituents of concern.

- Develop a research monitoring program to characterize the nature and extent of the various constituents of concern that may pose a risk to LADWP maximizing the utility of the SFB.

- Provide independent expert recommendations on economically feasible short and long-term capital improvement projects to address all regulatory agency requirements.

Through the GSIS, LADWP has begun developing a conceptual layout for Groundwater Treatment Facilities in the SFB that will include treatment facilities in the vicinity of LADWP's North Hollywood, Rinaldi-Toluca, and Tujunga Well Fields. It is anticipated that construction of the Groundwater Treatment Facilities could begin as early as July 2016. Construction of the Groundwater Treatment Facilities will greatly reduce LADWP's reliance on costly and scarce imported water supplies. The Groundwater Treatment Facilities will also enable LADWP to benefit from its activities to enhance local supplies through groundwater recharge and stormwater projects. An integral part of LADWP's Groundwater Treatment Facilities will be to work closely with the USEPA and the Cities of Burbank and Glendale to ensure that the facilities operations do not adversely affect the on-going cleanup activities being conducted by the aforementioned agencies. Towards this end, LADWP plans to enter into a Groundwater Management Plan with the USEPA.

As of November 2010, the work progress has included: a technical review of USEPA's Focused Feasibility Study for the North Hollywood Operable Unit; preparation of conceptual layouts and renderings for the proposed Groundwater Treatment Facilities in the vicinity of the North Hollywood, Rinaldi-Toluca and Tujunga Well Fields; providing assistance in the planning aspects for the installation of approximately 40 new monitoring wells in the San Fernando Basin; and providing an independent study to identify, characterize and evaluate emerging water constituents.

Tujunga Wellfield Joint Project
LADWP and MWD have developed a joint project utilizing simple liquid-phase granular activated carbon to recover the use of two of the City's contaminated groundwater production wells in the Tujunga Wellfield. The total estimated cost of this project was approximately $7.0 million and was completed in November 2009. LADWP received the permit from the CDPH in May 2010 and started to discharge into the distribution system on May 18, 2010.

Tujunga Wellfield Contamination
The Initial Discovery of the source of contamination at the Tujunga Wellfield by the USEPA and CDTSC is ongoing. Phase I is completed and has not conclusively identified the source of the contamination. The next phase will involve drilling 4 to 7 deep monitoring wells immediately up gradient of the wellfield to determine the direction of the contamination plumes. The well drilling is expected to be completed late 2012. LADWP is intending to construct up to 22 additional monitoring wells near other wellfields south of the Tujunga Wellfield. Water quality data from the new monitoring wells will assist with further characterizing the groundwater contamination in the SFB. Drilling of these additional wells is expected to begin in Fall 2011 and continue until Winter 2013.

North Hollywood Operable Unit

In 1989, the North Hollywood Operable Unit was placed into service with a capacity of 2,000 gallons per minute, or 3,230 AFY. This facility has one aeration tower with vapor-phase granular activated carbon air emissions control system. This technology uses air to remove the VOCs from the groundwater and uses the vapor-phase granular activated carbon to remove the VOCs from the air stream before it exits into the atmosphere. The fifteen year consent decree expired on December 31, 2004, however, the VOC plume has not been completely remediated. In Water Year 2008/2009, 1,038 AF of VOC contaminated groundwater was treated.

The USEPA is expected to start construction of the North Hollywood Operable Unit Second Remedy possibly as soon as 2014 to improve containment of contamination from two sites, the Honeywell and Lockheed sites. The primary plume contains high concentrations of VOCs, chromium, and other contaminants of concern. The USEPA issued the Record of Decision in September of 2009. The first technical meeting with the potentially responsible party was held in July 2010. A consent decree is expected in late 2011. The Record of Decision recommends more than doubling the capacity plus adding liquid phase granular activated carbon (a secondary treatment), construction of up to 37 monitoring wells, three new extraction wells, deepen existing well #1, rehabilitation of existing wells, and treatment of chromium and 1-4 Dioxane. As of 2010, Honeywell is continuing its removal of chromium plume at the source of contamination.

Chromium Treatment Research

A cost-effective treatment technology to remove low levels of hexavalent chromium from water does not exist for large scale applications. In 2001, LADWP, along with the Cities of Burbank, Glendale, and San Fernando, and the National Water Research Institute, entered into a research partnership with the American Water Works Association Research Foundation to identify and bench-test new technologies that can remove hexavalent chromium to extremely low levels. This research is being conducted in anticipation of a new standard for hexavalent chromium.

Pollock Wells Treatment Plant

In 1999, the Pollock Wells Treatment Plant was constructed and placed in service. This project was funded by LADWP, and it includes a groundwater treatment facility with four liquid-phase granular activated carbon units. Over 3,000 gallons per minute (4,840 AFY) of groundwater is treated by direct adsorption with granular activated carbon to remove VOCs before delivery to customers.

Remedial Investigation

In 1992, the Remedial Investigation to characterize the nature and extent of groundwater contamination in the SFB was completed for the USEPA. The Remedial Investigation activity included the construction of 88 shallow and clustered monitoring wells, which were developed to monitor contamination plumes of TCE, PCE, and nitrates in the SFB. These monitoring wells are also being used to monitor for emerging chemicals.

Biological Treatment Pilot Test

LADWP will be studying the effectiveness of biological treatment on removal of VOCs contaminants from the Tujunga Wellfield groundwater. Biological treatment is a proven technology for removal of perchlorate and nitrate contaminants from groundwater which are also present in the Tujunga Wellfield groundwater. If biological treatment can also effectively remove VOCs from the groundwater, LADWP can significantly reduce the capital as well as future operations and maintenance costs associated with cleanup and removal of contaminants from the Tujunga Wellfield groundwater.

Pilot Test of Advance and Emerging Groundwater Treatment Technologies

LADWP is investigating the utilization of other advance and/or emerging groundwater treatment technologies for removal of VOCs and perchlorate for possible pilot study(ies) at the Rinaldi-Toluca Wellfield within the next few years.

6.3 Sylmar and Eagle Rock Basins

The Sylmar Basin has provided slightly over 4 percent of the City's local groundwater ranging from 576 AF to 4,046 AF from FY 2005/06 through FY 2009/10. The Sylmar Basin, in the northern part of ULARA, consists of 5,600 acres and comprises 4.6 percent of the ULARA area. It is bounded on the north and east by the San Gabriel Mountains; on the west by a topographic divide in the valley fill between the Mission Hills and the San Gabriel Mountains; and on the south by the Little Tujunga syncline, which separates it from the SFB. (ULARA Watermaster Service Report, Water Year 2008/09) LADWP originally had a total of 3 production wells installed in the Sylmar Basin between 1961 and 1977. One of these wells was removed from service and is no longer utilized. The remaining wells have the capacity to pump 5 cfs.

The Eagle Rock Basin is the smallest of the four basins. It is located in the extreme southeast corner of ULARA. It consists of 800 acres and comprises 0.6 percent of the total ULARA area. LADWP is not pumping in the Eagle Rock Basin currently. The safe yield of Eagle Rock Basin is derived from imported water delivered by LADWP. There is no measurable native safe yield. LADWP has the right to extract the entire safe yield of the basin. Currently, the groundwater is being pumped by a private party and LADWP is reimbursed for such pumping in accordance with the San Fernando Judgment.

Groundwater Rights

In 1996 upon the recommendation of the Watermaster, the ULARA Administrative Committee approved a temporary safe yield increase for the Sylmar Basin thus temporarily increasing LADWP's rights from 3,105 AFY to 3,255 AFY for a ten-year period. Per the 1984 Stipulation, the safe yield minus private party overlying rights are to be equally split between LADWP and the City of San Fernando. In 2006, a subsequent evaluation of the safe yield was conducted and completed in accordance with Section 8.2.10 of the 1984 Stipulation. Upon recommendation of the parties, the Court approved a new stipulation further increasing the temporary safe yield of the basin and resulting in a temporary increase in LADWP's rights to 3,405 AFY subject to multiple conditions. Conditions imposed on LADWP and the City of San Fernando include installing groundwater monitoring wells to assist in determining basin outflows. This new stipulation became effective on October 1, 2006 and is set to expire on October 1, 2016.

Stored water credits accumulated in the basin are determined by adding the previous years stored water credit and the extraction right for the previous year together and then subtracting the actual extractions for the previous year. As of October 1, 2009, LADWP has accrued 9,423 AF of stored water credits in the Sylmar Basin. In 2006, the Watermaster recommended LADWP to begin pumping these rights due to the large amount of stored water credits. LADWP has proposed the Mission Wells Improvement Project to initiate pumping the credits and to replace the existing wells that have significantly deteriorated. As proposed, the project consists of constructing a water tank, three wells, and other operational facilities at the Mission Wellfield. Phase 1 was completed in February 2009 and involved replacement of the water tank that was beyond its useful life. Phase 2 is in the planning stages and consists of three new wells with operational facilities and is forecast for completion in August 2014. These new facilities will allow LADWP to pump its current entitlement of 3,405 AFY on an annual basis and draw from its existing stored water credits.

Water Quality

Groundwater quality issues have occurred in the Sylmar Basin related to TCE contamination at one of the two production wells. The effluent from the wellfield is managed in such a way that the groundwater quality meets or surpasses water quality standards. Primary limitations on pumping are related to the deterioration of pumping facilities and not contamination. However, the Mission Wells Improvement Project as previously discussed, will replace the deteriorated wells and increase production capacity to allow LADWP to pump its annual water rights.

6.4 Central Basin

From FY 2005/2006 through FY 2009/10, the Central Basin has provided on average approximately 17 percent of LADWP's local groundwater supply ranging from 11,766 AF to 13,358 AF through wells in two major production fields. The Central Basin Watermaster Service area overlies about 227 square miles of the Central Basin in the southeastern part of the Los Angeles Coastal Plain in Los Angeles County. The Watermaster Service Area is bounded by the Newport-Inglewood Uplift on the southwest, the Los Angeles-Orange County line on the southeast, and an irregular line that approximately follows Stocker Street, Martin Luther King Boulevard, Alameda Street, Olympic Boulevard, the boundary between the City of Los Angeles and unincorporated East Los Angeles, and the foot of the Merced and Puente Hills on the north. Twenty-three incorporated cities and several unincorporated areas are within the Central Basin Watermaster Service Area. Groundwater within the basin provides a large portion of the water supply needed by overlying residents and industries. In FY 2008/09, there were 140 parties with rights to water within the Central Basin (Central Basin Watermaster Service Report, FY 2009/10).

Two LADWP facilities provide groundwater supplies in the Central Basin, the Manhattan Wells and the 99th Street Wells. The active Manhattan Wells were installed between 1928 and 1974 and have a production capacity of 16.9 cfs. Wells at the 99 th Street location were installed between 1974 and 2002 and have a production capacity of 7.4 cfs.

While the 99th Street Wells are newer and have relatively little mechanical or other problems, the Manhattan Wells are much older and have experienced maintenance problems and are approaching the end of their useful life. To restore the City's pumping capacity, LADWP is working on plans to install two new production wells, replace two deteriorated wells, and improve other related facilities at the Manhattan Wells site.

Groundwater Rights

More than 50 years ago, groundwater overdraft and declining water levels in the Central Basin threatened the area's groundwater supply and caused seawater intrusion in the southern part of the Central Basin. However, timely legal action and adjudication of the water rights halted the overdraft and prevented further damage to the Central Basin. Today, groundwater use in the Central Basin is restricted to the allowed pumping allocations by a 1966 Superior Court Judgment and is monitored by a court-appointed Watermaster, the Department of Water Resources (DWR). Annually, the Watermaster prepares a Watermaster Service Report indicating groundwater extractions, replenishment operations, imported water use, recycled water use, finances of Watermaster services, administration of the water exchange pool, and significant water-related events in the Central Basin.

The City's entitlement in the Central Basin of 15,000 AFY was established in a judgment by the Superior Court of the State of California for the County of Los Angeles through the Central Basin Judgment (Case No. 786,656 –second amended judgment). In addition to its annual entitlement, the Central Basin Judgment allows for carryover of unused water rights up to a maximum total cumulative amount of 20 percent of the purveyor's pumping allocation and also allows for over extraction of an additional 20 percent under emergency situations that would be debited against the purveyor's following year entitlement. The City uses its carryover storage right for operational flexibility and conjunctive use. LADWP has allowable carryover storage of 3,000 AF into FY 2010/11.

The Central Basin or West Coast Basin Judgements do not permit storing water in the basin for later extraction. Through the assistance of a facilitator, multiple parties with groundwater rights have developed a draft framework to allow conjunctive use groundwater storage in the basins and are seeking amendment of the Judgments to allow groundwater storage. Two separate cases are currently in the Superior Court on the storage framework issue.

Water Quality

Although the Manhattan and 99th Street Well fields in the Central Basin are located only approximately 4 miles apart, there is a large difference in water quality between the facilities. One of the Manhattan Wells currently exceeds the MCL of 5 ppb for TCE. The effluent from the wellfield is managed in such a way that the groundwater quality meets or surpasses water quality standards.

Water from 99th Street Wellfield complies with the National Primary Drinking Water Regulations, but requires treatment to comply with the National Secondary Drinking Water Regulations for manganese and iron. These contaminants are not considered to present a risk to human health, but at existing concentrations the contaminants may present taste, color, and odor problems. Corrosion control treatment using zinc orthophosphate as a sequestering agent and sodium hypochlorite to oxidize manganese has been in place at the wellfield for twenty years. Hydrogen sulfide is also present but not an imminent threat to the reliability of this well supply when chlorinated. In 2002, two new wells were drilled and placed into operation. During the first several months of operation of the new wells, numerous color complaints were received from customers. Adjustments in the treatment process were made which improved water quality.

6.5 West Coast Basin

LADWP has not been able to pump its water entitlement from the West Coast Basin since 1980 due to localized groundwater contamination issues and deterioration of the wells at the Lomita Wellfield. The West Coast Basin underlies 160 square miles in the southwestern part of the Los Angeles Coastal Plain in Los Angeles County. The West Coast Basin is bounded on the west by Santa Monica Bay, on the north by Ballona Escarpment, on the east by the Newport-Inglewood Uplift, and on the south by San Pedro Bay and the Palos Verdes Hills. Twenty incorporated cities and several unincorporated areas overlie the West Coast Basin (West Coast Basin Watermaster Service Report, FY 2009/10).

Groundwater Rights

In 1945, when intrusion of sea water caused by declining water levels threatened the quality of the groundwater supply, legal action was taken to halt the overdraft and prevent further damage to the West Coast Basin. In 1955, the Superior Court of Los Angeles County appointed the DWR as the Watermaster to administer an Interim Agreement, and in 1961, the Court retained the DWR as the Watermaster of the Final West Coast Basin Judgment (Case No. 506,806 –amended judgment). Similar to the Central Coast Basin, an annual Watermaster Service Report is prepared. The West Coast Basin Judgment provided the City with a right to 1,503 AFY of groundwater.

Water Quality

Groundwater quality problems in the West Coast Basin were previously related to high levels of total dissolved solids and chlorides. LADWP halted operations in the basin in September of 1980 with closure of the Lomita Well Field, and intends to study the feasibility and cost of restoring groundwater pumping.

6.6 Unadjudicated Basins

The Central and West Los Angeles Areas include the Hollywood Basin and Santa Monica Basin. Both Basins are unadjudicated. In the past, LADWP studied the potential for utilizing these basins for increased groundwater supply. It was determined that developing groundwater was not recommended due to water quality and cost considerations. However, LADWP intends to revisit the potential for increased groundwater production from these two basins. It is anticipated that available supplies remain low and water quality issues remain, but as the cost of imported water increases, it is prudent to reconsider this local water source.

6.7 Water Quality Goals and Management

The groundwater management efforts that LADWP has undertaken have resulted in all groundwater delivered to customers meeting or exceeding all water quality regulations. As part of its regulatory compliance efforts, LADWP works with the CDPH to perform water quality testing on production and monitoring wells.

Groundwater Monitoring

LADWP conducts extensive field and laboratory tests throughout the year for hundreds of different chemicals, such as arsenic, chromium, lead, and disinfection by-products, to ensure that they are will within the safe levels before we serve the water to our customers.

Every well that is pumped to supply water to the City is actively monitored by LADWP as required by CDPH. LADWP's groundwater monitoring program is comprised of several distinct components, including monitoring of metals, coliform bacteria, inorganics, volatile organic

Exhibit 6D
Operating Limits of Regulated Compounds

Compound	State of California Limit	LADWP Operational Goals	LADWP Added Safety Margin
Trichloroethylene (TCE)	5 ppb	3 ppb	40%
Perchloroethylene (PCE)	5 ppb	3 ppb	40%
Nitrate ($N0_3$)	45 ppm	30 ppm	33%
Perchlorate (CIO_4)	6 ppb	4 ppb	33%
Total Chromium	50 ppb	30 ppb	40%

compounds (VOCs) and unregulated compounds such as vanadium, boron, and perchlorate. The frequency and level of monitoring (i.e., annually, quarterly, or monthly), depending on the level of contamination found in each well.

Monitoring for all contaminants is performed at entry points into the distribution system in close proximity to where the water is being pumped from the wells. If water quality problems are detected, the well source is immediately isolated and retested.

Operating Goals

LADWP has established operating goals for TCE, PCE, nitrates, perchlorate, and total chromium that are more stringent than the maximum contaminant levels (MCLs) permitted by Federal or State regulations. These stricter operational goals provide an additional safety margin from these contaminants for City customers. Exhibit 6D summarizes these water quality goals and compares them with the State-regulated requirements, which are generally more stringent than Federal requirements.

TCE and PCE compounds are commonly used in industries requiring metal degreasing. PCE is also used in dry cleaning and automotive repair industries.

Nitrate is a concern because of its acute effect of impeding the uptake of oxygen to the blood. Infants (who are in the earliest stages of development) are most sensitive to the effects of nitrates. The current standard for nitrate is 45 parts per million (ppm). A single exceedence of the nitrate standard is classified as an acute violation requiring immediate public notification. Treatment for nitrates may eventually become necessary for affected City groundwater supplies.

In October 2007, a MCL was adopted for perchlorate of 6 ppb. Perchlorate is an inorganic compound that is most commonly used in the manufacture of rocket fuels, munitions, and fireworks. In addition to its detection in groundwater, the compound has also been detected in Colorado River Aqueduct water.

Managing Emerging Contaminants of Concern

LADWP addresses emerging contaminants on many levels: 1) by encouraging the development of standardized testing to enable early detection and supporting the regulatory framework by providing early occurrence data, 2) by advocating good science and a balanced approach to risk assessment, 3) by seeking to gain a risk perspective with other existing contaminants to manage the emerging contaminants in the absence of regulations, 4) by supporting early interpretation of emerging contaminants in collaboration with research and regulatory agencies, and 5) by supporting the research to develop cost-effective treatment for the removal and management of these emerging contaminants.

An example of how LADWP addresses an emerging contaminant is chromium VI (otherwise known as hexavalent chromium). Hexavalent chromium does not have an enforceable drinking water standard at this time. However, hexavalent chromium is included in the State total chromium standard of 50 ppb. CDPH is expected to establish drinking water standards for the compound in the near future. Chromium is a heavy metal that has been used in industry for various purposes including electroplating, leather tanning, and textile manufacturing, as well as controlling biofilm formation in cooling towers. LADWP began low level monitoring of hexavalent chromium long before monitoring was required by regulators. LADWP supported new health-effects research needed to support risk assessment, and advocated a balanced approach to risk management. LADWP funded research to develop new treatment technologies to reduce hexavalent chromium detection levels.

Most recent among emerging contaminants are pharmaceutically active compounds and personal care products that are finding their way into rivers, lakes, and waterways from urbanized areas. There are concerns about the occurrence and effects of endocrine disrupters, hormone-shifting compounds, and pharmaceuticals. Technology now allows the detection of compounds down to the parts per trillion levels, thus some of these compounds are now being detected. The risk assessment field is finding it difficult to keep pace with advances in analytical detection technology. The question of these contaminants posing a health risk at low levels needs more investigation. LADWP will continue to proactively address emerging contaminants through early monitoring and utilization of a balanced approach to risk management.

LADWP will be incorporating appropriate treatment processes into future groundwater treatment facilities. LADWP has and will continue to solicit input from stakeholders to properly plan and develop processes for removal and treatment of emerging contaminants. LADWP's Recycled Water Advisory Group (RWAG) is an example of ongoing efforts to solicit input.

Exhibit 6E
Historical Cost of Groundwater Pumping

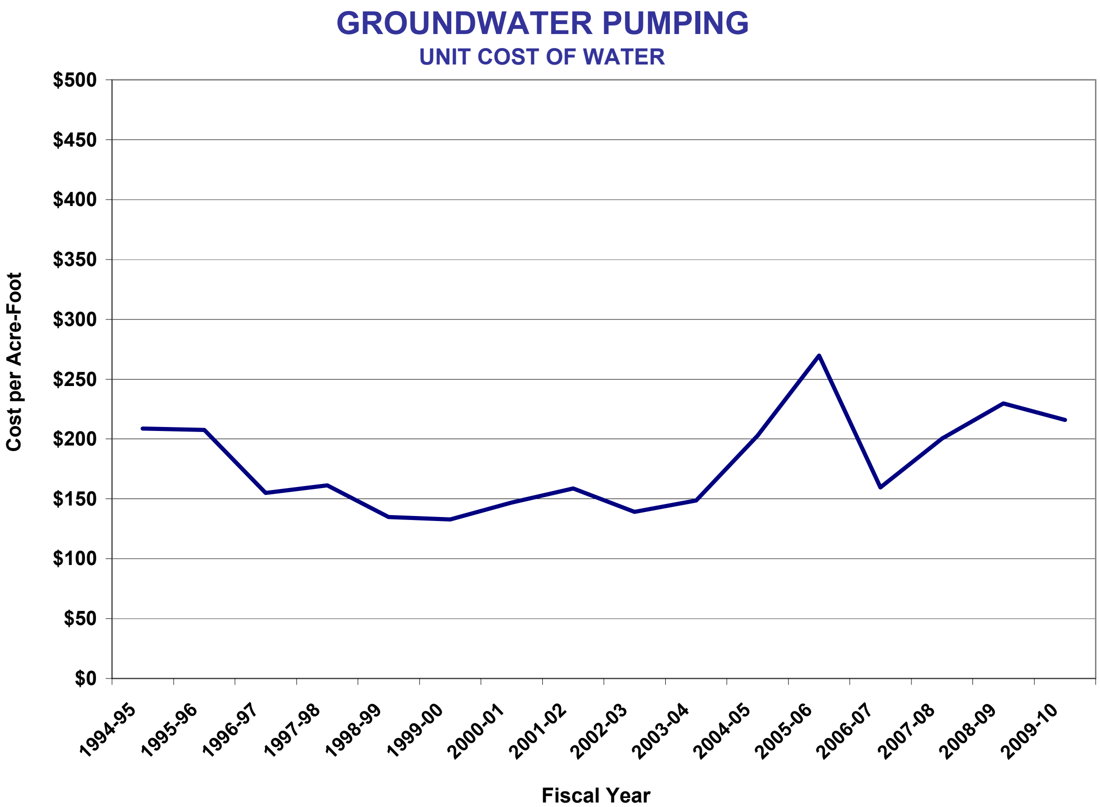


Exhibit 6F
Annual Unit Cost ($/AF)

Fiscal Year	2005/06	2006/07	2007/08	2008/09	2009/10
Unit Cost	$270	$160	$200	$230	$216

6.8 Groundwater Pumping Cost

The costs associated with groundwater pumping are primarily operation and maintenance costs. Therefore, the unit cost of groundwater pumping varies mainly with the quantity of water delivered. Exhibit 6E summarizes the historical unit cost of groundwater pumping.

Exhibit 6F shows the unit cost of groundwater pumping from FY 2005/2006 to FY 2009/2010. The 5-year average was $215/AF.

6.9 Groundwater Production Projections

Historically, with conjunctive use management of groundwater, storing imported water in the groundwater basins during wet and normal years, groundwater production can actually be increased during dry years. LADWP operated its groundwater resources in this manner. On average, LADWP pumped its adjudicated right of approximately 107,000 AFY, but in dry years LADWP could pump larger quantities of groundwater. For the purposes of an average, single-dry, and multi-dry year analysis, after the implementation of groundwater treatment for the SFB and completing the construction of new wells in the Sylmar and Central Basins, 110,405

AFY is assumed to be the City's local groundwater production in 2035. After completion of groundwater treatment for the SFB, if successive dry years occur, LADWP would likely pump at greater-than-average levels for the first few dry years, then start pumping at lower levels in order to prevent groundwater overdraft. LADWP would then replenish the groundwater in wet or normal years following the successive dry period. Exhibit 6G provides groundwater pumping projections by basin between 2010 and 2035 for average, single-dry, and multi-year dry weather conditions in five-year increments.

Not included in the figure below is increased groundwater pumping due to groundwater replenishment of advanced treated wastewater, as well as enhanced stormwater recharge. This Urban Water Management Plan projects increased groundwater pumping through groundwater replenishment of advanced treated wastewater of 15,000 AFY, and increased groundwater pumping through enhanced stormwater recharge of and additional 15,000 AFY, both by 2035.

Exhibit 6G
Groundwater Production 2010 to 2035 for Average, Single-Dry, and Multi-Year Dry Weather Conditions

Basin	FY 2009/10	FY 2014/15	FY 2019/20	FY 2024/25	FY 2029/30	FY 2034/35
	AFY					
San Fernando	62,218	21,000	76,800	92,000	92,000	92,000
Sylmar	2,998	4,500	4,500	4,500	4,500	3,405
Central	11,766	15,000	15,000	15,000	15,000	15,000
Total	76,982	40,500	96,300	111,500	111,500	110,405

- 2015 San Fernando pumping levels are decreased due to anticipated well contamination from plume migration.
- Assumes existing annual rights to 87,000 AFY in SFB will remain unchanged. The groundwater treatment facilities are expected to be in operation in FY 2020/21. Storage credit of 5,000 AFY will be used to maximize the pumping thereafter.
- Sylmar Basin production temporarily increases to 4,500 AFY to avoid the expiration of stored water credits then return back to the entitlement of 3,405 AFY in FY 2030/31.

Chapter Seven

Watershed Management

7.0 Overview

This Urban Water Management Plan projects that additional stormwater capture projects will provide for increased groundwater pumping rights in the San Fernando Basin of 15,000 AFY. Stormwater capture projects will also provide 10,000 AFY of additional water conservation from capture and reuse solutions such as rain barrels and cisterns, for a total of 25,000 AFY by fiscal year ending 2035. The Stormwater Capture Master Plan (refer to Section 7.3 below) will comprehensively evaluate stormwater capture potential within the City.

Stormwater runoff from urban areas is an underutilized resource. Within the City of Los Angeles, the majority of stormwater runoff is directed to storm drains and ultimately channeled into the ocean. Unused stormwater reaching the ocean carries with it many pollutants that are harmful to marine life. In addition, local groundwater aquifers that should be replenished by stormwater are receiving less recharge than in the past due to increased urbanization. Urbanization has increased the City's hardscape, which has resulted in less infiltration of stormwater and a decline in groundwater elevations.

In addition, development has encroached onto waterway floodplains requiring the channelization of these waterways that once recharged the groundwater aquifers with large volumes of stormwater runoff. When the floodplains were undergoing rapid development, LADWP and the Los Angeles County Flood Control District (LACFCD) reserved several parcels of land for use as spreading facilities. These facilities are adjacent to some of the largest tributaries of the Los Angeles River, and the Pacoima and Tujunga Washes.

During average and below average years, these spreading facilities are very effective at capturing a large portion of the stormwater flowing down the tributaries. However they are incapable of capturing a significant portion of the flows during wet and extremely wet years. Weather patterns in Los Angeles are highly variable, with many periods of dry years and wet years. Some climate studies predict that these patterns may become more extreme in the future.

Furthermore, a significant portion of the watershed is not located adjacent to large tributaries and therefore, cannot be served by existing spreading facilities. These areas are the urbanized low-lying flatlands that also produce stormwater, therefore a strategy to create and implement distributed stormwater infiltration solutions is needed. These distributed solutions include widespread, smaller projects at the neighborhood scale and landscape changes at the individual parcel scale.

With increased attention being placed on stormwater capture, other challenging conditions beyond imperviousness and climate patterns have been identified.

These include antiquated spreading facilities, landfills adjacent to spreading facilities, floodplain encroachment, substructures, and other man-made conditions that limit the ability to capture stormwater for later use. Some conditions such as the antiquated delivery systems at the spreading facilities can easily be retrofitted with new gates and telemetry. Other conditions such as the presence of large sanitary landfills adjacent to spreading facilities, are more difficult to rectify.

In January 2008, LADWP created the Watershed Management Group which is responsible for developing and managing the water system's involvement in emerging issues associated with local and regional stormwater capture. The Watershed Management Group coordinates activities with other agencies, departments, stakeholders and community groups for the purpose of planning and developing projects and initiatives to improve stormwater management within the City. The Group's primary goal is to increase stormwater capture by enhancing existing centralized stormwater capture facilities and promoting distributed stormwater infiltration systems to achieve the City's long-term strategy of enhancing local stormwater capture. While working to increase stormwater capture for improving long-term groundwater reliability, other watershed benefits can be achieved including increased water conservation, improved water quality, open space enhancements, and flood control.

Additionally, the City is investigating recharge of the San Fernando Basin (SFB) with advanced treated recycled water. A more in-depth discussion of efforts to maximize groundwater recharge with advanced treated recycled water is provided in Chapter 4, Recycled Water.

7.1 Importance of Watershed Management to Groundwater Supplies

Managing native stormwater is a necessary step towards maintaining groundwater elevations in the underlying groundwater basin. Urbanization and its associated increase in impervious surfaces has altered the ability of groundwater basins to naturally replenish pumped groundwater. Stormwater systems in the City were designed primarily for flood control to convey stormwater runoff to the Pacific Ocean as quickly as possible, therefore minimizing the potential for flooding or damage to structures while maximizing land available for development. Within LADWP's service area, the SFB is the most amenable to regional stormwater capture and recharge through spreading basins because of its predominantly sandy soils. However, stormwater that once percolated into the groundwater in the underlying SFB is now being channeled across impervious surfaces then through concrete-lined canals or conduits to areas outside of the San Fernando Valley.

The essential task of watershed management is to retain as much stormwater runoff as possible for groundwater recharge. Groundwater recharge is the process of increasing an aquifer's water content through percolation of surface water. This occurs in the SFB primarily with captured stormwater but also with imported water. Groundwater recharge is essential to maintain groundwater supplies, address the overall long-term decrease in stored groundwater within the SFB, and ensure the long-term water supply reliability of the SFB. Furthermore, increasing groundwater recharge and improving groundwater levels in the SFB could potentially lead to larger pumping rights for LADWP in the future.

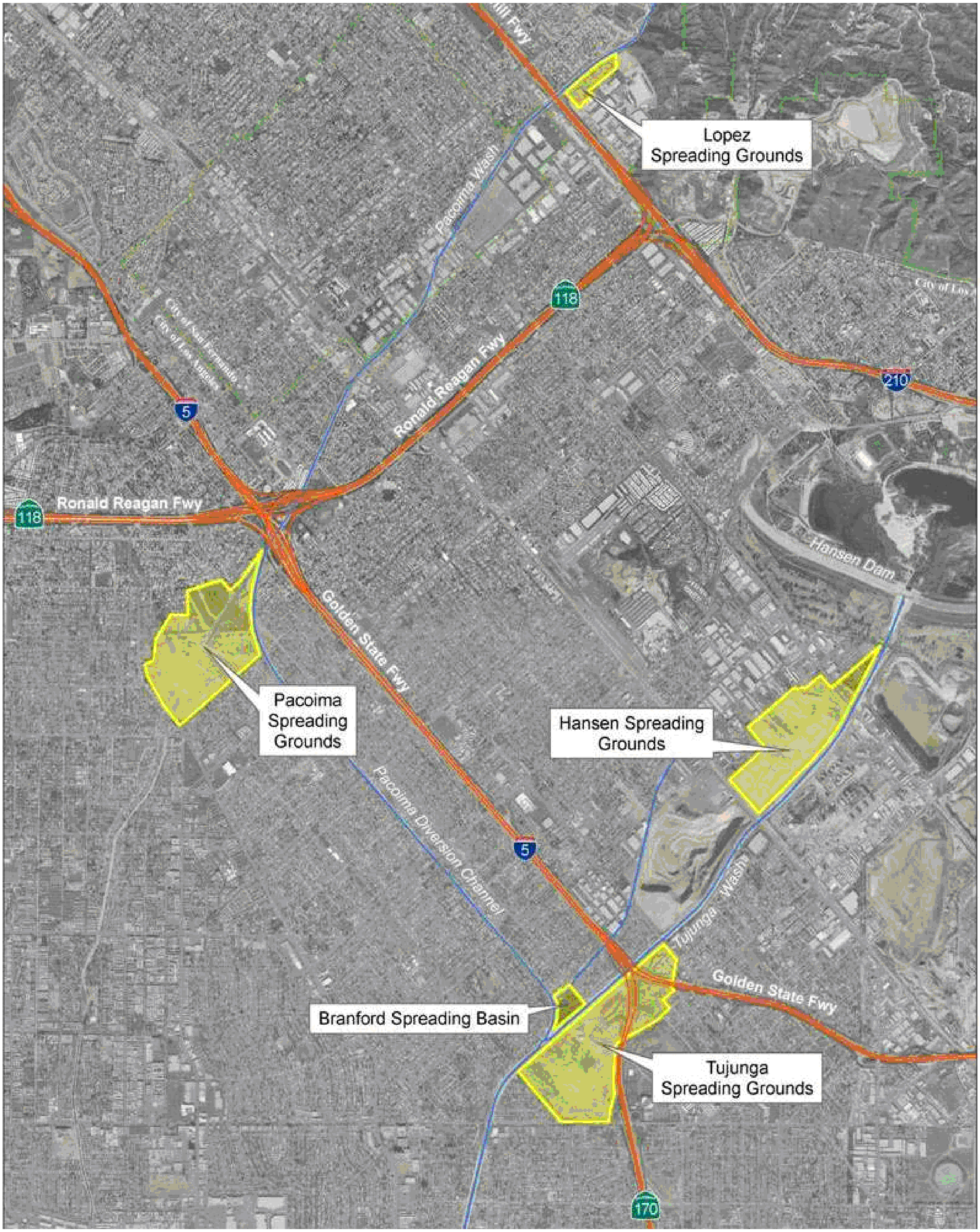
During storm events, large portions of stormwater are captured with existing facilities for spreading purposes. LADWP coordinates these activities with the LACFCD to effectively recharge the SFB through the spreading of native stormwater. Flood control facilities are the primary means to divert native runoff into the spreading ground facilities listed and mapped on Exhibits 7A and 7B. LACFCD oversees operations at the Branford, Hansen, Lopez, and Pacoima Spreading Grounds. The Tujunga Spreading Grounds are operated by LACFCD in partnership with LADWP. LADWP has the ability to spread imported supplies at the Tujunga Spreading Grounds and the Pacoima Spreading Grounds for storage in the SFB, but LADWP has not utilized imported water for groundwater recharge since 1998.

Exhibit 7A
SFB Spreading Grounds Operations Data

		Annual Spreading (AF)	
Facility	**Location**	**Average[1]**	**Historic High**
Branford	Mission Hills, CA	549	2,142
Hansen	Sun Valley, CA	13,834	35,192
Lopez	Lake View Terrace, CA	527	1,735
Pacoima	Pacoima, CA	6,453	22,972
Tujunga	Sun Valley, CA	4,419	21,115
	Total	25,782	83,156

1. Historic average through water year ending September 2009.

Exhibit 7B
Spreading Ground Facility Locations



7.2 Additional Benefits of Watershed Management

Watershed management provides additional important benefits to the City of Los Angeles, including surface water quality improvements, water conservation, open space enhancements, and flood control.

Water quality improvements are necessary because stormwater runoff is a conveyance mechanism that transports pollutants from the watershed into waterways and ultimately the Pacific Ocean. Pollutants include, but are not limited to, bacteria, oils, grease, trash, and heavy metals. The City must also comply with adopted Total Maximum Daily Loads (TMDLs) for pollutants. TMDLs set maximum limits for a specific pollutant that can be discharged to a water body without causing the water body to become impaired or limiting certain uses, such as water body contact during recreation. In 2008, the Los Angeles Board of Public Works adopted the Water Quality Compliance Master Plan for Urban Runoff (WQCMPUR). This 20-year plan provides a strategy for cleaning stormwater and runoff to protect the City's waterways and the Pacific Ocean. Capturing stormwater runoff for groundwater recharge removes a portion of the pollutant conveyance mechanism which reduces downstream pollution and thereby assists the City with water quality compliance and improving the overall health of its waterways.

Water conservation is achieved by enhancing the capture and management of localized runoff for local uses. Centralized and distributed mechanisms that provide for water conservation include spreading grounds, rain barrels, and residential cisterns.

Open space enhancement is an added benefit of groundwater recharge projects, which typically provide additional open space areas that may include passive and/or active recreation, educational opportunities, and habitat restoration. Most projects involve increasing vegetation and recreational amenities to create opportunities for wildlife habitat and a recreational/educational resource for the local community. Additionally, open space enhancements assist the City in improving the overall quality of life for residents.

Flood control benefits are achieved when additional storage capacity is added to the storm drain system. Groundwater recharge projects reduce potential flooding by diverting a portion of storm flows into recharge areas, thereby increasing the overall capacity of the storm drain system.

7.3 Stormwater Capture Master Plan

The Stormwater Capture Master Plan (Stormwater Plan) will investigate potential strategies for advancement of stormwater and watershed management in the City. The Stormwater Plan will be used to guide decision makers in the City when making decisions affecting how the City will develop both centralized and distributed stormwater capture goals. The Stormwater Plan will include evaluation of existing stormwater capture facilities and projects, quantify the maximum stormwater capture potential, develop feasible stormwater capture alternatives (i.e., projects, programs, potential policies, etc.), and provide potential strategies to increase stormwater capture. The Stormwater Plan will also evaluate the multi-beneficial aspects of increasing stormwater capture, including potential open space alternatives, improved downstream water quality, and peak flow attenuation in downstream channels, creeks, and streams such as the Los Angeles River.

The Stormwater Plan will recommend stormwater capture projects, programs, policies, and incentives for the City of Los Angeles.

Benefits of the Stormwater Plan include:

- Investigation of stormwater capture models such as the Groundwater Augmentation Model and the Watershed Management Modeling System to identify maximum potential groundwater recharge.

- Increased water conservation.

- Improved water quality .

- Reduced peak flow in the Los Angeles River.

- Project partners and supporters include:

- City of Los Angeles Department of Water and Power

- City of Los Angeles Department of Public Works

- County of Los Angeles Department of Public Works

- TreePeople, Inc.

A Request for Proposal for the Stormwater Plan was released on February 24, 2011. The contract is anticipated to be awarded by the last quarter of 2011, and completion of the Stormwater Plan will take approximately 24 months.

7.4 TreePeople – Memorandum of Agreement

The Memorandum of Agreement (MOA) with TreePeople has been forged to facilitate a high-level of collaboration between LADWP and TreePeople with the aim of fostering a more sustainable Los Angeles. The partnership it outlines leverages TreePeople's experience in public education and agency integration to further the long-term sustainability objectives of LADWP. Specifically, LADWP and TreePeople are working together to research opportunities within LADWP's facilities and operations for widespread groundwater recharge. This research includes an educational component wherein LADWP and TreePeople learn about each other's initiatives and core business. Ultimately, this exchange of ideas will help the two partners develop concepts for projects that will increase stormwater capture for groundwater recharge.

LADWP was an early sponsor of the TreePeople Trans-agency Resources for Environmental and Economic Sustainability (T.R.E.E.S.) Project, during which time TreePeople developed best management practices for capturing, cleaning and using stormwater; published the handbook Second Nature; created a computerized cost-benefit model; and facilitated a number of design workshops for public agencies. TreePeople has also been integral to the construction and management of three demonstration sites -- a single-family home (Hall House) retrofitted to capture all the rainwater onsite, and two elementary schools (Broadous and Open Charter) that feature strategic landscaping and a cistern or underground infiltrators. LADWP has supported public tours and educational materials for Hall House, and is a key partner in the school projects which were partially funded through the Cool Schools and Sustainable Schools programs.

The overlap between the objectives of LADWP and those of TreePeople is notable in the Tujunga Wash and Sun Valley watersheds, where both have been especially active. Stakeholder processes in which the two have worked successfully to further mutual goals include the City's Integrated Resources Plan, the Greater Los Angeles County Integrated Regional Water Management Plan, and development of the objectives of the California Urban Water Conservation Council.

7.5 Centralized Stormwater Capture Projects

Existing stormwater capture facilities are inadequate for capturing runoff during very wet years. Weather patterns vary dramatically in Los Angeles with very wet years and very dry years. Therefore, new projects are necessary to expand the capability to capture a larger portion of stormwater flows during wet years. LADWP is working proactively in close partnership with LACFCD on multiple stormwater projects, as listed in Exhibit 7C. These projects will increase centralized stormwater recharge capacity by approximately 26,000 AFY in the SFB, raising groundwater levels and ensuring the future water supply reliability of the SFB. These projects are designed to maximize groundwater recharge into the SFB by increasing the total average recharge to approximately 51,700 AFY.

Multiple opportunities exist to develop new recharge projects and improve existing recharge projects in the SFB. LADWP, in collaboration with LACFCD has supported and contributed resources toward the design, construction, and implementation of a variety of projects to increase groundwater recharge of the SFB. Additionally, multiple agreements between LADWP and LACFCD have been approved to facilitate the preparation of recharge studies, design work, and construction of projects in the SFB for groundwater recharge, flood protection, and other benefits.

Exhibit 7C
Planned Centralized Stormwater Capture Programs

Project	Current Annual Recharge (AFY)	Increased Annual Capture/ Recharge (AFY)	Expected Annual Recharge (AFY)	Estimated Project Completion	Total Project Cost (millions)	LADWP Share (millions)
Sheldon-Arleta Gas Collection System	-	4,000 [1]	-	Complete Nov 2009	$8.20	$6.30
Big Tujunga Dam Rehabilitation [3]	-	4,500	-	July 2011	$105.70	$9.00
Hansen Spreading Grounds Upgrade	13,834	1,200	17,284 [2]	Dec 2011	$9.30	$4.80
Tujunga Spreading Grounds Upgrade	4,419	8,000	18,669 [4]	2015	$24.00	$24.00
Pacoima Spreading Grounds Upgrade	6,453	2,000	8,453	2015	$32.00	$16.00
Lopez Spreading Grounds Upgrade	527	750	1,277	2016	$8.00	$4.00
Strathern Wetlands Park	-	900	900 [5]	2016	$46.00	$4.00
Hansen Dam Water Conservation	-	3,400	3,400	2017	$5.00	$2.50
Valley Generating Station Stormwater Capture	-	700	700	2018	$9.70	$9.70
Branford Spreading Basin Upgrade	549	500	1,049	2018	$4.00	$2.00
Total Estimated Yield	**25,782**	**25,950**	**51,732**		**$251.90**	**$82.30**
Total Expenditure-to-date						$18.60
Total Expenditure Remaining						$63.70

1. This will allow increased collection of 4,000 AFY at Tujunga Spreading Grounds.
2. Includes 1/2 benefits from Big Tujunga Dam Rehabilitation Project.
3. No recharge occurs at the facility. All additional capture has been divided between Hansen & Tujunga Spreading Grounds.
4. Including benefits from Sheldon-Arleta Project and 1/2 benefits from Big Tujunga Dam Rehabilitation Project.
5. To be recharged at Sun Valley Park.

Sheldon-Arleta Methane Gas Collection Project. In 1998, a task force comprised of representatives from LADWP, other City departments (Bureau of Sanitation (BOS), Bureau of Engineering, and Environmental Affairs) and the Upper Los Angeles River Area Watermaster was formed to review the issues surrounding the recharge of groundwater through spreading at the Tujunga Spreading Grounds. The objective of this Task Force was to maximize water spreading at the Tujunga Spreading Grounds without causing off-site landfill gas migration. An outcome of the Task Force was the Sheldon-Arleta Methane Gas Collection Project. The project is designed to restore the original Tujunga Spreading Grounds capacity of 250 cubic feet per second (cfs) with the potential for future enhancement by bringing the Tujunga Spreading Basins closest to the Sheldon-Arleta landfill back online. The Tujunga Spreading Grounds are located adjacent to the closed Sheldon-Arleta Landfill. During spreading operations, water displaces air from the ground potentially increasing migration of methane gas generated by the landfill. In the past, elevated levels of methane gas have been detected in the surrounding communities. Therefore, restrictions were enacted curtailing spreading operations to 20 percent of their original capacity. This project is a joint effort between LADWP and BOS to replace the methane gas collection system within the landfill and thereby contain methane gas onsite. The project is being implemented by LADWP through LABOS's Proposition "O" Clean Water Bond program. Proposition "O" funded approximately $3 million of the $9 million cost. Construction began in 2007 and was completed in November 2009.

Big Tujunga Dam – San Fernando Groundwater Enhancement Project. LADWP and LACFCD approved Cooperative Agreement No. 47717 on September 18, 2007 for the Big Tujunga Dam –San Fernando Groundwater Enhancement Project. This Project will increase stormwater capture and provide other benefits including improvements in flood prevention and environmental enhancement through seismically retrofitting the dam and spillway. Annual stormwater capture will increase by 4,500 AFY for a total capture amount of 6,000 AFY. The project is integrated with the following projects in this section: Hansen Spreading Grounds Enhancement Project, Tujunga Spreading Grounds Enhancement Project, and the Sheldon-Arleta Methane Gas Collection Project. Both the Greater Los Angeles County Integrated Regional Watershed Management Plan and the Tujunga/Pacoima Watershed Plan are being incorporated into the Project. LADWP is contributing $9 million of the $105 million project cost. Construction of the project is in progress with an anticipated completion date by July 2011.

Hansen Spreading Grounds Enhancement Project. The Hansen Spreading Grounds is a 120 acre parcel located adjacent to the Tujunga Wash Channel downstream from the Hansen Dam. Under Cooperative Agreement No. 47739, the LACFCD and LADWP propose to modernize the facility to increase intake and storage capacity thereby improving groundwater recharge, flood protection and water quality while providing recreational benefits and native habitat improvements. To accomplish the goals of the project, a phased approach is being proposed. Phase 1A will deepen and reconfigure the existing basins; Phase 1B will improve the intake capacity by replacing a radial gate with a new rubber dam and telemetry system; and Phase 2 will develop other compatible uses such as recreational trails and native habitat for the community. Estimated recharge is 17,284 AFY, and estimated cost of this project is $10 million of which LADWP will fund $5 million. The Phase 1A reconstruction of the spreading grounds was completed in December 2009 and the Phase 1B intake structure will be completed in December 2011.

Tujunga Spreading Grounds Enhancement Project. The Tujunga Spreading Grounds Enhancement Project is designed to increase average annual stormwater capture by 8,000 AFY through relocating and automating the current intake structure on the Tujunga Wash, installation of an automated intake structure on the Pacoima Wash, and reconfiguration of the Tujunga Spreading Basins. Other multiple benefits include habitat improvements, passive recreation, educational opportunities, flood protection, and water quality improvements. Owned by LADWP, the Tujunga Spreading Grounds are operated by LACFCD in conjunction with other facilities along the Tujunga and Pacoima Wash Channels. Construction is expected to begin in 2012.

Valley Generating Station Stormwater Capture Project. LADWP is leading efforts to capture and infiltrate stormwater from the Valley Generating Station, from adjacent streets, and from the Tujunga Wash Channel. Phase 1 will capture and infiltrate all stormwater from the Valley Generating Station. Phase 2 will divert water mainly from the Hansen

Spreading Grounds for infiltration at the abandoned gravel pit at the generating station. Total stormwater capture is estimated at 700 AFY. Project designs are expected to be completed at the end of 2013.

Pacoima Spreading Grounds Enhancement Project. LADWP in conjunction with LACFCD is proposing to upgrade the Pacoima Spreading Grounds by improving the intake and stormwater storage capacity. Annual average stormwater capture is expected to increase by approximately 2,000 AFY with completion of the project. Other project benefits include flood protection, water quality improvements, and passive recreation. The final concept report and design has an expected completion date by the end of 2012.

Lopez Spreading Grounds Enhancement Project. The Lopez Spreading Grounds Enhancement Project involves deepening the existing Lopez Spreading Grounds and improving the intake and delivery system. LACFCD is the lead agency for the project. Additional groundwater recharge to the SFB of approximately 750 AFY is expected from the project. Project designs are anticipated to begin in 2013.

Strathern Wetlands Park Project. The Strathern Wetlands Park Project involves the conversion of a 45-acre gravel pit into a multipurpose facility for flood protection, stormwater retention, treatment, groundwater recharge, habitat restoration, and recreation. Estimated stormwater capture is approximately 900 AFY. Proposition "O" funding of $17.8 million has been approved for acquisition of the site. LACFCD purchased the land and project planning is underway. Designs are expected in 2012, and construction is expected to occur in two phases from 2013 to 2016.

Hansen Dam Water Conservation Project. In 1999 the U.S. Army Corps of Engineers completed a feasibility study to examine operational changes and facility improvements at the Hansen Dam as part of a cost-shared study with LACFCD.

Pacoima Dam Reservoir Sediment Removal Project. The Pacoima Dam Reservoir Sediment Removal Project involves removing sediment from behind Pacoima Dam to increase storage volume. The sediment build-up behind the dam has decreased the capacity to about 3,300 acre-feet. In the fall of 2009 approximately 80 percent of the Pacoima Dam watershed was burned. This damage will likely increase sediment flow into the reservoir above the estimates provided based on 2005 topography. The project will involve excavating 5 million cubic yards of sediment and increasing the storage volume by 3,000 acre-feet. Increased storage would decrease the number of reservoir spill events and increase the available recharge flow for the Pacoima and Lopez Spreading Grounds. The excavation will extend over 7,000 feet upstream of the existing dam. The project will produce an additional annual water recharge benefit of 670 AFY.

Branford Spreading Basin Upgrade. The Branford Spreading Basin Project will remove fine silts from the basin and install new pumps to drain the basin. These pumps could be used to drain the existing facility into the Tujunga Spreading Grounds. The expected additional recharge for this project is approximately 500 AFY.

7.6 Distributed Stormwater Capture

Throughout the City there are opportunities to capture localized dry and wet weather runoff for local reuse. However, Los Angeles' storm drain systems have historically been designed to protect life and property from flood impacts by quickly redirecting rainfall and runoff from impervious surfaces into the City's storm drain system and ultimately the Pacific Ocean without regard to water quality impacts. The September 2, 2002 Municipal Stormwater National Pollutant Discharge Elimination System Permit

(NPDES Permit No. CAS004001) for the Los Angeles region requires all new development or redevelopment projects to develop and comply with a Standard Urban Stormwater Mitigation Plan (SUSMP) to reduce runoff leaving the project site and to improve the project's water quality impacts.

Recently the City has taken initial steps towards promoting distributed capture and infiltration of runoff through development of a suite of distributed runoff demonstration projects. Distributed stormwater capture (also known as decentralized stormwater capture) is defined as any groundwater recharge system capturing less then 500 AF or any direct stormwater capture system capturing less then 10 AF. In addition, the City is close to adopting a Low Impact Development (LID) ordinance requiring retention of stormwater onsite for new and redevelopment projects which extends beyond SUSMP regulations. The Watershed Management Group is working with the Los Angeles and San Gabriel Rivers Watershed Council (LASGRWC), TreePeople, BOS, Department of Building and Safety, Los Angeles County Department of Public Works (LACDPW), The River Project and others to evaluate and study the impacts of localized stormwater capture and source control within the City.

LADWP is providing various resources for projects that would enhance the City's ability to capture additional dry and wet weather runoff for beneficial use. Both dry and wet weather runoff can be beneficially used. Dry weather runoff occurs in the absence of rainfall while wet weather runoff occurs as a direct result of rainfall. Dry weather runoff is typically related to inefficient irrigation systems, overwatering, and other wasteful outdoor water use practices. Wet weather runoff represents a significantly larger volume of water than dry weather runoff. Exhibit 7G summarizes the potential water yield and average unit cost of the different resources available to increase localized capture and infiltration of runoff.

7.6.1 Watershed Council – Water Augmentation Study

The Los Angeles Basin Water Augmentation Study is a long-term research project, initiated in 2000, created to determine the benefits of implementing a broad-based approach to stormwater infiltration within the Los Angeles Region. The study was led by the Los Angeles & San Gabriel Rivers Watershed Council in partnership with local, state, and federal agencies and organizations, with major support from the U.S. Bureau of Reclamation. LADWP assisted in the funding and creation of the study report as part of the Technical Advisory Committee.

While centralized strategies such as spreading basins and dams are reliable and effective methods to capture stormwater, increased urbanization, high land costs, and scarcity of imported water for recharge signal the need to pursue additional stormwater capture methods. Furthermore, centralized stormwater infiltration is unable to capture the entire watershed which leaves a large quantity of additional stormwater to be tapped into. The Los Angeles Basin Water Augmentation Study research has concluded that decentralized strategies (distributed stormwater capture such as rainbarrels & cisterns) would provide a local and reliable supply of water that would not negatively impact groundwater quality. Distributed stormwater capture and infiltration system techniques provide a viable means of augmenting groundwater recharge and reducing the overall cost of treating urban runoff. Based on the findings of this study, the Los Angeles Basin Water Augmentation Study partnership moved forward on a demonstration project in a single family residential home neighborhood in northeast San Fernando Valley to validate the study findings.

CASE STUDY:
Elmer Avenue Neighborhood Retrofit Project

The Background

Initiated in 2000, the Los Angeles Basin Water Augmentation Study (WAS) is a long-term research project led by the Los Angeles & San Gabriel Rivers Watershed Council in partnership with eight local, state, and federal agencies of which LADWP is an active partner. The study is evaluating the practical potential to improve surface water quality and increase local groundwater supplies through infiltration of urban stormwater runoff.

Based on positive findings of the study, the WAS partnership moved forward with a demonstration project to display an integrated and comprehensive approach to water management by retrofitting a neighborhood with strategies to address water conservation, pollution reduction and treatment, flooding, and habitat restoration. The Elmer Avenue Neighborhood Retrofit Project was chosen after an extensive selection process that evaluated neighborhoods based on more than 80 criteria.

The Project

The Elmer Avenue Neighborhood Retrofit Project commenced in July 2009 and was completed in June 2010 and cost approximately $2.5 million. Elmer Avenue receives stormwater runoff from approximately 40 acres of upstream residential area causing flooding in most storms. To address this runoff, the project encompasses improvements to both the public right-of-way as well as the private residences. As such, the project required active interaction and cooperation between the WAS partnership and the residents to work together and come up with a solution for the neighborhood.

Public Right-of-Way Improvements:

Infiltration Gallery-

A large infiltration gallery was installed underneath the street right-of-way which is estimated to infiltrate 16 acre-feet annually. The gallery is a sub-surface groundwater collection system, shallow in depth, constructed with perforated pipes into which runoff water flows and is then allowed to infiltrate into the ground to recharge the local groundwater basin.

Bioswale-

The newly installed sidewalks include bio-swales in the parkways to capture and treat stormwater runoff from the local sub-watershed mostly from residential land use. The bioswales are open shallow channels with gently sloped sides and bottoms filled with vegetation and rip rap where stormwater runoff is collected. Bioswales help reduce the flow velocity and treat stormwater runoff by filtering it through the vegetation in the channel, through the subsoil matrix, and/or into the underlying soils. In addition, bioswales trap particulate pollutants (suspended solids and trace metals), promote infiltration and serve as part of the whole stormwater drainage system installed for this project.

Private Residence Improvements:

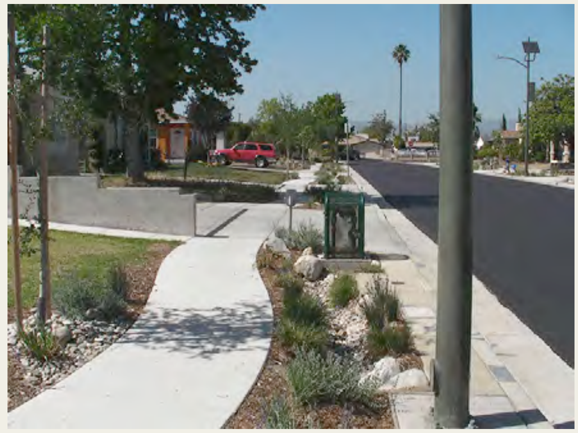
Numerous improvements were offered to residents who chose to participate to help reduce runoff as well as exercise better outdoor water conservation such as porous pavers, rain gardens, rain barrels, and drought-tolerant and native landscaping.

The Benefits

The finished project incorporates a mixture of strategies to produce multiple levels of benefits (to the neighborhood but also to the local, regional, and national community whom can take this work as an encouraging model):

- Capture stormwater and dry-weather runoff to prevent flooding and decrease pollution of local rivers and oceans
- Reduce impermeable surfaces and increase groundwater recharge
- Improve neighborhood aesthetics through increased green space and public right-of-way improvements
- Increase community awareness of watershed issues
- Encourage community awareness of water and associated environmental issues.

As a result of the success and positive feedback from citizens for the Elmer Avenue Neighborhood Retrofit Project, a second phase is currently underway at Elmer Avenue to retrofit its alleyway. Such small projects aim to spark large change by showing citizens and other communities that they also can make changes and improve their neighborhoods to be more water-efficient and environmentally friendly.



"By turning our yards into rain gardens and our streets into water recharge facilities, we can ensure clean water for the future. In contrast to a typical urban street, Elmer Avenue now reduces flooding and water pollution, improves water quality, replenishes groundwater supplies, and increases native habitat."

Nancy Steele, Executive Director
Los Angeles and San Gabriel Rivers Watershed Council

"This project is a prime example of how homeowners and the city can work together on a project that demonstrates smart watershed management through stormwater capture and water conservation measures that are beautiful and effective"

Edward Belden, Water Programs Manager
Los Angeles and San Gabriel Rivers Watershed Council

7.6.2 Integrated Water Resources Plan Analysis

As part of the City's Integrated Water Resources Plan, further described in Chapter 10, the City investigated the beneficial reuse of urban runoff for both dry and wet weather conditions.

7.6.2.1 Dry Weather Runoff Options

The beneficial use option for dry weather runoff consists of runoff capture, treatment, and reuse. For dry weather flow, most of the runoff could potentially be diverted directly for beneficial use, particularly during the summer months when demands for non-potable water are high (due to the higher irrigation demands in the summertime). The level of treatment of the runoff before beneficial use would be determined by the ultimate use of the water.

A computer modeling analysis was performed during development of the Integrated Water Resources Plan based on the recycled water demands in Los Angeles and the available dry weather runoff. Based on the data, the model determined which of the recycled water demands could be realistically met through treated runoff. The dry weather runoff available for reuse throughout the City is estimated at 97 mgd (approximately 26,000 million gallons per year). Exhibit 7D identifies the amount of this runoff that could, after treatment, be used to meet the recycled water demands.

7.6.2.2 Wet Weather Runoff Options

Rain Barrels

Rain barrels are distributed stormwater capture devices used to store rainwater collected from roofs via roof rain gutter systems. Harvested water can be used for outdoor irrigation at a later time. Rain barrels vary in size with a typical rain barrel holding approximately 55 gallons that can be readily installed under any residential roof gutter downspout. Installation of rain barrels at residences

Exhibit 7D
Potential Non-Potable Water Demands Met with Dry Weather Treated Runoff

Service Area	Total Demand Served	
	(AF per year)	(million gallon per year)
Aliso Wash	1,400	460
Canoga	3,250	1,050
Reseda	2,900	950
Tujunga / Burbank	9,050	2,950
LA River Reach 3	1,100	360
Dominguez Channel	8,500	2,770
Compton Creek	1,450	470
Ballona	10,850	3,530
Verdugo Wash	100	30
LA River/Arroyo	9,600	3,130
Total	48,200	15,700

Source: City of Los Angeles Integrated Resources Plan, Facilities Plan, Volume 3: Runoff Management

CASE STUDY:
Ballona Creek Watershed Rainwater Harvesting Pilot Program

Funded by the Safe Neighborhood Parks, Clean Water, Clean Air and Coastal Protection Bond Act of 2000 (Prop 12), a partnership between the Santa Monica Bay Restoration Commission and the California Coastal Conservancy, the City of Los Angeles, Department of Public Works, Bureau of Sanitation, Watershed Protection Division (Stormwater Program) began the City's first free Rainwater Harvesting pilot program in July 2009. The goal of this program is to engage as many property owners as possible by installing one downspout and rainbarrel retrofit per property thereby allowing the maximum number of residences engaged.

Liz Herron, Land Use Chair of Mt. Washington Association, supports rainwater harvesting systems: "Rain barrel systems serve environmental purposes by allowing homeowners to collect the rainwater for personal irrigational purposes. It also reduces the amount of rainwater entering into the streets and ocean. These residential systems are successful programs that save water and prevent pollution."

Designed to conserve potable water and reduce the amount of polluted rainwater that runs untreated into the ocean, the $1-million pilot plan has enough funds to install 490 residential rain barrels, provide consultation on rain gardens, and provide one custom-made commercial planter box for each of ten businesses. It is estimated to save 584,100 gallons of water each year. The City estimates there are roughly 18 rain events in Los Angeles each year filling each barrel at least once each time.

In a typical year, about 9,600 gallons of water is generated on an average 1,000-square foot residential City roof top. If each of the 400,000 residential parcels in the City were to install a single rain barrel, the City estimates that about 400 million gallons of water would be saved, thereby reducing the demand for water. An evaluation of the program is scheduled for completion in Spring 2011.

The 55-gallon capacity rain barrel was chosen because the weight of 200 pounds is relatively manageable. The rain barrels are also made from food-grade plastic, repurposed from containers in case the harvested rainwater is used to grow food. They are equipped with mesh netting to keep out debris and mosquitoes and connected to the downspouts by a trained rain barrel installation specialist.

Planter boxes that businesses are eligible for will be custom-made to fit the layout and dimensions of the property. The City will be working with each business to make sure they are content with the presentation of the planter box.

The program addresses the City's broad problems of water scarcity and stormwater pollution. Currently outdoor water usage accounts for 1/3 of the average family's overall water consumption. The Rainwater Harvesting program helps to meet the City's water conservation goals by reducing the amount of potable water used for irrigation and other outdoor purposes.

throughout Los Angeles could potentially capture 2,400 AFY assuming 400,000 residences, an annual average rainfall of 15.6 inches, one 55-gallon rain barrel installed per residence, and an average roof area of 500 square feet. If overflow infiltration is provided, and/or greater roof area is utilized, annual rainfall volume captured can be significantly greater.

Cisterns

Cisterns are larger than rain barrels and can range from 100 to 10,000 or more gallons. They store diverted runoff from roof areas and other impervious surfaces. This stored runoff can provide a source of untreated water for gardens and compost, free of most sediment and dissolved salts. Because residential irrigation can account for up to 40 percent of domestic water consumption, water conservation measures such as cisterns can be utilized to reduce demands, especially during hot summer months.

An analysis of the effect of installing cisterns in all single family and multi-family residences in the City was conducted as part of the Integrated Water Resources Plan, which was based on projected household demands, irrigation needs, and historical rainfall data. The results showed that during a storm event of 0.45 inches, the result of installing 1,000-gallon cisterns at all single-family and multi-family residences in the City would be a maximum capture of approximately 440 million gallons. This provides a substantial amount of water conservation and reduction in potable water demands within the City.

The primary beneficial use of dry and wet weather runoff is to meet irrigation demands. These demands are typically non-existent during rain events and low throughout the rainy season. Therefore, the wet weather runoff would need to be stored until the demand exists. This can be done through a regional and/or a localized approach. A regional approach to seasonal storage could include the use of out-of-service reservoirs for seasonal storage. A localized approach would be to construct distributed underground storage facilities in open spaces, parks, schools, etc. throughout the City.

Exhibit 7E demonstrates a modular storage media that holds the runoff in a honeycomb-like box under the ground.

Exhibit 7E
Construction of Underground Cistern for Stormwater Capture
(Photo courtesy of TreePeople)

Exhibit 7F Underground Storage Potential throughout the City

Land Use	Acres (acres)	Potential Storage Volume[1] (million gallons)
Open space	6,000	15,000
Schools (assume only ~ 25 percent suitable land)	1,500	4,000
Alleys	900 count	Unknown
Total	7,500	19,000

Note: 1. Maximum storage potential shown assumes 4.22 million gallons of storage per acre of land. Actual usable volume may be less.

Source: City of Los Angeles Integrated Resources Plan, Facilities Plan, Volume 3: Runoff Management

The storage media has approximately 95 percent voids, so almost all of the storage volume would be filled with water. The maximum depth is 8 feet, which translates to approximately 2.44 million gallons per acre of water storage potential. The containers can also be constructed to be impermeable to prohibit infiltration.

According to studies conducted during the development of the Los Angeles Integrated Water Resources Plan, the City currently has an estimated open space area of 6,000 acres, which includes parks, open space, and vacant lots. School sites are also a potential option for installing modular storage media under playgrounds and athletic fields. The total school area in the City is approximately 6,000 acres. Assuming that only 25 percent of this area has no buildings or other structures, this equals approximately 1,500 acres of potentially suitable land. Additionally, there are approximately 900 abandoned or no longer maintained alleys of various unknown dimensions that could potentially be converted to underground storage facilities. Exhibit 7F summarizes the approximate underground storage potential throughout the City.

The City has the potential to store a considerable volume of wet weather runoff in order to meet the potential future surface water quality regulations if the underground storage options were utilized. This stored water could then be drawn down and beneficially used during the dry weather months.

Rain Gardens

Rain gardens are another simple form of relatively small scale rainwater harvesting. As gardens or depressions, usually constructed sub-grade, they act as small retention/percolations basins for rainwater collection. Not only do they provide for an attractive landscape, but they are effective in treating and infiltrating stormwater for local groundwater recharge.

While extremely functional, these are basically regular gardens and can be designed to fit well into the surrounding landscape. Many cities and states across the country have extensive rain garden programs, and years of research have gone into their design and performance. Acting as a bio-retention systems, rain gardens treat runoff naturally as it seeps underground. In the case of lowered percolation rates or in hillside developments, rain gardens are typically installed with impermeable liners and supplied with under drains.

Unit cost of rain gardens are similar to that of rain barrels, as the mechanism for collecting water is the same. Cost is dependent upon the form and extent of construction and on the type and quantity landscape used, as well as the associated maintenance. Installation of rain gardens at residences throughout Los Angeles, assuming 400,000 residences, could potentially capture 6,400 AFY assuming an annual average rainfall of 15.6 inches, and an average roof area of 500 square feet. Under these conditions, assuming a 10-15 year lifespan, the cost of rain gardens varies from $308-$5,000 / AF.

Neighborhood Recharge

Neighborhood recharge involves installing recharge facilities in portions of vacant urban lots, abandoned alleys, and City parklands, where the soil is highly permeable. This option involves installing underground storage (such as a honeycomb shaped device shown in Exhibit 7F, but without the lining to allow infiltration). This would allow the runoff to be stored underground, while still maintaining a safe area above ground for human activity. The runoff would be pumped or would flow by gravity to the site where it would be collected temporarily until it is able to infiltrate.

The amount of runoff that could be managed by neighborhood recharge was determined as part of the Los Angeles Integrated Water Resources Plan by assuming that only the east San Fernando Valley area has predominantly permeable soils appropriate for infiltration (though there may be other areas within the City that could be usable for recharge with smaller-scale projects). Based on an analysis by the City's Geographical Information System, the maximum total area available for neighborhood recharge facilities is approximately 831 acres, which includes vacant urban lots, abandoned alleys, and 25 percent of City parklands. Assuming an infiltration rate of 2 feet per day, the maximum runoff that could potentially be managed by recharge facilities would be 550 million gallons per day (mgd).

7.6.3 Distributed Stormwater Capture Projects

As an outgrowth of the Los Angeles Integrated Water Resources Plan, neighborhood recharge concept efforts are moving from the conceptual stage visualized in the Los Angeles Integrated Water Resources Plan to actual identified projects in the City which infiltrate wet weather runoff as close as possible to the point of origin. A few of the identified projects are highlighted here.

Whitnall Highway Power Line Easement Stormwater Capture Project. This project involves the capture, treatment, and infiltration of stormwater from streets in the eastern San Fernando Valley using LADWP's Whitnall Power Line Easement in the lower Sun Valley Watershed. Average annual recharge is estimated at 110 AFY. Additional uses of the project site may include open space and recreational enhancements. Designs are anticipated for completion by the end of 2011.

Elmer Avenue Neighborhood Retrofit Project. In December of 2008, the City of Los Angeles partnered with TreePeople and the LASGRWC to retrofit an existing neighborhood in the Sun Valley portion of Los Angeles that is prone to flooding during wet weather events. A combination of Best Management Practices such as vegetated swales, infiltration trenches, rain gardens, rain barrels, native and climate appropriate landscaping, roof gutters, street tree plantings, and aligning driveways to drain to vegetated swales are incorporated into this project. This project was designed to capture and infiltrate the equivalent of a 2-year storm in order to increase groundwater recharge. Project funding was provided by the US Bureau of Reclamation, DWR, LACDPW, MWD, Water Replenishment District of Southern California and LADWP. Construction was completed in June 2010.

Woodman Avenue Multi-Beneficial Stormwater Capture Project. LADWP in partnership with the BOS Watershed Protection Division and The River Project, a non-profit organization, are developing the Woodman Avenue Median Retrofit Demonstration Project to capture, treat, and infiltrate stormwater runoff along a portion of Woodman Avenue. The Project will replace the existing median with pre-treatment devices, a vegetated swale, and an underground retention system. Project benefits include reductions in localized flooding, open space enhancements, groundwater recharge, and native habitat enhancement. The CalFed Watershed Program awarded the project a $1.6 million grant. Construction is expected to be completed by the end of 2012.

North Hollywood Alley Retrofit BMP Demonstration Project. The project's goal is to demonstrate the ability to infiltrate stormwater near the point of origin while increasing groundwater recharge, reducing flooding, and improving water quality. Four segments of alleyways in the San Fernando Valley are proposed to be retrofitted with pervious surfaces and diversion of flows from intersecting streets into these alleyways. Construction began in early 2011.

Laurel Canyon Parkway Infiltration Swale Project. Construction of the Laurel Canyon Parkway Infiltration Swale Project will involve construction of an infiltration trench and parkway swale between the street curb and sidewalk near the Tujunga Spreading Grounds in the San Fernando Valley. Stormwater will be collected and infiltrated into the groundwater from the local residential neighborhood. The project is currently in the conceptual stage.

7.6.4 Low Impact Development and Best Management Practices

LADWP, in conjunction with other City departments, is developing programs to highlight water conservation through Low Impact Development (LID) and installation of BMPs. LID is a stormwater management strategy that has been adopted by many localities across the country over the past several years. It is a stormwater management approach that is designed to reduce runoff of water and pollutants from the site(s) at which they are generated.

The past few decades of stormwater management have resulted in the current convention of control-and-treatment strategies. They are largely engineered, end-of-pipe practices that have been focused on controlling peak flow rate and suspended solids concentrations. Conventional practices, however, fail to address the widespread and cumulative hydrologic modifications within the watershed that increase stormwater volumes and runoff rates and cause excessive erosion and stream channel degradation.

In general, implementing integrated LID practices into new development and retrofit of existing facilities can result in enhanced environmental performance while at the same time reducing development costs when compared to traditional stormwater management approaches.

According to the U.S. Environmental Protection Agency, infrastructure costs associated with LID practices as compared to traditional stormwater treatment practices result in significant cost savings ranging between 15 percent and 80 percent less than traditional practices. BMPs consist of practices designed to infiltrate runoff for groundwater recharge, reduce runoff volume, and capture rainwater for reuse. Programs under development include pilot projects, retrofitting of existing facilities, new development standards, and assistance in ordinance development.

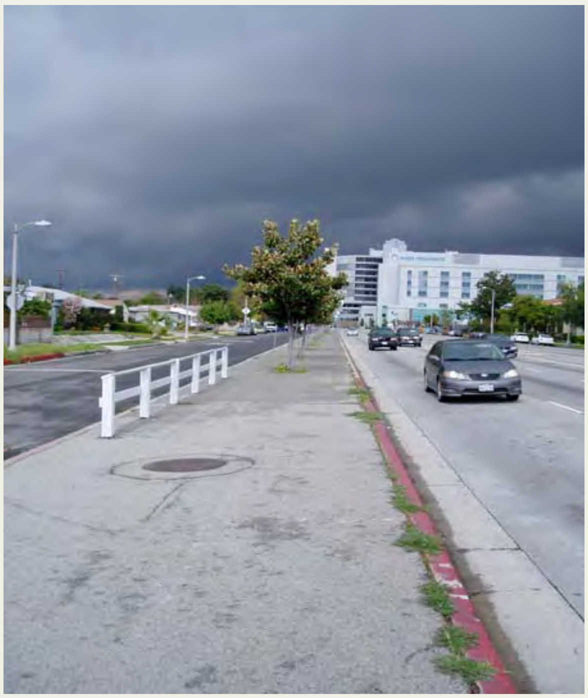
Retrofit of LADWP Facilities to Meet LID Standards

LADWP is assessing its existing facilities for potential retrofits using LID BMPs. LID BMPs under consideration include pervious pavement, stormwater capture, curb cuts, bioretention cells, and amended soils. Expected benefits include:

- Increased groundwater recharge.
- Decreased outdoor water use.
- Increased compliance with stormwater regulations.

CASE STUDY:
Woodman Avenue Multi-Beneficial Stormwater Capture Project

Originally proposed by the local Panorama City Neighborhood Council for the Tujunga-Pacoima Watershed Plan, the Woodman Avenue project represents an innovative example of stormwater capture, which includes extensive benefits for the environment, the City's groundwater basin, and the surrounding community. The Woodman Avenue median is located along the west side of Woodman Avenue from Lanark Street to Saticoy Street in Panorama City.



The project's construction will be relatively simple but effective. The project will capture surface runoff from approximately 130 acres that currently flows along street gutters to storm drains, through the Tujunga Wash and ultimately down the Los Angeles River and into the Pacific Ocean. Instead flows will now be directed through pre-treatment devices into a vegetated swale and an underground retention system for groundwater basin infiltration. The vegetated swale and underground retention/infiltration system will replace an existing 16-foot wide, 3,500-foot long concrete median. After construction of the project, participants will conduct active monitoring of water flows, water quality, and vegetation for approximately three years. This data should provide valuable information to facilitate the development of future projects, and optimize system processes.

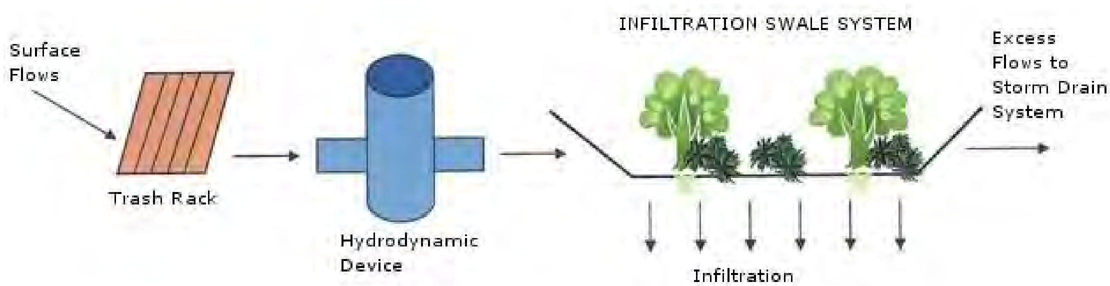
The direct water resource related benefits from this project are three fold. First, the additional water captured will recharge the San Fernando Groundwater Basin with approximately 80 AF per year. This replenishes the City's local groundwater supply, and helps protect pumping rights for City, which ultimately guarantees a more reliable water supply. Secondly, diverted flow alleviates local flooding, particularly during sizable rain events. Finally, the infiltration prevents contaminant carrying runoff and debris from entering local waterways and ultimately coastal areas.

Also recognized are the Community benefits associated with this project. These include creation of open space enhancements such as improved aesthetics and pedestrian access near schools, a walking path, benches, and native vegetation. The River Project will be running an active education program with the local community, including workshops with nearby business owners/residents and the introduction of a curriculum for students at the local elementary school. The organization's goal is to get the students involved in monitoring and maintenance of the project as part of their service learning requirements. Establishing knowledge of sustainable water supplies with the City's youth is an investment in constituent water use practices for generations to come.

Project participants include the Panorama City Neighborhood Council, Council District 6, the Los Angeles Bureau of Sanitation, the Los Angeles Bureau of Street Services, the State of California Water Resources Control Board (SCWRCB), The River Project, and LADWP. This cooperative partnership is anticipating the project's construction to begin in 2012.

State funding used for the project is provided through Proposition 50. SCWRCB has dedicated $1.6 million through the CALFED Watershed Grant Program, which covers roughly half of the overall project cost.

Melanie Winter from The River Project speaks positively of this stormwater capture project: "The community's involvement in the watershed planning process helped them identify a prime opportunity site that maximizes all the potential benefits. It helps reduce our dependence on imported supplies, addresses peak flows, improves water quality, and re-establishes habitat. It's gratifying to receive State funding to work in a well-rounded partnership to implement this integrated watershed project conceived at the grassroots level."



- Improved environmental conditions for employees and the public.
- Improved public image.
- Increased awareness of LID and provide examples for residents.
- Compliance with Model Water Efficient Landscape Ordinance.

New LADWP Facility Development Using LID Standards

LADWP's Watershed Management Group is developing a framework for implementation of LIDs and BMPs during the new facility development process. Within the framework, LID and BMPs are taken into consideration during the planning, design, implementation, and maintenance processes associated with new LADWP facilities. Benefits include:

- Reductions in costs associated with stormwater infrastructure and landscape maintenance.
- Reduced costs for grading by using natural drainage.
- Reduced sidewalk costs by using narrower sidewalks.
- Increased groundwater recharge.
- Reduced runoff volume and pollutant loading.
- Reductions in long-term maintenance and operation costs by using climate appropriate landscaping.
- Reduction in life cycle costs of replacing or rehabilitating pipe and below ground infrastructure.

Assistance in Ordinance Development

LADWP is represented on the City of Los Angeles Landscape & Stream Protection Ordinances Joint Meeting Committee through the Watershed Management Group. Other committee members include the Department of Recreation and Parks, the Department of Public Works, the Department of Environmental Affairs, the City Planning Department, and the Department of Building and Safety. The committee is tasked with developing ordinances for city-wide implementation that will reduce water use and improve groundwater recharge among other multiple benefits. Ordinances under review include the:

- Green Building Ordinance using the US Green Building Council's Leadership in Energy and Environmental Design (LEED) Green Building Rating System.
- LID Ordinance to incorporate improvements in stormwater management at the point of origin.
- Stream Protection Ordinance to incorporate methodologies for improving surface and groundwater quality.
- Hillside Ordinance revisions to include modifications in policies regarding front yards, side yards, height, fire protection, street access, lot coverage, off-street parking requirements, and exceptions in relation to the ordinances above.

7.6.5 Future Distributed Stormwater Programs

LADWP continues to investigate the potential for implementation of future distributed stormwater programs. Through its Watershed Management Group, LADWP will continue to develop partnerships and programs to improve utilization of stormwater runoff for outdoor water use and groundwater recharge. Potential programs that could be considered in the future include rain barrel/cistern/rain garden rebates and retrofit incentives for installation of LID BMPs.

7.7 Integrated Regional Water Management Plan (IRWMP) Program

LADWP is a participating agency in the IRWMP which encompasses 92 cities in the Greater Los Angeles County Region. The IRWMP aims to address the water quality, resource, and supply issues of the region. A final plan was adopted on December 16, 2006.

Highlights of the plan that pertain to watershed issues include:

- Short and long term objectives to comply with water quality regulations (including TMDLs) by improving the quality of urban runoff, stormwater, and wastewater.
- Optimize local water resources to reduce the region's reliance on imported water.
- Long term priority to protect groundwater supplies through stormwater recharge.
- Target goal to reduce and reuse 150,000 AFY (40%) of dry weather urban runoff and capture and treat an additional 170,000 AFY (50%) for a total target of 90%.
- Target goal to reduce and reuse 220,000 AFY (40%) of stormwater runoff from developed areas and capture and treat an additional 270,000 AFY (50%) for a total of 90%.

For more detailed information on the IRWMP, please refer to Chapter 10.

Exhibit 7G Cost Analysis

Water Source	Water Yield (AFY)	Average Unit Cost ($/AF)
Centralized Stormwater Capture[1]	25,950	$60 - $300
Distributed Stormwater Capture		
Urban Runoff Plants[2]	5,000	$4,044
Rain Barrels[3]	2,400	$278 - $2,778
Cisterns[4]	8,000	$2,426
Rain Gardens[5]	5,960	$149 - $1,781
Neighborhood Recharge[6]	12,000	$3,351

Notes:
1. Water Yield and cost are based on LADWP's current planned centralized stormwater capture projects. Additional centralized stormwater capture potential will be identified once the Stormwater Capture Master Plan is complete. Cost assumes 50 year project life.

2. Source: City of Los Angeles Integrated Resources Plan (2004); updated from 2004 to 2009 dollars using annual CPI index for LA-Riverside-Orange County MSA .

3. Source: TreePeople. Assumes 30 year life, one 55 gallon barrel per residence, 15.6 in annual rainfall (LA average) with 18 rain events per year (> ¼ in), and a collection roof area of 500 square feet. Minimum case assumes only material cost of $75 barrel and infiltration of 50 percent of barrel overflow into a permeable area such as a rain garden. Maximum case assumes $250 per barrel with installation cost included, and zero infiltration of overflow (worst case). Water yield assumes median between min/max range with 400,000 residences; 2010 dollars

4. Source: City of Los Angeles Integrated Resources Plan (2004); updated from 2004 to 2009 dollars using annual CPI index for LA-Riverside-Orange County MSA; capturing and reusing stormwater on-site for schools and government only.

5. Source: TreePeople. Assumes 30 year life, 15.6 in annual rainfall, an average roof collection area of 500 square feet, $2.50 - $25.66 / ft^2 (min/max) for rain garden construction, and 26.6- 31.0 ft^2 (min/max) rain garden size with 5.3% - 6.2% of contributing roof area respectively. Yield is based on 400,000 residences; 2010 dollars

6. Source: City of Los Angeles Integrated Resources Plan (2004); updated from 2004 to 2009 dollars using annual CPI index for LA-Riverside-Orange County MSMSA.

7.8 Cost Analysis

Exhibit 7G compares side by side the various watershed management opportunities LADWP is pursuing and/or investigating to add to its water portfolio.

It is important to note that the centralized stormwater capture values are based on the planned projects listed in Section 7.5. LADWP is currently compiling a Stormwater Capture Master Plan (see Section 7.3) which will investigate the maximum potential for stormwater capture within the City (for both centralized and distributed capture). Nevertheless, even with this fraction of the potential, it is clear that centralized stormwater capture is a very cost effective, plentiful water supply asset to be pursued. Recognizing its great potential, LADWP will proceed with its efforts on the centralized stormwater capture projects listed in Section 7.5, and closely monitor findings of the Stormwater Capture Master Plan to determine future potential centralized stormwater capture projects.

Distributed stormwater capture values are based on the maximum potential achievable by the City. While the cost listed is high, distributed stormwater capture options are highly variable based on a variety of factors such as the magnitude of the overall program, project locations, etc. Furthermore, distributed stormwater capture projects yield additional benefits to the public outside of water supply generation such as flood control, restored native habitat, community beautification, public right of way improvements, water conservation, as well as private residence safety and aesthetic improvements. LADWP will continue to investigate these options to evaluate the best approach to establish a cost effective program that will help add to LADWP's water portfolio.

7.9 Summary

There is a significant potential for increased stormwater capture in the City to create new water supplies. While stormwater capture occurs to replenish the SFB, the majority of stormwater runoff is not captured. Increased urbanization has decreased natural infiltration, thereby contributing to declines in local groundwater levels. Given the significant potential increased stormwater capture can play in a local, reliable water supply, LADWP is developing a Stormwater Capture Master Plan to determine overall stormwater capture targets and strategies to achieve those targets over the next twenty years.

City departments, other governmental agencies, non-profit organizations and numerous stakeholders recognize the necessity for public agencies to coordinate their activities toward improving stormwater capture. Increased stormwater capture can be used to augment local water supplies, improve water quality, restore natural waterways, and enhance neighborhoods.

For water supply benefits, stormwater can be captured in rain barrels or cisterns for reuse; or infiltrated through spreading basins, rain gardens, underground infiltration galleries, permeable surfaces or other green infrastructure and low impact development Best Management Practices.

Increased Groundwater Production due to Stormwater Infiltration

The UWMP projects that by 2035 there will be a minimum of 15,000 AFY of increased groundwater pumping in the SFB due to water supply augmentation through stormwater infiltration. In order to increase groundwater production, it must be determined that not only have groundwater levels recovered to sustain existing safe yield pumping amounts, but documented additional infiltration is occurring that could potentially increase the safe yield. Increasing the safe yield will require concurrence by the Watermaster and the courts to amend the basin judgment. Amending the judgment would be a lengthy process involving all basin pumpers.

Existing managed infiltration by the LACFCD results in an average of 25,782 AFY of recharge (see Exhibit 7A). LADWP has planned projects to double this amount (see Exhibit 7C). However, at this time there is not enough information to determine the quantity of additional stormwater infiltration required to restore groundwater levels required to sustain safe yield pumping, or to justify an increase in the safe yield. More studies must be conducted to determine how much more infiltration must be developed to increase the safe yield and groundwater production. The Stormwater Capture Master Plan will identify the potential acre-feet per year quantities available for recharge, and develop an implementation plan to augment the groundwater basin through centralized and decentralized infiltration projects and programs.

In addition to the proposed LADWP stormwater infiltration projects identified in Exhibit 7C, initiatives such as the proposed City of Los Angeles Low Impact Development Ordinance will augment stormwater infiltration by requiring stormwater capture for new development.

Capture and Reuse

By 2035, the UWMP projects 10,000 AFY of additional water conservation through rain barrels and cisterns. There have been some limited programs to distribute rain barrels, but much more remains to be done to achieve these projected stormwater capture amounts. The LADWP Stormwater Capture Master Plan will help identify how to achieve this goal.

Exhibit 7H summarizes existing and projected increased annual average stormwater capture and infiltration capability.

Exhibit 7H
Stormwater Capture Summary

Existing and Planned Annual Average Centralized Stormwater Capture	
Estimated existing annual average centralized stormwater infiltration	25,017 AFY
Planned increase in annual average centralized stormwater infiltration	25,950 AFY
Total Existing and Planned Annual Average Stormwater Infiltration	50,967 AFY

Projected Total Increase in Water Supplies from Stormwater Capture	
Projected 2035 increased annual groundwater production	15,000 AFY
Projected 2035 distributed stormwater capture and reuse	10,000 AFY
Total Projected 2035 Increased Water Supplies	25,000 AFY

Chapter Eight
Metropolitan Water District Supplies

8.0 Overview

As a member agency, the City of Los Angeles purchases water from the Metropolitan Water District of Southern California (MWD) to supplement its supplies from local groundwater, Los Angeles Aqueduct (LAA) deliveries, and recycled water. LADWP has historically purchased MWD water to make up the deficit between demand and other City supplies. As a percentage of the City's total water supply, MWD water varies from 4 percent in Fiscal Year (FY) 1983/84 to 71 percent in FY 2008/09 with the 5-year average of 52 percent between FY 2005/06 and FY 2009/10. Exhibit 1F in Chapter 1 illustrates the City's reliance on MWD water during dry years and increasingly in recent years as LAA supply as been cut back for environmental enhancement projects. Although the City plans to reduce its reliance on MWD supply, it has made significant investments in MWD and will continue to rely on the wholesaler to meet its current and future supplemental water needs.

MWD is the largest water wholesaler for domestic and municipal uses in California providing nearly 19 million people with on average 1.7 billion gallons of water per day to a service area of approximately 5,200 square miles. MWD was formed by the MWD Act and exists pursuant to this statute which was enacted by the California Legislature in 1927. MWD's adopted purpose is to develop, store, and distribute water to Southern California residents. In 1928, MWD was incorporated as a public agency following a vote by residents in 13 cities in Southern California. Operating solely as a wholesaler, MWD owns and operates the Colorado River Aqueduct (CRA), is a contractor for water from the California State Water Project (SWP), manages and owns in-basin surface storage facilities, stores groundwater within the basin via contracts, engages in groundwater storage outside the basin, and conducts water transfers to provide additional supplies for its member agencies. Today, MWD has 26 member agencies consisting of 11 water districts, one county water authority, and 14 cities, including the City of Los Angeles.

This Urban Water Management Plan projects LADWP's reliance on MWD water supplies will be reduced by half from the current five-year average of 52 percent of total demand to 24 percent by FY 2034/35 under average weather conditions.

8.0.1 History

Initially formed to import water into the Southern California region, MWD's first project was to build the CRA to import water from the Colorado River. The City of Los Angeles provided the capital dollars to initiate and complete land surveys of all proposed alignments for the Aqueduct. Construction was financed through $220 million in bond sales during the Great Depression. Ten years after initiating construction, Colorado River water reached Southern California in 1941. To meet further water demands in the southern California region, MWD contracted with the SWP in 1960 for almost half of the SWP's water supplies which are delivered from the San Francisco Bay-Delta region into Southern California via the California Aqueduct. After completion of the California Aqueduct, deliveries of SWP water were first received in 1972.

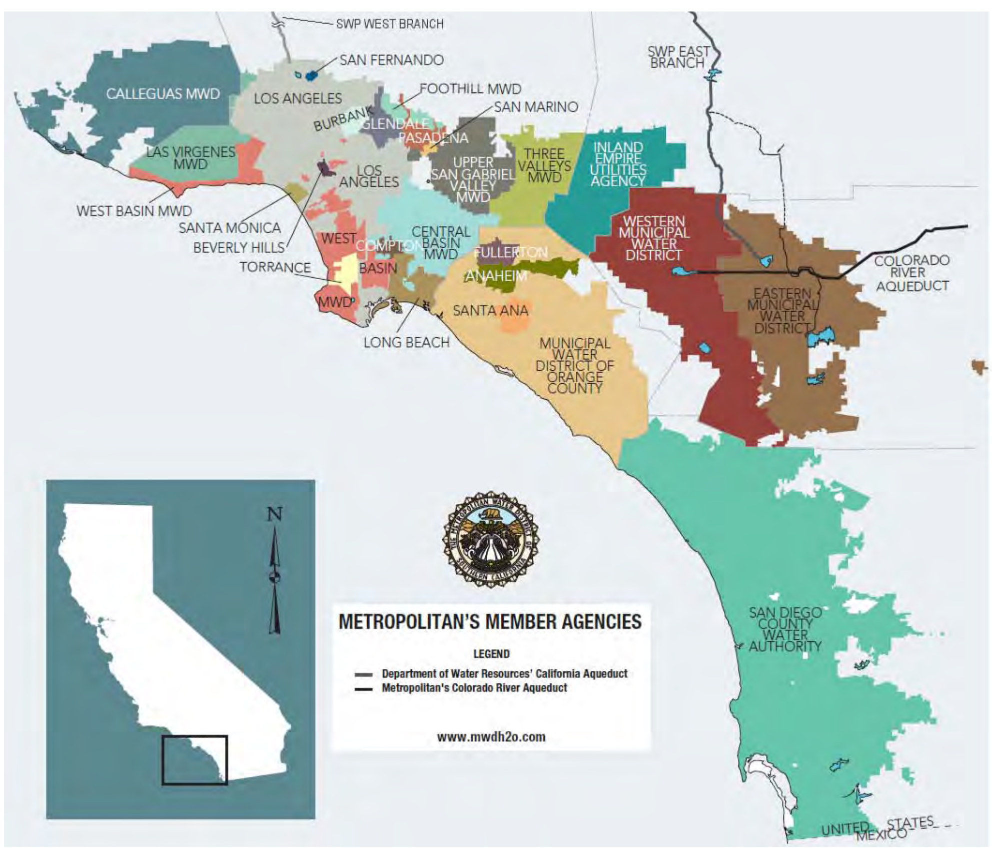
8.0.2 Governance

MWD is governed by a Board of Directors composed of 37 individuals with a minimum of one representative from each of MWD's 26 member agencies. The allocation of the directors and voting rights are determined by each agency's assessed valuation. The City of Los Angeles has four Directors on MWD's Board and controls 19.44 percent of the vote. MWD's Administrative Code defines various tasks which the Board has delegated to MWD staff. A General Manager oversees MWD staff. The General Manager, General Auditor, General Counsel, and Ethics Officer serve under direction and authority given directly by the Board.

8.0.3 Service Area

Originally serving an area of 675 square miles in 1928, MWD's service area has grown to approximately 5,200 square miles serving 19 million people via its 26 member agencies. MWD's service area covers portions of Los Angeles, Ventura, Orange, Riverside, San Bernardino, and

Exhibit 8A
MWD Service Area



Courtesy of The Metropolitan Water District of Southern California

San Diego counties as depicted in Exhibit 8A. MWD member agencies serve 152 cities and 89 unincorporated areas. Member agencies provide wholesale, retail, or a combination of wholesale/retail water sales in their individual service territories.

8.0.4 Major Infrastructure

MWD delivers approximately 6,000 AF per day of treated and untreated water to its member agencies through its vast infrastructure network. Major facilities include the CRA, pumping plants, pipelines, treatment plants, reservoirs, and hydroelectric recovery power plants. A summary of the major facilities and capacities are provided in Exhibit 8B and Exhibit 8C illustrates the geographic locations of the facilities.

Exhibit 8B Major MWD Facilities Summary

Facility	Units	Capacity
Colorado River Aqueduct		
Aqueduct	242 miles	1.3 million AFY
Pumping Plants	5 plants	1,617 feet of total lift
Pipelines	819 miles	
Water Treatment Plants		
Joseph Jensen		750 mgd
Robert A. Skinner		630 mgd
F.E. Weymouth		520 mgd
Robert B. Diemer		520 mgd
Henry J. Mills		220 mgd
Total Treatment Capacity		2,640 mgd
Reservoirs		
Diamond Valley Lake		810,000 AF
Lake Matthews		182,000 AF
Lake Skinner		44,000 AF
Copper Basin		24,200 AF
Gene Wash		6,300 AF
Live Oak		2,500 AF
Garvey		1,600 AF
Palos Verdes		1,100 AF
Orange County		212 AF
Total Reservoir Capacity		1,071,912 AF
Hydroelectric Recovery Plants	16 plants	122 megawatts

Exhibit 8C Major MWD Facilities

Courtesy of The Metropolitan Water District of Southern California

8.1 Supply Sources

Colorado River supplies, State Water Project supplies, In-Basin Storage, Outside-Basin Storage, and Water Transfers together comprise MWD's total system water supply sources. These sources provide supplemental water to meet the demands in Ventura, Los Angeles, Riverside, Orange, San Bernardino and San Diego Counties.

8.1.1 Colorado River

The Colorado River forms California's border with Arizona to the east. The drainage area in California that contributes water to the Colorado River is relatively small and has an arid climate. Accordingly, California has no major tributaries contributing water to the Colorado River.

The Colorado River Board of California is the California state agency given authority to protect the interests and rights of the state and its citizens in matters pertaining to the Colorado River. The Board is comprised of 10 gubernatorial appointees representing the LADWP, MWD, San Diego County Water Authority, Palo Verde Irrigation District, Coachella Valley Water District, Imperial Irrigation District, Department of Water Resources, Department of Fish and Game, and two public members.

8.1.1.1 The Law of the River

The Secretary of the Interior is vested with the responsibility to manage the mainstream waters of the Colorado River pursuant to applicable federal law. This responsibility is carried out consistent with a body of documents referred to as the Law of the River. Water rights to Colorado River water are governed by a complex collection of federal laws, state laws, a treaty with Mexico, other agreements with Mexico, Supreme Court decrees, contracts with the Secretary, interstate compacts, state, and administrative actions at the federal and state levels. Collectively, these documents and associated interpretations are commonly referred to as the "Law of the River" and govern water rights and operations on the Colorado River.

The following are particularly notable among these documents:

1. The Colorado River Compact of 1922, which apportioned beneficial consumptive use of water between the Colorado River Upper Basin and Lower Basin, and defined the term "States of the Lower Division" to mean the States of Arizona, California, and Nevada. Serving as the basis of the "Law of the River," the Compact apportioned water to each basin in anticipation of a dam on the Colorado River. The Upper Basin is the portion of the Basin upstream of Lee Ferry, Arizona, while the Lower Basin is downstream of this point. Each basin was apportioned 7.5 million acre-feet (MAF) annually, and the Lower Basin received the option to an additional 1 MAF annually based on excess flows. California is within the Lower Basin along with Arizona and Nevada.

2. The Boulder Canyon Project Act (Act) of 1928, enacted by Congress to authorize construction of Hoover Dam and the All-American Canal. The Act required that water users in the Lower Basin have a contract with the Secretary, and established the responsibilities of the Secretary to direct, manage, and coordinate the operation of Colorado River dams and related works in the Lower Basin. The Act stipulated conditions, one of which required California to limit Colorado River water use to 4.4 MAF annually plus one-half of the excess water unapportioned by the Colorado River Compact. To satisfy the condition, the California Legislature enacted the Limitation Act in 1929 limiting its use of Colorado River water to the basic apportionment of 4.4 MAF.

3. The California Seven Party Agreement of 1931. Developed in response to the Limitation Act and through regulations adopted by the Secretary, which established the relative priorities of rights among major users of Colorado River water in California. The Seven Party Agreement apportioned California's share of Colorado River water to California contractors. Within the agreement, priorities were established for each of the four agencies holding contracts for Colorado River water with the U.S. Bureau of Reclamation. These priorities are shown in Exhibit D. Seven priorities were established with the first four priorities satisfying California's allocation of 4.4 MAF annually and the fifth and sixth priorities relating to California's share of excess Colorado River flows. MWD holds the fourth and fifth priorities. The fourth priority allocates 550 thousand acre-feet (TAF) of California's apportionment to MWD and the fifth priority allocates 662 TAF of California's share of excess flows to MWD.

4. The 1944 Treaty (and subsequent minutes of the International Boundary and Water Commission) related to the quantity and quality of Colorado River water delivered to Mexico. The Treaty guaranteed an annual quantity of 1.5 MAF to be delivered in accordance with the provisions of the Treaty.

5. The 1963 United States Supreme Court Decision in Arizona v. California, which confirmed the Lower Basin mainstream apportionments of:

   2.8 million acre-feet per year (AFY) for use in Arizona,

   4.4 million AFY for use in California, and

   0.3 million AFY for use in Nevada provided water for Indian reservations and other federal reservations in Arizona, California, and Nevada; and confirmed the significant role of the Secretary in managing the mainstream Colorado River within the Lower Basin.

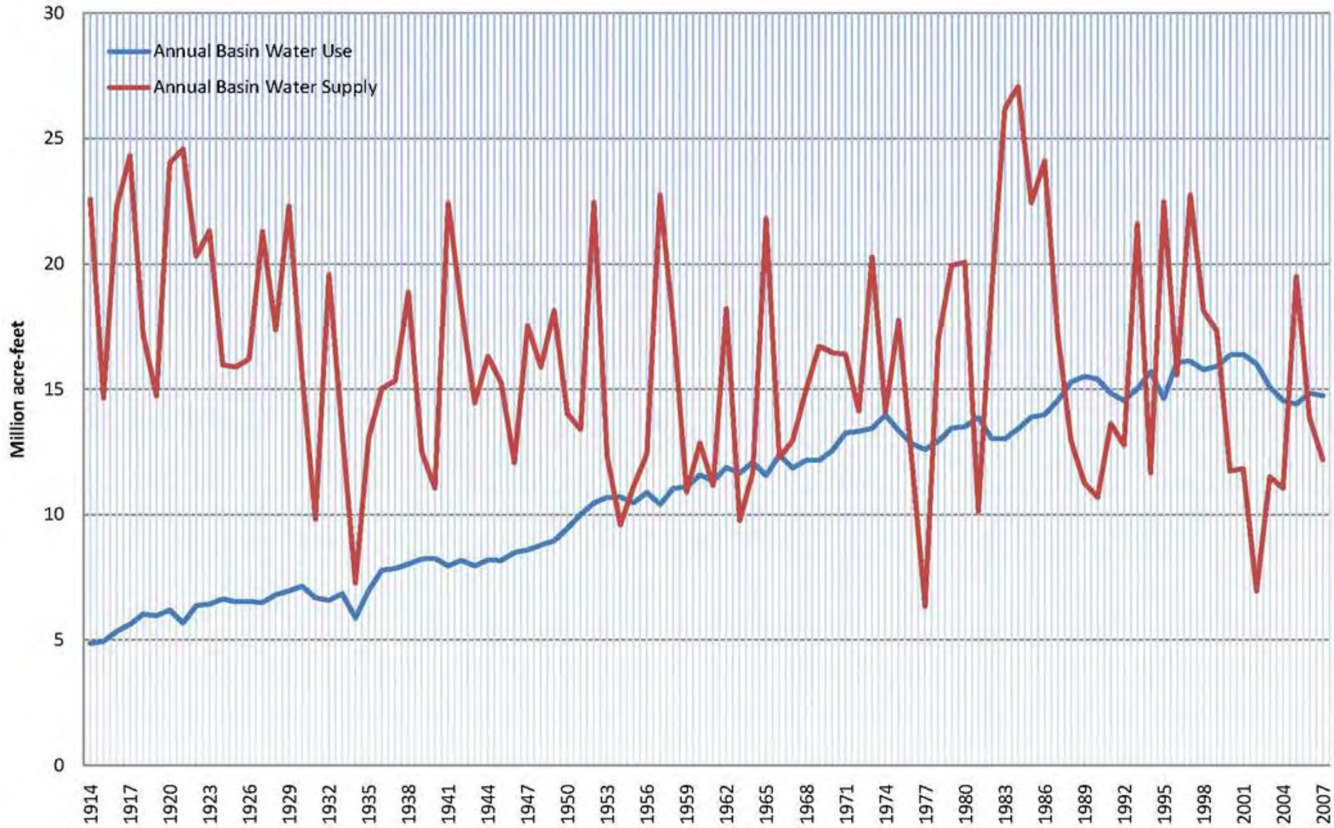
6. The 1964 United States Supreme Court Decree (Decree) in *Arizona v. California* which implemented the Supreme Court's 1963 decision; allocated 50 percent of the surplus water available for use in California; and allowed the Secretary to release water apportioned to but unused in one state for use in the other two states. The Decree was supplemented over time after its adoption and the Supreme Court entered a Consolidated Decree in 2006 which incorporates all applicable provisions of the earlier-issued Decrees.

7. The Colorado River Basin Project Act of 1968, which authorized construction of a number of water development projects including the Central Arizona Project (CAP); provided existing California, Arizona, and Nevada water contractors a priority over the CAP and other users of the same character in Arizona and Nevada whenever less than 7.5 million AFY is available; and required the Secretary to develop the Long Range Operating Criteria and issue an Annual Operating Plan for mainstream reservoirs.

Exhibit 8D
Listing of Priorities - Seven Party Agreement

Priority Number	Agency and Description of Service Area	Beneficial Consumptive Use (Acre-feet/year)
1	Palo Verde Irrigation District - 104,500 acres	3,850,000
2	Yuma Project, California Portion, not exceeding 25,000 acres	
3(a)	Imperial Irrigation District	
3(b)	Palo Verde Irrigation District - 16,000 acres	
4	Metropolitan Water District, City of Los Angeles and/or others on the coastal plain	550,000
5	Metropolitan Water District, City of Los Angeles and/or others on the coastal plain	662,000
6(a)	Imperial Irrigation District	300,000
6(b)	Palo Verde Irrigation District - 16,000 acres of adjoining mesa	
	Total	**5,362,000**

Exhibit 8E
Historical Annual Colorado River Supply and Use

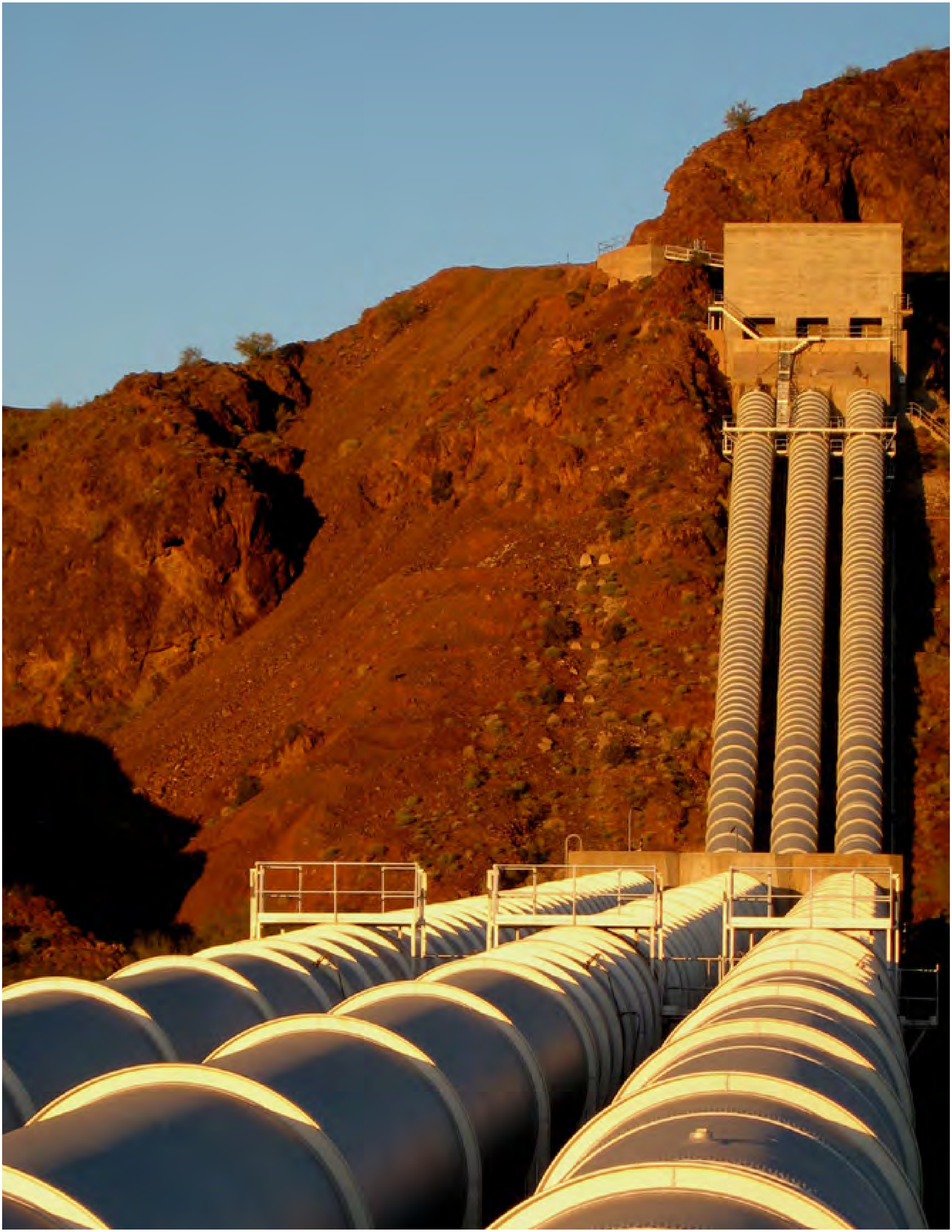


8.1.1.2 Colorado Supply Reliability

Exhibit 8E illustrates the historical annual Colorado River Basin supply and demand beginning 1914 through 2007. The steady increase of demand has caught up with the supply.

Reliability of CRA water for MWD has decreased overtime as a consequence of multiple events. Historically, California had used up to 5.4 million AFY as Arizona and Nevada were not using their normal apportionments of Colorado River water and surplus water was made available by the Secretary. The 1964 Decree and the 2006 Consolidated Decree of the US Supreme Court in *Arizona v. California* confirmed California's allocation was limited to 4.4 MAF annually. As a result, MWD can now only rely on its fourth priority allocation of 550 TAF annually. Prior to this, MWD was able to satisfy its fifth priority allocation with Nevada and Arizona's unused water. However, in 1985 Arizona began increasing deliveries to its Central Arizona Project reducing the availability of unused apportionment to fill MWD's fifth priority.

Because of dry years on the Colorado River system and Arizona and Nevada using their full apportionment, the U.S. Secretary of Interior asserted that California must come up with a plan to live within its 4.4 MAF apportionment. Therefore, users from California have developed California's Colorado River Water Use Plan (California Plan). The users included: MWD, Palo Verde Irrigation District (PVID), Imperial Irrigation District (IID), and Coachella Valley Water District (CVWD). This plan identifies actions that California will take to operate within its 4.4 million acre-foot entitlement. Exhibit 8F and Exhibit 8G illustrate the historical total Colorado River Basin storage and the historical Lake Mead elevation, which show a protracted dry period beginning around 1999.



California currently consumes its normal apportionment of 4.4 million AFY. The order of priority is as follows:

1. PVID - gross area of 104,500 acres of land in the Palo Verde Valley.

2. Yuma Project-Reservation Division - not exceeding a gross area of 25,000 acres in California.

3(a). IID - lands in the Imperial Valley served by the All-American Canal. Export out of basin, primarily agricultural usage. Also, second 63,000 AF in priority 6(a) and balance of any remaining priority 6(a) and 7 water available.

3(b). CVWD - lands in the Coachella Valley served by the Coachella Branch of the All-American Canal. Export out of basin, agricultural usage. Also third 119,000 AF in priority 6(a) and balance of any remaining priority 6(a) and 7 water available.

3(c). PVID - 16,000 acres of land on the Lower Palo Verde Mesa, also priority 6(b).

4. MWD – 550,000 AF, also 662,000 AF in priority 5, and first 38,000 AF in 6(a)

A component of the California Plan was completion of the Quantification Settlement Agreement (QSA) in 2003, which established baseline water use for each California party with Colorado River water rights. Key to the agreement is the quantification of IID at 3.1 MAF and CVWD at 330 TAF. Completion of the QSA facilitates the transfer of water from agricultural agencies to urban water suppliers by allowing water conserved on farm land to be made available for urban use. As a result of litigation, the QSA and eleven other agreements were ruled invalid on February 11, 2010. MWD in conjunction with CVWD and the SDCWA have appealed the court's decision. Ultimately, the total impact of the court's decisions on MWD's Colorado River supplies cannot be determined at this time pending the outcome of the appeal. However, MWD's existing conservation, land fallowing, and transfer programs for Colorado River supplies are independent of the QSA and will not be impacted by the QSA lawsuit.

Along with MWD's apportionment, MWD has developed a number of water supply programs to improve reliability of Colorado River supplies, such as agricultural water transfers and storage programs, and has multiple programs under development as listed in Exhibit 8G. Developed programs in conjunction

Exhibit 8F
Historical Total Colorado River Basin Storage

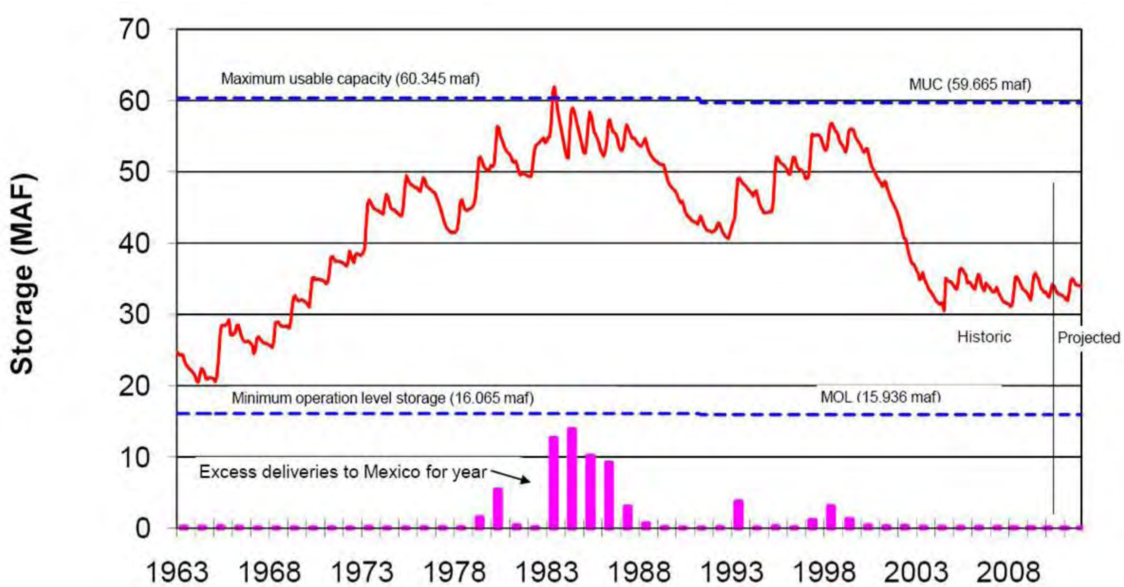
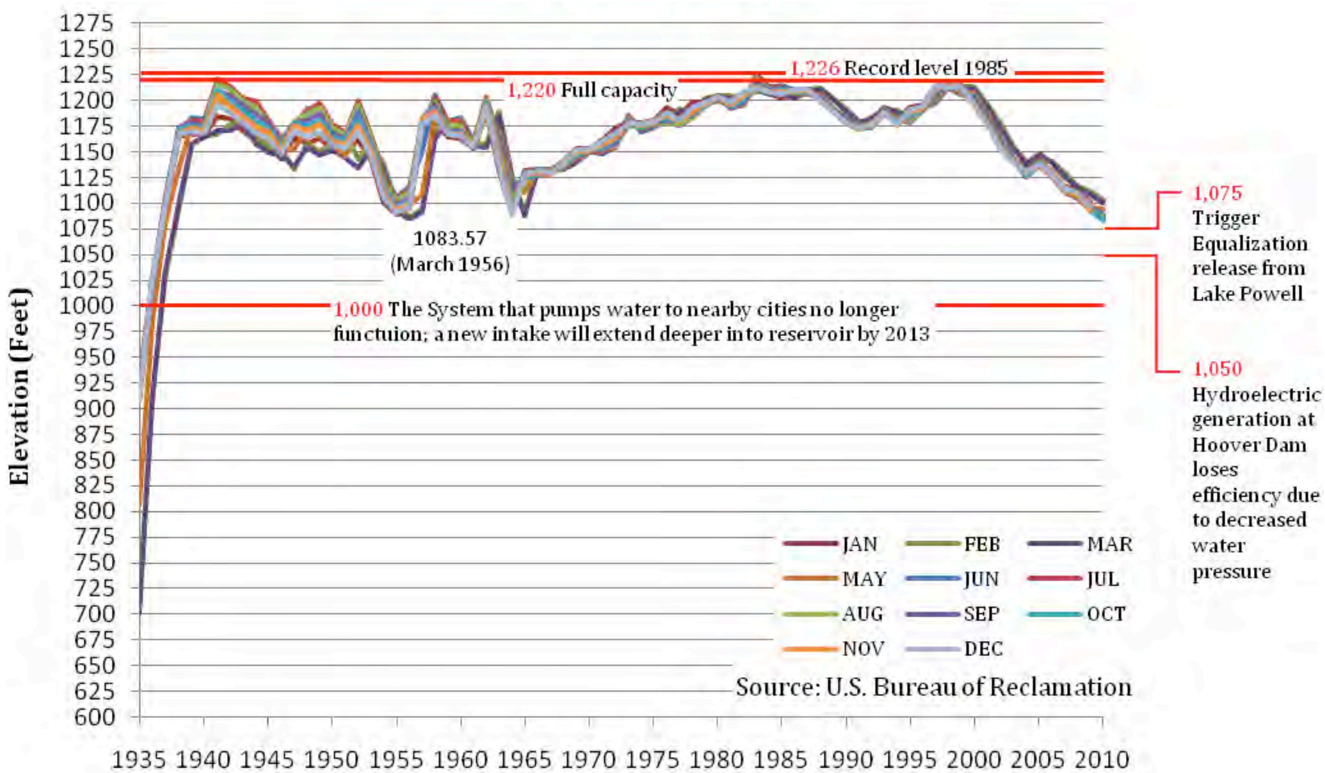


Exhibit 8G
Historical Lake Mead Elevation



The bathtub ring at Lake Mead, August 2010, lake elevation 1,087 feet.

Exhibit 8H
MWD's CRA Forecast Supplies in 2035, Average Year (1922 - 2004 Hydrology)

Program	Supply (Thousands of AF)/ Year
Current	
Basic Apportionment - Priority 4	550
Imperial Irrigation District/MWD Conservation Program	85
Priority 5 Apportionment (Surplus)	13
Palo Verde Irrigation District Land Management Crop Rotation and Water Supply Program	133
Lower Colorado Water Supply Project	5
Lake Mead Storage Program	400
Quechan Settlement Agreement Supply	7
Forbearance for Present Perfected Rights	-47
Coachella Valley Water District State Water Project/QSA Transfer Obligation	-35
Desert Water Agency and Coachella Valley Water District SWP Table A Obligation	-155
Desert Water Agency and Coachella Valley Water District SWP Table A Transfer Call-back	82
Desert Water Agency and Coachella Valley Water District Advance Delivery Account	73
Drop 2 Reservoir Funding	25
Southern Nevada Water Authority Agreement	0
Subtotal of Current Programs	**1,136**
Programs Under Development	
Additional Palo Verde Irrigation District Transfers	62
Arizona Programs - Central Arizona Project	50
California Indians/Other Agriculture	10
ICS Exchange	25
Agreements with Coachella Valley Water District	35
Hayfield Groundwater Extraction Project	0
Subtotal of Proposed Programs	**182**
Additional Non-MWD CRA Supplies	
San Diego County Water Authority/ Imperial Irrigation District Transfer	200
Coachella and All-American Canal Lining	
To San Diego County Water Authority	80
To San Luis Rey Settlement Parties[1]	16
Subtotal of Non-MWD CRA Supplies	**296**
Maximum CRA Supply Capability[2]	**1,614**
Minus Supply CRA Capacity Constraint of 1.25 MAF Annually	**-364**
Maximum Forecast CRA Deliveries	**1,250**
Minus Non-MWD Supplies[3]	**-296**
Maximum MWD Supply Capability[4]	**954**

1. Subject to satisfaction of conditions specified in agreement among MWD, the US, and the San Luis Rey Settlement Parties
2. Total amount of supplies available without taking into consideration of CRA capacity constraint of 1.25 MAF annually.
3. Exchange obligation for San Diego County Water Authority - Imperial Irrigation District transfer and the Coachella and All-American Canal Lining Projects.
4. The amount of CRA water available to MWD after meeting exchange obligations.

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

with MWD's apportionment will provide MWD with approximately 1.14 MAF in 2035 under an average year (1922 – 2004 hydrology). Proposed programs under development could add another 182 TAF per year. Non-MWD supplies conveyed through the CRA are forecast at 296 TAF for a total CRA supply capability of 1.61 MAF. However, the CRA has a supply capacity constraint of 1.25 MAF. After subtracting MWD's conveyance obligation of non-MWD supplies, MWD's supplies for 2035 under average year, single-dry year (1977 hydrology), and multi-dry year (1990 – 1992 hydrology) scenarios are all forecast at 954 TAF. Exhibit 8H summarizes the CRA supply forecast for 2035 under an average year.

8.1.1.3 Water Quality Issues

Water quality issues for Colorado River supplies cover high salinity levels, perchlorate, nutrients, uranium, chromium VI, N-nitrosodimethlamine (NDMA), and pharmaceuticals and personal care products (PPCPs). High salinity levels present the most significant issue and the only foreseeable water quality constraint for the Colorado River supply. MWD expects its source control programs for the CRA to adequately address the other water quality issues. MWD has also bolstered its water security measures across all of its operations since 2001, including an increase in water quality tests. Details of MWD's water quality initiatives are available in MWD's 2010 Regional Urban Water Management Plan (RUWMP).

Salinity

Water obtained from the Colorado River has the highest salinity levels of all MWD supply sources averaging 630 mg/L since 1976. Salts are eroded from saline sediments deposited in prehistoric marine environments in the Colorado River Basin (Basin), dissolved by precipitation, and conveyed into the Basin's water courses. Salinity issues have been recognized in the Basin for over 30 years. The seven basin states formed the Colorado River Basin Salinity Control Forum (Forum) to mutually cooperate on salinity issues in the Basin. The Forum recommended the U.S. Environmental Protection Agency (USEPA) to act upon the Forum's proposal and in response the USEPA approved water quality standards and established numeric criteria for controlling salinity increases. Each Basin State adopted the water quality standards, which are designed to limit the flow-weighted average annual salinity level to 1972 levels or below. An outgrowth of the Forum was the Colorado River Basin Control Program. At the core of the program is the reduction in salts entering the river system by intercepting and controlling non-point sources, wastewater, and saline hot springs. Salinity reduction projects have reduced salinity concentration of Colorado River water by over 100mg/L, which equates to approximately $264 million per year in avoided damages (2005 dollars).

MWD adopted a Salinity Management Policy in 1999 with the goal of achieving salinity concentrations of less than 500 mg/L at delivery. To reduce salinity levels, Colorado River supplies are blended with SWP water supplies to achieve the salinity target. In some years, the target is not possible to achieve as a result of hydrologic conditions that increase salinity on the Colorado River and decrease SWP water available for blending. Additionally, to maximize the use of recycled water for agriculture, MWD attempts to import lower salinity imported water during the spring/ summer months to reduce salinity levels in recycled water supplies.

Perchlorate

In 1997 perchlorate was first detected in the Colorado River. It was attributed to an industrial site upstream of the Las Vegas Wash in Nevada which drains to the river. Subsequently, an additional perchlorate plume was found to be migrating from an additional industrial site, but had not reached the Las Vegas Wash. Since the initial discovery of contamination, remediation efforts have significantly reduced perchlorate loading from the Las Vegas Wash. At Lake Havasu, downstream of the convergence of the Las Vegas Wash and Colorado River, perchlorate levels have decreased from 9 μg/L at their peak in 1998 to less than 6 μg/L in October 2002. Since June 2006, typical levels have been less than 2 μg/L.

Nutrients

Excessive nutrient levels in water can stimulate algal and aquatic weed growth leading to taste and odor concerns. Nutrients include both phosphorous and nitrogen compounds. Other impacts of algal and aquatic weed growth include reductions in operating efficiencies and potentially provide an additional food source for invasive aquatic species, such as quagga and zebra mussels.

Naturally, the Colorado River system has relatively low concentrations of phosphorous. Additional loading to the system as upstream urbanization increases has the ability to increase phosphorous concentrations and impact MWD's ability to blend low nutrient concentration CRA water with high nutrient concentration SWP water. MWD continues to work with agencies located along the lower Colorado River to improve wastewater management in order to reduce phosphorous loading.

Uranium

Near Moab, Utah, a 16-million ton pile of uranium tailings located approximately 750 feet from the Colorado River is a potential source of uranium loading to the river. In 1999, the US Department of Energy began remediating the site by removing tailings and treating contaminated groundwater. Complete removal of the pile is expected by 2025 or 2019 if additional funding is secured. MWD is tracking clean-up progress and continues to support rapid clean-up of the site.

To address recent uranium mining claims in the vicinity of the Colorado River and the Grand Canyon Area, MWD has sent letters to the Secretary of Interior to highlight MWD's concern of source water protection and recommended close federal oversight. In 1999, the Department of Interior placed a two-year hold on mining claims for 1 million acres adjacent to the Grand Canyon area to conduct additional analyses and H.R. 644, Grand Canyon Watersheds Protection Act, was introduced in 2009. H.R. 644, if approved, would prohibit new mining activities around the Grand Canyon area.

Chromium VI

Chromium VI has been detected in a groundwater aquifer in the vicinity of the Colorado River near Topock, Arizona. The source of the contamination is a natural gas compression site operated by Pacific Gas and Electric (PG&E) that previously used chromium VI in its operations. Monitoring upstream and downstream of the site range from non-detect (0.03 μg/L) to 0.06 μg/L which are considered within the background range for the river. MWD is actively involved in the corrective action process through its participation in stakeholder workgroups and partnerships with State and federal regulators, Indian tribes, and other stakeholders. The Final Environmental Impact Report (EIR) for the Topock Chromium VI remediation project is complete and has been certified by California Department of Toxic Substances Control. U.S. Department of Interior has issued a Federal Record of Decision which states that PG&E holds sole responsibility for the substantial threat of the release of Chromium VI near Topock, Arizona. A time-critical removal action is authorized and PG&E's clean-up operations are under the direction and oversight of the Department of Toxic Substances Control.

NDMA and Pharmaceuticals and Personal Care Products

N-nitrosodimenthylamine is a by-product formed by secondary disinfection of some natural waters with chloramines. MWD is

involved with projects to understand the potential sources of NDMA precursors in its source watersheds and to develop treatment strategies to minimize NDMA formation at its water treatment facilities. In 2007, MWD initiated monitoring efforts to measure PPCPs in its source supplies. PPCPs have been detected at very low levels (low ng/L level; parts per trillion) consistent with monitoring results from other utilities. MWD is involved with programs to improve analytical testing methods, characterize PPCP in drinking water sources in California, and effects of PPCPs on groundwater recharge and recycled water use.

8.1.2 State Water Project

MWD began receiving water from the SWP in 1972. MWD is the largest of 29 contractors for water from the SWP, holding a contract for 1.912 MAF per year, or 46 percent of the total contracted amount of the 4.173 MAF ultimate delivery capacity of the project. Variable hydrology, environmental issues, and regulatory restrictions in the San Francisco Bay/ Sacramento-San Joaquin River Delta (Bay-Delta) have periodically reduced the quantity of water that the SWP delivers to MWD.

Exhibit 81
State Water Project Major Facilities

Courtesy of the State of California Department of Water Resources

8.1.2.1 Major State Water Project Facilities

The SWP is owned by the State of California and operated by the Department of Water Resources (DWR) delivering water to two-thirds of the population of California and 750,000 acres of farmland. The SWP system consists of 701 miles of aqueduct, 34 storage facilities totaling 5.8 MAF of storage, five hydro-electric power plants, four pumping-generating plants, 17 pumping plants, and three pump stations. Exhibit 8I illustrates the location of major SWP facilities. SWP facilities originate in Northern California at Lake Oroville on the Feather River. Water released from Lake Oroville flows into the Feather River, goes downstream to its confluence with the Sacramento River, and then travels into the Bay-Delta. Water is pumped from the Bay-Delta region to contractors in areas north and south of the San Francisco Bay and south of the Bay-Delta. SWP deliveries consist solely of untreated water. In addition to delivering water to its contractors, the SWP is operated to improve water quality in the Bay-Delta region, control flood waters, and provide recreation, power generation, and environmental enhancement.

MWD receives SWP water at three locations: Castaic Lake in Los Angeles County, Devil Canyon Afterbay in San Bernardino County, and Box Spring Turnout at Lake Perris in Riverside County. In addition, MWD has flexible storage rights of 65 TAF at Lake Perris at the terminus of the East Branch of the SWP and 153.95 TAF at Castaic Lake at the terminus of the West Branch.

8.1.2.2 Contract Allocations

Contract allocations, also known as entitlements, for SWP contractors are provided by DWR in a table commonly referred to as Table A and shown in Exhibit 8J. Allocations are based on the original projected SWP maximum yield of 4.173 MAF. Table A is a tool used by DWR to allocate fixed and variable SWP costs and yearly water entitlements to the contractors. Table A contract amounts do not reflect actual deliveries a contractor should expect to receive. MWD has a Table A contract amount of 1.912 MAF. MWD's full Table A contract amount was made available to MWD for the first time in 2006.

DWR annually approves the amount of contract allocations SWP contractors will receive. The contract allocation amount received by contractors varies based on contractor demands and projected available water supplies. Variables impacting projected water supplies include snowpack in the Sierra Nevada, capacity available in reservoirs, operational constraints, and demands of other water users. Operational constraints include pumping restrictions related to fish species listed as either threatened or endangered under the federal or state Endangered Species Acts. Contractors' requests for portions of their entitlements cannot always be met. In some years there are shortages and in other years surpluses. In 2008 and 2009, SWP contractors received only 35 percent and 40 percent, respectively, of their SWP contract allocations.

DWR bi-annually prepares the State Water Project Delivery Reliability Report to provide contractors with current and projected water supply availability for SWP. The 2009 draft released in January 2010 indicates expected deliveries for multiple-dry year periods will vary from 32 to 38 percent of maximum Table A amounts and for multiple-year wet periods, 72 to 94 percent of maximum Table A amounts. Overall the report shows increased reductions in water deliveries on average when compared to the previous 2007 report. Factors impacting deliveries include environmental constraints and hydrologic changes as a result of climate change.

Exhibit 8J Table A Maximum Annual SWP Amounts (acre-feet)

Contractor Maximum SWP Table A

North Bay	
Napa County Flood Control and Water Conservation District	29,025
Solano County Water Agency	47,756
Subtotal	**76,781**
South Bay	
Alameda County Flood Control and Water Conservation District, Zone 7	80,619
Alameda County Water District	42,000
Santa Clara Valley Water District	100,000
Subtotal	**222,619**
San Joaquin Valley	
Oak Flat Water District	5,700
Kings County	9,305
Dudley Ridge Water District	57,343
Empire West Side Irrigation District	3,000
Kern County Water Agency	998,730
Tulare Lake Basin Water Storage District	95,922
Subtotal	**1,170,000**
Central Coastal	
San Luis Obispo County Flood Control and Water Conservation District	25,000
Santa Barbara County Flood Control and Water Conservation District	45,486
Subtotal	**70,486**
Southern California	
Antelope Valley-East Kern Water Agency	141,400
Castaic Lake Water Agency	95,200
Coachella Valley Water District	121,100
Crestline-Lake Arrowhead Water Agency	5,800
Desert Water Agency	50,000
Littlerock Creek Irrigation District	2,300
Mojave Water Agency	75,800
Metropolitan Water District of Southern California	1,911,500
Palmdale Water District	21,300
San Bernardino Valley MWD	102,600
San Gabriel Valley MWD	28,800
San Gorgonio Pass Water Agency	17,300
Ventura County Flood Control District	20,000
Subtotal	**2,593,100**
Delta Delivery Total	**4,132,986**
Feather River	
Butte County	27,500
Plumas County Flood Control and Water Conservation District	2,700
Yuba City	9,600
Subtotal	**39,800**
Total	**4,172,786**

In addition to MWD's Table A amount, MWD has long term agreements in place to obtain additional SWP supplies through five other programs:

- Article 21
- Turnback Pool
- Yuba River Accord
- San Luis Carryover Storage
- Desert Water Agency and Coachella Valley Water District Table A Transfer

Article 21 is in reference to a provision in the SWP contract with DWR that allows SWP contractors, such as MWD, to take additional water deliveries in addition to Table A amounts. Article 21 water is only available under certain conditions as outlined in Article 21. SWP Article 21 of the contracts permits delivery of water excess to delivery of SWP Table A and some other water types to those contractors requesting it. SWP Article 21 water is apportioned to those contractors requesting it in the same proportion as their SWP Table A.

Turnback Pool (Pool) water allows a contractor that has been allocated Table A annual entitlement that the contractor will not use to sell that water to other SWP contractors through the Pool. If there are more requests from contractors to purchase water from the Pool than the amount in the Pool, the water in the Pool is allocated among those contractors requesting water in proportion to their Table A entitlements. If requests to purchase water from the Pool total are less than the amount of water in the Pool, the sale of water is allocated to the selling contractors in proportion to their respective amounts of water in the Pool.

In 2007, MWD and DWR signed an agreement allowing MWD to participate in the Yuba Dry Year Water Purchase Program. Under this program, transfers are available from the Yuba County Water Agency during dry years up to 2025. MWD completed purchases of 26.4 TAF and 42.9 TAF in 2008 and 2009, respectively.

As part of the Monterey Amendment, which modified the contractors' long term contracts with DWR, the use of carryover storage by contractors was permitted in the San Luis Reservoir for use during dry years. Carryover storage is curtailed if it impedes with the storage of SWP water for project needs.

MWD entered into a transfer agreement with the DWA and CVWD for their Table A contract amounts in exchange for an equal amount of water from the CRA. Both DWA and CVWD are SWP contractors, but have no physical connections to obtain SWP water. MWD is able to transfer CRA water to both agencies as a result of their locations adjacent to CRA facilities. DWA and CVWD have a combined Table A amount of 1.912 MAF per year. MWD additionally can provide DWA and CVWD with deliveries of MWD's other SWP water supplies and non-SWP supplies utilizing SWP facilities, thus allowing MWD additional flexibility in managing its water supply portfolio.

MWD also engages in short-term transfer agreements using SWP facilities to bolster supplies as opportunities become available as discussed in the Groundwater Storage and Transfers sub-section. Historically, MWD has obtained transfers through the Governor's Water Bank, Dry-Year Purchase Programs, and the State Water Contractors Water Transfer Program.

MWD expects to receive 2.046 MAF through its SWP supplies in 2035 under average conditions (1922 – 2004 hydrology). Exhibit 8K summarizes MWD's SWP supplies by program. Current programs are expected to result in 1.441 MAF and programs under development are expected to add an additional 605 TAF. Under multi-year dry conditions (1990 – 1992 hydrology), MWD expects to receive only 956 TAF and 1,003 TAF under a single-dry year (1977 hydrology).

8.1.2.3 Water Quality Issues

Water quality issues for SWP supplies include total organic carbon (TOC), bromide, arsenic, nutrients, NDMA, and PPCPs. TOC and bromide in SWP water present the greatest water quality issues and have restricted MWD's ability to use SWP water at various times as the contaminants form disinfection byproducts during water treatment processes. MWD has initiated a process to upgrade its treatment processes to ozone disinfection to reduce formation of disinfection byproducts and lift potential restrictions on SWP water usage. MWD requires low salinity levels of SWP water to meet blending requirements for CRA water, and therefore, any increase in salinity levels in SWP supplies is a concern to MWD.

MWD supported DWR in the establishment of a policy regarding water quality of non-SWP water transported through the SWP system and in the expansion of Municipal Water Quality Investigations Programs to include additional monitoring and advanced warnings to contractors that may impact water treatment processes.

MWD is utilizing its water supply portfolio options to conduct water quality exchanges to reduce TOC and bromide. MWD has stored SWP water during periods of high water quality in groundwater storage basins for later use when SWP is at a lower water quality. These storage programs were initially designed to provide water during dry SWP conditions, but a few of these programs are now operated for dual-purposes.

TOC and bromide in high concentrations lead to the formation of disinfection byproducts when source water is treated with disinfectants, such as chlorine. Agricultural drainage to the Bay-Delta and seawater comingling with Bay-Delta supplies increases these contaminants. The Bay Delta Conservation Plan (BDCP) has outlined multiple options to improve the water supply reliability and habitat protection, which is being prepared through a collaboration of state, federal, and local water agencies, state and

Exhibit 8K
MWD Forecast Supplies of SWP Water in 2035, Average Year (1922 - 2004 Hydrology)

Program	Supply (Thousands of AF)
Current	
MWD Table A	1,026
Desert Water Agency and Coachella Valley Water District SWP Table A Transfer	155
San Luis Carryover Storage[1]	208
Article 21 Supplies	52
Yuba River Accord Purchase	0
Subtotal of Current Programs[2]	**1,441**
Programs Under Development	
Delta Conveyance Improvements	605
Integrated Resources Plan SWP Target[3]	0
Subtotal of Proposed Programs[2]	**605**
Maximum SWP Supply Capability[2]	**2,046**

1. Includes carryover water from Desert Water Agency and Coachella Valley Water District.
2. Does not include transfers and water banking associated with SWP.
3. Remaining supply needed to meet Integrated Resources Plan target.

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

federal fish agencies, environmental organizations, and other interested parties. The overall goal of BDCP is identifying water flow and habitat restoration actions to both improve water supply reliability and recover endangered and sensitive species and their habitats Bay-Delta. MWD is in the process of computing upgrades to its water treatment plants to use ozone as the primary disinfectant. Ozone disinfection is very effective treatment for control of bromate formation and will allow MWD to treat higher quantities of SWP supplies without blending those supplies with CRA water.

Arsenic

SWP supplies not banked in MWD's SWP groundwater storage programs naturally contain low levels of arsenic ranging from non-detect to 4.0 µg/L and do not require additional treatment for arsenic removal. SWP supplies banked in at least one of these groundwater storage programs contain arsenic levels close to or at the regulatory threshold of 10 µg/L requiring additional treatment for arsenic removal. Historically, MWD has at times restricted flows from one groundwater storage program as a result of arsenic levels. One groundwater storage partner has initiated a pilot arsenic removal program, albeit raising the cost of the groundwater storage program. Arsenic can also be removed at water treatment plants by increasing coagulant doses. To handle arsenic removed during water treatment processes, MWD has had to invest in solids handling facilities.

Nutrients

Nutrient levels in SWP water are significantly higher than in Colorado River water. Both phosphorous and nitrogen compounds are a concern in SWP water, but similar to CRA supplies phosphorous is the limiting nutrient. Nutrient sources in SWP water include wastewater discharges, agricultural drainage, and sediments from nutrient rich soils in the Bay-Delta. MWD reservoirs have been temporarily bypassed at times as a result of taste and odor events related to nutrients leading to short-term supply impacts.

MWD is working with other water agencies also receiving SWP water from the Bay-Delta region to reduce the impact of nutrient loading from wastewater plants discharging to the Bay-Delta. To assist in managing its operations, MWD has implemented an algae monitoring and management program designed to provide warnings in advance of algae and taste and odor issues at its reservoirs allowing adjustments in other system operations.

NDMA and Pharmaceuticals and Personal Care Products

Similar to all of its water supply sources, NDMA and PPCPs are constituents of emerging concern. As described above for Colorado River supplies, MWD is involved with efforts to address both NDMA and PPCPs.

Salinity

Over the long term salinity concentrations in SWP water are significantly lower than in CRA water, but the timing of supply availability and total dissolved solids (TDS) concentrations can vary in response to hydrologic conditions. Additionally, salinity concentrations vary in the short term in response to seasonal and tidal flow patterns. MWD requires lower salinity SWP water to blend with CRA water to meet salinity requirements for its member agencies. MWD's blended salinity objective is 500 mg/L.

Environmental constraints also impact MWD's ability to meet its salinity objective. Since 2007, pumping operations in the Bay-Delta have been limited to prevent environmental harm (as discussed in the Bay-Delta Issues subsection below). MWD must rely on higher salinity CRA water resulting in an exceedance in MWD's salinity objective at times.

SWP salinity concentrations as specified in the SWP Water Service Contract have not been met. Article 19 of SWP Water Service Contract specifies ten-year average salinity concentrations of 220 mg/L and a monthly maximum of 440 mg/L. MWD is working with DWR and other agencies to reduce salinity in SWP Bay-Delta supplies through multiple programs. These programs include modifying agricultural drainages and completing basin plans on the San Joaquin River, modifying levees around flooded islands in the Bay-Delta, and installing gates to reduce transportation of salts from seawater.

8.1.2.4 Bay-Delta Issues

The Bay-Delta is a major waterway at the confluence of the Sacramento and San Joaquin rivers serving multiple and at times conflicting purposes exacerbated during dry years when water to meet the needs of both people and the environment is in short supply. Approximately two-thirds of Californians receive at least a portion of their water from the Bay-Delta. Almost all water delivered via the SWP to Southern California must pass through the Bay-Delta. Runoff from more than 40 percent of the state is also conveyed through the Bay-Delta forming the eastern edge of the San Francisco bay's estuary. A large portion of the Bay-Delta region lies below sea level and is protected by more than 1,100 miles of levees to prevent flooding. Deterioration of the Bay-Delta ecosystem coupled with infrastructure concerns, hydrologic variability, climate change, litigation, regulatory restrictions, and previously discussed water quality issues have resulted in supply reliability challenges for SWP contractors who depend upon the Bay-Delta for water supplies.

Environmental

As an estuarine environment, the Bay-Delta provides habitat for migratory and resident fish and birds, including those placed on the threatened or endangered species list under the federal or California Endangered Species Act (ESA). Five fish species residing in the Bay-Delta were listed as endangered under the ESA, and one additional species was listed as threatened in 2009 under the California ESA. As a result of a combination of lawsuits regarding the ESA listed species and biological opinions and incidental take permits (permits for inadvertently harming ESA listed species) from the U.S. Fish and Wildlife Service and National Marine Fisheries Service, SWP exports and pumping operations in the Bay-Delta have been significantly curtailed. However, DWR prepared a Water Allocation Analysis in 2010 indicating that MWD could receive 150 to 200 TAF less water than forecast for 2010 under average hydrologic conditions. Ongoing litigation, additional species listing, and regulations could further curtail pumping operations and have an additional adverse impact on MWD's supplies and reserves. MWD has filed a lawsuit in conjunction with other SWP contractors challenging one of the biological opinions. As discussed below under the Delta Plan, the Delta Vision process is designed to develop long term solutions to these issues.

Infrastructure

Bay-Delta channels are constrained by a levee system to protect below sea level islands in the Bay-Delta from flooding. Land in the Bay-Delta subsides mainly from ongoing oxidation of aerated peat soils. Some islands are presently twenty feet or more below sea level. Land subsidence is expected to continue which increases the risk of levee failure and island flooding. Many of the levees are old and do not meet modern engineering standards. A catastrophic earthquake could cause widespread levee failure shutting down SWP operations for an extended period of time. Following a levee failure, the flow of water onto an island can pull saline water from the San Francisco Bay into the central Bay-Delta area and, if coupled with pumping in the south Bay-Delta, draw saline water into the south Bay-Delta area. Therefore, pumping in the south Bay-Delta may need to be stopped or slowed down for an extended period, and additional flows may

Photo courtesy of The Metropolitan Water District of Southern California.

need to be released from Lake Oroville to flush saline water out of the Bay-Delta. Any salinity introduced into Bay-Delta may also impact Bay-Delta water quality for an extended period of time.

Recognizing the need for protecting these vulnerable Bay-Delta levees, the Bay-Delta Levees Program was formed to coordinate improvements to and maintenance of the Bay-Delta levees. Over the next few years, the DWR and other agencies will conduct a Comprehensive Program Evaluation. This program will supplement existing risk studies, develop a strategic plan, recommend priorities, and provide estimates for the Bay-Delta Levees Program.

8.1.2.5 Delta Plan

Former California Governor Arnold Schwarzenegger established the Delta Vision Process in 2006 to address ongoing Bay-Delta conflicts through long-term solutions. The independent Blue Ribbon Task Force completed their vision for sustainable management of the Bay-Delta in 2008. After delivery of the Delta Vision recommendations and goals, the State Legislature initiated the process to conduct information hearings and draft legislation. Ultimately, the Governor called the Seventh Extraordinary Session to address the Bay-Delta and water issues in the State. Resulting legislation included the approval of SB 1 X7 addressing Bay-Delta policy reforms and governance of the Bay-Delta.

A key concept of SB 1 X7 is the formation of a Delta Stewardship Council (Council). The Council is an independent State agency tasked to equally further the goals of Delta restoration and water supply reliability. One of the Council's first major tasks is to develop, adopt, and begin implementation of a Delta Plan by January 1, 2012. Key requirements of the plan as summarized in the MWD RUWMP are:

- Further the coequal goals of ecosystem restoration and water supply reliability.
- Attempt to reduce risks to people, property, and State interests.
- Promote Statewide water conservation, water use efficiency, and sustainable use of water to achieve the coequal goals.
- Improvements to water conveyance/storage and operations of such facilities to achieve the coequal goals.
- Consider including the Bay Delta Conservation Plan (BDCP) into the Delta Plan and allow the BDCP to be eligible for State funding if specific conditions are met.

The BDCP is a joint effort of State and federal fish agencies; State, Federal, and local water agencies; environmental organizations; and other parties with the goal of providing for both improvements in water reliability through securing long-term permits to operate the SWP and species/habitat protection in the Delta. MWD is a member of the Steering Committee. An outcome of the plan will be the identification of water flow and habitat restoration actions that assist in recovery of ESA listed and sensitive species and their associated habitats in the Bay-Delta. A range of options to accomplish the outcome will be carried forward to the environmental review phase.

Photo courtesy of The Metropolitan Water District of Southern California.

8.1.3 In-Basin Storage

In basin-storage facilities play a key role in maintaining MWD's reliability during droughts or other imported water curtailments and emergency outages. In-basin storage facilities consist of surface reservoirs and contracted groundwater basin storage. Conjunctive use of surface reservoirs and groundwater basins was first initiated by MWD in the 1950's. Long term storage goals for in-basin storage facilities were established in MWD's Water Surplus and Drought Management Plan (WSDM). The WSDM plan allows storage for hydrology variances, water quality, and SWP and CRA issues.

MWD has established emergency in-basin storage requirements based on a major earthquake that could potentially cutoff all supplies for six months from the all aqueducts serving the region, the CRA, both SWP branches, and LADWP's LAA. Under this scenario, MWD would maintain deliveries by suspending interruptible deliveries, implementing mandatory water use reductions of 25 percent of normal-year demands, water would be made available from surface reservoir and groundwater supplies stored as part of MWD's interruptible supply program, and full local groundwater production would occur. MWD's emergency storage requirement is a function of projected demands and varies with time.

8.1.3.1 Surface Reservoirs

MWD owns and operates seven in-basin surface storage reservoirs. Four of the reservoirs, Live Oak, Garvey, Palos Verdes, and Orange County, are used for regulatory purposes and do not provide drought or emergency storage. Additionally, MWD owns and operates two reservoirs, Copper Basin and Gene Wash, along the CRA outside of the basin for system regulation purposes. Outside its basin, MWD has 1.45 MAF storage rights in Lake Mead on the Colorado River pursuant to its intentionally created surplus agreement with the U.S. Bureau of Reclamation. MWD also has storage rights in DWR's SWP terminal reservoirs, Lake Perris and Castaic Lake, as previously discussed. The total capacity of all in-basin surface reservoirs, inclusive of the rights in the terminal reservoirs, is 1.26 MAF, as listed in Exhibit 8L.

MWD operates its three main storage reservoirs, Diamond Valley Lake, Lake Skinner and Lake Matthews, for dry-year, emergency, and seasonal storage. MWD has identified a dry-year storage capacity goal of 620 TAF by 2020. To date, this goal has been met and will be sustained with storage at Diamond Valley Lake and the two terminal reservoirs. Under an average year scenario for 2035 (1922-1994 hydrology), 576 TAF per year

Exhibit 8L
MWD's In-Basin Surface Reservoir Capacity

Reservoir	Capacity (AF)
Dry Year/Emergency/Seasonal Storage Purposes	
Diamond Valley Lake	810,000
Lake Matthews	182,000
Lake Skinner	44,000
Lake Perris (Storage Rights)[1]	65,000
Castaic Lake (Storage Rights)[1]	153,940
Subtotal	1,254,940
Regulatory Purposes	
Live Oak	2,500
Garvey	1,600
Palos Verdes	1,100
Orange County	212
Subtotal	5,412
Total Reservoir Capacity	**1,260,352**

1. MWD holds storage rights for flexible use in DWR terminal storage facilities, Lake Perris and Castaic Lake. In addition, MWD has emergency storage of 334 TAF in DWR's reservoirs.

of in-basin surface storage is projected to be available, exclusive of emergency supplies, as summarized in Exhibit 8M.

MWD reserves a portion of its in-basin surface reservoir storage capacity for emergencies. MWD's emergency surface reservoir storage portfolio is split between storage in its three main reservoirs and DWR reservoirs. MWD's emergency storage capacity, based on demands for 2030, is forecast to be approximately 610 TAF. Approximately 276 TAF is projected to be stored in MWD's facilities and the balance of 334 TAF in DWR's facilities. The balance of available storage capacity, 975 TAF, is for dry-year and seasonal storage.

Any additional reservoir capacity is used for seasonal storage and system operations. Seasonal storage is required to meet peak demands. MWD incorporates reserves of 5 percent into reservoir operations to account for imported water transmission infrastructure maintenance that would restrict or temporarily halt imported water flows.

8.1.3.2 Contracted Groundwater Basin Storage

To improve reliability, MWD engages in contracted groundwater basin storage within the basin area. By 2020, MWD aims to develop an annual dry supply of 300 TAF. To meet this goal, MWD has worked with local water agencies to increase groundwater storage. Groundwater storage occurs using the following methods:

- Direct delivery – Water is delivered directly by MWD to local groundwater storage facilities through the use of injection wells and spreading basins.
- In-lieu delivery – Water is delivered directly to a member agency's distribution system and the member agency uses the delivered water and forgoes pumping allowing water to remain in storage.

MWD engages in three main types of storage programs: replenishment,

Exhibit 8M
MWD Forecast Supplies of In-Basin Surface Storage Supplies in 2035, Average Year (1922 - 2004 Hydrology)

Program	Supply (Thousands of AF)/Year
In-Basin Surface Storage (Diamond Valley Lake, Lake Skinner, Lake Matthews)	444
Lake Perris and Castaic Lake MWD Storage Rights	132
Maximum MWD Supply Capability	**576**

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

cyclical, and conjunctive use. These programs are designed to deliver water to agencies prior to the actual need for the demands, allowing MWD to store supplies for use in dry years. Since 2007, MWD has used these programs to address SWP shortages. MWD provides financial incentives and funding to assist agencies to assist with developing storage programs.

Replenishment programs provide water to agencies at a discounted cost and can be withdrawn by the recipient after one year. Cyclic storage contracts allow surplus imported water to be delivered for recharge in advance of the actual water purchase. The delivered water is in excess of an agency's planned and budgeted deliveries. The agency purchases the water at a later time when it has a need for groundwater replenishment deliveries.

Conjunctive use contracts allow MWD to request an agency to withdraw previously stored MWD water from storage during dry periods or emergencies. Agencies must pay MWD the current water rate when they are requested to withdraw water from storage. Water withdrawn from storage allows MWD to temporarily curtail deliveries by an equal amount. MWD currently has ten conjunctive use programs with a combined storage capacity of 421.9 TAF and a dry-year yield of 117.3 TAF per year as summarized in Exhibit 8N.

MWD prepared a Groundwater Assessment Study in 2007 in conjunction with local agencies and groundwater basin managers. As indicated in the report, there is substantial groundwater storage available in the basin, but there are multiple challenges that must be met to utilize the identified storage. Challenges include infrastructure limitations, contamination, legal issues, and funding.

To further increase the availability of in-basin groundwater storage, MWD has identified nine potential storage programs in the basin and an additional two

Exhibit 8N In-Basin Conjunctive Use Programs

Program	Storage Capacity (Thousands of AF)	Dry-Year Yield (Thousands of AF/Year)	Balance 12/31/09 (Thousands of AF)
Los Angeles County			
Long Beach Conjunctive Use Project	13	4.3	6.4
Foothill Area GW Storage Project	9	3	0.6
Long Beach Conjunctive Use Project: Expansion in Lakewood	4	1.2	`
City of Compton Conjunctive Use Program	2	0.8	0
Upper Claremont Heights Conjunctive Use	3	1	0
Orange County			
Orange County GW Conjunctive Use Program	66	22	8.6
San Bernardino County			
Chino Basin Programs	100	33	23
Live Oak Basin Conjunctive Use Project	3	1	0.7
Riverside County			
Elsinore Groundwater Storage Program	12	4	0
Ventura County			
North Las Posas Groundwater Storage Program	210	47	43.5
Total	421.9	117.3	84.6

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

Exhibit 80
MWD Forecast Supplies of In-Basin Groundwater Storage in 2035, Average Year (1922 – 2004 Hydrology)

Program	Supply (Thousands of AF/Year)
Current	
Conjunctive Use	115
Cyclic Storage	139
LADWP Tujunga Well Field Groundwater Recovery Project	12
Subtotal of Current Programs	266
Programs Under Development	
Raymond Basin Conjunctive Use	22
Subtotal of Programs Under Development	22
Maximum MWD Supply Capability	**288**

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

programs are under development. The Raymond Basin Conjunctive Use Program and the LADWP Groundwater Recovery Project are expected to add an additional 34 TAF per year in 2035 under an average year (1922 – 2004 hydrology).

In 2009, a reconnaissance-level analysis was prepared for analyzing the potential for using recycled water as a supply source for a conjunctive use program. The study concluded up to 100 TAF of groundwater storage and production could be potentially developed in four major groundwater basins using Los Angeles County Department of Sanitation supplies. MWD initiated a formal study in 2010 to further study. This concept along with the potential to use City of Los Angeles recycled water supplies from the Hyperion Wastewater Treatment Plant as an additional source.

Exhibit 80 provides a summary of forecast groundwater storage supplies available in 2035 under an average year (1922 -2004 hydrology). Approximately 289 TAF per year are forecast to be available.

8.1.4 Groundwater Storage and Water Transfers

MWD engages in groundwater storage outside of the basin and water transfers to increase the reliability of SWP dry-year supplies. Groundwater storage and water transfers were initiated by MWD in response to concerns that MWD's supply reliability objectives could not be met by the SWP. Groundwater storage and transfer programs were developed to allow MWD to reach its SWP reliability goal. All groundwater storage and water transfer programs designed to bolster SWP reliability are located within the vicinity of the SWP or Central Valley Project (CVP) facilities to facilitate the ultimate deliver of water to MWD. Groundwater storage programs involve agreements allowing MWD to store its SWP contract Table A water in excess of MWD demands and to purchase water for storage. MWD calls for delivery of the stored water during dry years. Transfers involve purchases by MWD from willing sellers during dry years when necessary.

Exhibit 8P
MWD Forecast Supplies of Groundwater Storage and Transfers in 2035, Average Year (1922 - 2004 Hydrology)

Program	Supply (Thousands of AF/Year)
Current	
San Bernardino Valley MWD Minimum Purchase	20
San Bernardino Valley MWD Option Purchase	29
Central Valley Storage and Transfers	
Semitropic Water Banking and Exchange Program	69
Arvin-Edison Water Management Program	75
San Bernardino Valley MWD Program	50
Kern Delta Water Management Program	50
Subtotal of Current Programs	**293**
Programs Under Development	
Mojave Groundwater Storage Program	43
North of Delta/In-Delta Transfers	33
San Bernardino Valley MWD Central Feeder	5
Shasta Return	18
Semitropic Agricultural Water Reuse	11
Subtotal of Proposed Programs	**110**
Maximum Supply Capability	**403**

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

Exhibit 8P summarizes MWD's out of basin groundwater storage and transfer programs supplies in 2035, under an average year (1922 – 2004 hydrology). Current programs are expected to deliver 293 TAF in 2035. Five programs under development are forecasted to deliver an additional 110 TAF for a total of 403 TAF in 2035.

8.1.4.1 Groundwater Storage

MWD has four Central Valley groundwater storage programs with a fifth program under development as described below.

The Semitropic Water Banking and Exchange Program is a partnership formed in 1994 between Semitropic Water Storage District (SWSD), MWD, and five other banking partners. The bank has a total storage capacity of 650 TAF, of which MWD has 350 TAF of storage volume. During years of excess SWP deliveries, beyond MWD's demands, a portion of MWD's SWP entitlement water is stored for withdrawal during dry years. Deliveries for storage are transferred via SWP facilities for direct use by agricultural users that in turn forgo pumping an equal volume of water. In dry years, water is pumped from storage to SWP facilities for delivery to MWD or entitlements are exchanged. MWD's average annual supply capability for a dry year (1977 hydrology) is 125 TAF and for multiple dry years (1990 – 1992 hydrology) is 107 TAF. By the end of 2009, MWD had 45 TAF in storage.

Since 1997, MWD has had an agreement with Arvin-Edison Water Storage District to use 350 TAF of storage in its groundwater basins. The agreement was amended in 2008 to include the South Canal Improvement project to deliver higher quality water to MWD. During wet years, MWD delivers SWP water in excess of its demands for storage and receives return water in dry years in a similar manner as the Semitropic program, except a combination of SWP and CVP facilities are used to transfer the water and water can be stored by a combination of direct spreading or in lieu use by agricultural users. MWD's average supply capability is 75 TAF for either a single dry year (1977 hydrology) or multiple dry years (1990 – 1992 hydrology). In 2009, MWF had 95 TAF in storage.

The San Bernardino Municipal Water District Program (SBMWD) allows for the purchase and storage of SWP water on behalf of MWD. MWD has a minimum purchase agreement with SBMWD of 20 TAF per year of SBMWD's SWP Table A amount. Additionally, MWD has the option to purchase SBMWD's additional SWP allocation when available and the first right-of-refusal to purchase additional SWP supplies available to SBMWD beyond the minimum and option agreements. If MWD does not require the minimum purchase amount for operations, MWD can store up to 50 AF for future use in dry years within SBMWD's groundwater basins. Water is delivered to MWD via SWP facilities and groundwater pumping conveyed through local connections to MWD's service area. MWD's average annual supply capability for a dry year (1977 hydrology) is 70 TAF and for multiple dry years (1990 – 1992 hydrology) is 37 TAF. By the end of 2009, MWD had no water in storage and deliveries have been suspended upon a mutual agreement between MWD and SBMWD.

MWD entered into an agreement with the Kern Delta Water District (Kern-Delta) for the Kern-Delta Water Management Plan in 2001 to allow up to 250 TAF of groundwater storage. During wet years MWD delivers SWP water in excess of its demands for storage and receives return water in a similar manner as the Semitropic program, except the water can be stored by direct recharge or in lieu use by agricultural users. Per terms of the agreement, MWD can potentially store beyond 250 TAF. In dry years, water is pumped from storage to SWP facilities for delivery to MWD or entitlements are exchanged. When the project is completed 50 TAF per year of dry year supply can be withdrawn. At the close of 2009, MWD had 10 TAF in storage and expects to fully withdraw the amount in 2010.

The Mojave Groundwater Storage Program is currently a demonstration project between MWD and Mojave Water Agency. Similar to the other groundwater storage programs, MWD's excess SWP water will be stored during wet years for withdrawal during dry years. When fully operational, the program is expected to have a dry year yield of 35 TAF.

8.1.4.2 Transfers

MWD utilizes Central Valley water transfers to obtain additional supplies originally destined for agricultural users on an as needed basis. Past transfer agreements have used both spot markets and option contracts. Spot markets occur when there are willing sellers and buyers. Option contracts lock-in MWD's ability to have the option to purchase supplies if needed. Additionally, MWD has multiple long-term transfer programs under

Exhibit 8Q
MWD Historic Central Valley Water Transfers

Program	Purchases by MWD[1] (AF/Year)
1991 Governor's Water Bank	215,000
1992 Governor's Water Bank	10,000
1994 Governor's Water Bank	100
2001 Dry Year Purchase Program	80,000
2003 MWD Transfer Program	126,230
2005 State Water Contractors Water Transfer Program[2]	0
2008 State Water Contractors Water Transfer Program	26,621
2009 Governor's Water Bank	36,900

1. Transfers requiring use of Bay-Delta result in a water loss of 20 percent. Transfers requiring the California Aqueduct for delivery to MWD's service area result in a 3 percent water loss.
2. 127,275 in options were secured, but not needed.

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

development. MWD's ability to conduct transfers and the amount of water to be transferred using SWP facilities are a function of hydrologic conditions, market conditions, and pumping restrictions in the Bay-Delta region. Transfers may require the use of the Bay-Delta for conveyance dependent upon the origin of the water. Historic transfers, as listed in Exhibit 8Q, indicate MWD is capable of negotiating contracts with agricultural districts and the State's Drought Water Bank to obtain transfers. MWD also has demonstrated it can work with DWR and the U.S. Bureau of Reclamation (USBR). Cooperation of both agencies is required as transfers use a combination of DWR's SWP and USBR's CVP facilities. Transfers from north of the Bay-Delta result in the loss of 20 percent of the water during conveyance while transfers via the California Aqueduct to MWD's service area result in the loss of 3 percent water during conveyance. During dry years and when pumping capacity in the Bay-Delta is available, MWD expects to be able to transfer 125 TAF through SWP facilities.

Exhibit 8R
MWD System Forecast Supplies and Demands, Average Year (1922 - 2004 Hydrology)

Forecast year	Supply (Thousands of AF per Year)				
	2015	2020	2025	2030	2035
Current Programs					
In-Basin Surface Reservoir and Groundwater Storage	685	931	1,076	964	830
State Water Project[1]	1,550	1,629	1,763	1,733	1,734
Colorado River Aqueduct					
Colorado River Aqueduct Supply[2]	1,507	1,529	1,472	1,432	1,429
Aqueduct Capacity Limit[3]	1,250	1,250	1,250	1,250	1,250
Colorado Aqueduct Capability	1,250	1,250	1,250	1,250	1,250
Capability of Current Programs	**3,485**	**3,810**	**4,089**	**3,947**	**3,814**
Demands					
Firm Demands on MWD	1,826	1,660	1,705	1,769	1,826
Imperial Irrigation District - San Diego County Water Authority Transfers and Canal Linings[4]	180	273	280	280	280
Total Demands on MWD	**2,006**	**1,933**	**1,985**	**2,049**	**2,106**
Surplus	**1,479**	**1,877**	**2,104**	**1,898**	**1,708**
Programs Under Development					
In-Basin Surface Reservoir and Groundwater Storage	206	306	336	336	336
State Water Project[1]	382	383	715	715	715
Colorado River Aqueduct					
Colorado River Aqueduct Supply	187	187	187	182	182
Aqueduct Capacity Limit[2]	0	0	0	0	0
Colorado Aqueduct Capability	0	0	0	0	0
Capability of Programs Under Development	**775**	**876**	**1,238**	**1,233**	**1,233**
Maximum MWD Supply Capability	**4,260**	**4,686**	**5,327**	**5,180**	**5,047**
Potential Surplus	**2,254**	**2,753**	**3,342**	**3,131**	**2,941**

1. Includes water transfers and groundwater banking associated with SWP.
2. Includes 296 TAF of non-MWD supplies conveyed in CRA for Imperial Irrigation District - San Diego County Water Authority Transfers and Canal Linings.
3. CRA has a capacity constraint of 1.25 MAF per year.
4. Does not include 16 TAF subject to satisfaction of conditions specified in agreement among MWD, the US, and the San Luis Rey Settlement

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

8.2 MWD Supply Reliability and Projected LADWP Purchases

MWD's 2010 Integrated Water Resources Plan (IRP) update serves as the foundation for supply forecasts discussed in the RUMWP and continues to ensure system reliability for its member agencies. The 2010 IRP update concluded that the resource targets identified in previous updates, taking into consideration changed conditions identified since that time, will continue to provide for 100 percent reliability through 2030. MWD's subsequent evaluation to extend the resource targets by an additional five years through their 2010 draft RUWMP also concluded the same full reliability during average (1922 – 2004 hydrology), single dry (1977 hydrology), and multiple dry years (1990 - 1992 hydrology). For each of the scenarios, there is a surplus in every forecast year. Exhibit 8R summarizes MWD's reliability in five year increments extending to 2035.

The City purchases MWD water to make up the deficit between demand and other City supplies. Whether LADWP can provide reliable water services to the residents of Los Angeles is highly dependent on MWD's assurance on supply reliability. However, the recent water supply shortage caused by dry weather and pumping restrictions in the Bay-Delta prompted the City to develop a more sustainable water supply portfolio with emphasis on local water supplies such as recycled water, groundwater cleanup, stormwater capture, and conservation. LADWP's reliance on MWD water supply is projected to be cut in half from the current five-year average of 52 percent of the total demand to 24 percent by 2034-35 under average weather conditions.

The reliability of MWD's water supply is more fully discussed in Chapter 10, Integrated Resources Planning. The projected LADWP water purchase is further discussed in Chapter 11, Water Service Reliability Assessment under various weather scenarios.

8.3 MWD Rate Structure and LADWP's Purchased Water Costs

8.3.1 MWD Rate Structure

MWD's rates are structured on a tier–based system with two tiers and a surplus category. Nine major elements determine the actual price a member agency will pay for deliveries. All of the elements are volumetric based except for two fixed rates, the Readiness-to Serve Charge and the Capacity Charge.

Tier 1 rates are reflective of actual costs of existing supplies and are designed to recover most of the supply costs. Member agencies are allocated a specified volume of Tier 1 water that can be purchased within a given year. In 2011, LADWP's Tier 1 limit is 304,970 AF. Any purchases above this are charged at the Tier 2 rate. MWD has instituted a temporary Bay-Delta surcharge to recover costs associated with lower SWP deliveries related to pumping restrictions. The surcharge will remain in effect until SWP yields improve.

Tier 2 rates send a price signal associated with MWD's costs of developing additional long-term firm supply options. Member agencies with growing demands on MWD will have a higher proportion of deliveries within the Tier 2 range.

Surplus water is water in excess of consumptive municipal and industrial demands. Surplus water is available at two discounted levels dependent upon the end use. Replenishment Program water is discounted for replenishing local agency supplies. The program has been suspended as a result of dry conditions and uncertain future supplies. The Interim Agricultural Water Program (IAWP) provides discounted water for agricultural use. This program is being phased out and will terminate beginning in 2013.

Exhibit 8S
MWD Rates and Charges

Rates and Charges	Effective Rate January 1		
	2010	2011	2012
Tier 1 Supply Rate ($/AF)	101	104	106
Delta Supply Surcharge ($/AF)	69	51	58
Tier 2 Supply Rate ($/AF)	280	280	290
System Access Rate ($/AF)	154	204	217
Water Stewardship Rate ($/AF)	41	41	43
System Power Rate ($/AF)	119	127	136
Full Service Untreated Volumetric Cost ($/AF)			
Tier 1	484	527	560
Tier 2	594	652	686
Replenishment Water Untreated ($/AF)	366	409	442
Interim Agricultural Water Untreated ($/AF)	416	482	537
Treatment Surcharge ($/AF)	217	217	234
Full Service Treated Volumetric Cost ($/AF)			
Tier 1	701	744	794
Tier 2	811	869	920
Treated Replenishment Water ($/AF)	558	601	651
Treated Interim Agricultural Water Program ($/AF)	615	687	765
Readiness-to-Serve Charge ($/M)	114	125	146
Capacity Charge ($/cfs)	7,200	7,200	7,400

Source: 2010 Regional Urban Water Management Plan, Metropolitan Water District of Southern California

Exhibit 8S summarizes the rates and charges for member agencies effective on January 1 of 2010, 2011, and 2012.

8.3.2 LADWP's Purchased Water Costs

MWD's water rates vary from $484 per AF of tier 1 untreated water to $811 per AF of tier 2 treated water in 2010. The average unit cost of MWD water supply depends on the proportions of treated water and untreated water, tier 1 water, and tier 2 water purchased in a given period. From 2003 to 2009, LADWP purchased 88 percent tier 1 water and 12 percent tier 2 water, and 70 percent untreated water and 30 percent treated water on average. The tier 2 water purchase varied from no purchase in 2005 and 2006 to 29 percent in 2007 and 2008. The treated water purchase varied from 20 percent in 2007 to 46 percent in 2005. Exhibit 8T illustrates the various combinations.

The Readiness-to-Serve Charge and Capacity Charge are predetermined fixed charges for each member agency and not affected by the quantity of MWD water purchased. However, they add on to the unit cost of the City's MWD water purchase. The City's current share of the Readiness-to-Serve Charge is 15.12 percent or $17.24 million in 2010. The Capacity Charge is calculated based on the summer daily peak flow from the previous three years. The City's 2010 Capacity Charge is $5.9 million based on the daily peak flow of 822 cfs in 2008 summer. Both charges added an additional $110 per AF to the unit cost of LADWP's MWD water purchase in 2010.

Exhibit 8T
Percentage of LADWP's Purchased Water in Various MWD Rate Categories

MWD Deliveries	Tier 1		Tier 2		Total Tier 1	Total Tier 2	Total Untreated	Total Treated
Calender Year	**Untreated**	**Treated**	**Untreated**	**Treated**				
	%	%	%	%	%	%	%	%
2003	73	22	4	2	95	5	76	24
2004	71	25	3	1	96	4	74	26
2005	54	46	0	0	100	0	54	46
2006	58	42	0	0	100	0	58	42
2007	56	15	25	5	71	29	80	20
2008	48	23	23	6	71	29	71	29
2009	67	20	10	3	87	13	77	23
2010	62	38	0	0	100	0	62	38
Average	61	29	8	2	90	10	69	31

Chapter Nine

Other Water Supplies

9.0 Overview

LADWP continually investigates other feasible water supplies to ensure the sustainability of water supply for the City of Los Angeles. In recent years, LADWP has actively pursued and investigated various supply options including water transfers and banking and seawater desalination. Evaluating the viability of these and other water resource options is a key element to ensuring the City's future water supply reliability. Such options, with proper planning, can contribute toward fulfilling future demand under various conditions. Future water resource challenges, which include increased demand that must be met without increasing imported supply, warrant thoughtful consideration of these and other feasible water supply resources.

Following is a discussion of other water resource options as mentioned above, highlighting LADWP's progress in developing each alternative source of water. Factors that affect feasibility and influence potential implementation are also discussed, as well as advances that facilitate development of the resource option. Of the water supplies discussed in this chapter, LADWP is planning to pursue water transfers of up to 40,000 Acre-Feet (AF) by Fiscal Year 2014/15.

9.1 Water Transfers and Banking

Water transfers involve the lease or sale of water or water rights between consenting parties. Water Code Section 470 (The Costa-Isenberg Water Transfer Act of 1986) states that voluntary water transfers between water users can result in a more efficient use of water, benefiting both the buyer and the seller. The State Legislature further declared that transfers of surplus water on an intermittent basis can help alleviate water shortages, save capital outlay development costs, and conserve water and energy. This section of the Water Code also obligates the California Department of Water Resources (DWR) to facilitate voluntary exchanges and transfers of water.

DWR is required to establish an ongoing program to facilitate the voluntary exchange or transfer of water and implement the various State laws that pertain to water transfers. In response to this mandate, DWR established an internal office dedicated specifically to water transfers in June 2001 and has developed various definitions and policies for transfers. Of particular importance are the rules protecting existing water rights. Water rights cannot be lost when they are transferred to another user if the transferor has an underlying right to the transferred water. DWR also developed three fundamental rules specifically regarding water transfers:

- There can be no injury to any legal user of water.
- There can be no unreasonable effect on fish and wildlife.
- There can be no unreasonable economic effects to the economy in the county of origin.

Water banking, a form of conjunctive use, is the storage of water in groundwater basins for future use. Typically, during wet periods water is stored or banked within groundwater basins for potential extraction during dry periods. Water banking sets up accounts to track the volumes of water recharged and extracted per terms of contract agreements between water agencies. Water banking may occur outside of a water agency's service area. If the water agency's own conveyance facilities are not directly adjacent to the water bank, stored water can be extracted and transferred through wheeling and exchange via other conveyance and storage facilities. Such movements of water involve institutional transfer agreements among water users and agencies.

9.1.1 LADWP Opportunities

LADWP plans on acquiring water through transfers to replace a portion of LAA water used for environmental enhancements in the eastern Sierra Nevada. The City would purchase water when available and economically beneficial for storage or delivery to LADWP's transmission and distribution system. The City is seeking non-State Water Project (SWP) water to replace the reallocation of LAA water supply for environmental enhancements. MWD holds an exclusive contractual right to deliver SWP entitlement water into its service territory, which includes the City of Los Angeles. Purchasing only non-SWP supplies will ensure the City's compliance with MWD's SWP contract.

To facilitate water transfers, LADWP is constructing an interconnection between the LAA and the SWP's California Aqueduct, located where the two aqueducts intersect in the Antelope Valley (see photo below). This interconnection, the Neenach Pumping Station will allow for water transfers from the East Branch of the SWP to the LAA system, as well as provide operational flexibility in the event of a disruption of flows along the LAA System. Construction of the Neenach Pumping Station required a four-way agreement between DWR, MWD, LADWP, and the Antelope Valley-East Kern Water Agency (AVEK). When completed, the Neenach Pumping Station facility will be owned by DWR but will be designated as an AVEK interconnection. The Neenach Pumping Station will be operated on behalf of the LADWP. MWD is involved in the agreement to provide consent for the transferred water to enter its service territory.

LADWP's current goal is to transfer up to 40,000 AFY once the Neenach Pumping Station facilities are in place. This will provide LADWP with the ability to replace some LAA supplies that have been reallocated to environmental enhancement projects in the Mono Basin and Owens Valley. This will also provide increased operational flexibility and cost savings for LADWP customers.

A demonstration study will be performed during the Neenach Pumping Station's first two years of operations. This study will include an evaluation of the operational and water quality impacts of the Neenach Pumping Station.

To supplement water transfers, LADWP also investigated the feasibility of water banking. A request for proposal (RFP) was issued in 2008 and five proposals were received for evaluation to identify the most mutually beneficial water banking program. However, after this evaluation

Neenach Temporary Pumping Station, construction site, looking northerly, taken September 16, 2010, by Aqueduct Aerial Patrol.

process, LADWP decided to not pursue full scale water banking projects at this time.

The City supports statewide water transfer legislation that will ensure the efficient use of the State's limited water resources and provide safeguards for the environment, public facilities, water conservation efforts and local economies. LADWP will continue to develop a responsible water transfer program that can assist in replacing City supplies that have been reallocated to the environment in the Eastern Sierra Nevada.

9.1.2 MWD Opportunities

Regionally, MWD has been active with water transfers and banking, seeking and implementing agreements and cooperative arrangement opportunities to supplement Southern California's water supply. MWD's water transfer activities are classified as *spot transfers, option transfers, core transfers, storage transfers,* or *exchanges*. Each activity is described briefly below.

- *Spot transfers* make water available through a contract entered into the same year that the water is delivered.

- *Option transfers,* through multi-year or single-year contracts, allow MWD to obtain water on an "as-needed" basis.

- *Core transfers* make water available through multi-year contracts that convey specific water entitlement to MWD each year.

- *Storage transfers* allow MWD to store and later recover available water that can then be transported immediately to Southern California.

- *Exchange agreements* involve the transfer to MWD of another agency's entitlements in exchange for water entitled to MWD from another source.

MWD is in the process of developing and implementing transfer/storage projects in the Central Valley, and off-stream banking and dry year supplies of Colorado River water. Water transfers, including the programs highlighted below, are an important element of California's plan to live within its 4.4 million acre-feet per year entitlement to Colorado River water. These programs have also helped MWD adjust to regulatory restrictions on State Water Project pumping from the San Francisco Bay-Delta. Current and potential MWD transfer, storage, and exchange agreements/activities include:

- Semitropic Water Storage Program

- Kern Delta Water District Water Management Program

- Arvin-Edison Water Transfer and Storage Program, Kern County

- San Bernardino Valley Transfer and Storage Program

- Desert Water Agency/Coachella Valley Water District Exchange Program

- Palo Verde Land Management, Crop Rotation, and Water Supply Program

- Hayfield Groundwater Storage Project (under development)

- Southern Nevada Water Authority and Metropolitan Storage and Interstate Release Agreement

- Central Valley Water Transfers

- Yuba Accord Dry Year Purchase Program

- Lower Colorado Water Supply Project

- Lake Mead Water Storage Program

- Drop 2 Reservoir Funding

- Arizona Exchange (under development)

- Yuma Desalter Exchange (under development)

- California Indians Exchange (under development)

- Expansion of Southern Nevada Water Authority Agreement (under development)

- ICS Exchange Program (under development)

- Expansion of Palo Verde Land Management, Crop Rotation, and Water Supply Program (under development)

- Mojave Water Agency Exchange Demonstration Program (under development)

- North of Delta/In Delta Transfers (under development)

- North Kern/Desert Water Agency Exchange (under development)

- Shasta Return Project

- Semitropic Agricultural Water Reuse Demonstration Project (under development)

- San Bernardino Valley MWD Central Feeder Project (under development)

- Chuckwalla Groundwater Storage Program (under development)

- Coachella Valley Water District Agreement (under development)

MWD's water rate structure is designed to allow water transfers using MWD infrastructure by establishing a water wheeling rate, which is a combination of the System Access Rate, Water

Stewardship Rate, System Power Rate, and if treated water is delivered, a Treatment Surcharge. This wheeling rate applies to all water conveyed through MWD's infrastructure, regardless of the agency using the system. MWD's unbundled rate structure and its associated wheeling rate encourage development of water markets by providing for competition at the supply level; MWD's member agencies can purchase supplies from any source and pay MWD's wheeling rate to transmit the water. MWD's current water rate structure establishes charges for each component on a per acre-foot basis for all water moving through MWD's system. As of January 1, 2011, current wheeling rate charges are:

- System Access Rate: $204/AF
- Water Stewardship Rate: $41/AF
- System Power Rate: $127/AF
- Treatment Surcharge: $217/AF

The System Access Rate recovers costs associated with conveyance and distribution capacity to meet average annual demands. The Water Stewardship Rate recovers the cost associated with providing financial incentives for investments in local water resources, such as water conservation and recycled water programs. The System Power Rate recovers the cost of power required to move water through MWD's system. The Treatment Surcharge applies to all water that is treated at one of MWD's five treatment plants.

MWD's water rate structure also incorporates a tiered supply rate format. The first tier price applies to a fixed base quantity of water as defined by each MWD member agency's purchase order contract. The second tier price reflects the incremental cost for MWD to acquire additional supplies that are above the first tier contract base amount.

9.2 Seawater Desalination

Seawater desalination, the process of removing salts and other impurities from seawater, has reached an all-time high in terms of worldwide production capacity. According to the International Desalination Association, between 2007 and 2009, worldwide seawater desalination capacity increased by approximately thirty percent to a total capacity of 9.5 billion gallons per day. This is partly driven by the fact that the cost to desalinate water has decreased significantly due to technological and process advancements. Of the more than 14,000 seawater and groundwater desalination plants in operation worldwide, the majority are located in the Middle East, where energy costs are relatively low. The world's largest seawater desalination plant in Saudi Arabia produces 232 mgd of desalted water. In contrast, the largest facility in the United States, located in Tampa Bay, FL, produces 25 mgd.

LADWP's current water resource strategy does not include seawater desalination as a water supply. There are concerns with cost and the environmental impacts associated with the implementation of desalination. LADWP is primarily focused on enhancing recycling and conservation. While desalination may be explored further in the future, it currently represents only a supply alternative.

9.2.1 Desalination Technology

Technology to desalt seawater to produce potable water which meets or exceeds drinking water standards has been available for some time, but has not been widely implemented primarily due to its high cost. Although the cost to desalinate seawater is still more expensive than obtaining water from conventional sources, continued research and development, as well as large scale projects are being implemented in the United States and other parts of the world to improve technology and further drive costs down. Additionally, increasing costs associated with new water supplies and existing supplies is reducing the cost differential between desalinated water and other water sources improving the viability of desalinated water as a part of an overall water supply portfolio.

The two basic seawater desalination processes are: 1) use of the distillation process to evaporate water from salts; and 2) use of semi-permeable membranes to filter the water while straining out the salts. While distillation has been the dominant seawater desalination technology (primarily in the Middle East), current worldwide desalination development is rapidly migrating toward membrane technology. Facilities using distillation are still prevalent in the Middle East. However, new plant installations are increasingly taking advantage of technological advancements (higher yield and lower energy requirements) in membrane-based process technology. Today, membrane filtration accounts for over half of the world's desalting capacity.

9.2.2 DWR Desalination Efforts

Recognizing the potential of seawater as a water resource, the DWR through a legislative mandate, convened a California Water Desalination Task Force in 2002. The task force was responsible for making recommendations to the State Legislature on potential opportunities, impediments, and the State's role in furthering desalination technology.

The task force was effective in providing a forum in which stakeholders could convene and discuss critical issues related to desalination. Key seawater desalination issues that have been raised through the task force fall into six general categories: environmental, economic, permitting, engineering, planning, and coordination.

To assist in addressing these issues, the California Water Desalination Task Force has developed draft guidelines for developing environmentally and economically acceptable desalination projects. These include the following:

- Each project should be considered on its own merits.
- Sponsoring agencies should be determined early in the planning process.
- Public and permitting agencies should be engaged early in the planning process.
- Collaborative processes should be used to enhance support for project implementation.
- A feedback loop should be incorporated to allow for continuously revisiting and revising the project at each step of the planning process.
- Key decision points (e.g., costs, environmental acceptability) should be identified to test the general feasibility of the project as early in the planning process as possible.

After establishment of the task force, desalination was added to the California State Water Plan as an alternative for consideration in regional water supplies. Furthermore, in 2008, DWR published the *California Desalination Planning Handbook*, building upon the task force's efforts. The handbook provides guidance on determining appropriate conditions for desalination plants, addressing concerns, and building public trust.

Proposition 50, Chapter 6, has provided funding for desalination research, feasibility studies, pilot projects, and construction of new facilities. Over $45 million was distributed under this proposition in two rounds of funding for both seawater and groundwater desalination. Fund recipients included LADWP.

With increasing demand for water and limited new supply options, the future value of seawater desalination as a part of California's water supply portfolio has become apparent. Within Southern California, a range of 270,000 AFY to 422,000 AFY of desalinated seawater could be potentially produced based on current efforts (see Exhibit 9A). While this production represents less than five percent of the region's total water supplies, it is nonetheless considered by water planners as an important part of the region's water supply portfolio.

9.2.3 MWD Desalination Efforts

MWD first incorporated desalinated seawater as a potential new water supply source in its 2003 Integrated Resources Plan Update. Subsequently in 2009, MWD's Board of Directors created a special committee on Desalination and Recycling to study MWD's role in regional efforts to develop desalination facilities.

In response to a proposal solicitation in 2001, MWD received proposals by five member agencies to provide up to 142,000 AFY of potable water. To provide an incentive for the development of desalinated seawater, MWD is offering subsidies of up to $250 for each acre-foot (326,000 gallons) of desalinated seawater produced. LADWP, Long Beach Water Department (LBWD), West Basin Municipal Water District (WBMWD), Municipal Water District of Orange County, and San Diego County Water Authority (SDCWA) submitted detailed proposals that qualified for the MWD's Seawater Desalination Program. Exhibit 9A summarizes the status of the desalination efforts in MWD's service area, including projects not in the Seawater Desalination Program. Each of these agencies serves coastal areas, and is looking to desalination as a means to further diversify its water supply portfolio.

9.2.4 LADWP Seawater Desalination Efforts

Scattergood Generating Station Seawater Desalination Plant

LADWP initiated efforts in 2002 to evaluate seawater desalination as a potential water supply source with the goals of improving reliability and increasing diversity in its water supply portfolio. These efforts led to the selection of Scattergood Generating Station as a potential site for a seawater desalination plant. For the City, seawater desalination is a potential resource that could also offset supplies that had been committed from the LAA for environmental restoration in the eastern Sierra Nevada. As an identified project in MWD's Seawater Desalination Program, the proposed full-scale project would have qualified for MWD's grant of $250 per AF of water produced. However, in May 2008, LADWP decided to focus on water conservation and water recycling as the primary strategies in creating a sustainable water supply for the City.

While seawater desalination is not a potential water supply strategy at this time, studies performed to date have provided beneficial data that in the future can assist LADWP with any future evaluations of seawater desalination. Completed studies include the LADWP Proposed Seawater Desalination Plant Site Selection Fatal Flaw Analysis (2002), LADWP Seawater Desalination Facility Feasibility Study for the Scattergood Generating Station in Playa Del Rey (2004), Brine Dilution Study for the LADWP Desalination Project at Scattergood Generating Station (2005), and Scattergood Seawater Desalination Pilot Project Preliminary Evaluation Report (2008).

Exhibit 9A
Desalination Efforts in MWD Service Area

Project Name	Member Agency	Capacity (AFY)	Status
MWD Seawater Desalination Program			
Long Beach Seawater Desalination	Long Beach	10,000	Pilot Study[1]
Los Angeles Seawater Desalination	LADWP	28,000	On-hold
South Coast Coastal Ocean Desalination	Municipal Water District of Orange County	16,000 - 28,000	Pilot Study
Carlsbad Seawater Desalination	San Diego County Water Authority	56,000	Permitting Complete
West Basin Seawater Desalination	West Basin Municipal Water District	20,000	Pilot Study[1]
Subtotal		130,000 - 142,000	
Other Potential Projects in MWD Service Area			
Huntington Beach Seawater Desalination	Municipal Water District of Orange County	56,000	Initiating Permitting
Camp Pendleton Seawater Desalination	San Diego County Water Authority	56,000 - 168,000	Planning
Rosarito Beach Seawater Desalination	San Diego County Water Authority	28,000 - 56,000	Feasibility Study
Subtotal		140,000 - 280,000	
Total		270,000 - 422,000	

1. Full scale feasibility studies in progress.

Source: Annual Progress Report to the State Legislature, Achievements in Conservation, Recycling, and Groundwater Recharge, February 2010.

To determine the proper site location for a City desalination plant, LADWP conducted the LADWP Proposed Seawater Desalination Plant Site Selection Fatal Flaw Analysis evaluating three City-owned coastal power generating plants. Based on the findings from this analysis, LADWP initially decided to investigate development of a 12 to 25 mgd desalination facility at the Scattergood Generating Station.

Optimum capacity of a future desalting facility at the Scattergood Generating Station was evaluated in the LADWP Seawater Desalination Facility Feasibility Study. Results of the study indicated a 25 mgd facility would be the most economical. Estimated capital costs for a 25 mgd facility were approximately $148.5 million in 2004 dollars with an annual operations and maintenance cost of $28.9 million (2004 dollars) resulting in a total water cost of approximately $1,257 per AF. The study also identified the five-mile Hyperion Treatment Plant Outfall, which is adjacent to the Scattergood Generating Station, as the most environmentally advantageous method to dispose of the brine concentrate produced from the desalting process.

In an effort to develop an environmentally compatible project, LADWP evaluated the feasibility of discharging the desalted concentrate into Hyperion Wastewater Treatment Plant's 5-mile outfall. The Brine Dilution Study for the LADWP Desalination Project at Scattergood Generating Station performed by the Scripps Institute of Oceanography found that there are potential environmental benefits to the Santa Monica Bay's marine biology due to improved salt balance if the effluent discharged by the Hyperion Wastewater Treatment Plant were to include brine from a desalination facility.

In March 2008 the Preliminary Evaluation Report of the Scattergood Generation Station Seawater Desalination Pilot Project was completed. This was the first task of multiple tasks that was to ultimately result in the operation of a pilot plant. Co-funded by the US Bureau of Reclamation and DWR through Proposition 50 funding the overall goal was to further investigate the viability of seawater desalination for LADWP. Recommendations on site specific technologies and processes were provided for carry over to the pilot plant design stage. Items for further study included subsurface intake evaluation, cooling alternatives for warm water, second pass reverse osmosis, post treatment stabilization, and finished water blending strategy.

After completion of the first task, the other tasks were not initiated reflecting the City's new primary strategies of conservation and recycled water to create a sustainable water supply for the City. Studies completed to date and LADWPs other seawater desalination efforts discussed below have provided important data that could assist LADWP if the decision is made to move forward with seawater desalination in the future.

Other LADWP Seawater Desalination Efforts

LADWP historically engaged in multiple partnerships to advance seawater desalination in Southern California. Seawater desalination is hindered by multiple challenges including, but not limited to, capital costs, operating costs, environmental considerations, water quality, and public acceptance. To overcome these challenges, LADWP has supported efforts to lower the capital and operating costs of producing desalinated ocean water. LADWP also participated with California stakeholders through multiple venues, such as the MWD and the California Water Desalination Task Force to develop desalination study projects within Southern California.

LADWP, LBWD, and the United States Bureau of Reclamation partnered in the construction of a 300,000 gpd prototype seawater desalination facility to complete testing of LBWD's proprietary two-stage nanofiltration process (using membranes that require lower operating pressures and thus, the potential for lower operating costs). LBWD successfully performed a 9,000-gpd bench-scale testing of this technology and began testing on a larger scale in October 2006 at LADWP's Haynes Generating Station in Long Beach. In March 2010, LBWD completed its testing and subsequently prepared the final report.

LADWP also partnered with the WBMWD and other agencies in the American Water Works Association Research Foundation Tailored Collaboration project, "Water Quality Implications for Large-Scale Applications of MF/RO Treatment for Seawater Desalination." A 30,000-gpd pilot facility operating off the coast of El Segundo, California, from 2002 to 2008, was tested for membrane performance, water quality, and operational cost.

In a joint study by LADWP, LBWD, and WBMWD, preliminary sampling of raw seawater quality was initiated at three potential seawater desalination sites - Scattergood Generating Station in Playa Del Rey, Haynes Generating Station in Long Beach, and El Segundo Power Generating Station. Water quality analysis on the seawater was performed at various times of the year to analyze seawater quality variations during storm events when city surface runoffs drain into the ocean. The next step would be to collaborate with the California Department of Health Services on developing guidelines to ensure that product water from future desalting facilities will meet all State and Federal water quality regulations.

9.3 Other Water Supplies Yield and Cost

The range of water supplies, the unit cost, risks, and other benefits besides reductions in water demands for water transfer and seawater desalination are presented in Exhibit 9B. LADWP recognizes the value of these water supplies in offsetting unanticipated changes to supply or demand. Strategic water planning necessarily includes continuous monitoring of existing and future alternative water resources.

Exhibit 9B
Other Water Supplies

Other Water Supplies				
Water Supply Alternatives	**Potential Water Yield (AFY)**	**Average Unit Cost ($/AF)**	**Implementation Risks**	**Additional Benefits**
Seawater Desalination [1]	25,000	$1,300-$2,000	Environmental permitting may be difficult.	Replaces water committed to the environment. Hedges against climate change.
Water Transfer	40,000	$440-$540[2]	Wheeling and other institutional issues must be addressed.	Replaces water committed to the environment.

For Comparison Purposes:
Local Groundwater Pumping Unit Cost = $230/AF
MWD Treated Tier 2 Water Supply Unit Cost = $811/AF

Notes:

1. Source: Metropolitan Water District of Southern California Integrated Water Resources Plan 2010 Update – Report No. 1373. While the ocean is a virtually unlimited supply, yield shown here is the maximum given available land, outfall capacity, and other constraints.
2. Cost includes cost of water and wheeling fees. Treatment costs not included.

Chapter Ten

Intergrated Resources Planning

10.0 Overview

Integrated resources planning is a process used by many water and wastewater providers to meet their future needs in the most effective way possible, and with the greatest public support. The integrated planning process incorporates:

- Public stakeholders in an open, participatory process.
- Multiple objectives such as reliability, cost, water quality, environmental stewardship, and quality of life.
- Risk and uncertainty.
- Partnerships with other agencies, institutions, and non-governmental organizations.

LADWP has been actively involved in integrated resources planning since 1993, when the Metropolitan Water District of Southern California (MWD) initiated the region's first Integrated Resources Plan (IRP). LADWP was an active member of the technical workgroup that oversaw the development of alternatives and recommendations from MWD's IRP. In 1999, the City embarked on its first IRP for wastewater, stormwater and water supply. LADWP was a partner in this effort, working with the City's Bureau of Sanitation (BOS). In 2006, the Greater Los Angeles County IRWMP was approved. LADWP is a member of the IRWMP Leadership Committee and serves as the chair of the of the Upper Los Angeles River Watersheds sub-region for the IRWMP region.

10.1 City of Los Angeles Integrated Water Resources Plan

10.1.1 Description and Purpose

The City's Integrated Water Resources Plan (IRP) is a unique approach of technical integration and community involvement to guide policy decisions and water resources facilities planning. As part of the IRP development, an Environmental Impact Report (EIR) was prepared identifying the recommended alternatives for implementing the City's wastewater, runoff, and recycled water programs to meet its 2020 needs. On November 14, 2006, the City Council unanimously adopted the IRP recommendations and implementation strategy and certified the final EIR.
The IRP development was a seven year stakeholder-driven process and was an innovative approach to guide the City's

policy decisions and facilities planning. The IRP recognizes the interrelationship of water, wastewater, and runoff management in forming a future vision for the City's water resources activities and functions. In the past, the City traditionally utilized single-purpose planning efforts for each agency, such as one plan for wastewater and a separate plan for water supply. With the IRP, the City can meet its 2020 needs in a more cost-effective and sustainable way by addressing and integrating all its water resources. Additionally, the IRP was designed to meet multiple objectives, including evaluation of innovative supply opportunities that were once thought of as being too expensive. The City's LADWP and BOS are partners in this effort, joined by public stakeholders and other agencies.

The objectives for the IRP were developed by the City and public stakeholders, and represent the major reasons why the plan was developed. These objectives are:

- Protect public health and safety
- Effectively manage system capacity
- Protect the environment
- Enhance cost efficiency
- Protect quality of life
- Promote education

The IRP was developed in three phases. The first phase set policy guidelines for managing the City's water resources for the next 20 years. The second phase had three main deliverables: (1) detailed facility plans for wastewater, stormwater, and recycled water; (2) comprehensive financial plans for wastewater and stormwater; and (3) a certified Environmental Impact Report (EIR). The third phase of the IRP, which is now underway, represents implementation of the facility plans and more detailed studies to support implementation.

10.1.2 Integrated Watershed Approach

By taking an integrated watershed approach, the IRP identified opportunities that would normally not have been identified if water, wastewater, and stormwater were planned separately. The IRP recognized that all of the City's water resources are linked from a technical, social, and institutional aspect.

The City's IRP has also assisted in identifying partnerships between City agencies for project implementation potentially leading to increases in outside funding from grants and low-interest loans.

An example is the potential three-way partnership between the City's Department of Recreation and Parks, BOS, and LADWP. Land reclamation of blighted industrial and warehouse uses allows the City to create more parks and recreational areas while simultaneously allowing for underground storage of wet weather runoff for subsequent beneficial reuse. With this integrated approach, the City can potentially obtain more parkland, assist BOS in reducing wet weather runoff to improve water quality, and assist LADWP in increasing water supplies. The integrated approach also allows the City to better position itself for grants and loans that typically prioritize projects that demonstrate multiple benefits (e.g., water quality, water supply and recreation).

10.1.3 Stakeholder Involvement

A key element of the IRP was involvement of stakeholders throughout the entire IRP process. Stakeholders represented a wide range of the City's interests including, but not limited to, community, business, and environmental organizations. Stakeholders were instrumental in development of the guiding principles and identification of innovative water resource opportunities.

During Phase 2, stakeholders participated in a Steering Group. Steering Group members regularly attended scheduled workshops and provided on going input on the technical, environmental, and financial development of the IRP. Members provided necessary feedback to keep the facilities planning efforts aligned with the decision-making process. The Steering Group also considered key project issues in regards to the development of alternatives, such as facilities siting, implementation risks, and acceptability of costs associated with projects.

10.1.4 IRP Alternatives

The IRP evaluated a broad range of integrated alternatives. Each alternative represented different combinations of wastewater treatment options, wastewater collection system options, recycled water options, conservation options, and dry and wet weather urban runoff management options.

Twenty-one (21) preliminary alternatives were created with different focuses, allowing stakeholders and decision-makers to see trade-offs in key planning objectives. Based on the evaluation of the preliminary alternatives, nine (9) hybrid alternatives were created that incorporated the best elements from the preliminary alternatives in order to improve overall performance. City staff recommended the top-scoring four (4) hybrid alternatives to be carried through to the EIR process. Public stakeholders concurred with staff recommendations.

In November 2006, City Council approved the staff-recommended alternative, which consists of "Go-Projects", "Go-If-Triggered Projects" and "Go-Policy Directions". "Go-Projects" are projects recommended for immediate implementation because the flow and regulatory triggers have already been met. "Go-If-Triggered Projects" will only be implemented if or when additional information or circumstances, such as regulatory requirements, population growth, or increases in sewage flow, materialize. "Go-Policy Directions" are specific directions to City staff on further studies and evaluations necessary to progress on programmatic elements.

10.1.5 IRP Implementation Status

LADWP, in partnership with the City's Department of Public Works, has been working collaboratively along with other City departments on coordinating and implementing the various IRP recommendations. As part of the IRP implementation phase, the City has worked on keeping IRP stakeholders engaged through annual stakeholder meetings. Through these meetings, the City has provided updates on the IRP implementation and has obtained valuable input from stakeholders on IRP related issues. In addition, the Board of Water and Power Commissioners and the Board of Public Works have held three public joint meetings to review the IRP progress and provide directions on policy issues. Since the adoption of the IRP by the City Council in November 2006, a number of initiatives have been undertaken by the City which fulfill the IRP goals, including the Green Streets and Green Alleys Committee, the development of a Low Impact Development Ordinance, Conservation Initiatives (Chapter 3), the Recycled Water Master Plan (Chapter 4), and Watershed Management (Chapter 7). Projects and policies in the IRP implementation strategy are detailed below. Some projects are currently being implemented, while others continue to be monitored for triggers or policy direction:

Go Projects

- Construct wastewater storage facilities at Donald C. Tillman Water Reclamation Plant (DCT).

- Construct wastewater storage facilities at Los Angeles-Glendale Water Reclamation Plant (LAG).

- Construct recycled water storage facilities at LAG.

- Construct solids handling and truck loading facility at Hyperion Treatment Plant (HTP).

- Construct two new sewer lines, Glendale Burbank Interceptor Sewer and Northeast Interceptor Sewer Phase II.

Go-If-Triggered Projects

- Potential upgrades at DCT to advanced treatment at current capacity (if triggered by regulations and/or decision to reuse DCT effluent for groundwater replenishment).

- Potential expansion and upgrade of DCT to 100 mgd (if triggered by an increase in population, regulations, and/or groundwater replenishment decision). In the unlikely event that the overall framework for recycled water changes to disallow its use, then HTP would be potentially expanded to 500 mgd instead.

- Potential upgrades at LAG to advanced treatment at current capacity (if triggered by regulations and/or availability of downstream sewer capacity).

- Design and construction of additional secondary clarifiers at HTP to provide 450 mgd operational performance.

- Design and construction of up to 12 solids digesters at HTP (if triggered by increased biosolids production in the service area).

- Design and construction of Valley Spring Interceptor Sewer.

Of the "Go-Policy Directions" which provide specific directions to City staff on further studies and evaluations necessary to progress on programmatic elements., those applicable to or with the potential to impact LADWP operations include:

Recycled Water – Non-Potable Uses

- Direct LADWP and the Department of Public Works to work together to maximize recycled water use and identify recycled water for non-potable uses in the TIWRP service area, west side, and LAG service areas. LADWP is to conduct additional Tier 1 and 2 customer analyses to verify potential demands and feasibility and develop a long-range marketing strategy for recycled water that includes a plan for recruiting and retaining new customers.

- Direct the Department of Building and Safety to evaluate and develop ordinances to require installation, where feasible, of dual plumbing for new multi-family, commercial and industrial development, schools, and government properties in the vicinity of existing or planned recycled water distribution systems in coordination with the Los Angeles River (LA River) Revitalization Master Plan. Proximity and demand will be considered when determining feasibility. The dual plumbing will consist of separate plumbing and piping systems, one for potable water and the second for recycled water for non-potable uses, such as irrigation and industrial use.

- Direct the Department of Public Works and LADWP to continue to coordinate, where feasible, the design/construction of recycled water distribution piping (purple pipe) with other major public works projects, including street widening, and LA River Revitalization Master Plan project areas. Also coordinate with other agencies, including the Metropolitan Transit Authority and Caltrans, on major transportation projects.

Recycled Water –Indirect Potable Uses (Groundwater Replenishment)

- Direct LADWP to develop a public outreach program to explore the feasibility of implementing groundwater replenishment with advanced treated recycled water.

Recycled Water – Environmental Uses

- Direct LADWP and the Department of Public Works to continue to provide water from DCT to Lake Balboa, Wildlife Lake, and the Japanese Garden at Sepulveda Basin, and the LA River to meet baseline needs for habitat.

Water Conservation

- Direct LADWP to continue conservation efforts, including programs to reduce outdoor water usage through the use of smart irrigation devices on City properties, schools, and large developments (those with 50 dwelling units or 50,000 gross square feet or larger), and to increase incentives to residential properties.

- Direct LADWP to work with the Department of Building and Safety in continued conservation efforts by evaluating and considering new water conservation technologies, including no-flush urinal technology.

- Direct LADWP to continue to work with the Department of Building and Safety on conservation efforts by evaluating and developing a policy that requires developers to implement individual water meters for all new apartment buildings.

- Direct LADWP to continue conservation awareness efforts, including increasing education programs on the benefits of using climate-appropriate plants with an emphasis on California friendly plants for landscaping or landscaped areas developed in coordination with the LA River Revitalization Master Plan, and to develop a program of incentives for implementation.

- Direct the City Planning Department to consider development of a City directive to require use of California friendly plants in all City projects where feasible and not in conflict with other facilities usage.

Runoff Management – Wet Weather Runoff

- Direct the Department of Public Works to review SUSMP (Standard Urban Stormwater Management Plan) requirements to determine ways to require, where feasible, on-site filtration and/or treatment/reuse, rather than treatment and discharge, including in-lieu fees for projects where infiltration is infeasible.

- Direct the Department of Building and Safety to evaluate and modify applicable codes to encourage the installation of all feasible Best Management Practices (BMPs), including the use of porous pavement to maximize on-site capture and retention and/or infiltration of stormwater instead of discharge to the street and storm drain.

- Direct the Department of Public Works and the City Planning Department to evaluate the possibility of requiring porous pavement in all new public facilities in coordination with the LA River Revitalization Master Plan, and developments larger than one acre. Program feasibility should consider slope and soil conditions.

- Direct the City Planning Department to evaluate ordinances that would need to be changed to reduce the area of on private properties that can be paved with non-permeable pavement.

- Direct the Department of Public Works to evaluate and implement integration of porous pavements into sidewalks and street programs where feasible.

- Direct the Department of Public Works, LADWP, and the Department of Recreation and Parks to prepare a concept report and determine the feasibility of developing a powerline easement demonstration project for greening, public access, stormwater management, and groundwater replenishment.

- Direct the Department of Public Works and LADWP to work with the Los Angeles Unified School District to determine the feasibility of developing projects for both new and retrofitted schools, as well as for government/City-owned facilities, to implement stormwater management BMPs (cisterns to store runoff for irrigation, reduce paving and hardscapes, add infiltration basins).

- Direct the Department of Public Works, the General Services Department, and the Department of Recreation and Parks, to identify sites that can provide on-site percolation of wet-weather runoff in surplus properties, vacant lots, parks/open spaces, abandoned alleys in the East Valley area, and along the LA River in the East San Fernando Valley where feasible. Program feasibility should consider slope and soil conditions.

- Direct the Department of Public Works, the General Services Department, and the Department of Transportation to maximize unpaved open space in City-owned properties and parking medians by using all feasible BMPs and by removing all unnecessary pavement.

- In the context of developing Total Maximum Daily Load (TMDL) implementation plans, direct the Department of Public Works to consider diversion of dry weather runoff from Ballona Creek to constructed wetlands, wastewater system, or urban runoff plants for treatment and/or beneficial use. For inland creeks and storm drains tributary to the LA River, direct the Department of Public Works to consider diversion of dry weather runoff to the wastewater system or constructed wetlands or treatment/retention/infiltration basins.

- Direct the General Services Department, in coordination with the City Planning Department and the Department of Public Works, to evaluate feasibility of all City properties identified as surplus for potential development of multi-benefit projects to improve stormwater management, water quality, and groundwater recharge.

Los Angeles River

The IRP planning effort included the Los Angeles River (LA River). The LA River is a valuable resource to the City providing habitat as well as recreational and economic opportunities. Since the City's water reclamation plants were built, recycled water has been released to the LA River resulting in the development of significant environmental benefits from riparian habitat in the unlined portions of the LA River near Glendale, to regionally significant migratory shore bird habitat in Long Beach. As a result, many efforts have been developed to protect existing habitat and promote interest in habitat restoration and river revitalization.

The IRP established that treated wastewater is needed for the operation of Lake Balboa, the Japanese Gardens, and the Wildlife Lake in the Sepulveda Basin. Treated wastewater flows through these features and ultimately is released to the LA River from DCT. The remainder of the treated wastewater produced by the City's water reclamation plants is available for recycled water use and distribution to LADWP customers.

Shortly after work on the IRP began, the Los Angeles City Council's Ad Hoc Committee on the LA River (Ad Hoc Committee) was formed to address LA River revitalization. LADWP staff routinely attends Ad Hoc Committee meetings and functions and monitors LA River-related activities.

LADWP also funded the preparation of a Los Angeles River Revitalization Master

Plan which was approved in 2007. This plan addresses economic development opportunities, water quality, water resources, flood control, and recreation along the Los Angeles River. The plan also discusses opportunities to improve access to the Los Angeles River and increase community awareness.

In addition, LADWP staff also actively participates on the City's LA River Task Force, which was formed in response to instructions by the Ad Hoc Committee to:

- Inventory all current and future City department projects, studies, and programs along the LA River.
- Assess opportunities for future funding, projects, and studies.
- Coordinate LA River related activities of City departments and other agencies.
- Partner with the U.S. Army Corps of Engineers for a Habitat Restoration Project Study.

LADWP recognizes the importance of the Los Angeles River as a resource that provides multiple benefits to the City.

10.1.6 Agency Coordination

LADWP was a partner with BOS in developing the IRP along with public stakeholders and other agencies. As with any integrated plan that extends beyond traditional departmental boundaries and government jurisdictions, close coordination is required with multiple City, state, and federal agencies including but not limited to, the Cities of Burbank and Glendale, County of Los Angeles, Caltrans, U.S. Army Corps of Engineers, U.S. Bureau of Reclamation, and the City Department of Recreation and Parks. Since approval of the IRP, ongoing project implementation and "Go-Policy Directions" continue to require close coordination with City departments and with the agencies listed above.

10.1.7 IRP Implications for City's Urban Water Management Plan

One of the primary purposes for developing the IRP was to explicitly consider the relationship between wastewater facility planning and other water resources issues, such as water supply and urban runoff. Implementation of the IRP has and will continue to result in increased beneficial reuse of water, water conservation, and groundwater supplies. IRP alternatives examined ways to decrease potable water needs by expanding the City's recycled water program; increase water efficiency by installing smart irrigation and other water efficient devices that reduce irrigation and indoor water demands; and increase groundwater resources by using wet weather runoff to recharge the aquifer. All of these options will have to be tested from a technical, institutional, and public acceptance perspective. Ongoing work on programmatic elements identified in the "Go-Policy Directions" applicable to LADWP will continue to investigate means of increasing local water supplies, water conservation, and groundwater recharge opportunities in an integrated manner. The IRP has demonstrated that by integrating water resources planning for the City, more opportunities for water supply development can be identified.

10.2 Greater Los Angeles County Integrated Regional Water Management Plan (IRWMP)

10.2.1 Description and Purpose

The Los Angeles County Department of Public Works led efforts to develop an

Integrated Regional Water Management Plan for the Greater Los Angeles County Region. Water quality, resource, and supply issues within the region are complex and managed by a myriad of government agencies subjected to a plethora of regulations. Exponential growth over the last century has required water managers to develop creative solutions to meet growing demands. Previously, projects addressing water issues were designed to appease single-focused visions and solutions of organizations operating independently. At the core of the plan, a clear vision and direction for the sustainable management of water resources within the region for the next twenty years was formulated. Over 1,600 projects were collected and synthesized for inclusion in the plan bringing together hundreds of local government agencies to cooperatively develop cost-effective, sensible, and economically feasible solutions to address regional water issues. New partnerships were forged between potential funding partners from within and outside the region. An innovative partnership between agencies was formed to create a new model of integrated regional planning to address competing water demands, water supply reliability, and project financing.

An Interim Draft of the IRWMP was adopted by the Leadership Committee on June 28, 2006 with a final plan adopted on December 16, 2006. To date the IRWMP has received $25 million from the Department of Water Resources (DWR) under Proposition 50, Chapter 8, for implementation of fourteen priority projects identified in the plan and $1.5 million from DWR for development of the IRWMP. Since completion of the document a revised Memorandum of Understanding (MOU) was executed by each of the sixteen agencies serving on the Leadership Committee for the purpose of developing, administering, updating, and implementing the IRWMP.

Region

The IRWMP region encompasses 92 cities, portions of four counties, and hundreds of government agencies and districts spread over 2,058 square miles. Approximately 10.2 million residents, or equivalent to roughly 28 percent of the population of California, reside within the region. To facilitate input, variations in geographic and water management strategies, and effective planning the region was further subdivided into five sub-regions:

- Lower San Gabriel and Los Angeles River Watersheds
- North Santa Monica Bay Watersheds
- South Bay Watersheds
- Upper Los Angeles River Watersheds
- Upper San Gabriel River and Rio Hondo Watersheds

Mission and Purpose

A collaborative process resulted in the following mission statement of the IRWMP: "To address the water resources needs of the Region in an integrated and collaborative manner." The IRWMP recognizes that in order to meet future needs water supply planning must be integrated with other resource strategies. Additionally, in a region with significant urban challenges, including population growth, densification, traffic congestion, poor air quality, and quality of life issues, it is imperative to consider water resources management in conjunction with other urban planning issues. The IRWMP's purpose is to proactively:

- Improve water supplies
- Enhance water supply reliability
- Improve surface water quality
- Preserve flood protection
- Conserve habitat
- Expand recreational access

10.2.2 Stakeholder Involvement

Over 1,400 invitations to participate in the IRWMP process were sent out to cities, counties, agencies, districts, disadvantaged communities, and community organizations. Stakeholders participated in workshops, project identification, and development of the IRWMP. Stakeholders were involved in the development of the IRWMP through participation in regional workshops, subregional workshops, and the Leadership Committee. Stakeholders assisted in the following:

- Development of the IRWMP mission and objectives.
- Refinement of procedures for incorporation of projects into the IRWMP.
- Identification of implementation strategies.
- Recommendation of stakeholder workshop improvements.

10.2.3 Recommended Projects

Over 1,600 projects were submitted and analyzed for inclusion in the IRWMP. This list was narrowed down to fourteen priority projects that met the objectives and priorities established by the IRWMP process and assisted in meeting the targets established for the planning region. Objectives and priorities were established to guide the project selection process. The IRWMP is a living document and will be updated as needed. Projects can continuously be submitted as they are identified by stakeholders.

Objectives and Priorities

Six objectives and six long-term priorities were developed through the stakeholder process to guide project selection based on stakeholder input and previously completed documents, including UWMPs, MWD's IRP, Common Ground (San Gabriel & Los Angeles Rivers and Mountains Conservancy Plan), Santa Monica Bay Restoration Plan, and watershed plans for the major tributaries in the region.

The objectives of the IRWMP are to:

- Optimize local water resources to reduce the Region's reliance on imported water.
- Comply with water quality regulations (including TMDLs) by improving the quality of urban runoff, runoff, stormwater, and wastewater.
- Protect and improve groundwater and drinking water quality.
- Protect, restore, and enhance natural processes and habitats.
- Increase watershed friendly recreational space for all communities.
- Maintain and enhance public infrastructure related to flood protection, water resources, and water quality.
- Long term regional priorities are to:
- Maintain a regional and sub-regional structure to oversee plan implementation and ensure continued stakeholder input.
- Optimize use of recycled water, groundwater, desalination, and stormwater to enhance water supply reliability.
- Reduce demand on imported water sources.
- Protect groundwater supplies.

- Improve surface water quality to meet applicable water quality regulations, including TMDLs.

- Preserve open space, conserve and restore functional habitats, and protect special-status species.

Targets

Targets for the region were developed to assist in prioritizing projects. Targets include:

- Increase water supply reliability by providing 800,000 AFY of additional water supply and demand reduction through conservation, including infiltration or reuse of 130,000 AFY of reclaimed water.

- Reduce and reuse 150,000 AFY (40%) of dry weather urban runoff and capture and treat an additional 170,000 AFY (50%) for a total target of 90 percent.

- Reduce and reuse 220,000 AFY (40%) of stormwater runoff from developed areas and capture and treat an additional 270,000 AFY (50%) for a total of 90 percent.

- Treat 91,000 AFY of contaminated groundwater.

- Restore 100+ linear miles of functional riparian habitat and associated buffer habitat.

- Restore 1,400 acres of functional wetland habitat.

- Develop 30,000 acres of recreational open space focused in under-served communities.

- Repair/replace 40 percent of aging water resources infrastructure.

Projects

Fourteen priority projects were developed for the Greater Los Angeles County region. As a regional plan encompassing an area larger than LADWP's service area, many of the IRWMP projects do not directly benefit LADWP's service area, but rather provide benefits towards improving water resources in the region as a whole. However, LADWP can utilize the results of these projects and apply the knowledge to potentially develop similar programs within the service area. Brief descriptions of the priority projects are provided below.

Southeast Water Reliability Project

The Southeast Water Reliability Project consists of an 11.4 mile recycled water transmission pipeline from the City of Pico Rivera to the City of Vernon to complete Central Basin Municipal Water District's recycled water transmission system. Recycled water will be mainly provided by the County Sanitation Districts of Los Angeles County via the San Jose Creek Water Reclamation Plant.

Joint Water Pollution Control Plant Marshland Enhancement

The Joint Water Pollution Control Plant Marshland Enhancement Project is designed to improve and maintain plant and wildlife habitat at the seventeen acre freshwater marshland located at the Joint Water Pollution Control Plant (JWPCP) in Carson. As proposed, the project will serve as a mitigation measure for upgrading the JWPCP to full secondary wastewater treatment. The JWPCP is operated by the County Sanitation Districts of Los Angeles County.

Large Landscape Water Conservation, Runoff Reduction, and Educational Program (Central Basin)

The Large Landscape Water Conservation, Runoff Reduction, and Education Program is an end-use water management program to reduce runoff and address water/energy management associated with large landscapes, residential land uses, and street medians within the Central Basin Municipal Water District's service area. Weather-based irrigation controllers coupled with Geographic Information Systems (GIS) to monitor runoff and two-way communication technologies will provide necessary information to address emergency, drought, and end-use management challenges.

Large Landscape Water Conservation, Runoff Reduction, and Educational Program (West Basin)

West Basin Municipal Water District's (WBMWD) Large Landscape Water Conservation, Runoff Reduction, and Educational Program is a four-component project. The first component targets large landscape sites of 1 acre or more by providing centralized weather-based irrigation controllers with the goal of conserving 1 AFY per acre of land. The second component provides 1,350 rebates for the purchase of smart irrigation controllers for the top residential water users. A third component consists of developing and offering classes on residential landscaping for residences and businesses. The last component involves installing ten "Ocean Friendly" demonstration gardens throughout watersheds in the service area.

Las Virgenes Creek Restoration Project

The City of Calabasas is initiating the Las Virgenes Creek Restoration Project to restore 450 linear feet of a concrete-lined section of the creek to a natural function. Native vegetation will be planted in place of the concrete liner to establish connectivity between riparian habitat north and south of the existing liner.

Malibu Creek Watershed Urban Water Conservation and Runoff Reduction Project

As proposed, the Malibu Creek Watershed Urban Water Conservation and Runoff Reduction Project seeks to conserve water and reduce runoff in the City of Westlake Village and within the Las Virgenes Municipal Water District's (LVMWD) service area. Irrigation controllers on city-owned land in Westlake Village will be replaced with weather-based irrigation controllers. Within the LVWMD service area, indoor conservation will be addressed by continuing rebates for residential and multi-family customers to install water saving devices. This project will also continue existing efforts to reduce urban runoff and outdoor conservation in the LVMWD service area by targeting customers with persistent and substantial irrigation runoff in the vicinity of storm drains. These customers are offered water-efficient equipment rebates and free on-site assistance to upgrade irrigation systems to eliminate runoff.

Morris Dam Water Supply Enhancement Project

The Morris Dam Water Supply Enhancement Project would allow the capture of additional local runoff (5,720 AF) for groundwater recharge and extraction in the San Gabriel River watershed. This project would reduce the minimum pool required by the Los Angeles County Flood Control District (LACFCD) to prevent sediment damage to the outlet works of the dam by modifying the dam valves and control systems.

Pacoima Wash Greenway Project

The Pacoima Wash Greenway will treat storm runoff from neighborhoods adjacent to the wash in a series of parks incorporating stormwater treatment BMPs along the wash. Project development will be a joint effort between the City of San Fernando and the Mountains Recreation and Conservation Authority.

San Gabriel Valley Riparian Habitat Arundo Removal Project

Arundo donax, a non-native plant classified federally and by California as noxious weed, will be removed from approximately 30 acres of riparian habitat in the San Gabriel Watershed. Removal will increase surface water flows to the Rio Hondo percolation basins and improve native habitat.

Solstice Creek Restoration Project

The Solstice Creek Restoration Project will restore side drainages of Solstice Creek and areas negatively impacting riparian habitat through sediment and invasive species introduction. This project is part of an overall larger project to restore Solstice Creek.

South Los Angeles Wetlands Park

The South Los Angeles Wetlands Park project will involve purchasing a 9 acre parcel in Los Angeles on Avalon Boulevard for conversion to a wetlands park. As proposed, the wetlands park will treat urban runoff from a 520 acre area through installation of a series of BMPs. Park vegetation will consist of plants not requiring supplemental irrigation.

Whittier Narrows Water Reclamation Plant Ultraviolet (UV) Disinfection

The Whittier Narrows Water Reclamation Plant UV Disinfection project will convert current disinfection processes at the 15 mgd plant to a UV disinfection process. Currently, tertiary-treated water is disinfected to Title 22 recycled water standards using chloramination resulting in the production of NDMA byproducts.

Wilmington Drain Restoration Multiuse

As proposed, the Wilmington Drain Restoration Multiuse Project involves restoration of the Wilmington Drain. Restoration will involve creation of a public park, improved public access, native revegetation, stormwater treatment, and educational signage. The drain is within the City on an easement held by the LACFCD.

North Atwater Creek Restoration

As a component of the overall Los Angeles River Revitalization Plan, the North Atwater Creek Restoration Project will restore North Atwater Creek at North Atwater Park by providing stormwater runoff capture and treatment and the provision of habitat linkage to the Los Angeles River. Additionally, the project will provide an educational component and includes BMP implementation at adjacent horse stables and riding trails.

10.2.4 Implications of IRWMP for LADWP's Urban Water Management Plan

LADWP is a member of the IRWMP Leadership Committee and additionally serves as the chair of the of the Upper Los Angeles River Watersheds sub-region for the IRWMP region. As member of the Leadership Committee, LADWP is a signatory to the MOU for the IRWMP approved by the Board of Water and Power Commissioners on July 15, 2008.

Participating agencies in the IRWMP coordinate and share information concerning water resources management planning programs and projects, share grant funding information, and improve and maintain overall communication among the participants. Coordination and information sharing assists LADWP and other agencies in achieving their respective missions and contribute to overall IRWMP goals.

10.3 MWD's 2010 Integrated Resources Plan

Approved by the Board on October 12, 2010, the updated IRP is MWD's strategic plan for water reliability through the year 2035. The plan was developed through a collaborative process which incorporated input from water districts, local governments, stakeholder groups and the public. The earliest version of the IRP, which dates back to 1996, sets a regional reliability goal of meeting "full-service demands at the retail level under all foreseeable hydrologic conditions." The 2010 IRP maintains this reliability goal by seeking to stabilize MWD's traditional imported water supplies and establish water reserves to withstand California's inevitable dry cycles and growth in water demand.

The 2010 IRP update has three main objectives: (1) develop an Emergency Response Plan for hydrologic, regulatory, and other types of uncertainties in the Bay-Delta; (2) identify energy-efficient and cost-effective energy management initiatives; and (3) evaluate the reliability of the IRP Preferred Resource Mix through 2035, adjust targets as needed to reflect changed conditions, and extend resource targets through 2035.

The 2010 IRP manages regional resource needs utilizing three baseline components. It begins with baseline efforts – or core resource strategies – designed to maintain reliable water supplies. Its second component – the uncertainty buffer – activates buffer actions to mitigate short-term changes. If changed conditions become more pronounced, there is a final component – foundational actions – which are strategies for securing additional water resources.

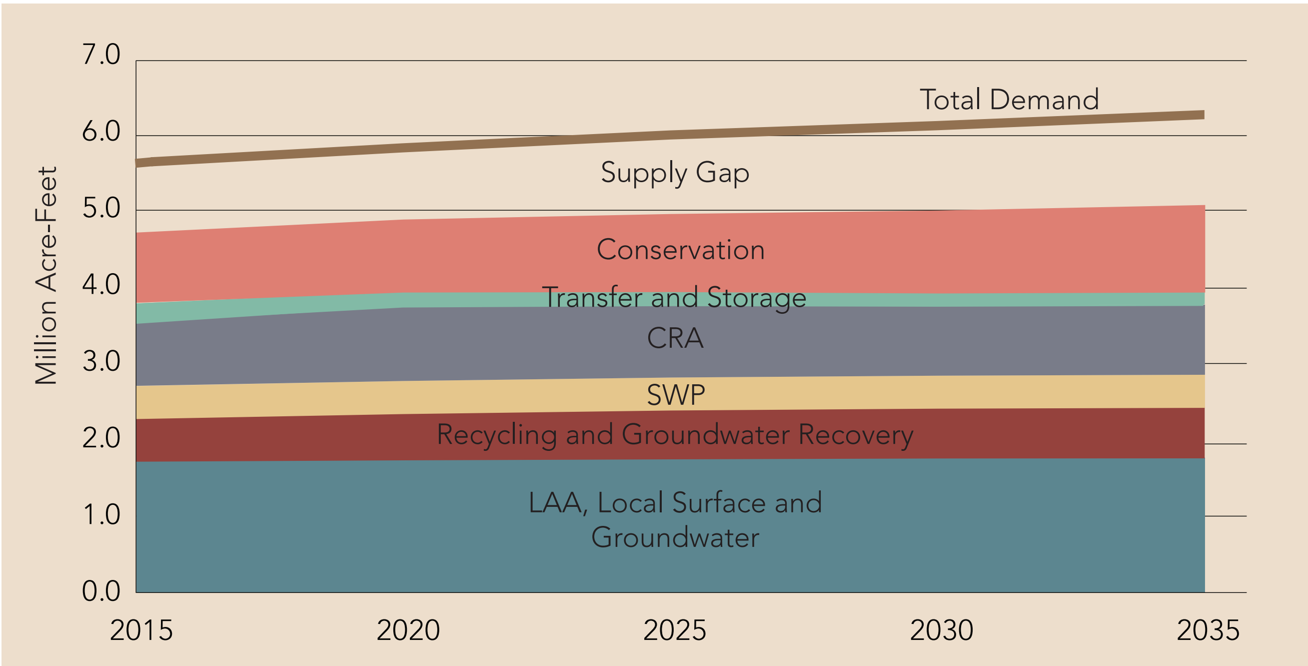
Additionally, the 2010 IRP takes additional steps to promote water use efficiency to further ensure reliability. It spells out a strategy to buffer the region from

Exhibit 10A
MWD's IRP Resource Targets

IRP Resource Targets	2004 IRP Update 2025	2010 IRP Update 2025	Change	2010 IRP Update 2035
Conservation	1,107,000	1,412,000	305,000	1,538,000
Local Projects*	750,000	905,000	155,000	928,000
Colorado River Aqueduct **	1,250,000	1,250,000	0	1,250,000
State Water Project	650,000	713,000	63,000	713,000
Groundwater Conjunctive Use	300,000	300,000	0	300,000
Central Valley/ State Water Project Storage and Transfers	550,000	1,070,000	520,000	1,092,000
MWD Surface Water Storage***	620,000	620,000	0	620,000

* Includes recycled water, brackish groundwater desalination, and seawater desalination
** Target for specific year types, the CRA is not intended to be full at all times
*** Represents the total amount that can be withdrawn from surface reservoirs
Source: MWD (2010)

Exhibit 10B
Meeting Regional Water Needs Through MWD's IRP



future changing circumstances through accelerated conservation and local supply development. And it advances long-term planning for potential future contingency resources, such as stormwater capture, large-scale seawater desalination, and local resource development through an adaptive management approach which will allow MWD, for the first time, to make direct equity investments and/or enter into partnerships for the development of local supply projects.

A summary of the 2004 IRP update and 2010 update targets are shown in Exhibit 10A.

Exhibit 10B shows regional water demands without conservation from 2015 to 2035 under dry weather. The graph also depicts the supply sources and water conservation identified in MWD's 2010 IRP update.

Exhibit 10B shows regional water demands without conservation from 2015 to 2035 under dry weather. The graph also depicts the supply sources and water conservation identified in MWD's 2010 IRP Update.

10.3.1 Stakeholder Participation

Like the preparation of previous IRPs, the crafting of the 2010 IRP was a collaborative effort. MWD sought input from its 26 public member agencies, retail water agencies, the public and other stakeholders including water and wastewater managers, environmental interests, and the business community. In preparation of MWD's IRP, all member agencies were closely involved, including LADWP. Additionally, LADWP was an active member of the technical workgroup.

To provide more direct involvement by MWD's Board in the 2010 IRP preparation, the IRP Steering Committee was created. This committee met on a regular basis to be briefed by MWD staff, review proposed resource strategies and provide recommended policy options. A Strategic Policy Review was conducted through a series of board workshops and managed public forums to help Metropolitan evaluate its future role for the region.

The managed public forums were regional assemblies held at critical milestones during the IRP development that provided a platform to collectively discuss strategic direction and regional water solutions. Participants in these assemblies included elected officials, board members, water agency managers, local retail water providers, groundwater basin managers, and public stakeholders from the business community, environmental groups, agricultural interests, and the general public.

10.3.2 Funding MWD's IRP

In accordance with the MWD Board's adoption of the IRP update, a revised Long-Range Finance Plan (LRP) was also developed and approved by the MWD Board. The LRP (2010) identifies MWD's planned capital improvement program (CIP) and operating expenses from 2015 to 2035.

The following summarizes MWD's CIP and operating expenses needed to implement the IRP:

- **Core Resources** (Fixed costs to maintain Bay-Delta habitat conservation and conveyance program, LRP contracts, CRA programs, and conservations funding) – costs for water supply will increase from the current $853/AF in 2015 to $1,484/AF in 2035.
- **Water Use Efficiency** – costs for water supply will increase from the current $892/AF in 2015 to $1,608/AF in 2035.
- **Capital Expenditures** – costs for water supply will increase from $919/AF in 2015 to $1,844/AF in 2035.
- **Demand Management & Local Projects** – costs from water supply will increase from $953/AF to $2,021/AF in 2035.

10.3.3 IRP Implications for City's Urban Water Management Plan

As LADWP evaluates its water supply options, it is important to understand the significance of a reliable and cost-effective water supply from MWD. The City's water supply reliability is directly linked to MWD's reliability, and LADWP's local supply development uses the cost of MWD water as one of the benchmarks for feasibility evaluation. Through its 2010 IRP update, MWD has shown that it will be able to meet the supplemental needs of all its member agencies reliably through 2035, even during prolonged drought events. MWD has also developed a plan to implement and finance the approved IRP targets.

Chapter Eleven

Water Supply Reliability and Financial Integrity

11.0 Overview

Providing a reliable water supply in a semiarid climate with high variability in weather is challenging. And because LADWP currently imports a substantial portion of its surface water from the Los Angeles Aqueduct (LAA) and Metropolitan Water District of Southern California (MWD), it is even more challenging. Imported surface supplies are highly variable due to climate and hydrology, and they are also subject to environmental restrictions. To diversify its water supply portfolio, LADWP has made and will continue to make significant investments in groundwater, recycled water, stormwater capture and water conservation. These local water supplies tend to be more reliable than imported water because they have less variability due to climate, weather, and environmental restrictions. And by investing in these local supplies, the City's urban environment is protected and enhanced.

11.1 Unit Cost and Funding of Supplies

11.1.1 Unit Cost Summary of Supplies

Unit costs play an important role in planning future water supply development and determining where supply investments provide the greatest benefits to LADWP. Unit costs of production vary dramatically by water supply source. Exhibit 11A summarizes the unit cost for each water supply source.

Among LA's existing and planned water supplies, costs per acre-foot ranged from a high of $1,500 for certain recycled water projects to a low of $215 for locally produced groundwater. LAA supply requires operation and maintenance costs regardless of water availability. Therefore, hydrology and increased water for environmental commitments in the Eastern Sierras result in LAA unit cost fluctuations from year to year. Local groundwater supply is the least expensive source. However, its production is limited by contamination. Unit costs for MWD purchased water vary based on tier allocations. MWD's water rates vary from $527 per AF of Tier 1 untreated water to $869 per AF of Tier 2 treated water in 2011. LADWP has a Tier 1 allocation of 304,970 AF. Any purchases above this amount will be at the Tier 2 rates. Conservation is relatively inexpensive and offsets water supplies that may otherwise be required to meet demand. Conservation unit costs are based on costs of conservation rebate and incentive programs and their potential water use reduction. Recycled water costs are project specific and vary widely depending on the infrastructure requirements of each project. Water transfers using a future connection between the LAA and the California Aqueduct are planned. Water transfer costs will include the purchase price of water and conveyance fees.

Unit costs for potential water supplies such as stormwater reuse and increased groundwater production from stormwater recharge are highly variable based on a variety of factors including the size of the overall program, project locations, etc. Centralized stormwater capture unit costs are based on LADWP's current planned centralized stormwater capture projects, and distributed stormwater capture unit costs are based on various sources as referenced in Chapter 7, Watershed Management. Stormwater projects are joint efforts among agencies, City departments, stakeholders and community groups and yield additional benefits beyond water supply.

Seawater desalination unit costs are based on estimates from MWD's 2010 IRP. Seawater desalination was a planned supply identified in the 2005 UWMP but is excluded from this 2010 UWMP. Its impacts to marine habitats and high energy consumption make seawater desalination less desirable compared to options such as recycled water, conservation, and stormwater capture.

Exhibit 11A Unit Costs of Supplies

Water Source	Chapter Reference	Average Unit Cost ($/AF)
Los Angeles Aqueduct[1]	**Chapter 5 - Los Angeles Aqueduct System**	$563
Groundwater[1]	**Chapter 6 - Local Groundwater**	$215
Metropolitan Water District[2]	**Chapter 8 - Metropolitan Water District Supplies**	$527 - $869
Conservation	**Chapter 3 - Conservation**	$75 - $900
Recycled Water	**Chapter 4 - Recycled Water**	$600 - $1,500
Water Transfer	**Chapter 9 - Other Potential Supplies**	$440 - $540
Stormwater Capture	**Chapter 7 - Watershed Management**	
- Centralized Stormwater Capture		$60 - $300
- Distributed Stormwater Capture		
Urban Runoff Plants		$4,044
Rain Barrels		$278 - $2,778
Cisterns		$2,426
Rain Gardens		$149 - $1,781
Neighborhood Recharge		$3,351
Seawater Desalination	**Chapter 9 - Other Potential Supplies**	**$1,300 - $2,000**

[1] Los Angeles Aqueduct supply and groundwater supply are based on FY2005/06 to FY2009/10 five-year average.
[2] MWD Water Rates effective on January 1, 2011.

11.1.2 Funding of Supplies

Funding for water resource programs and projects are primarily provided through LADWP water rates, with supplemental funding provided by the MWD, and state and federal grants. Funding for water conservation, water recycling, and stormwater capture projects has increased significantly in recent years. Currently, approximately $100 million is collected annually through water rates for the LADWP's water resource programs. The current level of annual expenditures is believed to be sufficient to achieve projected goals for conservation, water recycling, and stormwater capture. However, achieving the goals for contaminated groundwater treatment in the San Fernando Basin will require water rate increases. LADWP will also seek reimbursement from potential responsible parties to assist with groundwater treatment program costs.

The timeframe for achieving water resource goals as outlined in the 2008 document Securing L.A.'s Water Supply was based on the assumption that there would be additional increases in water rates to achieve the stated goals. With the exception of groundwater treatment, the 2010 UWMP assumes existing amounts of revenue.

Water Resource Project Funding

- Water Rates – An existing component of water rates currently provides approximately $100 million annually for water conservation, water recycling, and stormwater capture programs.

- MWD – Currently provides funding up to $250 per AF for water recycling through their Local Resources Program. MWD also provides some water conservation incentive funding through rebates equal to $195 per AF of water saved or half the product cost whichever is less.

- State Funds – Funds for recycling, conservation, and stormwater capture have been available on a competitive basis though voter approved initiatives, such as Propositions 50 and 84. The proposed 2012 Water Bond also includes potential funding for groundwater cleanup. Occasionally low or zero-interest loans are also available though State Revolving Fund programs.

- Federal Funds – Federal funding for recycling is available through the U.S. Army Corps of Engineers, via periodic Water Resource Development Act legislation, and the U.S. Bureau of Reclaimation's Title XVI program.

- Potentially Responsible Parties – LADWP may be able to recover some costs for groundwater cleanup from potentially responsible parties.

Receipt of state or federal funding will allow water resource goals to be achieved sooner than projected, or allow for increased local supply development.

11.2 Reliability Assessment Under Different Hydrologic Conditions

11.2.1 Los Angeles Aqueducts

Water supply from the LAA can vary substantially from year to year due to hydrology. In very wet years, LAA supply can exceed 500,000 AFY. During average year weather conditions (50-year average hydrology from Fiscal Year 1956/57 to 2005/06) LAA supply is projected to gradually decrease from 254,000 AFY to 244,000 AFY by 2035 due to climate change impact. Critical dry year (defined as a repeat of a 1990/91 drought) supplies can be as low as 48,520 AFY.

In the last decade environmental considerations have required the City to reallocate approximately one-half of the LAA water supply to environmental mitigation and enhancement projects. Reducing water deliveries to the City from the LAA has resulted in less water independence, and therefore, increased dependence on imported water supply from MWD.

11.2.2 Groundwater

Groundwater is also affected by local hydrology. However, with conjunctive use management of groundwater—storing imported water in the groundwater basins during wet and average years - groundwater production can actually be increased during dry years. During average weather conditions, LADWP projects it will pump approximately between 40,500 AFY and 111,500 AFY of groundwater during the projection period to Fiscal Year (FY) 2034/35. These projections are based on LADWP's planned Groundwater Treatment Facilities being operational in FY 2020/21 and groundwater storage credits of 5,000 AFY being used to maximize production thereafter. Although in dry years LADWP can pump larger quantities of groundwater, a more conservative approach was adopted by assuming the same level of projected groundwater production for both single dry year and multi-dry year analysis.

Groundwater is vulnerable to contamination. The clean-up of the contamination in San Fernando Basin will facilitate the plan of storing additional recycled water and stormwater for future extraction and is critical to ensuring the reliability of the City's groundwater supplies. The Groundwater Treatment Facilities will address this issue and restore LADWP's ability to fully utilize its local groundwater entitlements and will facilitate additional storage and extraction programs.

11.2.3 Conservation

LADWP has developed conservation goals to decrease water use in the City and to comply with the new State 20 percent by 2020 requirements. Multiple actions will be taken to increase water conservation including public education, targeting the CII sector, reducing outdoor water use, and continuing participation in MWD's rebate programs. LADWP is planning to increase water conservation levels by over 60,000 AFY between 2010 and 2035, assuming average weather conditions.

Conservation can be seen as both a demand control measure and/or a source of supply. Of the local supplies being pursued, additional planned conservation is the biggest contributor toward reducing MWD purchases and increasing local supply reliability through 2035 and is therefore a crucial supply asset for LADWP.

11.2.4 Recycled Water

Recycled water is based on wastewater effluent flows, which do not vary significantly due to hydrology. Therefore, recycled water use is mainly limited by system capacities and demands. These facts make recycled water a more reliable supply than imported water. As outlined in Chapter 4 on Recycled Water, LADWP is planning extensive expansion of its recycled water system not only to include expansion of irrigation and industrial uses, but also to include groundwater replenishment. Under average weather conditions, recycled water supply for irrigation and industrial purposes is projected to increase from 20,000 AFY in 2015 to 29,000 AFY in 2035. Groundwater replenishment with recycled water is projected to be 30,000 AFY in 2035. For a critical dry year available recycled water supplies would not change.

11.2.5 Water Transfers

Water transfers are being developed to replace a portion of the City's Los Angeles Aqueduct water that has been dedicated for environmental enhancement uses in the Eastern Sierra Nevada. Water acquired through transfers helps increase water supply reliability for the City. The Los Angeles Aqueduct and California Aqueduct interconnection is under construction and estimated to be completed after May 2013. LADWP is expected to enter into agreements to obtain 40,000 AF per year under average weather conditions beginning in FY 2014/15 and continuing through 2035.

11.2.6 MWD Imported Supplies

LADWP has historically purchased MWD water to make up the deficit between in-City demand and local supplies. The City relies on MWD water to a greater extent in dry years and has been increasing its dependence in recent years as LAA supplies have been reduced due to increased environmental mitigation and enhancement demands.

Historically, water from MWD (like supplies from the LAA) has been subject to severe variability due to water shortages (i.e., 1976/77, 1987-1992, and 2007-2010). This is a result of MWD's core sources of water supply being the Colorado River and SWP, both of which are highly affected by hydrology. More recently, restrictions to protect threatened fish species have further decreased pumping from the Bay-Delta, and limited SWP supplies available to MWD. After the 1987-1992 water shortage, MWD started to diversify its water supply portfolio. Partnering with its member agencies, MWD launched its first Integrated Resource Plan (IRP) in 1993 and most recently updated it in 2010. As a result of the resource targets in the IRP, MWD implemented a variety of projects and programs designed to reduce its dependency on imported water during water shortages and environmental triggering of SWP pumping restrictions. Efforts have included: (1) providing financial incentives for local projects and conservation; (2) increasing surface storage via Diamond Valley Lake, Lake Mead, and the use of SWP terminal reservoirs; (3) groundwater storage programs in the Central Valley, Imperial Valley, and Coachella Valley; (4) short- and long-term water transfers; and (5) contracted groundwater storage programs with participating member agencies.

In the 2010 IRP Update, MWD developed a three-part adaptive resource strategy that includes: (1) meeting demands by building on existing core resources to provide reliability under foreseen conditions; (2) implementing a supply buffer of 10 percent of retail demand through multiple actions to adapt to short-term uncertainty; and (3) implementing adaptive management through low-regret foundation actions, monitoring key vulnerabilities and bringing adaptive resources online, if required, and (4) using a comprehensive approach to meet specific needs and degrees of shortages. The 2010 IRP adaptive management concept seeks to mitigate against supply uncertainty to further increase reliability.

MWD's 2010 IRP Update concluded that the resource targets identified in previous IRP updates, taking into consideration changed conditions identified since that time, will continue to provide for 100 percent reliability through 2035 for all its member agencies. MWD's 2010 Regional Urban Water Management Plan also concluded the same full reliability through 2035 during average (1922 – 2004 hydrology), single dry (1977 hydrology), and multiple dry years (1990 - 1992 hydrology). For each of these scenarios there is a projected surplus of supply in every forecast year (see Exhibit 11B). The projected surpluses are based on the capability of current supplies and range from 1 percent to 106 percent. When

Exhibit 11B
MWD Supply Capability and Projected Demands (in AFY)

Single Dry-Year MWD Supply Capability and Projected Demands					
Fiscal Year	2015	2020	2025	2030	2035
Capability of Current Supplies	2,457,000	2,782,000	2,977,000	2,823,000	2,690,000
Projected Demands	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
Projected Surplus	286,000	620,000	776,000	569,000	371,000
Projected Surplus % (Proj. Surplus/Proj. Demands)	13%	29%	35%	25%	16%
Supplies under Development	762,000	862,000	1,036,000	1,036,000	1,036,000
Potential Surplus	1,048,000	1,482,000	1,812,000	1,605,000	1,407,000
Potential Surplus % (Potential Surplus/ Proj. Demands)	48%	69%	82%	71%	61%
Multiple Dry-Year MWD Supply Capability and Projected Demands					
Fiscal Year	2015	2020	2025	2030	2035
Capability of Current Supplies	2,248,000	2,417,000	2,520,000	2,459,000	2,415,000
Projected Demands	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
Projected Surplus	12,000	229,000	237,000	120,000	16,000
Projected Surplus % (Proj. Surplus/Proj. Demands)	1%	10%	10%	5%	1%
Supplies under Development	404,000	553,000	733,000	755,000	755,000
Potential Surplus	416,000	782,000	970,000	875,000	771,000
Potential Surplus % (Potential Surplus/ Proj. Demands)	19%	36%	42%	37%	32%
Average Year MWD Supply Capability and Projected Demands					
Fiscal Year	2015	2020	2025	2030	2035
Capability of Current Supplies	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
Projected Demands	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
Projected Surplus	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
Projected Surplus % (Proj. Surplus/Proj. Demands)	74%	97%	106%	93%	81%
Supplies under Development	588,000	689,000	1,051,000	1,051,000	1,051,000
Potential Surplus	2,067,000	2,566,000	3,155,000	2,949,000	2,759,000
Potential Surplus % (Potential Surplus/ Proj. Demands)	103%	133%	159%	144%	131%

Source: MWD 2010 Regional Urban Water Management Plan Tables 2-9 to 2-11.

including supplies under development, the potential surplus increases to between 19 percent and 159 percent of projected demand.

As part of the implementation of MWD's IRP, MWD and its member agencies worked together to develop MWD's Water Surplus and Drought Management Plan (WSDM Plan) in 1999. The WSDM Plan established broad water resource management strategies to ensure MWD's ability to meet full service demands at all times and provides principles for supply allocation if the need should ever arise. The WSDM Plan splits MWD's resource actions into two major categories: Surplus Actions and Shortage Actions. The Shortage Actions of the WSDM Plan are split into three sub-categories: Shortage, Severe Shortage, and Extreme Shortage. Under Shortage conditions, MWD will make withdrawals from storage and interrupt long-term groundwater basin replenishment deliveries. Under Severe Shortage conditions, MWD will call for extraordinary drought conservation in the form of voluntary savings from retail customers, interrupt 30 percent of deliveries to Agricultural Water Program users, call on its option transfer water, and purchase water on the spot market. The overall objective of MWD's IRP and WSDM Plan is to ensure that shortage allocations of MWD water supplies are not required.

Under Extreme Shortage conditions, MWD allocates supplies to its member agencies in accordance with its Water Supply Allocation Plan (WSAP). If shortage allocations are required, MWD will rely on the calculations established in its WSAP adopted in 2008. The plan equitably allocates shortages among its member agencies based on need with adjustments for growth, local investments, changes in supply conditions, demand hardening, and water conservation programs.

11.2.7 Potential Supplies

Other planned and potential water supplies that LADWP is exploring include capturing stormwater for reuse and infiltration leading to increased groundwater production (see Chapter 7). The beneficial reuse of stormwater presents significant opportunity and the development of these supplies will offset the need to import additional supplemental supplies from MWD. The City must also reduce pollutants in impaired receiving waters (rivers, creeks, and beaches in the Santa Monica and Los Angeles watersheds) as required by the Clean Water Act. By managing urban runoff during dry and wet periods, this pollution will be reduced.

Traditional ways of managing urban runoff would be to divert the runoff into existing wastewater treatment plants and/or build satellite treatment plants specifically designed to treat urban runoff. During the City's IRP process, stakeholders expressed the desire to examine other ways to manage runoff that would reduce pollution and provide for other benefits such as water supply and open space. These methods involve local and regional storage of wet weather runoff for groundwater infiltration, on-site storage and recovery of wet weather runoff for irrigation using cisterns and other devices, and reuse of treated dry weather effluent for irrigation (much like recycled water). As an outgrowth of the City's IRP, neighborhood recharge concept efforts are moving from the conceptual stage visualized in the IRP to actual projects in the City to infiltrate wet weather runoff as close as possible to the point of origin with multiple projects either complete, under construction, or in final design.

Under average weather conditions LADWP is projecting stormwater capture and reuse in 2015 could reach 2,000 AFY and increase to 10,000 AFY by 2035. Additionally, increased groundwater production from stormwater infiltration will potentially be 15,000 AFY in 2035. This increased groundwater production potential is contingent on modifying the court judgment which governs extractions from the San Fernando Groundwater Basin. If these resources reach fruition, LADWP will be able to reduce imported supplies purchased from MWD by 25,000 AFY in 2035 under average weather conditions.

11.2.8 Service Area Reliability Assessment

To determine the overall service area reliability, LADWP defined three hydrologic conditions: average year (50-year average hydrology from FY 1956/57 to 2005/06); single dry year (such as a repeat of the FY 1990/91 drought); and multi-dry year period (such as a repeat of FY1988/89 to FY1992/93). The average

Exhibit 11C
LADWP Supply Reliability FYE 2006-2010 Average

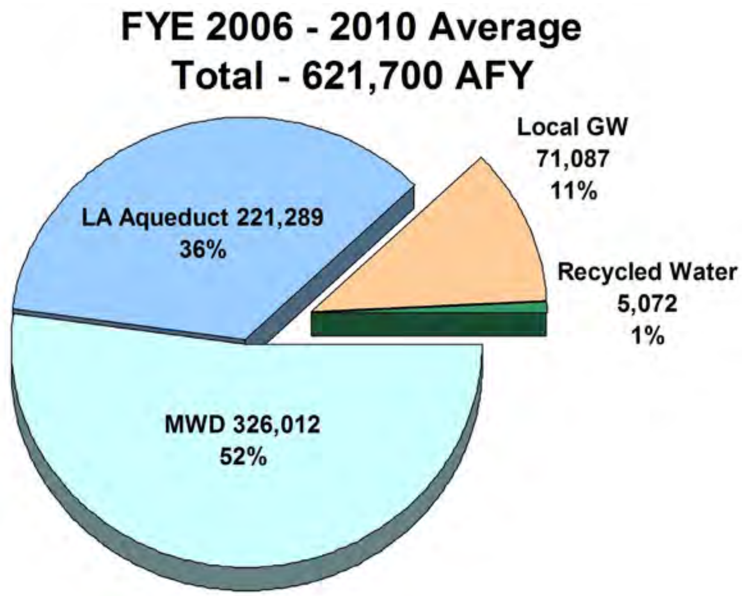
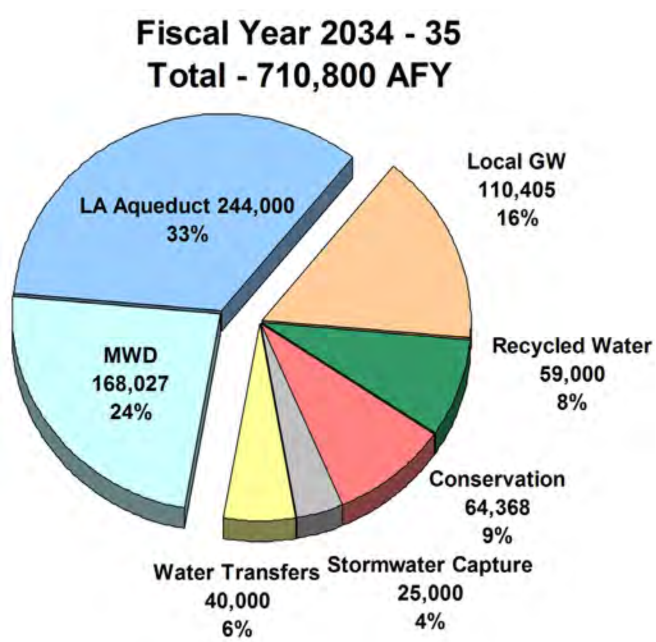


Exhibit 11D
LADWP Supply Reliability Under Average Weather Conditions in Fiscal Year 2034-35



Note: Charts do not reflect approximately 100,000 AF of existing conservation

year demand is based on the forecasted median demand as shown in Exhibit 2J. Weather patterns and water demands were further studied to determine single dry year demand and multi-dry year demands. The single dry year demand is estimated to be 6 percent higher than the forecasted median demand. The multi-dry year demands are increased above the forecasted median demands by the following percentages: 1st year – 4 percent, 2nd year – 5 percent, 3rd year – 6 percent, 4th year – 0 percent, and 5th year – 2 percent.

The water supply reliability summaries are shown in Exhibit 11C for the 5-year average from FY 2005/06 to FY 2009/10 and in Exhibit 11 D for FY 2034/35 under average weather conditions, with new water conservation shown as a supply source. The exhibits show that the City's reliance on MWD supply will decrease from 52 percent to 24 percent by FY 2034/35 while the combined imported supplies of LAA and MWD water will decrease from 88 percent to 57 percent by FY 2034/35. The locally-developed supplies will increase from 12 percent to 43 percent by FY 2034/35.

Exhibits 11E and 11F tabulate the service reliability assessment for normal and single dry year conditions, respectively. Exhibits 11G through 11K show reliability assessments in five year increments from 2010 to 2035 with each five year period assuming that a multiple dry year condition occurs. For these reliability tables, existing water conservation has been already subtracted from projected demands, but new water conservation is included as a supply source. Demands are met by the available supplies under all scenarios.

Exhibit 11E
Service Area Reliability Assessment for Average Weather Year

Demand and Supply Projections (in acre-feet)	FY2009-10 Actual	Average Weather Conditions (FY 1956/57 to 2005/06) Fiscal Year Ending on June 30				
		2015	2020	2025	2030	2035
Total Demand	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**
Existing / Planned Supplies						
Los Angeles Aqueduct[1]	199,739	252,000	250,000	248,000	246,000	244,000
Groundwater[2]	76,982	40,500	96,300	111,500	111,500	110,405
Conservation	8,178	14,180	27,260	40,340	53,419	64,368
Recycled Water						
- Irrigation and Industrial Use	6,703	20,000	20,400	27,000	29,000	29,000
- Groundwater Replenishment	0	0	0	15,000	22,500	30,000
Water Transfers	0	40,000	40,000	40,000	40,000	40,000
Subtotal	291,602	366,680	433,960	481,840	502,419	517,773
MWD Water Purchases With Existing/Planned Supplies	263,875	248,120	218,040	193,760	198,781	193,027
Total Supplies	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**
Potential Supplies						
Stormwater Capture						
- Capture and Reuse (Harvesting)	0	2,000	4,000	6,000	8,000	10,000
- Increased Groundwater Production (Recharge)	0	0	2,000	4,000	8,000	15,000
Subtotal	0	2,000	6,000	10,000	16,000	25,000
MWD Water Purchases With Existing/Planned/Potential Supplies	263,875	246,120	212,040	183,760	182,781	168,027
Total Supplies	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

Exhibit 11F
Service Area Reliability Assessment for Single Dry Year

Demand and Supply Projections (in acre-feet)	FY2009-10 Actual	Single Dry Year (FY1990-91) Fiscal Year Ending on June 30				
		2015	2020	2025	2030	2035
Total Demand	**555,477**	**651,700**	**691,100**	**716,100**	**743,200**	**753,400**
Existing / Planned Supplies						
Los Angeles Aqueduct[1]	199,739	48,520	48,120	47,720	47,330	46,940
Groundwater[2]	76,982	40,500	96,300	111,500	111,500	110,405
Conservation	8,178	14,180	27,260	40,340	53,419	64,368
Recycled Water						
- Irrigation and Industrial Use	6,703	20,000	20,400	27,000	29,000	29,000
- Groundwater Replenishment	0	0	0	15,000	22,500	30,000
Water Transfers	0	40,000	40,000	40,000	40,000	40,000
Subtotal	291,602	163,200	232,080	281,560	303,749	320,713
MWD Water Purchases With Existing/Planned Supplies	263,875	488,500	459,020	434,540	439,451	432,687
Total Supplies	**555,477**	**651,700**	**691,100**	**716,100**	**743,200**	**753,400**
Potential Supplies						
Stormwater Capture						
- Capture and Reuse (Harvesting)	0	2,000	4,000	6,000	8,000	10,000
- Increased Groundwater Production (Recharge)	0	0	2,000	4,000	8,000	15,000
Subtotal	0	2,000	6,000	10,000	16,000	25,000
MWD Water Purchases With Existing/Planned/Potential Supplies	263,875	486,500	453,020	424,540	423,451	407,687
Total Supplies	**555,477**	**651,700**	**691,100**	**716,100**	**743,200**	**753,400**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

Exhibit 11G
Service Area Reliability Assessment for Multi-Dry Years (2011-2015)

Demand and Supply Projections (in acre-feet)	FY2009-10 Actual	Multiple Dry Years (FY1988-89 to FY1992-93) Fiscal Year Ending on June 30				
		2011	2012	2013	2014	2015
Total Demand	**555,477**	**590,000**	**608,200**	**626,500**	**602,900**	**627,100**
Existing / Planned Supplies						
Los Angeles Aqueduct[1]	199,739	86,330	98,560	48,520	94,360	105,770
Groundwater[2]	76,982	61,090	53,660	46,260	47,300	40,500
Conservation	8,178	9,380	10,580	11,780	12,980	14,180
Recycled Water						0
- Irrigation and Industrial Use	6,703	7,500	8,300	9,000	15,500	20,000
- Groundwater Replenishment	0	0	0	0	0	0
Water Transfers	0	0	0	0	0	40,000
Subtotal	291,602	164,300	171,100	115,560	170,140	220,450
MWD Water Purchases With Existing/Planned Supplies	263,875	425,700	437,100	510,940	432,760	406,650
Total Supplies	**555,477**	**590,000**	**608,200**	**626,500**	**602,900**	**627,100**
Potential Supplies						
Stormwater Capture						
- Capture and Reuse (Harvesting)	0	0	0	0	0	2,000
- Increased Groundwater Production (Recharge)	0	0	0	0	0	0
Subtotal	0	0	0	0	0	2,000
MWD Water Purchases With Existing/Planned/Potential Supplies	263,875	425,700	437,100	510,940	432,760	404,650
Total Supplies	**555,477**	**590,000**	**608,200**	**626,500**	**602,900**	**627,100**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

Exhibit 11H
Service Area Reliability Assessment for Multi-Dry Years (2016-2020)

Demand and Supply Projections (in acre-feet)	Multiple Dry Years (FY1988-89 to FY1992-93) Fiscal Year Ending on June 30				
	2016	2017	2018	2019	2020
Total Demand	**647,100**	**661,200**	**675,400**	**644,600**	**665,100**
Existing / Planned Supplies					
Los Angeles Aqueduct[1]	86,330	98,560	48,520	94,360	105,770
Groundwater[2]	37,350	37,350	37,350	42,280	96,300
Conservation	16,800	19,410	22,030	24,640	27,260
Recycled Water					0
- Irrigation and Industrial Use	20,000	20,200	20,300	20,400	20,400
- Groundwater Replenishment	0	0	0	0	0
Water Transfers	40,000	40,000	40,000	40,000	40,000
Subtotal	200,480	215,520	168,200	221,680	289,730
MWD Water Purchases With Existing/Planned Supplies	446,620	445,680	507,200	422,920	375,370
Total Supplies	**647,100**	**661,200**	**675,400**	**644,600**	**665,100**
Potential Supplies					
Stormwater Capture					
- Capture and Reuse (Harvesting)	2,400	2,800	3,200	3,600	4,000
- Increased Groundwater Production (Recharge)	400	800	1,200	1,600	2,000
Subtotal	2,800	3,600	4,400	5,200	6,000
MWD Water Purchases With Existing/Planned/Potential Supplies	443,820	442,080	502,800	417,720	369,370
Total Supplies	**647,100**	**661,200**	**675,400**	**644,600**	**665,100**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

Exhibit 11I
Service Area Reliability Assessment for Multi-Dry Years (2021-2025)

Demand and Supply Projections (in acre-feet)	Multiple Dry Years (FY1988-89 to FY1992-93) Fiscal Year Ending on June 30				
	2021	2022	2023	2024	2025
Total Demand	**683,000**	**694,500**	**706,100**	**670,900**	**689,100**
Existing / Planned Supplies					
Los Angeles Aqueduct[1]	86,330	98,560	48,520	94,360	105,770
Groundwater[2]	111,500	111,500	111,500	111,500	111,500
Conservation	29,880	32,490	35,110	37,720	40,340
Recycled Water					0
- Irrigation and Industrial Use	20,400	21,000	23,000	25,000	27,000
- Groundwater Replenishment		15,000	15,000	15,000	15,000
Water Transfers	40,000	40,000	40,000	40,000	40,000
Subtotal	288,110	318,550	273,130	323,580	339,610
MWD Water Purchases With Existing/Planned Supplies	394,890	375,950	432,970	347,320	349,490
Total Supplies	**683,000**	**694,500**	**706,100**	**670,900**	**689,100**
Potential Supplies					
Stormwater Capture					
- Capture and Reuse (Harvesting)	4,400	4,800	5,200	5,600	6,000
- Increased Groundwater Production (Recharge)	2,400	2,800	3,200	3,600	4,000
Subtotal	6,800	7,600	8,400	9,200	10,000
MWD Water Purchases With Existing/Planned/Potential Supplies	388,090	368,350	424,570	338,120	339,490
Total Supplies	**683,000**	**694,500**	**706,100**	**670,900**	**689,100**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

Exhibit 11J
Service Area Reliability Assessment for Multi-Dry Years (2026-2030)

Demand and Supply Projections (in acre-feet)	Multiple Dry Years (FY1988-89 to FY1992-93) Fiscal Year Ending on June 30				
	2026	2027	2028	2029	2030
Total Demand	**707,900**	**720,100**	**732,400**	**696,100**	**715,200**
Existing / Planned Supplies					
Los Angeles Aqueduct[1]	86,330	98,560	48,520	94,360	105,770
Groundwater[2]	111,500	111,500	111,500	111,500	111,500
Conservation	42,960	45,570	48,190	50,800	53,420
Recycled Water					0
- Irrigation and Industrial Use	27,500	28,000	28,500	29,000	29,000
- Groundwater Replenishment	16,500	18,000	19,500	21,000	22,500
Water Transfers	40,000	40,000	40,000	40,000	40,000
Subtotal	324,790	341,630	296,210	346,660	362,190
MWD Water Purchases With Existing/Planned Supplies	383,110	378,470	436,190	349,440	353,010
Total Supplies	**707,900**	**720,100**	**732,400**	**696,100**	**715,200**
Potential Supplies					
Stormwater Capture					
- Capture and Reuse (Harvesting)	6,400	6,800	7,200	7,600	8,000
- Increased Groundwater Production (Recharge)	4,800	5,600	6,400	7,200	8,000
Subtotal	11,200	12,400	13,600	14,800	16,000
MWD Water Purchases With Existing/Planned/Potential Supplies	371,910	366,070	422,590	334,640	337,010
Total Supplies	**707,900**	**720,100**	**732,400**	**696,100**	**715,200**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

Exhibit 11K
Service Area Reliability Assessment for Multi-Dry Years (2031-2035)

Demand and Supply Projections (in acre-feet)	Multiple Dry Years (FY1988-89 to FY1992-93) Fiscal Year Ending on June 30				
	2031	2032	2033	2034	2035
Total Demand	**731,200**	**740,300**	**749,300**	**708,800**	**725,000**
Existing / Planned Supplies					
Los Angeles Aqueduct[1]	86,330	98,560	48,520	94,360	105,770
Groundwater[2]	110,405	110,405	110,405	110,405	110,405
Conservation	55,600	57,800	60,000	62,200	64,368
Recycled Water					0
- Irrigation and Industrial Use	29,000	29,000	29,000	29,000	29,000
- Groundwater Replenishment	24,000	25,500	27,000	28,500	30,000
Water Transfers	40,000	40,000	40,000	40,000	40,000
Subtotal	345,335	361,265	314,925	364,465	379,543
MWD Water Purchases With Existing/Planned Supplies	385,865	379,035	434,375	344,335	345,457
Total Supplies	**731,200**	**740,300**	**749,300**	**708,800**	**725,000**
Potential Supplies					
Stormwater Capture					
- Capture and Reuse (Harvesting)	8,400	8,800	9,200	9,600	10,000
- Increased Groundwater Production (Recharge)	9,400	10,800	12,200	13,600	15,000
Subtotal	17,800	19,600	21,400	23,200	25,000
MWD Water Purchases With Existing/Planned/Potential Supplies	368,065	359,435	412,975	321,135	320,457
Total Supplies	**731,200**	**740,300**	**749,300**	**708,800**	**725,000**

[1] Los Angeles Aqueduct supply is estimated to decrease 0.1652% per year due to climate change impacts.
[2] North Hollywood/Rinaldi-Toluca Treatment Complex is expected to be in operation in FY 2019-20. Tujunga Groundwater Treatment Plant is expected to be in operation in 2020-21. Storage credit of 5,000 afy will be used to maximize the pumping in FY 2020-21 and thereafter. Sylmar Basin production was increased to 4,500 AFY from FY 2014-15 to FY 2029-30 to avoid the expiration of stored water credits, then go back to its entitlement of 3,405 AFY in FY 2030-31.

11.3 Water Shortage Contingency Plan

The Los Angeles City Municipal Code Chapter XII, Article I, Emergency Water Conservation Plan is the City's water shortage contingency plan (see Appendix I). It was developed to provide for a sufficient and continuous supply of water in case of a water supply shortage in the service area. There are two scenarios that can cause a water shortage: 1) a severe hydrologic dry period affecting surface and groundwater supplies and 2) a catastrophic event that severs major conveyance and/or distribution pipelines serving water to the City. The following discusses LADWP's compliance with the UWMP Act as outlined in Section 10632 (a) (1) through (9) of the California Water Code.

11.3.1 Stages of Action – 10632 (a) (1)

As set forth in the Emergency Water Conservation Plan, the City has conservation phases or stages of action that can be undertaken in response to water supply shortages. Although there are no specific percentages of water shortage levels assigned to each phase, LADWP continually monitors water supplies and demands. As necessary, LADWP's Board of Water and Power Commissioners makes recommendations to the Mayor and City Council on the suggested conservation phase to address the water shortage conditions. The implementation of progressive conservation phases will cope with up to a 50 percent reduction in water supplies and roughly correspond to the water shortage percentages described below:

No Shortage, Phase I (0 percent)

Phase I prohibited uses of water are in effect at all times within the City. These prohibited uses, defined in article 10632 (a) (4) (see section 11.3.4), are intended to eliminate waste and increase public awareness of the need to conserve water. There are further stages of compounding actions in addition to the Phase I prohibited uses that might be imposed. Phase II to Phase V progressively responds to different severities of shortage and implement additional prohibited uses of water.

Moderate Shortage, Phase II (roughly corresponding to >0 to 15 percent)

1. Should Phase II be implemented, uses applicable to Phase I shall continue to be applicable, except as specifically provided herein.

2. No landscape irrigation shall be permitted on any day other than Monday, Wednesday, or Friday for odd-numbered street addresses and Tuesday, Thursday, or Sunday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to: (a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight minutes per watering day per station for a total of 24 minutes per week; (b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 90 minutes per week.

3. Upon written notice to LADWP, irrigation of sports fields may deviate from non-watering days to maintain play areas and accommodate event schedules; however, to be eligible for this means of compliance, a customer must reduce his overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 5 percent from the customer baseline water usage within 30 days.

4. Upon written notice to LADWP, large landscape areas may deviate from the non-watering days by meeting the following requirements (1) must have approved weather-based irrigation controllers registered with LADWP (eligible weather-based irrigation controllers are those approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative (2) must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 5 percent from the customer baseline water usage within 30 days; and (3) must use recycled water if it is available from LADWP.

5. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase II except between the hours of 9:00 am and 4:00 pm.

Severe Shortage, Phase III (roughly corresponding to 15 to 20 percent shortage)

1. Should Phase III be implemented, uses applicable to Phases I and II shall continue to be applicable, except as specifically provided herein.

2. No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street addresses and Tuesday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.

3. No washing of vehicles allowed except at commercial car wash facilities.

4. No filling of residential swimming pools and spas with potable water.

5. Upon written notice to LADWP, irrigation of sports fields may deviate from the specific non-watering days and be granted one additional water day (for a total of two watering days allowed). To be eligible for this means of compliance, a customer must reduce his overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 10 percent from the customer baseline water usage within 30 days.

6. Upon written notice to LADWP, large landscape areas may deviate from the specific non-watering days and be granted one additional watering day (for a total of two watering days allowed) by meeting the following requirements (1) must have approved weather-based irrigation controllers registered with LADWP (eligible weather-based irrigation controllers are those approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative (2) must reduce overall monthly water use by LADWP's Board of Water and Power Commissioners' adopted degree of shortage plus an additional 10 percent from the customer baseline water usage within 30 days; and (3) must use recycled water if it is available from LADWP.

7. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase III except between the hours of 9:00 am and 4:00 pm.

Critical Shortage, Phase IV (roughly corresponding to 20 to 35 percent shortage)

1. Should Phase IV be implemented, uses applicable to Phases I, II, and III shall continue to be applicable, except as specifically provided herein.

2. No landscape irrigation allowed.

Super Critical Shortage, Phase V (roughly corresponding to 35 to 50 percent shortage)

1. Phase I, II, III, and IV shall continue to remain in effect.

2. The Board of Water and Power Commissioners is hereby authorized to implement additional prohibited uses of water based on the water supply situation. Any additional prohibitions shall be published at least once in a daily newspaper of general circulation and shall become effective immediately upon such publication and shall remain in effect until cancelled.

11.3.2 Driest Three-Year Supply – 10632 (a) (2)

In the event that three consecutive dry-years curtailing the City's LAA System deliveries should follow the 2010 water supply conditions, LADWP will rely on increased groundwater pumping and purchases from MWD to meet City water demands. This particular sequence is quantified in Exhibit 11L, including relevant assumptions.

During such severe drought periods, the City's supplemental water supplier MWD will use its WSAP in conjunction with the framework developed in its WSDM Plan. Developed by MWD with substantial input from its member agencies, the WSDM

Exhibit 11L
Driest Three-Year Water Supply Sequence

Demand and Supply Projections (in acre-feet)	FY2009-10 Actual	**Followed by Repeat of Driest Three Consecutive Years FY1958/59 to 1960/61 Hydrology Fiscal Year Ending on June 30**		
		2011	2012	2013
Total Demand	**555,447**	**590,000**	**608,200**	**626,500**
Existing / Planned Supplies				
Los Angeles Aqueduct	199,739	104,530	50,849	59,382
Groundwater	76,982	61,090	53,660	46,260
Conservation	8,178	9,380	10,580	11,780
Recycled Water				
- Irrigation and Industrial Use	6,703	7,500	8,300	9,000
- Groundwater Replenishment	0	0	0	0
Water Transfers	0	0	0	0
Subtotal	291,602	182,500	123,389	126,422
MWD Water Purchases With Existing/Planned Supplies	263,845	407,500	484,811	500,078
Total Supplies	**555,447**	**590,000**	**608,200**	**626,500**

Assumptions

1. Driest three consecutive years on record in LAA watershed (FY1958-59 to FY1960-61) averaged 28 percent of normal runoff.
2. LAA deliveries reflect increased releases for environmental restoration in the Owens Valley and Mono Basin.
3. Dry year demands are 5 percent greater than normal year demands
4. MWD's Water Surplus and Drought Management Plan actions are sufficient to meet LADWP demands.

Plan provides for the WSAP's needs-based allocation strategy, and establishes priorities for the use of MWD's water supplies to achieve retail reliability.

The following are actions that could be taken by MWD, in accordance with their WSDM Plan, to augment its water supplies prior to implementation of any WSAP drought allocation action:

1. Draw on Diamond Valley Lake storage.

2. Draw on out-of-region storage in Semitropic and Arvin-Edison Groundwater Banks.

3. Reduce/suspend local groundwater replenishment deliveries.

4. Draw on contractual groundwater storage programs in MWD's service area.

5. Draw on State Water Project terminal reservoir storage (per Monterey Agreement).

6. Call for voluntary conservation and public education.

7. Reduce deliveries from MWD's Interim Agricultural Water Program.

8. Call on water transfer options contracts.

9. Purchase transfers on the spot market.

10. Allocate imported water in accordance with the WSAP if necessary.

In 2008 MWD adopted the WSAP which is designed to allocate supplies among its member agencies in a fair and efficient manner. The WSAP establishes the formula for calculating member agency allocations if MWD cannot meet firm demands in a given year.

11.3.3 Catastrophic Supply Interruption Plan – 10632 (a) (3)

Seismic Assessment of Major Imported Supplies

MWD performed a seismic risk assessment of its water distribution network to evaluate the impacts of seismic activity in the greater Southern California area. For MWD, there are three sources of imported water to the region: the Colorado River Aqueduct (CRA), the East SWP branch, and the West SWP branch. Each source was evaluated for the potential of failure during a seismic event. The SWP East branch is considered more vulnerable because the California Aqueduct's alignment follows the San Andreas fault-line and crosses over the San Andreas Fault at multiple locations. The SWP West branch and CRA are somewhat less vulnerable due to their proximity to the San Andreas fault-line, although the San Andreas Fault crosses all aqueducts entering the Southern California region. It crosses the SWP East branch three times, the SWP West branch once, the CRA once, and the LAA once.

LADWP investigated the ability of MWD to deliver Colorado River water into the west San Fernando Valley in the event that SWP supplies and LAA supplies are interrupted. This investigation included the two MWD service areas adjacent to the West San Fernando Valley, the Calleguas and Las Virgines Municipal Water Districts. If imported supply from the SWP and LAA are severed, MWD has prolonged emergency storage in Castaic and Pyramid Lakes. Given the proximity of MWD infrastructure to seismic activity on the San Andreas Fault, MWD staff predicts that if Castaic and Pyramid Lakes become disconnected from the City emergency repairs can be made to ensure that supply is not interrupted for an extended period of time. In a worst case scenario, if these sources are cut off from the City, 50 cubic feet per second of CRA water could be moved through

MWD's system to serve the west San Fernando Valley, Calleguas MWD, and Las Virgines MWD until repairs to the MWD facilities could be made. On-call contractors working around the clock could be deployed to repair seismic damage in as short as a two-week time period depending on the severity and location of the break(s). Due to these risks MWD's current storage policy is to maintain maximum emergency storage in both Pyramid and Castaic Lakes.

Emergency Response Plan

LADWP has Emergency Response Plans (ERPs revised January 2011) in place to restore water service for essential use in the City if a disaster, such as earthquakes and power outages, should result in the temporary interruption of water supply. Department personnel responsible for water transportation, distribution, and treatment have established ERPs to guide the assessment, prioritization, and repair of City facilities that have incurred damage during a disaster.

An Emergency Operations Center (EOC) serves as a centralized point for citywide management of information about disasters and for coordination of all available resources. The EOC supports the City's Emergency Operations Organization to achieve its mission of saving lives, protecting property, and returning the City to normal operations in the event of a disaster. LADWP coordinates its efforts with the EOC and will utilize the EOC to resume water supply service after a catastrophic event.

Earthquakes

In the event of a major earthquake, LADWP has a Disaster Response Plan dedicated for the LAA in addition to its overall Emergency Response Plan. The Disaster Response Plan details procedures for operating the LAA following an earthquake in order to prevent further damage of the LAA. If the LAA is severed by seismic activity on the San Andreas fault and is temporarily unable to provide water to the City, LADWP will be able to use its water storage in the Bouquet Reservoir to provide water supply to the City while repairs are made. In addition to this resource, if the California Aqueduct is intact south of the Neenach Pump Station (First Los Angeles Aqueduct – State Water Project Connection), arrangements may be made to transfer LAA water through this connection into the California Aqueduct for delivery to MWD. Arrangements can then be made to deliver water to the City through one of MWD's connections.

Power Outages

Most of LADWP's major pump stations have backup generators in the event a major power outage disrupts the primary energy system. Backup generators are either powered by a separate electric source or have independent diesel power. The diesel powered backup supplies are capable of running for at least 24 hours. In the event of a major power outage, all pump stations are designed to automatically switch to their backup generators to prevent disruption of water service. In addition, LADWP keeps an adequate storage supply which is able to keep the water distribution system operable until power is restored.

11.3.4 Mandatory Water Use Prohibitions – 10632 (a) (4)

Phase I prohibited uses of the Emergency Water Conservation Plan contain 13 wasteful water use practices that are permanently prohibited for all City of Los Angeles customers. These prohibited uses are intended to eliminate waste and increase public awareness of the need to conserve water. During times of shortage, education and enforcement of the following provisions will be increased:

1. No customer shall use a water hose to wash any paved surfaces including, but not limited to, sidewalks, walkways, driveways, and parking areas, except to alleviate immediate

safety or sanitation hazards. This section shall not apply to LADWP approved water conserving spray cleaning devices. Use of water pressure devices for graffiti removal is exempt. A simple spray nozzle does not qualify as a water conserving spray cleaning device.

2. No customer shall use water to clean, fill, or maintain levels in decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes unless such water is part of a recirculating system.

3. No restaurant, hotel, cafe, cafeteria, or other public place where food is sold, served, or offered for sale shall serve drinking water to any person unless expressly requested.

4. No customer shall permit water to leak from any pipe or fixture on the customer's premises; failure or refusal to affect a timely repair of any leak of which the customer knows or has reason to know shall subject said customer to all penalties for a prohibited use of water.

5. No customer shall wash a vehicle with a hose if the hose does not have a self-closing water shut-off device or device attached to it, or otherwise to allow a hose to run continuously while washing a vehicle.

6. No customer shall irrigate during periods of rain.

7. No customer shall water or irrigate lawn, landscape, or other vegetated areas between the hours of 9:00 a.m. and 4:00 p.m. During these hours, public and private golf courses greens and tees and professional sports fields may be irrigated in order to maintain play areas and accommodate event schedules. Supervised testing or repairing of irrigation systems is allowed anytime with proper signage.

8. All irrigating of landscape with potable water using spray head sprinklers and bubblers shall be limited to no more than ten minutes per watering station per day. All irrigating of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than fifteen minutes per cycle and up to two cycles per watering day per station. Exempt from these irrigation restrictions are irrigation systems using very low drip type irrigation when no emitter produces more than four gallons of water per hour and micro-sprinklers using less than fourteen gallons per hour. This provision does not apply to Schedule F water customers or water service water service that has been granted the General Provision M rate adjustment under the City's Water Rates Ordinance, subject to the Customer having complied with best management practices for irrigation approved by the Department. The 9:00 a.m. to 4:00 p.m. irrigation restriction shall apply unless specifically exempt as stated in subsection 7 of the Emergency Water Conservation Ordinance.

9. No customer shall water or irrigate any lawn, landscape, or other vegetated area in a manner that causes or allows excess or continuous flow or runoff onto an adjoining sidewalk, driveway, street, gutter, or ditch.

10. No installation of single pass cooling systems shall be permitted in buildings requesting new water service.

11. No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.

12. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each bathroom using clear and easily understood language. LADWP shall make suitable displays available.

13. No large landscape areas shall have irrigation systems without rain sensors that shut-off the irrigation systems. Large landscape areas with approved weather-based irrigation controllers registered with LADWP are in compliance with this requirement.

11.3.5 Consumption Reduction Methods During Most Restrictive Stages – 10632 (a) (5)

Short-Term Actions

During a water shortage or emergency condition, LADWP utilizes its Emergency Water Conservation Plan (11.3.1) to decrease water use as needed based on the severity of the shortage. The Emergency Water Conservation Plan is capable of reducing water use by up to 50 percent.

In addition, LADWP's existing rate structure (enacted in 1993) serves as a basis for further reducing consumption. First tier water allotments are reduced during shortages by the degree of the shortage. For single-family residential users, the adjusted first tier allotments apply for the entire year. For other users, the adjusted first tier allotments apply only during the high season (June 1 through October 31). Details of LADWP's water rate structure are provided in Appendix C – Water Rate Ordinance.

To provide immediate demand reductions and increase public awareness of the need to conserve water, additional measures can be phased in as the dry period continues. Included among these measures are water conservation public service announcements (through television and/or radio), billboard ads, flyer distributions, and conservation workshops. LADWP also actively participates in public exhibits to disseminate water conservation information within its service area. Conservation is a permanent and long-term ethic adopted by the City to counter the potentially adverse impacts of water supply shortages.

State law further regulates distribution of water in extreme water shortage conditions. Section 350-354 of the California Water Code states that when a governing body of a distributor of a public water supply declares a water shortage emergency within its service area, water will be allocated to meet needs for domestic use, sanitation, fire protection, and other priorities. This will be done equitably and without discrimination between customers using water for the same purpose(s).

Long-Term Actions

LADWP's long-range water conservation program is driven by the need to continuously increase water use efficiency. This will reduce demand, extend supply, and therefore, provide greater reliability. Dry cycle experiences, public trust responsibilities, and regulatory mandates have raised the level of awareness within the City of Los Angeles of the need to approach demand reduction from a permanent and long-term perspective.

LADWP will continue to maintain and increase its existing conservation programs and pursue the development of new and innovative programs as outlined in Chapter 3, Water Conservation with the goal of reducing potable water demands by 60,000 AFY by 2035. Emphasis continues to be placed on structural conservation for the residential and CII sectors (HETs, high-efficiency washing machine rebates, etc.) which result in permanent per capita water use reduction. Substantial efforts are also being placed on landscape water use efficiency and CII conservation opportunities. It should, however, be recognized that the ability to achieve water reduction during shortages by requesting additional voluntary measures is likely to be more difficult in the future. As customers adjust to a conservation ethic and adopt permanent measures to reduce water use, their water demands harden and become less susceptible to voluntary conservation.

11.3.6 Penalties for Excessive Use (Non-Compliance to Prohibited Use) – 10632 (a) (6)

The Emergency Water Conservation Plan sets penalties for violations of prohibited uses outlined in Sections 10632 (a) (1) and (a) (4). The penalties vary by water meter size. For water meters smaller than two inches the following penalties shall apply:

1. The first violation consists of a written warning.
2. The second violation within the preceding 12 month period will result in a surcharge in the amount of $100 added to the customer's water bill.
3. The third violation within the preceding 12 month period will result in a surcharge in the amount of $200 added to the customer's water bill.
4. The fourth violation within the preceding 12 month period will result in a surcharge in the amount of $300 added to the customer's water bill.
5. After a fifth violation or subsequent violation within the preceding 12 month period, LADWP may install a flow-restricting device of 1 gpm capacity for services up to 1 ½ inches in size and comparatively sized restrictors for larger services or terminate a customer's service, in addition to the aforementioned financial surcharges. Such action shall only be taken after a hearing held by LADWP.

For water meters two inches and larger the following penalties shall apply:

1. The first violation consists of a written warning.
2. The second violation within the preceding 12 month period will result in a surcharge in the amount of $200 added to the customer's water bill.
3. The third violation within the preceding 12 month period will result in a surcharge in the amount of $400 added to the customer's water bill.
4. The fourth violation within the preceding 12 month period will result in a surcharge in the amount of $600 added to the customer's water bill.
5. After a fifth violation or subsequent violation within the preceding 12 month period, LADWP may install a flow-restricting device or terminate a customer's service, in addition to the aforementioned financial surcharges. Such action shall only be taken after a hearing held by LADWP.

11.3.7 Analysis and Effects on Revenues and Expenditures of Reduced Sales during Shortages – 10632 (a) (7)

The City's Water Rate Ordinance, adopted in June 1995 and last amended in June 2008, provides a remedy to the impact of reduced water sales on revenues in the form of a Water Revenue Adjustment Factor (Adjustment). The Adjustment recovers any shortage in revenue due to variation in water sales. It is intended to support a fiscal year revenue target that is deemed sufficient to cover LADWP's essential expenses. The formula takes into account target and actual revenues as well as projected water sales to determine the appropriate Adjustment.

The Adjustment is currently limited to $.18 per hundred-cubic-feet (one billing unit). It cannot exceed this limit unless the Board of Water and Power Commissioners determines that a surcharge in excess of $0.18 per hundred-cubic-feet is financially required and approval from the Los Angeles City Council is obtained. The Board of Water and Power Commissioners also has the authority to reduce the factor to less than the formula-calculated amount.

A billing factor is calculated annually on January 1 and is added to the standard commodity charge. The factor is set to zero if a negative value is calculated. A Water Revenue Adjustment Account is maintained and updated each month by LADWP. This account is adjusted annually on July 1.

The City's Water Revenue Adjustment Factor ensures that resources are available to fund LADWP activities aimed at providing continuous water service to Los Angeles water users, even during periods of low water sales.

11.3.8 Water Shortage Contingency Resolution or Ordinance – 10632 (a) (8)

A draft water shortage contingency declaration resolution is shown in Exhibit 11M. Moreover, the City's Emergency Water Conservation Plan Section 121.07.B has the following conservation phase implementation procedures:

"The Department (LADWP) shall monitor and evaluate the projected supply and demand for water by its Customers monthly, and shall recommend to the Mayor and Council by concurrent written notice the extent of the conservation required by the Customers of the Department in order for the Department to prudently plan for and supply water to its Customers. The Mayor shall, in turn, independently evaluate such recommendation and notify the Council of the Mayor's determination as to the particular phase of water conservation, Phase I through Phase V, that should be implemented. Thereafter, the Mayor may, with the concurrence of the Council, order that the appropriate phase of water conservation be implemented in accordance with the applicable provisions of this Article. Said order shall be made by public proclamation and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The prohibited water uses for each phase shall take effect with the first full billing period commencing on or after the effective date of the public proclamation by the Mayor. In the event the Mayor independently recommends to the Council a phase of conservation different from that recommended by the Department, the Mayor shall include detailed supporting data and the reasons for the independent recommendation in the notification to the Council of the Mayor's determination as to the appropriate phase of conservation to be implemented."

The City's Water Rate Ordinance No. 170435 also has specific provisions for LADWP's Board of Water and Power Commissioners, through a resolution, to determine the degree of shortage and apply corresponding commodity charges in case of a water shortage (see Section 11.3.5 and Appendix C – Water Rate Ordinance). If a water shortage is declared, certified copies of the resolution will be transmitted to the offices of the Mayor and of the Los Angeles City Clerk, and the Los Angeles City Council for final approval. This particular water shortage act is included under Section 3 – General Provisions, Article R – Shortage Year Rates of the City's Water Rate Ordinance.

11.3.9 Methodology to Determine Actual Water Use Reductions during Shortages – 10632 (a) (9)

Water use is monitored closely by LADWP throughout its service area regardless of the supply conditions. With 100 percent of its over 700,000 service connections metered, there is a high degree of accountability on the quantity of water used within the LADWP service area. Information from meter reads is collected for billing and accounting purposes, with reports prepared on a monthly basis from the data compiled. The actual

Exhibit 11M
Draft Water Shortage Contingency Declaration Resolution

BE IT RESOLVED that the Board of Water and Power Commissioners (Board) recognizes that a Water Shortage Contingency Plan has been prepared and incorporated into the City of Los Angeles 2010 Urban Water Management Plan pursuant to the Urban Water Management Planning Act; the Urban Water Management Plan is on file with the Secretary of the Board; this Board has reviewed and considered the information and recommendations contained in this document, and makes the following findings and determinations:

1.The water supply available to the City of Los Angeles is insufficient to meet the City's normal water supply needs; and

2.The Department of Water and Power has developed a Water Shortage Contingency Plan for the City of Los Angeles that compiles with all the requirements of the Urban Water Management Planning Act; and

3.The Urban Water Management Plan has been developed, adopted, and implemented pursuant to Article 3, Sections 10640 through 10645 of the Urban Water Management Planning Act; and

4.The Water Shortage Contingency Plan includes stages of action that can be taken in response to water supply shortages, including up to a 50 percent reduction in water supply, a driest three-year water supply scenario, mandatory water use prohibitions, and penalties for non-compliance; and

5.The Water Shortage Contingency Plan identifies both short-term and long-term actions to maximize water use efficiency and minimize the effects of the current water shortage as well as future water supply shortages.

BE IT FURTHER RESOLVED that this Board has adopted the Water Shortage Contingency Plan as incorporated in the Urban Water Management Plan, and declares the provisions of the Water Shortage Contingency Plan in full force and effect during the duration of this period of water shortage.

I HEREBY CERTIFY that the foregoing is a full, true, and correct copy of the resolution adopted by the Board of Water and Power Commissioners of the City of Los Angeles at its meeting held water reductions are determined by comparing the metered water use to the normal water use under average weather condition when no mandatory water conservation is imposed. Based on these criteria, the water use level of FY 2006/07 was selected as the base year or the normal year to determine the effectiveness of water reduction measures during the recent water supply shortage.

LADWP also used a conservation model to establish a weather-normalized demand to estimate conservation efforts within the City since the early 1990s. The model estimated City water demand without conservation efforts using population and weather variables. A new conservation model was developed in 2010 to account for additional factors such as economic recession and drought conservation. This model is discussed in Chapter 2, Water Demand. The City's conservation effort is derived by comparing estimated pre-conservation demand with actual demand. Conservation efforts derived from this model are shown in Chapter 3, Water Conservation.

11.4 Water Supply Assessments

Background

In 1994, the California Legislature enacted Water Code Section 10910 (Senate Bill 901), which requires cities and counties, as part of California Environmental Quality Act (CEQA) review, to request the applicable public water system to assess whether the system's projected water supplies were sufficient to meet a proposed development's anticipated water demand. The intent was to link the land use and water supply planning processes to ensure that developers and water supply agencies communicate early in the planning process. However, a study of projects approved by local planning agencies revealed that numerous projects were exempted due to loopholes in the statute, and that the intent of the legislation had largely gone unfulfilled.

Subsequently, California Senate Bill (SB) 610 and SB 221, modeled after SB 901, amended State law effective January 1, 2002, to ensure that the original intent of the legislation is fulfilled. SB 610 and 221 are companion measures which seek to promote more collaborative planning between local water suppliers and cities and counties. These bills improve the link between information on water supply availability and certain land use decisions made by cities and counties. Both statutes require detailed information regarding water availability to be provided to the city and county decision-makers prior to approval of specified large development projects. Both statutes also require this detailed information be included in the administrative record that serves as the evidentiary basis for an approval action by the city or county on such projects. Both measures recognize local control and decision making regarding the availability of water for projects and the approval of projects.

Under SB 610, a water supply assessment (WSA) must be furnished to local governments for inclusion in any environmental documentation for specified types of development projects subject to CEQA. Specifically, SB 610 requires that for certain projects, the CEQA lead agency must identify a public water system that may supply water to the proposed project and request the public water system to determine the water demand associated with the project and whether such demand is included as part of the public water system's most recently adopted UWMP. If the projected water demand associated with the proposed project is accounted for in the most recently adopted UWMP, the public water system may incorporate the supporting information from the UWMP in preparing the elements of the assessment. If the proposed project's water demand is not accounted for in the most recently adopted UWMP, the WSA for the project shall include a discussion with regard to

whether the public water system's total projected water supplies available in normal, single dry, and multiple dry water years during a 20-year projection will meet the proposed project's water demand.

Per Section 10912 of the California Water Code, a project which is subject to the requirements of SB 610 includes: (1) a proposed residential development of more than 500 dwelling units; (2) a proposed shopping center or business establishment employing more than 1,000 persons or having more than 500,000 square feet of floor space; (3) a proposed commercial office building employing more than 1,000 persons or having more than 250,000 square feet of floor space; (4) a proposed hotel or motel, or both, having more than 500 rooms; (5) a proposed industrial, manufacturing, or processing plant, or industrial park planned to house more than 1,000 persons, occupying more than 40 acres of land, or having more than 650,000 square feet of floor area; (6) a mixed-use project that includes one or more of the projects specified in this subdivision; or (7) a project that would demand an amount of water equivalent to, or greater than, the amount of water required by a 500 dwelling unit project.

The assessment would include an identification of existing water supply entitlements, water rights, or water service contracts relevant to the identified water supply for the proposed project and water received in prior years pursuant to those entitlements, rights, and contracts. If the assessment concludes that water supplies will be insufficient, plans for acquiring additional water supplies would need to be presented.

Under SB 221, approval by a city or county of new large development projects requires an affirmative written verification of sufficient water supply; which is a "fail safe" mechanism to ensure that collaboration on finding the needed water supplies to serve a new large development occurs before construction begins.

Methodology

During the years from 2005 to 2010, LADWP has received requests to develop over 40 WSAs. Each WSA performed by LADWP is carefully evaluated within the context of the current adopted UWMP and current conditions, such as restrictions on SWP pumping from the Sacramento-San Joaquin Delta imposed by a Federal court. MWD, from whom the City purchases its SWP and Colorado River water supplies, has also been actively developing plans and making efforts to provide additional water supply reliability for the entire Southern California region. LADWP coordinates closely with MWD to ensure implementation of MWD's water resource development plans and supplemental water reliability report prepared by MWD.

LADWP's UWMP uses a service area-wide method in developing City water demand projections. This methodology does not rely on individual development demands to determine area-wide growth. Rather, the growth in water use for the entire service area was considered in developing long-term water projections for the City to the year 2035. The driving factors for this growth are demographics, weather, and conservation. LADWP used anticipated growth in the various customer class sectors as provided by MWD who reallocated projected demographic data from the Southern California Association of Governments (SCAG) into member agencies' service areas. The data used was based on SCAG's 2008 Regional Transportation Plan Forecast.

As governed by City Charter Sections 673 and 677, LADWP can serve surplus water supplies to areas outside of the City boundaries. There are approximately 4,500 services for customers outside of the City, with a combined annual water use less than 1 percent of all water delivered. Water served outside of the City includes a surcharge to account for the increased MWD purchased water.

The water demand forecast model in the UWMP was developed using LADWP total water use, including the water served by LADWP for use outside of the City. The service area reliability assessment was performed for three hydrologic conditions: average year, single dry year, and multiple-dry years; and a Shortage Contingency Plan was developed to provide for a sufficient and continuous supply in LADWP's service area. This Shortage Contingency Plan included water provided for use outside of the City.

An important part of the water planning process is for LADWP to work collaboratively with MWD to ensure that anticipated water demands are incorporated into MWD's long-term water resources development plan and water supply allocation plan. The City's allotment of MWD water supplies under MWD's Water Supply Allocation Plan is based on the City's total water demand which includes services to areas outside the City. The ongoing collaboration between LADWP and MWD is critical in ensuring that the City's anticipated water demands are incorporated into the development of MWD's long-term Integrated Resources Plan (IRP). MWD's IRP directs a continuous regional effort to develop regional water resources involving all of MWD's member agencies. Successful implementation of MWD's IRP has resulted in reliable supplemental water supplies for the City from MWD.

In summary, the WSAs are performed to ensure that adequate water supplies would be available to meet the estimated water demands of the proposed developments during normal, single-dry, and multiple-dry water years, as well as existing and planned future uses of the City's water system. LADWP will continue to perform WSAs as part of its long-term water supply planning efforts for its service area.

WSA Procedure

The CEQA lead agency, such as the City Planning Department or the Community Redevelopment Agency of the City of Los Angeles, evaluates the proposed project against the requirements for a WSA in accordance with the Water Code.

If the proposed project falls within the requirements for a WSA, a formal request is submitted to LADWP to perform a WSA.

In evaluating a proposed project's water demand, LADWP applies the Sewer Generation Factors (published by City of Los Angeles Bureau of Sanitation) to the development's project description for calculating indoor water use. Outdoor landscape water demand is calculated by using computer software which takes into account various factors such as landscape area square footage, location, and plant types. Historical billing records are used to establish existing baseline water demand on the property.

LADWP also encourages all projects to implement additional water conservation measures above and beyond the current water conservation ordinance requirements. As an example, if the proposed development is near an existing or future recycled water pipeline system, commitment to use recycled water for irrigation, toilet flushing and cooling towers is highly recommended as part of the additional conservation measures for the proposed development.

The net increase/decrease in water demand, which is the projected additional water demand of the development, is calculated by subtracting the existing baseline water demand and water saving amount from the total proposed water demand. If the land use of the proposed development is consistent with the City's General Plan, the projected water demand of the development is considered to be accounted for in the most recently adopted UWMP. The City incorporates the projected demographic data from the SCAG in its General Plan. MWD utilizes a land use based planning tool that allocates SCAG's projected demographic data into water service areas for their member agencies, which was adopted for water demand projection in the UWMP.

If the proposed land use is not consistent with the City's General Plan, the WSA will further evaluate if the projected supplies from the UWMP are able to accommodate the proposed project's water demand, which may include other resource options to offset the projected water demand.

All WSAs are subject to approval by the Board of Water and Power Commissioners. Upon approval, the CEQA lead agency is responsible for enforcing the requirements of the WSA as part of the approval for the project.

Chapter Twelve
Climate Change

12.0 Overview

LADWP is considering the impacts of climate change on its water resources as an integral part of its long-term water supply planning. Climate change is a global-scale concern, but is particularly important in the western United States where potential impacts on water supplies can be significant for water agencies. Climate change can impact surface supplies from the Los Angeles Aqueduct (LAA), imported supplies from Metropolitan Water District (MWD), and local demands. As part of this impact analysis, LADWP completed a study to analyze the operational and water supply impacts of potential shifts in the timing and quantity of runoff along the LAA system due to climate change in the 21st Century. Such potential shifts may require LADWP to modify both the management of local water resources and LAA supplies. Projected changes in climate are expected to alter hydrologic patterns in the LAA's eastern Sierra Nevada Watershed through changes in precipitation, snowmelt, relative ratios of rain and snow, winter storm patterns, and evapotranspiration.

To understand some of the key issues surrounding climate change impacts, it is important to put it into the context of LADWP's water supplies. California lies within multiple climate zones. Therefore, each region will experience unique impacts due to climate change. Because LADWP relies on both local and imported water sources, it is necessary to consider the potential impacts climate change could have on the local watershed as well as the western and eastern Sierra Nevada watersheds. The western Sierra Nevada is where a portion of MWD's imported water originates and the eastern Sierra Nevada is where LAA supplies originate. It is also necessary to consider impact in the Colorado River Basin where Colorado River Aqueduct supplies originate.

Generally speaking, any water supplies that are dependent on natural hydrology are vulnerable to climate change, especially if the water source originates from mountain snowpack. For LADWP, the most vulnerable water sources subject to climate change impacts are imported water supplies from MWD and the LAA. However, local sources can expect to see some changes in the future as well. In addition to water supply impacts, changes in local temperature and precipitation are expected to alter water demand patterns. However, there is still general uncertainty within the scientific community regarding the potential impacts of climate change within the City of Los Angeles. LADWP will continue to stay abreast of developments in climate change to better understand its potential implications for the City's local and imported water supplies and in-city demands.

12.1 Potential Impacts of Climate Change on Water Service Reliability

Scientists predict future climate change scenarios using highly complex computer global climate models (GCMs) to simulate climate systems. Although most of the scientific community agrees that climate change is occurring and, as a result, mean temperatures for the planet will increase, the specific degree of this temperature increase cannot be accurately predicted. Predictions of changes in precipitation are even more speculative, with some scenarios showing precipitation increasing in the future and others showing the opposite.

It is important to acknowledge that the predictions of the GCMs lack the desired precision due to the presence of uncertainties inherent in the analyses. The uncertainty relating to future emissions of greenhouse gases (GHG) and the chaotic nature of the climate system leads to uncertainty in regard to the response of the global climate system to increases in GHG. In addition, the science of climate change still lacks a complete understanding of regional manifestations resulting from global changes, thus restraining the projecting ability of these models. However, these model's projections are consistent with the state of science today, and they help predict the manner in which hydrologic variables are likely to respond to a range of possible future climate conditions, and thus they provide invaluable insight for water managers in their decisions pertaining to water supply reliability.

The regional areas of interest in assessing climate change impacts to LADWP include the local service area and sources of origination for imported water supplies in northern California, eastern Sierra Nevada Mountains, and the Colorado River Basin. Data regarding climate change impacts for the various regions of interest is provided in this section.

12.1.1 Local Impacts

Most scientific experts believe that because of the uncertainty involved with each model, several models should be used to test the potential impact of climate change. To downsize the global coarse-scale climate projections to a regional level incorporating local weather and topography, the GCMs are "downscaled". For the City of Los Angeles, future projections of precipitation and temperature were obtained for six GCMs under two GHG emission scenarios (A2 - higher and B1 - lower) , . Exhibits 12A and 12B plot the changes in projected average annual mean temperature and precipitation, respectively for the model scenarios. The bold line represents the running average of all six models for each emission scenario. These six models were also used in preparation of the California Energy Commision – Public Interest Energy Research Program's study entitled *Climate Change Scenarios and Sea Level Rise Estimates for the 2008 California Climate Change Scenarios Assessment*, which investigated possible future climate changes throughout California.

Local climate changes within the vicinity of the LADWP service area are expected to include:

- An increase in average temperatures that will be more pronounced in the summer than in the winter with annual mean temperatures in year 2100 increasing greater than 3°F when lower GHG emission scenarios are used and may exceed 6°F when high higher emissions scenarios are used dependent upon the GCM employed.
- An increase in extreme temperatures.
- An increase in heat waves and dry periods that will extend for a longer duration.
- A slight decrease in precipitation coupled with increases in temperature will result in greater evapotranspiration.
- An increase in short-duration/high volume intense storm events during the winter.

The impact of these climate effects will likely be increased water demands for irrigation and cooling purposes earlier in the year and for longer periods coupled with decreased local surface runoff available to recharge groundwater basins. Other impacts might include an increase

Exhibit 12A
Climate Change Impacts to Local Temperatures for Los Angeles

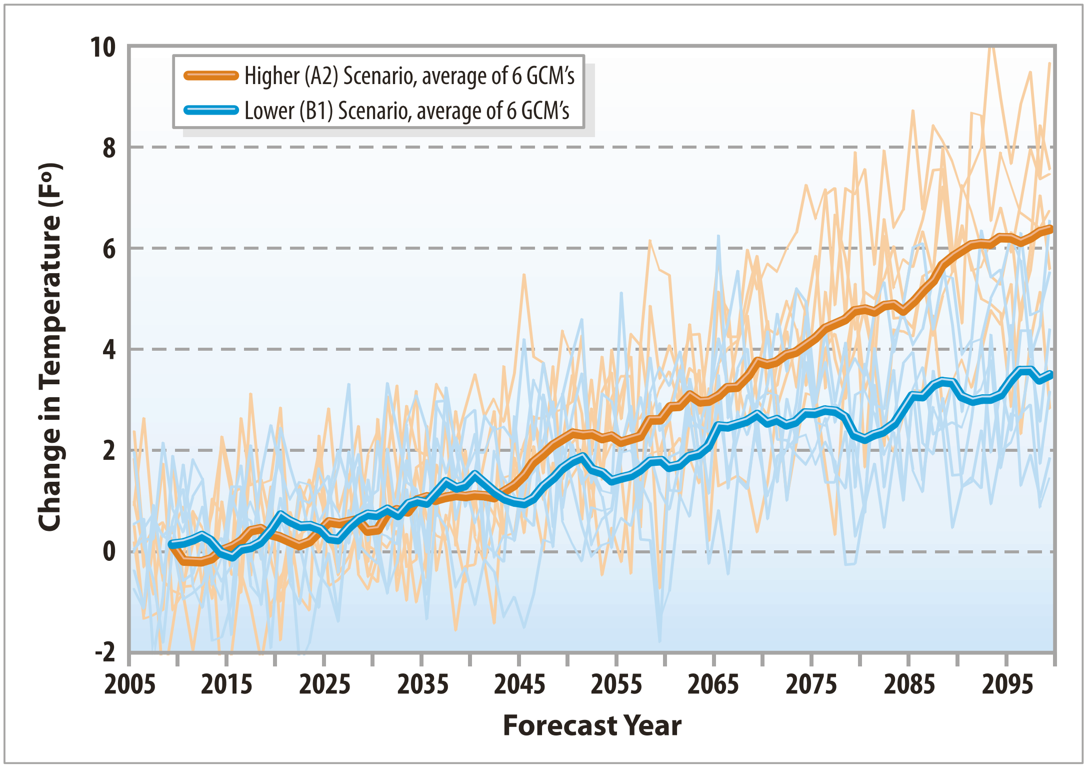
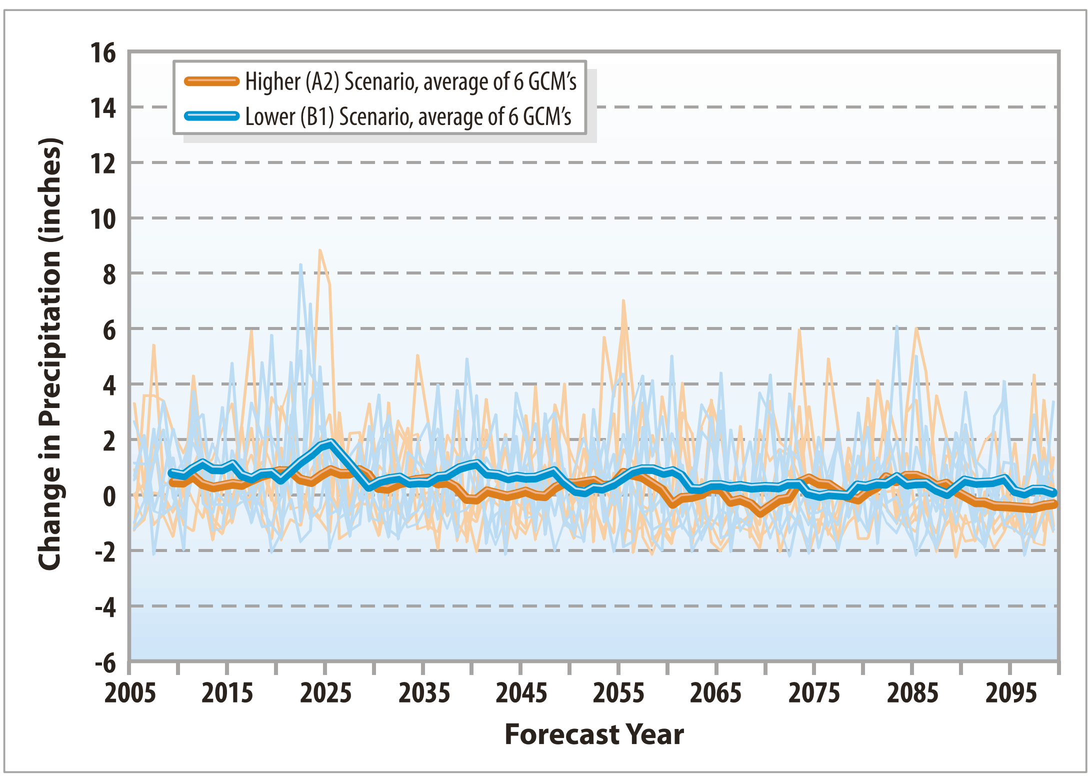


Exhibit 12B
Climate Change Impacts to Local Precipitation for Los Angeles



Dan Cayan and Mary Tyree (University of California, San Diego, Scripps Institute of Oceanography) provided downscaled data for the City of Los Angeles under two emissions scenarios from six climate models: CNRM CM3, GFDL CM2.1, Miroc3.2 (medium resolution), MPI ECHAM5, NCAR CCSM3, NCAR PCM1.

Note: These scenarios do not bracket the highest and lowest emission futures possible, but represent a status quo approach (A2) and a pro-active mitigation (B1) approach to reduce carbon emissions in fire events impacting water quality and sedimentation, a decrease in groundwater recharge due to lower soil moisture, and sea level rise increasing seawater intrusion into coastal groundwater basins.

12.1.2 Los Angeles Aqueduct Impacts

The LAA is one of the major imported water sources delivering a reliable water supply to the City of Los Angeles. The LAA originates approximately 340 miles away gathering snowmelt runoff in the eastern Sierra Nevada; hence the LAA is subject to hydrologic variability which will be impacted by climate change. Since the majority of precipitation occurs during winter in the eastern Sierra Nevada watershed, water is stored in natural reservoirs in the form of snowpack, and is gradually released into streams that feed into the LAA during spring and summer. More detailed information regarding the LAA is presented in Chapter 5, Los Angeles Aqueduct Systems.

Higher concentrations of GHG in the atmosphere are often indications of pending climate change. These changes threaten the hydrologic stability of the eastern Sierra Nevada watershed through alterations in precipitation, snowmelt, relative ratios of rain and snow, winter storm patterns, and evapotranspiration, all of which have major potential impacts on the LAA water supply and deliveries.

To address the possible challenges posed by climate change on the LAA, LADWP completed a climate change study. The study evaluated the potential impacts of climate change on the eastern Sierra Nevada watershed and on LAA water supply and deliveries. It also investigated opportunities to improve the LAA system as a result of potential impacts in the 21st century. In this study, future climate conditions are predicted using a set of sixteen GCMs and two GHG emission scenarios.

The impacts of these climate change scenarios and the associated hydrology on the LAA's eastern Sierra Watershed includes an analysis of historical temperature, precipitation, water quality, and runoff records. Hydrologic modeling was performed to estimate runoff changes from current conditions and to determine the impact of these runoff changes on the performance of the LAA infrastructure with regards to storage and conveyance to Los Angeles. As part of the evaluation of potential adaptation measures if existing infrastructure proves to be inadequate, recommendations were provided on how to modify the LAA infrastructure and operations to accommodate these impacts.

Results of the study show steady temperature increases throughout the 21st century and are consistent with other prior studies performed in the scientific community. Exhibit 12C displays the time series of 30-year running means of the projected temperature for the A2 GHG emission scenario (higher GHG emissions) averaged over the simulation area for each of the sixteen GCM models. All GCMs project temperature increases throughout the 21st century.

Exhibit 12C
30-Year Time Series Projected Temperature Means for Eastern Sierra Nevada Watershed

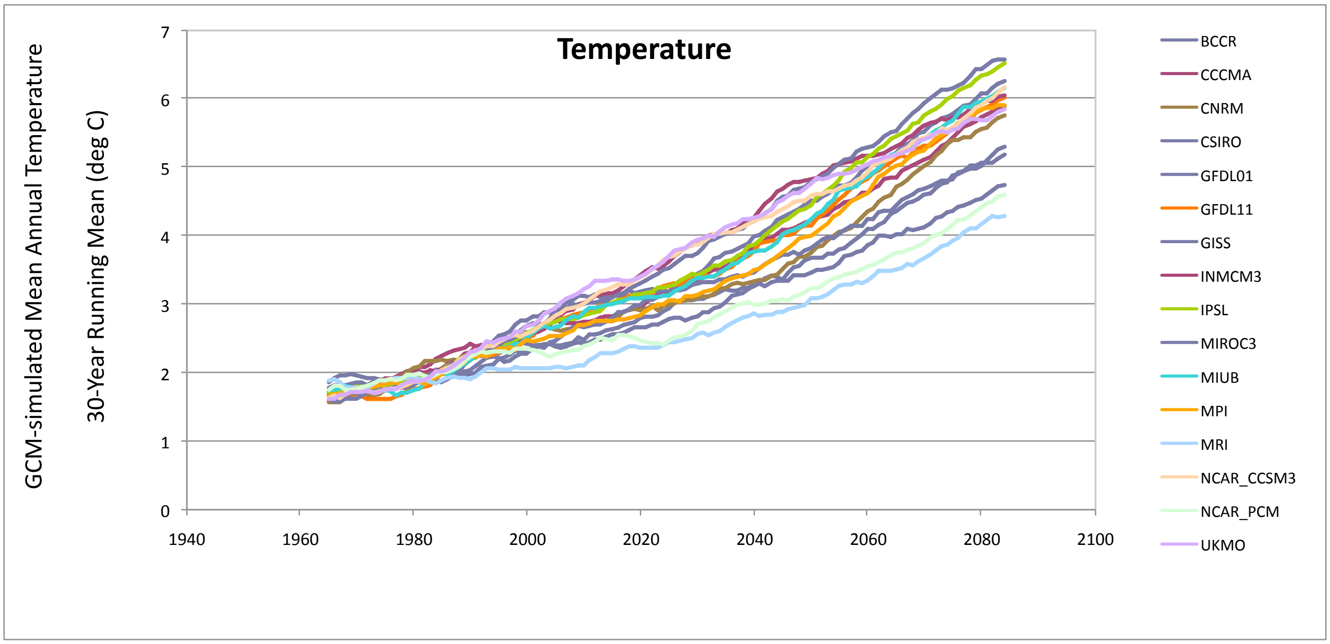
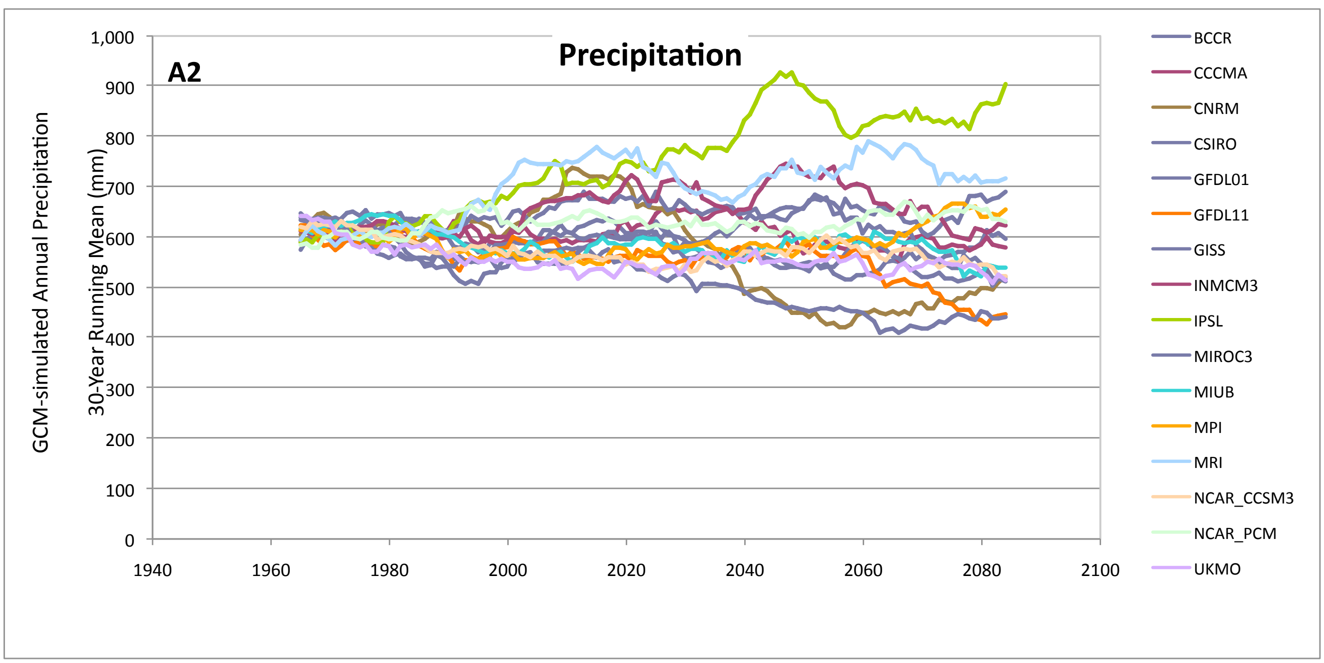


Exhibit 12D
30-Year Time Series Projected Precipitation Means for Eastern Sierra Nevada Watershed



On the other hand, forecasts for precipitation differ greatly between the GCMs. Some GCMs projected increases, but the majority of the model outputs projected decreases in precipitation over the study period. Exhibit 12D displays the time series of 30-year running means of the projected precipitation using the A2 GHG emission scenario (higher GHG emissions) averaged over the simulation area for each of the sixteen GCM models.

Temperature is the main climate variable that is projected to rise significantly in the coming years and decades. The rise in temperature directly affects several variables including:

- Whether precipitation falls as snow or rain.

- The ground-level temperature that determines the timing and rate of snowmelt.

- The temperature profile in the canopy that determines the rate of evapotranspiration.

Results have shown that future predictions for the early-21st century suggest a warming trend of 0.9 to 2.7˚F and almost no change in average precipitation. Mid-21st century projections suggest a warming trend of 3.6 to 5.4˚F and a small average decrease in precipitation, approximately 5 percent. This warming trend is expected to increase by the end of the 21st century, as the results indicate further warming of 4.5 to 8.1 ˚F and a decrease in precipitation of approximately 10 percent. In addition, results indicate an increase in the frequency and length of droughts in the end-of-century period.

Projected changes in temperature (warmer winters) will change precipitation patterns from snowfall to rainfall with a larger percentage coming as rain than historically encountered. Consequently, peak Snow Water Equivalent (SWE) and runoff are projected to undergo a shift in timing to earlier dates.

With a long term-shift in mean temperature of 3.6˚F, the snowpack of the eastern Sierras, at elevations of up to about 9,800 feet, is susceptible to earlier melt and less accumulation. On average, mean temperature rises are in the range of 3.6 to 10.8 ˚F resulting in about a 17 to 50 percent loss in snowpack storage, respectively. This vulnerability shows up in average to warm winters and will directly affect stream levels and stream discharge. This raises potential operational concerns for LADWP regarding adequate storage, especially the capacity of the LAA system to store the earlier runoff in surface reservoirs.

The projected temperature and precipitation dataset form the basis of the hydrologic model projections for runoff, SWE, and rain-to-snow ratio. To compare the future projections of these variables, the trends that dominated the second half of the 20th century are considered baselines for future trends. The baseline values for runoff, SWE, and rain-to-snow ratio are 0.6 million acre-feet (MAF), 15 inches, and 0.2, respectively. By early 21st century (2010 – 2039), results illustrate runoff is projected to undergo increases and decreases averaging between 0.5 to 0.85 MAF, the SWE is projected to undergo decreases and increases ranging between 10.6 to 19.0 inches, and the rain-to-snow ratio is projected to increase between 0.24 to 0.33. By mid-century (2040 – 2069), the same trends are expected to dominate, with runoff ranging between 0.34 to 0.9 MAF, the SWE ranging between 7.0 to 19.7 inches, and the rain-to-snow ratio increasing between 0.25 to 0.43. These trends are expected to govern until the end-of-century (2070 -2099) with runoff ranging between 0.35 to 1.1 MAF, the SWE ranging between 5.0 to 16.0 inches, and the rain-to-snow ratio increasing between 0.28 to 0.54. Exhibit 12E summarizes the projections for runoff, SWE, and rain-to-snow ratio for the 21st century.

Exhibit 12E
Projected Runoff, Snow-Water Equivalent, and Rain-to-Snow Ratio for Eastern Sierra Nevada Watershed

	Runoff (MAF)	April 1 SWE (Inches)	Rain/Snow Ratio
Baseline (Second Half of 20th Century)	**0.6**	**15.0**	**0.2**
Early 21st-century (2010-2039)	0.5 - 0.85	10.6 - 19.0	0.24 - 0.33
Mid-century (2040-2069)	0.34 - 0.9	7.0 - 19.7	0.25 - 0.43
End-of-century (2070-2099)	0.35 – 1.1	5.0 - 16.0	0.28 - 0.54

Exhibit 12F
Projected Rain to Precipitation Ratio Based on Projected Precipitation and Temperature

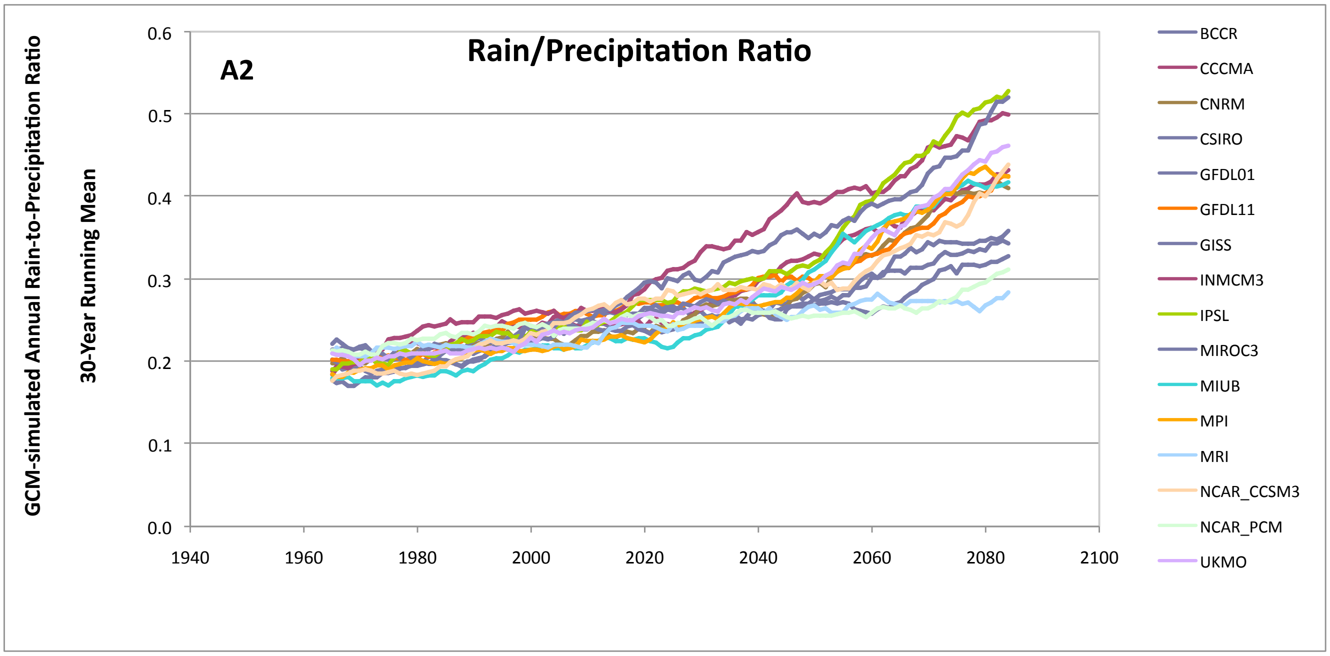


Exhibit 12F displays the rain-to-snow ratio based on the projected precipitation and temperature for the 16 GCMs. The rain-to-snow ratio is projected to increase throughout the 21st century, ranging between 0.24 to 0.33 by early 21st century, between 0.25 to 0.43 by mid-century, and between 0.28 to 0.54 by the end-of-century.

The increase of rain-to-snow ratio indicates the shift from snowfall to rainfall, specifically at low to moderate elevations, where the temperature tends to be warmer. This shift indicates more precipitation as liquid, and in turn, leads to loss of the snowpack. The snowpack is critical in providing seasonal storage by releasing winter precipitation in the spring and summer. The spring and summer snowmelt provides for increased soil moisture and stream flows needed to sustain both ecosystems and human populations.

Although the results above are quantitative in nature, it is important to account for the uncertainties inherent in these predictions. The results of this study will help guide the water managers in planning and developing water supply and infrastructure to ensure the reliability and sustainability of adequate water supply and delivery well into the future.

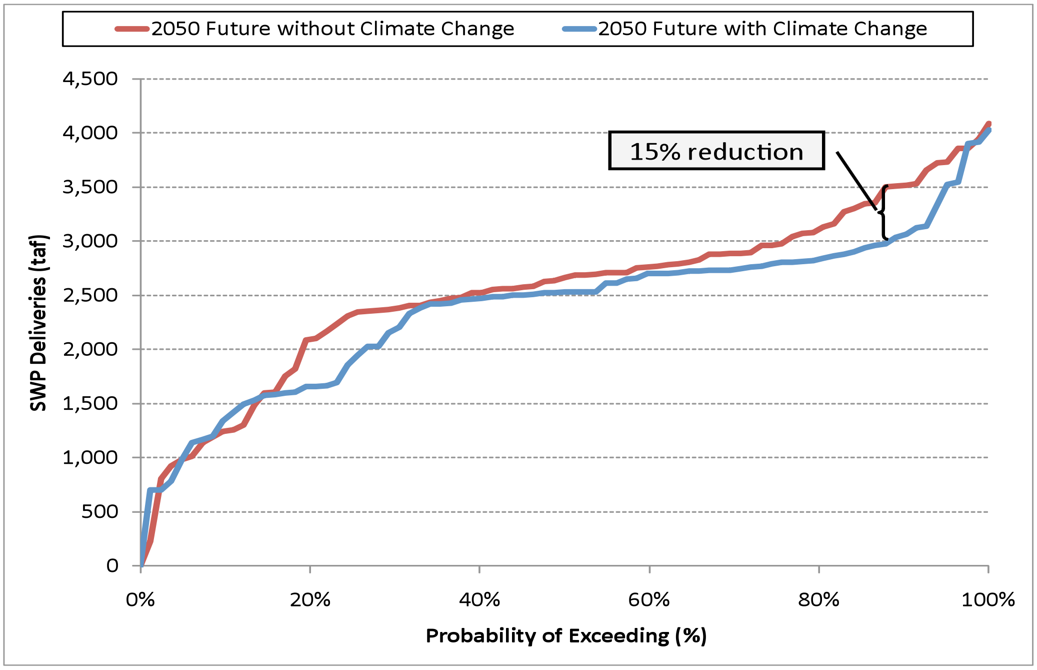
12.1.3 State Water Project Impacts

To date, most studies on climate change impacts to California's water supply have been conducted for the Northern California region. In August 2010, DWR released the 2009 State Water Project Delivery Reliability Report, which specifically analyzes changes in volume of water available under various climate change scenarios. DWR projected that SWP deliveries could be reduced by as much as 15 percent in some cases as illustrated in Exhibit 12G.

To incorporate climate change into its reliability reports, DWR reviewed 6 GCMs for year 2050 projections using lower emission and higher emission scenarios contained in *Using Future Climate Projections to Support Water Resources Decision Making in California* prepared in April 2009 by DWR. DWR selected the model most representing median effects on the SWP, which included a higher GHG scenario.

Climate change has the potential to disrupt SWP source supplies, impact conveyance, and alter storage levels in reservoir carryover storage. Annual Bay-Delta exports to areas south of the Bay-

Exhibit 12G
Climate Change Impacts on SWP Delivery



Delta are expected to decline 7 percent for the lower GHG emissions scenario and 10 percent for the higher emissions scenario. However, it should be noted that for the six GCMs under the lower and higher emission scenarios the range varies from a 2 percent increase to a 19 percent decrease illustrating the variability in the various GCMs.

By 2050, median reservoir carryover storage is projected to decline by 15 percent for the lower emissions scenario and 19 percent for the higher emissions scenario thereby reducing operational options if water shortages were to occur. Furthermore, by 2050 it is projected a water shortage worse than the 1977 drought could potentially occur in 1 out of every 6 to 8 years requiring acquisition of other supplies, reductions in water demands, or a combination thereof. An additional 575 to 850 TAF would be needed to maintain minimum SWP operation requirements and meet regulatory requirements. The main supply reservoirs on the SWP must maintain minimum water levels to allow water to pass through their lower release outlets in the dams. However, the April 2009 report does not consider the SWP vulnerable to a system interruption such as this under current conditions.

The primary effects of climate change on the SWP identified in the 2009 Reliability Report include, among others:

- More precipitation will fall as rain than snow.
- Reductions in Sierra snowpack.
- Sea level rise threatening the Bay-Delta levee system.
- Increased salinity in the Bay-Delta due to sea level rise requiring releases of freshwater from upstream reservoirs to maintain water quality standards.
- Shifted timing of snowmelt runoff into streams – spring runoff comes earlier resulting in increased winter flows and decreased spring flows.
- Increased flood events.

The most severe climate impacts in California are expected to occur in the Sierra watershed, where the SWP supply originates. Therefore, imported SWP water is extremely vulnerable to climate change.

12.1.4 Colorado River Aqueduct Impacts

Per MWD Board report titled "Report on Sustainable Water Deliveries from the Colorado River Factoring in Climate Change" and dated August 28, 2009, there have been numerous studies attempting to predict the impacts of climate change on the Colorado River. Several of the studies concluded that the Colorado River flow could be reduced by climate change by anywhere from 5 percent to 45 percent by the year 2050. The range of potential impacts can be very large thereby making it very challenging for water agencies to develop water management plans to address climate change impacts on the Colorado River Basin. Factors that have been identified and may contribute to this difficulty in narrowing the range of potential impacts of climate change on the Colorado River Basin include the following:

- The topography of the Colorado River Basin is difficult to model. Hydrologists have found that 80 percent of the flow of the Colorado River Basin is dependent upon the precipitation that falls in about 20 percent of the highest portions of the Upper Basin, in the mountains above 8,000 feet. Most global climate models are not precise enough to take into account the highly variable nature of the Colorado River Basin and can provide misleading results.

- There is a lack of data for much of the Colorado River Basin. While the runoff in the Colorado River Basin is well known, many other important watershed datasets are not readily available, including vegetation and soil type, soil moisture, wind, and solar radiation. These factors are important to predict future Colorado River flow and lack of data in remote areas presents uncertainty.

- Differences in modeling methods. Different modeling methods predict different runoff impacts from temperature increases due to GHG emissions. Each study used a different technique ranging from (1) using output from global climate models, to (2) statistical relationships relating temperature and precipitation to stream flow, to (3) a sophisticated model simulating soil moisture, snow accumulation and melt and evapotranspiration. Additionally, there is uncertainty in the level of GHG in the future based on the existing scientific literature.

In response to the potential impacts, MWD has worked to reduce demands by implementing water use efficiency programs in their service area including aggressive water conservation programs, and by increasing Colorado River supplies through programs such as agricultural to urban transfers.

12.2 Water and Energy Nexus

It is widely believed in the scientific community that the increase in concentrations of GHG in the atmosphere is a major contributing factor to climate change. As such, California is leading the way with laws that require reductions in GHG emissions and requirements to incorporate climate change impacts into long range water resource planning.

Carbon dioxide emissions into the atmosphere and the emissions of other GHGs are often associated with the burning of fossil fuels like crude oil and

12.2.1 State Water Project Supplies

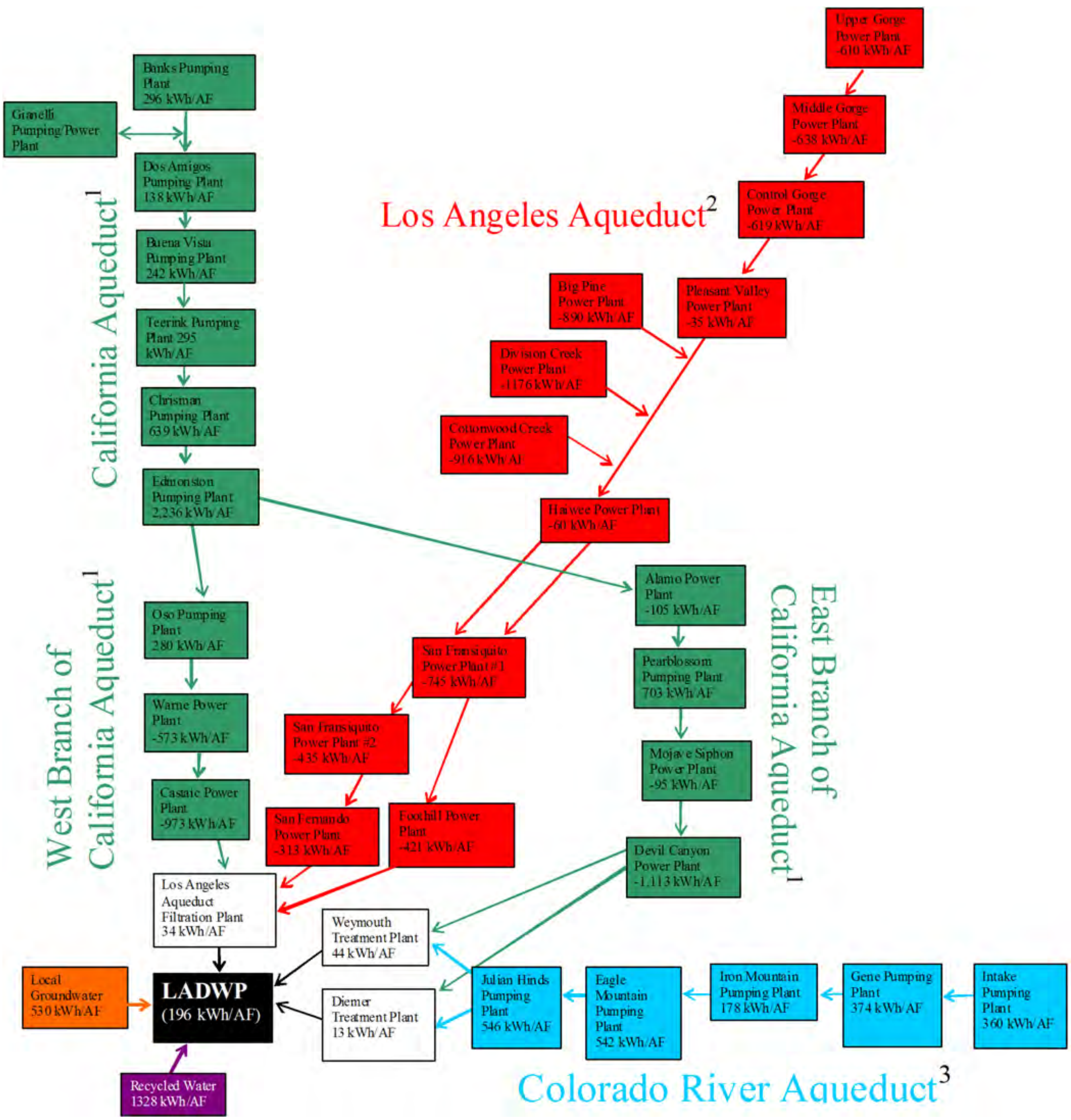
coal in the generation of energy. As a significant amount of energy is required for the movement of water over long distances and elevations, a link was subsequently realized between water supply conveyance and corresponding GHG emissions through its energy consumption. An assessment of the GHG emissions, sometimes also known as carbon footprint expressed in units of tons CO_2, could be estimated for water. Once the size of a carbon footprint is known, a strategy can be developed to better manage and reduce its impact on climate change.

LADWP has taken the initiative to study the nexus between water and energy consumption and to evaluate the associated carbon footprint of its water system. The most energy intensive source of water for LADWP is water purchased from MWD, which imports SWP supplies via the California Aqueduct and Colorado River supplies via the CRA. LADWP also imports water via the LAA, which is a net producer of energy. Local sources of water for LADWP include groundwater and recycled water. Exhibit 12H outlines the sources of LADWP's water supply as well as the energy profiles of each facility that provides water to LADWP. For those sources of water operated by LADWP, the energy intensity has been computed by dividing the total energy consumed/generated by the total water produced or processed by that source.

Water supplied to Los Angeles via the SWP originates from Northern California and the Bay-Delta and is conveyed along the 444-mile long California Aqueduct to Southern California. Six pump stations are required to lift the water to the point at which the California Aqueduct splits into two branches. At the zenith of the California Aqueduct in the Tehachapi Mountains, approximately 3,846 kilowatt hours per acre foot (kWh/AF) is required to lift the water from the start of the aqueduct. After the water passes through Edmonston Pumping Plant, the California Aqueduct separates into two branches, the West Branch and the East Branch. Along the West Branch, the water is lifted once more at the Oso Pumping Plant and then energy is recovered through hydro-electric generation at the Warne and Castaic Power Plants. By the time the West Branch reaches its terminus at Lake Castaic, the net energy consumed in transporting the water from the Bay-Delta is approximately 2,580 kWh/AF. Water supplied through the West Branch is provided to the San Fernando Valley, Western Los Angeles, and Central Los Angeles communities.

Along the East Branch, the water generates power at the Alamo Power Plant, is lifted once more at Pearblossom Pumping Plant, and then used for generation at Mojave Siphon and Devil Canyon Power Plants. At the East Branch terminus at Lake Perris, approximately 3,236 kWh/AF of energy has been expended in the transport. Water conveyed through the East Branch is provided to the Eastern Los Angeles and Harbor communities. The water supplied from the SWP is the most energy intensive source of water available to LADWP.

Exhibit 12H
Energy Intensity of LADWP's Water Sources



1.Source: Methodology for Analysis of the Energy Intensity of California's Water Systems. p. 27.

2.Generation on the Los Angeles Aqueduct is not considered in LADWP's total energy intensity.

3.Energy intensities for the Colorado River Aqueduct pumping stations were derived by multiplying the total energy intensity for the aqueduct by the proportion of load for each individual pumping station in relation to the total load for all five pump stations.

4.Positive numbers indicate power consumption due to pumping and negative numbers indicate power generation.

12.2.2 Colorado River Aqueduct Supplies

Water supplied from the Colorado River is imported via the 242 mile CRA operated by MWD. From the start of the aqueduct at Lake Havasu to its terminus at Lake Mathews, the water is lifted approximately 1,617 feet. Five pumping stations along the aqueduct lift the water to MWD's service area requiring approximately 2,000 kWh/AF. CRA water is the second most energy intensive water source for Los Angeles and is supplied to the eastern Los Angeles and Harbor communities. Together SWP water and CRA water comprise the total imported provided by MWD to LADWP. MWD imported water is the most expensive water source for LADWP in terms of both cost and energy.

12.2.3 Los Angeles Aqueduct Supplies

The LAA provides water from the Eastern Sierra watershed and is entirely gravity fed. As a result, no energy is required to import LAA water, making it the most desirable source of water in terms of energy intensity. There are twelve power generation facilities along the aqueduct system. On average, the LAA generates approximately 6,848 kWh/AF from water directly used to generate power. This number was determined using the same methodology as was used to determine the energy intensity for the two branches of the SWP. The individual energy intensities for each individual generating facility were summed up to arrive at the total energy intensity for the water used to generate power. However, when considered from the perspective of total amount of water delivered to Los Angeles via the LAA, the energy generated along the aqueduct is approximately 2,456 kWh/AF. The variance between the numbers can be attributed to the fact that not all water wheeled through the aqueduct is used to generate power and the fact that a portion of the water is introduced into the aqueduct system at a point downstream of several of the power plants. For the purposes of determining LADWP's total energy intensity, the energy intensity of the LAA is considered to be zero since the power generated does not directly offset the energy required for other sources of water. However, in terms of supply the LAA is able to offset the more energy intensive sources of water, consequently reducing the overall energy intensity of LADWP's water supplies. As LAA flows to Los Angeles are decreased due to environmental enhancement efforts in the Owens Valley and Mono Basin, LADWP is forced to increasingly rely on energy intensive water purchased from MWD. LAA water currently supplies approximately 37 percent of the demand for Los Angeles.

12.2.4 Local Groundwater Supplies

Groundwater currently accounts for approximately 11 percent of LADWP's water supply and has an average energy intensity of approximately 530 kWh/AF. As LADWP continues with its cleanup of the contaminated water in the San Fernando Basin, groundwater will play an increasingly important role in Los Angeles' water supply. Although there is potential for a future increase in the energy required to produce groundwater due to the introduction of new treatment technologies, groundwater is expected to remain a low energy source of water when compared to imported supplies purchased from MWD. Increasing groundwater production will allow LADWP to offset the energy intensive MWD sources and reduce its overall energy intensity.

12.2.5 Recycled Water Supplies

Recycled water is currently the smallest component of LADWP's water supply portfolio, with municipal and industrial uses accounting for less than 1 percent of total supplies. Currently, LADWP directly receives recycled water from three wastewater treatment plants operated by Bureau of Sanitation (BOS), two of which provide recycled water treated to a tertiary level: Los Angeles Glendale (LAG) Treatment Plant and Donald C. Tillman (DCT) Treatment Plant. The Terminal Island Treatment Plant (TITP) performs advanced treatment of recycled water in addition to tertiary treatment. LADWP also directly receives a small portion of recycled water from the West Basin Municipal Water District (WBMWD), which provides additional treatment of wastewater from the Hyperion Treatment Plant (HTP) in El Segundo. Since all water at the plants directly supplying recycled water to LADWP is treated to at least a tertiary level regardless of disposal or reuse, the energy cost to treat the water to this level is considered a sunk cost because the water would be treated whether it offsets potable use or not. The advanced treatment process at the TITP is beyond the requirements for discharge and is therefore not considered a sunk cost. The incremental energy required to treat water from tertiary levels to advanced treatment levels at TITP requires approximately 2,200 kWh/AF. Since the treatment energy at the other two plants is not considered additional energy, only the pumping energy is included in the overall LADWP recycled water energy intensity. For the LAG, the pumping requires approximately 690 kWh/AF, and for the DCT the pumping requires approximately 450 kWh/AF. A weighted average of these values gives recycled water an energy intensity of approximately 1,139 kWh/AF. In the future, this number will likely change as the recycled water infrastructure is expanded. In addition to the municipal and industrial recycled water that is considered in LADWP's total supplies, the plants produce significant additional volumes of recycled water that is beneficially used. Beneficial uses include the seawater barrier for the Dominquez Gap using recycled water from TITP and the Japanese Garden and Los Angeles River from DCT.

12.2.6 Treatment Energy

Another factor in determining the energy intensity of LADWP's water is the energy required to treat water. All LAA water and nearly all West Branch SWP water purchased by LADWP are treated at the Los Angeles Aqueduct Filtration Plant (LAAFP). For the LAAFP, the average treatment energy intensity is approximately 34 kWh/AF. The East Branch SWP water and the CRA water are primarily treated at the Weymouth Treatment Plant in the San Gabriel Valley and the Diemer Treatment Plant in Orange County. Both of these treatment plants are operated by MWD. The average energy intensity for Weymouth Treatment Plant is approximately 42 kWh/AF and supplies water to the East Los Angeles Community. The average energy intensity for the Diemer Treatment Plant is 13 kWh/AF and supplies water to the Harbor Community. The mix of SWP East Branch water and CRA water that flows through these two treatment plants varies depending on the regional hydrology of the two sources, but on average approximately 55 percent SWP East Branch water and 45 percent CRA water flows through each of these MWD treatment plants.

The proportion that each of the above mentioned sources contributes to the LADWP's total supplies is displayed in Exhibit 12I. Of note is the relationship that the volume of LAA flow has to the amount of SWP water imported into the system. In this case, the energy free LAA water is replaced by the energy intensive SWP water resulting in an increase in the overall energy intensity.

12.2.7 Distribution Energy

LADWP benefits from the topography of its service area in that much of the hydraulic head required for water distribution is provided by gravity. With the major sources of LADWP's water entering the service area at higher elevation than the rest of the City, the energy required for distribution is lower than much of the region. The average energy intensity for LADWP water distribution is approximately 196 kWh/AF.

Exhibit 12J shows the sum of the energy intensities for LADWP from each of the individual sources between 2003 and 2009. Exhibit 12K shows a graphical representation of the total energy intensity for LADWP for the same time period. An important detail is the influence that LAA water has on the total energy intensity for a given year. For those years with large volumes of LAA water, such as 2005 and 2006, the total energy intensity was correspondingly low. Alternatively, those years with low volumes of LAA water have high total energy intensity as a result of the energy requirements for imported MWD supplies

Exhibit 12I
Proportion of Volume Delivered and Total Energy Intensity (Inclusive of Treatment)

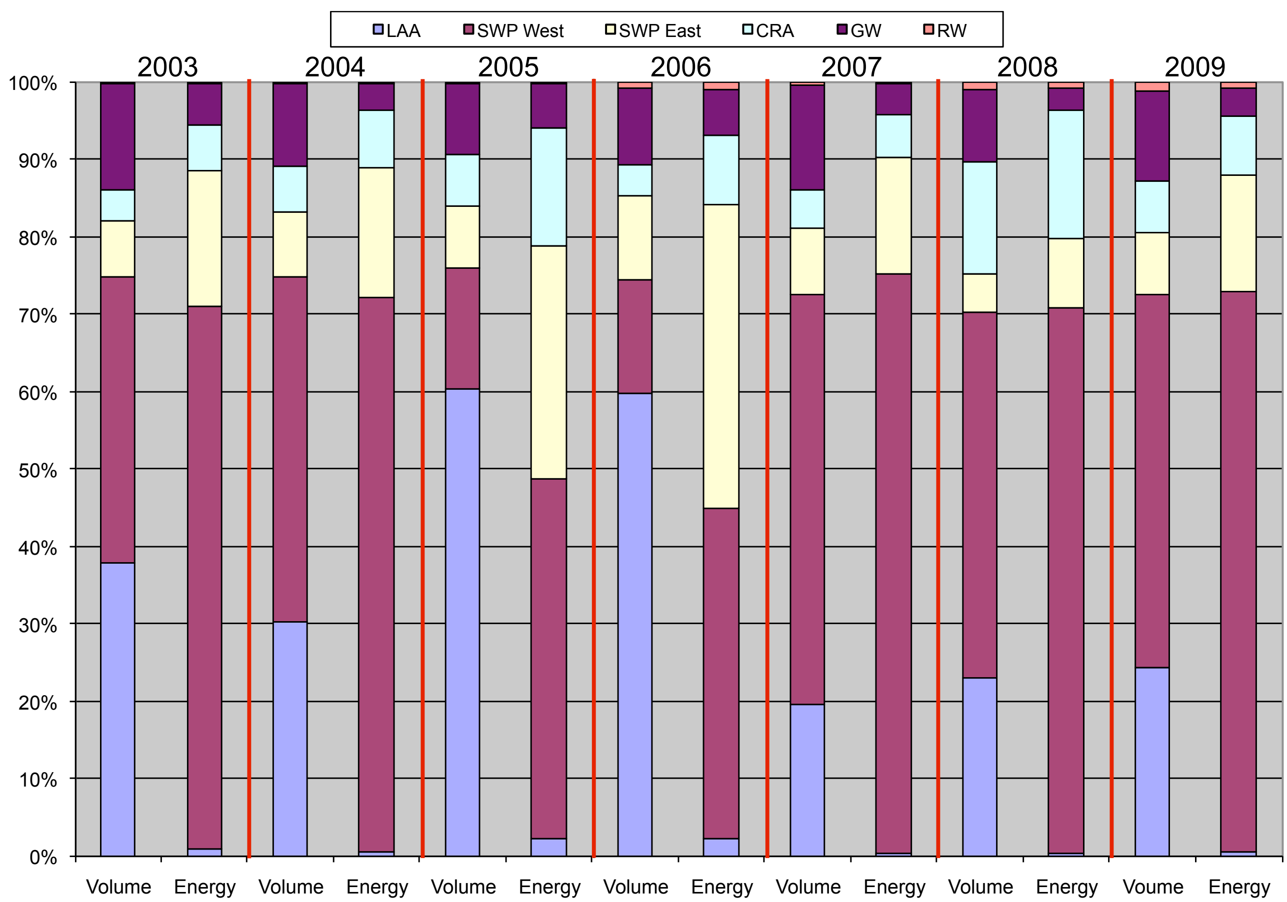


Exhibit 12J
LADWP Energy Intensity 2003-2009

		2003	2004	2005	2006	2007	2008	2009
Los Angeles Aqueduct (0 kWh/AF)	Volume (AF)	251,942	202,547	368,839	378,922	129,400	147,365	137,084
	Treatment Energy Intensity (kWh/AF)[1]	34	34	34	34	34	34	34
	Weighted Energy Intensity (kWh/AF)	13	10	20	20	7	8	8
State Water Project West Branch (2580 kWh/AF)	Volume (AF)	244,218	296,722	95,538	93,694	350,302	304,221	270,653
	Treatment Energy Intensity (kWh/AF)[1]	34	34	34	34	34	34	34
	Weighted Energy Intensity (kWh/AF)	961	1,161	408	386	1,384	1,237	1,258
State Water Project East Branch[3] (3236 kWh/AF)	Volume (AF)	48,980	56,301	49,526	68,796	56,357	31,016	45,246
	Treatment Energy Intensity (kWh/AF)[2]	27	27	27	27	27	27	27
	Weighted Energy Intensity (kWh/AF)	241	275	264	354	278	157	262
Colorado River Aqueduct[3] (2000 kWh/AF)	Volume (AF)	26,374	39,124	40,522	25,445	33,098	93,047	37,012
	Treatment Energy Intensity (kWh/AF)[2]	27	27	27	27	27	27	27
	Weighted Energy Intensity (kWh/AF)	80	119	134	81	101	293	133
Local Groundwater (530 kWh/AF)	Volume (AF)	90,835	71,831	56,547	63,270	89,018	60,149	64,996
	Weighted Energy Intensity (kWh/AF)	72	57	49	53	71	50	61
Recycled Water[4] (1,139 kWh/AF)	Volume (AF)	1,759	1,774	1,401	4,890	3,639	7,081	7,489
	Weighted Energy Intensity	3	3	3	9	6	13	15
Distribution (196 kWh/AF)	Volume (AF)	664,108	668,300	612,373	635,017	661,814	642,879	562,480
	Weighted Energy Intensity (kWh/AF)	196	196	196	196	196	196	196
Total Volume Delivered (AF)		664,108	668,300	612,373	635,017	661,814	642,879	562,480
Total Energy Intensity (kWh/AF)		1,567	1,820	1,074	1,098	2,043	1,954	1,934

1. Los Angeles Aqueduct and State Water Project West Branch supplies are treated at the Los Angeles Aqueduct Filtration Plant
2. Colorado River Aqueduct and State Water Project East Branch supplies are treated at Weymouth and Diemer Filtration Plants operated by Metropolitan Water District of Southern California. The listed energy intensity is based on an average of the energy intensity for the two plants.
3. Amount of SWP water and CRA water delivered is based on the reported average ratio of the two sources in Weymouth Treatment Plant and Diemer Treatment Plant effluent from MWD annual Water Quality Report
4. Recycled water volume is based on use for municipal and industrial uses, not all beneficial uses. Energy intensity is a weighted average of energy used for pumping to customers and the incremental energy to treat from tertiary to advanced treatment.

12.2.8 Carbon Footprint

All of LADWP's water supply sources have an associated carbon footprint related to the energy required to pump the water. Exhibit 12L provides the annual carbon footprint by water source. Exhibit 12M shows a graphical representation of the total annual carbon footprint for the same time period. For imported sources, the 2007 CAMX (Western Electricity Coordinating Council California Subregion name) California average carbon emission of 0.72412 lbs CO_2/kWh was used to estimate the amount of carbon emissions produced per acre-foot of water imported. For local sources, the CO_2 metric LADWP reported to the California Climate Action Registry in 2007 was used to estimate the carbon emissions released in the production of this water. LAA is a net producer of energy and produces only green hydropower. There are no carbon emissions associated with water imported through the LAA.

As Los Angeles increases its reliance on energy intensive imported supplies from MWD, its overall energy intensity will increase. Reductions in LAA flows due to environmental mitigation have the consequence of increasing Los Angeles' reliance on supplies imported through the SWP via the California Aqueduct, and Colorado River through the CRA.

Exhibit 12K
LADWP Annual Energy Intensity

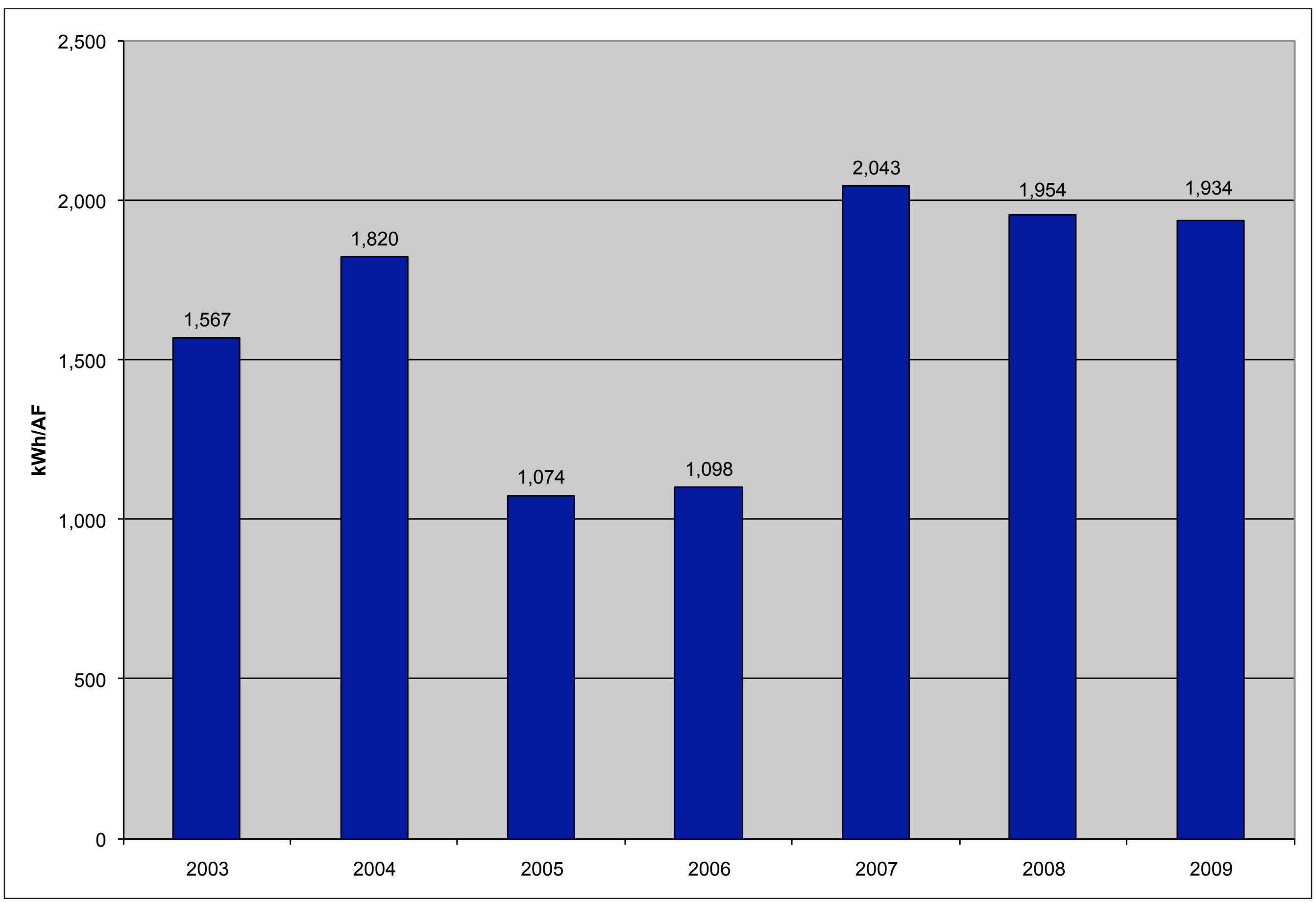


Exhibit 12L
Annual Footprint by Carbon Source

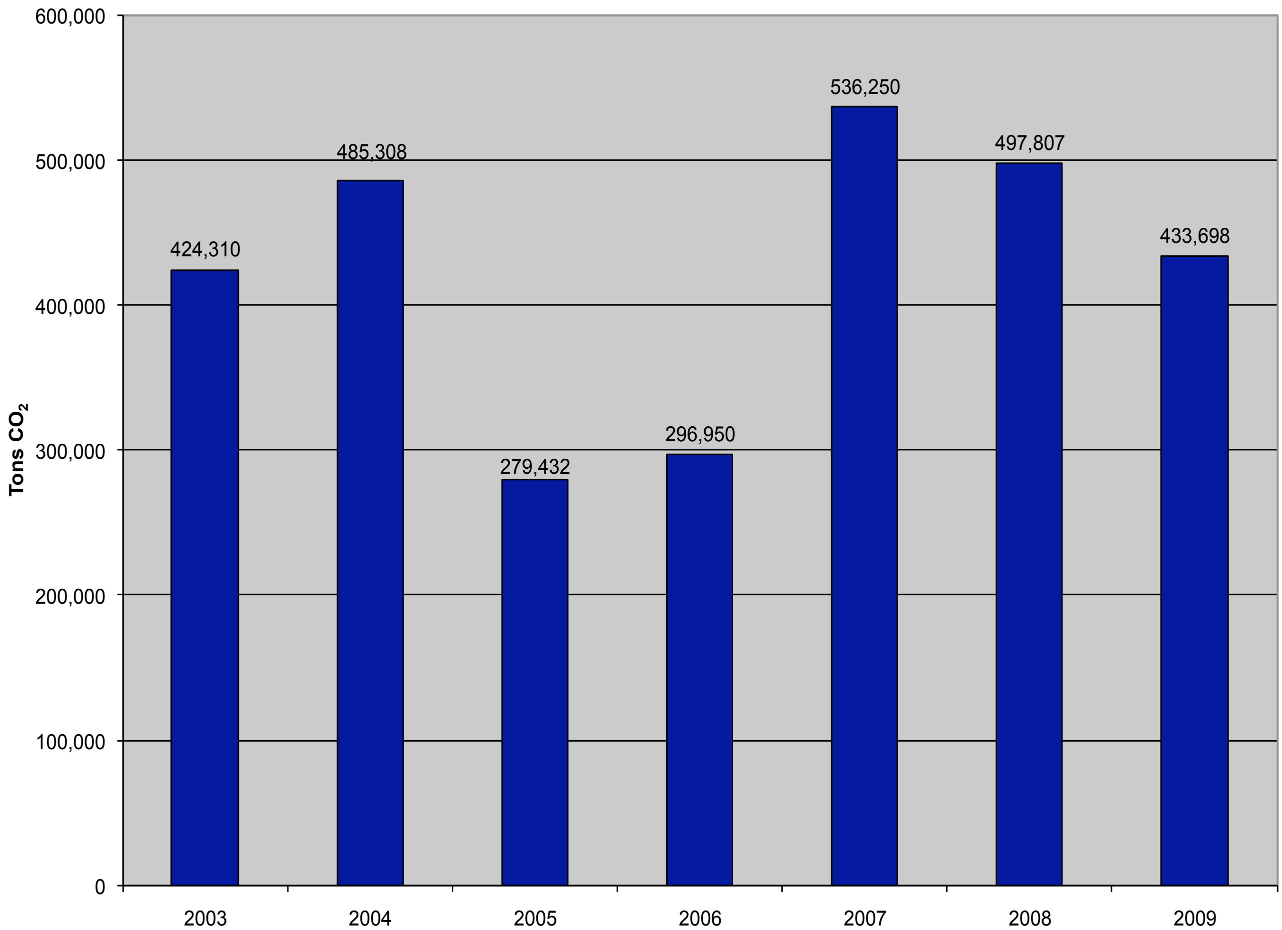
		2003	2004	2005	2006	2007	2008	2009
Los Angeles Aqueduct (0 kWh/AF)	Volume Delivered (AF)	251,942	202,547	368,839	378,922	129,400	147,365	137,084
	Energy Intensity (kWh/AF)	0	0	0	0	0	0	0
	Weighted Energy Intensity (kWh/AF)	13	10	20	20	7	8	8
	Carbon Footprint (tons CO_2)[2]	5,259	4,228	7,699	7,909	2,701	3,076	2,861
State Water Project West Branch (2,580 kWh/AF)	Volume Delivered (AF)	244,218	296,722	95,538	93,694	350,302	304,221	270,653
	Weighted Energy Intensity (kWh/AF)	961	1,161	408	386	1,384	1,237	1,258
	Carbon Footprint (tons CO_2)[3]	231,134	280,825	90,420	88,674	331,535	287,922	256,153
State Water Project East Branch (3,236 kWh/AF)	Volume Delivered (AF)	48,980	56,301	49,526	68,796	56,357	31,016	45,246
	Weighted Energy Intensity (kWh/AF)	241	275	264	354	278	157	262
	Carbon Footprint (tons CO_2)[3]	57,865	66,514	58,510	81,276	66,580	36,642	53,454
Colorado River Aqueduct[1] (2,000 kWh/AF)	Volume Delivered (AF)	26,374	39,124	40,522	25,445	33,098	93,047	37,012
	Weighted Energy Intensity (kWh/AF)	80	119	134	81	101	293	133
	Carbon Intensity (lbs CO2/kWh)	0.72412	0.72412	0.72412	0.72412	0.72412	0.72412	0.72412
	Carbon Footprint (tons CO_2)[3]	19,356	28,713	29,739	18,674	24,290	68,287	27,163
Local Groundwater (530 kWh/AF)	Volume Delivered (AF)	90,835	71,831	56,547	63,270	89,018	60,149	64,996
	Weighted Energy Intensity (kWh/AF)	72	57	49	53	71	50	61
	Carbon Footprint (tons CO_2)[2]	29,556	23,372	18,399	20,587	28,964	19,571	21,148
Recycled Water (1,139 kWh/AF)	Volume Delivered (AF)	1,759	1,774	1,401	4,890	3,639	7,081	7,489
	Weighted Energy Intensity (kWh/AF)	3	3	3	9	6	13	15
	Carbon Footprint (tons CO_2)[2]	1,230	1,240	980	3,419	2,545	4,951	5,237
Distribution (196 kWh/AF)	Volume Delivered (AF)	664,108	668,299	612,373	635,017	661,814	642,879	562,480
	Weighted Energy Intensity (kWh/AF)	196	196	196	196	196	196	196
	Carbon Footprint (tons CO_2)[3]	79,911	80,415	73,686	76,411	79,635	77,357	67,682
Total Volume Delivered (AF)		664,108	668,299	612,373	635,017	661,814	642,879	562,480
Total Energy Intensity (kWh/AF)		1,567	1,820	1,074	1,098	2,043	1,954	1,934
Total Carbon Footprint (tons CO_2)		424,310	485,308	279,432	296,950	536,250	497,807	433,698

1. Amount of SWP water and CRA water delivered is based on average of the proportion of the two sources delivered to MWD Weymouth Treatment Plant and Diemer Treatment Plant for the calendar year

2. Based on 2007 CO_2 metric of 1.22789 lbs CO_2/kWh reported to the California Climate Action Registry

3. Based on eGRID 2007 CAMX (California Average) of 0.72412 lbs CO_2/kWh

Exhibit 12M
Total Annual Carbon Footprint for Water Supply Portfolio



12.3 Climate Change Adaption and Mitigation

Climate change strategies fall under two main categories: adaptation and mitigation. For water resources planning, a climate change adaptation strategy involves taking steps to effectively manage the impacts of climate change by making water demands more efficient and relying on supply sources that are less vulnerable to climate change. A mitigation strategy involves proactive measures that reduce greenhouse gas emissions, such as placing a stronger emphasis on using water resources requiring less greenhouse gas emissions. Both LADWP and its wholesale supplier for imported water, MWD, are implementing adaption and mitigation strategies as they become aware of potential climate change impacts.

It is imperative that supply options are carefully vetted and evaluated against both adaptation and mitigation goals, as they may conflict and work against each other. For example, desalination is a typical supply option that performs quite well in adapting to climate change impacts; however, due to the energy necessary to draw from and manage the supply source, it could result in higher greenhouse gas emissions if conventional energy sources are utilized.

12.3.1 LADWP Adaption and Mitigation

LADWP has outlined strategies to dramatically increase conservation and water recycling. Increasing conservation and water recycling encompasses both adaption and mitigation goals to address climate change. The UWMP calls for reducing potable demands by an additional 64,368 AFY through conservation and 59,000 AFY of additional recycled water use by fiscal year 2030. Additional adaption strategies under investigation by LADWP and the City includes beneficial reuse of stormwater as discussed in Chapters Seven and Nine, Watershed Management and Other Potential Water Supplies, respectively.

Conservation has a double savings in terms of energy intensity because not only does it save energy in importing or producing the water, but it also saves energy through reduction of end use, such as heating water for a shower or for a dishwasher and wastewater treatment. The anticipated conservation savings will not only help to provide Los Angeles a secure and dependable water supply, but it will also reduce the energy footprint of the water supply, and consequently the carbon footprint. A further discussion regarding conservation is provided in Chapter Three, Conservation.

Recycled water use reduces reliance on potable water imported through MWD and provides a year round drought resistant water supply source. While the energy consumption requirements to produce recycled water are greater than local and LAA supply sources, recycled water assists LADWP in bolstering its supply portfolio to address potential supply changes related to climate change. A further discussion regarding recycled water is provided in Chapter 4, Recycled Water.

There is still general uncertainty within the scientific community regarding the potential impacts of climate change for the City of Los Angeles. LADWP will continue to stay abreast of developments in climate change to better understand its potential implications to the City's water supplies to assist in further developing adaption and mitigation strategies.

12.3.2 MWD Adaption and Mitigation

MWD is taking an active approach to adapt and mitigate against climate changes in its operations. Adaption and mitigation measures include:

- Investments in local resources to diversify MWD's water supply portfolio.
- Tracking climate change legislation – MWD provides input and direction on legislation.
- Collaborating on climate change with state, federal, and non-governmental agencies.
- Monitoring state and local climate change actions.
- Investigating the water supply and energy nexus.
- Coordinating with large water retailers.
- Integrating climate change into integrated resource planning as discussed in Chapter 10, Integrated Resource Planning.
- Sharing climate change knowledge and providing support – founding member of Water Utility Climate Alliance.
- Adopting energy management policies to support cost-effective and environmentally responsible programs, projects, and initiative.

MWD has also taken structural adaption measures including construction of the Inland Feeder. The Inland Feeder completed in 2009 connects SWP supplies with MWD's CRA supplies and allows delivery of SWP supplies to MWD's major reservoir, Diamond Valley Lake. In relation to climate change, the project will increase conveyance capacity allowing more rain to be conveyed as projected snowpack levels decrease and allow MWD to capture rain associated with projected short duration high intensity storms.

Urban Water Management Planning Act

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

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

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

WATER CODE
SECTION 10610-10610.4

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10611-10617

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10620-10621

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

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

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

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

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

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

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

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

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

supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

WATER CODE
SECTION 10630-10634

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

10631. A plan shall be adopted in accordance with this chapter that shall do all of the following:
(a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.
(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.
(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.
(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

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

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

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

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

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

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

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

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

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

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

(B) Residential plumbing retrofit.

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

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

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

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

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(i) Compliance on an individual basis.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE SECTION 10635

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

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

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

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

WATER CODE
SECTION 10640-10645

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10650-10656

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

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

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

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

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

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

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

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

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

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

Urban Water Management Plan

Appendix B

Urban Water Management Plan Checklist and Standard Tables

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	System Demands	p 51-52 (Sec 3.1.2), Appendix G (2020 Water Use Target)	13, 14, 15	
2	Wholesalers: Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. Retailers: Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36, 10608.26 (a)	System Demands	Appendix D - Four public worshops were held on 1/2/10, 1/20/10, 2/3/11, & 2/9/11. Final public hearings for the adoption was held on 5/3/11.	Not Applicable	
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not Applicable	Standardized form not yet available	Not Applicable	
4	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	10620(d)(2)	Plan Preparation	Various pages reference reports, communication, and coordination with City Planning, Bureau of Sanitation, MWD, SCAG, TreePeople, and other agencies & stakeholders. Appendix D documents public involments.	1	
5	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.	10620(f)	Water Supply Reliability	p 1	Not Applicable	
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments of 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.	10621(b)	Plan Preparation	Appendix D (Notice of Meeting & Public Comments)	Not Applicable	
7	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).	10621(c)	Plan Preparation	To be enclosed with transmittal letter to DWR.	Not Applicable	
8	Describe the service area of the supplier	10631(a)	System Description	p 1 & 30 (Sec 1.2)	Not Applicable	
9	(Describe the service area) climate	10631(a)	System Description	p 34 (Sec1.2.3 & Exhibit 1E)	Not Applicable	
10	(Describe the service area) current and projected population . . . 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…	10631(a)	System Description	p 31-33 (Sec 1.2.2)	2	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	p 32 (Exhibit 1C)	2	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply Documents
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description	p 32 (Exhibit 1C), p 43 (Exhibit 2G), p 44 (socioeconomic variables)	Not Applicable	
13	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).	10631(b)	System Supplies	p 229 (Exhibit 11E)	16	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .?	10631(b)	System Supplies	p 123 (Exhibit 6B) & p 136 (Exhibit 6G)	18, 19	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
15	(Provide 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. Indicate whether a groundwater management plan been adopted by the water supplier or if there is anyother specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies	p 8 (Local Groundwater), Appendix F (Groundwater Basin Adjudications)	Not Applicable	
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies	p 123, 129, 130, 132 (description of individual basin)	Not Applicable	
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	System Supplies	Appendix F (Groundwater Basin Adjudications)	Not Applicable	
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	System Supplies	p 121 (Sec 6.1, Exhibit 6A)	Not Applicable	
19	For basins that have not been adjudicated, (provide) 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.	10631(b)(2)	System Supplies	Not Applicable	Not Applicable	
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records	10631(b)(3)	System Supplies	p 121-132, Exhibit 6B	18	
21	(Provide 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.	10631(b)(4)	System Supplies	p 136	19	Provide projections for 2015, 2020, 2025, and 2030.
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Water Supply Reliability	p 223-227 (Sec 11.2 with description), p 229-235 (data, Exhibits 11E-11K)	27, 28, 32, 33, 34	
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)	Water Supply Reliability	Sec 11.2.3 to 11.2.7	29, 30	
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies	p 195-199	20	

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), 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) Sakine water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural.	10631(e)(1)	System Demands	p 10 (Exhibit ES-G), p 45 (Exhibit 2J)	3, 4, 5, 6, 7, 11	Consider “past” to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.
26	(Describe and provide a schedule of implementation for) 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 ultralow- flush toilet replacement programs	10631(f)(1)	DMMs	p 52-70 (Sec 3.2)	Not Applicable	(A) Water Survey for Single and Multi-family residential customers: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Residential Category (B) Residential Plumbing Retrofit: Section 3.2.1 and 3.2.4, Exhibit 3G (C) System Water Audits, Leak Detection, and Repair: Exhibit 3F, Exhibit 3G, Section 3.2.4 - System Maintenance Category (D) Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections: Exhibit 3F, Exhibit 3G, Section 3.2.2 (E) Large Landscape Conservation Programs and Incentives: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Landscape (F) High-Efficiency Washing Machine Rebate Programs: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Residential (G) Public Information Programs: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Awareness/Support Measures (H) School Education Programs: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Awareness/Support Measures(I) Conservation Programs for Commercial, Industrial, and Institutional Accounts: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Commercial/Industrial/Institutional Category (J) Wholesale Agency Programs: Not applicable (stated so in 3.2.3) (K) Conservation pricing: Section 3.2.2, Exhibit 3F, Exhibit 3G (L) Water Conservation Coordinator: Exhibit 3F, Exhibit 3G, Section 3.2.4 (M) Water Waste Prohibition: Section 3.2.1, Exhibit 3F, Exhibit 3G (N) Residential Ultralow-flush Toilet Replacement Programs: Exhibit 3F, Exhibit 3G, Section 3.2.4 - Residential Category
27	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.	10631(f)(3)	DMMs	p 41-42 (Sec 2.2, Exhibits 2E & 2F), p 245-246 (Sec 11.3.9)	Not Applicable	
28	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 future reduce demand.	10631(f)(4)	DMMs	p 49 (Exhibit 3B)	16	

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
29	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	10631(g)	DMMs	Not Applicable. All items listed in paragraph (1) of subdivision (f) have been addressed aside from Wholesale agency programs which does not apply to LADWP	Not Applicable	This checklist item not applicable to LADWP. LADWP is implementing all demand management measures listed in paragraph (1) of subdivision (f)
30	(Describe) 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.	10631(h)	System Supplies	p 98-101 (Exhibits 4L, 4M, 4N, 4O, 4P)	26	
31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	System Supplies	p 20 & 199	10 (Not Applicable)	
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Appendix H	Not Applicable	Since the CUWCC BMP Reporting Database is not available at this time, LADWP has attached the CUWCC BMP Reports from 2007-2008 which shows LADWP has met all the BMP coverage requirements. In addition, LADWP has submitted the necessary documentation to comply with the DMMs.
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	10631(k)	System Supplies	p 226 (Exhibit 11B), p 229-235 (Exhibits 11E to 11K), p 238 (Exhibit 11L)	12, 17, 29, 31	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	System Demands	p 46 (Exhibit 2L)	8	
35	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.	10632(a)(1)	Water Supply Reliability	p 236-238 (Sec 11.3.1)	35	
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(a)(2)	Water Supply Reliability	p 238-239 (Sec 11.3.2)	31	
37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(a)(3)	Water Supply Reliability	p 239-240 (Sec 11.3.3)	Not Applicable	
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(a)(4)	Water Supply Reliability	p 240-242 (Sec 11.3.4)	36	
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply	10632(a)(5)	Water Supply Reliability	p 242-243 (Sec 11.3.5)	37	
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(a)(6)	Water Supply Reliability	p 243 (Sec 11.3.6)	38	
41	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 resserves and rate adjustments.	10632(a)(7)	Water Supply Reliability	p 244 (Sec 11.3.7)	Not Applicable	
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(a)(8)	Water Supply Reliability	p 244-245 (Sec 11.3.8) & Appendix I	Not Applicable	
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(a)(9)	Water Supply Reliability	p 41-42 (Sec 2.2, Exhibits 2E & 2F), p 245-246 (Sec 11.3.9)	Not Applicable	
44	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	10633	System Supplies	p 14-15, p 81-82	16, 21	
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wasterwater disposal.	10633(a)	System Supplies	p 88-91 (Sec 4-2, Exhibit 4D)	21	
46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	System Supplies	p 88-91 (Sec 4-2, Exhibits 4C & 4D)	21, 22	

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	System Supplies	p 92-97 (Sec 4.3, Exhibits 4E - 4J)	24	
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses	10633(d)	System Supplies	p 97-105 (Sec 4.4.1 to 4.4.4, Exhibits 4K - 4Q)	23	
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	System Supplies	p 97-98 (Sec 4.4, Exhibit 4L), p 96-97 (Sec 4.3.5, Exhibit 4J)	24, 25	
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	System Supplies	p 105-106 (Sec 4.4.6)	25	
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use	10633(g)	System Supplies	p 97-107 (Sec 4.4)	26	
52	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	10634	Water Supply Reliability	p 20-22	30	For years 2015, 2020, 2025, 2030, and 2035 (changed this from 2010, 2015,...)
53	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.	10635(a)	Water Supply Reliability	p 229-235 (Exhibits 11E to 11K)	32, 33, 34	
54	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	10635(b)	Plan Preparation	Appendix D	Not Applicable	
55	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.	10642	Plan Preparation	Appendix D	Not Applicable	

2010 UWMP Checklist

No.	UWMP Requirements	CA Water Code Reference	Subject	UWMP Location	UWMP Guidebook Standardized Table Locations	Additional Clarification
56	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.	10642	Plan Preparation	Appendix D	Not Applicable	
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation	Adoption resolution included within cover page	Not Applicable	
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	Plan Preparation	p 2-3	Not Applicable	
59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.	10644(a)	Plan Preparation	To be enclosed with transmittal letter to DWR.	Not Applicable	
60	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.	10645	Plan Preparation	To be enclosed with transmittal letter to DWR.	Not Applicable	

Table 1
Coordination with appropriate agencies

Coordinating Agencies[1,2]	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not involved / No information
Department of Water Resources				X	X		
Metropolitan Water District				X		X	
Tree People	X	X	X	X	X	X	
City of Los Angeles Dept. of Planning	X			X			
City of Los Angeles Department of Public Works, Bureau of Sanitation				X			
Upper Los Angeles River Area (ULARA) Watermaster			X				
Los Angeles County Department of Public Works Flood Control District			X				
San Gabriel Rivers Watershed Council			X				X
Safe Neighborhood Parks			X				
Panorama City Neighborhood Council			X				
West Hollywood Neighborhood Council			X				
Camp, Dresser, and McKee (CDM)	X	X	X	X	X	X	
Metropolitan Transit Authority (MTA)			X				
Forest Lawn Memorial Park			X				
Mt. Washington Association			X				
Council District 14			X				
Arroyo Seco Neighborhood Council			X				
Northridge West Neighborhood Council			X				
Greywater Corps			X				
Mar Vista Community Council			X				
Greater Cypress Park NC			X				
North East Trees			X				
Reseda Neighborhood Council			X				
LA Community Garden Council			X				
Midtown Noho Neighborhood Council			X				
River Project and Tujunga Watershed Council			X				
Encino Neighborhood Council			X				
Homeowners of Encino			X				
WaterWoman			X				
Sunland Tujunga Neighborhood Council			X				
Studio City Neighborhood Council			X				
Silverlake Reservoirs Conservancy			X				
Society of Hispanic Professional Engineers			X				
General public		X	X		X		

[1] Indicate the specific name of the agency with which coordination or outreach occurred.
[2] Check at least one box in each row.

Table 2 (Exhibit 1C)
Population — current and projected

	2010	2015	2020	2025	2030	2035 - optional	Data source[2]
Service area population[1]	4,100,260	4,172,760	4,250,861	4,326,012	4,398,408	4,467,560	SCAG Regional Transportation Plan (2008)

[1] Service area population is defined as the population served by the distribution system. See Technical Methodology 2: Service Area Population (2010 UWMP Guidebook, Section M).
[2] Provide the source of the population data provided.

Table 3 (Exhibit 2J)
Water deliveries — actual, 2005

	2005				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	476,201	233,192			233,192
Multi-family	114,656	185,536			185,536
Commercial	51,428	107,414			107,414
Industrial/Governmental	10,588	62,418			62,418
Non-revenue (System Loss)		26,786			26,786
Total	652,873	615,346	0	0	615,346

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

Table 4 (Exhibit 2J)
Water deliveries — actual, 2010

	2010				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family	478,629	196,500			196,500
Multi-family	115,317	166,810			166,810
Commercial	50,017	96,675			96,675
Industrial/Governmental	10,671	52,877			52,877
Non-revenue (System Loss)		32,909			32,909
Total	654,634	545,771	0	0	545,771

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

Table 5 (Exhibit 2J) Water deliveries — projected, 2015					
	2015				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family		225,699			225,699
Multi-family		178,782			178,782
Commercial		135,112			135,112
Industrial/Governmental		18,600			18,600
Non-revenue (System Loss)		41,370			41,370
Total	0	599,563	0	0	599,563

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 6 (Exhibit 2J) Water deliveries — projected, 2020					
	2020				
	Metered		Not metered		Total
Water use sectors	# of accounts	Volume	# of accounts	Volume	Volume
Single family		236,094			236,094
Multi-family		193,220			193,220
Commercial		133,597			133,597
Industrial/Governmental		16,852			16,852
Non-revenue (System Loss)		42,969			42,969
Total	0	622,732	0	0	622,732

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 7 (Exhibit 2J) Water deliveries — projected 2025, 2030, and 2035						
	2025		2030		2035 - optional	
	metered		metered		metered	
Water use sectors	# of accounts	Volume	# of accounts	Volume	# of accounts	Volume
Single family		241,180		246,879		247,655
Multi-family		202,999		213,284		218,762
Commercial		129,761		126,567		120,420
Industrial/governmental		14,708		12,634		10,513
Non-revenue (System Loss)		43,627		44,421		44,272
Total	0	632,275	0	643,785	0	641,622

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 8 (Exhibit 2L) Low-income projected water demands					
Low Income Water Demands[1]	2015	2020	2025	2030	2035 - opt
Single-family residential	11,917	12,466	12,734	13,036	13,076
Multi-family residential	23,313	25,196	26,471	27,812	28,527
Total	35,230	37,662	39,205	40,848	41,603

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] Provide demands either as directly estimated values or as a percent of demand.

Table 9 - NOT APPLICABLE Sales to other water agencies							
Water distributed	2005	2010	2015	2020	2025	2030	2035 - opt
name of agency							
name of agency							
name of agency							
Total	0	0	0	0	0	0	0

Units (circle one): acre-feet per year million gallons per year cubic feet per year

Table 10 - NOT APPLICABLE Additional water uses and losses							
Water use[1]	2005	2010	2015	2020	2025	2030	2035 -opt
Saline barriers							
Groundwater recharge							
Conjunctive use							
Raw water							
Recycled water							
System losses							
Other (define)							
Total	0	0	0	0	0	0	0

Units (circle one): acre-feet per year million gallons per year cubic feet per year

[1] Any water accounted for in Tables 3 through 7 are not included in this table.

Table 11 (Exhibit 2J) Total water use							
Water Use	2005	2010	2015	2020	2025	2030	2035 - opt
Total water deliveries (from Tables 3 to 7)	615,346	545,771	599,563	622,732	632,275	643,785	641,622
Sales to other water agencies (from Table 9)	-	-	-	-	-	-	-
Additional water uses and losses (from Table 10)	-	-	-	-	-	-	-
Total	615,346	545,771	599,563	622,732	632,275	643,785	641,622

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 12 (Exhibit 11E) Retail agency demand projections provided to wholesale suppliers							
Wholesaler	Contracted Volume[3]	2010	2015	2020	2025	2030	2035 -opt
LADWP provided LA's demand projections to MWD on Feb. 22, 2011	203,313	263,875	248,120	218,040	193,760	198,781	193,027

[3] Indicate the full amount of water (LADWP Purchase Order Commitment is minimum of 2,033,132.4 AF from 1/1/2003 to 1/1/2013. MWD is capable of providing more.)

Table 13 (Exhibit 3C; Appendix G) Base period ranges			
Base	Parameter	Value	Units
10- to 15-year base period	2008 total water deliveries	649,822	*see below*
	2008 total volume of delivered recycled water	4,181	*see below*
	2008 recycled water as a percent of total deliveries	1	percent
	Number of years in base period[1]	10	years
	Year beginning base period range	1996	
	Year ending base period range[2]	2005	
5-year base period	Number of years in base period	5	years
	Year beginning base period range	2004	
	Year ending base period range[3]	2008	

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] If the 2008 recycled water percent is less than 10 percent, then the first base period is a continuous 10-year period. If the amount of recycled water delivered in 2008 is 10 percent or greater, the first base period is a continuous 10- to 15-year period.

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

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

Table 14 (Exhibit 3C; Appendix G) Base daily per capita water use — 10- to 15-year range				
Base period year		Distribution System Population	Daily system gross water use (AF)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
1996		3,568,651	610,144	153
1997		3,584,227	628,265	156
1998		3,613,170	587,398	145
1999		3,653,878	619,467	151
2000		3,705,600	659,121	159
2001		3,770,806	657,873	156
2002		3,829,677	667,145	156
2003		3,881,069	650,664	150
2004		3,925,129	688,213	157
2005		3,955,022	614,072	139
			Base Daily Per Capita Water Use[1]	152

[1] Add the values in the column and divide by the number of rows.

Table 15 (Exhibit 3C; Appendix G) Base daily per capita water use — 5-year range				
Base period year		Distribution System Population	Daily system gross water use (AF)	Annual daily per capita water use (gpcd)
Sequence Year	Calendar Year			
2004		3,925,129	688,213	157
2005		3,955,022	614,072	139
2006		3,986,385	626,194	140
2007		4,006,145	665,030	148
2008		4,042,085	645,641	143
			Base Daily Per Capita Water Use[1]	145

[1] Add the values in the column and divid by the number of rows.

Table 16 (Exhibit 11E) Water supplies — current and projected							
Water Supply Sources		2010	2015	2020	2025	2030	2035 - opt
Water purchased from[1]:	Wholesaler supplied volume (yes/no)						
MWD Water Purchased	**Yes**	263,875	248,120	218,040	193,760	198,781	193,027
Supplier-produced groundwater[2]		76,982	40,500	96,300	111,500	111,500	110,405
Los Angeles Aqueduct		199,739	252,000	250,000	248,000	246,000	244,000
Conservation		8,178	14,180	27,260	40,340	53,419	64,368
Recycled Water - Irrigation/Industrial Use		6,703	20,000	20,400	27,000	29,000	29,000
Recycled Water - Groundwater Replenishment		0	0	0	15,000	22,500	30,000
Water Transfers		0	40,000	40,000	40,000	40,000	40,000
	Total	**555,477**	**614,800**	**652,000**	**675,600**	**701,200**	**710,800**

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] Volumes shown here should be what was purchased in 2010 and what is anticipated to be purchased in the future. If these numbers differ from what is contracted, show the contracted quantities in Table 17.

[2] Volumes shown here should be consistent with Tables 17 and 18.

Table 17 (Exhibit 11E) Wholesale supplies — existing and planned sources of water						
Wholesale sources[1,2]	Contracted Volume[3]	2015	2020	2025	2030	2035 - opt
MWD provided LA's demand projections to LADWP on Jan. 24, 2011	203,313	397,748	413,628	414,180	417,533	418,378

[1] If the water supplier is a wholesaler, indicate all customers (excluding individual retail customers) to which water is sold. If the water supplier is a retailer, indicate each wholesale supplier, if more than one.

[2] Indicate the full amount of water (LADWP Purchase Order Commitment is minimum of 2,033,132.4 AF from 1/1/2003 to 1/1/2013. MWD is capable of providing more.)

Table 18 (Exhibit 6B) Groundwater — volume pumped						
Basin name(s)	Metered or Unmetered[1]	2006	2007	2008	2009	2010
San Fernando	Metered	35,486	75,640	57,060	49,106	62,218
Sylmar	Metered	1,844	3,901	4,046	576	2,998
Central	Metered	13,290	13,358	12,207	11,937	11,766
	Total groundwater pumped	50,620	92,899	73,313	61,619	76,982
	Groundwater as a percent of total water supply	8.0%	13.8%	11.3%	10.0%	14.1%

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] Indicate whether volume is based on volumeteric meter data or another method

Table 19 (Exhibit 6G) Groundwater — volume projected to be pumped					
Basin name(s)	2015	2020	2025	2030	2035 - opt
San Fernando	21,000	76,800	92,000	92,000	92,000
Sylmar	4,500	4,500	4,500	4,500	3,405
Central	15,000	15,000	15,000	15,000	15,000
Total groundwater pumped	40,500	96,300	111,500	111,500	110,405
Percent of total water supply[1]	6.7%	15.4%	17.6%	17.2%	17.1%

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Include future planned expansion

[1] As a percentage of wet supplies excluding water conservation

Table 20 (Page 9-1) Transfer and exchange opportunities			
Transfer agency	Transfer or exchange	Short term or long term	Proposed Volume
TBD	Transfer	Long Term	40,000
Total			

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

Table 21 (Exhibit 4D) Recycled water — wastewater collection and treatment							
Type of Wastewater	2005 (actual)	2010 (actual)	2015	2020	2025	2030	2035 - opt
(1) Wastewater collected & treated in service area	487,296	408,044	468,432	478,308	488,408	508,015	527,621
(2) Volume that meets recycled water standard	65,018	57,171	112,391	114,163	115,586	117,627	117,694
(3) Secondary water sent to West Basin for Recycling		34,115	44,230	45,365	45,365	50,865	50,865
Calculation to match Table 22 totals below = (1) - (2) - (3)		316,758	311,811	318,781	327,457	339,523	359,062

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

(1) Only includes recycled water from DCT, LAG and TIWRP AWTF.

(3) Secondary water sent to West Basin is not included as part of LADWP recycled water.

Table 22 Recycled water — non-recycled wastewater disposal							
Method of disposal	Treatment Level	2010	2015	2020	2025	2030	2035 - opt
Recycling and Pacific Ocean via Los Angeles River	Tertiary to Title 22 standards with Nitrification/Denitrification	0	0	0	0	695	3,464
Recycling and Ocean via Los Angeles River	Tertiary to Title 22 standards with Nitrification/Denitrification	0	3,027	4,932	7,062	9,192	11,322
Recycling and Outfall to Ocean	Tertiary; Advanced treatment (MF/RO)	15,694	13,004	13,228	13,564	14,125	14,573
Conveyance to WBMWD for Recycling and Ocean outfall	Full secondary	301,064	295,781	300,620	306,831	315,511	329,703
	Total	316,758	311,811	318,781	327,457	339,523	359,062

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

The following water is not included: All water treated to Title 22 standards, and Secondary Water delivered to West Basin.

Table 23 Recycled water — potential future use							
User type	Description	Feasibility[1]	2015	2020	2025	2030	2035 - opt
Agricultural irrigation			NA	NA	NA	NA	NA
Landscape irrigation[2]			4,220	4,220	4,220	6,135	15,135
Commercial[3]			165	165	165	165	165
Golf course irrigation			1,400	1,400	1,400	1,400	1,400
Wildlife habitat			26,990	26,990	26,990	26,990	26,990
Wetlands							
Industrial reuse			9,300	9,300	9,300	9,300	9,300
Groundwater recharge (GWR)			0	15,000	15,000	30,000	30,000
Seawater barrier			3,000	3,000	3,000	3,000	3,000
Getothermal/Energy			NA	NA	NA	NA	NA
Indirect potable reuse			NA	NA	NA	NA	NA
Other (user type)							
Other (user type)							
	Total	0	45,075	60,075	60,075	76,990	85,990

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] Technical and economic feasibility.

[2] Includes parks, schools, cemeteries, churches, residential, or other public facilities

[3] Includes commercial building use such as landscaping, toilets, HVAC, and commercial uses (car washes, laundries, nurseries, etc)

Table 24 (Exhibit 4J) Recycled water — 2005 UWMP use projection compared to 2010 actual		
Use type	2010 actual use	2005 Projection for 2010[1]
Agricultural irrigation		
Landscape irrigation[2]		
Commercial[3]		
Golf course irrigation		
Wildlife habitat		
Wetlands		
Industrial reuse		
Groundwater recharge		
Seawater barrier		
Getothermal/Energy		
Indirect potable reuse		
Other (user type) - Municipal & Industrial Uses	6,703	16,950
Other (user type) - Environmental Uses	25,008	26,990
Total	31,711	43,940

Units (circle one): ***acre-feet per year*** *million gallons per year* *cubic feet per year*

[1] From the 2005 UWMP. There has been some modification of use types. Data from the 2005 UWMP can be left in the existing catagories or modified to the new catagories, at the discretion of the water supplier.

[2] Includes parks, schools, cemeteries, churches, residential, or other public facilities

[3] Includes commercial building use such as landscaping, toilets, HVAC, etc) and commercial uses (car washes, laundries, nurseries, etc)

Table 25 (Exhibit 4L & Sec 4.4.6) Methods to encourage recycled water use (NA - Financial incentives incorporated into goals above)						
Actions	Projected Results					
	2010	2015	2020	2025	2030	2035 - opt
Financial incentives						
Cost savings, shared conservation of resources, environmental benefit, reliability	6,703	20,000	20,400	27,000	29,000	29,000
Sustainability (groundwater replenishment)				15,000	22,500	30,000
Total	6,703	20,000	20,400	42,000	51,500	59,000

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

Table 26 (Exhibits 4L, 4M, 4N, 4O, 4P) Future water supply projects								
Project name[1]	Projected start date	Projected completion date	Potential project constraints[2]	Normal-year supply[3]	Single-dry year supply[3]	Multiple-dry year first year supply[3]	Multiple-dry year second year supply[3]	Multiple-dry year third year supply[3]
Recycling Projects								
Harbor Irrigation, Commercial, Industrial	2009	2015	Funding	9520	9520	9520	9520	9520
Metro Irrigation (llittle Commercial, Industrial)	2009	2015	Funding	1813	1813	1813	1813	1813
Valley Irrigation(little Commercial/Industrial)	2009	2013	Funding	844	844	844	844	844
Westside Irrigation, Commercial, Industrial	2009	2015	Funding	350	350	350	350	350
Indirect Potable Reuse (Groundwater Recharge) Initial Stage	2015	2021	Funding	15000	15000	15000	15000	15000
Indirect Potable Reuse (Groundwater Recharge) 2nd Stage	2021	2035	Funding	15000	15000	15000	15000	15000
Other Municipal and Industrial Projects	2015	2035	Funding	16,473	16,473	16,473	16,473	16,473
		Total	0	59,000	59,000	59,000	59,000	59,000

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

[1] Water volumes presented here should be accounted for in Table 16.

[2] Indicate whether project is likely to happen and what constraints, if any, exist for project implementation.

[3] Provide estimated supply benefits, if available.

Table 27 (Section 11.2.8) Basis of water year data	
Water Year Type	Base Year(s)
Average Water Year	FY1956/57 to FY2005/06
Single-Dry Water Year	FY1990/91
Multiple-Dry Water Years - Driest 5-year sequence	FY1988/89 to FY1992/93
Multiple-Dry Water Years - Driest 3-year sequence	FY1958/59 to FY1960/61

Table 28 Supply reliability — historic conditions					
Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years			
		Year 1	Year 2	Year 3	Year 4
FY1956/57 to FY2005/06	FY1990/91	FY1988/89	FY1989/90	FY1990/91	FY1991/92
360,509	130,325	327,181	206,215	130,325	176,888
Percent of Average/Normal Year:	36.2%	90.8%	57.2%	36.2%	49.1%

** Showing LA Aqueduct supply reliability only. Groundwater & Recycled Water don't vary with weather. MWD supply is used to supplement insufficient local supplies and is not directly co-related to weather.*

Table 29 Factors resulting in inconsistency of supply							
Water supply sources[1]	Specific source name, if any	Limitation quantification	Legal	Environmental	Water quality	Climatic	Additional information
Metropolitan Water District			x	x		x	
Supplier-produced groundwater				x	x		
Los Angeles Aqueduct			x	x		x	
Conservation						x	
Recycled Water - Irrigation/Industrial Use			x	x		x	

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

[1] From Table 16.

Table 30 (Exhibit 6G) Water quality — current and projected water supply impacts							
Water source	Description of condition	2010	2015	2020	2025	2030	2035 - opt
Groundwater - San Fernando Basin (See Exhibit 6G)*	Expected increased contamination issues (2015) and clean up programs expected to be completed (2021)	24,782	66,000	10,200	0	0	0

***Yearly Quantities listed represent total amount of water LADWP is unable to pump from the SFB due to groundwater contamination. Contamination issues are resolved after completion of clean-up programs in 2021**

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

Table 31 (Exhibit 11L) Supply reliability — current water sources				
Water supply sources[1]	Average / Normal Water Year Supply[2]	Multiple Dry Water Year Supply[2]		
		Year 2011	Year 2012	Year 2013
Los Angeles Aqueduct	**254,000**	104,530	50,849	59,382
Groundwater	**106,500**	61,090	53,660	46,260
Conservation	**8,178**	9,380	10,580	11,780
Recycled Water - Irrigation/Industrial Use	**7,500**	7,500	8,300	9,000
Recycled Water - Groundwater Replenishment	**0**	0	0	0
Water Transfers	**0**	0	0	0
MWD Water Purchases	**245,522**	407,500	484,811	500,078
Percent of normal year:	100.0%	94.9%	97.8%	100.8%

*Units (circle one): **acre-feet per year** million gallons per year cubic feet per year*

[1] From Table 16.

[2] See Table 27 for basis of water type years.

Table 32 (Exhibits 2J, 11E) Supply and demand comparison — normal year					
	2015	2020	2025	2030	2035 - opt
Supply totals (from Table 16)	614,800	652,000	675,600	701,200	710,800
Demand totals (From Table 11)	599,563	622,732	632,275	643,785	641,622
Difference (Conservation)	15,237	29,268	43,325	57,415	69,178
Difference as % of Supply	2.5%	4.5%	6.4%	8.2%	9.7%
Difference as % of Demand	2.5%	4.7%	6.9%	8.9%	10.8%

Units are in acre-feet per year.

Table 33 (Exhibit 11F) Supply and demand comparison — single dry year					
	2015	2020	2025	2030	2035 - opt
Supply totals[1,2]	651,700	691,100	716,100	743,200	753,400
Demand totals[2,3,4]	637,520	663,840	675,760	689,781	689,032
Difference	14,180	27,260	40,340	53,419	64,368
Difference as % of Supply	2.2%	3.9%	5.6%	7.2%	9.3%
Difference as % of Demand	2.2%	4.1%	6.0%	7.7%	9.3%

Units are in acre-feet per year.

[1] Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.

[2] Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.
[3] Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.
[4] The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

Table 34 (Exhibit 11G - Exhibit 11K) Supply and demand comparison — multiple dry-year events						
		2015	2020	2025	2030	2035 - opt
Multiple-dry year first year supply	**Supply totals[1,2]**	608,200	661,200	694,500	720,100	740,300
	Demand totals[2,3,4]	597,620	641,790	662,010	674,530	682,500
	Difference	10,580	19,410	32,490	45,570	57,800
	Difference as % of Supply	1.7%	2.9%	4.7%	6.3%	7.8%
	Difference as % of Demand	1.8%	3.0%	4.9%	6.8%	8.5%
Multiple-dry year second year supply	**Supply totals[1,2]**	626,500	675,400	706,100	732,400	749,300
	Demand totals[2,3,4]	614,720	653,370	670,990	684,210	689,300
	Difference	11,780	22,030	35,110	48,190	60,000
	Difference as % of Supply	1.9%	3.3%	5.0%	6.6%	8.0%
	Difference as % of Demand	1.9%	3.4%	5.2%	7.0%	8.7%
Multiple-dry year third year supply	**Supply totals[1,2]**	602,900	644,600	670,900	696,100	708,800
	Demand totals[2,3,4]	589,920	619,960	633,180	645,300	646,600
	Difference	12,980	24,640	37,720	50,800	62,200
	Difference as % of Supply	2.2%	3.8%	5.6%	7.3%	8.8%
	Difference as % of Demand	2.2%	4.0%	6.0%	7.9%	9.6%

Units are in acre-feet per year.
[1] Consider the same sources as in Table 16. If new sources of water are planned, add a column to the table and specify the source, timing, and amount of water.
[2] Provide in the text of the UWMP text that discusses how single-dry-year water supply volumes were determined.
[3] Consider the same demands as in Table 3. If new water demands are anticipated, add a column to the table and specify the source, timing, and amount of water.
[4] The urban water target determined in this UWMP will be considered when developing the 2020 water demands included in this table.

Table 35 (Section 11.3.1) Water shortage contingency — rationing stages to address water supply shortages		
Stage No.	**Water Supply Conditions**	**% Shortage**
Phase I	No Shortage	0%
Phase II	Modereate Shortage	> 0 to 15%
Phase III	Severe Shortage	15 to 20%
Phase IV	Critical Shortage	20 to 35%
Phase V	Super Critical Shortage	35 to 50%

[1] One of the stages of action must be designed to address a 50 percent reduction in water supply.

Table 36 (Section 11.3.4) Water shortage contingency — mandatory prohibitions	
Examples of Prohibitions	**Stage When Prohibition Becomes Mandatory**
Using potable water for washing paved surfaces	Phase I
Using water to clean, fill, or maintain levels in decorative fountains, ponds, lakes, or similar structures for aethetic purposes	Phase I
Any public place where food is sold, served, or offered for sale should not serve water unless requested.	Phase I
No customer should permit water to leak from any pipe or fixture on customer's premises	Phase I
No customer shall wash a vehicle with a hose that does not have a self-closing water shut-off device	Phase I
No customer shall irrigate during periods of rain	Phase I
No customer shall irrigate between the hours of 9:00 a.m. and 4:00 p.m.	Phase I
Irrigating of landscape with potable water using spray head sprinklers and bubblers shall be limited to no more than ten minutes per watering station per day	Phase I
No customer shall irrigate in a manner that causes excess or continuous flow or runoff onto an adjoining sidewalk, driveway, street, gutter, or ditch	Phase I
No installation of single pass cooling systems shall be permitted in buildings requesting new water service.	Phase I
No installation of single pass cooling systems shall be permitted in new conveyor car wash and new commercial laundry systems	Phase I
Operators of hotels and motels provide guests with the option of choosing not to have towels and linens laundered daily	Phase I
No large landscape shall have irrigation systems without rain sensors that shut-off the irrigation systems	Phase I
No landscape irrigation shall be permitted on any day other than Monday, Wednesday, or Friday for odd-numbered street addresses and Tuesday, Thursday, or Sunday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to: (a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight minutes per watering day per station for a total of 24 minutes per week; (b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than 15 minutes per cycle and up to two cycles per watering day per station for a total of 90 minutes per week.	Phase II
No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street addresses and Tuesday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.	Phase III
No washing of vehicles allowed except at commercial car wash facilities.	Phase III
No filling of residential swimming pools and spas with potable water.	Phase III

Table 37 (Section 11.3.5) Water shortage contingency — consumption reduction methods		
Consumption Reduction Methods	**Stage When Method Takes Effect**	**Projected Reduction (%)**
LADWP's existing rate structure (enacted in 1993) serves as a basis for further reducing consumption. First tier water allotments are reduced during shortages by the degree of the shortage. For single-family residential users, the adjusted first tier allotments apply for the entire year. For other users, the adjusted first tier allotments apply only during the high season (June 1 through October 31). Details of LADWP's water rate structure are provided in Appendix C – Water Rate Ordinance.	During a water shortage or emergency condition	Up to 25%
Emergency Water Conservation Plan (UWMP Section 11.3.1)	Phase I is permanent with higher phases activated during a water shortage or emergency condition	Up to 50%
Water conservation public service announcements (through television and/or radio), billboard ads, flyer distributions, and conservation workshops. Participation in public exhibits to disseminate water conservation information within its service area. Conservation is a permanent and long-term application used within the City to counter the potentially adverse impacts of water supply shortages.	During a water shortage or emergency condition	
Water will be allocated to meet needs for domestic use, sanitation, fire protection, and other priorities. This will be done equitably and without discrimination between customers using water for the same purpose(s).	extreme water shortage conditions	

Table 38 (Section 11.3.6)
Water shortage contingency — penalties and charges

Penalties or Charges	Stage When Penalty Takes Effect	
Written Warning	First violation	For water meters smaller than two inches
Surchage in the amount of $100	Second violation within preceding 12-month period	
Surchage in the amount of $200	Third violation within preceding 12-month period	
Surchage in the amount of $300	Fourth violation within preceding 12-month period	
LADWP may install a flow-restricting device of 1 gpm capacity for services up to 1 1/2 inches in size and comparatively sized restrictors for larger services or terminate a customer's service, in addition to aforementioned financial surcharges	Fifth violation or subsequent violation within preceding 12-month period	
Written Warning	First violation	For water meters two inches and larger
Surcharge in the amount of $200	Second violation within preceding 12-month period	
Surcharge in the amount of $400	Third violation within preceding 12-month period	
Surcharge in the amount of $600	Fourth violation within preceding 12-month period	
LADWP may install a flow-restricting device or terminate a customer's service, in addition to aforementioned financial surcharges	Fifth violation or subsequent violation within preceding 12-month period	

Urban Water Management Plan

Appendix C

Water Rate Ordinance

Los Angeles

Water Rates

June 1, 1995

Amended July 28, 1997,
February 4, 2000, June 20, 2004,
November 27, 2006, and June 19, 2008

Los Angeles Department of Water and Power

Ordinance No. 170435

As Amended by Ordinance No. 171639, Ordinance No. 173017,
Ordinance No. 175964, Ordinance No. 177968
and Ordinance No. 179802

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R. SHORTAGE YEAR RATES

When the Board of Water and Power Commissioners, by resolution, finds and determines that the water supply available to the City of Los Angeles is insufficient to meet the City's normal water demand, it shall determine the degree of shortage and apply the corresponding commodity charges stated below, instead of the otherwise applicable commodity charges.

Certified copies of such resolution shall be transmitted to the offices of the Mayor, City Clerk, and the Council. At any time within such period as may be specified by resolution, which shall not be less than fifteen days after delivery of such certified copies to said offices, the Mayor, in writing, or the Council, by majority vote, may disapprove such resolution. If neither the Mayor nor the Council disapprove on said resolution within the period so specified, the same shall take effect upon the expiration of said period and shall be applicable to charges commencing on the first day of the billing cycle after the expiration of the period prescribed in the resolution. If the Mayor shall disapprove said resolution within said period, he shall forthwith advise the Council and the Board, in writing, of such disapproval. The Council shall thereupon consider such disapproval in the same manner as upon the reconsideration of an ordinance notwithstanding the veto of the Mayor, and if upon such consideration the Council shall, by the votes of two-thirds of the whole Council, determine that the Mayor's disapproval should be overruled, such disapproval by the Mayor shall be of no effect, and the said resolution of the Board shall forthwith take effect and shall be applicable to charges commencing on the first day of the billing cycle after the action by the Council overruling the Mayor's disapproval and the expiration of the period prescribed in the resolution.

The following commodity rates shall be substituted into the appropriate corresponding schedule and shall continue during the time that a water shortage determined by the Board of Water and Power Commissioners remains in effect.

1. Schedule A - Single-Dwelling Unit Residential Customers

   a. The first tier usage block shall be reduced by the degree of the shortage and shall be billed at the rate specified in Section 2.A.3.a.

   b. Second Tier Usage

      Usage above the first tier usage block as prescribed in Section 3.R.1.a above shall be billed as follows:

Commodity Charge	Rate Per Hundred Cubic Feet

10% Shortage

Low Season - November 1 through May 31
1.201 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

High Season - June 1 through October 31
1.201 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

15% Shortage

Low Season - November 1 through May 31
1.442 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

High Season - June 1 through October 31
1.442 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

20% Shortage

Low Season - November 1 through May 31
1.682 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

High Season - June 1 through October 31
1.682 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

25% Shortage

Low Season - November 1 through May 31
1.964 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

High Season - June 1 through May 31
1.964 times the High Season rate specified in Section 2.A.3.b, rounded to the nearest penny

2. Schedule B - Multi-Dwelling Unit Residential Customers

Commodity Charge	Rate Per Hundred Cubic Feet

10% Shortage

a. Up to 115% of Adjusted First Tier Usage Block shall be billed at the rate specified in Section 2.B.3.a.

b. Usage above 115% of Adjusted First Tier Usage Block shall be billed at 1.201 times the High Season rate specified in Section 2.B.3.b, rounded to the nearest penny.

15% Shortage

c. Up to 115% of Adjusted First Tier Usage Block shall be billed at the rate specified in Section 2.B.3.a.

d. Usage above 115% of First Tier Usage Block shall be billed at 1.442 times the High Season rate specified in Section 2.B.3.b, rounded to the nearest penny.

20% Shortage

e. Up to 110% of Adjusted First Tier Usage Block shall be billed at the rate specified in Section 2.B.3.a.

f. Usage above 110% of Adjusted First Tier Usage Block shall be billed at 1.682 times the High Season rate specified in Section 2.B.3.b, rounded to the nearest penny.

25% Shortage

g. Up to 110% of Adjusted First Tier Usage Block shall be billed at the rate specified in Section 2.B.3.a.

h. Usage above 110% of Adjusted First Tier Usage Block shall be billed at 1.964 times the High Season rate specified in Section 2.B.3.b, rounded to the nearest penny.

3. Schedule C – Commercial and Industrial Customers

Commodity Charge	Rate Per Hundred Cubic Feet

10% Shortage

a. Up to 115% of Adjusted First Tier Usage Block shall be billed at the rate specified in Section 2.C.3.a.

b. Usage above 115% of Adjusted First Tier Usage Block shall be billed at 1.201 times the High Season rate specified in Section 2.C.3.b, rounded to the nearest penny.

15% Shortage

c. Up to 115% of Adjusted First Tier Usage Block shall be billed at the rate specified Section 2.C.3.a.

d. Usage above 115% of Adjusted First Tier Usage Block shall be billed at 1.442 times the High Season rate specified in Section 2.C.3.b, rounded to the nearest penny.

20% Shortage

e. Up to 110% of Adjusted First Tier Usage Block shall be billed at the rate specified Section 2.C.3.a.

f. Usage above 110% of Adjusted First Tier Usage Block shall be billed at 1.682 times the High Season rate specified in Section 2.C.3.b, rounded to the nearest penny.

25% Shortage

g. Up to 110% of Adjusted First Tier Usage Block shall be billed at the rate specified Section 2.C.3.a.

h. Usage above 110% of Adjusted First Tier Usage Block shall be billed at 1.964 times the High Season rate specified in Section 2.C.3.b, rounded to the nearest penny.

4. Schedule F - Publicly-Sponsored Irrigation; Recreational; Agricultural, Horticultural, and Floricultural Uses; Community Gardens and Youth Sports

Commodity Charges	Rate Per Hundred Cubic Feet

10% Shortage

a. First Tier Usage Block shall be billed at the rate specified in Section 2.F.3.a.

Monthly first tier usage blocks shall be established by the Department for domestic water use, landscape and large area irrigation after an audit has been completed, considering site conditions and based upon best management practices approved by the Board of Water and Power Commissioners, and shall be subject to periodic review and revision by the Department.

b. Second Tier Usage

Usage above the first tier usage block as prescribed in Section 3.R.4.a above shall be billed at 1.201 times the High Season rate specified in Section 2.F.3.c, rounded to the nearest penny.

15% Shortage

c. First Tier Usage Block shall be billed at the rate specified in Section 2.F.3.a.

Monthly first tier usage blocks shall be established by the Department for domestic water use, landscape and large area irrigation after an audit has been completed, considering site conditions and based upon best management practices approved by the Board of Water and Power Commissioners, and shall be subject to periodic review and revision by the Department.

d. Second Tier Usage

Usage above the first tier usage block as prescribed in Section 3.R.4.c above shall be billed at 1.442 times the High Season rate specified in Section 2.F.3.c, rounded to the nearest penny.

<u>20% Shortage</u>

e. First Tier Usage Block shall be billed at the rate specified in Section 2.F.3.a.

Monthly first tier usage blocks shall be established by the Department for domestic water use, landscape and large area irrigation after an audit has been completed, considering site conditions and based upon best management practices approved by the Board of Water and Power Commissioners, and shall be subject to periodic review and revision by the Department.

f. Second Tier Usage

Usage above the first tier usage block as prescribed in Section 3.R.4.e above shall be billed at 1.682 times the High Season rate specified in Section 2.F.3.c, rounded to the nearest penny.

<u>25% Shortage</u>

g. First Tier Usage Block shall be billed at the rate specified in Section 2.F.3.a.

Monthly first tier usage blocks shall be established by the Department for domestic water use, landscape and large area irrigation after an audit has been completed, considering site conditions and based upon best management practices approved by the Board of Water and Power Commissioners, and shall be subject to periodic review and revision by the Department.

h. Second Tier Usage

Usage above the first tier usage block as prescribed in Section 3.R.4.g above shall be billed at 1.964 times the High Season rate specified in Section 2.F.3.c, rounded to the nearest penny.

5. Adjustments and credits pursuant to General Provisions F, G, H, I, K, L, O and P shall be applied to the commodity charges set forth in this General Provision R in the same manner that they apply to the commodity charge set forth in Rate Schedules A, B, C, D, E, and F, inclusive.

6. The Adjusted First Tier Usage Block shall be each customer's maximum December through March average consumption for the three winter periods preceding the declared water shortage event reduced by the degree of water shortage, except that the minimum adjusted first tier usage for Schedule B customers only shall be twenty-eight (28) hundred cubic feet per month reduced by the degree of water shortage and the minimum adjusted first tier usage for Schedule C customers shall be one one-hundred cubic feet per month.

   Each customer's December through March average consumption that is applied at the beginning of each declared water shortage event shall continue to be applied during the time that a water shortage determined by the Board of Water and Power Commissioners remains in effect.

7. Those Schedules B and C customers that are found to not have established an Adjusted First Tier Usage Block based on prior usage may have an adjusted first tier usage block computation made by the Department that is based on the customer's water use characteristics, site conditions, and all applicable best management practices for conservation approved by the Board of Water and Power Commissioners.

8. Application of this General Provision R shall be subject to rules and regulations adopted by the Board of Water and Power Commissioners.

9. When the Board of Water and Power Commissioners determines that the water supply available to the City of Los Angeles is either sufficient, or if not sufficient, is better able to meet the City's normal water supply, it shall, by resolution, either terminate the implementation of these shortage year rates or determine the lesser degree of shortage and apply the applicable commodity charges stated above instead of the commodity charges theretofore implemented pursuant to this Provision R. Such determination shall become effective upon publication of the resolution.

Appendix D

Notice of Meeting and Public Comments

PUBLIC NOTICES

Public Notification

An extensive outreach campaign was conducted for the 2010 update of the LADWP Urban Water Management Plan (UWMP). As shown in the following table, a total of four workshops were conducted, seeking public input on the 2010 update. The first two workshops were held in January 2010 and were intended to receive input concurrent with the preparation of the 2010 UWMP draft. The third and fourth workshops were conducted in February 2011. These workshops were intended to present the 2010 draft UWMP and usher in the beginning of a 60 day period during which comments could be submitted. Comments were collected by LADWP and are shown in a separate section in the pages that follow.

Event	Date	Time	Location	Attendees
Workshop 1 (2010)	1/12/10	6:00 p.m.	Marvin Braude Constituent Center	23
Workshop 2 (2010)	1/20/10	5:00 p.m.	Los Angeles River Center	18
Workshop 1 (2011)	2/3/11	6:00 p.m.	LADWP Van Nuys Service Center	30
Workshop 2 (2011)	2/9/11	6:00 p.m.	LADWP John Ferraro Building, Downtown Los Angeles	44
Final Public Hearing for LADWP Board Adoption	5/3/11	1:30 p.m.	LADWP John Ferraro Building, Downtown Los Angeles	NA

Following incorporation of comments and the production of a finalized version, the UWMP was adopted by the LADWP Board of Commissioners on May 3, 2011.

E-mail Notification

For notification of both rounds of workshops, a flyer was e-mailed to all City of Los Angeles neighborhood councils, homeowners organizations, and stakeholders. The flyer announcement is shown in the pages that follow.

Media Publications

For the February 2011 workshops, an announcement (see next pages) was published in the publications listed in the following table on the dates indicated. As shown, the announcement was also translated and included in multiple foreign language publications. Three example foreign language ads are included in the pages that follow.

Media Outlet	Run date(s)
Wave/Independent/Equal Access Media	Thursday 1/27
Eastern Group Publications	Thursday 1/27
LA Watts Times	Thursday 1/27
LA Sentinel	Thursday 1/27
Korean Daily	Friday 1/28

Downtown News	Monday 1/24
Philippine Media (formally *California Examiner*) Filipino weekly (English language)	Thursday 1/27
La Opinion (Spanish)	Friday 1/28
Our Weekly Newspaper	Thursday 1/27
Palisadian Post	Thursday 1/27
Beverly Press/Park LaBrea News	Thursday 1/27
Tolucan Times-Wed.	Wednesday 1/26
Korean Times	Friday 1/28
Daily Breeze	Friday 1/28
Daily News	Friday 1/28
LA Business Journal	Monday 1/24
SF Valley Business Journal	Monday 1/24
Sing Tao (Chinese)	Friday 1/28
CityWatch Web Site	On-going to 2/9

Website Posting

The flyer notifications for both rounds of workshops and comments/responses from the January 2010 workshops were posted on the LADWP website www.ladwp.com. In addition, the workshop notification was posted on several other websites, including LADWPNews, Twitter, facebook, and neighborhood council web pages. Examples are included in the pages that follow.

60-Day Notification

60-days prior to LADWP Board adoption, the County of Los Angeles, and the Cities of Culver City and West Hollywood were notified (via e-mail and regular mail) of the anticipated adoption of the 2010 UWMP. In addition, the following publications were used for Notification of Board adoption on the dates specified. Letters and ads are shown in the pages that follow.

Media Outlet	Run date(s)
Metropolitan News	Thursday 3/3/11 and 3/10/11
La Opinion	

From: Repp, Chris
Sent: Wednesday, December 22, 2010 11:26 AM
Subject: Urban Water Management Plan (UWMP) Workshops Rescheduled
Attachments: UWMP Workshop Rev 12.22.10.pdf

The workshops originally scheduled for January 13, and January 18, 2011 have been postponed to the following dates, times, and locations. We apologize for any inconvenience.

Thursday, February 3, 2011
6:00 p.m.
VAN NUYS
Van Nuys Service Center
14401 Saticoy Street

Wednesday, February 9, 2011
6:00 p.m.
DOWNTOWN L.A.
LADWP John Ferraro Building, Cafeteria Conference Room
111 N. Hope St.

Free Parking will be provided. The draft 2010 UWMP will be available for review after January 13, 2011 at http://www.ladwp.com.

For more information, contact Simon Hsu at (213) 367-2970.

See attached (revised) flyer.

From: Repp, Chris
Sent: Tuesday, December 14, 2010 8:26 AM
Subject: LADWP's Draft 2010 Urban Water Management Plan Workshops

The public is invited to hear an overview of the LADWP Water System's strategic priorities and preview the draft 2010 Urban Water Management Plan (UWMP) that will outline the City's long-term water resources management strategy. The UWMP is the City's master plan for water supply and resources management. All large California urban water agencies prepare a UWMP and provide an update to their plan every five years.

Please join us at one of the following workshops:

Thursday, January 13 – 5:00 p.m.
CYPRESS PARK
Los Angeles River Center Los Feliz Room
570 West Avenue 26

Tuesday, January 18 – 5:00 p.m.
VAN NUYS
Van Nuys Service Center
7501 Tyrone Avenue

The draft 2010 UWMP will be available for review after January 13, 2011 at

http://www.ladwp.com.

For more information, contact Simon Hsu at (213) 367-2970.

See attached flyer.

Los Angeles LA DWP Department of Water & Power

YOU ARE INVITED!

Please join the Los Angeles Department of Water and Power (LADWP) at a public workshop to share your views regarding Los Angeles' water supply as the City prepares it's

2010 Urban Water Management Plan

We would appreciate your thoughts and will be seeking your input on various topics and questions such as:

- What water resource options should LADWP pursue to meet future needs?
- What water management strategies should LADWP consider?
- How should LADWP manage water supplies during times of shortage?

TUESDAY, JANUARY 12, 6:00 P.M.

VAN NUYS
Marvin Braude Constituent Center
6262 Van Nuys Blvd.

WEDNESDAY, JANUARY 20, 5:00 P.M.

CYPRESS PARK
Los Angeles River Center – Los Feliz Room
570 West Avenue 26

Presentation to be followed by a group discussion. Light refreshments will be provided.

The City of Los Angeles 2005 Urban Water Management Plan is available on LADWP's web site at: http://www.ladwp.com/ladwp/cms/ladwp001354.jsp

For more information, please contact
Simon Hsu at (213) 367-2970, or simon.hsu@ladwp.com

About LADWP's Urban Water Management Plan (UWMP):
All large California urban water agencies prepare a UWMP and provide an update every five years. LADWP's UWMP offers a detailed discussion on the status of Los Angeles' imported water sources, and provides an update of future water supply and demand for the City. The Water Plan also discusses the management and development of water resources, as well as efforts relating to the efficient use water. Additional topics include existing and future water conservation measures, water recycling, and management of the City's groundwater basins.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, service and activities. To ensure availability, such request should be made 72 hours in advance by calling (213) 367-1361, TDD: 1(800) 432-7397.

Los Angeles Department of Water & Power

Draft 2010 Urban Water Management Plan

NEW WORKSHOP DATES*

The public is invited to hear an overview of the LADWP Water System's strategic priorities and preview the draft 2010 Urban Water Management Plan that will outline the City's long-term water resources management strategy.

*** Workshops originally scheduled for January 13 and 18 have been moved to:**

THURSDAY, FEBRUARY 3	WEDNESDAY, FEBRUARY 9
6:00 p.m.	6:00 p.m.
VAN NUYS	**DOWNTOWN LOS ANGELES**
Van Nuys Service Center	LADWP John Ferraro Building, Cafeteria Conference Room
14401 Saticoy Street	111 N. Hope St.

Free parking provided.

Presentation to be followed by public comment.
Public input received from the workshop will be considered for the final 2010 UWMP. The final 2010 UWMP will be presented for adoption by the LADWP Board of Commissioners in May 2011.

About the UWMP:
The UWMP will address requirements under California Water Code Sections 10610 through 10657. The purpose of the UWMP is to cover the management and development of water resources, as well as efforts relating to efficient use of water. The UWMP addresses the areas of existing and future water conservation measures, water recycling, stormwater capture, and management of the City's groundwater basins. In addition, the UWMP offers information on the status of Los Angeles' imported water sources, water quality issues, and projections of future water supply and demand for the City.

Draft 2010 UWMP will be available at www.ladwp.com after January 13, 2011.

Written comments are due no later than March 15, 2011 by email to simon.hsu@ladwp.com, or by mail to:

LADWP - Water System
111 N. Hope Street, Room 1460
Los Angeles, CA 90012
Attn: Simon Hsu

For questions, please call Simon Hsu at (213) 367-2970.

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, service and activities. To ensure availability, such requests should be made 72 hours in advance by calling (213) 367-2970, TDD: 1 (800) 432-7397.

Internet Outreach

Twitter

workshop tomorrow morning? We want to hear fro... (cont)
http://deck.ly/~gplCB
9 Feb

LADWP LADWP
Come talk water with us: public workshop on the Urban Water Management Plan. Tonight, 6pm, Downtown LA. http://bit.ly/gRYYNF
9 Feb Favorite Retweet Reply

LADWP LADWP
Have your say on LADWP's long-range water plan at public workshop tomorrow night, 6pm in Downtown LA. ALL are invited! http://bit.ly/gRYYNF
8 Feb

ReadyLA ReadyLA

@LADWP
LADWP

Come talk water with us: public workshop on the Urban Water Management Plan. Tonight, 6pm, Downtown LA. http://bit.ly/gRYYNF

9 Feb via TweetDeck Favorite Retweet Reply

Retweeted by BernardCParks

LADWP News

DATE: February 7, 2011 11:47:39 AM PST

LADWP News

LOS ANGELES DEPARTMENT OF WATER AND POWER
111 North Hope St., Room 1520, Los Angeles, CA. 90012-5701
Phone (213) 367-1361 - After Hours (213) 367-3227
www.ladwp.com

Los Angeles Department of Water & Power

FOR IMMEDIATE RELEASE
February 7, 2011

Urban Water Management Plan Workshop this Wednesday at 6pm in Downtown Los Angeles

Help Us Plan LA's Water Future!

WHAT: The public is invited to hear an overview of the LADWP Water System's strategic priorities and preview the draft 2010 Urban Water Management Plan that will outline the City's long-term water resources management strategy. Workshop attendees are invited to share their thoughts during the program.

WHO: LADWP Water System Representatives

WHEN: Wednesday, February 9, 2011
6:00 p.m.

WHERE: LADWP John Ferraro Building
Cafeteria Conference Room
111 N. Hope Street
Los Angeles, CA 9012
Map

WHY: LADWP is currently preparing the 2010 Urban Water Management Plan (UWMP), which will outline the City's long-term water resources management strategy. Public input received from the workshops will be considered for the final 2010 UWMP, to be presented for adoption by the LADWP Board of Commissioners in May 2011.

For more information on the UWMP workshop, click here.

# # #

SHARE

facebook

facebook

Email Password Login

Keep me logged in Forgot your password?

Sign Up**Facebook helps you connect and share with the people in your life.**

I'm Attending

LADWP Draft 2010 Urban Water Management Plan Workshop

Share · Public Event

Time	Thursday, February 3 · 6:00pm - 9:00pm
Location	Van Nuys Service Center 14401 Saticoy Street Van Nuys, CA
Created By	SOCAL ASLA
More Info	http://www.lariver.org/

Wall

Export · Report Event

Facebook © 2011 · English (US)

Mobile · Find Friends · Badges · People · Pages · About · Advertising · Developers · Careers · Privacy · Terms · Help

United Neighborhoods (Neighborhood Council) Website

Board Members	Current Agenda

Urban Water Management Plan Workshop this Wednesday at 6pm in Downtown Los Angeles

Help Us Plan LA's Water Future!

WHAT:
The public is invited to hear an overview of the LADWP Water System's strategic priorities and preview the draft 2010 Urban Water Management Plan that will outline the City's long-term water resources management strategy. Workshop attendees are invited to share their thoughts during the program.
WHO:
LADWP Water System Representatives
WHEN:
Wednesday, February 9, 2011
6:00 p.m.
WHERE:
LADWP John Ferraro Building
Cafeteria Conference Room
111 N. Hope Street
Los Angeles, CA 9012
Map
WHY:
LADWP is currently preparing the 2010 Urban Water Management Plan (UWMP), which will outline the City's long-term water resources management strategy. Public input received from the workshops will be considered for the final 2010 UWMP, to be presented for adoption by the LADWP Board of Commissioners in May 2011.

For more information on the UWMP workshop, click here.

Foreign Language Publications Advertisements for February 2011 Public Workshops

Korean Daily

Los Angeles Department of Water & Power

LA 시 수자원의 미래를 지키기 위한 전략 과제

LA 수도전력국의 전략적 우선과제의 개요와 LA 시의 장기적 수자원 관리 전략의 윤곽을 그릴 2010 어반 워터 매니지먼트 플랜 (UWMP)의 초안에 대해 함께 논의하고자 귀하를 초대합니다. 최종 2010 UWMP는 2011년 5월 LA 수도전력국 임원회에서 채택을 발표하게 됩니다.

퍼블릭 워크샵

VAN NUYS

2월 3일 목요일 오후 6시
Van Nuys Service Center
14401 Saticoy Street

DOWNTOWN LOS ANGELES

2월 9일 수요일 오후 6시
LADWP John Ferraro Building, Cafeteria Conference Room
111 N. Hope Street

무료 파킹 제공

2010 UWMP 초안은 www.ladwp.com에서 확인하실 수 있으며
서면으로 된 의견은 2011년 3월 15일까지 아래의 주소나 이메일로 보내주십시오:
LADWP, 111 N. Hope St, Room 1460, Los Angeles, CA 90012,
Attn: Simon Hsu or simon.hsu@ladwp.com

더 자세한 사항은 (213) 367-2970으로 문의하시거나
Simon.hsu@ladwp.com으로 이메일을 보내주시길 바랍니다

As a covered entity under Title II of the Americans with Disabilities Act, the City of Los Angeles does not discriminate on the basis of disability and, upon request, will provide reasonable accommodation to ensure equal access to its programs, service and activities. To ensure availability, such requests should be made 72 hours in advance by calling (213) 367-2970, TDD: 1 (800) 432-7397.

La Opinion

Los Angeles Department of Water & Power

ASEGURANDO EL FUTURO DEL AGUA DE LOS ÁNGELES

El público está invitado para conocer un panorama general de las prioridades estratégicas del Sistema de Agua de LADPW y una vista previa del proyecto Plan de Gestión del Agua 2010 (UWMP, por sus siglas en inglés) que será una idea general de la estrategia para el manejo de recursos del agua de la ciudad a largo plazo. El UWMP 2010 final será presentado para su aprobación por el Concejo de Comisionados de LADWP en mayo de 2011.

Talleres Públicos

VAN NUYS

Jueves 3 de febrero, 6:00 p.m.
Centro de Servicio Van Nuys
14401 Saticoy Street

CENTRO DE LOS ÁNGELES

Miércoles 9 de febrero, 6:00 p.m.
LADWP Edificio John Ferraro
Sala de Conferencias Cafetería
111 N. Hope Street

Estacionamiento Gratuito

El proyecto UWMP 2010 está disponible en www.ladwp.com
Comentarios escritos se reciben hasta el 15 de marzo de 2011 a:
LADWP, 111 N. Hope St, Sala 1460, Los Ángeles, CA 90012,
Attn: Simon Hsu o simon.hsu@ladwp.com

Para más información contactar al (213) 367-2970
o al correo electrónico simon.hsu@ladwp.com

Como una entidad cubierta bajo el Título III de la Ley de Americanos con Discapacidades, la ciudad de Los Ángeles no discrimina por motivos de discapacidad y, previa solicitud, proveerá ajustes razonables para asegurar la igualdad de acceso a su programa, servicios y actividades. Para asegurar la disponibilidad, las solicitudes deberán hacerse con 72 horas de anticipación llamando al (213) 367-2970, TDD 1 (800) 432-7397.

Sing Tao (Chinese)

Los Angeles Department of Water & Power

保障洛縣未來用水

歡迎民眾參加洛縣水電局介紹用水系統的策略重點
及預覽概述城市的長遠用水資源管理戰略的
2010城市用水資源管理計劃(UWMP)草案。
最終的2010城市用水資源管理計劃
將於2011年5月提交洛縣水電局董事會通過。

社區研討會

VAN NUYS

2/3/2011 (星期四) 下午六時
Van Nuys Service Center
14401 Saticoy Street

洛杉磯市中心

2/9/2011 (星期三) 下午六時
LADWP John Ferraro Building, Cafeteria Conference Room
111 N. Hope Street

免費停車

2010城市用水資源管理計劃(UWMP)草案詳情，
請上網至www.ladwp.com
書面意見請於3/15/2011前寄到：
LADWP, 111 N. Hope St, Room 1460, Los Angeles, CA 90012,
Attn: Simon Hsu or simon.hsu@ladwp.com

查詢電話：(213)367-2970或
電郵 simon.hsu@ladwp.com

在美國殘障法案第二條所保障下，洛杉磯市沒有歧視殘障者的基本人權，並且一旦有所要求時，將會提供合理的協助，以確保對洛杉磯市之節目、服務以及活動的公平性。為確保時限有效，任何要求必須在72小時前撥打(213) 367-2970，聽力障礙者專線：1(800) 432-7397。

March 3, 2011

Mr. Sol Blumenfeld
Community Development Director
City of Culver City, Planning Division
9770 Culver Boulevard
Culver City, CA 90232

Dear Mr. Blumenfeld:

Subject: City of Los Angeles 2010 Urban Water Management Plan Public Hearing

The Los Angeles Department of Water and Power (LADWP) is providing this notice of a public hearing for our 2010 Urban Water Management Plan (UWMP). As part of its regularly scheduled meeting on May 3, 2011, the Los Angeles Board of Water and Power Commissioners will hold a public hearing during which members of the public may comment on the adoption of our 2010 UWMP. The hearing will be held on May 3, 2011 at 1:30 p.m. (tentative), 111 N. Hope Street, Room 1555, Los Angeles, CA 90042. Please check the website (http://www.ladwp.com) to confirm the start time.

The 2010 UWMP outlines the City of Los Angeles' (City) long-term water resources management strategy. It is the City's master plan for water supply and resources management. It includes details on LADWP's plans for recycled water, conservation, stormwater capture and other water resource options.

All large California urban water agencies prepare an UWMP every five years. The LADWP's 2010 UWMP is currently available for review on our website at (http://www.ladwp.com) by searching "UWMP."

If you have any questions or comments, please contact Mr. Simon Hsu of my staff at (213) 367-2970, or e-mail him at simon.hsu@ladwp.com.

Sincerely,

Thomas M. Erb

Thomas M. Erb
Director of Water Resources

CR:lsf
c: Mr. Simon Hsu

Department of Water and Power the City of Los Angeles

ANTONIO R. VILLARAIGOSA
Mayor

Commission
THOMAS S. SAYLES, *President*
ERIC HOLOMAN, *Vice-President*
CHRISTINA E. NOONAN
JONATHAN PARFREY
BARBARA E. MOSCHOS, *Secretary*

RONALD O. NICHOLS
General Manager

March 3, 2011

Ms. Gail Farber
Los Angeles County Department of Public Works
900 South Fremont Avenue
Alhambra, CA 91803

Dear Ms. Farber::

Subject: City of Los Angeles 2010 Urban Water Management Plan Public Hearing

The Los Angeles Department of Water and Power (LADWP) is providing this notice of a public hearing for our 2010 Urban Water Management Plan (UWMP). As part of its regularly scheduled meeting on May 3, 2011, the Los Angeles Board of Water and Power Commissioners will hold a public hearing during which members of the public may comment on the adoption of our 2010 UWMP. The hearing will be held on May 3, 2011 at 1:30 p.m. (tentative), 111 N. Hope Street, Room 1555, Los Angeles, CA 90042. Please check the website (http://www.ladwp.com) to confirm the start time.

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Sincerely,

Thomas M. Erb

Thomas M. Erb
Director of Water Resources

CR:lsf
c: Mr. Simon Hsu

Department of Water and Power the City of Los Angeles

ANTONIO R. VILLARAIGOSA
Mayor

Commission
THOMAS S. SAYLES, *President*
ERIC HOLOMAN, *Vice-President*
CHRISTINA E. NOONAN
JONATHAN PARFREY
BARBARA E. MOSCHOS, *Secretary*

RONALD O. NICHOLS
General Manager

March 3, 2011

Mr. Oscar Delgado, Director
City of West Hollywood
Department of Public Works
8300 Santa Monica Boulevard
West Hollywood, CA 90069

Dear Mr. Delgado:

Subject: City of Los Angeles 2010 Urban Water Management Plan Public Hearing

The Los Angeles Department of Water and Power (LADWP) is providing this notice of a public hearing for our 2010 Urban Water Management Plan (UWMP). As part of its regularly scheduled meeting on May 3, 2011, the Los Angeles Board of Water and Power Commissioners will hold a public hearing during which members of the public may comment on the adoption of our 2010 UWMP. The hearing will be held on May 3, 2011 at 1:30 p.m. (tentative), 111 N. Hope Street, Room 1555, Los Angeles, CA 90042. Please check the website (http://www.ladwp.com) to confirm the start time.

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If you have any questions or comments, please contact Mr. Simon Hsu of my staff at (213) 367-2970, or e-mail him at simon.hsu@ladwp.com.

Sincerely,

Thomas M. Erb
Director of Water Resources

CR:lsf
c: Mr. Simon Hsu

Water and Power Conservation ... a way of life

111 North Hope Street, Los Angeles, California 90012-2607 *Mailing address:* Box 51111, Los Angeles 90051-5700
Telephone: (213) 367-4211 *Cable address:* DEWAPOLA

60-Day Notification Ads (March 3 and 10, 2011)

La Opinion

TENGA PRESENTE que como parte de su reunión programada para el 3 de mayo de 2011, la Junta de Comisionados de Agua y Energía realizara una audiencia publica durante la cual cualquier mimbre del publico podrá comentar sobre la adopción del Plan de Gestión Urbano del Agua 2011 (UWMP, por sus siglas en inglés).

La audiencia se llevara a cabo a la 1:30 p.m. (tentativamente) el 3 de mayo de 2011, 111 N. Hope Street, Los Angeles, cuarto 1555.

Favor de revisar nuestro sitio en la red en: (http://www.ladwp.com) y buscar en "UWMP"

Los Angeles Department of Water and Power

Metropolitan News

.RATION OF PUBLICATION

STATE OF CALIFORNIA

COUNTY OF LOS ANGELES

KIM HUGHES

DEPT OF WATER AND POWER
GOV'T LEGISLATIVE & PUB AFFAIR
111 N HOPE ST RM 1510
LOS ANGELES CA 90012

NOTICE
2010 URBAN WATER MANAGEMENT PLAN (UWMP)

HEARING/CLOSE/SALE DATE: 05/03/11

The undersigned says:

I am over the age of 18 years and a citizen of the United States. I am not a party to and have no interest in this matter. I am a principal clerk of the METROPOLITAN NEWS-ENTERPRISE*, a newspaper of general circulation in the City of Los Angeles, the Judicial District of Los Angeles, the County of Los Angeles, and the State of California, as adjudicated in Los Angeles Superior Court Case No. 601165. The notice, a printed copy of which appears hereon, was published on the following date(s): Mar 3,10, 2011

I declare under penalty of perjury that the foregoing is true and correct. Executed at Los Angeles, California on 03/10/11.

signature

Metropolitan News-Enterprise
P.O. Box 60859
Los Angeles, Ca 90060

Phone: (213) 346-0033
Fax: (213) 687-3886

Cust. Num.: 012120 Control Num.: 851942
Cust. Ref. Num.:

NOTICE OF PUBLIC HEARING
PLEASE TAKE NOTICE that as part of its regularly scheduled meeting on May 3, 2011, the Board of Water and Power Commissioners will hold a public hearing during which any members of the public may comment on the adoption of the 2010 Urban Water Management Plan (UWMP). The hearing will be held at 1:30 pm (tentative) on May 3, 2011, 111 N. Hope Street, Los Angeles, CA, Room 1555. Please check the website (http://www.ladwp.com) to confirm the start time.
The UWMP is currently accessible for review on our website (http://www.ladwp.com) by searching for "UWMP"
Los Angeles Department of Water and Power.
CN851942 Mar 3,10, 2011

Page 1 of 1

PUBLIC COMMENTS

WORKSHOP PUBLIC COMMENTS

Following is a summary of questions, comments received, as well as LADWP responses at public workshops on the City of Los Angeles Draft 2010 Urban Water Management Plan (UWMP). The first round of public workshops were held on January 12th and 20th, 2010 and then a second round was held on February 3rd and 9th, 2011.

Los Angeles Department of Water and Power

2010 Urban Water Management Plan Public Workshop Comments/Suggestions for What Should be Included in the Plan

INCLUDES LADWP COMMENT RESPONSES

Date: January 12 and January 20, 2010

Time: 6:00 – 8:30 pm and 5:00 – 7:00 pm (respectively)

Location: Marvin Braude Constituent Center, 6262 Van Nuys Blvd., Van Nuys, Room 1B
Los Angeles River Center, 570 West Avenue 26, Los Feliz Room

Participants: LADWP (Thomas Erb, David Pettijohn, Simon Hsu, Chris Repp), See Also attached sign-in sheet

Meeting Objective: To present a preliminary summary of the topics to be addressed in the 2010 Urban Water Management Plan (UWMP), and collect comments/suggestions for what should be included in the Plan from the public on these various topics.

If you feel your suggestion is not included, please let us know by e-mailing chris.repp@ladwp.com or calling (213)367-4736.

Links for Workshop Requests

- Plume contamination drawings for the San Fernando Valley, Figures 3-1 to 3-8: http://yosemite.epa.gov/r9/sfund/r9sfdocw.nsf/3dc283e6c5d6056f88257426007417a2/49aa6d700fbae1988825763200575b46/$FILE/2007_SFV_Report_1_Main.pdf
- Graywater systems for residential buildings from the Dept. of Building and Safety: http://www.ladbs.org/LADBSWeb/LADBS_Forms/InformationBulletins/IB-P-PC2008-012Graywater.pdf
- Summer 2009 Water Main Leak Preliminary Investigation Report (dated November 2009): http://www.ladwpnews.com/posted/1475/Summer_09_Water_Main_Leaks_Prelim_Investigation_Rpt_.398503.pdf

Groundwater

1. **Comment:** The groundwater recharge program should be expanded. The vast majority of the LA River and other stormwater runoff wastefully flows directly to the ocean. Much more of the runoff within the City needs to be captured to recharge our aquifers or supplement other supplies.

   Response: LADWP will be preparing a Stormwater Capture Master Plan which will address the potential of stormwater capture infiltration and distributed stormwater capture projects. The Stormwater Capture Master Plan is covered in Section 7.3 of the draft report.

Stormwater Capture and Graywater

2. **Comment:** Land use should be changed to allow more rainwater harvesting and stormwater capture. If a developer wants to build and consequently use more water, they should be required to provide open space to be used for stormwater capture. The City codes should have more emphasis on promoting stormwater capture.

Response: On December 17, 2010, the L.A. City Council directed the Los Angeles City Attorney to draft language for a Low Impact Development (LID) Ordinance addressing new development.

3. **Comment:** LADWP should communicate more with other City agencies (LA City Bureau of Engineering) on LA River and other watershed issues to increase stormwater capture.

   Response: LADWP is working with other City agencies and the LA County Flood Control District to enhance Stormwater Capture. This is detailed in Chapter 7 and 10, particularly in sections 7.1, 7.3, 7.7, and 10.2. LADWP involvement with the LA River is covered in section 10.2, under *Los Angeles River*, and *Agency Coordination.* A case study on the LA River Revitalization is also included in Chapter 3.

4. **Comment:** A good way to study sustainable use and stormwater capture potential is to get universities and large public facilities involved.

   Response: The Stormwater Capture Master Plan will examine alternative methods to implement Stormwater Capture.

5. **Comment:** In terms of Recycled Water Systems for private family residents, the City should implement incentives for graywater applications (see link on first page), rainbarrels, and cisterns.

   Response: LADWP continually assesses conservation programs. For stormwater capture solutions, the Stormwater Capture Master Plan will review potential incentives. The link to the graywater regulations is provided on the first page (Refer to "Links for Workshop Requests"). The Bureau of Sanitation conducted a pilot study for rain barrel use in the City. It is discussed in Chapter 7 of the draft report as "Case Study: Ballona Creek Watershed Rainwater Harvesting Pilot Program". The Bureau of Sanitation, Watershed Protection Division, began the City's first free Rainwater Harvesting pilot program in July 2009.

6. **Comment:** It would be advantageous if there was an action body or group within the City that the public could work with to speed the development of small scale rainwater capture and graywater applications.

   Response: LADWP will continue to look for ways to work with other agencies and stakeholders in advancing stormwater capture solutions. Implementation of Low Impact Development (LID) will significantly facilitate the development of stormwater capture and graywater applications. The link to the graywater regulation is provided on the first page. The LADWP website is currently being revised and should contain additional information on graywater once complete. See also response number 8.

7. **Comment:** In the UWMP there should be more emphasis on practical examples of stormwater capture and rainwater harvesting. More pamphlet materials would also be helpful.

   Response: Chapter 7 – Watershed Management provides three case studies on neighborhood recharge, rainwater harvesting, and stormwater capture. More information will be available following the completion of the Stormwater Capture Master Plan, as part of public outreach. See also response number 8.

8. **Comment:** The new UWMP plan should have specific guidelines and instructions of how to implement graywater and other water saving systems. This would include how to obtain permits from Building and Safety, and would streamline the entire process.

   Response: The link to the graywater regulations is provided on the first page (above) and Section 3.3.1 of the draft 2010 UWMP. It states that a permit is not required for untreated residential graywater systems using water from clothes washers. Furthermore, The LADWP webpage is currently being revised, and once complete will contain updated information on promoting graywater. The website will familiarize our customers with graywater and promote safe and legal installations of graywater systems. It will include various graywater systems, permits required, water saving estimates, frequently asked questions, and additional information resources. LADWP has obtained International Association of Plumbing and Mechanical Officials (IAPMO) approval to use and modify copyrighted material (i.e. graywater figures) to reflect California State regulations.

Water Recycling

9. **Comment:** There should be an emphasis not only on large scale recycling but also on small scale recycling as in rainwater harvesting and graywater applications.

   Response: Section 7.6, entitled Distributed Stormwater Capture, discusses several types of de-centralized stormwater capture, including rain barrels, cisterns, rain gardens, and several neighborhood recharge projects. Graywater is discussed in the Conservation Chapter in Section 3.3.1 and mentioned in response 8 above.

10. **Comment:** Setting incremental goals for recycled water past 2019 onto 2035 is a positive step in meeting the challenge of dependence on imported water. Increasing the amount of recycled water used not only for environmental use, but to replace potable water, is the right direction for the City.

    Response: Chapter 4, Recycled Water, discusses these very issues, covering LADWP's recycled water program for the next 25 years. It includes plans for groundwater replenishment, along with recycled water "purple pipe" distribution projects to industries and businesses within the City.

Costs

11. **Comment:** There is a concern of the increase of water rates, the costs for planned projects, and the marginal costs of various sources of water supply.

    Response: With the exception of the proposed groundwater remediation efforts in the San Fernando Valley, it is believed all resource initiatives in the 2010 UWMP can be funded with current water rates. The groundwater cleanup project is a very costly large scale project, and will require additional funding. Unit costs of various sources of supply are covered in Chapter 11, Section 11.1.

12. **Comment:** The additional funding from increased water rates should be used to improve the water infrastructure.

    Response: Infrastructure improvements (reliability), compliance with regulatory requirements (safety), increasing local supply, protecting the environment (sustainability) and maintaining competitive water rates are the top water priorities for LADWP.

13. **Comment:** The decision to implement particularly expensive projects throughout the City should be based more upon environmental and economical feasibility than on neighborhood influence. This benefits the greater good of the community.

    Response: When moving forward with expensive water resource projects, LADWP considers environmental and economical feasibility. A good example is that recycled water is favored over seawater desalination mainly because of its more competitive cost and lesser environmental impact.

Los Angeles Department of Water and Power

2010 Urban Water Management Plan Public Workshop Comments/Suggestions for What Should be Included in the Plan

New Developments

14. **Comment:** There should be a link between water supply and community development planning.

    Response: The link between water supply and development planning is explained in Section 11.4, Water Supply Assessments.

15. **Comment:** New developments (particularly those on multi family residences) should bear a greater burden for the costs of acquiring water. The cost of acquiring additional water supply is unjustly being shared by the rate payers.

    Response: This comment will be recorded and included in the appendix of the 2010 UWMP.

16. **Comment:** In terms of conservation, some high-density projects may be beneficial in ways such as allocating more open space that can be used for stormwater capture.

    Response: The City of Los Angeles is close to adopting a low impact development (LID) ordinance requiring stormwater capture for all new development.

Climate Change

17. **Comment:** LADWP needs to educate constituents about the water crisis and the potential effects of dry climate conditions furthering the drought situation. The Department should enlist experts to provide insight into this challenge.

    Response: Chapter 12 is dedicated to the topic of climate change. LADWP is currently conducting a climate change study regarding its impacts on the Eastern Sierra watershed, which provides water to the Los Angeles Aqueduct.

Conservation

18. **Comment:** Some of the lesser known Phase III Water Conservation Ordinance restrictions should not be lifted if they produce a City that is more responsible and efficient.

    Response: Conservation efforts in Los Angeles have proven very successful, and have significantly increased water use efficiency in the City. The Los Angeles City Council ultimately determines whether or not these restrictions are lifted. At this time LADWP does not recommend any changes.

19. **Comment:** LADWP should work with other City departments to ensure maximum public benefit with the incentive programs. Additional fees across departments may discourage the use of these incentives.

    Response: LADWP will keep this in mind to ensure incentive programs are effective. LADWP recently worked with the L.A. Department of Building and Safety (LADBS) to eliminate fees for turf removal in parkways.

20. **Comment:** Conservation alone is not adequate to sustain an increasing population. We will need to introduce additional and/or increased supplies.

    Response: Exhibit 11C of Section 11.2.8, entitled Service Area Reliability Assessment, highlights LADWP's plans to increase our local supplies significantly. This will reduce purchase of imported water from the Metropolitan Water District by approximately 50 percent by 2035.

Los Angeles Department of Water and Power

2010 Urban Water Management Plan Public Workshop Comments/Suggestions for What Should be Included in the Plan

Water Supplies

21. **Comment:** There is concern over the amount of water used for environmental reasons in the Owens Valley as this supply diversion significantly increases our dependence on imported water.

    Response: Annually, LADWP diverts up to 95,000 acre-ft (AF) of Los Angeles Aqueduct water for the Owens Lake Dust Mitigation Project. This is one of the City's many environmental challenges. LADWP is proposing dust mitigation solutions on Owens Lake that will not increase water usage from what is currently used.

22. **Comment:** There is concern about meeting our supplies with an ever growing City population, and an interest in seawater desalination. As costs of various water supplies increase, and technological improvements lower operating cost, it may eventually become economically feasible. However desalination still has its fair share of environmental challenges.

    Response: LADWP has studied seawater desalination and concluded that it presents too many economic and environmental obstacles at this time. LADWP has decided to focus its efforts on water conservation and recycling.

23. **Comment:** It would be beneficial to have a long term vision for eliminating the City's need for water imports.

    Response: See comment number 20.

Miscellaneous

24. **Comment:** There is an interest in the cause of recent water main breaks (See also link on first page); it's relation to the two day water restriction, and the bombardment of overweight trucks.

    Response: The link on the first page shows the Summer 2009 Water Main Leaks Preliminary Investigation Report. In addition, the Conservation chapter shows the most recent Water Conservation Ordinance amendments, which implement revised Phase III restrictions. In the amendments, odd numbered addresses are allowed to water on Monday, Wednesday, or Friday, while even numbered addresses can water only on Tuesday, Thursday, or Sunday. This is designed to prevent large fluctuations of pressure within the water distribution system.

25. **Comment:** The City should set up a forum with blogs where the public can share ideas and comments on water related issues.

    Response: As discussed in comment number 6, the LADWP website is currently being revised. It will include Facebook and Twitter links.

Los Angeles Department of Water and Power

Summary of 2010 Urban Water Management Plan Public Workshops Comments and Suggestions with LADWP Responses

Workshop 1: February 3, 2011, Van Nuys Service Center, 14401 Saticoy St.

Workshop 2: February 9, 2011, LADWP John Ferraro Building, 111 N. Hope St.

Attendees: See attached sign-in sheets

Water Demands

1. **Comment:** How long has the State Department of Water Resources required submittal of Urban Water Management Plans (UWMP)? Historically, how accurate have the projections been?

   Response: The water demand projections and UWMP have been a requirement since the UWMP Act was established in 1984. Historically, LADWP's projections have turned out to be higher than actual use. The 2010 UWMP is the first UWMP where water demand projections are significantly lower than previous versions. Section 2.3 provides a description of the demand forecast methodology.

2. **Comment:** Water demand projections are significantly lower than those developed in the 2005 UWMP. Why is this?

   Response: As stated above, previous projections were higher than what actually occurred. For this UWMP, LADWP devoted a lot of study on projected water demands and developed a new forecasting model. Water efficient practices and numerous regulations effecting water use are much more commonplace than in the past, which are expected to prevent significant increases in water demands.

3. **Comment:** The population increased in the last 30 years but water usage has seemed to decrease. However, LADWP has now projected a continual increase with population and increase in water demand. What is changing this historical trend?

   Response: Today, as compared to the 1970's and 1980's, the City has achieved a much higher level of conservation. This is why our water demand has stayed relatively the same even though the City population has increase by over 1 million since 1970. As the City continues to grow in population, water demand is projected to increase slightly.

4. **Comment:** Why is water use staying relatively the same versus a steady increase of population over time?

   Response: The City's water use has not increased significantly due changes in customer awareness and efficient use of water, more stringent plumbing standards, LADWP incentives and rebates, and requirements such as mandatory restrictions on water use.

5. **Comment:** Twenty five years from now what percentage of our water supply will come from local water supplies?

   Response: According to the UWMP 43 percent of water supplies will come from local sources in 2035. By increasing water conservation, recycled water, and stormwater capture, LADWP is projecting to cut the current average annual amount of MWD purchases in half in 25 years.

6. **Comment:** Through 2050, the Southern California Association of Governments (SCAG) projects the Southern California area to double in size from 15 to 30 million people. How can we meet these water requirements, especially considering that other adjacent cities are far behind LA and have not implemented such aggressive conservation measures?

   Response: The major focus of LADWP's UWMP is the development of increased local water supplies to lessen our dependence on imported water that must be shared with all of Southern California. Many other cities in Southern California are pursuing similar local water resource goals. State Senate Bill X7-7 (SBX7-7), passed by the State Senate in 2010 requires a 20 percent reduction in water use by all water agencies by 2020. This requirement will assist in driving other agencies to meet conservation targets.

7. **Comment:** The presentation shows a slight increase in Los Angeles Aqueduct supplies will increase in 2035. Why?

   Response: The most recent 5-year average Los Angeles Aqueduct deliveries are slightly lower than the historical average. The 2035 projection of Los Angeles Aqueduct deliveries assumes average weather conditions, with a slight decrease due to anticipated climate change impacts.

Water Supplies and MWD

8. **Comment:** Where, how, and when is the connection between the State Water Project and Los Angeles Aqueduct (LAA) going to be built?

   Response: A turnout facility is currently being constructed where the Los Angeles Aqueduct and the California Aqueduct intersect in the Antelope Valley, a few miles west of the 14 freeway. The purpose of the facility is to allow the pumping of water from the California Aqueduct into the Los Angeles Aqueduct and allow LADWP to participate in water transfers from the water market. The turnout facility is currently under construction and should be in service by the summer of 2013.

9. **Comment:** Is there a document that summarizes the structure of water supplies for the City?

   Response: The UWMP is primary water resource planning documents. It is updated every 5 years.

10. **Comment:** Is LADWP planning to purchase more water from the Bay-Delta?

    Response: There are a number of water supply and environmental challenges in the Bay-Delta. As outlined in the UWMP, LADWP is planning on decreasing purchases from MWD, which imports water from the Bay-Delta. The UWMP discusses how local water supplies are being developed and how LADWP is planning to rely less on MWD.

11. **Comment:** MWD has been decreasing its allocations from the Bay-Delta via the State Water Project, and Colorado River storage has been decreasing as is evident in Lake Mead's low levels. The City's water demand will increase while LADWP's supply from MWD seems to decrease. How can LADWP reconcile this difference?

Response: LADWP projects a small increase in water use due to population increases, however the UWMP projects LADWP's reliance on MWD water supplies will be reduced by half; from the current five-year average of 52 percent of total demand to 24 percent by 2035 under average weather conditions. The reliability of MWD's water supplies from both the State Water Project and the Colorado River are discussed in detail in Chapters 8 and 11 of the UWMP.

12. **Comment:** What water will be exchanged when the connection between the California Aqueduct and the Los Angeles Aqueduct is developed?

    Response: LADWP will seek to purchase water from willing sellers, most likely agricultural entities. State Water Project supplies provided to agencies such as MWD will not be a source of these water purchases.

13. **Comment:** Is there a reciprocal agreement between Metropolitan Water District and LADWP on water transfers occurring at the connection of the California Aqueduct and Los Angeles Aqueduct?

    Response: Yes, there is a reciprocal agreement between MWD and LADWP. MWD has the exclusive right to sell State Water Project supplies within its service territory. LADWP has the ability to move non-State Water Project water through the California Aqueduct into LADWP's service territory.

14. **Comment:** Are there salinity problems with Colorado River water?

    Response: Salinity continues to be an issue with Colorado River water supplies. MWD addresses this through water blending. MWD blends Colorado River Aqueduct water with lower salinity State Water Project water.

Water Conservation and Graywater

15. **Comment:** Is the new watering schedule going to decrease the effectiveness of LADWP's outdoor watering conservation efforts?

    Response: The new watering schedule went into effect in late August 2010. Since that time, water savings have been essentially unchanged compared to the period prior to the change. Overall monthly conservation savings continue at approximately 20 percent, with single-family residential savings at approximately 25 percent. LADWP will continue to monitor conservation.

16. **Comment:** LADWP should abandon the Irrigation Association Smart Water Application Technologies (SWAT) testing as a means of evaluating weather based irrigation controllers.

    Response: The SWAT project is an international utility/irrigation industry initiative to achieve landscape water use efficiency through the application of irrigation technology. It includes an independent third party testing protocol for weather based irrigation controllers. LADWP's Water Conservation staff is reviewing this suggestion with the individual who provided it.

17. **Comment:** LADWP should have more information and guides on graywater projects.

    Response: The LADWP website update will contain information on graywater. Included will be information on benefits, available alternative installations, costs and savings, and how to obtain permits.

Water Recycling

18. **Comment:** What are LADWP's plans to use recycled water for environmental enhancement improvements?

    Response: Recycled water is currently being provided for the Sepulveda Basin Japanese Garden, Lake Balboa, the Wildlife Lake, and the Los Angeles River. Those commitments will be maintained as LADWP expands recycled water use.

19. **Comment:** Provide a description of the Recycled Water Master Plan.

    Response: Section 4.4 of the UWMP describes the components of Recycled Water Master Plan. Once complete, the Recycled Water Master Plan will act as a roadmap for how to expand recycled water in the City.

Stormwater Capture

20. **Comment:** Why are the stormwater infiltration goals of 10,000 AF of rainwater harvesting and 15,000 AF of infiltration so low?

    Response: Currently, stormwater infiltrates and replenishes local groundwater basins so LADWP can fully exercise its pumping rights. The UWMP projects that by 2035 there will be a minimum of 15,000 AFY of increased groundwater pumping in the San Fernando Basin due to water supply augmentation through stormwater infiltration. In order to increase groundwater production, it must be determined that not only have groundwater levels recovered to sustain existing safe yield pumping amounts, but documented additional infiltration is occurring that could potentially increase the safe yield. Increasing the safe yield will require concurrence by the Watermaster and the courts to amend the basin judgment. Amending the judgment would be a lengthy process involving all basin pumpers. More studies must be conducted to determine how much more infiltration must be developed to increase the safe yield and groundwater production. The Stormwater Capture Master Plan will identify the potential acre-feet per year quantities available for recharge, and develop an implementation plan to augment the groundwater basin through centralized and decentralized infiltration projects and programs.

21. **Comment:** Provide a description of the Stormwater Capture Master Plan, and what is its cost?

    Response: A Request for Proposal for consulting services to prepare a Stormwater Capture Master Plan has been released. The Master Plan's goal is to study the potential for increased stormwater capture and identify feasible alternatives and estimated costs. The cost of the Master Plan will be determined once proposals are received and reviewed, and a contract negotiated.

22. **Comment:** The City states that it will cost $8 billion for stormwater capture projects. How does the Stormwater Capture Master Plan fit in with this cost?

    Response: While the City has potential obligations for improving stormwater quality, the Stormwater Capture Master Plan's focus is on developing new water supplies. However, the Stormwater Capture Master Plan will include input from other City departments and examine potential alternatives that achieve multiple objectives.

23. **Comment:** Watershed management needs to be evaluated on a regional level.

    Response: LADWP increasing coordinates with other agencies and organizations on watershed issues, including the United States Army Corps of Engineers, the Los Angeles County Flood Control District, the Greater Los Angeles Integrated Regional Water Management Group, the Los Angeles and San Gabriel Rivers Watershed Council, and numerous environmental organizations and stakeholders. LADWP will continue to work with others to improve regional coordination of watershed management.

24. **Comment:** Construction of more subsurface infiltration basins will help counteract the effects of hardscape in the City.

    Response: Agreed. LADWP participated in the Elmer Avenue Neighborhood Retrofit Demonstration Project, the North Hollywood Alley Retrofit Project, and other projects to highlight alternatives to impervious hardscape.

25. **Comment:** Required infiltration from roof gutters on property development should prevent more runoff

    Response: The City's Low Impact Development Ordinance will require stormwater capture and reuse on all new development. Capturing water from roof gutters is one available option to meet the Ordinance requirements.

26. **Comment:** Construction of reservoirs along the Los Angeles River is a good way to enhance infiltration of runoff along the Los Angeles River channel.

    Response: This option may be feasible if available parcels can be identified and obtained.

27. **Comment:** There are some areas in the City that have historically had repeated flooding. What is being done to solve this problem?

    Response: While flood control is not LADWP's primary mission, it is possible that areas prone to flooding may also be candidates for stormwater capture projects. Examples are the Elmer Avenue Neighborhood Retrofit Demonstration Project and the recently approved Woodman Avenue Multi-Beneficial Storm Water Capture Project. LADWP will seek involvement by other City departments during the preparation of the Stormwater Capture Master Plan to explore solutions that have multiple benefits.

28. **Comment:** There should be collaboration with the City Planning Department to regulate the structure of roofs and gutters on parking lots, etc., to promote infiltration and water reuse on new projects.

    Response: LADWP works with other City departments on ordinances to require stormwater capture for all new developments in the City. An example of this is the Low Impact Development (LID) ordinance, currently being drafted by the City Attorney. See Section 7.6.4.

29. **Comment:** How is LADWP working to increase capture of stormwater runoff in urban developments such as parking lots and other hardscape?

    Response: LADWP is currently participating in various stormwater capture demonstration projects in order to develop alternative city-approved construction standards and gather cost data. An example is the Elmer Avenue Neighborhood Retrofit Project. LADWP actively worked on the development of the Low Impact Development

Ordinance currently being drafted, and has begun the process to initiate a Stormwater Capture Master Plan to identify the potential for stormwater capture and identify alternative solutions.

30. **Comment:** Does LADWP partner with other agencies to promote more progressive parking lot strategies and similar approaches to increase stormwater capture?

    Response: LADWP worked with other City departments on the Low Impact Development Ordinance, and continues to work with other departments on the Green Streets Committee and stormwater capture demonstration projects. Increased stormwater capture from parking lots will be explored in the Stormwater Capture Master Plan.

Groundwater

31. **Comment:** What is the percent make-up of the City's local groundwater supply?

    Response: Historically, 15 percent of the City's total water supply has come from local groundwater. However, due to contamination issues in the San Fernando Basin, the City's largest groundwater source, local groundwater currently comprises only 11 percent of overall water supplies.

32. **Comment:** LADWP has not been able to meet groundwater production as stated in previous Urban Water Management Plans. The Department needs to improve their approach to meet the long-range groundwater goals. How will LADWP do this?

    Response: Groundwater contamination has prevented LADWP from pumping its full entitlement. LADWP is conducting a comprehensive analysis of groundwater quality to determine the location and type of treatment necessary to fully clean up the contamination. The analysis will lead to specific groundwater treatment project proposals. With groundwater improvements in place, LADWP expects to meet long-range groundwater pumping goals.

33. **Comment:** Water supply issues in the Bay-Delta could be offset by using advanced treated groundwater. What type of treatment technologies are planned for groundwater cleanup in the San Fernando Basin?

    Response: The analysis of San Fernando Basin contaminants and potential treatment technologies is still being studied. However, potential treatment methods under review include: Air Stripping with Vapor Phase Granular Activated Carbon and Liquid Phase Granular Activated Carbon (for volatile organic compounds), Ion Exchange and/or Biological Treatment (for nitrate and perchlorate), Catalytic Media Filtration (for heavy metals), Ultraviolet Light/Hydrogen Peroxide (for 1,4, dioxane and NDMA), Filtration (for chromium 6), and Reverse Osmosis (for total dissolved solids).

34. **Comment:** Are there groundwater storage opportunities up North in areas outside of the City?

    Response: Yes. The Antelope Valley contains a large groundwater basin that can be used for groundwater storage. In the Antelope Valley, the City of Los Angeles is a party in current litigation to establish an adjudication that will potentially address storage rights. Other groundwater storage opportunities exist in the San Joaquin Valley. While groundwater storage outside of the Los Angeles basin can assist with water supply management, it is not a new water supply and is potentially costly. LADWP will continue to review opportunities for cost-effective groundwater storage outside of the Los Angeles basin.

Costs

35. **Comment:** There is a significant concern over water rates and costs associated with all the projects in the 2010 UWMP.

    Response: The UWMP includes information on the costs of different resource options. With existing revenues for local supply development, LADWP believes we can achieve the water resource goals as stated in the 2010 UWMP, with the exception of the groundwater cleanup effort which will require rate increases. Section 11.1 addresses unit costs and funding.

36. **Comment:** The LADWP Power System is planning to significantly increase energy rates to support green energy sources. How will the Water System deal with the extra cost of the groundwater cleanup alongside the power cost increase?

    Response: All proposed rate increases are reviewed with Neighborhood Councils and the public, and the LADWP Board of Commissioners carefully considers the justification and impact of increased rates prior to making any decision. Also, all LADWP rate revisions require approval by the Los Angeles City Council.

Climate Change

37. **Comment:** To what region does the climate change study apply?

    Response: The climate change study LADWP is conducting is specifically for the Eastern Sierra watershed that feeds the Los Angeles Aqueduct. However, Section 12.1 provides information on projected local climate change impacts.

Miscellaneous

38. **Comment:** There is an interest in ocean desalination. Why is this not a water supply LADWP is pursuing?

    Response: Five years ago, LADWP conducted studies and began planning an ocean desalination pilot project adjacent to the Scattergood Power Generation Facility. However, we found desalination to be too costly and have numerous environmental challenges. LADWP determined that conservation and recycling are more cost effective, easier to implement, and more environmentally friendly.

39. **Comment:** Explain the inconsistency whereby City Planning Department updates to the General Plan are not in line with LADWP's updates for the 2010 UWMP projections.

    Response: The UWMP includes projected population increases provided by demographic projections from Southern California of Governments (SCAG) data. The City's General Plan also uses population forecasts provided by SCAG data; therefore, the UWMP projections are generally consistent with the City's General Plan as both use SCAG projections as their basis. Both of these planning documents are interdependent, however, their updates may not necessarily be on the same schedule.

40. **Comment:** The 2010 UWMP should state that the City's water allotment is based on the preferential rights agreement of the MWD Allocation Plan which is now a fixed number and does not increase with City's demographics or demand projections.

    Response: MWD adopted a Water Supply Allocation Plan in 2008 that is not based on preferential rights. If shortage allocations are required, the calculations established in the Water Supply Allocation Plan equitably allocate available supplies among MWD's member agencies primarily based on need, with adjustments to account for growth, local investments, changes in supply conditions, demand hardening, and water conservation programs.

41. **Comment:** LADWP is doing a good job of projecting demands and implementing conservation, recycling, and stormwater programs; however, LADWP still has a long way to go.

    Response: The 2010 Urban Water Management Plan highlights the significant potential for increased local resources development.

42. **Comment:** Financial incentives, either positive or negative, should be used to modify water use behavior. Rebates and incentives for exceptional conservation or citations for water waste will help encourage conservation and spread the word of efficient water use.

    Response: Since November 2008 the Water Conservation Team (formerly know as Drought Busters) have been enforcing the City's Emergency Water Conservation Ordinance, issuing both warnings and citations for water waste. Also, LADWP continues to offer rebates and incentives for all customer types.

43. **Comment:** Development should be limited and should be required to compensate for additional water needs.

    Response: In December 2009, the High Efficiency Plumbing Ordinance went into effect requiring the next generation of water efficient plumbing fixtures in all new development. Also, the City Attorney is currently drafting the Low Impact Development Ordinance for City Council approval that will require on-site stormwater capture for all new development.

44. **Comment:** In the "Securing L.A.'s Water Future" presentation, under Regulatory Requirements – Other, there are significant proposed expenditures of $337 million. What are these expenditures for?

    Response: The largest portion of these proposed expenditures are for air quality requirements at Owens Lake.

45. **Comment:** Please explain the high number of pipe breaks recently. Is it because of the watering schedule?

    Response: The expert panel formed to examine pipe breaks reviewed possible causes. The panel reviewed whether the 2-day per week watering schedule in place at the time was contributing to the increased frequency of pipe leaks. The 2-day per week watering schedule caused water system pressures to cycle more frequently than prior to watering restrictions. The panel theorized that these pressure cycles increased pipe breaks. In response to that analysis, the City Council modified the watering schedule to 3-days per week watering, with separate watering days for odd and even addresses.

46. **Comment:** Explain the budget for groundwater storage.

    Response: There is $2 million budgeted for groundwater storage in fiscal year 2010-11 to study groundwater storage opportunities outside of the Los Angeles basin.

47. **Comment:** How many miles of riveted steel pipe does LADWP have?

    Response: LADWP has 86.3 miles of riveted steel pipe within the city's water distribution system. In addition, the First Los Angeles Aqueduct contains 13.8 miles of riveted pipe.

48. **Comment:** Describe the power usage of the State Water Project in comparison to the Los Angeles Aqueduct?

    Response*:* As explained in the UWMP's Section 12.2 entitled "Water Energy Nexus", State Water Project supplies are the most energy intensive, ranging from approximately 2,580 kilowatt hours per acre foot (kWh/AF) for the west branch, to 3,236 kwh/AF for the east branch. The Los Angeles Aqueduct water is conveyed from the eastern Sierra Nevada watershed by gravity flow, and does not require pumping as compared to the State Water Project water. Los Angeles Aqueduct water requires no energy for delivery and generates hydroelectric power as it travels from the eastern Sierra Nevada to Los Angeles.

49. **Comment:** What is LADWP doing to install individual meters for multi-family residences?

    Response: LADWP supports efforts to encourage individual meters in new multi-family construction. Studies show that customers who pay individual water bills use water more efficiently.

50. **Comment:** When will electronic meters be used?

    Response: LADWP continues to investigate so-called smart water meters and at this time we do not have an estimate when they will begin to be introduced. Smart water meters allow for more frequent readings and can provide useful water information such as leak detection.

51. **Comment:** What is the current status of the Palos Verdes Reservoir in San Pedro? Is it empty?

    Response: The Palos Verdes Reservoir is owned and operated by MWD. It is in service, but looks empty since a floating cover is installed. This floating cover is one option that we are investigating for some of our own open reservoirs to meet water quality regulations.

52. **Comment:** Is most of the infrastructure work being done going to be performed by LADWP employees or will any of the work be contracted out?

    Response: Major water quality improvement projects, such as reservoir covers will be contracted out. Small diameter pipe replacement is performed by LADWP personnel. For large diameter pipelines, it is estimated that approximately half will be contracted out and half performed by LADWP personnel.

WRITTEN PUBLIC COMMENTS

Following are responses to written correspondences (attached) from Accurate WeatherSet, S.Schron, Edward Saltzberg & Associates Forensic Mechanical Engineers, David Coffin, Phoenix, Aquacell, Heal the Bay, Joyce Dillard, Elmco/Duddy, Environmental Now, TreePeople, and Southern California Watershed Alliance on the City of Los Angeles Draft 2010 Urban Water Management Plan (UWMP).

Responses to Written Questions

Heal the Bay, 3/15/11

Question: Why have water recycling goals decreased from the original target?

Response: Recycled water projections in the UWMP reflect what can be achieved with the existing amount of annual revenue. Receipt of federal or state grants will allow projections to be increased.

Question: LADWP should prioritize stormwater capture projects and set goals for new stormwater capture projects in Los Angeles. When will the Stormwater Capture Master Plan be completed?

Response: The Stormwater Capture Master Plan will address these suggestions. It is projected that the Master Plan will be completed by the fall of 2013.

Joyce Dillard, 3/15/11

Question: You conclude that outdoor water use is estimated at 39% of demand, but the water demand data in Exhibit 2C does not indicate a reason to come to that conclusion.

Response: The projection of outdoor water use is based on estimated water needs for landscape irrigation and an analysis of wastewater system flows compared to total water consumption. Section 2.1 of the UWMP discuss the analysis.

Question: What is the definition of non-revenue water use?

Response: Non-revenue water use is defined as the difference between the total water supplied to the City and total water sales. Non-revenue water consists of water for used for fire fighting, reservoir evaporation, pipeline leaks, meter errors, theft from hydrants, water used for street sweeping and pipeline flushing for water quality purposes.

Environment Now, 3/15/11

Qustion: Why has LADWP been behind on its water recycling targets compared to the original benchmark? Why have the water recycling goals decreased from the original target?

Response: The 2010 UWMP water recycling targets and current progress reflect the current level of revenue. Based on current levels of revenue, LADWP projects they can meet the current water recycling goals. If LADWP is successful in acquiring additional grants, then goals may be increased.

TreePeople, 3/15/11

Question: Page 11-8, Exhibit 11E: Note 1 indicates a loss in the LA Aqueduct at 0.1652% per year due to climate change. There is no indication of loss from MWD (California Aqueduct, and Colorado River Aqueducts) due to climate change. Does this account for MWD's projections?

Response: MWD's recently adopted 2010 Regional Urban Water Management Plan (RUWMP) and their 2010 Integrated Resources Plan (IRP) documents discuss in detail the potential impacts to supplies to the California and

Colorado River Aqueducts due to climate change. LADWP's draft 2010 Urban Water Management Plan (UWMP) makes references to these to MWD documents.

Although MWD's State Water Project (SWP) contract entitlement is 1,911 thousand acre-feet (TAF), projected SWP water deliveries to MWD are expected to be much less than their full entitlement due to many factors. The State's Department of Water Resources (DWR) issued the 2009 draft Reliability Report which identified climate change as one of the significant factors that could reduce future SWP water deliveries. MWD used the DWR's 2009 Reliability Report in reporting its SWP supply projections in its RUWMP, which was the source document for MWD SWP supplies as reported in the LADWP's 2010 UWMP.

The impacts of climate change is also projected to reduce Colorado River supplies, however, it's not expected to impact California as the state has senior water rights on the use of Colorado River water. Under the Seven Party Agreement of 1931 that divided California's share of the Colorado River supplies among the seven major water uses in the state, MWD's full Priority 4 Apportionment of Colorado River water has been consistently delivered and can reasonably be expected to be available in the future as indicated in their RUWMP. This is due in part to the fact that MWD's allocation of Colorado River holds a senior priority right to both Nevada and Arizona. In effect this means that any shortages on the Colorado River from climate change or other causes up to 1 million acre-feet will be born first by Arizona and Nevada before MWD is impacted.

Please note that MWD's SWP and Colorado River supply projections in their RUWMP indicate no reductions in deliveries even during extended dry periods because MWD has made numerous investments in other water supply and storage programs on the Colorado River, which are in addition to MWD's projected base apportionment and entitlement deliveries. MWD's 2010 IRP also establishes goals for a range of potential "buffer" supplies, up to approximately 500,000 acre-feet, to protect the region from possible shortages due to potential climate change and other impacts to its supplies.

Southern California Watershed Alliance (3/28/11)

Question: Regarding Exhibits 2I, 2J, and 2K. While projection of conservation savings go up, the demand seems to rise gradually until 2035. If you take the historic savings in the last few years and combine that with future investments why would demand continue to rise?

Response: Exhibit 2I was found to contain some errors and has been corrected and updated. It now shows that per capita water use consistently decreases. Though per capita water use decreases due to increased conservation efforts, demand will continue to increase in the future due to projected economic growth and population increases.

Question: Why, on page 3-5, did you choose Method 3 for reporting, when you are already at 19% conservation? If the current gallons per capita per day is 124, by taking this approach you are actually looking at a higher per capita into the future.

Response: LADWP reviewed all four available methods for compliance with the State's 20 percent by 2020 water use efficiency mandate and selected Method 3 because it is the most straightforward calculation method which also accounts for the City's past conservation investments.

Responses to Written Comments

Edward Saltzberg & Associates Forensic Mechanical Engineers, 2/28/11

Comment: Have a list of abbreviations on a page that readers can refer to if they are not conversant with all of the acronyms. In the written material, spell out what an abbreviation stands for when it's first used in a section.

Response: LADWP has created a Glossary of Abbreviations and Terms which is included in the final 2010 UWMP, and reviewed the UWMP to spell out abbreviations when first used.

Heal the Bay, 3/15/11

Comment: LADWP should investigate reclaimed water purification as a water supply alternative in the future. LADWP should explore advanced wastewater treatment for future indirect or even direct potable use before exploring seawater desalination as an option for water supply.

Response: The UWMP outlines plans for groundwater replenishment of advanced treated recycled water in the San Fernando Valley. The current Recycled Water Master Plan is reviewing the long-term potential of advanced treated water from the Hyperion Wastewater Treatment Plant for groundwater replenishment as well as potential direct potable use.

Comment: LADWP should provide further support for Los Angeles Unified School District (LAUSD) to achieve the goals set forth in the LAUSD Water Savings Resolution. In addition to providing financial incentives for retrofits and for new zero-water urinal and high efficiency toilets used in a new construction project, LADWP should provide incentives for new fixtures in redevelopment and retrofit projects as well. In addition to these rebates, LADWP should consider expanding the purple pipe system to LAUSD schools.

Response: LADWP does provide conservation rebates and incentives for redevelopment and retrofit projects, in fact, these rebate amounts are significantly more than those for new construction. Some LAUSD schools are currently receiving recycled water. The Recycled Water Master Plan will identify expansion of purple pipe projects to reach additional schools.

Mr. David Coffin, 3/7/11

Comment: Water supply projections published in previous UWMP's between 1990 and 2005 have been much higher than actual water supply.

Response: It is true that previous UWMP water supply projections turned out to be higher than actual demands. However, it is important to point out that projections of supply reflect what can be produced and delivered if necessary to meet projected demands. If actual demands do not materialize at projected levels, then less supply is produced and delivered to meet those demands.

In previous UWMP's, LADWP anticipated that demands would gradually increase over time. This has not been the case for several reasons. The City has been successful in implementing one of the country's most aggressive water conservation programs. Additionally, demand forecasts could not foresee events such as economic recession, environmental and regulatory restrictions on Delta exports, and the recent multiple dry year conditions throughout California and the Southwest. All of these factors have lead to changes in customer water use behavior resulting in both increased water use efficiency and decreased demands.

The net effect of these changes were that LADWP produced and purchased less water to meet actual demands than was envisioned in previous UWMP's between 1990 and 2005.

Comment: UWMP's between 1990 and 2005 seriously miscalculated future groundwater supply projections.

Response: We agree that previous UWMP's contained groundwater projections that were significantly higher than the actual groundwater yield. There are several reasons for this over projection. For instance, previous UWMP's groundwater projections envisioned groundwater replenishment with recycled water which would increase groundwater yield. However, previous plans to replenish the groundwater basin with recycled water were halted following public opposition.

In addition, starting in the mid 1980's, LADWP significantly decreased groundwater pumping in order to minimize the migration of a contamination plume toward active wells in the San Fernando Groundwater Basin (SFB). Contamination issues in the SFB continue to adversely affect groundwater pumping. To restore LADWP's full groundwater pumping rights in the SFB, the 2010 UWMP incorporates plans for construction of groundwater contamination treatment facilities. Additionally, the 2010 UWMP includes increases in groundwater pumping due to groundwater replenishment with advanced treated recycled water as well as increased stormwater capture.

Comment: Water Supply Assessments should cite the UWMP and not the City's General Plan when assessing the proposed water demand for a project.

Response: LADWP does cite the UWMP in water supply assessments in accordance with Water Code Section 10910.

UWMP Section 11.4 Water Supply Assessments states that LADWP's UWMP uses anticipated growth as provided by demographic projections from Southern California of Governments (SCAG) data, re-allocated by MWD into LADWP's service area. The City's General Plan uses population forecasts as provided by SCAG data as well; therefore, the UWMP projections are consistent with the City's General Plan as both use SCAG projections as their basis.

In preparing water supply assessments, LADWP works with the Planning Department to confirm that all proposed projects conform to the City's General Plan.

Comment: The City's allocation of water from the Metropolitan Water District is based on property tax assessments and the value of the investments it has made with MWD infrastructure projects.

Response: The City's preferential rights to purchase water from MWD, as defined in Section 135 of the MWD Act, was not included in the development of MWD's Water Supply Allocation Plan (WSAP). While it is correct that the City may have this entitlement, no member agency, including the City, has historically ever invoked this entitlement during an allocation of water by MWD.

The WSAP is discussed in the UWMP, Section 11.2.6, entitled "MWD Imported Supplies". LADWP, along with other member agencies, worked collaboratively with MWD in developing the WSAP to equitably allocate water supplies during periods of a regional shortage by taking into account many factors including demands, growth, local investments, changes in supply conditions, and water conservation programs. Preferential entitlement was not a factor in developing the WSAP, which is fundamentally a needs-based allocation plan.

Joyce Dillard, 3/15/11

Comment: 2035 water demand projections for most customer service sectors exceed the 2005-2010 average water usage. You need to compare the projections with baseline per capita use to see if 20 percent by 2020 compliance can be obtained.

Response: Although water use in some customer sectors is projected in to increase, expanded water conservation and water recycling will offset this increase water use. LADWP projects we will be in compliance with 20 by 2020 requirements.

Comment: Recycled water cannot be sold to water down dust on horse ranches, yet you consider irrigation usage.

Response: The California Department of Public Health and Los Angeles Regional Water Quality Control Board recently provided approval for use of recycled water for dust control subject to certain conditions. LADWP recycled water staff will be working with interested customers to comply with the new regulations so recycled water use can be expanded.

Comment: Non-adjudicated groundwater basins such as the Santa Monica Basin and the Hollywood Basin are not addressed.

Response: Chapter 6 of the UWMP was amended to mention these unadjudicated basins, and LADWP's plans to revisit previous studies to determine the current potential for expanded groundwater supplies.

TreePeople, 3/15/11

Comment: Page 2-9 Exhibit 2I – Although we applaud LADWP's leadership in water conservation, we believe much greater water savings can be obtained and will be necessary to meet future local water needs. We believe that LADWP should continue to lead by setting conservation targets that well exceed the minimum 20 x 2020 state mandated goals. Exhibit 2I appears to assume no new innovation or transformation will take place beyond 2015.

Response: Exhibit 2I was based on a preliminary demand forecast model and contained erroneous data. It has now been corrected and updated.

Comment: Page 3-26: Identify next steps necessary for incorporating graywater systems into LADWP conservation programs.

Response: The section on graywater in Chapter 3 was amended to state that LADWP is reviewing the concept of assisting in the creation of ad hoc committees to develop a standard for graywater systems.

Comment: Page 7-10 references "Exhibit 7D" which "summarizes the potential water yield and average unit cost of the different resources available to increase localized capture and infiltration of runoff" is missing from the document, or is this referencing the cost table "Exhibit 7H"?

Response: The exhibit reference was corrected. Also, Exhibit 7H has now been revised to Exhibit 7G.

Comment: Page 7-17 and Exhibit 7H: Update cost table with new figures.

Response: Updates have been incorporated into the final 2010 UWMP. Exhibit 7H has been renamed to Exhibit 7G.

Comment: Replace "drought tolerant" with "climate appropriate" throughout the document. Climate appropriate is becoming the more accepted description for landscape transformation.

Response: This change has been made throughout the final 2010 UWMP.

Comment: Page 7-22, Section 7.6.5 Future Distributed Stormwater Programs: Add rain gardens to the list of potential rebates (TreePeople is beginning a pilot rain garden rebate program with the Watershed Management Group).

Response: A reference to rain gardens have been added to section 7.6.5.

Comment: Page 7-24 (revise language): "Furthermore, distributed stormwater capture projects yield additional benefits to the public outside of water supply generation such as flood control, restored native habitat, community beautification, public right of way improvements, water conservation, as well as private residence safety and aesthetic improvements."

Response: This suggested change has been made.

Comment: Chapter 7 General: Revisit the projected stormwater capture estimates as the Stormwater Capture Master Plan is finalized and projects come online. We believe that more than 25,000 acre feet per year can be captured by 2035.

Response: The Stormwater Capture Master Plan will comprehensively evaluate stormwater capture potential within the City. Once the Master Plan is complete, LADWP will be able to reevaluate its future stormwater capture goals.

Comment: Chapter 11, Exhibits 11E to 11L: Targets for stormwater capture stay consistent at 25,000 AF for both dry and normal years.

Response: The 15,000 AFY of increased groundwater production due to stormwater capture is anticipated to be available in every year. The 10,000 AFY of increased conservation due to stormwater capture and reuse will need further analysis in the Stormwater Capture Master Plan.

Southern California Watershed Alliance, 3/28/11

Comment: Given that the UWMP does not include desalination as a projected supply, the historical list of past planning on the issue is confusing and leads one to believe that there are plans to move forward.

Response: At this time LADWP has no plans to pursue ocean desalination as a supply.

FROM: Andrew Davis
Accurate WeatherSet

Simon,

In the DRAFT 2010 URBAN WATER MANAGEMENT PLAN, I see page 11-15 section 4 (1) that it states
(1) must have approved weather-based irrigation controllers registered with LADWP (eligible weather- based irrigation controllers are those approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative

MWD uses only controller that passed the SWAT testing. So the statement of "approved by MWD or the Irrigation Association Smart Water Application Technologies (SWAT) initiative are equivalent.

SWAT testing a is bad requirement. SWAT testing is meaningless because:
1) SWAT testing is done in laboratory under highly technical conditions and not in the field with homeowners and contractors;
2) SWAT tests only one controller from each manufacturer which is programmed by the technical staff of the manufacturer;
3) test results cover only 30 days;
4) manufacturers may suppress bad results, pay another $3500 testing fee, reprogram their controller and resubmit for another test until the manufacturers get the results that they want.

Below are the published results from SWAT laboratory testing. All ten controllers scored identically on Irrigation Adequacy. All ten controllers scored nearly identically on Irrigation Excess. These nearly identical results were achieved even though their technologies differ widely. From these nearly identical SWAT results, you would expect all controllers to deliver the same water savings.

The results of SWAT testing by some manufacturers have varied over the years as manufactures have suppressed unfavorable results. These manufacturers have reprogrammed and resubmitted their controller for SWAT testing until they get nearly perfect results. Such tests are rigged by manufacturers and meaningless when measuring water conservation in the hands of homeowners and contractors in the field. Because of these flaws, Accurate WeatherSet has NOT submitted its controllers for testing at SWAT.

While SWAT testing "proves" that all controllers are nearly identical, field tests show that is NOT true.The most meaningful test of weather-based irrigation controllers in the field is the 309-page report submitted by MWD and EBMUD to Cal DWR. That engineering field-study was performed by Aquacraft and can be downloaded at http://www.aquacraft.com/Download_Reports/Evaluation_of_California_Smart_Controller_Programs_-_Final_Report.pdf

This most significant table in that 309-page, multi-year report of 1,000s of controllers shows water savings by manufacturer. Note the we, Accurate WeatherSet, saved MUCH MORE water than any of the other controllers AND our water saving ARE STATISTICALLY SIGNIFICANT and we have the lowest retail price. Look at column labeled **Avg.%Change in Outdoor Use for** water savings that are very different from SWAT testing.
This report shows that Accurate WeatherSet is the lowest cost (see Retail Price column) with the HIGHEST WATER SAVINGS (see **Avg.%Change in Outdoor Use**). Lowest cost with greatest water savings should be highest on your list of controllers to include and is another reason the use 309-page report and reject SWAT testing as your criteria. By achieving 33% outdoor water savings, our controller by itself can reduce water consumption nearly 20% water since 60% to 70% of all water that goes thru a residential meter is used on lawns. This is another reason to include our controller in LA's URBAN WATER MANAGEMENT PLAN.

Please note that the **95% Conf Interval**. Since standard deviation in the chart above was greater than the water savings for most controllers, most controllers did NOT save significant water. This report covers nearly 600 controllers installed in LADWP's service area (see Table ES.3) on page xix. One hundred of the controllers were from Accurate WeatherSet. So the water savings of ALL controllers was not statistically significant because our statistically significant water savings of our controllers was buried by the wide variation in water savings/excess of the other manufacturers.

This 309-page report contains the result of 1,000s of controllers, purchased, installed and programmed by homeowners and contractors. This is real-world testing, not testing in for 30 days in the a laboratory.

This report show the real results that you will have from weather-based irrigation controllers when purchased, installed and programmed by homeowners and contractors and should be used for LA's URBAN WATER MANAGEMENT PLAN to assure success.

Search thru the 309 page report for "SWAT" and see that the report also states that SWAT testing is not designed to measure water conservation.

If you use the 309-page, multi-year field report instead of SWAT testing, you will include my company. A happy feature of including us in your approved list of weather-based irrigation controllers is that you will include/help a company located in the City of Los Angeles in the neighborhood called Winnetka in the west San Fernando Valley. I understand that city agencies are dedicated to encouraging businesses to stay in LA.

Also, I suggest that you talk to Al Pinnaro in LA City Parks & Rec. Last year, he completed a 5-year field study of all the weather-based irrigation controllers and found MANY problems, except with ours. He has ordered controllers from us for installation in LA City parks. You may reach him at 213-216-7351. If you want to give irrigation problems to LA residences and business, then ignore Al Pinnaro and use the SWAT laboratory results. If you want to give well-tested controllers, the listen to Pinnaor's experience over 5 years and eliminate some of the controllers based on his experience AND include us.

LA and California have led the country in science-based standards. Science-based water conservation is the next challenge. Please use the 309 page report and the experience of Al Pinnaro to determine which controllers to include in LA's URBAN WATER MANAGEMENT PLAN.

Will there be anymore public meetings?

Andrew Davis

From: ****@***.com

Sent: Sunday, January 30, 2011 10:30 AM

To: Hsu, Chiun-Gwo (Simon)

Subject: COMMENT/SUGGESTION

Evaporation of water from swimming pools during the summer time can be greatly reduced with the use of pool covers/blankets. I would like the DWP to offer some sort of REBATE for homeowners who invest in pool covers/blankets. thank you, S. Schron

Edward Saltzberg & Associates
Forensic Mechanical Engineers
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818.994.2613
Fax.818.782.7792
Ed@ESaltzberg.com

February 28, 2011

LADWP-Water System

111 North Hope Street, Room #1460

Los Angeles, California 90012

Attn: Simon Hsu

RE: Urban Water management Plan

Dear Mr. Hsu:

I thought the publication of the water management plan was very good. However, I have a few suggestions to make it better.

1. Have a list of abbreviations on a page that readers can refer to if they are not conversant with all of the acronyms.

2. In the written material spelled out what an abbreviation stands for when its first used in a section.

3. Make sure that all graphs and charts are properly labeled as to what the units of the chart are. For example exh. 5B, are the units on the left acre feet? There are a few others where the units are not labeled or the title of the chart or graph does not clarify what the chart or graph represents.

I hope that these suggestions help improve the management plan.

Very truly yours,

Edward Saltzberg & Associates

Edward Saltzberg PE, CPD, FASPE

Pres.

COMMENTS TO THE LOS ANGELES DEPARTMENT OF WATER AND POWER 2010 DRAFT URBAN WATER MANAGEMENT PLAN

March 7, 2011

Simon Hsu
Los Angeles Department of Water and Power
111 N. Hope St., Room 1460
Los Angeles, CA 90012

Thank you for the opportunity to comment on the LADWP draft 2010 Urban Water Management Plan ("UWMP" or "water plan").

Missing from past water plans published from 1990 through today has been a review of past water plans. Deliberation and adoption of a new water plan should be done with an understanding of how well the city has met stated goals in previous plans. Did they meet their targets and goals? Did they fall short? What lessons have been learned? Will the 2010 UWMP follow the same pattern as water plans before it?

Sections 1 and 2 provide an overview of the past water projections and how well the city met those projections.

1. **PROJECTED VERSUS ACTUAL WATER SUPPLY - A REVIEW OF PAST WATER PLANS**
   a. Water plans published between 1990 and 2005 seriously miscalculated future water supply projections (Figure 1). In one example the 1990 UWMP overstated the 2010 water supply projection by 41 percent.
   b. In every projection cited by UWMP's published between 1990 and 2010, records show that that the city's actual supply failed to meet expectations by a large amount.
   c. UWMP's routinely cited water supplies over 700,000 AF and as much as 799,000 AF, yet records show the city has never received more than 699,000 AF of water since 1986.

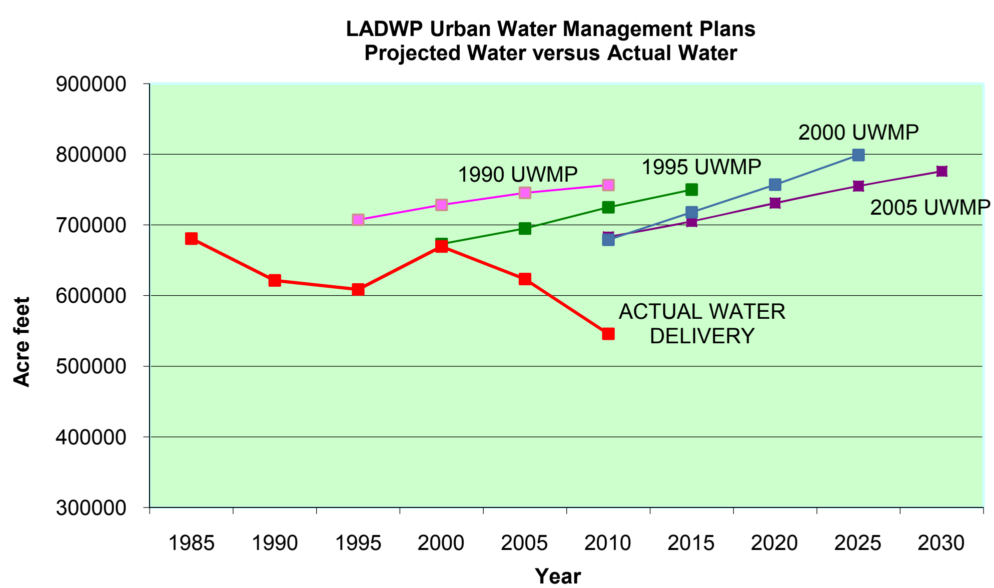

Figure 1 – This chart plots the overstated projections of the past four urban water management plans (1990 through 2005) and compares them with actual water amount received by the LADWP. The 1990 UWMP over-projected water supply by 41 percent for 2010, enough for 146,000 single family housing units.

Given the failure to meet nearly every past projection since 1990, At what point should UWMP's stop projecting supplies in excess of 700,000 AF when it is an historical fact that the DWP has never been able break through that level?

Twenty years of seriously overstated projections have lead city officials to believe that sufficient water supplies existed when they were faced with assessing infrastructure impacts of large developments seeking city permits. A total of 65 major projects were approved using the projected figures in the 2000 and 2005 UWMP. Records show that not one of the water supply projections used by these assessments were ever met by the city. The approvals of such projects and subsequent failure to meet these projections have led to water supply shortfalls and today's permanent drought conditions in the area served by LADWP.

2. **PROJECTED VERSUS ACTUAL GROUND WATER SUPPLY - A REVIEW OF PAST WATER PLANS**
   a. Water plans between 1990 and 2005 seriously miscalculated future groundwater supply projections. In some years as high as 195 percent. (See Figure 2)
   b. The city has not met groundwater supply projections anytime in water plans between 1990 and 2010.
   c. All water plans from 1990 through 2010 routinely projected groundwater pumping well above 100,000 AF annually though the actual amount received annually between 1990 and 2010 averaged just 83,582 AF.
   d. The 1995 UWMP over-projected groundwater pumping for 2005 by 178%. Likewise, the 2000 water plan overstated the 2005 projection by 195%.

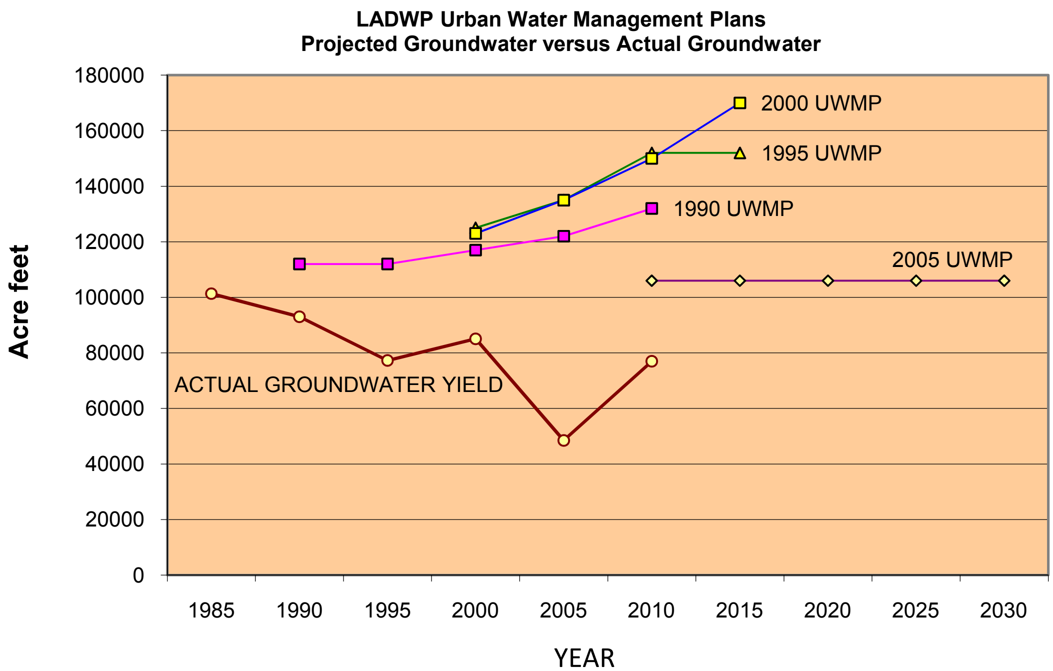

Figure 2 – This chart summarizes the groundwater projections from the past four urban water management plans (1990 through 2005) and compares them with actual groundwater pumped by the LADWP. The 1990 UWMP over-projected water supply by 51 percent for 2010, enough for 150,000 single family housing units.

3. **WATER SUPPLY ASSESSMENTS (Sec 11.4) – A SERIOUS DEPARTURE FROM THE PAST**
   a. The 2010 draft urban water management plan cites that *"If the land use of the proposed development is consistent with the City's General Plan, the projected water demand of the development is considered to be accounted for in the most recently adopted UWMP."*

   In this section the 2010 draft UWMP is inconsistent with Section 10910 (c)(1), (2) & (3) of the California Water Code. Section 10910 requires a city or county to cite the "most recently adopted urban water management plan", not the General Plan as stated above when assessing the proposed water demand of a project.

> ***Section 10910**(c)*
> *(1) The city or county, at the time it makes the determination required under Section 21080.1 of the Public Resources Code, shall request each public water system identified pursuant to subdivision (b) to determine whether the projected water demand associated with a proposed project was included as part of the **most recently adopted urban water management plan** adopted pursuant to Part 2.6 (commencing with Section **10610**).*
> *(2) If the projected water demand associated with the proposed project was accounted for **in the most recently adopted urban water management plan,** the public water system may incorporate the requested information **from the urban water management plan** in preparing the elements of the assessment required to comply with subdivisions (d), (e), (f), and (g).*
> *(3) **If the projected water demand associated with the proposed project was not accounted for in the most recently adopted urban water management plan**, or the public water system has no urban water management plan, the water supply assessment for the project shall include a discussion with regard to whether the public water system's total projected water supplies available during normal, single dry, and multiple dry water years during a 20-year projection will meet the projected water demand associated with the proposed project, in addition to the public water system's existing and planned future uses, including agricultural and manufacturing uses.*

This section in the 2010 UWMP is a serious departure of past water assessments (See figure 3). If left in place, all new water supply assessments performed over the next five years (or until a new general plan is adopted) will be referencing a water plan that is no longer the most recent plan, and a plan that seriously overstates the city's water supply.

Findings

The proposed Bundy Village and Medical Park Draft Project is estimated to increase water demand within the site by 170 acre-feet annually based on review of information submitted by the City Planning Department.

The 170 acre-feet increase falls within the available and projected water supplies for normal, single-dry, and multiple-dry years through the year 2030 as described in LADWP's year 2005 UWMP. LADWP finds that it will be able to meet the water demand of the Bundy Village and Medical Park Draft Project as well as existing and planned future water demands of its service area.

Figure 3 – Typical finding found in water assessments for developments within the LADWP service area.

b. The 2010 draft states that "The water demand forecast model in the UWMP was developed using LADWP total water use, including the water served by LADWP for use outside of the City."

Given that demand has exceeded supply since the 1985 UWMP, the 'demand forecast' is no longer a useful model since it encourages drought conditions. The demand is based on population projections provided by the Southern California Association of Governments (SCAG) that encourage growth with reckless disregard to water supply. This model should be replaced with an annual water 'supply forecast' model that manages growth to avoid costly and damaging droughts.

4. METROPOLITAN WATER DISTRICT (MWD)

a. The 2010 LADWP UWMP notes that *"An important part of the water planning process is for LADWP to work collaboratively with MWD to ensure that anticipated water demands are incorporated into MWD's long-term water resources development plan and water supply allocation plan. The City's allotment of MWD water supplies under MWD's water supply allocation plan is based on the City's total water demand which includes services to areas outside the City."*

The City's allotment of MWD water is not based on the city's total water demand but instead on property tax assessments and the value of the investments it has with MWD infrastructure projects. Combined, those investments have earned LADWP the rights to about 20.8 percent of MWD water. The rest is split up among the MWD's twenty-five other member agencies.

The City's full contractual allotment of water from MWD would be approximately 511,000 AF of water annually which is about 20.8 percent of MWD's total annual inventory[1].

However, the city's water annual allocation has been substantially limited because of *a)* legal restrictions caused by environmental over-commitment (damage caused to other regions of the state)[2], *b)* the rights of other member agencies, agricultural interests, and the rights of other states[3].

In 2007 the city received approximately 421,000 AF of water and in 2010 the city received only 262,538 despite increased demands.

David Coffin
8430 Truxton Ave.
Westchester, CA 90045

[1] Includes 1.91 million AF from State Water Project and 550,000 AF of Colorado River Aqueduct

[2] Sacramento Delta restrictions (Wanger 2007); LA/Inyo Long Term Water Agreement; State Water Resources Control Board issues decision 1631; 1997 LORP MOU Provisions.

[3] Sacramento Delta restrictions (Wanger 2007) and State of Arizona v. State of California 2006 Consolidated Decree.

March 9, 2011

PHOENIX

Exclusive U.S. aquacell™ Distributor

Mr. Ronald Nichols
General Manager and Chief Engineer
Los Angeles Department of Water and Power
111 North Hope Street, Room 1550
Los Angeles, CA 90012

Dear Mr. Nichols:

Decentralized greywater and blackwater recycling have made a significant impact on the water supply in Sydney, Australia. Sydney Water, in collaboration with the state of New South Wales, has defined a goal to recycle 18 billion gallons of water per year by 2015 in the greater Sydney area. As of today, 78 greywater and blackwater projects are recycling and saving 8 billion gallons a year. Aside from the water savings, imagine the implications on the city's water and sewer systems – nothing short of dramatic.

The key ingredient to the progress in Sydney is the broad scale effort by Sydney Water. The utility recognized the potential for onsite greywater and blackwater recycling and has not only embraced, but encouraged the practice. Instead of leaving the green building movement to initiate comprehensive water conservation, Sydney Water decided to address water conservation at the source – their organization. Sydney Water understands they cannot do it alone and that promoting private decentralized recycling will make a more immediate impact on the water supply. I believe Los Angeles has the potential to make a similar impact with greywater and blackwater recycling – an impact that would serve current and future generations.

Upon reading the 2010 Los Angeles Urban Water Management Plan I find that it improperly addresses the potential for greywater and blackwater recycling. These topics should be a priority for the LADWP and I write this letter to ask that the Plan be revised to include funding dollars towards greywater and blackwater onsite reuse programs.

I also support the creation of ad hoc committees made up of manufacturers, consultants, engineers and experts in the field of onsite water recycling to begin work towards developing a standard for greywater and blackwater recycling in Los Angeles. Regulators and policymakers need to discuss and understand the benefits and challenges associated to implementing these solutions. For instance, where can this non-potable effluent make the most impact on water demands? Cooling towers, surface irrigation and toilet flushing are typically the heaviest water users and this is where the technology should be applied. Officials will also need to address the risks associated with onsite water recycling and this is where my firm can add significant value to the conversation.

My company, PHOENIX Process Equipment Co, has partnered with Aquacell, an industry leader in onsite water recycling in Australia, to usher in a safe and reliable solution for water recycling in the United States. Based on an integrated approach which includes consulting, installation, project management and operations of greywater and blackwater systems, Aquacell has a remarkable track record and serves as a great example how to properly implement this practice. Aquacell's success illustrates that if employed with care and risk management in mind, onsite water recycling can be safe and effective – all while providing the inhabitants of the building something to be proud of. I should also testify that as of today, Aquacell has no reported health incidents as a result of their systems.

I hope you will consider the accounts outlined above as an impetus to engage greywater and blackwater recycling more seriously at LADWP. Please let me know if I can be of any service to LADWP as you begin to research and adopt this practice. PHOENIX and Aquacell would be delighted to partner and/or assist LADWP at any level deemed appropriate.

Sincerely,

Mark Meredith
Product Manager, Aquacell

cc:
James McDaniel
Simon Hsu

14 March 2011

Mr. Ronald Nichols
General Manager and Chief Engineer
Los Angeles Department of Water and Power
111 North Hope Street, Room 1550
Los Angeles, CA 90012

Re: 2010 LA Urban Water Management Plan

Dear Mr. Nichols,

I have read the 2010 Los Angeles Urban Water Management Plan and I believe it should be a priority to allocate more funding dollars towards greywater and blackwater onsite reuse programs in the plan. As green building initiatives such as LEED drive the building movement towards a more sustainable built environment, I believe LADWP has an opportunity to play a critical role in building a sustainable Los Angeles. By developing policies and a framework for onsite greywater and blackwater recycling, LADWP can take ownership of this significant water conservation measure and promote the use of these technologies to make a remarkable impact on the region's water supplies. A water crisis in Los Angeles will ultimately fall on the shoulders of LADWP, therefore I believe it is in the organization's best interest to promote water conservation measures such as onsite recycling to mitigate risks.

I support the creation of ad hoc committees made up of manufacturers, consultants, engineers and experts in the field of onsite water recycling to discuss the parameters and scope for developing a standard for greywater and blackwater recycling in Los Angeles.

My company, Aquacell, builds and operates water recycling plants for business, industry and government. Our focus is on non-potable (non-drinking) water for use in a variety of applications including surface irrigation, cooling tower makeup, clothes washing and toilet flushing. Aquacell's plants recycle greywater which is water discharged from showers, baths, basins and washing machines; and blackwater which is any water that has been contaminated with water discharged from a toilet.

Aquacell takes an integrated approach to water recycling plants including consulting, installation and project management for commercial and new residential developments. It also offers ongoing operations and maintenance agreements.

Aquacell staff has many years experience in the water industry and are very knowledgeable about each Australian state and territory's regulatory requirements. Our experience in Australia is that a properly structured regulatory framework can safely ensure decentralised recycled water systems, such as those we install in buildings and neighbourhoods can contribute in a major way to saving water and reducing hydraulic loading on water and sewer systems.

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With such a depth of knowledge and successful track record implementing onsite water recycling, Aquacell would be eager to partner with LADWP and contribute to the development of a viable approach to recycling water in Los Angeles.

Yours sincerely,

Colin Fisher
Managing Director

cc:
James McDaniel
Simon Hsu

14th March 2011

Mr. Ron Nichols
General Manager & Chief Engineer
Los Angeles Department of Water and Power
111 North Hope Street, Room 1550
Los Angeles, CA 90012

Dear Mr Nichols,

RE: 2010 LA URBAN WATER MANAGEMENT PLAN

I understand from reading the 2010 Los Angeles Urban Water Management Plan (LAUWMP) that the City of LA wants to establish a Water Management Framework that aims to reduce overall water demands for the city and improve Water Security. Obviously this will be a multi-prong approach given that water is primarily sourced from Los Angeles aqueducts, groundwater, and is imported with supplemental water purchases from MWD. We understand that Recycle water currently only contributes <1% of the total water supply.

The LAUWMP appears to look at Water Conservation mainly through pricing incentive schemes, improved water efficiency fixtures, and domestic graywater reuse, but hasn't realised the full potential that decentralised commercial graywater and blackwater systems can contribute to the City of LA's water management objectives.

Despite large scale recycling schemes being in place in LA since 1979 (when water was delivered to the Department of Recreation and Parks for irrigation of areas in Griffith), such centralised reuse schemes are limited to where they can be utilised by physical infrastructure constraints. Centralised systems typically only benefit very large scale water users (e.g. golf course, freeway irrigation), and then only those users who are also located directly next to where the distribution piping is built. Whilst significantly contributing to the city's overall Water security, developments that are located outside of the central recycled water distribution network are precluded from accessing the water saving benefits that a centralised reuse scheme provides.

Medium scale decentralised Plants (e.g. 15,000 – 100,000 gallons / day Plants) have an opportunity to afford a high level of flexibility to implement reuse schemes across a wider area of LA City than what current or future centralised systems offers, whilst being large enough to meet the costs associated with maintaining and demonstrating that public health risks are appropriately managed. Broadly speaking, decentralised graywater systems that manage the total water balance of a site can reduce on-site water demand/wastewater production by 30-50%, and blackwater reuse system can reduce on-site water demand/wastewater production by 70-90%. Developments that currently have significant water demands either through surface irrigation (e.g. any development with a sports fields, city or precinct gardens) or cooling towers are major candidates for decentralised systems because of their localised high water demands.

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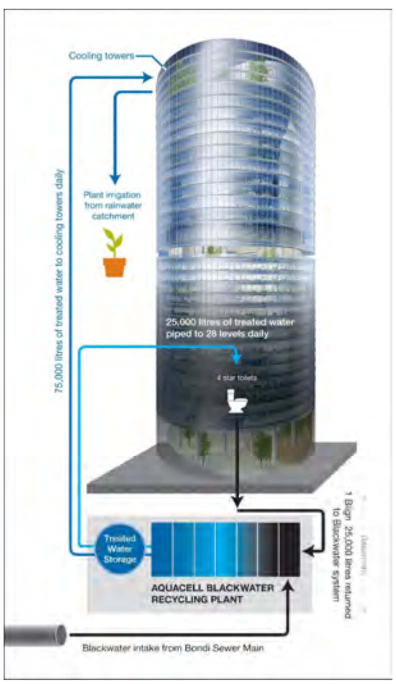
Aquacell is an Australian company that specialises in commercial graywater and blackwater reuse systems. We have both blackwater and greywater systems which have been operating for a number of years that can demonstrate what can be achieved. With more and more decentralised schemes coming on line in Australia, reuse ius becoming more widely accepted and consequently the interest is growing. The main project drivers why facilities look at decentralised reuse schemes cover a range of reasons, including: regulatory or development approval requirements, sourcing alternative water sources (e.g. to add to available water sources), green or environmental marketing, infrastructure solutions (either no sewer or sewer at limited capacity).

To demonstrate what can be done with decentralised schemes, I have attached an Aquacell case study of a 25,000 gallon a day blackwater reuse Plant that we have had operational for the last 5 years at a sports club in Western Sydney. The site treats blackwater generated from the site and uses it for surface irrigation of the sports fields. In addition to water saving measures, the site has also reduced fertiliser use by 30-50% due to the available nutrients in the effluent – another non-water environmental benefit. Note that nutrient removal can be done at other sites if required.

In addition to this, I show some schematically pictures below of a Blackwater to cooling tower system that Aquacell is in the final stages of project implementation – practical completion due May 2011. In this project, we are collecting 100% of the blackwater from a CBD building in Sydney (6,600 gal/day), plus drawing in an extra 25,000 gallon per day from the main Sydney sewer to reuse the effluent in the buildings cooling tower. Although technology for such schemes has existed for a number of years, the reason why this project can be considered in Sydney is because the regulatory framework is in place to allow it to legally occur.



We see that the key to tapping into the very significant potential that decentralised reuse Plants can offer, starts with the development of a LA city blueprint standard for graywater and blackwater reuse.   It is important that this standard gets the right balance between protecting public health and also being commercially realistic. In Australia, Aquacell has seen a range of regulatory positions; some being too lax that let systems get through the cracks which perhaps havn't been fully scrutinised, while other regulations are driven too much by bureaucrats and academics and have subsequently imposed such unrealistic expectations on reuse systems that they become commercially inhibitive below any scheme less than 250,000 gallon per day.   It therefore is important that when Standards for blackwater and graywater reuse are developed for LA City, they are done so by an ad hoc committee that is able to bring a range of expertise and perspectives to the table. This should not only include law makers, but also public health experts, commercial representatives that could benefit from implementing these systems (e.g. developers or facility owners), consultants and people with prior experience in operating decentralised reuse schemes.

I would be more than happy to share our experience in Australia with LA City to ensure that it steps forward with a pragmatic and protective Standard, which establishes a template for effectively and safely implementing reuse opportunities throughout the city of LA.   Please don't hesitate to call or email if you require further information.

Sincerely

I Kikkert

Ian Kikkert
Business Development Engineer
m) +61 (0)409 018 383
e) iank@aquacell.com.au

Heal the Bay
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www.healthebay.org

March 15, 2010

Attn: Simon Hsu
LADWP--Water System
111 N. Hope St. Room 1460
Los Angeles, CA 90012

Re: Draft 2010 Urban Water Management Plan

Dear Mr. Simon Hsu:

On behalf of Heal the Bay, we submit these comments regarding the City of Los Angeles Department of Water and Power Draft 2010 Urban Water Management Plan ("Plan" or "Draft UWMP"). We appreciate the opportunity to provide these comments.

There are many aspects of the Draft UWMP that we support. For instance, we agree with LADWP's prioritization of expanded water conservation and water recycling over the use of desalination to provide additional water supply. Heal the Bay supports the expansion of LADWP's recycled water system and the commitment to move towards a more sustainable water supply. However, we do have a few concerns with the Plan as drafted. LADWP should revert to a more ambitious goal for expanding recycled water use, provide additional support for stormwater capture, and investigate direct and indirect potable use of advanced treated water as a supply alternative. These and other concerns and suggestions are expressed below.

LADWP should set more aggressive goals for water recycling.

The goals the Draft UWMP sets for expanding recycled water use are not ambitious enough given the present condition of our current water supply and the available source water from POTWs. In fact, the goals provided are a major step backwards from previously set goals. The Draft UWMP states that LADWP has the goal of replacing 50,000 AFY of potable water with recycled water by 2029. When Heal the Bay began participation on the Recycled Water Advisory Task Force in 2009, the stated goal was "to produce 50,000 acre-feet of recycled water by 2019." Another stated action was to "pursue options to maximize recycling beyond 50,000 AFY." Of note, several members of RWAG held that we should look beyond this goal and increase the new recycling opportunities to 100,000 AFY by 2019. The revised goal stated in the Draft UWMP takes a major step backwards. Compounding this concern is the fact that LADWP has not met the goals set in the 2005 Urban Water Management Plan for recycled water usage, as noted in the Draft UWMP.

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LADWP should prioritize expanding demand and delivery of recycled water. The four major treatment plants operated by Los Angeles BOS produce enough treated water to allow for much more aggressive recycled water goals than are presented within this document. According to the draft, Los Angeles used approximately 550,000 acre-feet of water last year, and around half of that volume was imported through MWD (Draft UWMP Exhibit 1F). Los Angeles-Glendale, Donald C. Tillman, Terminal Island, and Hyperion Water Reclamation Plants combined produce an average of around 460,000 AFY. Utilizing recycled water in our region to the fullest extend could greatly reduce our reliance on imported water in Los Angeles. This is a crucial step toward a sustainable water future. It is critical that we use local reliable water, such as recycled water that would otherwise be discharged to the ocean, to offset the demand for imported water supplies as soon as possible. Thus, the Draft UWMP should be modified to, at a minimum, return to the more ambitious goal of 50,000 AFY of new recycled water usage by 2019. We urge LADWP to look beyond this initial goal and plan for 100,000 AFY by 2019.

LADWP should prioritize stormwater capture projects and set goals for new stormwater capture projects in Los Angeles.

Stormwater must be used as a resource in order for Los Angeles to achieve a sustainable water supply. Using stormwater as a water source requires less energy and results in far fewer environmental impacts than many other sources of water such as desalination and water importation. Stormwater proves to be a much more sustainable, cost-effective local water resource than desalinated water, yet no incentives are provided in the Draft UWMP for its capture and use throughout the region. We strongly encourage LADWP to create a policy that provides economic incentives for stormwater recharge and reuse projects. Further, the Plan should establish a goal for increased stormwater capture in Los Angeles. At a minimum, LADWP should set a goal of an additional 50,000 AFY by 2020 for stormwater capture projects. The Tujunga Spreading Grounds alone currently capture 8,000 AFY, with plans to expand to 16,000 AFY and the potential to capture 50,000 AFY, so we believe this is a realistic goal.

There are also opportunities for stormwater capture at the individual lot scale. In Section 7.6 (Distributed Stormwater Capture), the Draft UWMP highlights that "Installation of rain barrels at residences throughout Los Angeles… could potentially capture 6,400 AFY…" As you know, the City of Los Angeles had a very successful rain barrel pilot project. This would be a great program for LADWP to help fund and take city-wide. We also urge LADWP's continued support for the Low Impact Development Ordinance, which the City of Los Angeles is in the process of adopting. This ordinance will go a long way in using stormwater as a resource.

The Draft UWMP mentions that LADWP is partnering with Los Angeles City Department of Public Works, Los Angeles County Department of Public Works, and Treepeople Inc. to draft a Stormwater Capture Master Plan. When will the Stormwater Capture Master Plan be completed? Will it be released to the public for review? The Draft UWMP should discuss these goals in more detail and involve additional stakeholders in this effort.

Heal the Bay

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LADWP should actively increase water conservation measures

In the Draft UWMP, LADWP sets a water conservation goal of 50,000 AFY by 2019. In terms of conservation, the City has moved in the right direction, but there is more that can be done to provide conservation incentives. In addition to the measures mentioned in the Plan, LADWP should require that all public buildings get retrofitted with waterless urinals and other ultra-efficient conservation devices. New high-use visitor-serving commercial properties should be required to install these devices as well. In addition, LADWP should offer incentives for graywater treatment and reuse systems. Also, LADWP should push for the city to develop a landscape conservation ordinance that weans Los Angeles off of the use of thirsty non-native plants and requires the use of natives or xeriscape plants. Finally, water pricing needs to be more equitable city-wide and provide greater incentives to conserve.

LADWP should investigate reclaimed water purification as a water supply alternative in the future.

The Draft UWMP mentions that in 2002 LADWP identified Scattergood Generating Station as a potential site for a seawater desalination plant. While we support the fact that LADWP's current water resource strategy does not include seawater desalination as water supply due to environmental and cost considerations, we are concerned that this option is still being considered for future supply while there are still water saving projects that are "lower-hanging fruit". Before exploring seawater desalination as an option for water supply, LADWP should aggressively explore stormwater capture and water recycling as discussed above. In addition, LADWP should explore advanced wastewater treatment for future indirect or even direct potable use. Hyperion Treatment Plant, for example, produces nearly 360,000 AFY, most of which is discharged directly to the ocean. If this water were utilized, it would offset a significant portion of the freshwater needed in Los Angeles. Wastewater purification takes about a quarter of the energy that seawater desalination requires, strictly looking at thermodynamic considerations, and would not have as many negative environmental impacts as seawater desalination. This type of project has seen great success in other areas. The benefits and constraints of advanced wastewater treatment through reverse osmosis and microfiltration should be considered in the Draft UWMP.

If LADWP does pursue research of seawater desalination as a potential water supply, LADWP should focus on the least environmentally harmful types of desalination, such as subsurface cooling intakes, desalination of brackish water, or desalting Hyperion effluent in order to avoid some of the negative impacts of seawater desalination on marine life and energy usage. Several desalination proposals in California rely on co-locating with once-through cooled power plants, causing impingement and entrainment of marine life. Researching alternative forms of desalination to co-location with once-through cooled power plants would help inform future water supply technologies that pose a lower threat to marine life and are less energy intensive.

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LADWP should provide further support for LAUSD to achieve the goals set forth in the LAUSD Water Savings Resolution.

Los Angeles Unified School District (LAUSD) is one of the largest water consumers in the county. This past December, the LAUSD School Board passed a Water Savings Resolution with extremely ambitious goals for water conservation, water efficiency, and the offset of potable water with recycled water resources. LAUSD resolved to utilize recycled water, where available within one-half mile from the local utility distribution source, for irrigation and in urinals and toilets. In addition to providing financial incentives for every retrofit and for every new zero-water urinal and high efficiency toilet used in a new construction project, LADWP should provide incentives for new fixtures in redevelopment and retrofit projects as well. In addition to these rebates, LADWP should consider expanding the purple pipe system to LAUSD schools.

To summarize, LADWP should should set more aggressive goals for water recycling and stormwater capture, provide more support for widespread implementation of LID and Stormwater capture projects throughout Los Angeles, investigate reclaimed water purification for future as a water supply alternative, and provide further support for LAUSD to achieve the goals set forth in the LAUSD Water Savings Resolution. Thank you for your consideration of these comments. If you have any questions, please contact us at (310) 451-1500.

Sincerely,

Kirsten James

Kirsten James, MESM
Water Quality Director

W. Santilena

W. Susie Santilena, MS, E.I.T.
Water Quality Scientist

Comments to LADWP Draft 2010 Urban Water Management Plan due 3.15.2011

The **Population, Housing** and **Employment** history (1980) and projected (2035) shows increases of the following:

Total Population: 1,497,560 or 50.42%
Total Housing: 543,947 or 49.45%
Total Employment: 320,664 or 18.95%

In reference to "**Securing L.A.'s Water Supply**," you state:

"By 2028, the Plan envisioned a six-fold increase in recycled water supplies to a total of 50,000 AFY.

Similarly, by 2030, an increase of 50,000 AFY was planned for conservation. As described in the Plan, this aggressive approach included: investments in state-of-the-art technology; a combination of rebates and incentives; efficient clothes washers, and urinals; and long-term measures such as expansion of water recycling and remediating contaminated groundwater supplies. . A multi-faceted approach to developing a locally sustainable water supply was developed incorporating the following key short-term and long-term strategies:

Short-Term Conservation Strategies

- Enforcing prohibited uses of water
- Expanding prohibited uses of water
- Extending outreach efforts
- Encouraging regional conservation measures

- Long-Term Strategies
- Increasing water conservation through reduction of outdoor water use and new technology
- Maximizing water recycling
- Enhancing stormwater capture
- Accelerating groundwater basin clean-up
- Expanding groundwater storage
- Green Building Initiatives (added subsequent to the release of the Plan)"

Land Use, on the other hand is:

Single Family Dwellings: 121,470 acres of 40.2%

Other including specific plans, transportation, freeways, rights of way and other miscellaneous uses that are not zoned: 52,806 or 17.48%

Open Space/Parks: 40,263 acres or 13.32%

Multi-Family Dwellings: 34,189 acres or 11.31%

Commercial includes public facilities, libraries, public schools and government facilities: 30,083 acres or 9.96%

Manufacturing: 23,353 acres or 7.73%

Historical Water Demand has been **reduced**, on average from the 1986-1990 to the 2005-2010 periods:

Single Family Dwellings: 2,094 AF or 0.88%

Multifamily Dwellings: 17,033 AF or 8.63%

Commercial: 16,369 AF or 13.27%

Industrial: 7,301 AF or 23.94%

Government: 438 AF or 1.01%

Non-Revenue: 20,901 AF or 39.56%

Overall: 64,136 AF or 9.35%

You conclude that **outdoor water use** is estimated at 39% of demand, yet the usage above does not indicate a reason to come to that conclusion. In fact, non-revenue almost matches that 30% outdoor demand. What is the definition of non-revenue, city usage?

Your **2035 estimates** exceed the **2005-2010 Average usage** except in Industrial passive, Industrial passive and active; and Commercial/Government passive and active:

Single Family:

2005-2010: 236,154 AF
2035 Passive: 259,904 AF
2035 Passive and Active: 247,655 AF

Multifamily:

2005-2010: 180,279 AF
2035 Passive: 221.912 AF
2035 Passive and Active: 218,762 AF

Commercial/Government:

2005-2010: 149,895 AF
2035 Passive: 160,049 AF
2035 Passive and Active: 120,420 AF

Industrial:

2005-2010: 23,201 AF
2035 Passive: 19,852 AF
2035 Passive and Active: 10,513 AF

Non-Revenue:

2005-2010: 31,929 AF
2035 Passive: 49,042 AF
2035 Passive and Active: 44,272 AF

You need to compare these with the Baseline Per Capita Use to see if compliance can be obtained for the 20 X 2020. Those calculations are not included in this draft.

Conservation should not be used as a category of source. It is a method of reduction, so 9.05% needs to be replaced by source usage.

Industrial and **Manufacturing** bases need to be placed in reality. Is there an overall reduction of businesses with no future growth, or is growth planned in the manufacturing arena with more demand to be placed.

This plan needs to be overlaid with the LA Power Plan for consistency of forecasting. Both plans need to be consistent with the General Plan.

Recycled Water

You state:

"These include expanding the recycled water distribution system for Non-Potable Reuse (NPR) such as for irrigation and industrial use, along with replenishment of groundwater basins with highly purified recycled water. Beyond 50,000 AFY, LADWP expects to increase recycled water use by approximately 1,500 AFY annually, bringing the total to 59,000 AFY by 2035."

There are several problems here.

Recycled water needs to be treated for use. So far, these water cannot be sold to water down dust on horse ranches, yet you only consider irrigation usage.

Purple pipe is a capital expense limited to age of existing infrastructure, homes and subject to gravity for delivery.

Tanks and underground storage need to be addressed. There are legal issues with underground storage of groundwater in an adjudicated basin. Nothing is mentioned of the lawsuit against the **Water Replenishment District** regarding groundwater rights extraction and the Storage Framework in the Central Basin. The Storage Framework was not allowed.

Nothing is mentioned of West Basin and recycled water processing or of **CeLAC** Central Los Angeles County Regional Recycled Water Project.

Nothing is mentioned of the **2009-2010 Grand Jury Report** or the County's answer. There has been no City of Los Angeles response. The Grand Jury notes discrepancies with charts supplied.

Storm water runoff and **urban water runoff** is under the jurisdiction of the County of Los Angeles and the Los Angeles County Flood Control District. Runoff is not an asset of the City, the Bureau of Sanitation or the LADWP. We are attaching the United States Court of Appeals Ninth Circuit Opinion No. 10-56017 in a recent case involving the County of Los Angeles ETAL.

The assumption in this document is that the Bureau of Sanitation can partner with LADWP. Only LADWP can have possession, management and control of water and water rights, lands and facilities and can capture, transport, distribute and deliver water for the benefit of the City, its inhabitants and its customers.

Non adjudicated groundwater basins such as the Santa Monica Basin and the Hollywood Basin are not addressed. There are no groundwater extraction rights and storage would probably be applicable to the individual property owner.

Groundwater replenishments projects in the San Fernando Valley are part of the Greater Los Angeles County Integrated Regional Water Management Plan under the jurisdiction of the State Department of Water Resources.

Greater Los Angeles County Integrated Regional Water Management Plan shows the Metropolitan Water District Integrated Resource Plan Supply Targets and proportion of targets. There is no reconciliation in this report to the LADWP portion of those targets in all categories.

Overall, this report touches on aspects of water, but does not address the complexities of supply and demand in a realistic sense. Growth is evident without supply considerations and cost (demand). Green Building is so minimal, it should not even be considered as a method. Recycled water is not a reliable source at this point in time.

Capital costs and operation and maintenance funding are not addressed properly.

This leaves the inhabitants and customers in the City of Los Angeles at risk financially, in public health and safety issues and quality of life issues.

Joyce Dillard
P.O. Box 31377
Los Angeles, CA 90031

Attachment: Opinion No. 10-56017

elmco duddy

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9750 Birch Canyon Place, San Diego, CA 92126 858/437-0112 Fax/437-0117

March 13, 2011

To: Ronald O. Nichols, General Mgr. & Chief Engineer WP

First, let me congratulate you on your appointment as General Manager of the DWP. I, along with my fellow ASPE members look forward to your aggressive and far reaching plans for the City of Los Angeles.

I have had the opportunity to attend several DWP workshops in regards to the proposed 2010 Urban Water Management Plan and I applaud the efforts of the DWP to address the upcoming water shortage issues that face the Southern California region.

It goes without exception that we are facing issues that mirror the energy crisis that was addressed decades ago. That crisis forced the public and the industry to address fuel economy and most recently alternative power sources.

In reviewing the proposed plan, the issues of Graywater, Rainwater Harvesting and Stormwater Management I feel are areas that can be readily obtainable and cost effective. There are already Graywater systems being used not only worldwide, in particular Australia, but in the City of New York there is an existing commercial/residential application installed. The technology for Graywater, Rainwater Harvesting already exist meaning that the "wheel doesn't have to be re-invented" There are major Universities involved with these technologies, in particular UCLA and UC Davis.

The Water Purveyors and Utility Companies such as LADWP should develop a strategic plan to convince policy makers and building officials to accept these types of technological innovations which already have a successful track record in Australia.

Like any game changing effort, this will be a herculean task. That being said, rather than grinding slowly toward a solution, I propose that an ad-hoc committee be formed consisting of engineers, manufactures, contractors, university experts and DWP personnel to add to the Urban Plan specifically in these three areas with the mandate that a workable plan and technologies to go with it be presented for DWP review within the next 180 days. As a member of the industry that addresses these issues, I would be happy to serve on such a committee.

The recent tragedy in Japan is an example of how a catastrophe can affect both the water and power delivery when it is most needed.

I am enclosing separate sheets of industry professional signatures that likewise share my enthusiasm and concern for this task at hand. They represent members of the Los Angeles Chapter of ASPE.

Sincerely,

Bob Pehrson

elmco duddy

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Elmco/Duddy
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cc: James B Mc Daniel, Simon Hsu, Ms. Lorraine Paskett, Thomas Gackstetter, Thomas Erb, Dr. Parekh Pankaj, Amir Tabakh, Michael Benisek

Environment Now®

March 15, 2010

Attn: Simon Hsu
LADWP – Water System
111 N. Hope St, Room 1460
Los Angeles, CA 90012

Re. Recommended Amendments to Urban Water Management Plan 2010: Chapter Four

Dear Mr. Hsu:

Environment Now submits the following comments to Los Angeles Department of Water & Power (LADWP) on its 2010 Urban Water Management Plan (UWMP). Environment Now (EN) is an independent, non-partisan, non-profit organization, founded in 1989. EN's mission is to be an active leader in creating measurably effective environmental programs to protect and restore California's environment.

Thank you for this opportunity to comment on the UWMP. California's water supply is becoming increasingly vulnerable as our population grows and landscape dries. To meet the challenges of our heightened demands and diminished supply, EN has supported the diversification of water supplies. EN has worked with water providers and clean water advocates to establish regulations that will bring millions of acre-feet of recycled water on-line —including reclaimed wastewater, captured stormwater, and recharged groundwater basins.

EN has been committed to helping LADWP reach water re-use targets since 2006. We formed partnerships between LADWP staff and community leaders to promote reclaimed water by addressing permitting concerns. In 2007, we formed the State Water Resources Control Board's stakeholder group including LADWP staff to draft the state's first "Recycled Water Policy." In 2008, we also worked with LADWP to host community workshops in order to allay concerns about the "toilet to tap" campaign. In 2009, we worked with LADWP to reconcile their Recycled Water Master Plan with 2005 and 2008 benchmarks. In 2010, we participated in the Recycled Water Advisory Group and supported the staff's plans to reach benchmarks with ongoing rate dedication to "environmental" projects such as recycled water.

The commitment to reclaimed water from community leaders and LADWP staff has been unwavering. For this reason, we are surprised to see rollbacks in the 2010 UWMP water re-use benchmarks. In its 2005 UWMP, LADWP forecasted 16,000 AFY by 2010 and 30,000 AFY by 2030. In 2008 the City of LA promised 50,000 AFY of reclaimed water by 2019 and 100,000 AFY by 2030. Unfortunately, LADWP appears to be plagued with rollbacks. Regardless of the community support and staff expertise, the agency has only met half its original benchmark with 8,000 AFY of reclaimed water on-line today. Now the 2010 UWMP projects a total of 59,000 AFY by 2035. This is considerably below its 2005 and 2008 benchmarks.

LADWP has considerable resources on which to draw for increased reclaimed water supplies. In addition to upgrading the Tillman Plant by 15,000 AFY, the Terminal Island plant could be expanded to 12,000 AFY with an additional 20,000 AFY transferred for treatment from Hyperion. Further, the L.A.-Glendale Plant tertiary water could be distributed for irrigation use rather than discharged into the LA River. Moreover, Hyperion remains a tremendous resource for nearly half-a-million AFY of reclaimed water if only it were upgraded. Even without Hyperion, the potential capacity for existing reclamation facilities is higher than the 2010 UWMP benchmark.

EN has provided comments regarding commitments and financing for reclaimed water on many occasions. Most recently, we provided verbal comments to General Manager, Ron Nichols, and staff on February 10, 2010. We do not see our comments reflected in your recent comment responses (published at: https://www.piersystem.com/go/doc/1643/992207/) To secure our comments are included and addressed, we are submitting these written comments.

Thank you again for this opportunity to comment on LADWP's 2010 UWMP. We look forward to working with the LADWP staff to implement these important reclaimed water plans and, ultimately, make the City of Los Angeles' water supply more reliable. If we can provide further research or comments please do not hesitate to contact us, cmandelbaum@environmentnow.org, 310-829-5568*241

Sincerely,

Caryn Mandelbaum
Freshwater Program Director

TreePeople

March 15, 2011

Los Angeles Department of Water and Power
111 N. Hope St
Los Angeles, CA 90012

To: Chris Repp, and Simon Hsu
Cc: Thomas Erb
RE: Urban Water Management Plan, 2010 Comments

Thank you for the opportunity to submit comments on the LADWP Draft Urban Water Management Plan, 2010. Should you have any questions about our comments and recommendations, feel free to call or email.

Sincerely,

Rebecca Drayse
Director, Natural Urban Systems Group

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TreePeople comments and recommendations on the Draft 2010 Urban Water Management Plan dated January 14, 2011

Chapter 2

- **2-9, Exhibit 2I -** Although we applaud LADWP's leadership in water conservation, we believe much greater water savings can be obtained and will be necessary to meet future local water needs. We believe that LADWP should continue to lead by setting conservation targets that well exceed the minimum 20 x 2020 state mandated goals. Exhibit 2I appears to assume no new innovation or transformation will take place beyond 2015.

Chapter 3

- **3-16 to 3-18:** As residential outdoor water use (for irrigation needs) accounts for the bulk of water use, LADWP should create a stronger and more concerted public campaign focused on landscape transformation (turf to native, or climate appropriate landscaping). Most of the conservation savings have so far been seen in incorporating efficient technologies, however a greater savings can be had in embracing a new landscape ethic.

- **3-22, final paragraph –** Revise sentence to better reflect Watershed Council's leadership in the Elmer Avenue project. Suggested language: "**Most recently TreePeople, LADWP, and other state and federal agencies partnered on an effort led by the Los Angeles and San Gabriel Rivers Watershed Council, to retrofit an entire residential block on Elmer Avenue in Sun Valley.**"

- **3-26:** Identify next steps necessary for incorporating graywater systems into LADWP conservation programs.

Chapter 6

- **6-1, Section 6.1:** Explore opportunities to receive credit for additional stormwater recharge in the San Fernando Basin, particularly if large scale decentralized stormwater infiltration strategies are employed.

Chapter 7

- **7-10** references **"Exhibit 7D"** which "summarizes the potential water yield and average unit cost of the different resources available to increase localized capture and infiltration of runoff". It is missing from the document. Is the cost table in **"Exhibit 7H"** the proper reference here?

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- **7-17 and Exhibit 7H:** We recommend updating cost table (Exhibit H) according to the new figures TreePeople provided for internal review under separate cover. Update text in 7-17 to reflect new figures in Exhibit H.

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- **7-22, Section 7.6.5 Future Distributed Stormwater Programs:** Add rain gardens to the list of potential rebates (TreePeople is beginning a pilot rain garden rebate program with the Watershed Management Group).

- **From 7-24 (revise language):** "Furthermore, distributed stormwater capture projects yield additional benefits to the public outside of water supply generation such as **flood control, restored native habitat,** community beautification, public right of way improvements, **water conservation,** as well as private residence safety and aesthetic improvements."

- **General:** Revisit the projected stormwater capture estimates as the Stormwater Master Plan is finalized and new targets are established. We believe that significantly more than **25,000 acre feet per year** can be captured by **2035.**

Chapter 11

- **11-8, Exhibit 11E:** Note 1 indicates a loss in the LA Aqueduct at 0.1652% per year due to climate change. There is no indication of loss from MWD (California Aqueduct, and Colorado River Aqueducts) due to climate change. Does this account for MWD's projections?

- **Chapter 11, Exhibits 11E to 11L:** Targets for stormwater capture stay consistent at 25,000 AF for both dry and normal years. Can this be revised?

General

- Coordinate and package conservation, rainwater harvesting, low impact development, and graywater incentive programs to customers who implement these strategies. This will decrease implementation costs for these programs and increase consumer awareness of steps they can take to manage water supply.

- Replace "**drought tolerant**" with "**climate appropriate**" throughout the document. Climate appropriate is becoming the more accepted description for landscape transformation.

- Please replace "**Tree People**" with "**TreePeople**" (without a space) where referenced including the Table of Contents.

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Comments on 2010 Urban Water Management Plan

From: Conner Everts
Southern California Watershed Alliance

To: Tom Urb, Simon Hsu
LADWP

After reviewing your draft 2010 Urban Water Management Plan, attending your public workshops while making comments there, I just have a few final thoughts that I hope you will accept.

While I find this Urban Water Management Plan a vast improvement over past plans that I have commented on there are a couple of places where I think you do not give yourself enough credit. That is specifically the projections of per capita water use into the future, which is expressed in household use in Exhibit 21 on page 2-9 and Exhibit 2J with CII worked in and finally Exhibit 2K. While projection of conservation savings go up the demand seems to rise gradually until 2035. If you take the historic savings in the last few years and combine that with future investments why would demand continue to drop? La has that history and population has not been shown to 1) Be equal to SCAG or Department of Finance numbers or 2) mean increases of consumption.

This leads me to question why, on page 3-5, you chose Method 3 for reporting, when you are already at 19%. If current gpd is 124 by taking this approach you are actually looking at a higher per capita into the future. Other cities are taking a more aggressive approach, like Long Beach, which is about to reach 100 gpd, and therefore assuring the city of a full allocation under MWD's water shortage plan which then comes a real reliability factor. I believe that this should be discussed, as required, at a separate workshop.

There is an opportunity to make this a real planning tool for future water supply and inclusion of greywater, watershed management with stormwater, the City of LA's IRP make this plan very different. Inclusion and reference of LID and smart streets and the River Project's Tujunga Watershed plan would be helpful. Given that the 2020 Water Supply Plan does not list desalination, the historical list of past planning on the issue is confusing and leads one to believe that there are plans to move forward.

I wanted to attend the SCWC workshop last Friday at MWD and got this language:

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:
(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20,

for determining its urban water use target.

We just interpreted this to mean that this public input should take place prior to when the UWMP is finalized, otherwise, if the public input takes place at the same time the plan is adopted, that input is pretty meaningless.

On another note, my fellow environmentalists and I have concerns with the direction and facilitation of the RWAG. We will attend the public workshops in support, like San Pedro this week but would like to talk about how we move forward. Lastly, the movement of AB 1180 is causing greater concern.

Again, thanks for your consideration and I am available if you want to talk about it.

Conner Everts

Urban Water Management Plan
Appendix E

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Urban Water Management Plan

Appendix F

Groundwater Basin Adjudications

- San Fernando Basin – Judgment 650079
- Sylmar Basin – Judgment 650079
- Eagle Rock Basin – Judgment 650079
- West Coast Basin – Judgment 506806
- Central Basin – Judgment 786656

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

THE CITY OF LOS ANGELES, Plaintiff,	)	No. 650079
vs.	)	JUDGMENT
CITY OF SAN FERNANDO, ET AL. Defendants.	)	

There follows by consecutive paging Recitals (page 1), Definitions and List of Attachments (pages 1 to 6), Designation of Parties (page 6), Declaration re Geology and Hydrology (pages 6 to 12), Declaration of Rights (pages 12 to 21), Injunctions (pages 21 to 22), Continuing Jurisdiction (page 23), Watermaster (pages 23 to 29), Physical Solution (pages 29 to 34), and Miscellaneous Provisions (pages 34 to 35), and Attachments (pages 36 to 46). Each and all of said several parts constitute a single integrated Judgment herein.

1. RECITALS

This matter was originally tried before the Honorable Edmund M. Moor, without jury, commencing on March 1, 1966, and concluding with entry of Findings, Conclusions and Judgment on March 14, 1968, after more than 181 trial days. Los Angeles appealed from said judgment and the California Supreme Court, by unanimous opinion, (14 Cal. 3d 199) reversed and remanded the case; after trial of some remaining issues on remand, and consistent with the opinion of the Supreme Court, and pursuant to stipulations, the Court signed and filed Findings of Fact and Conclusions of Law. Good cause thereby appearing,

IT IS ORDERED, ADJUDGED AND DECREED:

2. DEFINITIONS AND ATTACHMENTS

2.1 Definitions of Terms. As used in this Judgment, the following terms shall have the meanings herein set forth:

[1] Basin or Ground Water Basin -- A subsurface geologic formation with defined boundary conditions, containing a ground water reservoir, which is capable of yielding a significant quantity of ground water.

[2] Burbank -- Defendant City of Burbank.

[3] Crescenta Valley -- Defendant Crescenta Valley County Water district.

[4] Colorado Aqueduct -- The aqueduct facilities and system owned and operated by MWD for the importation of water from the Colorado River to its service area.

[5] Deep Rock -- Defendant Evelyn M. Pendleton, dba Deep Rock Artesian Water Company.

[6] Delivered Water -- Water utilized in a water supply distribution system, including reclaimed water.

[7] Eagle Rock Basin -- The separate ground water basin underlying the area shown as such on Attachment “A”.

[8] Extract or Extraction -- To produce ground water, or its production, by pumping or any other means.

[9] Fiscal Year -- July 1 through June 30 of the following calendar year.

[10] Foremost -- Defendant Foremost Foods Company, successor to defendant Sparkletts Drinking Water Corp.

[11] Forest Lawn -- Collectively, defendants Forest Lawn Cemetery Association, Forest Lawn Company, Forest Lawn Memorial-Park Association, and American Security and Fidelity Corporation.

[12] Gage F-57 -- The surface stream gaging station operated by Los Angeles County Flood Control District and situated in Los Angeles Narrows immediately upstream from the intersection of the Los Angeles River and Arroyo Seco, at which point the surface outflow from ULARA is measured.

[13] Glendale -- Defendant City of Glendale.

[14] Ground Water -- Water beneath the surface of the ground and within the zone of saturation.

[15] Hersch & Plumb -- Defendants David and Eleanor A. Hersch and Gerald B. and Lucille Plumb, successors to Wellesley and Duckworth defendants.

[16] Import Return Water -- Ground water derived from percolation attributable to delivered imported water.

[17] Imported Water -- Water used within ULARA, which is derived from sources outside said watershed. Said term does not include inter-basin transfers wholly within ULARA.

[18] In Lieu Storage -- The act of accumulating ground water in a basin by intentional reduction of extractions of ground water which a party has a right to extract.

[19] Lockheed -- Defendant Lockheed Aircraft Corporation.

[20] Los Angeles -- Plaintiff City of Los Angeles, acting by and through its Department of Water and Power.

[21] Los Angeles Narrows -- The physiographic area northerly of Gage F-57 bounded on the east by the San Rafael and Repetto Hills and on the west by the Elysian Hills, through which all natural outflow of the San Fernando Basin and the Los Angeles River flow en route to the Pacific Ocean.

[22] MWD -- The Metropolitan Water District of Southern California, a pubic agency of the State of California.

[23] Native Safe Yield -- That portion of the safe yield of a basin derived from native waters.

[24] Native Waters -- Surface and ground waters derived from precipitation within ULARA.

[25] Overdraft -- A condition which exists when the total annual extractions of ground water from a basin exceed its safe yield, and when any temporary surplus has been removed.

[26] Owens-Mono Aqueduct -- The aqueduct facilities owned and operated by Los Angeles for importation to ULARA water from the Owens River and Mono Basin watersheds easterly of the Sierra-Nevada in Central California.

[27] Private Defendants -- Collectively, all of those defendants who are parties, other than Glendale, Burbank, San Fernando and Crescenta Valley.

[28] Reclaimed Water -- Water which, as a result of processing of waste water, is made suitable for and used for a controlled beneficial use.

[29] Regulatory Storage Capacity -- The volume of storage capacity of San Fernando Basin which is required to regulate the safe yield of the basin, without significant loss, during any long-term base period of water supply.

[30] Rising Water -- The effluent from a ground water basin which appears as surface flow.

[31] Rising Water Outflow -- The quantity of rising water which occurs within a ground water basin and does not rejoin the ground water body or is not captured prior to flowing past a point of discharge from the basin.

[32] Safe Yield – The maximum quantity of water which can be extracted annually from a ground water basin under a given set of cultural conditions and extraction patterns, based on the long-term supply, without causing a continuing reduction of water in storage.

[33] San Fernando -- Defendant City of San Fernando.

[34] San Fernando Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[35] Sportsman's Lodge -- Defendant Sportsman's Lodge Banquet Association.

[36] Stored Water -- Ground water in a basin consisting of either (1) imported or reclaimed water which is intentionally spread, or (2) safe yield water which is allowed to accumulate by In Lieu Storage. Said ground waters are distinguished and separately accounted for in a ground water basin, notwithstanding that the same may be physically commingled with other waters in the basin.

[37] Sylmar Basin -- The separate ground water basin underlying the area indicated as such on Attachment "A".

[38] Temporary Surplus – The amount of ground water which would be required to be removed from a basin in order to avoid waste under safe yield operation.

[39] Toluca Lake -- Defendant Toluca Lake Property Owners Association.

[40] ULARA or Upper Los Angeles River Area – The Upper Los Angeles River watershed, being the surface drainage area of the Los Angeles River tributary to Gage F-57.

[41] Underlying Pueblo Waters -- Native ground waters in the San Fernando Basin which underlie safe yield and stored waters.

[42] Valhalla -- Collectively, Valhalla Properties, Valhalla Memorial Park, Valhalla Mausoleum Park.

[43] Van de Kamp -- Defendant Van de Kamp's Holland Dutch Bakers, Inc.

[44] Verdugo Basin -- The separate ground water basin underlying the area shown as such on Attachment "A".

[45] Water Year -- October 1 through September 30 of the following calendar year.

Geographic Names, not herein specifically defined, are used to refer to the places and locations thereof as shown on Attachment "A".

2.2 List of Attachments. There are attached hereto the following documents, which are by this reference incorporated in this Judgment and specifically referred to in the text hereof:

"A" -- Map entitled "Upper Los Angeles River Area", showing Separate Basins therein.

"B" -- List of "Dismissed Parties".

"C" -- List of "Defaulted Parties".

"D" -- List of "Disclaiming Parties".

"E" -- List of "Prior Stipulated Judgments."

"F" -- List of "Stipulated Non-Consumptive or Minimal-Consumptive Use Practices."

"G" -- Map entitled "Place of Use and Service Area of Private Defendants."

"H" -- Map entitled "Public Agency Water Service Areas."

[Attachments B-H are available upon request from LADWP – UWMP Note 2005]

3. PARTIES

3.1 Defaulting and Disclaiming Defendants. Each of the defendants listed on Attachment "C" and Attachment "D" is without any right, title or interest in, or to any claim to extract ground water from ULARA or any of the separate ground water basins therein.

3.2 No Rights Other Than as Herein Declared. No party to this action has any rights in or to the waters of ULARA except to the extent declared herein.

4. DECLARATION RE GEOLOGY AND HYDROLOGY

4.1 Geology.

4.1.1 ULARA. ULARA (or Upper Los Angeles River Area), is the watershed or surface drainage area tributary to the Los Angeles River at Gage F-57. Said watershed contains a total of 329,000 acres, consisting of approximately 123,000 acres of valley fill area and 206,000 acres of hill and mountain area, located primarily in the County of Los Angeles, with a small portion in the County of Ventura. Its boundaries are shown on Attachment "A". The San Gabriel Mountains form the northerly portion of the watershed, and from them two major washes--the Pacoima and the Tujunga--discharge southerly. Tujunga Wash traverses the valley fill in a southerly direction and joins the Los Angeles River, which follows an easterly course along the base of the Santa Monica Mountains before it turns south through the Los Narrows. The waters of Pacoima Wash as and when they flow out of Sylmar Basin are tributary to San Fernando Basin. Lesser tributary washes run from the Simi Hills and the Santa Susana Mountains in the westerly portion of the watershed. Other minor washes, including Verdugo Wash, drain the easterly portion of the watershed which consists of the Verdugo Mountains, the Elysian, San Rafael and Repetto Hills. Each of said washes is a non-perennial stream whose flood flows and rising waters are naturally tributary to the Los Angeles River. The Los Angeles River within ULARA and most of said tributary natural washes have been replaced, and in some instances relocated, by concrete-lined flood control channels. There are 85.3 miles of such channels within ULARA, 62% of which have lined concrete bottoms.

4.1.2 San Fernando Basin. San Fernando Basin is the major ground water basin in ULARA. It underlies 112,047 acres and is located in the area shown as such on Attachment "A". Boundary conditions of the San Fernando Basin consist on the east and northeast of alluvial contacts with non-waterbearing series along the San Rafael Hills and Verdugo Mountains and the Santa Susana Mountains and Simi Hills on the northwest and west and the Santa Monica Mountains on the south. Water-bearing material in said basin extends to at least 1000 feet below the surface. Rising water outflow from the San Fernando Basin passes its downstream and southerly boundary in the vicinity of Gage F-57, which is located in Los Angeles Narrows about 300 feet upstream from the Figueroa Street (Dayton Street) Bridge. The San Fernando Basin is separated from the Sylmar Basin on the north by the eroded south limb of the Little Tujunga Syncline which causes a break in the ground water surface of about 40 to 50 feet.

4.1.3 Sylmar Basin. Sylmar Basin underlies 5,565 acres and is located in the area shown as such on Attachment "A". Water-bearing material in said basin extends to depths in excess of 12,000 feet below the surface. Boundary conditions of Sylmar Basin consist of the San Gabriel Mountains on the north, a topographic divide in the valley fill between the Mission Hills and San Gabriel Mountains on the west, the Mission Hills on the southwest, Upper Lopez Canyon Saugus Formation on the east, along the east bank of Pacoima Wash, and the eroded south limb of the Little Tujunga Syncline on the south.

4.1.4 Verdugo Basin. Verdugo Basin underlies 4,400 acres and is located in the area shown as such on Attachment "A". Boundary conditions of Verdugo Basin consist of the San Gabriel Mountains on the north, the Verdugo Mountains on the south and southwest, the San

Rafael Hills on the southeast and the topographic divide on the east between the drainage area that is tributary to the Tujunga Wash to the west and Verdugo Wash to the east, the ground water divide on the west between Monk Hill-Raymond Basin and the Verdugo Basin on the east and a submerged dam constructed at the mouth of Verdugo Canyon on the south.

4.1.5 Eagle Rock Basin. Eagle Rock Basin underlies 807 acres and is located in the area shown as such on Attachment "A". Boundary conditions of Eagle Rock Basin consist of the San Rafael Hills on the north and west and the Repetto Hills on the east and south with a small alluvial area to the southwest consisting of a topographic divide.

4.2 Hydrology.

4.2.1 Water Supply. The water supply of ULARA consists of native waters, derived from precipitation on the valley floor and runoff from the hill and mountain areas, and of imported water from outside the watershed. The major source of imported water has been from the Owens-Mono Aqueduct, but additional supplies have been and are now being imported through MWD from its Colorado Aqueduct and the State Aqueduct.

4.2.2 Ground Water Movement. The major water-bearing formation in ULARA is the valley fill material bounded by hills and mountains which surround it. Topographically, the valley-fill area has a generally uniform grade in a southerly and easterly direction with the slope gradually decreasing from the base of the hills and mountains to the surface drainage outlet at Gage F-57. The valley fill material is a heterogeneous mixture of clays, silts, sand and gravel laid down as alluvium. The valley fill is of greatest permeability along and easterly of Pacoima and Tujunga Washes and generally throughout the eastern portion of the valley fill area, except in the vicinity of Glendale where it is of lesser permeability. Ground water occurs mainly within the valley fill, with only negligible amounts occurring in hill and mountain areas. There is no significant ground water movement from the hill and mountain formations into the valley fill. Available geologic data do not indicate that there are any sources of native ground water other than those derived from precipitation. Ground water movement in the valley fill generally follows the surface topography and drainage except where geologic or man-made impediments occur or where the natural flow has been modified by extensive pumping.

4.2.3 Separate Ground Water Basins. The physical and geologic characteristics of each of the ground water basins, Eagle rock, Sylmar, Verdugo and San Fernando, cause impediments to inter-basin ground water flow whereby there is created separate underground reservoirs. Each of said basins contains a common source of water supply to parties extracting ground water from each of said basins. The amount of underflow from Sylmar Basin, Verdugo Basin and Eagle Rock Basin to San Fernando Basin is relatively small, and on the average has been approximately 540 acre feet per year from the Sylmar Basin; 80 acre feet per year from Verdugo Basin; and 50 acre feet per year from Eagle Rock Basin. Each has physiographic, geologic and hydrologic differences, one from the other, and each meets the hydrologic definition of "basin". The extractions of water in the respective basins affect the other water users within that basin but do not significantly or materially affect the ground water levels in any of the other basins. The underground reservoirs of Eagle Rock, Verdugo and Sylmar Basins are independent of one another and of the San Fernando Basin.

4.2.4 Safe Yield and Native Safe Yield. The safe yield and native safe yield, stated in acre feet, of the three largest basins for the year 1964-65 was as follows:

Basin	Safe Yield	Native Safe Yield
San Fernando	90,680	43,660
Sylmar	6,210	3,850
Verdugo	7,150	3,590

The safe yield of Eagle Rock Basin is derived from imported water delivered by Los Angeles. There is no measurable native safe yield.

4.2.5 Separate Basins -- Separate Rights. The rights of the parties to extract ground water within ULARA are separate and distinct as within each of the several ground water basins within said watershed.

4.2.6 Hydrologic Condition of Basins. The several basins within ULARA are in varying hydrologic conditions, which result in different legal consequences.

4.2.6.1 San Fernando Basin. The first full year of overdraft in San Fernando Basin was 1954-55. It remained in overdraft continuously until 1968, when an injunction herein became effective. Thereafter, the basin was placed on safe yield operation. There is no surplus ground water available for appropriation or overlying use from San Fernando Basin.

4.2.6.2 Sylmar Basin. Sylmar Basin is not in overdraft. There remains safe yield over and above the present reasonable beneficial overlying uses, from which safe yield the appropriative rights of Los Angeles and San Fernando may be and have been exercised.

4.2.6.3 Verdugo Basin. Verdugo Basin was in overdraft for more than five consecutive years prior to 1968. Said basin is not currently in overdraft, due to decreased extractions by Glendale and Crescenta Valley on account of poor water quality. However, the combined appropriative and prescriptive rights of Glendale and Crescenta Valley are equivalent to the safe yield of the Basin. No private overlying or appropriative rights exist in Verdugo Basin.

4.2.6.4 Eagle Rock Basin. The only measure water supply to Eagle Rock Basin is import return water by reason of importations by Los Angeles. Extractions by Foremost and Deep Rock under the prior stipulated judgments have utilized the safe yield of Eagle Rock Basin, and have maintained hydrologic equilibrium therein.

5. DECLARATION OF RIGHTS

5.1 Right to Native Waters.

5.1.1 Los Angeles River and San Fernando Basin.

5.1.1.1 Los Angeles' Pueblo Right. Los Angeles, as the successor to all rights, claims and powers of the Spanish Pueblo de Los Angeles in regard to water rights, is the owner of a prior and paramount pueblo right to the surface waters of the Los Angeles River and the native ground waters of San Fernando Basin to meet its reasonable beneficial needs and for its inhabitants.

5.1.1.2 Extent of Pueblo Right. Pursuant to said pueblo right, Los Angeles is entitled to satisfy its needs and those of its inhabitants within its boundaries as from time to time modified. Water which is in fact used for pueblo right purposes is and shall be deemed needed for such purposes.

5.1.1.3 Pueblo Right -- Nature and Priority of Exercise. The pueblo right of Los Angeles is a prior and paramount right to all of the surface waters of the Los Angeles River, and native ground water in San Fernando Basin, to the extent of the reasonable needs and uses of Los Angeles and its inhabitants throughout the corporate area of Los Angeles, as its boundaries may exist from time to time. To the extent that the Basin contains native waters and imported waters, it is presumed that the first water extracted by Los Angeles in any water year is pursuant to its pueblo right, up to the amount of the native safe yield. The next extractions by Los Angeles in any year are deemed to be from import return water, followed by stored water, to the full extent of Los Angeles' right to such import return water and stored water. In the event of need to meet water requirements of its inhabitants, Los Angeles has the additional right, pursuant to its pueblo right, withdraw temporarily from storage Underlying Pueblo Waters, subject to an obligation to replace such water as soon as practical.

5.1.1.4 Rights of Other Parties. No other party to this action has any right in or to the surface waters of the Los Angeles River or the native safe yield of the San Fernando Basin.

5.1.2 Sylmar Basin Rights.

5.1.2.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground waters in Sylmar Basin.

5.1.2.2 Overlying Rights. Defendants Moordigian and Hersch & Plumb own lands overlying Sylmar Basin and have a prior correlative right to extract native waters from said Basin for reasonable beneficial uses on their said overlying lands. Said right is appurtenant to said overlying lands and water extracted pursuant thereto may not be exported from said lands nor can said right be transferred or assigned separate and apart from said overlying lands.

5.1.2.3 Appropriative Rights of San Fernando and Los Angeles. San Fernando and Los Angeles own appropriative rights, of equal priority, to extract and put to reasonable beneficial use for the needs of said cities and their inhabitants, native waters of the Sylmar Basin in excess of the exercised reasonable beneficial needs of overlying users. Said appropriative rights are:

San Fernando	3,580 acre feet
Los Angeles	1,560 acre feet.

5.1.2.4 No Prescription. The Sylmar Basin is not presently in a state of overdraft and no rights by prescription exist in said Basin against any overlying or appropriative water user.

5.1.2.5 Other Parties. No other party to this action owns or possesses any right to extract native ground waters from the Sylmar Basin.

5.1.3 Verdugo Basin Rights.

5.1.3.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground water in Verdugo Basin.

5.1.3.2 Prescriptive Rights of Glendale and Crescenta Valley. Glendale and Crescenta Valley own prescriptive rights as against each other and against all private overlying or appropriative parties in the Verdugo Basin to extract, with equal priority, the following quantities of water from the combined safe yield of native and imported waters in Verdugo Basin:

Glendale	3,856 acre feet
Crescenta Valley	3,294 acre feet.

5.1.3.3 Other Parties. No other party to this action owns or possesses any right to extract native ground waters from the Verdugo Basin.

5.1.4 Eagle Rock Basin Rights.

5.1.4.1 No Pueblo Rights. The pueblo right of Los Angeles does not extend to or include ground water in Eagle Rock Basin.

5.1.4.2 No Rights in Native Waters. The Eagle Rock Basin has no significant or measurable native safe yield and no parties have or assert any right or claim to native waters in said Basin.

5.2 Rights to Imported Waters.

5.2.1 San Fernando Basin Rights.

5.2.1.1 Rights to Recapture Import Return Water. Los Angeles, Glendale, Burbank and San Fernando have each caused imported waters to be brought into ULARA and to be delivered to lands overlying the San Fernando Basin, with the result that percolation and return flow of such delivered water has caused imported waters to become a part of the safe yield of San Fernando Basin. Each of said parties has a right to extract from San Fernando Basin that portion of the safe yield of the Basin attributable to such import return waters.

5.2.1.2 Rights to Store and Recapture Stored Water. Los Angeles has heretofore spread imported water directly in San Fernando Basin. Los Angeles, Glendale, Burbank and San Fernando each have rights to store water in San Fernando Basin by direct spreading or in lieu practices. To the extent of any future spreading or in lieu storage of import water or reclaimed water by Los Angeles, Glendale, Burbank or San Fernando, the party causing said water to be so stored shall have a right to extract an equivalent amount of ground water from San Fernando Basin. The right to extract waters attributable to such storage practices is an undivided right to a quantity of water in San Fernando Basin equal to the amount of such Stored Water to the credit of any party, as reflected in Watermaster records.

5.2.1.3 Calculation of Import Return Water and Stored Water Credits. The extraction rights of Los Angeles, Glendale, Burbank and San Fernando in San Fernando Basin in any year, insofar as such rights are based upon import return water, shall only extend to the amount of any accumulated import return water credit of such party by reason of imported water delivered after September 30, 1977. The annual credit for such import return water shall be calculated by Watermaster based upon the amount of delivered water during the preceding water year, as follows:

Los Angeles:	20.8% of all delivered water (including reclaimed water) to valley fill lands of San Fernando Basin.
San Fernando:	26.3% of all imported and reclaimed water delivered to valley-fill lands of San Fernando Basin.
Burbank:	20.0% of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas.
Glendale:	20.0% of all delivered water (including reclaimed water) to San Fernando Basin and its tributary hill and mountain areas (i.e., total delivered water, [including reclaimed water], less 105% of total sales by Glendale in Verdugo Basin and its tributary hills).

In calculating Stored Water credit, by reason of direct spreading of imported or reclaimed water, Watermaster shall assume that 100% of such spread water reached the ground water in the year spread.

5.2.1.4 Cumulative Import Return Water Credits. Any import return water which is not extracted in a given water year shall be carried over, separately accounted for, and maintained as a cumulative credit for purposes of future extractions.

5.2.1.5 Overextractions. In addition to extractions of stored water, Glendale, Burbank or San Fernando may, in any water year, extract from San Fernando Basin an amount not exceeding 10% of such party's last annual credit for import return water, subject, however, to an obligation to replace such overextraction by reduced extractions during the next succeeding water year. Any such overextraction which is not so replaced shall constitute physical solution water, which shall be deemed to have been extracted in said subsequent water year.

5.2.1.6 Private Defendant. No private defendant is entitled to extract water from the San Fernando Basin on account of the importation of water thereto by overlying public entities.

5.2.2 Sylmar Basin Rights.

5.2.2.1 Rights to Recapture Import Return Waters. Los Angeles and San Fernando have caused imported waters to be brought into ULARA and delivered to lands overlying the Sylmar Basin with the result that percolation and return flow of such delivered water has caused imported waters to become a part of the safe yield of Sylmar Basin. Los Angeles and San Fernando are entitled to recover from Sylmar Basin such imported return waters. In calculating the annual entitlement to recapture such import return water, Los Angeles and San Fernando shall be entitled to 35.7% of the preceding water year's imported water delivered by such party to lands overlying Sylmar Basin. Thus, by way of example, in 1976-77, Los Angeles was entitled to extract 2370 acre feet of ground water from Sylmar Basin, based on delivery to lands overlying said Basin of 6640 acre feet during 1975-76. The quantity of San Fernando's imported water to, and the return flow therefrom, in the Sylmar Basin in the past has been of such minimal quantities that it has not been calculated.

5.2.2.2 Rights to Store and Recapture Stored Water. Los Angeles and San Fernando each have the right to store water in Sylmar Basin equivalent to their rights in San Fernando Basin under paragraph 5.2.1.2 hereof.

5.2.2.3 Carry Over. Said right to recapture stored water, import return water and other safe yield waters to which a party is entitled, if not exercised in a given year, can be carried over for not to exceed five years, if the underflow through Sylmar Notch does not exceed 400 acre feet per year.

5.2.2.4 Private Defendants. No private defendant is entitled to extract water from within the Sylmar Basin on account of the importation of water thereto by overlying public entities.

5.2.3 Verdugo Basin Rights.

5.2.3.1 Glendale and Crescenta Valley. Glendale and Crescenta Valley own appropriative and prescriptive rights in and to the total safe yield of Verdugo Basin, without regard as to the portions thereof derived from native water and from delivered imported waters, notwithstanding that both of said parties have caused waters to be imported and delivered on lands overlying Verdugo Basin. Said aggregate rights are as declared in Paragraph 5.1.3.2 of these Conclusions.

5.2.3.2 Los Angeles. Los Angeles may have a right to recapture its import return waters by reason of delivered import water in the Basin, based upon imports during and after water year 1977-78, upon application to Watermaster not later than the year following such import and on subsequent order after hearing by the Court.

5.2.3.3 Private Defendants. No private defendant, as such, is entitled to extract water from within the Verdugo Basin on account of the importation of water thereto by overlying public entities.

5.2.4 Eagle Rock Basin Rights.

5.2.4.1 Los Angeles. Los Angeles has caused imported water to be delivered for use on lands overlying Eagle Rock Basin and return flow from said delivered imported water constitutes the entire safe yield of Eagle Rock Basin. Los Angeles has the right to extract or cause to be extracted the entire safe yield of Eagle Rock Basin.

5.2.4.2 Private Defendants. No private defendants have a right to extract water from within Eagle Rock Basin, except pursuant to the physical solution herein.

6. INJUNCTIONS

Each of the parties named or referred to in this Part 6, its officers, agents, employees and officials is, and they are, hereby ENJOINED and RESTRAINED from doing or causing to be done any of the acts herein specified:

6.1 Each and Every Defendant -- from diverting the surface waters of the Los Angeles River or extracting the native waters of SAN FERNANDO BASIN, or in any manner interfering with the prior and paramount pueblo right of Los Angeles in and to such waters, except pursuant to the physical solution herein decreed.

6.2 Each and Every Private Defendant -- from extracting ground water from the SAN FERNANDO, VERDUGO, or EAGLE ROCK BASINS, except pursuant to physical solution provisions hereof.

6.3 Defaulting and Disclaiming Parties (listed in Attachments “C” and “D”) -- from diverting or extracting water within ULARA, except pursuant to the physical solution herein decreed.

6.4 Glendale -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution; and from extracting water from VERDUGO BASIN n excess of its appropriative and prescriptive right declared herein.

6.5 Burbank -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution decreed herein.

6.6 San Fernando -- from extracting ground water from SAN FERNANDO BASIN in any water year in quantities exceeding its import return water credit and any stored water credit, except pursuant to the physical solution herein decreed.

6.7 Crescenta Valley -- from extracting ground water from VERDUGO BASIN in any year in excess of its appropriative and prescriptive right declared herein.

6.8 Los Angeles -- from extracting ground water from SAN FERNANDO BASIN in any year in excess of the native safe yield, plus any import return water credit and stored water credit of said city; provided, that where the needs of Los Angeles require the extraction of Underlying Pueblo Waters, Los Angeles may extract such water subject to an obligation to replace such excess as soon as practical; and from extracting ground water from VERDUGO BASIN in excess of any credit for import return water which Los Angeles may acquire by reason of delivery of imported water for use overlying said basin, as hereinafter confirmed on application to Watermaster and by subsequent order of the Court.

6.9 Non-consumptive and Minimal Consumptive Use Parties. The parties listed in Attachment "F" are enjoined from extracting water from San Fernando Basin, except in accordance with practices specified in Attachment "F", or pursuant to the physical solution herein decreed.

7. CONTINUING JURISDICTION

7.1 Jurisdiction Reserved. Full jurisdiction, power and authority are retained by and reserved to the Court for purposes of enabling the Court upon application of any party or of the Watermaster by motion and upon at least 30 days' notice thereof, and after hearing thereon, to make such further or supplemental orders or directions as may be necessary or appropriate, for interpretation, enforcement or carrying out of this Judgment, and to modify, amend or amplify any of the provisions of this Judgment or to add to the provisions thereof consistent with the rights herein decreed; provided, however, that no such modification, amendment or amplification shall result in a change in the provisions of Section 5.2.1.3 or 9.2.1 hereof.

8. WATERMASTER

8.1 Designation and Appointment.

8.1.1 Watermaster Qualification and Appointment. A qualified hydrologist, acceptable to all active public agency parties hereto, will be appointed by subsequent order of the Court to assist the Court in its administration and enforcement of the provisions of this Judgment and any subsequent orders of the Court entered pursuant to the Court's continuing jurisdiction. Such Watermaster shall serve at the pleasure of the Court, but may be removed or replaced on motion of any party after hearing and showing of good cause.

8.2 Powers and Duties.

8.2.1 Scope. Subject to the continuing supervision and control of the Court, Watermaster shall exercise the express powers, and shall perform the duties, as provided in this Judgment or hereafter ordered or authorized by the Court in the exercise of the Court's continuing jurisdiction.

8.2.2 Requirement for Reports, Information and Records. Watermaster may require any party to furnish such reports, information and records as may be reasonably necessary to determine compliance or lack of compliance by any party with the provisions of this Judgment.

8.2.3 Requirement of Measuring Devices. Watermaster shall require all parties owning or operating any facilities for extraction of ground water from ULARA to install and maintain at all times in good working order, at such party's own expense, appropriate meters or other measuring devices satisfactory to the Watermaster.

8.2.4 Inspection by Watermaster. Watermaster shall make inspections of (a) ground water extraction facilities and measuring devices of any party, and (b) water use practices by any party under physical solution conditions, at such times and as often as may be reasonable under the circumstances to verify reported data and practices of such party. Watermaster shall also identify and report on any new or proposed new ground water extractions by any party or non-party.

8.2.5 Policies and Procedures. Watermaster shall, with the advice and consent of the Administrative Committee, adopt and amend from time to time Policies and Procedures as may be reasonably necessary to guide Watermaster in performance of its duties, powers and responsibilities under the provisions of this judgment.

8.2.6 Data Collection. Watermaster shall collect and verify data relative to conditions of ULARA and its ground water basins from the parties and one or more other governmental agencies. Where necessary, and upon approval of the Administrative Committee, Watermaster may develop supplemental data.

8.2.7 Cooperation With Other Agencies. Watermaster may act jointly or cooperate with agencies of the United States and the State of California or any political subdivisions, municipalities or districts (including any party) to secure or exchange data to the end that the purpose of this Judgment, including its physical solution, may be fully and economically carried out.

8.2.8 Accounting for Non-consumptive Use. Watermaster shall calculate and report annually the non-consumptive and consumptive uses of extracted ground water by each party listed in Attachment "F".

8.2.9 Accounting for Accumulated Import Return Water and Stored Water. Watermaster shall record and verify additions, extractions and losses and maintain an annual and cumulative account of all (a) stored water and (b) import return water in San Fernando Basin. Calculation of losses attributable to Stored Water shall be approved by the Administrative Committee or by subsequent order of the Court. For purposes of such accounting, extractions in any water year by Glendale, Burbank or San Fernando shall be assumed to be first from accumulated import return water, second from stored water, and finally pursuant to physical solution; provided, that any such city may, by written notice of intent to Watermaster, alter said priority of extractions as between import return water and stored water.

8.2.10 Recalculation of Safe Yield. Upon request of the Administrative Committee, or on motion of any party and subsequent Court order, Watermaster shall recalculate safe yield of any basin within ULARA. If there has been a material long-term change in storage over a base period (excluding any effects of stored water) in San Fernando Basin the safe yield shall be adjusted by making a corresponding change in native safe yield of the Basin.

8.2.11 Watermaster Report. Watermaster shall prepare annually and (after review and approval by Administrative Committee) cause to be served on all active parties, on or before May 1, a report of hydrologic conditions and Watermaster activities within ULARA during the preceding water year. Watermaster's annual report shall contain such information as may be requested by the Administrative Committee, required by Watermaster Policies and Procedures or specified by subsequent order of this Court.

8.2.12 Active Party List. Watermaster shall maintain at all times a current list of active parties and their addresses.

8.3 Administrative Committee.

8.3.1 Committee to be Formed. An Administrative Committee shall be formed to advise with, request or consent to, and review actions of Watermaster. Said Administrative Committee shall be composed of one representative of each party having a right to extract ground water from ULARA, apart from the physical solution. Any such party not desiring to participate in such committee shall so advise Watermaster in writing.

8.3.2 Organization and Voting. The Administrative Committee shall organize and adopt appropriate rules and regulations to be included in Watermaster Policies and Procedures. Action of the Administrative Committee shall be by unanimous vote of its members, or of the members affected in the case of an action which affects one or more basins but less than all of ULARA. In the event of inability of the Committee to reach a unanimous position, the matter may, at the request of Watermaster or any party, be referred to the Court for resolution by subsequent order after notice and hearing.

8.3.3 Function and Powers. The Administrative Committee shall be consulted by Watermaster and shall request or approve all discretionary Watermaster determinations. In the event of disagreement between Watermaster and the Administrative Committee, the matter shall be submitted to the Court for review and resolution.

8.4 Watermaster Budget and Assessments.

8.4.1 Watermaster's Proposed Budget. Watermaster shall, on or before May 1, prepare and submit to the Administrative Committee a budget for the ensuing water year. The budget shall be determined for each basin separately and allocated between the separate ground water basins. The total for each basin shall be allocated between the public agencies in proportion to their use of ground water from such basin during the preceding water year.

8.4.2 Objections and Review. Any party who objects to the proposed budget, or to such party's allocable share thereof, may apply to the Court within thirty (30) days of receipt of the proposed budget from Watermaster for review and modification. Any such objection shall be duly noticed to all interested parties and heard within thirty (30) days of notice.

8.4.3 Notice of Assessment. After thirty (30) days from delivery of Watermaster's proposed budget, or after the order of Court settling any objections thereto, Watermaster shall serve notice on all parties to be assessed of the amount of assessment and the required payment schedule.

8.4.4 Payment. All assessments for Watermaster expenses shall be payable on the dates designated in the notice of assessment.

8.5 Review of Watermaster Activities.

8.5.1 Review Procedures. All actions of Watermaster (other than budget and assessment matters, which are provided for in Paragraph 8.4.2) shall be subject to review by the Court on its own motion or on motion by any party, as follows:

8.5.1.1 Noticed Motion. Any party may, by a regularly noticed motion, apply to the court for review of any Watermaster's action. Notice of such motion shall be served personally or mailed to Watermaster and to all active parties.

8.5.1.2 De Novo Nature of Proceedings. Upon the filing of any such motion, the Court shall require the moving party to notify the active parties of a date for taking evidence and argument, and on the date so designated shall review de novo the question at issue. Watermaster's findings or decision, if any, may be received in evidence at said hearing, but shall not constitute presumptive or prima facie proof of any fact in issue.

8.5.1.3 Decision. The decision of the Court in such proceeding shall be an appealable supplemental order in this case. When the same is final, it shall be binding upon the Watermaster and all parties.

9. PHYSICAL SOLUTION

9.1 Circumstances Indicating Need for Physical Solution. During the period between 1913 and 1955, when there existed temporary surplus waters in the San Fernando Basin, overlying cities and private overlying landowners undertook to install and operate water extraction, storage and transmission facilities to utilize such temporary surplus waters. If the injunction against interference with the prior and paramount rights of Los Angeles to the waters of the San Fernando and Eagle Rock Basins were strictly enforced, the value and utility of those water systems and facilities would be lost or impaired. It is appropriate to allow continued limited extraction from the San Fernando and Eagle Rock Basins by parties other than Los Angeles, subject to assurance that Los Angeles will be compensated for any cost, expense or loss incurred as a result thereof.

9.2 Prior Stipulated Judgments. Several defendants heretofore entered into separate stipulated judgments herein, during the period June, 1958 to November, 1965, each of which judgments was subject to the court's continuing jurisdiction. Without modification of the substantive terms of said prior judgments, the same are categorized and merged into this judgment and superseded hereby in the exercise of the Court's continuing jurisdiction, as follows:

9.2.1 Eagle Rock Basin Parties. Stipulating defendants Foremost and Deep Rock have extracted water from Eagle Rock Basin, whose entire safe yield consist of import return waters of Los Angeles. Said parties may continue to extract water from Eagle Rock Basin to supply their bottled drinking water requirements upon filing all required reports on said extraction with Watermaster and Los Angeles and paying Los Angeles annually an amount equal to $21.78 per acre foot for the first 200 acre feet, and $39.20 per acre foot for any additional water extracted in any water year.

9.2.2 Non-consumptive or Minimal-consumptive Operations. Certain stipulating defendants extract water from San Fernando Basin for uses which are either non-consumptive or have a minimal consumptive impact. Each of said defendants who have a minimal consumptive impact has a connection to the City of Los Angeles water system and purchases annually an amount of water at least equivalent to the consumptive loss of extracted ground water. Said defendants are:

Non-Consumptive

Walt Disney Productions

Sears, Roebuck & Co.

Minimal-Consumptive

Conrock Co., for itself and as successor to California Materials Co.; Constance Ray White and Lee L. White; Mary L. Akmadzich and Peter J. Akmadzich

Livingston Rock & Gravel, for itself and as successor to Los Angeles Land & Water Co.

The nature of each said defendant's water use practices is described in Attachment "F". Subject to required reports to and inspections by Watermaster, each said defendant may continue extractions for said purposes so long as in any year such party continues such non-consumptive or minimal-consumptive use practices.

9.2.3 Abandoned Operations. The following stipulating defendants have ceased extracting water from San Fernando Basin and no further need exists for physical solution in their behalf:

Knickerbocker Plastic Company, Inc.

Carnation Company

Hidden Hills Mutual Water Company

Southern Pacific Railroad Co.

Pacific Fruit Express Co.

9.3 Private Defendants. There are private defendants who installed during the years of temporary surplus relatively substantial facilities to extract and utilize ground waters of San Fernando Basin. Said defendants may continue their extractions for consumptive use up to the indicated annual quantities upon payment of compensation to the appropriate city wherein their use of water is principally located, on the basis of the following physical solution:

9.3.1 Private Defendants and Appropriate Cities. Said private defendants and the cities to which their said extractions shall be charged and to which physical solution payment shall be made are:

		Annual Quantities (acre feet)
Los Angeles	- Toluca Lake	100
	Sportsman's Lodge	25
	Van de Kamp	120
Glendale	- Forest Lawn	400
	Southern Service Co.	75
Burbank	- Valhalla	300
	Lockheed	25

Provided that said private defendants shall not develop, install or operate new wells or other facilities which will increase existing extraction capacities.

9.3.2 Reports and Accounting. All extractions pursuant to this physical solution shall be subject to such reasonable reports and inspection as may be required by Watermaster.

9.3.3 Payment. Water extracted pursuant hereto shall be compensated for by annual payment to Los Angeles, and as agreed upon pursuant to paragraph 9.3.3.2 to Glendale and Burbank, thirty days from day of notice by Watermaster, on the following basis:

9.3.3.1 Los Angeles. An amount equal to what such party would have paid had water been delivered from the distribution system of Los Angeles, less the average energy cost of extraction of ground water by Los Angeles from San Fernando.

9.3.3.2 Glendale or Burbank. An amount equal to the sum of the amount payable to Los Angeles under paragraph 9.4 hereof and any additional charges or conditions agreed upon by either such city and any private defendant.

9.4 Glendale and Burbank. Glendale and Burbank have each installed, during said years of temporary surplus, substantial facilities to extract and utilize waters of the San Fernando Basin. In addition to the use of such facilities to recover import return water, the distribution facilities of such cities can be most efficiently utilized by relying upon the San Fernando Basin for peaking supplies in order to reduce the need for extensive new surface storage. Glendale and Burbank may extract annual quantities of ground water from the San Fernando Basin, in addition to their rights to import return water or stored water, as heretofore declared, in quantities up to:

Glendale	5,500 acre feet
Burbank	4,200 acre feet;

provided, that said cities shall compensate Los Angeles annually for any such excess extractions over and above their declared rights at a rate per acre foot equal to the average MWD price for municipal and industrial water delivered to Los Angeles during the fiscal year, less the average energy cost of extraction of ground water by Los Angeles from San Fernando Basin during the preceding fiscal year. Provided, further, that ground water extracted by Forest Lawn and Southern Service Co. shall be included in the amount taken by Glendale, and the amount extracted by Valhalla and Lockheed shall be included in the amount taken by Burbank. All water taken by Glendale or Burbank pursuant hereto shall be charged against Los Angeles' rights in the year of such extractions.

In the event of emergency, and upon stipulation or motion and subsequent order of the Court, said quantities may be enlarged in any year.

9.5 San Fernando. San Fernando delivers imported water on lands overlying the San Fernando Basin, by reason of which said city has a right to recover import return water. San Fernando does not have water extraction facilities in the San Fernando Basin, nor would it be economically or hydrologically useful for such facilities to be installed. Both San Fernando and Los Angeles have decreed appropriative rights and extraction facilities in the Sylmar Basin. San Fernando may extract ground water from the Sylmar Basin in a quantity sufficient to utilize its San Fernando Basin import return water credit, and Los Angeles shall reduce its Sylmar Basin extractions by an equivalent amount and receive an offsetting entitlement for additional San Fernando Basin extractions.

9.6 Effective Date. This physical solution shall be effective on October 1, 1978, based upon extractions during water year 1978-79.

10. MISCELLANEOUS PROVISIONS

10.1 Designation of Address for Notice and Service. Each party shall designate the name and address to be used for purposes of all subsequent notices and service herein by a separate designation to be filed with Watermaster within thirty (30) days after Notice of Entry of Judgment has been served. Said designation may be changed from time to time by filing a written notice of such change with the Watermaster. Any party desiring to be relieved of receiving notices of Watermaster activity may file a waiver of notice on a form to be provided by Watermaster. Thereafter such party shall be removed from the Active Party list. For purposes of service on any party or active party by the Watermaster, by any other party, or by the Court, of any item required to be served upon or delivered to such party or active party under or pursuant to the Judgment, such service shall be made personally or by deposit in the United States mail, first class, postage prepaid, addressed to the designee and at the address in the latest designation filed by such party or active party.

10.2 Notice of Change in Hydrologic Condition -- Sylmar Basin. If Sylmar Basin shall hereafter be in a condition of overdraft due to increased or concurrent appropriations by Los Angeles and San Fernando, Watermaster shall so notify the Court and parties concerned, and notice of such overdraft and the adverse effect thereof on private overlying rights shall be given by said cities as prescribed by subsequent order of the Court, after notice and hearing.

10.3 Judgment Binding on Successors. This Judgment and all provisions thereof are applicable to and binding upon not only the parties to this action, but also upon their respective heirs, executors, administrators, successors, assigns, lessees and licensees and upon the agents, employees and attorneys in fact of all such persons.

10.4 Costs. Ordinary court costs shall be borne by each party, and reference costs shall be borne as heretofore allocated and paid.

DATED: _______________, 1979.

____
Judge of the Superior Court

HELM, BUDINGER & LEMIEUX
An Association, Including A
Professional Corporation
4444 Riverside Drive, Suite 201
Burbank, CA. 91505
(213) 849-6473

Attorneys for Defendant,
Dominguez Water Corporation

SUPERIOR COURT OF THE STATE OF CALIFORNIA
FOR THE COUNTY OF LOS ANGELES

CALIFORNIA WATER SERVICE COMPANY, et al., Plaintiff,	No. 506,806
vs.	AMENDED JUDGMENT
CITY OF COMPTON, et al., Defendants.	(DECLARING AND ESTABLISHING WATER RIGHTS IN THE WEST COAST BASIN, IMPOSING A PHYSICAL SOLUTION THEREIN AND ENJOINING EXTRACTIONS THEREFROM IN EXCESS OF SPECIFIED QUANTITIES.)

SB 257081 v1: 06774.0096

INTRODUCTION

The above - entitled matter came on regularly for further trial before the Honorable George Francis, Judge of the Superior Court of the State of California, assigned by the Chairman of the Judicial Council to sit in this case on Friday the 21st day of July, 1961. Thereupon plaintiffs filed a dismissal of the action as to certain defendants named in the Complaint and in the Amended Complaint herein who are not mentioned or referred to in Paragraph III of this Judgment, and the further trial of the action proceeded in respect to the remaining parties.

The objections to the Report of Referee and to all supplemental Reports thereto, having been considered upon exceptions thereto filed with the Clerk of the Court in the manner of and within the time allowed by law, were overruled.

Oral and documentary evidence was introduced, and the matter was submitted to the Court for decision. Findings of Fact, Conclusions of Law and Judgment herein have heretofore been signed and filed.

Pursuant to the reserved and continuing jurisdiction of the Court under the Judgment herein, certain amendments to said Judgment and temporary Orders have heretofore been made and entered.

Continuing jurisdiction of the Court under said Judgment is currently assigned to the HONORABLE JULIUS M. TITLE.

The motion of defendant herein, DOMINGUEZ WATER CORPORATION, for further amendments to the Judgment, notice thereof and of the hearing thereon having been duly and regularly given to all parties, came on for hearing in Department 48 of the above-entitled Court on March 21, 1980, at 1:30 o'clock P.M., before said HONORABLE JULIUS M. TITLE. Defendant, DOMINGUEZ WATER CORPORATION, was represented by its attorneys, Helm, Budinger & Lemieux, and Ralph B. Helm. Various other parties were represented by counsel of record appearing on the Clerk's records. Hearing thereon was concluded on that date. The within "Amended Judgment" incorporates amendments and orders heretofore made to the extent presently operable and amendments pursuant to said last mentioned motion. To the extent this Amended Judgment is a restatement of the Judgment as heretofore amended, it is for convenience in incorporating all matters in one document, it is not a readjudication of such matters and is not intended to reopen any such matters. As used hereinafter the word "Judgment" shall include the original Judgment as amended to date.

NOW, THEREFORE, IT IS HEREBY ORDERED, ADJUDGED AND DECREED AS FOLLOWS:

I.

Existence of Basin and Boundaries Thereof.

There exists in the County of Los Angeles, State of California, an underground water basin or reservoir known and hereinafter referred to as "West Coast Basin", "West Basin" or the "Basin", and the boundaries thereof are described as follows:

Commencing at a point in the Baldwin Hills about 1300 feet north and about 100 feet west of the intersection of Marvale Drive and

Northridge Drive; thence through a point about 200 feet northeasterly along Northridge Drive from the intersection of Marvale and Northridge Drives to the base of the escarpment of the Potrero fault; thence along the base of the escarpment of the Potrero fault in a straight line passing through a point about 200 feet south of the intersection of Century and Crenshaw Boulevards and extending about 2650 feet beyond this point to the southerly end of the Potrero escarpment; thence from the southerly end of the Potrero escarpment in a line passing about 700 feet south of the intersection of Western Avenue and Imperial Boulevard and about 400 feet north of the intersection of El Segundo Boulevard and Vermont Avenue and about 1700 feet south of the intersection of El Segundo Boulevard and Figueroa Street to the northerly end of the escarpment of the Avalon-Compton fault at a point on said fault about 700 feet west of the intersection of Avalon Boulevard and Rosecrans Avenue; thence along the escarpment of the Avalon-Compton fault to a point in the Dominguez Hills located about 1300 feet north and about 850 feet west of the intersection of Central Avenue and Victoria Street; thence along the crest of the Dominguez Hills in a straight line to a point on Alameda Street about 2900 feet north of Del Amo Boulevard as measured along Alameda Street; thence in a straight line extending through a point located on Del Amo Boulevard about 900 feet west of the Pacific Electric Railway to a point about 100 feet north and west of the intersection of Bixby Road and Del Mar Avenue; thence in a straight line to a point located about 750 feet west and about 730 feet south of the intersection of Wardlow Road and Long Beach Boulevard at the escarpment of the Cherry Hill fault; thence along the escarpment of the Cherry Hill fault through the intersection of Orange Avenue and Willow Street to a point about 400 feet east of the intersection of Walnut and Creston Avenues; thence to a point on Pacific Coast Highway about 300 feet west of its intersection with Obispo Avenue; thence along Pacific Coast Highway easterly to a point located about 650 feet west of the intersection of the center line of said Pacific Coast Highway with the intersection of the center line of Lakewood Boulevard; thence along the escarpment of the Reservoir Hill fault to a point about 650 feet north and about 700 feet east of the intersection of Anaheim Street and Ximeno Avenue; thence along the trace of said Reservoir Hill fault to a point on the Los Angeles - Orange County line about 1700 feet northeast of the Long Beach City limit measured along the County line; thence along said Los Angeles - Orange County line in a southwesterly direction to the shore line of the Pacific Ocean; thence in a northerly and westerly direction along the shore line of the Pacific Ocean to the intersection of said shore line with the southerly end of the drainage divide of the Palos Verdes Hills; thence along the drainage divide of the Palos Verdes Hills to the intersection of the northerly end of said drainage divide with the shore line of the Pacific Ocean; thence northerly along the shore line of the Pacific Ocean to the intersection of said shore line with the westerly projection of the crest of the Ballona escarpment; thence easterly along the crest of the Ballona escarpment to the mouth of Centinela Creek; thence easterly from the mouth of Centinela Creek across the Baldwin Hills in a line encompassing the entire watershed of Centinela Creek to the point of beginning.

All streets, railways and boundaries of Cities and Counties herinabove referred to are as the same existed at 12:00 o'clock noon on August 20, 1961.

The area included within the foregoing boundaries is approximately 101,000 acres in extent.

II.

Definitions:

1. Basin, West Coast Basin and West Basin, as these terms are interchangeably used herein, mean the ground water basin underlying the area described in Paragraph I hereof.
2. A fiscal year, as that term is used herein, is a twelve month period beginning July 1 and ending June 30.
3. A water purveyor, as that term is used in Paragraph XII hereof, means a party which sells water to the public, whether a regulated public utility, mutual water company or public entity, which has a connection or connections for the taking of imported water through The Metropolitan Water District of Southern California, through West Basin Municipal Water District, or access to such imported water through such connection, and which normally supplies at

least a part of its customers' water needs with such imported water.

4. A water year, as that term is used herein, is a twelve month period beginning October 1 and ending September 30, until it is changed to a "fiscal year," as provided in Paragraph XVI hereof.

III.

Declaration of Rights - Water Rights Adjudicated.

Certain of the parties to this action have no right to extract water from the Basin. The name of each of said parties is listed below with a zero following his name, and the absence of such right in said parties is hereby established and declared. Certain of the parties to this action and/or their successors in interest (through September 30, 1978) are the owners of rights to extract water from the Basin, which rights are of the same legal force and effect and without priority with reference to each other, and the amount of such rights, stated in acre-feet per year, hereinafter referred to as "Adjudicated Rights" is listed below following such parties' names, and the rights of the last-mentioned parties are hereby declared and established accordingly. Provided, however, that the Adjudicated Rights so declared and established shall be subject to the condition that the water, when used, shall be put to beneficial use through reasonable methods of use and reasonable methods of diversion; and provided further that the exercise of all of said Rights shall be subject to a pro rata reduction, if such reduction is required, to preserve said Basin as a common source of water supply.

PARTY AND SUCCESSOR, IF ANY		ADJUDICATED RIGHT IN ACRE FEET, ANNUALLY
LERMENS, EVELYN (Formerly Alfred Lermens)		0.7
LENZINER, EMMA L. sued as Mrs. E.L. Leuziner		1.4
LINDERMAN, ABRAHAM		0
Second West Coast Basin Judgment		
LISTON, LAWRENCE	0.7	0
Sold to R. Harris and L. Harris	-0.7	
LITTLE, WILLIAM	0.1	0
Sold to Watt Industrial Properties	-0.1	
LIZZA, PAT		0
LOCHMAN, ERNEST C.		0
LOCHMAN, WALTER		
Second West Coast Basin Judgment		
LONG, BEN		0
Persilla Long, sued as Pricilla Long		
LONG, JOHN		0
LONG BEACH, CITY OF		0.7
LOPEZ, FRANK		3.7
LOPEZ, MANUEL		0
one Rudolph E. Lopez		
LOS ANGELES, CITY OF		1503.0
LOS ANGELES CITY SCHOOL DISTRICT		0
LOS ANGELES COUNTY (ALONDRA PARK)	28.7	67.7
Successor to Los Angeles County Flood Control District	39.0	

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SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

CENTRAL AND WEST BASIN WATER REPLENISHMENT DISTRICT, etc., Plaintiff, v. CHARLES E. ADAMS, et al., Defendants. CITY OF LAKEWOOD, a municipal corporation, Cross-Complaint, v. CHARLES E. ADAMS, et al., Cross-Defendants.	No. 786,656 <u>SECOND AMENDED JUDGMENT</u> (Declaring and establishing water rights in Central Basin and enjoining extractions therefrom in excess of specified quantities.)

The above-entitled matter duly and regularly came on for trial in Department 73 of the above-entitled Court (having been transferred thereto from Department 75 by order of the presiding Judge), before the Honorable Edmund M. Moor, specially assigned Judge, on May 17, 1965, at 10:00 a.m. Plaintiff was represented by its attorneys BEWLEY, KNOOP,

LASSLEBEN & WHELAN, MARTIN E. WHELAN, JR., and EDWIN H. VAIL, JR., and cross-complainant was represented by its attorney JOHN S. TODD. Various defendants and cross-defendants were also represented at the trial. Evidence both oral and documentary was introduced. The trial continued from day to day on May 17, 18, 19, 20, 21 and 24, 1965, at which time it was continued by order of Court for further trial on August 25, 1965, at 10:00 a.m. in Department 73 of the above-entitled Court; whereupon, having then been transferred to Department 74, trial was resumed in Department 74 on August 25, 1965, and then continued to August 27, 1965 at 10:00 a.m. in the same Department. On the latter date, trial was concluded and the matter submitted. Findings of fact and conclu-sions of law have heretofore been signed and filed. Pursuant to the reserved and continuing jurisdiction of the court under the judgment herein, certain amendments to said judgment and temporary orders have heretofore been made and entered. Continuing jurisdiction of the court for this action is currently assigned to HON. FLORENCE T. PICKARD. Motion of Plaintiff herein for further amendments to the judgment, notice thereof and of the hearing thereon having been duly and regularly given to all parties, came on for hearing in Department 38 of the above-entitled court on MAY 6, 1991 at 8:45 a.m. before said HONORABLE PICKARD. Plaintiff was represented by its attorneys LAGERLOF, SENECAL, DRESCHER & SWIFT, by William F. Kruse. Various defendants were represented by counsel of record appearing on the Clerk's records. Hearing thereon was concluded on that date. The within "Second Amended Judgment" incorporates amendments and orders heretofore made to the extent presently operable and amendments pursuant to said last mentioned motion. To the extent this Amended judgment is a restatement of the judgment as heretofore amended, it is for convenience in incorporating all matters in one document, is not a readjudication of such matters and is not intended to reopen any such matters. As used hereinafter the word "judgment" shall include the original judgment as amended to date. In connection with the following judgment, the following terms, words, phrases and clauses are used by the Court with the following meanings:

"Administrative Year" means the water year until operation under the judgment is converted to a fiscal year pursuant to Paragraph 4, Part I, p. 53 hereof, whereupon it shall mean a fiscal year, including the initial 'short fiscal year' therein provided.

"Allowed Pumping Allocation" is that quantity in acre feet which the Court adjudges to be the maximum quantity which a party should be allowed to extract annually from Central Basin as set forth in part I hereof, which constitutes 80% of such party's Total Water Right.

"Allowed Pumping Allocation for a particular Administra- tive year" and "Allowed Pumping Allocation in the following Administrative year" and similar clauses, mean the Allowed Pumping Allocation as increased in a particular Administrative year by an authorized carryovers pursuant to Part III, Subpart A of this judgment and as reduced by reason of any over-extractions in a previous Administrative year.

"Artificial Replenishment" is the replenishment of Central Basin achieved through the spreading of imported or reclaimed water for percolation thereof into Central Basin by a governmental agency.

"Base Water Right" is the highest continuous extractions of water by a party from Central Basin for a beneficial use in any period of five consecutive years after the commencement of over-draft in Central Basin and prior to the commencement of this action, as to which there has been no cessation of use by that party during any subsequent period of five consecutive years. As employed in the above definition, the words "extractions of water by a party" and "cessation of use by that party" include such extractions and cessations by any predecessor or predecessors in interest.

"Calendar Year" is the twelve month period commencing January 1 of each year and ending December 31 of each year.

"Central Basin" is the underground water basin or reservoir underlying Central Basin Area, the exterior boundaries of which Central Basin are the same as the exterior boundaries of Central Basin Area.

"Central Basin Area" is the territory described in Appendix "1" to this judgment, and is a segment of the territory comprising Plaintiff District.

"Declared water emergency" shall mean a period commencing with the adoption of a resolution of the Board of Directors of the Central and West Basin Water Replenishment District declaring that conditions within the Central Basin relating to natural and imported supplies of water are such that, without implementation of the water emergency provision of this Judgment, the water resources of the Central Basin risk degradation. In making such declaration, the Board of Directors shall consider any information and requests provided by water producers, purveyors and other affected entities and may, for that purpose, hold a public hearing in advance of such declaration. A Declared Water Emergency shall extend for one (1) year following such resolution, unless sooner ended by similar resolution.

"Extraction", "extractions", "extracting", "extracted", and other variations of the same noun and verb, mean pumping, taking, diverting or withdrawing ground water by any manner or means whatsoever from Central Basin.

"Fiscal year" is the twelve (12) month period July 1 through June 30 following.

"Imported Water" means water brought into Central Basin Area from a non-tributary source by a party and any predecessors in interest, either through purchase directly from The Metropolitan Water District of Southern California or by direct purchase from a member agency thereof, and additionally as to the Department of Water and Power of the City of Los Angeles, water brought into Central Basin area by that party by means of the Owens River Aqueduct.

"Imported Water Use Credit" is the annual amount, computed on a calendar year basis, of imported water which any party and any predecessors in interest, who have timely made the required filings under Water Code Section 1005.1, have imported into Central Basin Area in any calendar year and subsequent to July 9, 1951, for beneficial use therein, but not exceeding the amount by which that party and any predecessors in interest reduces his or their extractions of ground water from Central Basin in that calendar year from the level of his or their extractions in the preceding calendar year, or in any prior calendar year not earlier than the calendar year 1950, whichever is the greater.

"Natural Replenishment" means and includes all processes other than "Artificial Replenishment" by which water may become a part of the ground water supply of Central Basin.

"Natural Safe Yield" is the maximum quantity of ground water, not in excess of the long term average annual quantity of Natural Replenishment, which may be extracted annually from Central Basin without eventual depletion thereof or without otherwise causing eventual permanent damage to Central Basin as a source of ground water for beneficial use, said maximum quantity being determined without reference to Artificial Replenishment.

"Overdraft" is that condition of a ground water basin resulting from extractions in any given annual period or periods in excess of the long term average annual quantity of Natural Replenishment, or in excess of that quantity which may be extracted annually without otherwise causing eventual permanent damage to the basin.

"Party" means a party to this action. Whenever the term "party" is used in connection with a quantitative water right, or any quantitative right, privilege or obligation, or in connection with the assessment for the budget of the Watermaster, it shall be deemed to refer collectively to those parties to whom are attributed a Total Water Right in Part I of this judgment.

"Person" or "persons" include individuals, partner-ships, associations, governmental agencies and corporations, and any and all types of entities.

"Total Water Right" is the quantity arrived at in the same manner as in the computation of "Base Water Right", but including as if extracted in any particular year the Imported Water Use Credit, if any, to which a particular party may be entitled.

"Water" includes only non-saline water, which is that having less than 1,000 parts of chlorides to 1,000,000 parts of water.

"Water Year" is the 12-month period commencing October 1 of each year and ending September 30th of the following year.

In those instances where any of the above-defined words, terms, phrases or clauses are utilized in the definition of any of the other above-defined words, terms, phrases and clauses, such use is with the same meaning as is above set forth.

NOW THEREFORE, IT IS ORDERED, DECLARED, ADJUDGED AND DECREED WITH RESPECT TO THE ACTION AND CROSS-ACTION AS FOLLOWS:

I. DECLARATION AND DETERMINATION OF WATER RIGHTS OF PARTIES; RESTRICTION ON THE EXERCISE THEREOF.[1]

1. Determination of Rights of Parties.

(a) Each party, except defendants, The City of Los Angeles and Department of Water and Power of the City of Los Angeles, whose name is hereinafter set forth in the tabulation at the conclusion of Subpart 3 of Part 1, and after whose name there appears under the column "Total Water Right" a figure other than "0", was the owner of and had the right to extract annually groundwater from Central Basin for beneficial use in the quantity set forth after that party's name under said column "Total Water Right" pursuant to the Judgment as originally entered herein. Attached hereto as Appendix "2" and by this reference made a part hereof as though fully set forth are the water rights of parties and successors in interest as they existed as

[1]headings in the judgment are for purposes of reference and the language of said headings do not constitute, other than for such purpose, a portion of this judgment.

of the close of the water year ending September 30, 1978 in accordance with the Watermaster Reports on file with this Court and the records of the Plaintiff. This tabulation does not take into account additions or subtractions from any Allowed Pumping Allocation of a producer for the 1978-79 water year, nor other adjustments not representing change in fee title to water rights, such as leases of water rights, nor does it include the names of lessees of landowners where the lessees are exercising the water rights. The exercise of all water rights is subject, however, to the provisions of this Judgment is hereinafter contained. All of said rights are of the same legal force and effect and are without priority with reference to each other. Each party whose name is hereinafter set forth in the tabulation set forth in Appendix "2" of this judgment, and after whose name there appears under the column "Total Water Right" the figure "0" owns no rights to extract any ground water from Central Basin, and has no right to extract any ground water from Central Basin.

(b) Defendant The City of Los Angeles is the owner of the right to extract fifteen thousand (15,000) acre feet per annum of ground water from Central Basin. Defendant Department of Water and Power of the City of Los Angeles has no right to extract ground water from Central Basin except insofar as it has the right, power, duty or obligation on behalf of defendant The City of Los Angeles to exercise the water rights in Central Basin of defendant The City of Los Angeles. The exercise of said rights are subject, however, to the provisions of this judgment hereafter contained, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet bears to the Allowed Pumping Allocations of the other parties.

(c) No party to this action is the owner of or has any right to extract ground water from Central Basin except as herein affirmatively determined.

2. Parties Enjoined as Regards Quantities of Extractions.

(a) Each party, other than The State of California and The City of Los Angeles and Department of Water and Power of The City of Los Angeles, is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting from Central Basin any quantity of Water greater than the party's Allowed Pumping Allocation as hereinafter set forth next to the name of the party in the tabulation appearing in Appendix 2 at the end of this Judgment, subject to further provisions of this judgment. Subject to such further provisions, the officials, agents and employees of The State of California are enjoined and restrained in any such Administrative year from extracting from Central Basin collectively any quantity of water greater than the Allowed Pumping Allocation of The State of California as hereinafter set forth next to the name of that party in the same tabulation. Each party adjudged and declared above not to be the owner of and not to have the right to extract ground water from Central Basin is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting any ground water from Central Basin, except as may be hereinafter permitted to any such party under the Exchange Pool provisions of this judgment.

(b) Defendant The City of Los Angeles is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting from Central Basin any quantity of water greater than fifteen thousand (15,000) acre feet, subject to further provisions of this judgment, including but not limited to, sharing with other parties in any subsequent decreases or increases in the quantity of extractions permitted from Central Basin by parties, pursuant to continuing jurisdiction of the Court, on the basis that fifteen thousand (15,000) acre feet bears to the Allowed Pumping Allocations of the other parties. Defendant Department of Water and Power of The City of Los Angeles is enjoined and restrained in any Administrative year commencing after the date this judgment becomes final from extracting from Central Basin any quantity of water other than such as it may extract on behalf of defendant The City of Los Angeles, and which extractions, along with any extractions by said City, shall not exceed that quantity permitted by this judgment to that City in any Administrative year. Whenever in this judgment the term "Allowed Pumping Allocation" appears, it shall be deemed to mean as to defendant The City of Los Angeles the quantity of fifteen thousand (15,000) acre feet.

10. Effect of this Amended Judgment on Orders Filed Herein. This Second Amended Judgment shall not abrogate such rights of additional carry-over of unused water rights as may otherwise exist pursuant to orders herein filed June 2, 1977 and September 29, 1977.

THE CLERK WILL ENTER THIS SECOND AMENDED JUDGMENT FORTHWITH.

DATED: May 6, 1991

/s/ Florence T. Packard
Judge of the Superior Court

Urban Water Management Plan

Appendix G

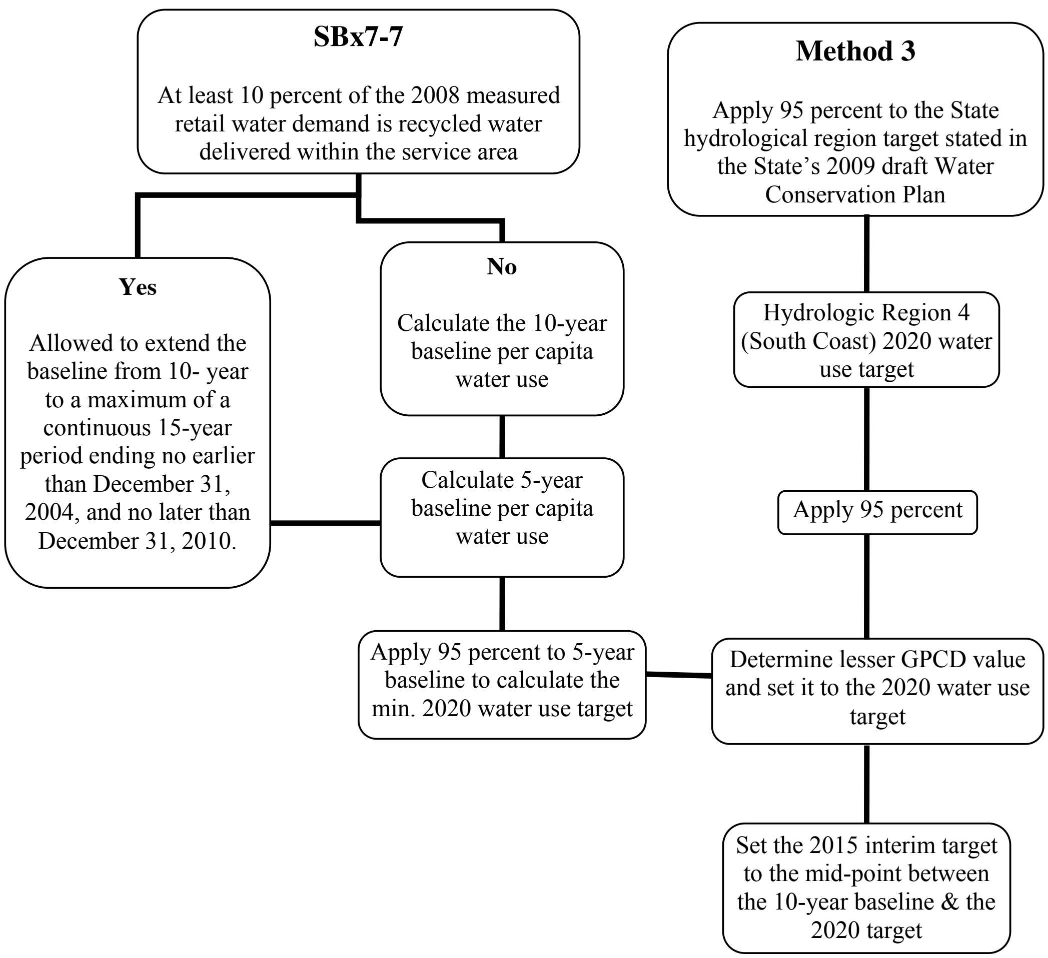
Calculating LADWP's 2020 Water Use Target

Calculating LADWP's Baseline and Compliance Urban Per Capita Water Use

Introduction of Method 3

As an urban retail water supplier, LADWP is required to calculate and report the 2020 water use target and the 2015 interim target in the Urban Water Management Plan. Four methods are stipulated for calculating the 2020 water use target in the Water Conservation Act of 2009, SBX7-7, which is also incorporated in the California Water Code.

LADWP selected Method 3 for the calculation. Using Method 3, 95 percent of the applicable state hydrologic region target, as stated in the State's draft 20x2020 Water Conservation Plan dated April 30, 2009, is set as the 2020 water use target. However, according to California Water Code Section 10608.22, the 2020 water use target shall be no less than 5 percent of the urban retail water supplier's 5-year base daily per capita water use (baseline) if this 5-year baseline is greater than 100 gallons per capita per day (GPCD). The 2015 interim target is the mid-point between the 10- or 15-year baseline and the 2020 water use target. The following flow chart illustrates how to determine the 2020 target and 2015 interim target with Method 3.



Determination of Hydrologic Region Water Use Target for LADWP

LADWP's service area is entirely located in the California State Hydrologic Region 4 – South Coast. As set forth in Table 8 of the State's draft 20x2020 Water Conservation Plan dated April 30, 2009, the 2020 water use target of Hydrologic Region 4 is 149 GPCD. LADWP's hydrologic region target is 142 GPCD or 95 percent of 149 GPCD.

Hydrologic Region Interim Target (2015)	165 GPCD
Hydrologic Region Target (2020)	149 GPCD
95% of the Hydrologic Region 4 Target	142 GPCD

LADWP's Base Daily Per Capita Water Use (Baseline)

As defined in California Water Code Section 10608.12 (b), the baseline is the average gross water use expressed in GPCD and calculated over a continuous, multiyear base period. The 10- or 15-year baseline shall be a continuous period ending no earlier than December 31, 2004, and no later than December 31, 2010.

For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water, it has the option of using a 10-year period plus up to an additional 5 years to a maximum of 15-year period for baseline calculation. LADWP can only use the 10-year baseline since it does not meet this requirement.

The 5-year baseline is also calculated for determining the minimum water use reduction requirement if the 5-year baseline is greater than 100 GPCD per Section 10608.22. The 5-year baseline shall be a continuous period ending no earlier than December 31, 2007, and no later than December 31, 2010.

Gross Water Use

As defined in Section 10608.12 (g), LADWP's gross water use is the total volume of water entering the distribution system excluding the recycled water. All 4 LADWP's water sources: Los Angeles Aqueduct, local groundwater, MWD water, and recycled water, are metered before entering the distribution system.

Gross Water Use = LAA deliveries + Local Groundwater + MWD Water

or Total Water Supplies – Recycled Water

Service Area Population

LADWP's service area population is based on the city-level population estimates published by State of California, Department of Finance (DOF) in *E-8 Historical Population and Housing Estimates for Cities, Counties and the State, 1990-2000, August 2007 and E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark, May 2010.* The service area population is adjusted from the City population by adding approximately 28,000 persons who live outside the City limits but within LADWP's service area, and reducing approximately 2,000 persons who live within the City limits but outside LADWP's service area.

Service Area Population = City Population (DOF) + 28,000 – 2,000

LADWP's 10-Year Baseline

LADWP's 10-year baseline is calculated at 152 GPCD for the 10-year period beginning July 1, 1995 and ending June 30, 2005. It is used to determine the minimum water use reduction requirement per Section

10608.22. The following table shows the source data and the calculated annual GPCD for the 10-year period.

Fiscal Year Ending June 30	Total Water Supply (Acre-Feet) [1]	Recycled Water (Acre-Feet) [1]	Gross Water Use	City Population per DOF[2]	Service Area Population [3]	GPCD
1996	612,164	2,020	610,144	3,542,651	3,568,651	153
1997	630,013	1,747	628,265	3,558,227	3,584,227	156
1998	588,847	1,449	587,398	3,587,170	3,613,170	145
1999	621,063	1,596	619,467	3,627,878	3,653,878	151
2000	661,106	1,984	659,121	3,679,600	3,705,600	159
2001	659,955	2,082	675,873	3,744,806	3,770,806	156
2002	669,051	1,907	667,145	3,803,677	3,829,677	156
2003	652,299	1,635	650,664	3,855,069	3,881,069	150
2004	690,266	2,053	688,213	3,899,129	3,925,129	157
2005	615,572	1,500	614,072	3,929,022	3,955,022	139

[1] Operation records are based on meter reads.
[2] Per DOF *E-8 Historical Population and Housing Estimates for Cities, Counties and the State, 1990-2000, August 2007 and E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark, May 2010.*
[3] Adjustments made to reflect the addition of approximately 28,000 persons who live outside City limits but within Water System service area, and the reduction of approximately 2,000 persons who live within the City limits but outside LADWP's service area.

10-Year Baseline between FYE 1996-2005	152 GPCD

LADWP's 5-Year Baseline

The 5-year baseline is calculated at 145 GPCD for the 5-year period beginning July 1, 2004 and ending June 30, 2008. It is used to determine the minimum water use reduction requirement per Section 10608.22. The following table shows the source data and the calculated annual GPCD for the 5-year period.

Fiscal Year Ending June 30	Total Water Supply (Acre-Feet) [1]	Recycled Water (Acre-Feet) [1]	Gross Water Use	City Population per DOF[2]	Service Area Population [3]	GPCD
2004	690,266	2,053	688,213	3,899,129	3,925,129	157
2005	615,572	1,500	614,072	3,929,022	3,955,022	139
2006	627,612	1,417	626,194	3,960,385	3,986,385	140
2007	670,181	5,151	665,030	3,980,145	4,006,145	148
2008	649,822	4,181	645,641	4,016,085	4,042,085	143

[1] Operation records are based on meter reads.
[2] Per DOF *E-8 Historical Population and Housing Estimates for Cities, Counties and the State, 1990-2000, August 2007 and E-4 Population Estimates for Cities, Counties and the State, 2001-2010, with 2000 Benchmark, May 2010.*
[3] Adjustments made to reflect the addition of approximately 28,000 persons who live outside City limits but within Water System service area, and the reduction of approximately 2,000 persons who live within the City limits but outside LADWP's service area.

5-Year Baseline between FYE 2004-2008	145 GPCD

The 2020 Water Use Target and the 2015 Interim Water Use Target

According to California Water Code Section 10608.22, LADWP's 2020 water use target of 142 GPCD based on 95 percent of the hydrologic region target, shall be no less than 5 percent of the 5-year baseline of 145 GPCD, which is 138 GPCD. Therefore, LADWP's 2020 water use target shall be 138 GPCD. The 2015 interim target is the mid-point between the 10-year baseline of 152 GPCD and the 2020 water use target of 138 GPCD and is calculated at 145 GPCD per Section 10608.12 (j).

95% of the Hydrologic Region 4 Target	142 GPCD
95% of 5-Year Baseline	138 GPCD
2020 Target = the lesser of the two above	***138 GPCD***
10-Year Baseline	152 GPCD
2015 Interim Target = the midpoint between 10-Year Baseline & 2020 Target	***145 GPCD***

Urban Water Management Plan

Appendix H

CUWCC Biennal Reports

BMP Coverage Status Report 2007-2008

BMP 1 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

An agency must meet three conditions to satisfy strict compliance for BMP 1.

Condition 1: Adopt survey targeting and marketing strategy on time
Condition 2: Offer surveys to 20% of SF accounts and 20% of MF units during report period
Condition 3: Be on track to survey 15% of SF accounts and 15% of MF units within 10 years of implementation start date.

Test For Condition 1

Latest Year RU to Implement Targeting/Marketing Program: 1999

	Single Family	Multi Family
Year RU Reported Implementing Targeting/Marketing Program:	1990	1990
RU Met Targeting/Marketing Coverage Requirement:	Yes	Yes

Test For Condition 2

Latest Year Survey Program to Start: 1998

Select a Reporting Period: 07-08

	Single Family	Multi Family
Res Survey Offers (%)	2.69%	1.73%
Survey Offers 20%	No	No

Test For Condition 3

	Completed Residential Surveys: Single Family	Multi Family
Total Completed Surveys through 2008	46,796	169,066
Credit for Surveys Completed Prior to Implementation of Reporting Database	53,384	67,216
Total + Credit	100,180	236,282
Res. Accounts in Base Year	464,661	724,199
RU Survey Coverage as % of Base Year Res Accounts	21.56%	32.63%
Coverage Requirement by Year 10 of Implementation per Exhibit 1	13.50%	13.50%
RU on Schedule to Meet 10 Year Coverage Requirement	Yes	Yes

BMP 1 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 2 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

An agency must meet **one** of three conditions to satisfy strict compliance for BMP 2.

Condition 1: The agency has demonstrated that 75% of SF accounts and 75% of MF units constructed prior to 1992 are fitted with low-flow showerheads.

Condition 2: An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area.

Condition 3: The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family accounts and 10% of multi-family units constructed prior to 1992 during the reporting period.

Test For Condition 1

		Single Family		Multi Family	
Report Year	Report Period	Reported Saturation	Saturation 75%?	Reported Saturation	Saturation 75%?
1999	99-00	99	Yes	99	Yes
2000	99-00	99	Yes	99	Yes
2001	01-02	99	Yes	99	Yes
2002	01-02	99	Yes	99	Yes
2003	03-04	99	Yes	99	Yes
2004	03-04	99	Yes	99	Yes
2005	05-06	99	Yes	99	Yes
2006	05-06	99	Yes	99	Yes
2007	07-08	99	Yes	99	Yes
2008	07-08	99	Yes	99	Yes

BMP 2 Coverage Requirement Status

Test For Condition 2

Report Year	Report Period	RU has ordinance requiring showerhead retrofit?
1999	99-00	Yes
2000	99-00	Yes
2001	01-02	Yes
2002	01-02	Yes
2003	03-04	Yes
2004	03-04	Yes
2005	05-06	Yes
2006	05-06	Yes
2007	07-08	Yes
2008	07-08	Yes

Test For Condition 3

1992 SF Accounts	Num. Showerheads Distributed to SF Accounts	Single Family Coverage Ratio	SF Coverage Ratio 10%
462,000	11,506	2.5%	No

1992 MF Accounts	Num. Showerheads Distributed to MF Accounts	Multi Family Coverage Ratio	MF Coverage Ratio 10%
710,000	37,083	5.2%	No

BMP 2 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 3 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

An agency must meet one of two conditions to be in compliance with BMP 3:

Condition 1: Perform a prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done.

Condition 2: Perform a prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.

RU operates a water distribution system: Yes

Tests For Conditions 1 and 2

Report Year	Report Period	Pre Screen Completed	Pre Screen Result	Full Audit Indicated	Full Audit Completed
1999	99-00	Yes	93.8%	No	No
2000	99-00	Yes	91.8%	No	No
2001	01-02	No			No
2002	01-02	No			No
2003	03-04	No			No
2004	03-04	No			No
2005	05-06	No			No
2006	05-06	No			No
2007	07-08	Yes	95.2%	No	No
2008	07-08	Yes	94.3%	No	No

BMP 3 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 4 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

For agencies signing the MOU prior to December 31, 1997:

100% of existing unmetered accounts to be metered and billed by volume of use by July 1, 2009.

For agencies signing the MOU after December 31, 1997:

100% of existing unmetered accounts to be metered and billed by volume of use by July 1, 2012
OR within six years of signing the MOU (whichever date is later). All retrofits must be completed no later than one year prior to the requirements of state law (January 1, 2025).

Tests For Compliance

Total Meter Retrofits Reported through 2008	0
No. of Unmetered Accounts in Base Year	159
Meter Retrofit Coverage as % of Base Year Unmetered Accounts	0.0%
Coverage Requirement by Year 10 of Implementation	90.0%
RU on Schedule to Meet 10 Year Coverage Requirement	Yes

BMP 4 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 5 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

RU indicated "At least as effective as" implementation during report period: Yes

Exhibit 1 Coverage Requirement

An agency must meet three conditions to comply with BMP 5.

Condition 1: Develop water budgets for 90% of its dedicated landscape meter accounts within four years of the date implementation is to start.

Condition 2: (a) Offer landscape surveys to at least 20% of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15% of its CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters.

Condition 3: Implement and maintain customer incentive program(s) for irrigation equipment retrofits.

Test For Condition 1

Report Year	Report Period	BMP 5 Implementation Year	No. of Irrigation Meter Accounts	No. of Irrigation Accounts with Budgets	Budget Coverage Ratio	90% Coverage Met by Year 4
1999	99-00	0	952	37	0.04	NA
2000	99-00	1	1198	118	0.10	NA
2001	01-02	2	949	132	0.14	NA
2002	01-02	3	949	175	0.18	NA
2003	03-04	4	955	249	0.26	No
2004	03-04	5	956	250	0.26	No
2005	05-06	6	879	252	0.29	No
2006	05-06	7	743	256	0.34	No
2007	07-08	8	745	258	0.35	No
2008	07-08	9	766	269	0.35	No

Test For Condition 2a (survey offers)

Select Reporting Period: 07-08

Large Landscape Survey Offers as % of Mixed Use Meter CII Accounts: 0.0%

Survey Offers Equal or Exceed 20% Coverage Requirement: No

BMP 5 Coverage Requirement Status

Test For Condition 2a (surveys completed)

Total Completed Landscape Surveys Reported through 2008	530
Credit for Surveys Completed Prior to Implementation of Reporting Database	114
Total + Credit	644
CII Accounts with Mixed Use Meters in Base Year	74,316
RU Survey Coverage as % of Base Year CII Accounts	0.9%
Coverage Requirement by Year 9 of Implementation per Exhibit 1	11.5%
RU on Schedule to Meet 10 Year Coverage Requirement	No

Test For Condition 2b (mixed use budget or meter retrofit program)

Report Year	Report Period	BMP 5 Implementation Year	Agency has mix-use budget program	No. of mixed-use budgets
1999	99-00	0	no	0
2000	99-00	1	no	0
2001	01-02	2	no	
2002	01-02	3	no	
2003	03-04	4	no	0
2004	03-04	5	no	0
2005	05-06	6	no	0
2006	05-06	7	no	0
2007	07-08	8	no	0
2008	07-08	9	no	0

Report Year	Report Period	BMP 4 Implementation Year	No. of mixed use CII accounts	No. of mixed use CII accounts fitted with irrig. meters
1999	99-00	1	74500	0
2000	99-00	2	71768	0
2001	01-02	3	76866	0
2002	01-02	4	77165	0
2003	03-04	5	76616	0
2004	03-04	6	77144	0
2005	05-06	7	62479	0
2006	05-06	8	63735	0
2007	07-08	9	60437	0
2008	07-08	10	60327	0

BMP 5 Coverage Requirement Status

Test For Condition 3

Report Year	Report Period	BMP 5 Implementation Year	RU offers financial incentives?	Loans No.	Loans Total Amount	Grants No.	Grants Total Amount	Rebates No.	Rebates Total Amount
1999	99-00	0	yes	0	0	0	0	1	1050
2000	99-00	1	yes	0	0	0	0	1	1740
2001	01-02	2	yes	0	0	0	0	4	133900
2002	01-02	3	yes	0	0	31	120000	5	22475
2003	03-04	4	yes	0	0	0	0	2	11624
2004	03-04	5	yes	0	0	0	0	5	21542
2005	05-06	6	yes	0	0	0	0	4	58760
2006	05-06	7	yes	0	0	16	80000	0	0
2007	07-08	8	yes	0	0	0	0	0	0
2008	07-08	9	yes	0	0	0	0	1	8538

BMP 5 Coverage Status Summary

Water supplier has selected an "At Least As Effective As" option for this BMP.

BMP 6 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Pre-2004 Exhibit 1 Coverage Requirement

An agency must meet one condition to comply with BMP 6.

Condition 1: Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.

Revised Exhibit 1 Coverage Requirement

An agency must meet two conditions to comply with BMP 6.

Condition 1: Offer cost-effective financial incentives for high-efficiency washers with Water Factors of 9.5 or less.

Condition 2: Meet Coverage Goal (CG=Total Dwelling Units x 0.0768) by July 1, 2008. Agencies signing the MOU after July 1, 2003, shall have a prorated Coverage Goal, based on implementation period of less than 4.0 years.

Test For Condition 1

Agency offered cost-effective financial incentives for high-efficiency washers with Water Factors of 9.5 or less: yes

Test For Condition 2

Coverage Goal:	91,304
Total Coverage Points Awarded (incl. past credit):	110,989
% of Coverage Goal:	121.6%

BMP 6 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 7 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

An agency must meet one condition to comply with BMP 7.

Condition 1: Implement and maintain a public information program consistent with BMP 7's definition.

Test For Condition 1:07-08

Report Year	Report Period	BMP 7 Implementation Year	RU Has Public Information Program
1999	99-00	1	Yes
2000	99-00	2	Yes
2001	01-02	3	Yes
2002	01-02	4	Yes
2003	03-04	5	Yes
2004	03-04	6	Yes
2005	05-06	7	Yes
2006	05-06	8	Yes
2007	07-08	9	Yes
2008	07-08	10	Yes

BMP 7 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 8 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

An agency must meet one condition to comply with BMP 8.

Condition 1: Implement and maintain a school education program consistent with BMP 8's definition.

Test For Condition 1

Report Year	Report Period	BMP 8 Implementation Year	RU Has School Education Program
1999	99-00	1	Yes
2000	99-00	2	Yes
2001	01-02	3	Yes
2002	01-02	4	Yes
2003	03-04	5	Yes
2004	03-04	6	Yes
2005	05-06	7	Yes
2006	05-06	8	Yes
2007	07-08	9	Yes
2008	07-08	10	Yes

BMP 8 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 9 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exception for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

An agency must meet two conditions to comply with BMP 9.

Condition 1: Agency has identified and ranked by use commercial, industrial, and institutional accounts.

Condition 2(a): Agency is on track to survey 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of date implementation to commence.

OR

Condition 2(b): Agency is on track to reduce CII water use by an amount equal to 10% of baseline use within 10 years of date implementation to commence.

OR

Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.

Test For Condition 1

Ranked Commercial Customers	**yes**
Ranked Industrial Customers	**yes**
Ranked Institutional Customers	**yes**
Rank Coverage Met	**Yes**

Test For Condition 2a

	Commercial	Industrial	Institutional
Total Completed Surveys Reported through 2008	248	51	32
Credit for Surveys Completed Prior to Implementation of Reporting Database	32	3	8
Total + Credit	280	54	40
CII Accounts in Base Year	59,649	7,298	7,369
RU Survey Coverage as % of Base Year CII Accounts	0.5%	0.7%	0.5%
Coverage Requirement by Year 9 of Implementation per Exhibit 1	7.7%	7.7%	7.7%
RU on Schedule to Meet 10 Year Coverage Requirement	No	No	No

BMP 9 Coverage Requirement Status

Test For Condition 2b

Coverage Year	Performance Target Savings (AF/Yr)	Performance Target Savings Coverage	Performance Target Savings Coverage Requirement	Coverage Requirement Met
1999	5,097	3%	0.5%	Yes
2000	8,383	5%	1%	Yes
2001	12,281	8%	1.7%	Yes
2002	16,716	10%	2.4%	Yes
2003	21,743	14%	3.3%	Yes
2004	28,619	18%	4.2%	Yes
2005	29,420	18%	5.3%	Yes
2006	33,135	21%	6.4%	Yes
2007	33,819	21%	7.7%	Yes
2008	34,673	22%	9%	Yes

Test For Condition 2c

Total BMP 9 Surveys + Credit	374
BMP 9 Survey Coverage	0.5%
BMP 9 Performance Target Coverage	21.7%
BMP 9 Survey + Performance Target Coverage	22.2%
Combined Coverage Equals or Exceeds BMP 9 Survey Coverage Requirement?	Yes

BMP 9 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 11 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exception for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing.

Test For Compliance

Fully metered?	Yes
Water Coverage Met?	Yes
Provide Sewer Service?	No
Sewer Coverage Met?	Yes

BMP 11 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 11 Sewer Coverage Status Summary

Agency does not provide sewer service

BMP 12 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

Test For Compliance

Report Year	Report Period	Conservation Coordinator Position Staffed?	Total Staff on Team (incl. CC)
1999	99-00	yes	6
2000	99-00	yes	5
2001	01-02	yes	5
2002	01-02	yes	6
2003	03-04	yes	6
2004	03-04	yes	6
2005	05-06	yes	6
2006	05-06	yes	6
2007	07-08	yes	5
2008	07-08	yes	5

BMP 12 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 13 Coverage Requirement Status

Reporting Unit ID 152

Rep Unit Name: Los Angeles Dept. of Water and Power

Date MOU Signed: 9/12/1991

Reporting Period: 07-08

Rep Unit Category: Retail Only

RU indicated "At least as effective as" implementation during report period: No

RU filed an exemption for this BMP during report period: No exemption request filed

If exemption filed, type:

Exhibit 1 Coverage Requirement

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

Test For Compliance

Agency or service area prohibits:

Report Year	Gutter Flooding	Single-Pass Cooling Systems	Single-Pass Car Wash	Single-Pass Laundry	Single-Pass Fountains	Other	RU has ordinance that meets coverage requirement
1999	yes	no	no	no	yes	yes	No
2000	yes	no	no	no	yes	yes	No
2001	yes	no	no	no	yes	yes	No
2002	yes	no	no	no	yes	yes	No
2003	yes	no	no	no	yes	yes	No
2004	yes	no	no	no	yes	yes	No
2005	yes	no	no	no	yes	yes	No
2006	yes	no	no	no	yes	yes	No
2007	yes	Yes	Yes	Yes	yes	yes	Yes
2008	yes	Yes	Yes	Yes	yes	yes	Yes

BMP 13 Coverage Status Summary

Water supplier has met the coverage requirements for this BMP.

BMP 14 Coverage Requirement Status

Reporting Unit ID: 152

Base Year: 1997

Rep Unit Name: Los Angeles Dept. of Water and Power

Rep Unit Category: Retail Only

Exhibit 1 Coverage Requirement

An agency must meet one of the following conditions to be in compliance with BMP 14.

Condition 1: Retrofit-on-resale (ROR) in effect in service area
Condition 2: Water savings from toilet replacement programs equal to 90% of Exhibit 6 coverage requirement.

An agency with an exemption for BMP 14 is not required to meet one of the above conditions.
The report treats an agency with missing base year data required to compute the Exhibit 6 coverage requirement as out of compliance with BMP 14.

Coverage Year	BMP 14 Data Submitted to CUWCC	Exemption Filed with CUWCC	ALAEA	ROR Ordinance in Effect	Exhibit 6 Coverage Req'mt (AF)	Toilet Replacement Program Water Savings (AF)
1999	☒	☐	☐	☒	3,511	159,92
2000	☒	☐	☐	☒	9,987	188,96
2001	☒	☐	☐	☒	18,948	219,42
2002	☒	☐	☐	☒	29,980	250,86
2003	☒	☐	☐	☒	42,721	282,87
2004	☒	☐	☐	☒	56,857	315,57
2005	☒	☐	☐	☒	72,115	348,59
2006	☒	☐	☐	☒	88,259	381,44
2007	☒	☐	☐	☒	105,08	413,69
2008	☒	☐	☐	☒	122,41	444,64

BMP 14 Coverage Status Summary: 2010

Water supplier has met the coverage requirements for this BMP.

2007 CUWCC Biennial Report

Water Supply & Reuse

Reporting Unit: **Los Angeles Dept. of Water and Power**

Year: **2007**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
LA Aqueduct	277942	Imported
MWDSC	295602	Imported
Groundwater	88906	Groundwater
Recycled	5186	Recycled
Transfer	1136	Imported
Storage	242	Imported

Total AF: 669014

Reported as of 6/10/10

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
Los Angeles Dept. of Water and Power	**02/08/2009**	**2007**

What is the reporting year?	Fiscal	Month Ending	June

A. Service Area Population Information:

1. Total service area population 4044080

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	481908	261323	0	0
2. Multi-Family	123597	188149	0	0
3. Commercial	72130	114298	0	0
4. Industrial	6867	21838	0	0
5. Institutional	7403	48320	0	0
6. Dedicated Irrigation	745	248	0	0
7. Recycled Water	42	6509	0	0
8. Other	0	0	0	0
9. Unaccounted	NA	32080	NA	0
Total	692692	672765	0	0
	Metered		**Unmetered**	

Reported as of 6/10/10

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Implementation

1. Based on your signed MOU date, 09/12/1991, your Agency STRATEGY DUE DATE is:	09/11/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1990
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1990

B. Water Survey Data

Single

Survey Counts:	Family Accounts	Multi-Family Units
1. Number of surveys offered:	12500	12500
2. Number of surveys completed:	5444	9913
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	no
a. If yes, in what form are surveys tracked?		database
b. Describe how your agency tracks this information.		

Contractor reporting & invoice support documentation

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Period: FY 06-07. Interior assessments with installation of devices as needed (ULFTs, showerheads, aerators, flappers). Direct and indirect marketing for MF segment

Reported as of 6/10/10

BMP 02: Residential Plumbing Retrofit

Reporting Unit:

Los Angeles Dept. of Water and Power	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes

    a. If YES, list local jurisdictions in your service area and code or ordinance in each:

    City of Los Angeles "Water Closet, Urinal and Showerhead Regulations-Retrofit on Resale" Ordinance (No. 172075)

2. Has your agency satisfied the 75% saturation requirement for single-family housing units? yes

3. Estimated percent of single-family households with low-flow showerheads: 99%

4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? yes

5. Estimated percent of multi-family households with low-flow showerheads: 99%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

    LA enacted an ordinance requiring all LADWP customers to install low flow showerheads & have installations certified or incur financial penalties for non-compliance. 99+% of LADWP customers have demonstrated compliance

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes

    a. If YES, when did your agency begin implementing this strategy? 07/01/1988

    b. Describe your targeting/ marketing strategy.

    Direct mail to all SF customers; element of all survey pgms; req'd per L.A. ordinance; provided upon request to any residential customer; distributed with program ULFTs.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	7694	24187
3. Number of toilet-displacement devices distributed:	3	0
4. Number of toilet flappers distributed:	118	1658
5. Number of faucet aerators distributed:	9395	38148

6. Does your agency track the distribution and cost of low-flow devices? yes

    a. If YES, in what format are low-flow devices tracked? Database

    b. If yes, describe your tracking and distribution system :

    Tracking: in-house inventory control; contractor invoices & support documentation. Distribution: direct install by CBOs; distribution by CBOs & through Conservation office.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Direct install accounts for vast majority of devices and cost.
Showerheads are 2.0 gpm

Reported as of 6/10/10

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	Yes
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	634178
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	666258
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.95
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	yes
7. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

B. Survey Data

1. Total number of miles of distribution system line.	7228
2. Number of miles of distribution system line surveyed.	0

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:		
2. Volume treated water supplied into the system:		
3. Volume of water exported from the system:		
4. Volume of billed authorized metered consumption:		

5. Volume of billed authorized unmetered consumption:

6. Volume of unbilled authorized metered consumption:

7. Volume of unbilled authorized unmetered consumption:

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:

2. How frequently are they tested and calibrated?

3. Length of mains:

4. What % of distribution mains are rigid pipes (metal, ac, concrete)?

5. Number of service connections:

6. What % of service connections are rigid pipes (metal)?

7. Are residential properties fully metered?

8. Are non-residential properties fully metered?

9. Provide an estimate of customer meter under-registration:

10. Average length of customer service line from the main to the point of the meter:

11. Average system pressure:

12. Range of system pressures: From to

13. What percentage of the system is fed from gravity feed?

14. What percentage of the system is fed by pumping and re-pumping?

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?

2. Does your agency test, repair and replace your meters on a regular timed schedule?

a. If yes, does your agency test by meter size or customer category?:

b. If yes to meter size, please provide the frequency of testing by meter size:

Less than or equal to 1"

1.5" to 2"

3" and Larger

c. If yes to customer category, provide the frequency of testing by customer category:

SF residential

MF residential

Commercial

Industrial & Institutional

3. Who is responsible for repairs to the customer lateral or customer service line?

4. Who is responsible for service line repairs downstream of the customer meter?

5. Does your agency proactively search for leaks using leak

survey techniques or does your utility reactively repair leaks which are called in, or both?

6. What is the utility budget breakdown for:

Leak Detection	$
Leak Repair	$
Auditing and Water Loss Evaluation	$
Meter Testing	$

H. Comments

Reported as of 6/10/10

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

1. Does your agency have any unmetered service connections?	No
a. If YES, has your agency completed a meter retrofit plan?	
b. If YES, number of previously unmetered accounts fitted with meters during report year:	
2. Are all new service connections being metered and billed by volume of use?	Yes
3. Are all new service connections being billed volumetrically with meters?	Yes
4. Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?	Yes

5. Please fill out the following matrix:

Account Type	Number of Metered Accounts	Number of Metered Accounts Read	Number of Metered Accounts Billed by Volume	Billing Frequency Per Year	Number of Volume Estimates
a. Single Family	483433	483433	483433	6	0
b. Multi-Family	121693	121693	121693	6	0
c. Commercial	60327	60327	60327	12	0
d. Industrial	6552	6552	6552	12	0
e. Institutional	6707	6707	6707	12	0
f. Landscape Irrigation	766	766	766	12	0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	

b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters:	60437
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.	0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No

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

D. Comments

Fire services are metered; hydrants are not.

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2007**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	745
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	258
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	6/10/1996

b. Description of marketing / targeting strategy:

Work with LA Dept Rec & Parks, school district to audit and provide audit training. All accts applying for landscape incentives also audited. Review consumption history for excess use.

2. Number of Surveys Offered.	15
3. Number of Surveys Completed.	11

4. Indicate which of the following Landscape Elements are part of your survey:

a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes

5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Accounts with poor distribution uniformity re-audited after system improvements completed

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	no
2. Number of CII mixed-use accounts with landscape budgets.	0
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	100000	0	0
b. Loans	0	0	0
c. Grants	80000	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services?	No

a. If YES, describe below:

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	yes
7. Do you provide customer notices at the start of the irrigation season?	no
8. Do you provide customer notices at the end of the irrigation season?	no

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	Yes

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

The Los Angeles Department of Water and Power (LADWP) is taking a multi-pronged approach and implementing several programs to target our large landscapes (e.g. parks and schools) and commercial, industrial, and institutional (CII) customers having irrigated landscapes. LADWP implements the ambitious Technical Assistance Program (TAP), which is a custom financial incentive program offering CII and Multi-Family Residential customers in Los Angeles up to $250,000 for the installation of pre-approved equipment and products (including the design and installation of efficient irrigation systems) that demonstrate persistent water savings. LADWP staff is currently working with a major customer on significant modifications for a new proprietary process that will conserve a considerable amount of water annually. LADWP has entered into a Memorandum of Understanding (MOU) with the Los Angeles

Department of Recreation and Parks (RAP) for the purpose of funding water use efficiency improvements for large landscapes in City parks. These water conservation improvements that LADWP and RAP are working in partnership to advance include installation of weather-based irrigation controllers, high efficiency sprinkler heads, and repair or replacement of irrigation distribution systems. The MOU strengthens LADWP's commitment to conservation as a means of providing a sustainable source of water to the City of Los Angeles as adopted by the Board in the 2005 Urban Water Management Plan. In August of 2008, LADWP amended its Emergency Water Conservation Plan (a City Ordinance) to address the increasing water shortage. The Plan's requirements are applicable to all LADWP customers, and are focused primarily on landscape irrigation. The Plan permits customers to use water only during specified hours of the day and specified days of the week, depending on the declared severity of water shortage. Water allotment varies by each phase (I-VI), such that phase I has the least amount of restrictions and phase VI having the most stringent restrictions. LADWP is currently developing a proposal for "Shortage Year" Water Rates (Tier 1 and Tier 2) for both commercial and residential customers that will become effective in mid-2009. Customers will be required to conserve 15% below their Tier 1 allotment to avoid a bill increase; however, those who exceed their allotment must pay Tier 2 rates resulting in higher water bills. Shortage Year Water Rates are designed to ensure that costs are recovered without penalizing customers who conserve during the years when projected demand for water exceeds the available supply. As has been demonstrated by LADWP's 100% volumetric rate structure, price signal is a most effective conservation tool. In addition to the Ordinance modifications described above, LADWP has developed and is planning to launch a Turf Buy Back Program in 2009. This new program will pay single family residential and commercial customers $1.00 per square foot of turf removed and replaced with drought tolerant plants, mulch or permeable hardscape. Any subsequent irrigation requirements will be met with low volume drip or microspray emitters. LADWP is also in the process of expanding our recycled water program and are working with water intensive CII customers such as golf courses, parks, and refineries to promote and use recycled water. LADWP is currently converting all of our golf courses and parks to dedicated irrigation meters for the usage of recycled water. Our recycled water goal is to deliver at least 50,000 acre-feet per year by 2019. This will be done by expanding the "purple pipe" distribution system to new customers who can use recycled water for non-potable uses such as irrigation and industrial processes.

E. Comments

Reported as of 6/10/10

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers?

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

2. Does your agency offer rebates for high-efficiency washers? yes
3. What is the level of the rebate?
4. Number of rebates awarded.

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures		
2. Actual Expenditures		

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

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

D. Comments

Reported as of 6/10/10

BMP 07: Public Information Programs

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both materially participate in program
Which wholesaler(s)?
Metropolitan Water District of Southern California

2. Describe the program and how it's organized:
LADWP's Public Affairs Division works closely with the Water Conservation office. Information is made available on LADWP Web site, conservation publications distributed at public venues and by request (in English and Spanish); customer newsletter; Speakers Bureau and school presentations; fleet vehicle signage; posters and brochures in LADWP Customer Service Centers and City Council field offices; permanent water display located at Olvera Street, a popular Los Angeles landmark and tourist venue; a special flier regarding conservation was produced and inserted for distribution in the Los Angeles Times and Daily News in English and in Impacto in Spanish. Print advertisements were placed twice monthly beginning in November of 2005 and terminating December 2006 in various languages in the community press and major daily newspapers serving Los Angeles to Promote awareness of and participation in LADWP's residential water conservation programs. The LADWP Public Affairs Division prepares an outreach program annually based on the specific program needs of the Water Conservation office. Public Affairs implements the elements of the program which include development and production of collateral materials and exhibits; development and placement of all advertisements and public service announcements; development and posting of Web site announcements. MWDSC independently promotes conservation through various media channels and directly promotes programs via the bewaterwise.com website as well as by its program

implementation contractor.

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	yes	81
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	21
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	3
g. Speaker's Bureau	yes	5
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing)

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Reported as of 6/10/10

BMP 08: School Education Programs

Reporting Unit:
Los Angeles Dept. of Water and Power

BMP Form Status:
100% Complete

Year:
2007

A. Implementation

1. How is your public information program implemented?
Retailer runs program without wholesaler sponsorship

2. Please provide information on your region-wide school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	2	490	13
Grades 4th-6th	yes	2	4325	13
Grades 7th-8th	yes	0	37800	13
High School	yes	0	56800	13

4. Did your Agency's materials meet state education framework requirements?	yes
5. When did your Agency begin implementing this program?	09/15/1975

B. School Education Program Expenditures

1. Annual Expenditures (Excluding Staffing)

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

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

D. Comments

Teachers' guide and supporting materials funded and/or provided by LADWP. Dedicated LADWP staff coordinate with school district throughout the school year.

Reported as of 6/10/10

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period:	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	25	10	4
b. Number of New Surveys Completed	25	10	4
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	10	6	1
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	10	3	1

CII Survey Components	Commercial	Industrial	Institutional

	Accounts	Accounts	Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	yes	yes	yes
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	yes	yes
Agency CII Customer Incentives	**Budget ($/Year)**	**# Awarded to Customers**	**Total $ Amount Awarded**
h. Rebates	150000	6980	737808
i. Loans	0	0	0
j. Grants	350000	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	4469
b. Dual Flush Toilets	1
c. High Efficiency Toilets	1404
d. High Efficiency Urinals	0
e. Non-Water Urinals	0
f. Commercial Clothes Washers (coin-op only; not industrial)	1037
g. Cooling Tower Controllers	23
h. Food Steamers	0
i. Ice Machines	0
j. Pre-Rinse Spray Valves	0
k. Steam Sterilizer Retrofits	0
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year

1. Budgeted Expenditures	2750000	2750000
2. Actual Expenditures	737808	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Implementation

Water Service Rate Structure Data by Customer Class

1. Single Family Residential

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 274,814,458
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$,

2. Multi-Family Residential

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 188,638,894
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

3. Commercial

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 119,179,953
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

4. Industrial

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 23,200,289
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

5. Institutional / Government

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 32,620,283
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

6. Dedicated Irrigation (potable)	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 7,587,195
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
7. Recycled-Reclaimed	
a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 2,665,729
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
8. Raw	
a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
9. Other	
a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

B. Implementation Options

Select Either Option 1 or Option 2:

1. Option 1: Use Annual Revenue As Reported
V/(V+M) >= 70%
V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges

Selected

2. Option 2: Use Canadian Water & Wastewater Association Rate Design Model
V/(V+M) >= V'/(V'+M')
V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges
V' = The uniform volume rate based on the signatory's long-run incremental cost of service
M' = The associated meter charge

a. If you selected Option 2, has your agency submitted to the Council a completed Canadian Water & Wastewater Association rate design model?

b. Value for **V'** (uniform volume rate based on agency's long-run incremental cost of service) as determined by the Canadian Water & Wastewater Association rate design model:

c. Value for **M'** (meter charge associated with V' uniform volume rate) as determined by the Canadian Water & Wastewater Association rate design model:

C. Retail Wastewater (Sewer) Rate Structure Data by Customer Class

1. Does your agency provide sewer service? (If YES, answer questions 2 - 7 below, else continue to section D.)		No

2. Single Family Residential

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

3. Multi-Family Residential

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

4. Commercial

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

5. Industrial

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

6. Institutional / Government

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

7. Recycled-reclaimed water

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No

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

E. Comments

Link to LADWP Water Rate Ordinance: http://www.ladwp.com/ladwp/cms/ladwp001149.pdf

BMP 12: Conservation Coordinator

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	no
a. Partner agency's name:	
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	100%
b. Coordinator's Name	Thomas Gackstetter
c. Coordinator's Title	Water Conservation Manager
d. Coordinator's Experience and Number of Years	20
e. Date Coordinator's position was created (mm/dd/yyyy)	12/11/1991
4. Number of conservation staff (FTEs), including Conservation Coordinator.	5

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	597610
2. BMP Program Implementation Expenditures	5989000

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

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

D. Comments

BMP 13: Water Waste Prohibition

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2007**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area?	yes

a. If YES, describe the ordinance:

Prohibits use of water on hardscape, gutter flooding, unattended leaks, mid-day watering, serving water in restaurants w/o request, non recirc fountains

2. Is a copy of the most current ordinance(s) on file with CUWCC?	yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Los Angeles	Ord No. 166080

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	Yes
c. Non-recirculating systems in all new conveyor or car wash systems	Yes
d. Non-recirculating systems in all new commercial laundry systems	Yes
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name See above	yes

2. Describe measures that prohibit water uses listed above:

Specific ordinance language, monetary penalties, service restrictions/shutoff. Cost of water/wastewater and common practice limits number of single pass systems

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	no
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	no
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	no
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	no
4. Does your agency include water softener checks in home water audit programs?	no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

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

D. Comments

BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2007**

A. Implementation

Number of 1.6 gpf Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	2043	386
3. Direct Install	5448	9912
4. CBO Distribution	126	92
5. Other	0	0
Total	**7617**	**10390**

Number of 1.2 gpf High-Efficiency Toilets (HETs) Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate		
8. Direct Install		
9. CBO Distribution		
10. Other		
Total		

Number of Dual-Flush Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	Multi-Family Units
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	0	0
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0
Total	**0**	**0**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for

single-family residences.

Rebate of $100 per toilet replaced or free toilet in exchange for old toilet (installed free on request). Rebate paid on ULFT, HET and Dual Flush.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

Rebate of $75 per toilet replaced or free toilet in exchange for old toilet (installed free on request). Rebate paid on ULFT, HET and Dual Flush.

18. Is a toilet retrofit on resale ordinance in effect for your service area? yes

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

City of Los Angeles	Ord. No. 172075

B. Residential ULFT Program Expenditures

1. Estimated cost per ULFT/HET replacement: 242.86

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

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

D. Comments

Cost per unit includes all programmatic costs.

2008 CUWCC Biennial Report

Water Supply & Reuse

Reporting Unit: **Los Angeles Dept. of Water and Power**

Year: **2008**

Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
LA Aqueduct	152642	Imported
MWDSC	421732	Imported
Groundwater	71023	Groundwater
Recycled	4273	Recycled
Transfer	1241	Imported
Storage	198	Imported

Total AF: 651109

Reported as of 6/10/10

Accounts & Water Use

Reporting Unit Name:	Submitted to CUWCC	Year:
Los Angeles Dept. of Water and Power	**02/08/2009**	**2008**

What is the reporting year?	Fiscal	Month Ending	June

A. Service Area Population Information:

1. Total service area population 4071873

B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	482675	249530	0	0
2. Multi-Family	124403	183064	0	0
3. Commercial	72403	109091	0	0
4. Industrial	6830	24257	0	0
5. Institutional	7583	44803	0	0
6. Dedicated Irrigation	766	264	0	0
7. Recycled Water	45	4130	0	0
8. Other	0	0	0	0
9. Unaccounted	NA	37223	NA	0
Total	694705	652362	0	0
	Metered		**Unmetered**	

Reported as of 6/10/10

BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Implementation

1. Based on your signed MOU date, 09/12/1991, your Agency STRATEGY DUE DATE is:	09/11/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1990
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?	yes
a. If YES, when was it implemented?	06/01/1990

B. Water Survey Data

Single

Survey Counts:	**Family Accounts**	**Multi-Family Units**
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
Indoor Survey:		
3. Check for leaks, including toilets, faucets and meter checks	yes	yes
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	yes	yes
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as neccesary; replace leaking toilet flapper, as necessary	yes	yes
Outdoor Survey:		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	yes	no
a. If yes, in what form are surveys tracked?		manual activity

b. Describe how your agency tracks this information.

In-house filing system

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Period: FY 07-08 ULFT Rebate and D.I. programs end on 12/31/06. Marketing stops.

Reported as of 6/10/10

BMP 02: Residential Plumbing Retrofit

Reporting Unit:
Los Angeles Dept. of Water and BMP Form Status: Year:

Power **100% Complete** **2008**

A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts?	yes

a. If YES, list local jurisdictions in your service area and code or ordinance in each:

City of Los Angeles "Water Closet, Urinal and Showerhead Regulations-Retrofit on Resale" Ordinance (No. 172075)

2. Has your agency satisfied the 75% saturation requirement for single-family housing units?	yes
3. Estimated percent of single-family households with low-flow showerheads:	99%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units?	yes
5. Estimated percent of multi-family households with low-flow showerheads:	99%

6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

LA enacted an ordinance requiring all LADWP customers to install low flow showerheads & have installations certified or incur financial penalties for non-compliance. 99+% of LADWP customers have demonstrated compliance

B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices?	yes
a. If YES, when did your agency begin implementing this strategy?	07/01/1988

b. Describe your targeting/ marketing strategy.

Direct mail to all SF customers; element of all survey pgms; req'd per L.A. ordinance; provided upon request to any residential customer; distributed with program ULFTs.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	3812	12896
3. Number of toilet-displacement devices distributed:	2	0
4. Number of toilet flappers distributed:	39	11
5. Number of faucet aerators distributed:	57	2300

6. Does your agency track the distribution and cost of low-flow devices?	yes
a. If YES, in what format are low-flow devices tracked?	Database

b. If yes, describe your tracking and distribution system :

Tracking: in-house inventory control; Distribution through Water Conservation office to customers who call in and through LADWP account executivs.

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

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

D. Comments

Reported as of 6/10/10

BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Implementation

1. Does your agency own or operate a water distribution system?	yes
2. Has your agency completed a pre-screening system audit for this reporting year?	Yes
3. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:	
a. Determine metered sales (AF)	611008
b. Determine other system verifiable uses (AF)	0
c. Determine total supply into the system (AF)	648231
d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required.	0.94
4. Does your agency keep necessary data on file to verify the values entered in question 3?	yes
5. Did your agency complete a full-scale audit during this report year?	no
6. Does your agency maintain in-house records of audit results or completed AWWA M36 audit worksheets for the completed audit which could be forwarded to CUWCC?	yes
7. Does your agency operate a system leak detection program?	no
a. If yes, describe the leak detection program:	

B. Survey Data

1. Total number of miles of distribution system line.	7228
2. Number of miles of distribution system line surveyed.	0

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Voluntary Questions (Not used to calculate compliance)

E. Volumes

	Estimated	Verified
1. Volume of raw water supplied to the system:		
2. Volume treated water supplied into the system:		
3. Volume of water exported from the system:		
4. Volume of billed authorized metered consumption:		

5. Volume of billed authorized unmetered consumption:

6. Volume of unbilled authorized metered consumption:

7. Volume of unbilled authorized unmetered consumption:

F. Infrastructure and Hydraulics

1. System input (source or master meter) volumes metered at the entry to the:

2. How frequently are they tested and calibrated?

3. Length of mains:

4. What % of distribution mains are rigid pipes (metal, ac, concrete)?

5. Number of service connections:

6. What % of service connections are rigid pipes (metal)?

7. Are residential properties fully metered?

8. Are non-residential properties fully metered?

9. Provide an estimate of customer meter under-registration:

10. Average length of customer service line from the main to the point of the meter:

11. Average system pressure:

12. Range of system pressures: From to

13. What percentage of the system is fed from gravity feed?

14. What percentage of the system is fed by pumping and re-pumping?

G. Maintenance Questions

1. Who is responsible for providing, testing, repairing and replacing customer meters?

2. Does your agency test, repair and replace your meters on a regular timed schedule?

   a. If yes, does your agency test by meter size or customer category?:

   b. If yes to meter size, please provide the frequency of testing by meter size:

      Less than or equal to 1"

      1.5" to 2"

      3" and Larger

   c. If yes to customer category, provide the frequency of testing by customer category:

      SF residential

      MF residential

      Commercial

      Industrial & Institutional

3. Who is responsible for repairs to the customer lateral or customer service line?

4. Who is responsible for service line repairs downstream of the customer meter?

5. Does your agency proactively search for leaks using leak

survey techniques or does your utility reactively repair leaks which are called in, or both?

6. What is the utility budget breakdown for:

Leak Detection	$
Leak Repair	$
Auditing and Water Loss Evaluation	$
Meter Testing	$

H. Comments

Reported as of 6/10/10

BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Does your agency have any unmetered service connections?	No
a. If YES, has your agency completed a meter retrofit plan?	
b. If YES, number of previously unmetered accounts fitted with meters during report year:	
2. Are all new service connections being metered and billed by volume of use?	Yes
3. Are all new service connections being billed volumetrically with meters?	Yes
4. Has your agency completed and submitted electronically to the Council a written plan, policy or program to test, repair and replace meters?	Yes

5. Please fill out the following matrix:

Account Type	Number of Metered Accounts	Number of Metered Accounts Read	Number of Metered Accounts Billed by Volume	Billing Frequency Per Year	Number of Volume Estimates
a. Single Family	483433	483433	483433	6	0
b. Multi-Family	121693	121693	121693	6	0
c. Commercial	60327	60327	60327	12	0
d. Industrial	6552	6552	6552	12	0
e. Institutional	6707	6707	6707	12	0
f. Landscape Irrigation	766	766	766	12	0

B. Feasibility Study

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	

b. Describe the feasibility study:

2. Number of CII accounts with mixed-use meters:	60327
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.	0

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No

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

D. Comments

Fire services are metered; hydrants are not.

BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts:	766
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:	269
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):	0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):	0
5. Does your agency provide water use notices to accounts with budgets each billing cycle?	yes

B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys?	yes
a. If YES, when did your agency begin implementing this strategy?	6/10/1996

b. Description of marketing / targeting strategy:

Work with LA Dept Rec & Parks, school district to audit and provide audit training. All accts applying for landscape incentives also audited. Review consumption history for excess use.

2. Number of Surveys Offered.	6
3. Number of Surveys Completed.	6

4. Indicate which of the following Landscape Elements are part of your survey:

a. Irrigation System Check	yes
b. Distribution Uniformity Analysis	yes
c. Review / Develop Irrigation Schedules	yes
d. Measure Landscape Area	yes
e. Measure Total Irrigable Area	yes
f. Provide Customer Report / Information	yes

5. Do you track survey offers and results?	yes
6. Does your agency provide follow-up surveys for previously completed surveys?	yes

a. If YES, describe below:

Accounts with poor distribution uniformity re-audited after system improvements completed

C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets?	no
2. Number of CII mixed-use accounts with landscape budgets.	0
3. Do you offer landscape irrigation training?	yes
4. Does your agency offer financial incentives to improve landscape water use efficiency?	yes

Type of Financial Incentive:	Budget (Dollars/ Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	1000000	1	8538
b. Loans	0	0	0
c. Grants	80000	0	0

5. Do you provide landscape water use efficiency information to new customers and customers changing services?	No

a. If YES, describe below:

6. Do you have irrigated landscaping at your facilities?	yes
a. If yes, is it water-efficient?	yes
b. If yes, does it have dedicated irrigation metering?	yes
7. Do you provide customer notices at the start of the irrigation season?	no
8. Do you provide customer notices at the end of the irrigation season?	no

D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	Yes

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

The Los Angeles Department of Water and Power (LADWP) is taking a multi-pronged approach and implementing several programs to target our large landscapes (e.g. parks and schools) and commercial, industrial, and institutional (CII) customers having irrigated landscapes. LADWP implements the ambitious Technical Assistance Program (TAP), which is a custom financial incentive program offering CII and Multi-Family Residential customers in Los Angeles up to $250,000 for the installation of pre-approved equipment and products (including the design and installation of efficient irrigation systems) that demonstrate persistent water savings. LADWP staff is currently working with a major customer on significant modifications for a new proprietary process that will conserve a considerable amount of water annually. LADWP has entered into a Memorandum of Understanding (MOU) with the Los Angeles

Department of Recreation and Parks (RAP) for the purpose of funding water use efficiency improvements for large landscapes in City parks. These water conservation improvements that LADWP and RAP are working in partnership to advance include installation of weather-based irrigation controllers, high efficiency sprinkler heads, and repair or replacement of irrigation distribution systems. The MOU strengthens LADWP's commitment to conservation as a means of providing a sustainable source of water to the City of Los Angeles as adopted by the Board in the 2005 Urban Water Management Plan. In August of 2008, LADWP amended its Emergency Water Conservation Plan (a City Ordinance) to address the increasing water shortage. The Plan's requirements are applicable to all LADWP customers, and are focused primarily on landscape irrigation. The Plan permits customers to use water only during specified hours of the day and specified days of the week, depending on the declared severity of water shortage. Water allotment varies by each phase (I-VI), such that phase I has the least amount of restrictions and phase VI having the most stringent restrictions. LADWP is currently developing a proposal for "Shortage Year" Water Rates (Tier 1 and Tier 2) for both commercial and residential customers that will become effective in mid-2009. Customers will be required to conserve 15% below their Tier 1 allotment to avoid a bill increase; however, those who exceed their allotment must pay Tier 2 rates resulting in higher water bills. Shortage Year Water Rates are designed to ensure that costs are recovered without penalizing customers who conserve during the years when projected demand for water exceeds the available supply. As has been demonstrated by LADWP's 100% volumetric rate structure, price signal is a most effective conservation tool. In addition to the Ordinance modifications described above, LADWP has developed and is planning to launch a Turf Buy Back Program in 2009. This new program will pay single family residential and commercial customers $1.00 per square foot of turf removed and replaced with drought tolerant plants, mulch or permeable hardscape. Any subsequent irrigation requirements will be met with low volume drip or microspray emitters. LADWP is also in the process of expanding our recycled water program and are working with water intensive CII customers such as golf courses, parks, and refineries to promote and use recycled water. LADWP is currently converting all of our golf courses and parks to dedicated irrigation meters for the usage of recycled water. Our recycled water goal is to deliver at least 50,000 acre-feet per year by 2019. This will be done by expanding the "purple pipe" distribution system to new customers who can use recycled water for non-potable uses such as irrigation and industrial processes.

E. Comments

Reported as of 6/10/10

BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers?

a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.

2. Does your agency offer rebates for high-efficiency washers?	yes
3. What is the level of the rebate?	
4. Number of rebates awarded.	

B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures		
2. Actual Expenditures		

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

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

D. Comments

Reported as of 6/10/10

BMP 07: Public Information Programs

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Implementation

1. How is your public information program implemented?
Wholesaler and retailer both materially participate in program
Which wholesaler(s)?
Metropolitan Water District of Southern California

2. Describe the program and how it's organized:
LADWP's Public Affairs Division works closely with the Water Conservation office. Information is made available on LADWP Web site, conservation publications distributed at public venues and by request (in English and Spanish); customer newsletter; Speakers Bureau and school presentations; fleet vehicle signage; posters and brochures in LADWP Customer Service Centers and City Council field offices; permanent water display located at Olvera Street, a popular Los Angeles landmark and tourist venue; a special flier regarding conservation was produced and inserted for distribution in the Los Angeles Times and Daily News in English and in Impacto in Spanish. Print advertisements were placed twice monthly beginning in November of 2005 and terminating December 2006 in various languages in the community press and major daily newspapers serving Los Angeles to Promote awareness of and participation in LADWP's residential water conservation programs. The LADWP Public Affairs Division prepares an outreach program annually based on the specific program needs of the Water Conservation office. Public Affairs implements the elements of the program which include development and production of collateral materials and exhibits; development and placement of all advertisements and public service announcements; development and posting of Web site announcements. MWDSC independently promotes conservation through various media channels and directly promotes programs via the bewaterwise.com website as well as by its program

implementation contractor

3. Indicate which and how many of the following activities are included in your public information program:

Public Information Program Activity in Retail Service Area	Yes/No	Number of Events
a. Paid Advertising	yes	250
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	22
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	3
g. Speaker's Bureau	yes	10
h. Program to coordinate with other government agencies, industry and public interest groups and media	yes	

B. Conservation Information Program Expenditures

1. Annual Expenditures (Excluding Staffing)

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

Reported as of 6/10/10

BMP 08: School Education Programs

Reporting Unit:
Los Angeles Dept. of Water and Power

BMP Form Status:
100% Complete

Year:
2008

A. Implementation

1. How is your public information program implemented?
Retailer runs program without wholesaler sponsorship

2. Please provide information on your region-wide school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3rd	yes	0	0	0
Grades 4th-6th	yes	0	3600	0
Grades 7th-8th	yes	0	18500	0
High School	yes	0	29500	0

4. Did your Agency's materials meet state education framework requirements?	yes
5. When did your Agency begin implementing this program?	09/15/1975

B. School Education Program Expenditures

1. Annual Expenditures (Excluding Staffing)

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No

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

D. Comments

Teachers' guide and supporting materials funded and/or provided by LADWP. Dedicated LADWP staff coordinate with school district throughout the school year.

Reported as of 6/10/10

BMP 09: Conservation Programs for CII Accounts

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Implementation

1. Has your agency identified and ranked COMMERCIAL customers according to use?	yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use?	yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use?	yes

Option A: CII Water Use Survey and Customer Incentives Program

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? If so, please describe activity during reporting period:	yes

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	15	7	4
b. Number of New Surveys Completed	15	7	4
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	6	4	1
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	6	2	1

CII Survey Components	Commercial	Industrial	Institutional

	Accounts	Accounts	Accounts
e. Site Visit	yes	yes	yes
f. Evaluation of all water-using apparatus and processes	yes	yes	yes
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	yes	yes	yes
Agency CII Customer Incentives	**Budget ($/Year)**	**# Awarded to Customers**	**Total $ Amount Awarded**
h. Rebates	1500000	6605	925931
i. Loans	0	0	0
j. Grants	350000	0	0
k. Others	0	0	0

Option B: CII Conservation Program Targets

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	yes
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	yes

7. **System Calculated** annual savings (AF/yr):

CII Programs	# Device Installations
a. Ultra Low Flush Toilets	1127
b. Dual Flush Toilets	525
c. High Efficiency Toilets	1721
d. High Efficiency Urinals	1327
e. Non-Water Urinals	346
f. Commercial Clothes Washers (coin-op only; not industrial)	835
g. Cooling Tower Controllers	26
h. Food Steamers	13
i. Ice Machines	0
j. Pre-Rinse Spray Valves	2
k. Steam Sterilizer Retrofits	5
l. X-ray Film Processors	0

8. **Estimated** annual savings (AF/yr) from agency programs not including the devices listed in Option B. 7., above:

CII Programs	Annual Savings (AF/yr)
a. Site-verified actions taken by agency:	0
b. Non-site-verified actions taken by agency:	0

B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year

1. Budgeted Expenditures	2750000	2750000
2. Actual Expenditures	925931	

C. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP? No

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

D. Comments

BMP 11: Conservation Pricing

Reporting Unit:	BMP Form Status:	Year:
Los Angeles Dept. of Water and Power	**100% Complete**	**2008**

A. Implementation

Water Service Rate Structure Data by Customer Class

1. Single Family Residential

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 299,536,198
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$,

2. Multi-Family Residential

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 216,210,111
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

3. Commercial

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 138,218,700
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

4. Industrial

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 30,670,561
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

5. Institutional / Government

a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 36,762,959
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

6. Dedicated Irrigation (potable)	
a. Rate Structure	Increasing Block Seasonal
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 7,965,994
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
7. Recycled-Reclaimed	
a. Rate Structure	Uniform
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 1,679,516
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
8. Raw	
a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0
9. Other	
a. Rate Structure	Service Not Provided
b. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0
c. Total Revenue from Customer Meter/Service (Fixed) Charges	$ 0

B. Implementation Options

Select Either Option 1 or Option 2:

1. Option 1: Use Annual Revenue As Reported
V/(V+M) >= 70%
V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges

Selected

2. Option 2: Use Canadian Water & Wastewater Association Rate Design Model
V/(V+M) >= V'/(V'+M')
V = Total annual revenue from volumetric rates
M = Total annual revenue from customer meter/service (fixed) charges
V' = The uniform volume rate based on the signatory's long-run incremental cost of service
M' = The associated meter charge

a. If you selected Option 2, has your agency submitted to the Council a completed Canadian Water & Wastewater Association rate design model?

b. Value for **V'** (uniform volume rate based on agency's long-run incremental cost of service) as determined by the Canadian Water & Wastewater Association rate design model:

c. Value for **M'** (meter charge associated with V' uniform volume rate) as determined by the Canadian Water & Wastewater Association rate design model:

C. Retail Wastewater (Sewer) Rate Structure Data by Customer Class

1. Does your agency provide sewer service? (If YES, answer questions 2 - 7 below, else continue to section D.)		No

2. Single Family Residential

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

3. Multi-Family Residential

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

4. Commercial

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

5. Industrial

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

6. Institutional / Government

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

7. Recycled-reclaimed water

a. Sewer Rate Structure	
b. Total Annual Revenue	$ 0
c. Total Revenue from Commodity Charges (Volumetric Rates)	$ 0

D. "At Least As Effective As"

1. Is your agency implementing an "at least as effective as" variant of this BMP?	No

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

E. Comments

Link to LADWP Water Rate Ordinance:
http://www.ladwp.com/ladwp/cms/ladwp001149.pdf

BMP 12: Conservation Coordinator

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

1. Does your Agency have a conservation coordinator?	yes
2. Is a coordinator position supplied by another agency with which you cooperate in a regional conservation program ?	no
a. Partner agency's name:	
3. If your agency supplies the conservation coordinator:	
a. What percent is this conservation coordinator's position?	100%
b. Coordinator's Name	Thomas Gackstetter
c. Coordinator's Title	Water Conservation Manager
d. Coordinator's Experience and Number of Years	21
e. Date Coordinator's position was created (mm/dd/yyyy)	12/11/1991
4. Number of conservation staff (FTEs), including Conservation Coordinator.	5

B. Conservation Staff Program Expenditures

1. Staffing Expenditures (In-house Only)	609562
2. BMP Program Implementation Expenditures	6989200

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

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

D. Comments

BMP 13: Water Waste Prohibition

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2008**

A. Requirements for Documenting BMP Implementation

1. Is a water waste prohibition ordinance in effect in your service area?	yes

a. If YES, describe the ordinance:

Prohibits use of water on hardscape, gutter flooding, unattended leaks, mid-day watering, serving water in restaurants w/o request, non recirc fountains

2. Is a copy of the most current ordinance(s) on file with CUWCC?	yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

City of Los Angeles Ord No. 166080

B. Implementation

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	Yes
c. Non-recirculating systems in all new conveyor or car wash systems	Yes
d. Non-recirculating systems in all new commercial laundry systems	Yes
e. Non-recirculating systems in all new decorative fountains	yes
f. Other, please name See above	yes

2. Describe measures that prohibit water uses listed above:

Specific ordinance language, monetary penalties, service restrictions/shutoff. Cost of water/wastewater and common practice limits number of single pass systems

Water Softeners:

3. Indicate which of the following measures your agency has supported in developing state law:

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	no
b. Develop minimum appliance efficiency standards that:	
i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.	no
ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced.	no
c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply.	no
4. Does your agency include water softener checks in home water audit programs?	no
5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models?	no

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	no

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

D. Comments

BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Los Angeles Dept. of Water and Power**	BMP Form Status: **100% Complete**	Year: **2008**

A. Implementation

Number of 1.6 gpf Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	**Multi-Family Units**
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	yes	yes
Replacement Method	**SF Accounts**	**MF Units**
2. Rebate	0	42
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
Total	**0**	**42**

Number of 1.2 gpf High-Efficiency Toilets (HETs) Replaced by Agency Program During Report Year

	Single-Family Accounts	**Multi-Family Units**
6. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
7. Rebate		
8. Direct Install		
9. CBO Distribution		
10. Other		
Total		

Number of Dual-Flush Toilets Replaced by Agency Program During Report Year

	Single-Family Accounts	**Multi-Family Units**
11. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
Replacement Method	**SF Accounts**	**MF Units**
12. Rebate	0	0
13. Direct Install	0	0
14. CBO Distribution	0	0
15. Other	0	0
Total	**0**	**0**

16. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for

single-family residences.

Residential ULFT rebate and distribution programs ended in 2007.

17. Describe your agency's ULFT, HET, and/or Dual-Flush Toilet programs for multi-family residences.

Residential ULFT rebate and distribution programs ended in 2007.

18. Is a toilet retrofit on resale ordinance in effect for your service area? yes

19. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

City of Los Angeles	Ord. No. 172075

B. Residential ULFT Program Expenditures

1. Estimated cost per ULFT/HET replacement: 242.86

C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

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

D. Comments

Urban Water Management Plan

Appendix I

Emergency Water Conservation Plan

ORDINANCE NO. 181288

An ordinance amending Chapter XII, Article I of the Los Angeles Municipal Code to clarify prohibited uses and modify certain water conservation requirements of the Water Conservation Plan of the City of Los Angeles.

THE PEOPLE OF THE CITY OF LOS ANGELES DO ORDAIN AS FOLLOWS:

Section 1. Chapter XII, Article I, of the Los Angeles Municipal Code is amended in its entirety to read:

ARTICLE I
EMERGENCY WATER CONSERVATION PLAN

SEC. 121.00. SCOPE AND TITLE.

This Article shall be known as The Emergency Water Conservation Plan of the City of Los Angeles.

SEC. 121.01. DECLARATION OF POLICY.

It is hereby declared that because of the conditions prevailing in the City of Los Angeles and in the areas of this State and elsewhere from which the City obtains its water supplies, the general welfare requires that the water resources available to the City be put to the 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 the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interests of the people of the City and for the public welfare.

SEC. 121.02. DECLARATION OF PURPOSE.

The purpose of this Article is to provide a mandatory water conservation plan to minimize the effect of a shortage of water to the Customers of the City and, by means of this Article, to adopt provisions that will significantly reduce the consumption of water over an extended period of time, thereby extending the available water required for the Customers of the City while reducing the hardship of the City and the general public to the greatest extent possible, voluntary conservation efforts having proved to be insufficient.

SEC. 121.03. DEFINITIONS

The following words and phrases, whenever used in this Article, shall be construed as defined in this Section unless from the context a different meaning is intended or unless a different meaning is specifically defined within individual Sections of this Article:

a. "**Article**" means the ordinance providing for "**The Emergency Water Conservation Plan of the City of Los Angeles**".

b. **"Baseline Water Usage"** means the amount of water used for the same period during Fiscal Year 2006-2007. The Baseline Water Usage for Customers without a water usage history prior to 2007 shall be calculated pursuant to a Department water budget.

c. "**Billing Unit**" means the unit amount of water used to apply water rates for purposes of calculating commodity charges for Customer water usage and equals one hundred (100) cubic feet or seven hundred forty-eight (748) gallons of water.

d. "**City**" means the City of Los Angeles.

e. "**City Council**" means the Council of the City of Los Angeles.

f. "**Conservation Phase**" means that level of mandatory water conservation presently required from Customers pursuant to this Article.

g. "**Customer**" means any person, persons, association, corporation or governmental agency supplied or entitled to be supplied with water service by the Department.

h. "**Department**" means the Los Angeles Department of Water and Power.

i. **"Drip Irrigation"** means an efficient and targeted form of irrigation in which water is delivered in drops directly to the plants roots where no emitter produces more than four (4) gallons of water per hour.

j. **"Even-numbered"** means street addresses ending with the following numerals: 0 (Zero), 2 (Two), 4 (Four), 6 (Six), 8 (Eight). Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.

k. "**Gray Water**" means a Customer's second or subsequent use of water supplied by the Department on the Customer's premises, such as the use of laundry or bathing water for other purposes.

l. "**His**" as used herein includes masculine, feminine or neuter, as appropriate.

m. **"Irrigate"** means any exterior application of water, other than for firefighting purposes, dust control, or as process water, including but not limited to the watering of any vegetation whether it be natural or planted.

n. **"Large Landscape Area"** means an area of vegetation at least three acres in size supporting a business necessity or public benefit uses such as parks, golf courses, schools, and cemeteries, and includes without limitation Schedule F and Provision M rate Customers.

o. "**Mayor**" means the Mayor of the City of Los Angeles

p. **"Notice to the Department"** means written communication documenting compliance with all requirements and directed to the Department.

q. **"Odd-numbered"** means street addresses ending with the following numerals: 1 (One), 3 (Three), 5 (Five), 7 (Seven), 9 (Nine). Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.

r. "**Officer**" means every person designated in Section 200 of the Los Angeles City Charter as an officer of the City of Los Angeles.

s. **"Potable Water"** means water supplied by the Department which is suitable for drinking and excludes recycled water from any source.

t. **"Private Golf Course"** means a facility with a business license where play is restricted to members and their guests, and does not include personal use facilities such as backyard golf greens or courses.

u. "**Process Water**" means water used to manufacture, alter, convert, clean, heat, or cool a product, or the equipment used for such purpose; water used for plant and equipment washing and for transporting of raw materials and products; and water used for community gardens, or to grow trees, plants, or turf for sale or installation.

v. **"Recycled Water"** means water which as a result of treatment of wastewater, is suitable for a direct beneficial use, or a controlled use as approved by the California Department of Public Health.

w. "**Section**" means a section of this Article unless some other ordinance or statute is specifically mentioned.

x. **"Single pass cooling systems"** means equipment where water is circulated only once to cool equipment before being disposed.

y. **"Sports Fields"** means a public or private facility supporting a business necessity or public benefit use that provides turf areas as a playing surface for individual and team sports, and does not include a facility on a residential property.

z. **"Station"** means those sprinklers or other water-emitting devices controlled by a single valve.

SEC. 121.04. AUTHORIZATION.

The various officers, boards, departments, bureaus and agencies of the City are hereby authorized and directed to immediately implement the applicable provisions of this Article upon the effective date hereof.

SEC. 121.05. APPLICATION.

The provisions of this Article shall apply to all Customers and property served by the Department wherever situated, and shall also apply to all property and facilities owned, maintained, operated, or under the jurisdiction of the various officers, boards, departments, bureaus or agencies of the City.

SEC. 121.06. WATER CONSERVATION PHASES.

A. No Customer of the Department shall make, cause, use, or permit the use of water from the Department for any residential, commercial, industrial, agricultural, governmental, or any other purpose in a manner contrary to any provision of this Article. The waste or unreasonable use of water is prohibited.

B. For the purposes of this Article, a use of water by a tenant or by an employee, agent, contractor or other designee acting on behalf of a Customer whether with real or ostensible authority shall be imputed to the Customer. Nothing contained in this Article shall limit the remedies available to a Customer under law or equity for the actions of a tenant, agent, contractor or other acting on behalf of a Customer.

SEC. 121.07. CONSERVATION PHASE IMPLEMENTATION.

A. Notwithstanding any other provisions of this Article, the provisions of Section 121.08A, Phase I, Prohibited Uses applicable to all Customers, shall take effect immediately upon the effective date of this Article, shall be permanent and shall not be subject to termination pursuant to the provisions of this Article providing for the termination of a conservation phase.

B. The Department shall monitor and evaluate the projected supply and demand for water by its Customers monthly, and shall recommend to the Mayor and Council by concurrent written notice the extent of the conservation required by the Customers of the Department in order for the Department to prudently plan for and supply water to its Customers. The Mayor shall, in turn, independently evaluate such recommendation and notify the Council of the Mayor's determination as to the particular phase of water conservation, Phase I through Phase V that should be implemented. Thereafter, the Mayor may, with the concurrence of the Council, order that the appropriate phase of water conservation be implemented in accordance with the applicable provisions of this Article. Said order shall be made by public proclamation and shall be published one time only in a daily newspaper of general circulation and shall become effective immediately upon such publication. The prohibited water uses for each phase shall take effect with the first full billing period commencing on or after the effective date of the public proclamation by the Mayor.

In the event the Mayor independently recommends to the Council a phase of conservation different from that recommended by the Department, the Mayor shall include detailed supporting data and the reasons for the independent recommendation in the notification to the Council of the Mayor's determination as to the appropriate phase of conservation to be implemented.

C. Phase Termination

1. At such time as the Department reports an April 1 forecast of annual Owens Valley and Mono Basin Runoff equal to or exceeding 110 percent of normal and the Metropolitan Water District of Southern California officially states that the sum of its Colorado River and State Water Project supplies exceeds 100 percent of projected demand, the Mayor shall forthwith recommend to the Council the termination of any Customer curtailment phase then in effect. Said recommendation to terminate shall take effect upon concurrence of the Council.

2. The provisions of Subsection C1 above shall not preclude the Department on the basis of information available to it from recommending to the Mayor the termination of a water conservation phase then in effect. The Mayor shall forward said recommendation to the Council and it shall take effect upon concurrence by the Council.

SEC. 121.08. WATER CONSERVATION PHASES.

A. PHASE I

Prohibited Uses Applicable To All Customers.

1. No Customer of the Department shall use a water hose to wash any paved surfaces including, but not limited to, sidewalks, walkways, driveways, and parking areas, except to alleviate immediate safety or sanitation hazards. This Section shall not apply to Department-approved water-conserving spray cleaning devices. Use of water-pressure devices for graffiti removal is exempt. A simple spray nozzle does not qualify as a water-conserving spray cleaning device.

2. No Customer of the Department shall use water to clean, fill, or maintain levels in decorative fountains, ponds, lakes, or similar structures used for aesthetic purposes unless such water is part of a recirculating system.

3. No restaurant, hotel, café, cafeteria, or other public place where food is sold, served or offered for-sale, shall serve drinking water to any person unless expressly requested.

4. No Customer of the Department shall permit water to leak from any pipe or fixture on the Customer's premises; failure or refusal to effect a timely repair of any leak of which the Customer knows or has reason to know shall subject said Customer to all penalties provided herein for a prohibited use of water.

5. No Customer of the Department shall wash a vehicle with a hose if the hose does not have a self-closing water shut-off or device attached to it, or otherwise allow a hose to run continuously while washing a vehicle.

6. No Customer of the Department shall irrigate during periods of rain.

7. No Customer of the Department shall water or irrigate lawn, landscape, or other vegetated areas between the hours of 9:00 a.m. and 4:00 p.m. During these hours, public and private golf course greens and tees and professional sports fields may be irrigated in order to maintain play areas and accommodate event schedules. Supervised testing or repairing of irrigation systems is allowed anytime with proper signage.

8. All irrigating of landscape with potable water using spray head sprinklers and bubblers shall be limited to no more than ten (10) minutes per watering day per station. All irrigating of landscape with potable water using standard rotors and multi-stream rotary heads shall be limited to no more than fifteen (15) minutes per cycle and up to two (2) cycles per watering day per station. Exempt from these landscape irrigation restrictions are irrigation systems using very low-flow drip-type irrigation when no emitter produces more than four (4) gallons of water per hour and micro-sprinklers using less than fourteen (14) gallons per hour. This provision does not apply to Schedule F water Customers or water service that has been granted the General Provision M rate adjustment under the City's Water Rates Ordinance, subject to the Customer having complied with best management practices for irrigation approved by the Department. The 9:00 a.m. to 4:00 p.m. irrigation restriction shall apply unless specifically exempt as stated in subsection 7 above.

9. No Customer of the Department shall water or irrigate any lawn, landscape, or other vegetated area in a manner that causes or allows excess or continuous water flow or runoff onto an adjoining sidewalk, driveway, street, gutter or ditch.

10. No installation of single pass cooling systems shall be permitted in buildings requesting new water service.

11. No installation of non-recirculating systems shall be permitted in new conveyor car wash and new commercial laundry systems.

12. Operators of hotels and motels shall provide guests with the option of choosing not to have towels and linens laundered daily. The hotel or motel shall prominently display notice of this option in each bathroom using clear and easily understood language. The Department shall make suitable displays available.

13. No Large Landscape Areas shall have irrigation systems without rain sensors that shut off the irrigation systems. Large Landscape Areas with approved weather-based irrigation controllers registered with the Department are in compliance with this requirement.

B. PHASE II

1. **Prohibited Uses Applicable To All Customers.** Should Phase II be implemented, uses applicable to Phase I of this Section shall continue to be applicable, except as specifically provided below.

2. Non-Watering Days. No landscape irrigation shall be permitted on any day other than Monday, Wednesday, or Friday for odd-numbered street addresses and Tuesday, Thursday , or Sunday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address. Watering times shall be limited to:

(a) Non-conserving nozzles (spray head sprinklers and bubblers) – no more than eight (8) minutes per watering day per station for a total of 24 minutes per week.

(b) Conserving nozzles (standard rotors and multi-stream rotary heads) – no more than fifteen (15) minutes per cycle and up to two (2) cycles per watering day per station for a total of 90 minutes per week.

(With the above watering times, water consumption used for both types of nozzles is essentially equal.)

3. Upon written Notice to the Department, irrigation of Sports Fields may deviate from the non-watering days to maintain play areas and accommodate event schedules; however, to be eligible for this means of compliance, a Customer must reduce his overall monthly water use by the Department's Board of Water and Power Commissioners (Board)-adopted

degree of shortage plus an additional five percent from the Customer Baseline Water Usage within 30 days.

4. Upon written Notice to the Department, Large Landscape Areas may deviate from the non-watering days by meeting the following requirements: 1) must have approved weather-based irrigation controllers registered with the Department (eligible weather-based irrigation controllers are those approved by the Metropolitan Water District of Southern California or the Irrigation Association Smart Water Application Technologies [SWAT] initiative); 2) must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional five percent from the Customer Baseline Water Usage within 30 days; and 3) must use recycled water if it is available from the Department.

5. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase II except between the hours of 9:00 am and 4:00 pm.

C. PHASE III

1. **Prohibited Uses Applicable to All Customers.** Should Phase III be implemented, uses applicable to Phase I of this Section shall continue to be applicable, except as specifically provided below.

2. Non-Watering Days. No landscape irrigation shall be permitted on any day other than Monday for odd-numbered street addresses and Tuesday for even-numbered street addresses. Street addresses ending in ½ or any fraction shall conform to the permitted uses for the last whole number in the address.

3. No washing of vehicles allowed except at commercial car wash facilities.

4. No filling of residential swimming pools and spas with potable water.

5. Upon written Notice to the Department, irrigation of Sports Fields may deviate from the specific non-watering days and be granted one additional watering day (for a total of 2 days allowed). To be eligible for this means of compliance, a Customer must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional ten percent from the Customer Baseline Water Usage within 30 days.

6. Upon written Notice to the Department, Large Landscape Areas may deviate from the specific non-watering days and be granted one additional watering day (for a total of 2 days allowed) by meeting the following requirements: 1) must have approved weather-based irrigation controllers

registered with the Department (eligible weather-based irrigation controllers are those approved by the Metropolitan Water District of Southern California or the Irrigation Association Smart Water Application Technologies [SWAT] initiative); 2) must reduce overall monthly water use by the Department's Board-adopted degree of shortage plus an additional ten percent from the Customer Baseline Water Usage within 30 days; and 3) must use recycled water if it is available from the Department.

7. These provisions do not apply to drip irrigation supplying water to a food source or to hand-held hose watering of vegetation, if the hose is equipped with a self-closing water shut-off device, which is allowed everyday during Phase IV except between the hours of 9:00 a.m. and 4:00 p.m.

D. PHASE IV

1. **Prohibited Uses Applicable To All Customers**. Should Phase IV be implemented, uses applicable to Phases I, II, and III of this Section shall continue to be applicable, except as specifically provided below.

2. Non-Watering Days. No landscape irrigation allowed.

E. PHASE V

1. **Prohibited Uses Applicable To All Customers.** Phases I, II, III, and IV of Section 121.08 shall continue to remain in effect.

2. Additional Prohibited Uses - The Board is hereby authorized to implement additional prohibited uses of water based on the water supply situation. Any additional prohibition shall be published at least once in a daily newspaper of general circulation and shall become effective immediately upon such publication and shall remain in effect until cancelled.

F. **EXCEPTION**. The prohibited uses of water provided for by Subsections A, B, C, D, and E of this Section are not applicable to the uses of water necessary for public health and safety or for essential government services such as police, fire, and other similar emergency services.

G. **VARIANCE.** If, due to unique circumstances, a specific requirement of this Section would result in undue hardship to a Customer using water or to property upon which water is used, that is disproportionate to the impacts to water users generally or to similar property or classes of water uses, then the Customer may apply for a variance from the requirements. Unique circumstances include, but are not limited to, physical disabilities which prevent compliance with the Water Conservation Plan. The Department shall adopt procedures for variance applications, review, and decision.

SEC. 121.09 FAILURE TO COMPLY.

A. Penalties – Water Meters Smaller Than Two Inches (2"). It shall be unlawful for any Customer of the Department to fail to comply with any of the provisions of this Article. Notwithstanding any other provision of the Los Angeles Municipal Code, the penalties set forth herein shall be exclusive and not cumulative with any other provisions of this Code. The penalties for failure to comply with any of the provisions of this Article shall be as follows:

1. For the first violation by any Customer of any of the provisions of Subsection A, B, C and D of Section 121.08, the Department shall issue a written notice of the fact of such violation to the Customer.

2. For a second violation by any Customer of any of the provisions of Subsection A, B, C and D of Section 121.08 within the preceding twelve (12) calendar months, a surcharge in the amount of One Hundred Dollars ($100.00) shall be added to the Customer's water bill.

3. For a third violation by any Customer of any of the provisions of Subsection A, B, C and D of Section 121.08 within the preceding twelve (12) calendar months, a surcharge in the amount of Two Hundred Dollars ($200.00) shall be added to the Customer's water bill.

4. For a fourth and any subsequent violation by a Customer of any of the provisions of Subsection A, B, C and D of Section 121.08 within the preceding twelve (12) calendar months, a surcharge in the amount of Three Hundred Dollars ($300.00) shall be added to the Customer's water bill.

5. After a fifth or subsequent violation, the Department may install a flow-restricting device of one-gallon-per-minute (1 GPM) capacity for services up to one and one-half inch (1-1/2") size and comparatively sized restrictors for larger services or terminate a Customer's service, in addition to the financial surcharges provided for herein. Such action shall be taken only after a hearing held by the Department where the Customer has an opportunity to respond to the Department's information or evidence that the Customer has repeatedly violated this Article or Department rules regarding the conservation of water and that such action is reasonably necessary to assure compliance with this Article and Department rules regarding the conservation of water.

Any such restricted or terminated service may be restored upon application of the Customer made not less than forty-eight (48) hours after the implementation of the action restricting or terminating service and only upon a showing by the Customer that the Customer is ready, willing and able to comply with the provisions of this Article and Department rules regarding the conservation of water. Prior to any restoration of service, the Customer shall pay all Department charges for any restriction or termination of service and its restoration as provided for in the Department's rules governing water service, including but not limited to payment of all past due bills and fines.

B. **Penalties – Water Meters Two Inches (2") and Larger**. It shall be unlawful for any Customer of the Department to fail to comply with any of the provisions of this Article. Notwithstanding any other provision of the Los Angeles Municipal Code, the penalties set forth herein shall be exclusive and not cumulative with any other provisions of this Code. The penalties for failure to comply with any of the provisions of this Article shall be as follows:

1. For the first violation by any Customer of any of the provisions of Subsection A, B, C and D of Section 121.08, the Department shall issue a written notice of the fact of such violation to the commercial or industrial Customer.

2. For a second violation by any Customer of any of the provisions of Subsection A, B, C and D of Section 121.08 within the preceding twelve (12) calendar months, a surcharge in the amount of Two Hundred Dollars ($200.00) shall be added to the Customer's water bill.

3. For a third violation by any Customer of any of the provisions of Subsection A, B, C and D of Section 121.08 within the preceding twelve (12) calendar months, a surcharge in the amount of Four Hundred Dollars ($400.00) shall be added to the Customer's water bill.

4. For a fourth and any subsequent violation by a Customer of any of the provisions of Subsection A, B, C and D of Section 121.08 within the preceding twelve (12) calendar months, a surcharge in the amount of Six Hundred Dollars ($600.00) shall be added to the Customer's water bill.

5. After a fifth or subsequent violation, the Department may install a flow-restricting device or terminate a Customer's service, in addition to the financial surcharges provided for herein. Such action shall be taken only after a hearing held by the Department where the Customer has an opportunity to respond to the Department's information or evidence that the Customer has repeatedly violated this Article or Department rules regarding the conservation of water and that such action is reasonably necessary to assure compliance with this Article and Department rules regarding the conservation of water.

Any such restricted or terminated service may be restored upon application of the Customer made not less than forty-eight (48) hours after the implementation of the action restricting or terminating service and only upon a showing by the Customer that the Customer is ready, willing and able to comply with the provisions of this Article and Department rules regarding the conservation of water. Prior to any restoration of service, the Customer shall pay all Department charges for any restriction or termination of service and its restoration as provided for in the Department's rules governing water service, including but not limited to payment of all past due bills and fines.

C. Notice. The Department shall give notice of each violation to the Customer committing such violation as follows:

1. For any violation of the provisions of Section 121.08, the Department may give written notice of the fact of such violation to the Customer personally, by posting a notice at a conspicuous place on the Customer's premises, or by United States mail, First-Class, postage prepaid addressed to the Customer's billing address.

2. If the penalty assessed is, or includes, the installation of a flow restrictor or the termination of water service to the Customer, notice of the violation shall be given in the following manner:

(a) By giving written notice thereof to the Customer personally; or

(b) If the Customer is absent from or unavailable at either his place of residence or his place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail, First-Class postage prepaid, addressed to the Customer at his place of business, residence, or such other address provided by the Customer for bills for water or electric service if such can be ascertained; or

(c) If such place of residence, business or other address cannot be ascertained, or a person of suitable age or discretion at any such place cannot be found, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person of suitable age and discretion there residing, or employed, if such person can be found, and also sending a copy through the United States mail, First-Class, postage prepaid, addressed to the Customer at the place where the property is situated as well as such other address provided by the Customer for bills for water or electric service if such can be ascertained.

Said notice shall contain, in addition to the facts of the violation, a statement of the possible penalties for each violation and statement informing the Customer of his right to a hearing on the violation.

D. **Hearing**. Any Customer who disputes any penalty levied pursuant to this Section shall have a right to a dispute determination conducted pursuant to the Department's Rules Governing Water and Electric Service. Any Customer dissatisfied with the Department's dispute determination may appeal that determination within 15 days of issuance to the Board, or to a designated hearing officer at the election of the Board. The provisions of Sections 19.24, 19.25, 19.26 and Sections 19.29 through 19.39 of the Los Angeles Administrative Code shall apply to such appeals. All defenses, both equitable and legal, may be asserted by a Customer in the appeal process. The decisions of the Board shall become final at the expiration of 45 calendar days, unless the Council acts within that time by a majority vote to bring the action before it or to waive review of the action. If the Council timely asserts jurisdiction, the Council may, by a majority vote, amend, veto or approve the action of the Board within 21 calendar days of voting to bring the matter before it, or the action of the Board shall become final. If the City Council asserts jurisdiction over the matter and acts within 21 calendar days of voting to bring the matter before it, the City Council's action shall be the final decision.

E. Reservation of Rights. The rights of the Department hereunder shall be cumulative to any other right of the Department to discontinue service. All monies collected by the Department pursuant to any of the surcharge provisions of this Article shall be deposited in the Water Revenue Fund as reimbursement for the Department's costs and expenses of administering and enforcing this Article.

SEC. 121.10. GENERAL PROVISIONS.

A. Enforcement. The Department of Water and Power shall enforce the provisions of this Article.

B. Department to Give Effect to Legislative Intent. The Department shall provide water to its Customers in accordance with the provisions of this Article, and in a manner reasonably calculated to effectuate the intent hereof.

C. Public Health and Safety Not to be Affected. Nothing contained in this Article shall be construed to require the Department to curtail the supply of water to any Customer when, in the discretion of the Department, such water is required by that Customer to maintain an adequate level of public health and safety; provided further that a Customer's use of water to wash the Customer's property immediately following the aerial application of a pesticide, such as Malathion, shall not constitute a violation of this Article.

D. **Recycled Water and Gray Water.** The provisions of this Article shall not apply to the use of Recycled Water or Gray Water, provided that such use does not result in excess water flow or runoff onto the adjoining sidewalk, driveway, street, gutter, or ditch. This provision shall not be construed to authorize the use of Gray Water if such use is otherwise prohibited by law.

E. Large Landscape Areas. Large Landscape Areas that have multiple irrigation system stations can deviate from prescribed non-watering days if their systems include weather-based irrigation controllers, and each irrigation station is limited to the number of days prescribed in this ordinance.

F. Hillside Burn Areas. The provisions of this Article shall not apply to hillside areas recovering from fire that have been replanted for erosion control. To qualify for this exemption, a Customer must obtain verification from the agency requiring erosion control measures. The duration of the exemption is limited to, either, one growing cycle, one year, or establishment of the vegetation, whichever is the lesser time period.

SEC. 121.11. SEVERABILITY.

If any section, subsection, clause or phrase in this Article or the application thereof to any person or circumstances is for any reason held invalid, the validity of the remainder of the Article or the application of such provision to other persons or circumstances shall not be affected thereby. The City Council hereby declares that it would have passed this Article and each section, subsection, sentence, clause, or phrase thereof, irrespective of the fact that one or more sections, subsections, sentences, clauses, or phrases or the application thereof to any person or circumstance be held invalid.

Sec. 2. **URGENCY CLAUSE.**

The Council of the City of Los Angeles hereby finds and declares that there exists within this City a current water shortage and the likelihood of a continuing water shortage into the immediate future and that as a result there is an urgent necessity to take legislative action through the exercise of the police power to protect the public peace, health, and safety of this City from a public disaster or calamity. Therefore, this Ordinance shall take effect immediately upon publication.

Sec. 3. The City Clerk shall certify to the passage of this ordinance and have it published in accordance with Council policy, either in a daily newspaper circulated in the City of Los Angeles or by posting for ten days in three public places in the City of Los Angeles: one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall; one copy on the bulletin board located at the Main Street entrance to the Los Angeles City Hall East; and one copy on the bulletin board located at the Temple Street entrance to the Los Angeles County Hall of Records.

I hereby certify that the foregoing ordinance was introduced at the meeting of the Council of the City of Los Angeles AUG 1 1 2010, and passed at it's meeting of AUG 1 8 2010.

JUNE LAGMAY, City Clerk

By ______________ Deputy

Approved AUG 23 2010

______________ Mayor

Approved as to Form and Legality

CARMEN A. TRUTANICH, City Attorney

By Victor Sofelkanik (ABE)
VICTOR SOFELKANIK
Deputy City Attorney)

Date 8/4/10

File No. 09-0369-S9

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Golden State Water Company

A Subsidiary of American States Water Company

Final Report

2010 Urban Water Management Plan

South San Gabriel

Corporate Office
630 E. Foothill Blvd.
San Dimas CA 91773

August 2011

Kennedy/Jenks Consultants

Final Report

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Notice of Adoption

A meeting to solicit public comments on the 2010 Urban Water Management Plan for the Golden State Water Company South San Gabriel System was held on July 19, 2011 at 6 p.m. at the San Dimas Community Center in San Dimas, California. Notice of this meeting was published in accordance with Section 6066 of the Government Code in the San Gabriel Valley Tribune on May 17, 22, and June 15, 2011.

Copies of the Urban Water Management Plan were made available to the public at the Golden State Water Company Customer Service Office in Arcadia, California, at least one week prior to the public hearing.

Golden State Water Company, hereby, adopts the 2010 Urban Water Management Plan for the South San Gabriel System.

William C. Gedney
Vice President, Asset Management
Golden State Water Company

August 31, 2011

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Abbreviations

µg/L	micrograms per liter
ac-ft	acre-feet
ac-ft/yr or AFY	acre-feet per year
Act	Urban Water Management Planning Act
AMR	automatic meter reading
AWWA	American Water Works Association
BMPs	best management practices
Cal EMA	California Emergency Management Agency
CAL Green Code	California Green Building Standards Code
ccf	hundred cubic feet
CDPH	California Department of Public Health
CII	commercial, industrial, institutional
CIMIS	California Irrigation Management Information System
COG	Council of Governments
Council or CUWCC	California Urban Water Conservation Council
CPUC	California Public Utilities Commission
CRA	Colorado River Aqueduct
D/DBP	disinfectant/disinfection by-product
DMM	Demand Management Measure
DOF	Department of Finance
DSC	Discovery Science Center
DWF	dry weather flow
DWR	Department of Water Resources (California)
DWR Guidebook	Guidebook to Assist Water Suppliers in the Preparation of a 2010 Urban Water Management Plan

ERP	Emergency Response Plan
ETo	evapotranspiration
GAC	Granular Activated Carbon
GIS	Geographic Information System
gpcd	gallons per capita day
gpd	gallons per day
gpm	U.S. gallons per minute
GSWC	Golden State Water Company
HCD	Housing and Community Development
HECW	high-efficiency clothes washers
HET	high-efficiency toilets
IRP	Integrated Resources Plan
LACSD	Sanitation Districts of Los Angeles County
MAF	million acre-feet per year
MCL	maximum contaminant levels
Metropolitan	Metropolitan Water District of Southern California
MF	multi-family
mgd	million gallons per day
MOU	memorandum of understanding (regarding urban water conservation in California)
msl	mean sea level
N/A	not available, not applicable
NAICS	North American Industry Classification System
O&M	operation and maintenance
OSY	operating safe yield
pCi/L	picoCuries per liter
RAP	Resource Action Programs
RHNA	Regional Housing Needs Allocation

RTP	Regional Transportation Plan
RUWMP	Regional Urban Water Management Plan
SBX7-7	Senate Bill X7-7, The Water Conservation Act of 2009
SCAG	Southern California Association of Governments
SD	Science Discover
SDWA	Safe Drinking Water Act
SF	single-family
SWP	State Water Project
TAF	thousand acre-feet per year
ULFT	ultra-low-flush-toilet
Upper District	Upper San Gabriel Valley Municipal Water District
USEPA	U.S. Environmental Protection Agency
USGVMWD	Upper San Gabriel Valley Municipal Water District
UWMP	Urban Water Management Plan
VOCs	volatile organic compounds
WAP	Water Action Plan
WBIC	weather based irrigation controllers
WLCD	Water Loss Control Department
WRCC	Western Regional Climate Center
WRP	water reclamation plant
WSAP	Water Supply Allocation Plan
WSDM Plan	Water Surplus and Drought Management Plan
WSS	WaterSense Specification

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Definitions

Chapter 2, Part 2.6, Division 6 of the California Water Code provides definitions for the construction of the Urban Water Management Plans. Appendix A contains the full text of the Urban Water Management Planning Act.

CHAPTER 2. DEFINITIONS

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

Section 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.

Section 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.

Section 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.

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

Section 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, and 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.

Section 10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

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

Section 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.

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Chapter 1: Plan Preparation

1.1 Background

This Urban Water Management Plan (UWMP) has been prepared for the Golden State Water Company (GSWC) South San Gabriel System in compliance with Division 6, Part 2.6, of the California Water Code, Sections 10608 through 10657 as last amended by Senate Bill No. 7 (SBX7-7), the Water Conservation Act of 2009. The original bill requiring an UWMP was enacted in 1983. SBX7-7, which became law in November 2009, requires increased emphasis on water demand management and requires the state to achieve a 20 percent reduction in urban per capita water use by December 31, 2020.

Urban water suppliers having more than 3,000 service connections or water use of more than 3,000 acre-feet per year (ac-ft/yr) for retail or wholesale uses are required to submit a UWMP every 5 years to the California Department of Water Resources (DWR). The UWMP typically must be submitted by December 31 of years ending in 0 and 5, however SBX7-7 extended the UWMP deadline to July 1, 2011 to provide for development by DWR of required evaluation methodologies for determining water demand reduction targets. GSWC prepared an UWMP for the South San Gabriel System in 1985, 1990, 1995, 2000, and 2005. This 2010 UWMP is an update to the 2005 plan.

GSWC water use targets for the South San Gabriel System were developed based on Compliance Method 3 and the Minimum Reduction requirement, as described by SBX7-7 and supplemental guidance from DWR.

The portion of the Urban Water Management Planning Act (Act) that describes the purpose and intent of the UWMP states and declares the following:

Section 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.

Section 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.

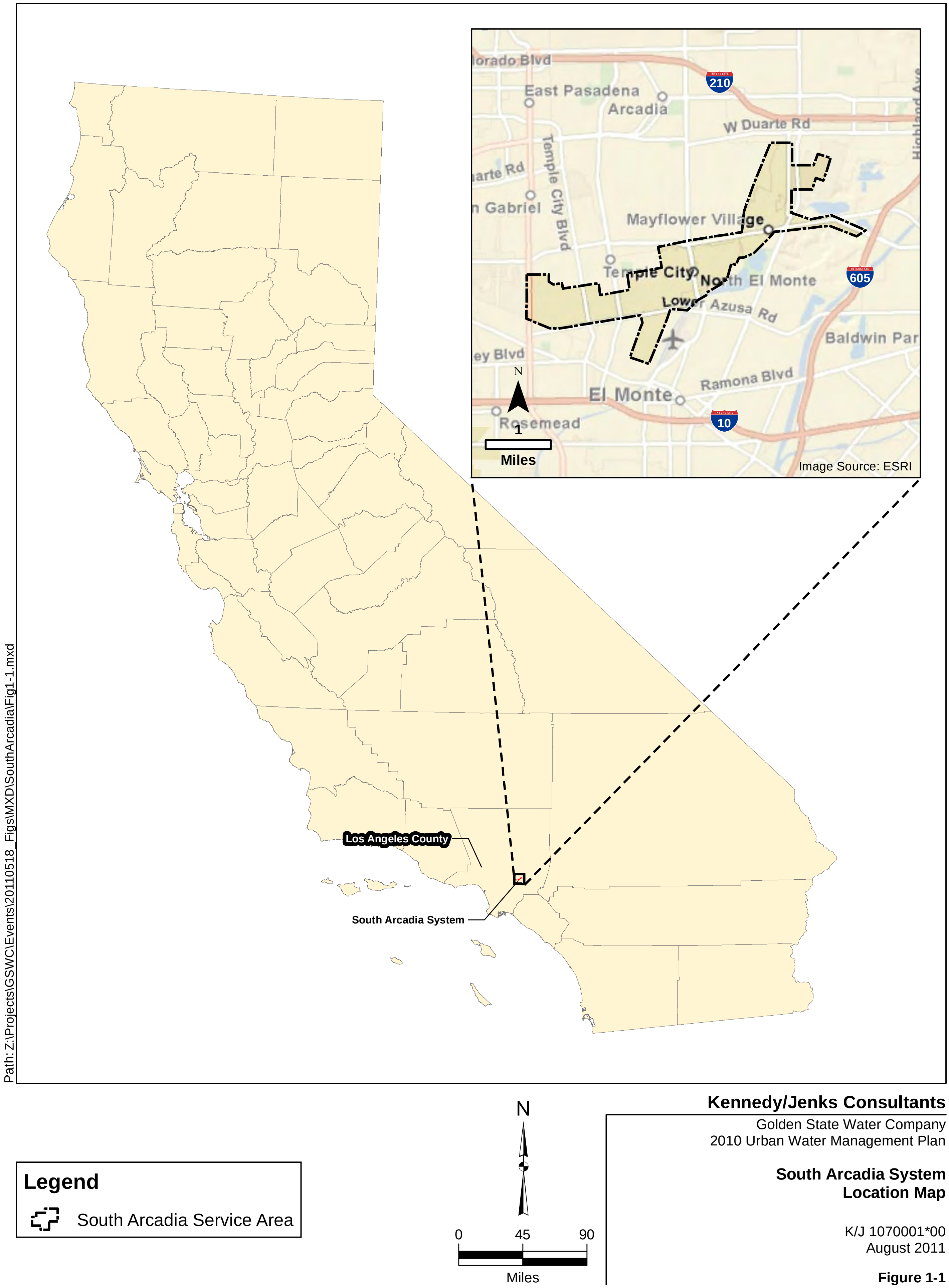
1.2 System Overview

GSWC is an investor-owned public utility company which owns 38 water systems throughout California regulated by the California Public Utilities Commission (CPUC). This UWMP has been prepared for the South San Gabriel System.

Located in Los Angeles County, the South San Gabriel System serves half of the City of Rosemead, parts of the City of San Gabriel, the City of Monterey Park, and adjacent unincorporated areas of Los Angeles County. The service area is primarily characterized by residential and commercial areas. Figure 1-1 illustrates the location of the South San Gabriel System.

1.3 Notice of Document Use

GSWC is committed to implementation of the projects, plans, and discussions provided within this document. However, it is important to note that execution of the plan is contingent upon the regulatory limitations and approval of the CPUC and other state agencies. Additionally, this document merely presents the water supply, reliability, and conservation programs known and in effect at the time of adoption of this plan.



Legend

South Arcadia Service Area

Kennedy/Jenks Consultants

Golden State Water Company
2010 Urban Water Management Plan

South Arcadia System
Location Map

K/J 1070001*00
August 2011

Figure 1-1

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1.4 Public Utility Commission 2010 Water Action Plan

The CPUC adopted the 2005 Water Action Plan (WAP) in December 2005 and an updated 2010 WAP in October 2010. The WAP is a general policy document, and specific implementation of policies and programs, along with modifications to CPUC ratemaking policies, and other programs including conservation, long-term planning, water quality and drought management programs are ongoing.

The purpose of the 2010 WAP update was to establish renewed focus on the following elements:

1. Maintain the highest standards of water quality;
2. Promote water infrastructure investment;
3. Strengthen water conservation programs to a level comparable to those of energy utilities;
4. Streamline CPUC regulatory decision-making;
5. Set rates that balance investment, conservation, and affordability; and
6. Assist low-income ratepayers.

GSWC has been actively involved with the CPUC in suggesting optimal approaches to the WAP. In particular, the GSWC has suggested specific implementation measures and modifications to certain CPUC rate setting practices so that regulated utilities are able as a practical matter to achieve the policy objectives of the WAP. These efforts are intended to include further investment in local resource optimization, reduced reliance on imported supplies, enhanced conservation, and intensification of company-wide efforts to optimize water resource mix, including planned water supply projects and programs to meet the long-term water supply needs of GSWC's customers.

1.5 Agency Coordination

The 2010 UWMP requirements for agency coordination include specific timetables and requirements as presented in this chapter. The required elements of the Act are as follows:

Section 10620.

(d) (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.

Section 10621.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

Section 10635.

(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.

Section 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.

Table 1-1 lists the agencies with which coordination occurred while preparing this 2010 UWMP. The initial coordination included the distribution of letter notification and request for information as indicated in Table 1-1 followed by telephone correspondence as necessary to obtain supporting data for the preparation of the UWMP. Table 1-1 also provides a checklist of agencies that have been provided the notifications and access to the documents.

Table 1-1: Coordination with Agencies

Agency	Contacted for Assistance	Participated in UWMP Development	Commented on the Draft	Attended Public Meetings	Received Copy of the Draft	Sent Notice of Intent to Adopt	Not Involved/ No Information
Southern California Association of Governments	✓						
City of Anaheim	✓	✓				✓	
City of Monterey Park	✓					✓	
City of Rosemead	✓					✓	
City of San Gabriel	✓	✓				✓	
Covina Irrigating Company	✓	✓				✓	
County of Los Angeles	✓					✓	
Upper San Gabriel Valley Municipal Water District	✓				✓	✓	
Los Angeles County Sanitation District	✓	✓				✓	

Note:
This table is based on DWR's *Guidebook to Assist Water Suppliers in the Preparation of a 2010 Urban Water Management Plan* (DWR Guidebook) Table 1.

1.6 Plan Adoption and Submittal

Public participation and plan adoption requirements are detailed in the following sections of the Act:

> *Section 10621.*
>
> *(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)*
>
> *Section 10642. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.*
>
> *Section 10644.*
>
> *(a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.*
>
> *Section 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.*

A public hearing to review the 2010 South San Gabriel System UWMP was held on July 19, 2011 at the San Dimas Community Center in San Dimas, California. This public session was held for review and comment on the draft UWMP before approval by GSWC. Legal public notices for the public hearing and availability of the plan for review and comment were published in advance in the local newspapers in accordance with Government Code Section 6066. Notifications were also posted to GSWC's website (www.gswater.com).

In addition, notifications of preparation of the plan were provided to cities and counties within which GSWC provides water at least 60 days in advance of the public hearing as required by the Act. Copies of the draft plan were available to the public for review at GSWC's South San Gabriel office and posted on GSWC's website. Appendix B contains the following:

- Copy of the public hearing notice from the local newspaper,
- Screen capture of website posting of public hearing notice,
- Notifications and follow-up correspondence provided to cities and counties, and
- Meeting minutes from the public hearing pertaining to the UWMP.

The final UWMP, as adopted by GSWC, will be submitted to DWR, the California State Library, and cities and counties within which GSWC provides water within 30 days of adoption. Likewise, copies of any amendments or changes to the plan will be provided to the aforementioned entities within 30 days. This plan includes all information necessary to meet the requirements of California Water Code Division 6, Part 2.6 (Urban Water Management Planning). Adopted copies of this plan will be made available to the public at GSWC's South San Gabriel Customer Service Office no later than 30 days after submitting the final UWMP to DWR.

1.7 UWMP Preparation

GSWC prepared this UWMP with the assistance of its consultant, Kennedy/Jenks Consultants, as permitted by the following section of the Act:

> *Section 10620.*
>
> *(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.*

During the preparation of the UWMP, documents that have been prepared over the years by GSWC and other entities were reviewed and information from those documents incorporated, as applicable, into this UWMP. The list of references is provided in Chapter 9.

The adopted plan is available for public review at GSWC's South San Gabriel Office as required by Section 10645. Copies of the plan were submitted to DWR, cities and counties within the service area, the State Library, and other applicable institutions within 30 days of adoption as required by Section 10644. Appendix H includes copies of the transmittals included with the adopted plan as supporting documentation.

1.8 UWMP Implementation

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

GSWC is committed to the implementation of this UWMP concurrent with the scheduled activities identified herein as required by Section 10643 of the Act. Each system is managed through GSWC District offices and is afforded staff with appropriate regulatory approval to properly plan and implement responses identified in this document and other key planning efforts to proactively address water supply reliability challenges. Furthermore, each region of GSWC has a conservation coordinator that oversees the implementation of Demand Management Measures (DMMs) through GSWC participation in the California Urban Water Conservation Council's (Council) Memorandum of Understanding (MOU).

1.9 Content of the UWMP

This UWMP addresses all subjects required by Section 10631 of the Act as defined by Section 10630, which permits "levels of water management planning commensurate with the numbers of customers served and the volume of water supplied." All applicable sections of the Act are discussed in this UWMP, with chapters of the UWMP and DWR Guidebook Checklist cross-referenced against the corresponding provision of the Act in Table 1-2. Also, a completed copy of the 2010 Urban Water Management Plan Checklist organized by subject is included as Appendix J.

Table 1-2: Summary of UWMP Chapters and Corresponding Provisions of the California Water Code			
Chapter	**Corresponding Provisions of the Water Code**		**DWR Guidebook Checklist No.**
Chapter 1: Plan Preparation	10642	Public participation	55 and 56
	10643	Plan implementation	58
	10644	Plan filing	59
	10645	Public review availability	60
	10620 (a)–(e)	Coordination with other agencies; document preparation	4
	10621 (a)–(c)	City and county notification; due date; review	6 and 54
	10621 (c)	UWMP adoption	7 and 57
	10620 (f)	Resource optimization	5
Chapter 2: System Description	10631 (a)	Area, demographics, population, and climate	8-12
Chapter 3: Water Use	10608	Urban water use targets	1
	10631 (e), (k)	Water use, data sharing	25 and 34
	10631 (k)	Data to wholesaler	33
Chapter 4: Water Supply	10631 (b)–(d), (h), (k)	Water sources, reliability of supply, transfers and exchanges, supply projects, data sharing	13-21, 24, 30, 33
	10631 (i)	Desalination	31
	10633	Recycled water	44-51
Chapter 5: Water Quality	10634	Water quality impacts on reliability	52
Chapter 6: Water Supply Reliability	10631 (c) (1)	Water supply reliability and vulnerability to seasonal or climatic shortage	22
	10631 (c) (2)	Factors resulting in inconsistency of supply	23
	10635 (a)	Reliability during normal, dry, and multiple-dry years	53
Chapter 7: Conservation Program and Demand Management Measures	10631 (f)–(g), (j),10631.5, 10608.26 (a), 10608.36	Conservation Program, DMMs, and SBX7-7 water use reduction plan	2, 26-29, 32
Chapter 8: Water Shortage Contingency Plan	10632	Water shortage contingency plan	35-43

1.10 Resource Optimization

Section 10620(f) of the Act asks urban water suppliers to evaluate water management tools and options to maximize water resources and minimize the need for purchased water from other regions. GSWC understands the limited nature of water supply in California and is committed to optimizing its available water resources. This commitment is demonstrated through GSWC's use of water management tools throughout the company to promote the efficient use of water supplies from local sources, wherever feasible. Additionally, GSWC takes efforts to procure local reliable water supplies wherever feasible and cost effective. GSWC is a regular participant in regional water resources planning efforts, has developed internal company water resource plans and robust water conservation programs.

GSWC has implemented a robust water conservation program, deployed through each region of the company. In an effort to expand the breadth of offered programs, GSWC partners with wholesale suppliers, energy utilities, and other agencies that support water conservation programs.

Chapter 2: System Description

Chapter 2 summarizes the South San Gabriel System's service area and presents an analysis of available demographics, population growth projections, and climate data to provide the basis for estimating future water requirements.

The water system description requirements are detailed in the following section of the Act:

Section 10631

(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.

2.1 Area

The South San Gabriel System, located in Los Angeles County, serves half of the City of Rosemead, parts of City of San Gabriel, City of Monterey Park, and unincorporated area of Los Angeles County. The system is located in the westerly portion of the San Gabriel Valley and is divided by the San Bernardino Freeway. The service area is generally flat with some hills in the south part of the system. Figure 2-1 illustrates the service area of the South San Gabriel System. The service area is primarily characterized by residential and commercial areas.

2.2 Demographics

The City of Rosemead was chosen as demographically representative of the South San Gabriel System. According to 2000 U.S. Census Data, the median age of Rosemead's residents is 32.3 years. Rosemead has an average household size of 3.80 and a median household income of approximately $36,181 in 1999 dollars or $47,252 in 2010 dollars.

A General Plan or land use information is not available for the South San Gabriel System. Based on the San Gabriel System map and review of recent satellite imagery, it appears to be near build-out. There are only a few undeveloped individual parcels in the system and any growth occurring will likely be a combination of urban expansion, redevelopment, and in-fill. In a built-out or nearly built-out area, changes are typically minor and difficult to predict.

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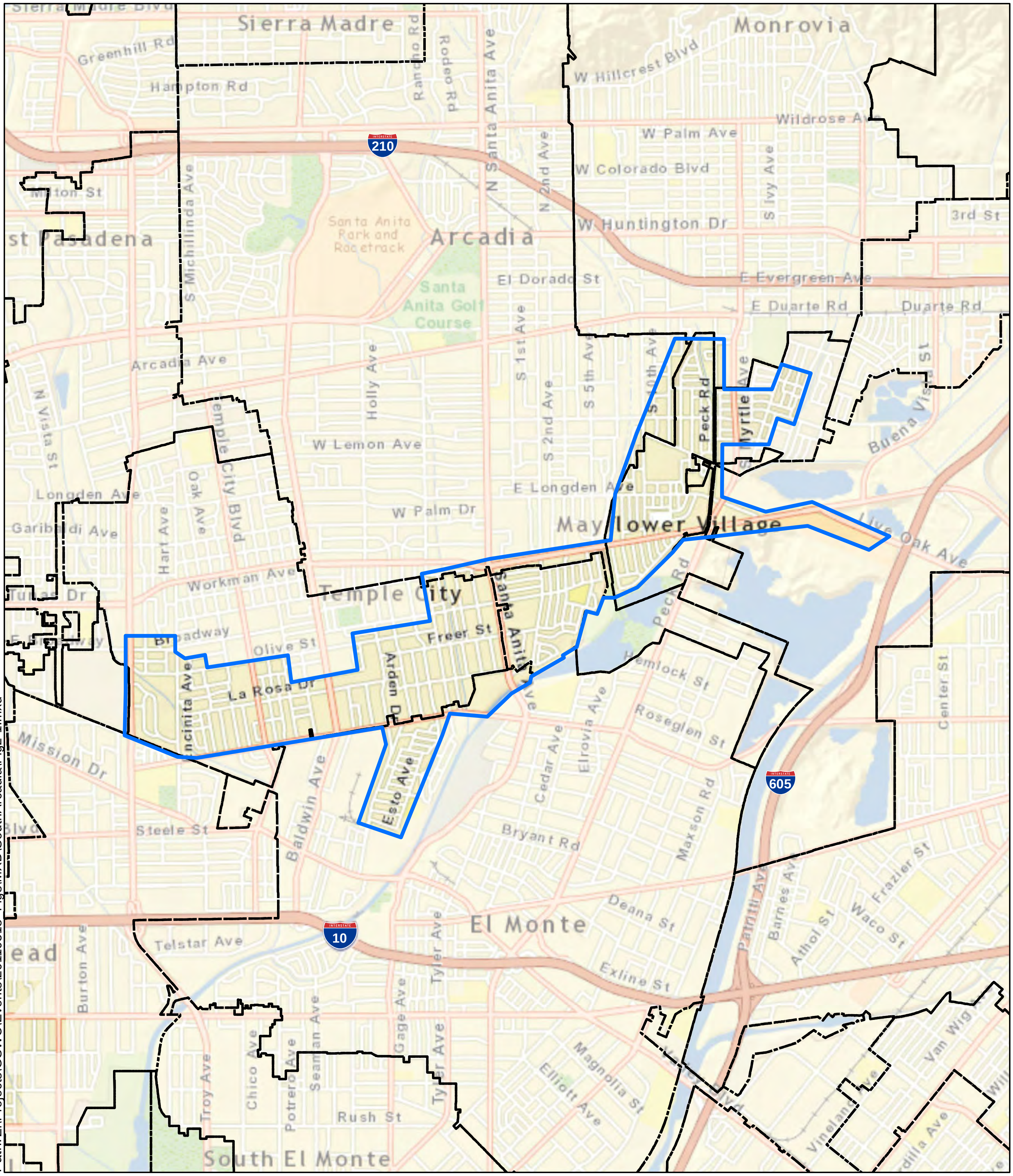

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Legend

- South Arcadia System Boundary
- City Boundary

N

0 2,500 5,000

Feet

Kennedy/Jenks Consultants

Golden State Water Company
2010 Urban Water Management Plan

South Arcadia System Service Area

K/J 1070001*00
August 2011

Figure 2-1

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2.3 Population, Housing and Employment

Population, housing, and employment projections were developed for the South San Gabriel System using the Southern California Association of Governments (SCAG) population, housing and employment data. SCAG last updated its projections for population, household, and employment growth through the year 2035 using the 2008 "Integrated Growth Forecasting" process used in the 2008 Regional Transportation Plan (2008 RTP). SCAG's methodology is described below, followed by the derivation of population projections for the South San Gabriel System. Previous and current projections utilize 2000 U.S. Census Data.

SCAG is currently in the process of developing its 2012 Regional Transportation Plan (2012 RTP) which will utilize a new population projection model based 2010 Census data. In certain cases, growth rates using these preliminary data are significantly reduced from the 2008 model. The population, household, and employment projections in this document use the adopted 2008 RTP data. Future UWMP updates will be able to utilize 2012 RTP projections as well as 2010 Census data.

2.3.1 SCAG Population Projection Development Methodology

Population, housing, and employment data are derived from the 2000 U.S. Census, which forms a baseline for local data projections. SCAG applies a statistical cohort-component model and the headship rate to the 2000 U.S. Census data for regional, county, and household demographic projections. To evaluate the South San Gabriel System, SCAG data was used in census tract form, the smallest geographic division of data that SCAG provides. SCAG projects subcounty and census tract demographic trends using the housing unit method.

The Integrated Growth Forecasting process uses a variety of estimates and projections from the federal and state governments. Sources include the U.S. Department of Labor, Internal Revenue Service (IRS), U.S. Citizenship and Immigration Services, U.S. Department of Health and Human Services, California Department of Finance (DOF), California Employment Development Department, and information received through the Intergovernmental Review process. A detailed explanation of the population projection process can be found in the adopted SCAG 2008 Regional Transportation Plan, Growth Forecast Report for SCAG.

2.3.2 Historical and Projected Population

SCAG-derived census-tract projections were used to determine historical and projected population from 1997 to 2035. The South San Gabriel System service area boundaries often contain multiple census tracts, many of which have boundaries that do not coincide exactly with service area boundaries. The population projection analysis consisted of superimposing service area boundaries over census tract boundaries, identifying the applicable overlapping census tracts, and developing a percentage estimate for each overlapping area. For a census tract 100 percent within the service area boundaries, it was assumed that 100 percent of the associated census tract population data was applicable to the South San Gabriel System. For areas where the overlap was not exact, the area of overlap as a percentage was applied to the data to develop an estimate of applicable population. Appendix G, Table G-1 lists the census tracts with a corresponding estimate of what percent of each tract lies within the South San Gabriel System. It was typically assumed that the various types of housing and employment within a census tract are distributed uniformly within all parts of that census tract, unless maps indicated non-uniform concentrations. In these cases, population estimates were either increased or decreased as applicable to match the existing land use. Appendix G, Table G-2 contains all of the SCAG's historic and projected demographic data for each census tract number from 2015 through 2035. Figure 2-2 details the census tracts within the South San Gabriel System.

Annual estimates of historical population between 1997 and 2010 required for SBX7-7 are provided in Table 2-1. The population estimates were developed following DWR Technical Methodology 2: Service Area Population. GSWC is considered a Category 2 water supplier because they maintain a Geographic Information System (GIS) of their service area. The per-connection methodology described in Appendix A of *Technical Methodology 2* was used since annual estimates of direct service area population from SCAG or other local government agencies were not available. This method estimates annual population by anchoring the ratio of year 2000 residential connections to the year 2000 U.S. Census population. This ratio was then linearly scaled to active residential connections data to estimate population for the non-census years in which water supply data were available: 1997 through 2010. The residential billing category includes traditional single-family residential connections; however since GSWC does not have a specific multi-family billing category that only encompasses apartment complexes and other types of multi-family housing units, the ratio of year 2000 U.S. Census total population per residential connections was used for projecting population growth.

Table 2-1: South San Gabriel System Historical Population

Year	Service Area Population
1997	27,589
1998	27,513
1999	27,646
2000	27,545 (1)
2001	27,785
2002	27,855
2003	27,899
2004	28,038
2005	28,140
2006	28,317
2007	28,443
2008	28,608
2009	28,633
2010	28,715

Note:
1. Population for year 2000 from 2005 UWMP.

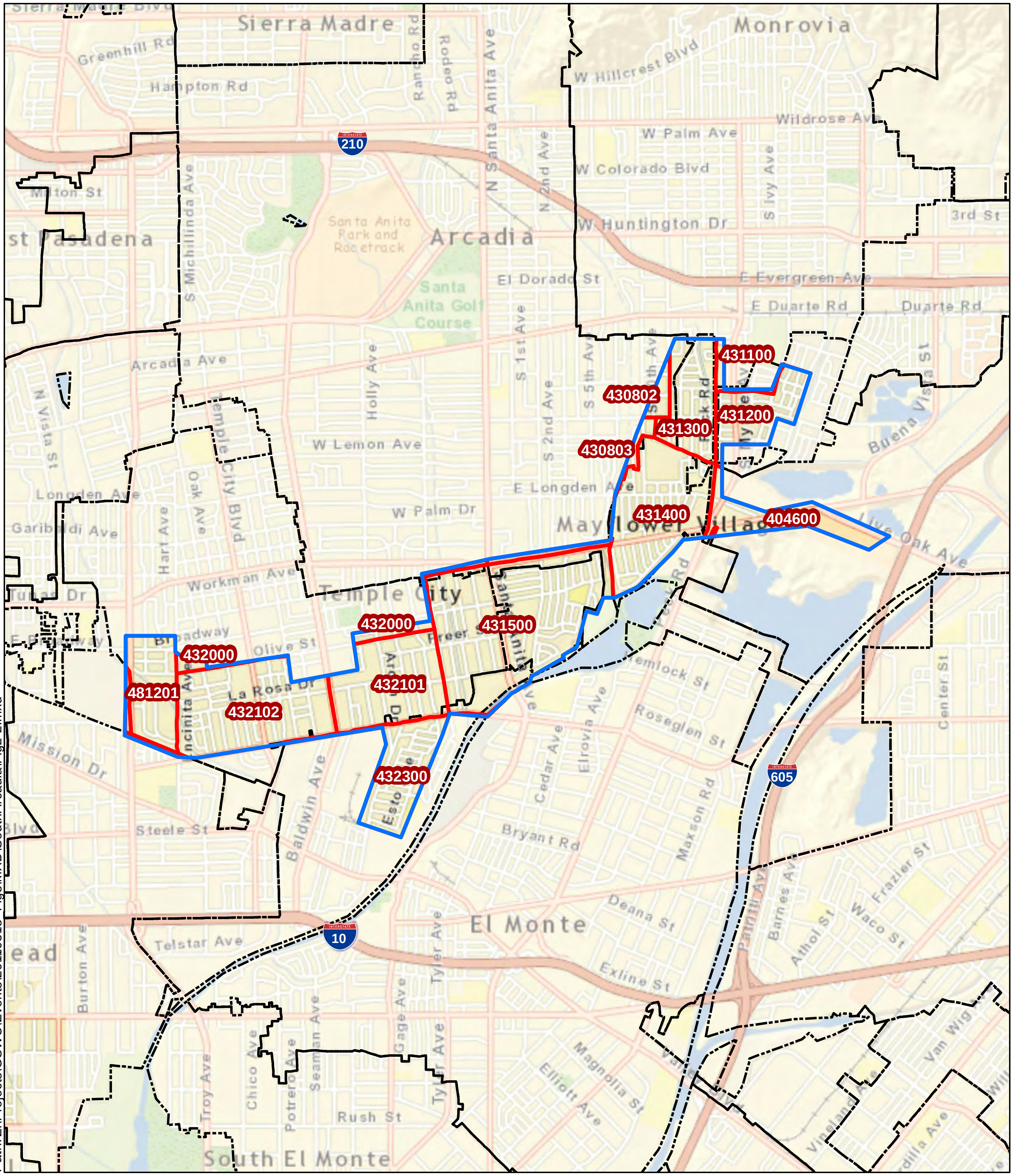

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Image Source: ESRI

Legend

- South Arcadia System Boundary
- Census Tract Boundary within Service Area
- City Boundary

N

0 2,500 5,000

Feet

Kennedy/Jenks Consultants

Golden State Water Company
2010 Urban Water Management Plan

South Arcadia System Service Area with Census Tract Boundary

K/J 1070001*00
August 2011

Figure 2-2

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As concluded from analysis of SCAG demographic data, the South San Gabriel System had an estimated population of 28,715 people in 2010 and is expected to reach 31,932 by 2035. A summary of historic and projected population, households, and employment within the South San Gabriel System (based on SCAG growth rate data) is presented in Table 2-2 and illustrated in Figure 2-3. To ensure consistency between the historical and projected population data required for this plan, projections for 2015 through 2035 were adjusted relative to the 2010 population benchmark using the appropriate SCAG percentage growth rates in each category. For this reason, SCAG projections after 2000 for the Census Tracts do not correlate precisely with the estimates included in this plan.

Table 2-2: South San Gabriel System Historical and Projected Population

Year	Service Area Population	Service Area Household	Service Area Employment	Data Source
2005	28,140	6,758	4,428	GSWC(3)
2010	28,715	6,945	4,610	GSWC(3)
2015	29,414	7,187	4,752	SCAG
2020	30,065	7,420	4,841	SCAG
2025	30,710	7,604	4,947	SCAG
2030	31,332	7,780	5,059	SCAG
2035	31,932	7,925	5,166	SCAG

Notes:

1. This table is based on the DWR Guidebook Table 2.
2. Dashed line represents division between historic and projected data.
3. Growth rates for population, household and employment are based on SCAG projections.

In summary, from 2005 to 2010 the South San Gabriel population increased 2 percent, which is a growth rate of approximately 0.5 percent per year. By 2035, population is expected to increase by a total of 11 percent, from 28,715 in 2010 to 31,932 in 2035, which is a 0.5 percent growth rate per year. The number of households is expected to grow 14 percent during the same period, which equates to an annual household growth rate of 0.6 percent. Employment is expected to grow 12 percent during the same period, which equates to an annual employment growth rate of 0.5 percent. Areas with the highest projected growth increases are also the areas that will see the largest increase in water use. SCAG's demographic analysis does not project any planned residential developments for future years. As discussed in demographic section, new development and redevelopment projects in the South San Gabriel System may contribute to future growth.

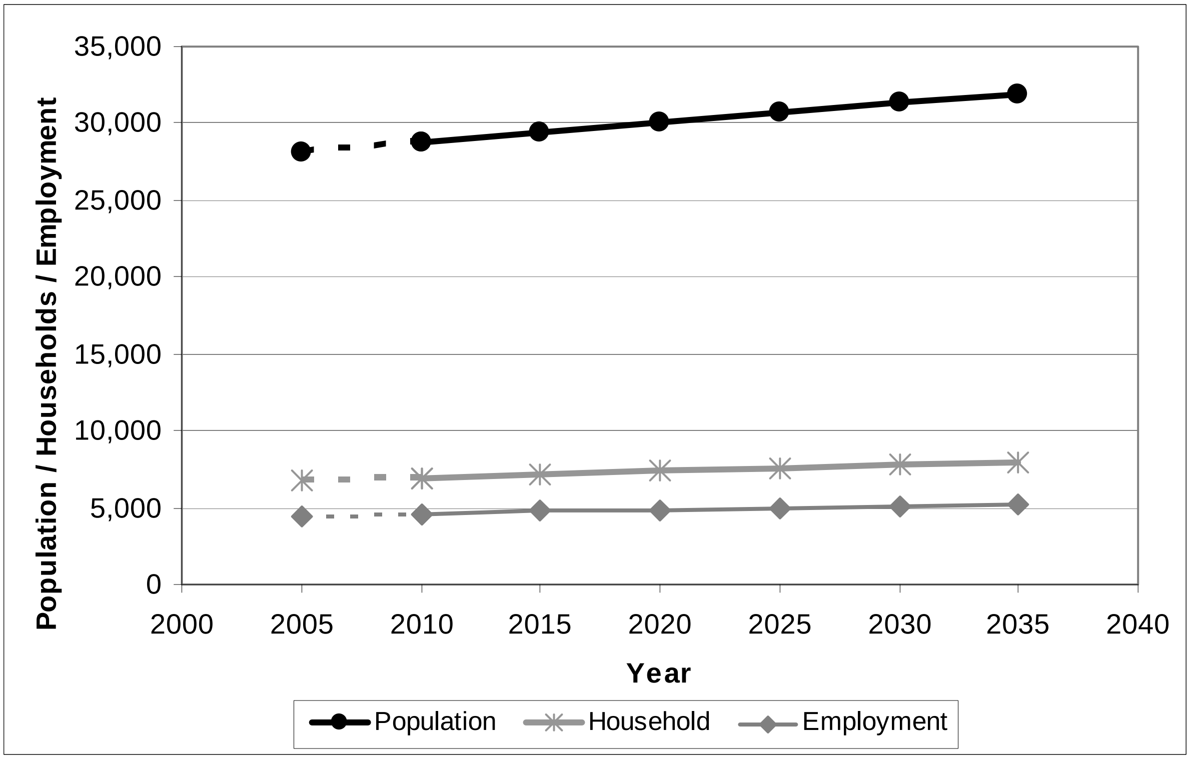

Figure 2-3: Historical and Projected Population, Household and Employment Growth within the South San Gabriel System

2.4 Climate

South San Gabriel System has cool, humid winters and warm, dry summers. Western Regional Climate Center (WRCC) has maintained 30-year historic climate data for selected cities throughout the West. The WRCC's website (www.wrcc.dri.edu) maintains climate records for the past 70 years for the San Gabriel Station. Table 2-3 presents the average climate summary based on the 70-year historical climate data for South San Gabriel System.

In the winter, the lowest average monthly temperature is approximately 42 degrees Fahrenheit. The highest average monthly temperature reaches approximately 90 degrees Fahrenheit in the summer. Figure 2-4 presents the monthly average precipitation based on 30-year historical data. The rainy season is typically from November to March. Monthly precipitation during the winter months ranges from 2 to 4 inches. Low humidity occurs in the summer months from May to October. The moderately hot and dry weather during the summer months typically results in moderately high water demand.

Similar to the WRCC in the South San Gabriel area, the California Irrigation Management Information System (CIMIS) website (http://www.cimis.water.ca.gov) tracks and maintains records of ETo for selected cities. ETo statistics used for this system come from the Monrovia station, which is the closest station (6 miles) to the South San Gabriel System. ETo is a standard measurement of environmental parameters that affect the water use of plants. ETo is given in inches per day, month, or year and is an estimate of the evapotranspiration from a large field of well-watered, cool-season grass that is 4- to 7-inches tall. The monthly average ETo is presented in inches in Table 2-3. As the table indicates, a greater quantity of water is evaporated during July and August in correlation to high temperatures and low humidity, which may result in high water demand.

Table 2-3: Monthly Average Climate Data Summary for South San Gabriel System

Month	Standard Monthly Average ETo[1] (inches)	Average Total Rainfall (inches)	Average Temperature (degrees Fahrenheit)	
			Max	Min
January	2.2	3.70	69.1	41.8
February	2.3	3.98	70.2	43.6
March	3.8	3.00	71.7	45.9
April	4.2	1.21	75.2	49.1
May	5.3	0.28	77.7	53.5
June	5.8	0.09	82.5	57.2
July	6.9	0.02	88.8	61.1
August	6.4	0.07	89.7	61.5
September	5.1	0.35	88.1	59.4
October	3.4	0.56	82.2	53.8
November	2.5	1.64	75.3	46.4
December	2.0	2.35	69.8	41.9

Note:
1. Evapotranspiration (ETo) from http://www.cimis.water.ca.gov/cimis/welcom.jsp.

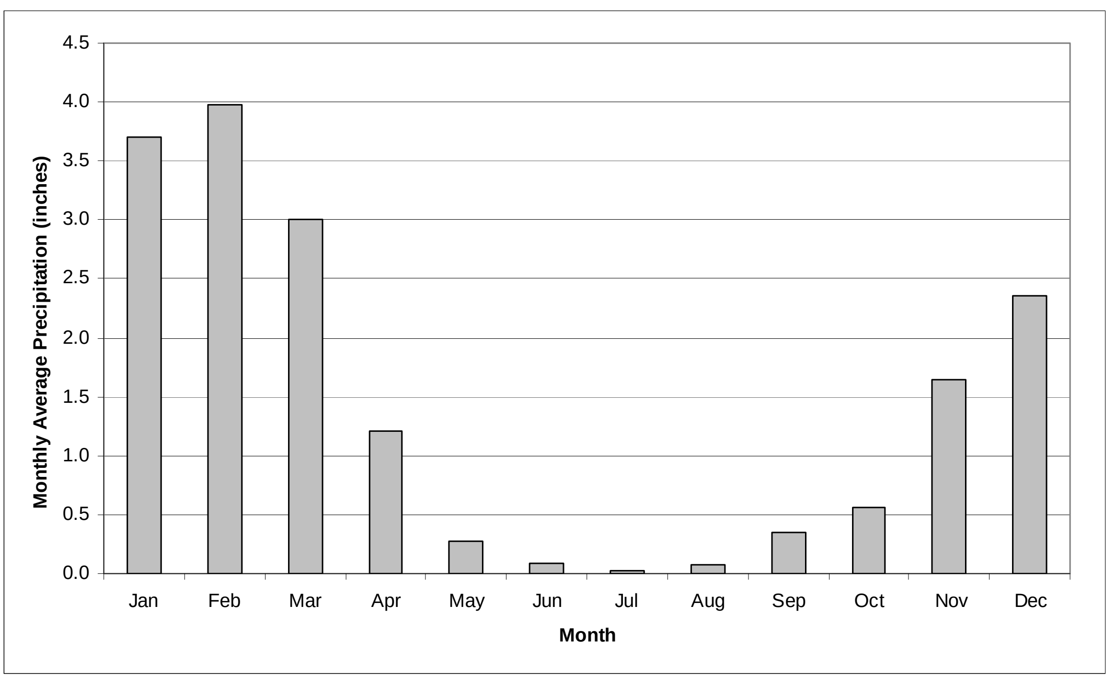

Figure 2-4: Monthly Average Precipitation in South San Gabriel System Based on 70-Year Historical Data

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Chapter 3: Water Use

Section 10631(e) of the Act requires that an evaluation of water use be performed for the South San Gabriel System. The Act states the following:

Section 10631.

(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).

In addition, Section 10631(k) directs urban water suppliers to provide existing and projected water-use information to wholesale agencies from which water deliveries are obtained. The Act states the following:

Section 10631.

(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).

In conjunction with projecting total water demand, each urban water retail supplier must develop urban water use targets and an interim urban water use target in accordance with SBX7-7. SBX7-7 amends the Act and requires statewide urban demand reduction of 20 percent by the year 2020. The bill sets specific methods for calculating both the baseline water usage and water use targets in gallons per capita day (gpcd).

Section 10608.20(e) states the following:

> *Section 10608.20.*
>
> *(e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.*

This chapter presents an analysis of water use data with the resulting projections for future water needs and water use targets in accordance with SBX7-7 for the South San Gabriel System.

3.1 Historical Water Use

Historical water use data from 1994 to 2010 were analyzed in order to provide an overview of historical water usage for the South San Gabriel System. Figure 3-1 shows the historical number of metered service connections and water use for the South San Gabriel System from 1994 through 2010.

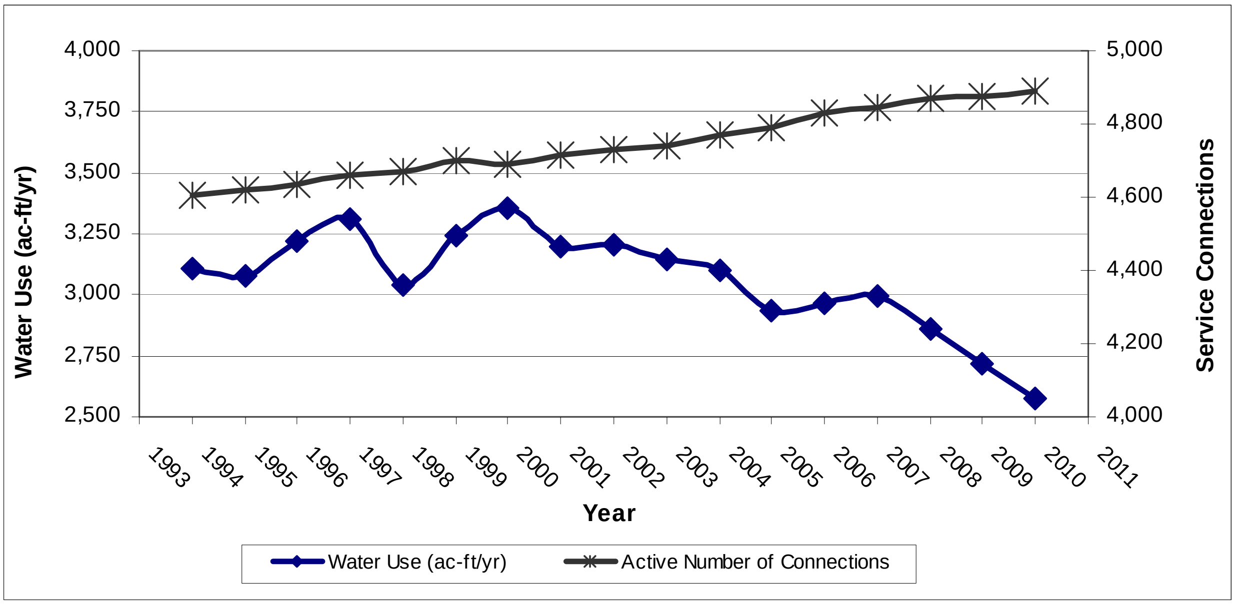

Figure 3-1: Historical Number of Metered Service Connections and Water Use

Figure 3-1 shows a decline in water use beginning in 2007 with an approximate 11 percent decline from 2008 to 2010. Review of similar data from other systems suggests the recent decline in water use has been widespread and is not isolated to the South San Gabriel System. The decline in water use is not yet fully understood, but may be a result of several factors including: several years of cool summers, a statewide drought that forced mandatory water reductions and conservation in many areas, and an economic downturn that has caused many businesses to close and increased housing vacancies.

The customer billing data for the system consists of annual water sales data. The water sales data was sorted by customer type using the assigned North American Industry Classification System (NAICS) codes. Then, the sorted water sales data were further grouped into the following seven categories: single-family, multi-family, industrial, commercial, institutional/government, landscape, and other. Table 3-1 shows the historical water use by customer type.

Table 3-1: Historical Water Use (ac-ft/yr) by Customer Type

YEAR	Commercial	Industrial	Institutional/ Government	Landscape	Multi-Family	Other	Single-Family	Total
1994	271	7	129	64	887	0	1,747	3,105
1995	305	4	96	72	927	0	1,673	3,077
1996	319	3	111	81	991	0	1,717	3,222
1997	353	5	140	86	1,007	0	1,722	3,313
1998	347	3	111	65	995	0	1,521	3,042
1999	422	2	158	114	1,058	0	1,489	3,243
2000	469	5	162	123	1,136	0	1,457	3,352
2001	451	5	162	94	1,097	4	1,387	3,200
2002	423	6	136	103	1,097	5	1,437	3,207
2003	491	6	125	74	1,062	6	1,382	3,146
2004	465	4	124	85	1,043	6	1,372	3,099
2005	429	3	114	90	978	6	1,315	2,935
2006	408	3	126	94	991	6	1,338	2,966
2007	403	4	124	87	986	5	1,385	2,994
2008	371	3	128	84	935	5	1,337	2,863
2009	368	2	105	90	887	4	1,262	2,718
2010	379	2	101	64	836	3	1,190	2,575

3.2 Water Use Targets

This section includes documentation of the water use targets commensurate with enactment of SBX7-7. The 2010 UWMP update is the first in which such targets have been required to be documented. The projected water use for each urban retail water supplier is required to be reduced by a total of up to 20 percent by the year 2020 from a calculated baseline gpcd as required by SBX7-7. The steps described throughout this section follow the guideline methodologies developed by DWR over the past year, as documented in Section D of the *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (DWR Guidebook) issued March 2011. The three overall steps to determine the 2020 water use target are as follows:

- Step 1 – Calculate the baseline per capita water use, using the required methodologies.
- Step 2 – Calculate the per capita reduction using at least one of the four methodologies (including the minimum reduction target – which is a provision included to ensure all agencies achieve a minimum level of water savings).
- Step 3 – Select the target reduction methodology and set interim (2015) and compliance (2020) water use targets. The chosen methodology is the responsibility of the water supplier and may be changed in 2015.

The Act now stipulates that the state shall review the progress made towards reaching the statewide water savings targets as reported in the 2015 UWMP updates. Currently, no single urban water supplier is required to conserve more than 20 percent, however there are provisions in the law that could require additional conservation after 2015 if it is found that the program is not on track to reach 20 percent statewide water savings by 2020.

3.2.1 Baseline Per Capita Water Use

The first step in the process of determining the water use target is calculation of the baseline per capita water use (baseline gpcd). In order to calculate the baseline gpcd, service area population within the South San Gabriel System was estimated and compared to actual water use records. The following three baseline gpcd calculations identified in SBX7-7 were evaluated for the South San Gabriel System:

- Baseline Method 1 – Average water use over a continuous 10-year period ending no earlier than December 31, 2004 and no later than December 31, 2010.
- Baseline Method 2 – For retailers with at least 10 percent of 2008 demand served by recycled water (either retail-or wholesale-provided), this calculation may be extended to include an additional 5 years ending no earlier than December 31, 2004 and no later than December 31, 2010.
- Baseline Method 3 – Estimate of average gross water use reported in gpcd and calculated over a continuous 5-year period ending no earlier than December 31, 2007 and no later than December 31, 2010.

The Baseline Methods 1 and 3 were evaluated using water supply data for the years ending December 31, 1997 through December 31, 2010. The base water use was calculated for each year commencing with 1997 as this was the first year with production data records available. The South San Gabriel system does not currently receive recycled water; therefore Baseline Method 2 is not applicable. Table 3-2 below presents the base period ranges, total water deliveries and the volume of recycled water delivered in 2008; these data are used to determine the number of years that can be included in the base period range. Also shown are the actual start and end years for the selected base period range.

Table 3-2: Base Period Ranges			
Base	**Parameter**	**Value**	**Units**
10-year base period	2008 total water deliveries	3,096	Ac-ft
	2008 total volume of delivered recycled water	0	Ac-ft
	2008 recycled water as a percent of total deliveries	0	Percent
	Number of years in base period	10	Years
	Year beginning base period range	1997	
	Year ending base period range	2006	
5-year base period	Number of years in base period	5	Years
	Year beginning base period range	2003	
	Year ending base period range	2007	

Note:
Table format based on DWR Guidebook Table 13.

The average annual daily per capita water use in gpcd from 1997 through 2010 is provided in Table 3-3. The gallons per day calculation includes potable water entering the distribution system.

Table 3-3: 1997-2010 Base Daily Use Calculation			
Calendar Year	**Distribution System Population**	**Gallons / Day**	**Daily per Capita Water Use, gpcd**
1997	27,589	3,299,623	120
1998	27,513	3,091,203	112
1999	27,646	3,173,668	115
2000	27,545	3,260,774	118
2001	27,785	3,113,270	112
2002	27,855	3,080,299	111
2003	27,899	3,021,992	108
2004	28,038	3,067,966	109
2005	28,140	2,864,906	102
2006	28,317	3,023,029	107
2007	28,443	2,863,002	101
2008	28,608	2,763,565	97
2009	28,633	2,575,696	90
2010	28,715	2,400,543	84

Note:
Table format based on DWR Guidebook Tables 14 and 15.

The 10-year averages are presented in Table 3-4; and the 5-year averages are shown in Table 3-5. The 1997-2006 10-year and 2003-2007 5-year average base daily usages of 111 and 105 gpcd, respectively, were selected.

Table 3-4: 10-Year Average Base Daily Per Capita Water Use

10-Year Period	Average Base Daily Per Capita Water Use (gpcd)
1997-2006	111
1998-2007	110
1999-2008	108
2000-2009	105
2001-2010	102

Table 3-5: 5-Year Average Base Daily Per Capita Water Use

5-Year Period	Average Base Daily Per Capita Water Use (gpcd)
2003-2007	105
2004-2008	103
2005-2009	99
2006-2010	96

3.2.2 Urban Water Use Targets

Retail suppliers must identify their urban water use targets by utilizing one of four compliance methods identified in SBX7-7. The four urban water use target development methods are as follows:

- Compliance Method 1 – 80 percent of baseline gpcd water use.
- Compliance Method 2 – The sum of the following performance standards: indoor residential use (provisional standard set at 55 gpcd); plus landscape use, including dedicated and residential meters or connections equivalent to the State Model Landscape Ordinance (70 percent of reference ETo; plus 10 percent reduction in baseline commercial, industrial institutional (CII) water use by 2020.
- Compliance Method 3 – 95 percent of the applicable state hydrologic region target as identified in the 2020 Conservation Plan (DWR, 2010).
- Compliance Method 4 – A provisional method identified and developed by DWR through a public process released February 16, 2011, which aims to achieve a cumulative statewide 20 percent reduction. This method assumes water savings will be obtained through metering

of unmetered water connections and achieving water conservation measures in three water use categories: (1) indoor residential, (2) landscape, water loss and other water uses and (3) CII.

GSWC elected to evaluate Compliance Methods 1 and 3 for selecting urban water use targets for the 2010 plan. The following section provides an explanation of the target calculations and a summary of the interim and compliance water use targets.

Compliance Method 1 Calculation Summary

The Compliance Method 1 2020 water use target was calculated by multiplying the base daily gpcd by 80 percent. A 20 percent reduction in baseline water use would require reduction of 22 gpcd by 2020, as shown in Table 3-6. The 2015 interim target would be 100 gpcd with a 2020 water use target of 89 gpcd.

Table 3-6: 2020 Water Use Target Method 1 Calculation Summary

Description	Baseline	2015 Interim Target	2020 Compliance Target
Per Capita Water Use (gpcd)	111	100	89
Percent Reduction	N/A	10%	20%

Compliance Method 3 Calculation Summary

The Compliance Method 3 2020 water use target was calculated by multiplying the respective hydrologic region target by 95 percent. The South San Gabriel System is located in the South Coast region (Region 4), which has a hydrologic region target of 149 gpcd and a baseline water use of 180 gpcd. Ninety-five (95) percent of the Region 4 hydrologic region target results in a 2020 water use target of 142. Since the baseline of 111 gpcd is lower than 95 percent of the hydrologic regional target of 142 gpcd, a review of the minimum reduction target was triggered per the DWR methodologies to ensure minimum water conservation targets are established for the South San Gabriel System. Table 3-7 presents the results of the Method 3 calculation:

Table 3-7: 2020 Water Use Target Method 3 Calculation Summary

Description	Baseline	2015 Interim Target	2020 Compliance Target
Per Capita Water Use (gpcd)	111	126	142
Percent Reduction	N/A	N/A	N/A

Minimum Compliance Reduction Target

Systems with a 5-year baseline per capita water use of greater than 100 gpcd must calculate a minimum water use reduction, which the 2020 water use target cannot exceed. The minimum water use reduction compliance target is 95 percent of the 5-year rolling average base daily per capita water use (ending no earlier than December 31, 2007, and no later than December 31, 2010). By this method, the minimum 2020 water use target for the South San Gabriel System is 100 gpcd as presented in Table 3-8 below:

Table 3-8: Minimum 2020 Reduction			
Description	**5-Yr Average**	**2015 Interim Target**	**2020 Compliance Target**
Minimum Allowable 2020 Target (gpcd)	105	103	100

3.2.3 Interim and Compliance Water Use Targets

The interim and compliance water use targets are provided per Section 10608.20(e) of the Act. Compliance Method 3 was selected by GSWC for the South San Gabriel System, which in turn triggered the minimum reduction target since the Method 3 hydrologic region target (142 gpcd) is greater than the Minimum 100 gpcd. As a result, Table 3-9 shows the 2020 SBX7-7 compliance target for the South San Gabriel System is 100 gpcd and the 2015 interim water use target is 103 gpcd. The implementation plan for achieving these targets is described in Section 4.8, Recycled Water and Chapter 7, Demand Management Measures.

Table 3-9: SBX7-7 Water Use Reduction Targets (gpcd)		
Baseline	**2015 Interim Target**	**2020 Compliance Target**
111	103	100

3.3 Projected Water Use

Growth projections for the number of service connections and volume of water use were calculated for the year 2015 through 2035, in 5-year increments. Future water demands were estimated using two different methods, a population-based approach and a historical-trend approach, in order to present a projection range reflecting the inherent uncertainty in growth trends. Additionally, demand projections are provided showing a scenario where the South San Gabriel System fully meets water use target reductions by 2020 for comparison to current per capita water use trends. Detailed descriptions of how the population-based and historical-trend projections were calculated are provided below.

The range established between these two approaches is intended as supplemental information; all connection and demand estimates use the population-based growth rate projections which are higher and provide a more conservative estimate of future water use. The historical-trend projections are provided as ancillary information only.

Figure 3-2 shows the historical and projected number of metered service connections for the South San Gabriel System from 1994 through 2035. Figure 3-3 shows the historical and projected water use for the South San Gabriel System from 1994 until 2035.

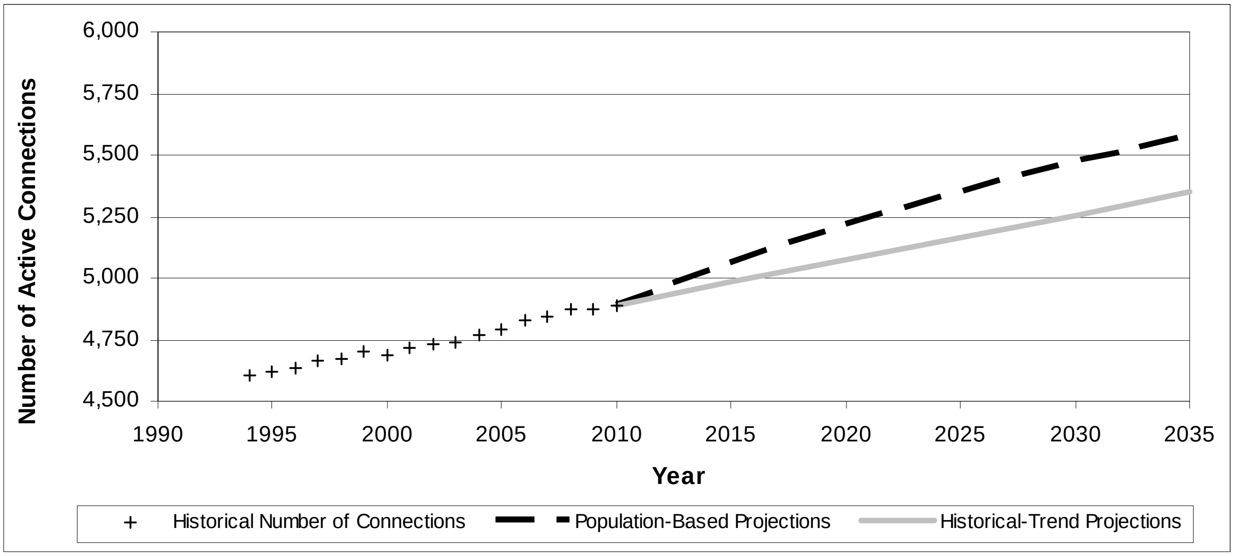

Figure 3-2: Historical and Projected Number of Metered Service Connections

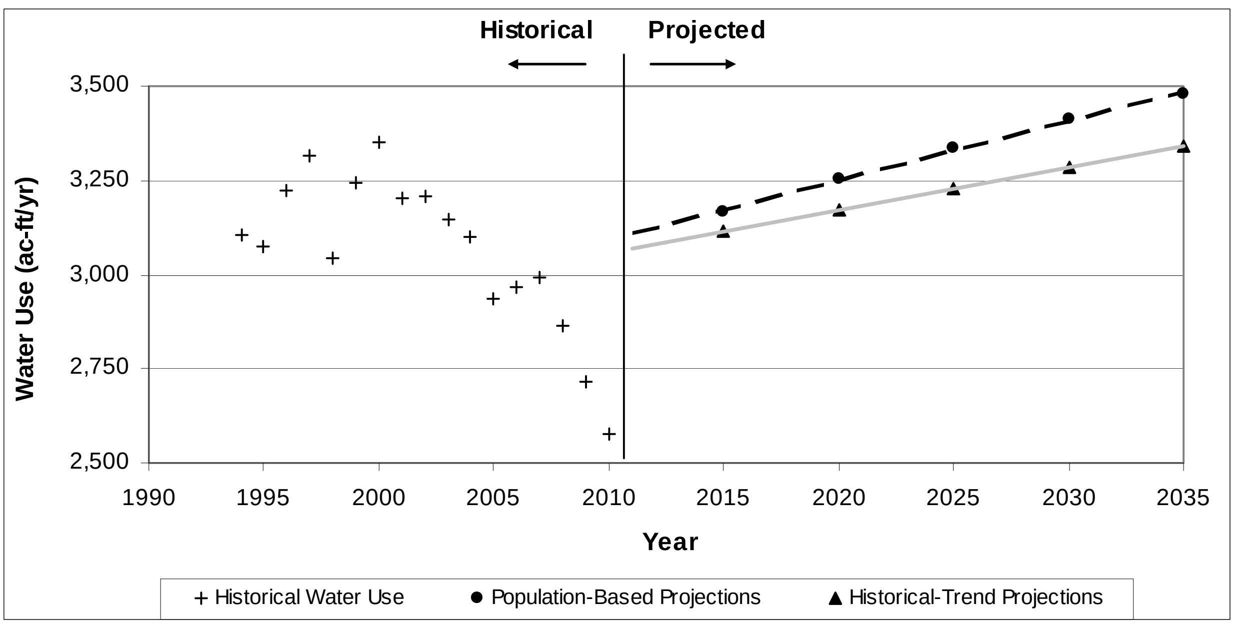

Figure 3-3: Historical Water Use and Future Water Use Projections

Historical water use records from 2000 through 2010 were analyzed to generate estimates of future water demands.

Water use factors were then developed for the projection of future water use. A water use factor was calculated for each category in order to quantify the average water used per metered connection. For a given customer type, the unit water use factor is calculated as the total water sales for the category divided by the number of active service connections for that category. The unit water use factors for each customer type were averaged over the data range from 2000 through 2010 in order to obtain a representative water use factor for determining water demand projections by customer type. Table 3-10 presents the water use factors calculated for each customer category.

Table 3-10: Water Use Factors for the South San Gabriel System

	Account Category						
	Single-Family	**Multi-family**	**Commercial**	**Industrial**	**Institutional/ Government**	**Landscape**	**Other(2)**
Water Use Factor(1)	0.40	0.95	1.96	0.61	1.72	2.31	1.34

Notes:
1. Based on customer water use data for calendar years 2000-2010.
2. Other accounts for any service connections not included in any other category, including idle or inactive connections.

The population-based water use projections are based on the population and housing growth rates described in Chapter 2. SCAG household projections were used to determine the growth in single-family and multi-family service connections for the years 2015, 2020, 2025, 2030, and 2035. For example, the percent growth rate in households from the year 2010 to year 2015 was multiplied by the number of residential service connections in 2000 to obtain a projection of the number of connections in the year 2015. Similarly, employment growth projections were used to determine the growth for commercial, industrial, institutional/government, and landscape service connections. The population-based projected water use was then calculated by multiplying the number of projected active service connections for each customer category by the corresponding customer average water use factor calculated above.

The historical-trend water use projections are based on a linear projection of the historical number of metered service connections. The average growth rate established by this historical trend was applied to the number of connections in each customer category to project the future number of service connections. The historical-trend projected water use was then calculated by multiplying the number of projected active service connections for each customer category with the corresponding customer average water use factor calculated above.

Figure 3-4 shows the population based water use projections by customer type. The population-based projections of the number of service connections, and the resulting water demand, are provided in Table 3-11.

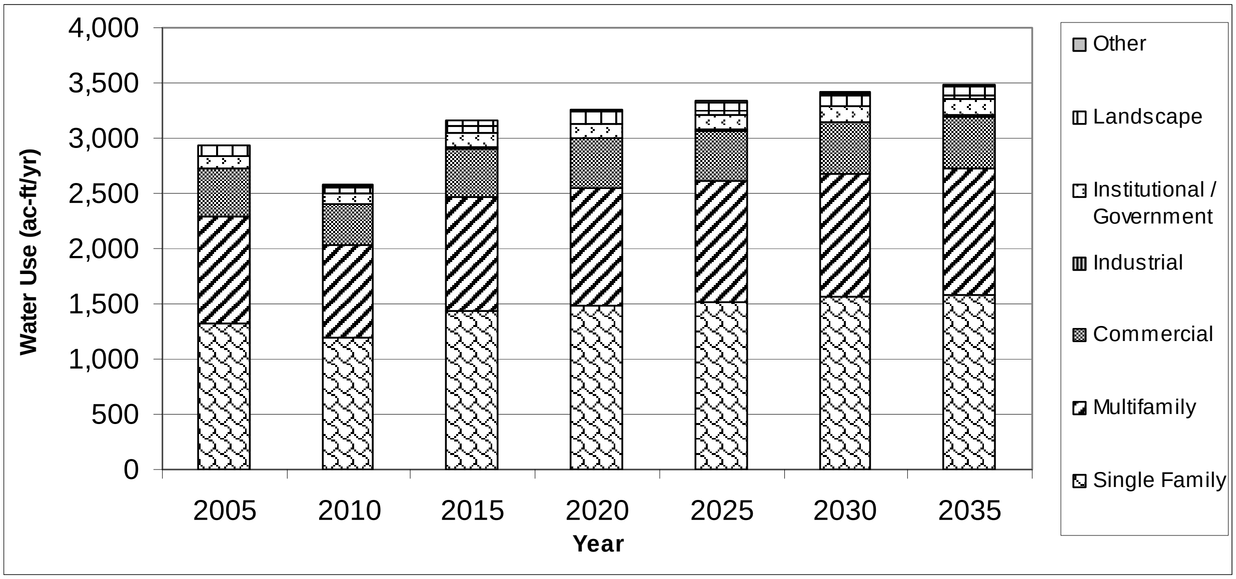

Figure 3-4: Projected Water Use by Customer Type

Table 3-11: Projections of the Number of Metered Service Connections and Water Use for the South San Gabriel System									
Year	Projection Type	Accounts by Type							
		Single-Family	Multi-family	Commercial	Industrial	Institutional/ Government	Landscape	Other[3]	Total
2005[2]	*No. of Accounts*	3,395	1,053	220	6	75	39	4	4,792
	Water Use (ac-ft)	1,315	978	429	3	114	90	6	2,935
2010	*No. of Accounts*	3,492	1,047	218	7	75	45	5	4,889
	Water Use (ac-ft)	1,190	836	379	2	101	64	3	2,575
2015	*No. of Accounts*	3,614	1,084	225	8	78	47	6	5,062
	Water Use (ac-ft)	1,438	1,030	440	5	134	109	8	3,164
2020	*No. of Accounts*	3,731	1,119	229	8	79	48	6	5,220
	Water Use (ac-ft)	1,485	1,063	448	5	136	111	8	3,256
2025	*No. of Accounts*	3,824	1,147	234	8	81	49	6	5,349
	Water Use (ac-ft)	1,522	1,090	458	5	139	113	8	3,335
2030	*No. of Accounts*	3,912	1,173	240	8	83	50	6	5,472
	Water Use (ac-ft)	1,556	1,115	470	5	142	116	8	3,412
2035	*No. of Accounts*	3,985	1,195	245	8	85	51	6	5,575
	Water Use (ac-ft)	1,586	1,136	479	5	146	118	8	3,478

Notes:

1. This table is based on the DWR Guidebook Tables 3 through 7.
2. Based on calendar year.
3. Other accounts for any service connections not included in any other category, including idle or inactive connections.
4. All connections are metered.

3.4 Sales to Other Agencies

There are no sales to other agencies for the South San Gabriel System; therefore, Table 3-12 has intentionally been left blank.

Table 3-12: Sales to Other Agencies in ac-ft/yr

Water Distributed	2005(2)	2010	2015	2020	2025	2030	2035
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Notes:
1. This table is based on the DWR Guidebook Table 9.
2. Based on calendar year.

3.5 Other Water Uses and System Losses

In order to estimate total water demand, other water uses, as well as any water lost during conveyance, must be added to the customer demand. California regulation requires water suppliers to quantify any additional water uses not included as a part of water use by customer type. There are no other water uses in addition to those already reported in the South San Gabriel System.

System losses must be incorporated when projecting total water demand. System losses (also known as non-revenue water) are defined as the difference between annual water production and annual sales. Included are system losses due to leaks, reservoir overflows, or inaccurate meters, and other water used in operations such as system flushing and filter backwashing GSWC does not tabulate system losses separately from other water uses; such as operations. In the South San Gabriel System, from 1997 through 2010, system water losses have averaged approximately 8 percent of the total production; therefore, this rate was incorporated into water demand projections. Table 3-13 provides a summary of projected system losses in the South San Gabriel System.

Table 3-13: Additional Water Uses and Losses in ac-ft/yr

Water-Use Type	2005(2)	2010	2015	2020	2025	2030	2035
Other Water Uses	N/A	N/A	N/A	N/A	N/A	N/A	N/A
Unaccounted-for System Losses(3)	274	114	246	253	260	266	271
Total	274	114	246	253	260	266	271

Notes:
1. This table is based on the DWR Guidebook Table 10.
2. Based on calendar year.
3. Includes system losses due to leaks, reservoir overflows, and inaccurate meters, as well as water used in operations.

3.6 Total Water Demand

As described above, other water uses, as well as any water lost during conveyance, must be added to the customer demand in order to project total water demand for the South San Gabriel System. Although there are no other water uses contributing to the total water demand in the South San Gabriel System, other water uses and system water losses must be incorporated into the total water demand. Table 3-14 summarizes the projections of water sales, other water uses and system losses, and total water demand through the year 2035.

The projected water sales and system losses were added to estimate the total baseline water demand shown in Table 3-14. The baseline demand projections below do not include water use reductions due to additional implementation of future DMMs or other conservation activities. Baseline demands are used for supply reliability evaluation purposes throughout this UWMP for estimates of water supplies that may be required to meet system demands for the next 25 years. Figure 3-5 shows the projected total water demand through 2035.

Projected water demands assuming SBX7-7 compliance are also provided in Table 3-14 for reference purposes; assuming full compliance with the SBX7-7 interim and 2020 water use reduction targets. SBX7-7 compliance water demands were calculated by multiplying the projected population by the applicable water use target. Future water use that is exempt from SBX7-7, such as industrial process water or direct reuse recycled water is not included in this projection.

Table 3-14: Projected Total Water Demand and SBX7-7 Compliance Projections in ac-ft/yr

				SBX7-7 Compliance Projections	
Year[2]	Projected Water Sales	Other Water Uses and System Losses	Total Baseline Water Demand	Water Savings	Total Water Demand with Savings
2005	2,935	274	3,209	0	n/a
2010	2,575	114	2,689	0	n/a
2015	3,164	246	3,410	17	3,394
2020	3,256	253	3,509	141	3,368
2025	3,335	260	3,595	155	3,440
2030	3,412	266	3,678	168	3,510
2035	3,478	271	3,748	172	3,577

Notes:
1. This table is based on the DWR Guidebook Table 11.
2. Based on calendar year.

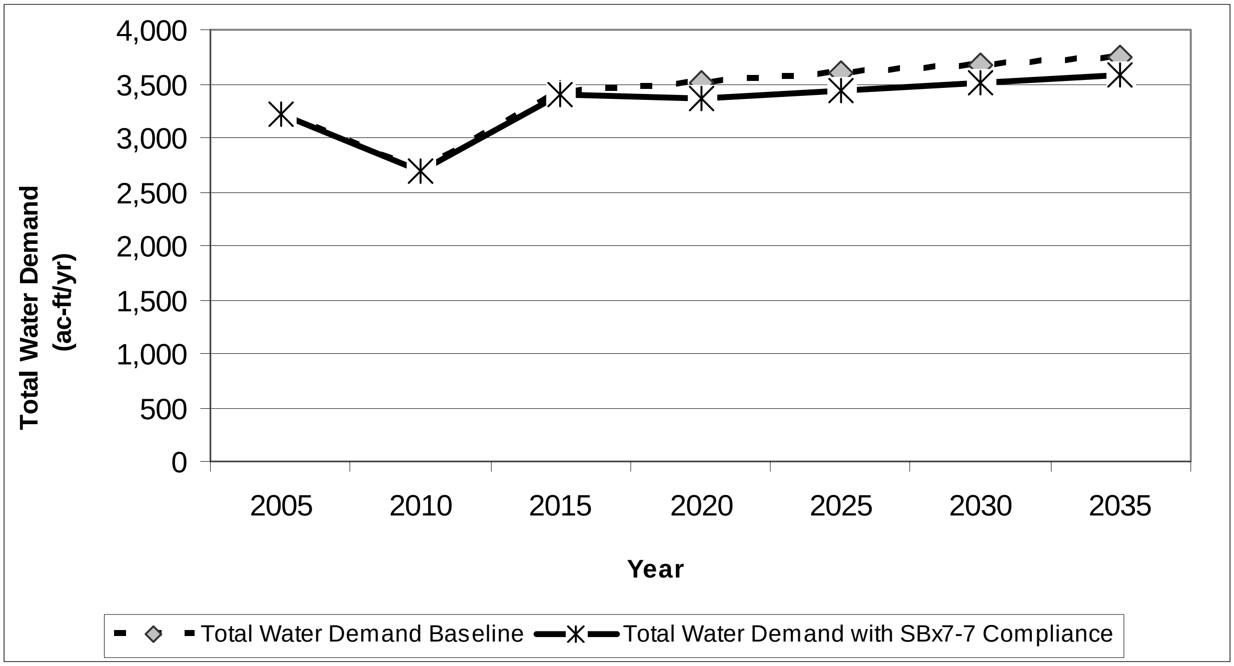

Figure 3-5: Total Water Demand

3.7 Data Provided to Wholesale Agency

GSWC provided the following projected water use data to the Upper San Gabriel Valley Municipal Water District (USGVMWD, Upper District), the wholesale water supplier for the South San Gabriel System, as summarized in Table 3-15. Since the preliminary projections were submitted in 2010, GSWC has refined projections by integrating actual 2010 water usage and supply data. As a result, the projections shown in Table 3-15 below do not agree with the demands presented in other chapters of this UWMP. As required per Section 10631(k) the supporting documentation providing the water use projections to the wholesale agency is included in Appendix I.

Table 3-15: Summary of South San Gabriel System Data Provided to USGVMWD in ac-ft/yr

Wholesaler	Contracted Volume	2010	2015	2020	2025	2030	2035
USGVMWD	N/A	2,896	3,200	3,500	3,745	3,969	4,044

Note:
This table is based on the DWR Guidebook Table 12.

3.8 Disadvantaged Community Water Use Projections

Section 10631.1 (a). Include projected water use for single-family and multi-family residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Senate Bill 1087 requires that water use projections of a UWMP include the projected water use for single-family and multi-family residential housing for lower income households as identified in the housing element of any city, county, or city and county in the service area of the supplier.

Housing elements rely on the Regional Housing Needs Allocation (RHNA) generated by the State Department of Housing and Community Development (HCD) to allocate the regional need for housing to the regional Council of Governments (COG) (or a HCD for cities and counties not covered by a COG) for incorporation into housing element updates. Before the housing element is due, the HCD determines the total regional housing need for the next planning period for each region in the state and allocates that need. The COGs then allocate to each local jurisdiction its "fair share" of the RHNA, broken down by income categories; very low, low, moderate, and above moderate, over the housing element's planning period.

The County of Los Angeles last updated its housing element in 2006. A lower income house is defined as 80 percent median income, adjusted for family size. The County's housing element identifies the target number of low-income households in the County from 2006 to 2013 as 15.7 percent and very low-income households as 24.7 percent. However, it is unknown what percentage of the low-income and very low-income households are within GSWC's South San Gabriel service area. For this reason, it is not possible to project water use for lower income households separately from overall residential demand. However, to remain consistent with the intent of the SB-1087 legislation and to comply with the UWMP Act, an effort has been made to identify those water use projections for future single and multi-family households based on the aggregate percentage of both the low-income and very low-income categories. 40 percent was used to estimate the lower income demand projections as shown in Table 3-16 below.

Table 3-16: Low-Income Projected Water Demands in ac-ft/yr

	2015	2020	2025	2030	2035
Single-Family Residence	101	119	134	148	160
Multi-Family Residence	78	92	102	112	121
Total	179	211	237	261	281

Note:
This table is based on the DWR Guidebook Table 8.

GSWC will not deny or conditionally approve water services, or reduce the amount of services applied for by a proposed development that includes housing units affordable to lower income households unless one of the following occurs:

- GSWC specifically finds that it does not have sufficient water supply.
- GSWC is subject to a compliance order issued by the State Department of Public Health that prohibits new water connections.
- The applicant has failed to agree to reasonable terms and conditions relating to the provision of services.

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Chapter 4: Water Supply

A detailed evaluation of water supply is required by the Act. Sections 10631 (b) through (d) and (h) of the Act state the following:

(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.

(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.

This chapter addresses the water supply sources of the South San Gabriel System. The following chapter provides details in response to those requirements of this portion of the Act.

4.1 Water Sources

GSWC obtains its water supply for the South San Gabriel System from two primary sources: imported water and GSWC-operated groundwater wells. Imported water is purchased from the Upper San Gabriel Valley Municipal Water District (USGVMWD), also called the Upper District. The Upper District obtains its imported water supply from the Metropolitan Water District of Southern California (Metropolitan).

As described in Section 4.3.1, below, the groundwater rights for the South Arcadia System and the South San Gabriel System are shared and are not preferential to either system. GSWC manages the allocation between the two systems. South Arcadia does not have any water supply from purchased sources, and therefore is 100 percent reliant upon groundwater supply from the Main San Gabriel Basin. If demands increase beyond the allocated OSY shared water right for the South Arcadia or South San Gabriel systems, GSWC can either find additional water rights or purchase replenishment water. Water rights may be obtained by purchasing or leasing existing rights from other producers in the basin. Groundwater pumping in excess of the OSY and any additional purchased or leased rights is permitted when replaced in kind with available replenishment water that is purchased from the Basin's responsible agency. The Upper District is the responsible agency for the portion of the Basin from which groundwater is pumped from the South Arcadia and South San Gabriel Systems.

Table 4-1, below, summarizes the approximate amount of water supplied by each source in acre-feet per year. The availability of water from each source is estimated through the year 2035, in accordance with GSWC's long-term water supply planning projections and those of its wholesale suppliers. GSWC's water supply is projected to increase by about 39 percent from 2010 to 2035 to meet the projected water demands, with most of this increased demand being met by imported water from the Upper District. Water demand projections are documented in Chapter 3.

Table 4-1: Current and Planned Water Supplies for the South San Gabriel System in ac-ft/yr

Source	2010	2015	2020	2025	2030	2035
Purchased water from USGVMWD	338	2,097	2,375	2,604	2,828	3,015
Groundwater(1)	2,352	1,313	1,134	991	850	733
Recycled water	0	0	0	0	0	0
Total	2,689	3,410	3,509	3,595	3,678	3,748

Notes:

1. Based on projected use in the Main San Gabriel Groundwater Basin. 2015-2035 groundwater projections assume a long-term average OSY of 190,000 ac-ft.
2. 2010 water supplies are based on actual production records.
3. Table format based on DWR Guidebook Table 16.

This water supply summary is based on GSWC's groundwater management strategy for the South San Gabriel and South Arcadia Systems, and data provided by the Upper District. In the future, GSWC expects to use its Main Basin groundwater rights to supply the South Arcadia System, and shift the South San Gabriel System to rely more heavily on the Upper District imported water supply.

There is no recycled water supply planned for this system. The potential for future recycled water use is described in Section 4.8. Details of the water supply are presented in the following section, while water supply reliability is discussed in Chapter 6.

4.2 Purchased Water

The Upper District is a member agency of the Metropolitan, providing treated water to several agencies, including GSWC. Additional details regarding Upper District's imported water supply can be found in the Upper District's 2010 UWMP. The South San Gabriel System has one connection through which it receives water from the Upper District, named the USG-1 connection, with a capacity of 3,375 gallons per minute (gpm).

In addition, the South San Gabriel System has an emergency connection with the City of Monterey Park, with a capacity of 1,500 gpm. Two reservoirs with a total volume of 0.52 million gallons serve as storage in the South San Gabriel System.

4.3 Groundwater

This section provides a brief description of the Main San Gabriel Groundwater Basin, including the groundwater supplies available to GSWC. More detailed information can be found in the references cited in these sections.

Groundwater supplying GSWC's South San Gabriel System is pumped from a total of three active groundwater wells in the Main San Gabriel Basin, which has a surface area of approximately 154,000 acres (241 square miles). These wells have a current total normal year active capacity of 4,356 ac-ft/yr. Between 1999 and 2010, the actual production averaged 2,836 ac-ft/yr.

The Main San Gabriel Basin is bounded by the Raymond fault and the contact between Quaternary sediments and consolidated basement rocks of the San Gabriel Mountains on the north, by the Repetto, Merced, and Puente Hills on the south and west, and by the Chino and San Jose faults on the east.

Water-bearing units in the Main San Gabriel Basin are recent alluvium and the San Pedro Formation. The alluvium consists of Pleistocene and Holocene deposits with a total thickness ranging from 40 feet to over 4,000 feet. The Holocene alluvium consists of alluvial fans and stream deposits approximately 100 feet in thickness (DWR, 2004). The Pleistocene alluvium is composed of unsorted, angular to sub-rounded sedimentary deposits ranging from gravels near the San Gabriel Mountains to sands and silts in the central and western parts of the basin. These Pleistocene alluvium deposits constitute the most of the productive water-bearing units in the basin (DWR, 2004). The Pleistocene alluvium varies in thickness from 40 feet in the north to 4,100 feet in the central portion of the basin (DWR, 2004). The San Pedro formation also bears fresh water and consists of interbedded marine sand, gravel, and silt. The maximum thickness of the San Pedro formation is approximate 2,000 feet (DWR, 2004)

Estimates of the hydraulic conductivities in the Basin range from 270 feet per day (ft/d) for gravel to 0.001 ft/d for clay (CH2M HILL, 1986). Sand and gravel units were estimated to have a hydraulic conductivity of 135 ft/d and sandy clay estimated at 10 ft/d (CH2M HILL, 1986). These values of hydraulic conductivities are an estimate based on aquifer test and boring log descriptions of the sediments.

Groundwater levels have historically fluctuated in the basin. Since 1993, the water levels for the Baldwin Park Key Well have varied about from an elevation high of 272 feet to a historic low in 2009 of 189.2 feet (Upper District, 2010). The Watermaster reported in 2010 that the groundwater levels in the Baldwin Park Key Well have been just above the lower value of the operating range of storage for the groundwater basin at 204.2 feet as of June 26, 2010. One foot of elevation change of the Key Well is roughly equal to a change in water storage of 8,000 ac-ft. The total storage capacity of the San Gabriel Basin is estimated to be about 8.6 million ac-ft (Main San Gabriel Basin Watermaster, 2011). The historic high groundwater elevation was measured in 1916 at 329.1 feet at which time the Main San Gabriel Basin storage was estimated at 8.7 million ac-ft. The historic low groundwater elevation was 189.2 feet in 2009 when the Main San Gabriel Basin storage was estimated at 7.6 million ac-ft.

4.3.1 Main San Gabriel Basin Adjudication

In 1973, the rights to use groundwater from the San Gabriel Valley Basin were adjudicated in the case *Upper San Gabriel Valley Municipal Water District vs. City of Alhambra, et al* (Superior Court, County of Los Angeles, Case No. 924128, Appendix F). During the adjudication process, the safe yield of the basin was studied to help assign prescriptive pumping rights. The total prescriptive pumping right for the Main San Gabriel Basin was established at 197,634 ac-ft. This prescriptive right was used during the adjudication to determine the baseline share of pumping rights for each water producer in the basin.

The Main San Gabriel Basin Watermaster regulates groundwater production within the basin. Each year the Watermaster determines the operating safe yield (OSY) for the basin, which may be larger or smaller than the total prescriptive right of 197,634. The Watermaster performs hydrologic balance calculations to assess the groundwater conditions in the Main San Gabriel Basin. The hydrologic assessments are based on an evaluation of groundwater levels in the Basin, determination of the previous year's recharge and extraction activities, estimates of the current year's recharges and extractions, water quality, historic and current rainfall data, and the availability of imported water. The OSY has historically fluctuated to account for wet or dry conditions in the basin and to accommodate the availability of imported water that may be needed to supplement local water supplies and recharge of the basin.

The OSY is the amount of water that can be pumped from the basin before the Watermaster imposes a "Replacement Water Assessment" to replenish the basin with imported water. Each water right holder is entitled to a set percentage of the OSY annually. Because the OSY is recalculated each fiscal year (FY), the actual amount of water GSWC has rights to pump without paying a replenishment assessment fee can fluctuate annually. Since the basin was adjudicated in 1973, the OSY has ranged from a low of 140,000 (FY 1991 – 1992) to a high of 240,000 ac-ft (FY's 2005 – 2007).

Water pumped in excess of the OSY is managed by Upper District, the applicable responsible agency, which is determined by geographic and political boundaries under terms of the Judgment. Upper District is responsible for ensuring that the basin is not overpumped in any given year, i.e. that total groundwater production equals OSY water rights plus replenishment water. Replenishment water must be available to allow pumping in excess of the OSY. For the past 2 years, replenishment water was not available when the producers over pumped in the basin. The responsible parties have implemented cyclic storage agreements to provide replenishment water supplies during periods of reduced imported water availability. Additional descriptions of groundwater supply reliability and cyclic storage are provided in Chapter 6.

GSWC has pumping rights to 2.92105 percent of the OSY for the Main San Gabriel Basin, which is shared between the South San Gabriel and South Arcadia Systems. GSWC's total pumping rights for these two Systems have varied from 4,089 ac-ft/yr to 6,718 ac-ft/yr as shown in Table 4-2. In May 2011, the Watermaster established an OSY of 210,000 ac-ft/yr for FY 2011-12, which means that GSWC's current pumping right is 6,134 ac-ft/yr. However, since the OSY is set annually by the Watermaster, it was conservatively assumed that the long-term average OSY will be equal to 190,000 ac-ft/yr, for a pumping right of 5,550 ac-ft/yr. This total could be augmented by purchasing or leasing water rights from other right-holders in the basin. Furthermore, the adjudication for the Main San Gabriel Basin permits producers to carry over water rights from previous years and to pump more than their share of the OSY, provided they pay a replenishment fee for all excess production. The historic low, high, and current operating safe yield for the Main San Gabriel Basin are shown in Table 4-2.

Table 4-2: Main San Gabriel Basin Groundwater Pumping Rights

Condition/Time Period	Operating Safe Yield (ac-ft/yr)	GSWC Pumping Rights(1) (ac-ft/yr)
Historic Low OSY (FY 1991 – 1992)	140,000	4,089
Historic High OSY (FY 2005 – 2007)	240,000	7,011
Current OSY (FY 2011 – 2012)	210,000	6,134

Notes:

1. GSWC pumping right is equal to 2.92105 percent of the OSY for the South Arcadia and South San Gabriel Systems.
2. OSY is reassessed on an annual basis.

GSWC's South San Gabriel System currently operates 3 active wells in the Main San Gabriel Groundwater Basin; they are listed in Table 4-3. Well production capacity is provided in terms of instantaneous capacity in gpm and annual yield in ac-ft/yr for the South San Gabriel System. The total normal year active well capacity for GSWC's South San Gabriel System is 2,700 gpm (4,356 ac-ft/yr).

Table 4-3: Well Name and Capacity

Well Name	Current Well Capacity (gpm)(1)	Current Well Capacity (ac-ft/yr)
Earle	0	0
Garvey No. 1	0	0
Garvey No. 2	0	0
San Gabriel No. 1	1,200	1,936
San Gabriel No. 2	0	0
Saxon No. 3	1,000	1,613
Saxon No. 4	500	807
Total Capacity	**2,700**	**4,356**

Note:

1. Estimated annual average current well production capacity is provided; actual and design instantaneous pumping capacity may be greater for each well.

Table 4-4 shows the groundwater pumping history for the South San Gabriel System for calendar years 2005 through 2010. The amount of water pumped from the Main San Gabriel Basin for the South San Gabriel System has varied through this 5 year period. From 2005 to 2010, groundwater represented between 68 and 92 percent of the total water supply for the South San Gabriel System.

Table 4-4: Groundwater Pumping History by South San Gabriel System (2005 to 2010) in ac-ft

Basin Name	Metered or Unmetered	2005	2006	2007	2008	2009	2010
Main San Gabriel	Metered	2,192	2,555	2,912	2,877	2,628	2,352
Percent of Total Water Supply		68%	74%	90%	92%	91%	87%

Notes:
1. Table format based on DWR Guidebook Table 18.
2. Years are reported in calendar years (January 1 – December 31).

The projected groundwater pumping volumes for the South San Gabriel System through 2035 are summarized in Table 4-5. If needed, the South San Gabriel System's share of the OSY could be augmented through the purchase or lease of pumping rights from other producers in the Main San Gabriel Basin. The adjudication for the Main San Gabriel Basin also permits a producer to pump more than its share of the OSY if replenishment water is available, and if the producer pays a replenishment fee for all production in excess of the allocated rights.

Table 4-5: Projected Groundwater Pumping Amounts by South San Gabriel System to 2035 in ac/ft

Basin Name	2010	2015	2020	2025	2030	2035
Main San Gabriel	2,352	1,313	1,134	991	850	733
Percent of Total Water Supply	87%	38%	32%	28%	23%	20%

Notes:
1. Table format based on DWR Guidebook Table 19.
2. Years are reported in calendar years (January 1 – December 31).

4.4 Transfers and Exchanges

GSWC has historically transferred groundwater rights for its holdings in the Main San Gabriel Basin between the San Dimas District and the San Gabriel District. Additionally, if GSWC's actual need for groundwater exceeds its share of the OSY, GSWC can lease available groundwater rights from other producers in the basin to increase their allowed pumping. GSWC has the ability to obtain leases for additional groundwater in the Main San Gabriel Basin annually, on an as-needed basis, following an evaluation of the economic benefits to their rate payers.

No specific transfer or exchange opportunities have been identified in the South San Gabriel System at this time; therefore, Table 4-6 has been left blank.

Table 4-6: Transfer and Exchange Opportunities

Source Transfer Agency	Transfer or Exchange	Short Term	Proposed Quantities	Long-Term	Proposed Quantities
GSWC	N/A	N/A	N/A	N/A	N/A

Note:
Table format based on DWR Guidebook Table 20.

4.5 Planned Water Supply Projects and Programs

GSWC, as a part of its normal maintenance and operations, will construct new wells, pipelines, and treatment systems as needed as a part of its ongoing Capital Investment Program to maintain its supply and meet distribution system requirements.

Additionally, GSWC participates with the Upper District in a variety of programs intended to enhance regional water supply. These projects include surface water treatment plant improvements, groundwater replenishment and recharge studies, recycled water, and groundwater cleanup. In addition, the Upper District is currently evaluating the expanded use of recycled water for groundwater recharge. See the Upper District's 2010 UWMP for details.

A potential long-term water supply transfer opportunity that GSWC is evaluating is the Cadiz Valley Water Conservation, Recovery and Storage Project (Cadiz Project). The project is designed to capture and conserve thousands of acre-feet of native groundwater currently being lost to evaporation through an aquifer system beneath Cadiz's property in eastern San Bernardino County, California. By implementing established groundwater management practices, the project will create a new, sustainable annual water supply for project participants. In addition, the project offers storage capacity that can be used by participants to carry-over – or "bank" – annual supplies, without the high rates of evaporative loss suffered by local surface reservoirs.

The Cadiz Project will produce up to 50,000 ac-ft/yr for fifty years. GSWC is one of five entities that have expressed an interest in receiving water from the project. In 2009, GSWC signed a letter of intent to purchase up to 5,000 ac-ft/yr and committed to paying a share of the cost of the project's environmental evaluation. GSWC continues to evaluate the economics and technical feasibility of this project. Table 4-7 shows the potential water supply that could be provided by the Cadiz Project.

Table 4-7: Future Water Supply Projects in ac-ft

Project Name	Normal Year	Single-Dry Year	Multiple-Dry Years		
			Year 1	Year 2	Year 3
Cadiz Project	5,000	5,000	5,000	5,000	5,000

Note:
This table is based on the DWR Guidebook Table 26.

4.6 Wholesale Agency Supply Data

Table 4-8 provides the Upper District's existing and planned water sources available to the South San Gabriel System during normal years. These supplies are expected to meet the projected imported water demands.

Table 4-8: Existing and Planned Wholesale Water Supplies in ac-ft/yr

Wholesaler Sources	Contracted Volume	2010	2015	2020	2025	2030	2035
USGVMWD		338	2,097	2,375	2,604	2,828	3,015

Note:
This table is based on DWR Guidebook Table 17.

Table 4-9 demonstrates the reliability of wholesale water supply available to meet annual water demand under an average, single-dry year condition for the South San Gabriel System. The table includes single-dry year and multiple-dry year supplies for 2035. The Upper District is assured by Metropolitan of 100 percent reliability to meet the water demand through 2035 (Metropolitan RUWMP, 2010).

Table 4-9: Reliability of Wholesale Supply for Year 2035 in ac-ft/yr

			Multiple-Dry Water Years		
Wholesaler	Average / Normal Water Year Supply	Single-Dry	Year 1	Year 2	Year 3
USGVMWD	3,015	3,015	3,015	3,015	3,015
Percent Normal		100	100	100	100

Note:
Table format based on DWR Guidebook Table 31.

Table 4-10 lists factors affecting wholesale supply for the South San Gabriel System. Metropolitan intends to provide 100 percent supply reliability to the Upper District, which in turn provides 100 percent reliability of supply to the South San Gabriel System.

Table 4-10: Factors Affecting Wholesale Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
USGVMWD	N/A	N/A	N/A	N/A

Note:
Table format based on DWR Guidebook Table 29.

4.7 Desalination

This section presents a discussion of opportunities to use desalinated water as a supplemental future water supply source for the South San Gabriel System. Section 10631(i) of the Act requires an evaluation of desalination opportunities within the South San Gabriel System. The Act states the following:

Section 10631

(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.

GSWC obtains the majority of its water supply for the South San Gabriel System from local groundwater which has not been impacted by salinity issues and does not require desalination. There are currently no opportunities for using desalinated water as a source of water supply for the South San Gabriel System by GSWC or the groundwater basin responsible agency, Upper District. Therefore, Table 4-11 has been intentionally left blank.

Upper District has concluded that due to the high quality (low TDS concentration) groundwater, Upper District and its member agencies do not need to investigate the use of desalination to develop or reestablish a new long-term supply (Upper District, 2011). Likewise, while it is currently economically impractical and infeasible for GSWC to participate in a desalination program that directly benefits the South San Gabriel System, GSWC would be open to considering partnering opportunities with other water suppliers in the region who may participate in a desalination project that would provide a direct or indirect benefit through mechanisms such as groundwater replenishment.

Table 4-11: Summary of Opportunities for Water Desalination

Source of Water	Yield (ac-ft/yr)	Start Date	Type of Use	Other
None	N/A	N/A	N/A	N/A

4.8 Recycled Water Plan

This chapter covers Section 10633 which details the requirements of the Recycled Water Plan that are included in the Act. The Act states the following:

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

(c) 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.

(d) 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.

(e) 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.

(f) 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.

4.8.1 Coordination

Table 4-12 summarizes the role of the agencies that participate in the development of recycled water plans that affect the South San Gabriel System of the Golden State Water Company (GSWC).

Table 4-12: Role of Participating Agencies in the Development of the Recycled Water Plan

Participating Agencies	Role in Plan Development
Water agencies	GSWC works closely with the Los Angeles County Sanitation District (LACSD) in planning a potential recycled water distribution system and identifying potential recycled water customers. The Upper San Gabriel Valley Municipal Water District acting as the recycled water wholesaler, would lead the way in implementing the recycled water plan and distribution network.
Wastewater agencies	The LACSD provides a reliable supply of recycled water that meets California recycled water quality standards set forth in Title 22 of the California Code of Regulations.
Groundwater agencies	Not applicable for this System.
Planning agencies	Los Angeles County Sanitation District plays a key role in conducting data and customer assessments, as well as analyzing community and economic impacts.

4.8.2 Wastewater Quantity, Quality, and Current Uses

Wastewater in the South San Gabriel System is collected by gravity sewers and lift stations owned by the cities of Rosemead, San Gabriel, and Monterey Park, as well as by the Sanitation Districts of Los Angeles County (LACSD). The wastewater is transported through trunk sewers to LACSD's San Jose Creek and Whittier Narrows Water Reclamation Plants (WRP).

The San Jose Creek WRP provides primary, secondary, and tertiary treatment for an average dry weather flow (DWF) of 100 million gallons of wastewater per day (mgd). The plant serves a largely residential population of approximately one million people. About 35 mgd of treated effluent from San Jose Creek WRP is reused at 17 different sites. The recycled water is primarily used for groundwater recharge and agricultural and landscape irrigation. The remaining effluent (65 mgd) is discharged into the San Gabriel River (LACSD 2011).

The Whittier Narrows WRP provides primary, secondary, and tertiary treatment for an average DWF of 15 mgd. The plant serves a population of approximately 150,000 people. According to the LACSD, nearly all of the treated effluent is reused as groundwater recharge into the Rio Hondo and San Gabriel Coastal Spreading Grounds or for irrigation at an adjacent nursery. Any remaining effluent is discharged into the San Gabriel River (LACSD 2011).

Because the Whittier Narrows and San Jose Creek WRPs treat wastewater for a larger population than exists in the South San Gabriel System, an estimated per capita wastewater generation factor was used to calculate the volume of wastewater generated by GSWC's customers in South San Gabriel. Based on the populations served and the average wastewater treatment rates for the San Jose Creek and Whittier Narrows WRPs as detailed above, the average per capita wastewater generation factor for both of these WRPs is 100 gallons per person per day. This factor was used to estimate existing and projected volumes of wastewater collected and treated in the South San Gabriel System as summarized in Table 4-13.

Because all of the effluent from Whittier Narrows and San Jose Creek WRPs is treated to meet Title 22 recycled water standards, 100 percent of the treated effluent is included in Table 4-13 as meeting such standards. However, out of the combined wastewater effluent (115 mgd) from these two treatment plants, 50 mgd (43 percent) of the treated water is actively reused throughout the region. Therefore, the assumption is that 43 percent of the treated wastewater that is collected in the South San Gabriel System is recycled while the remaining 57 percent is discharged into the unlined portions of the San Gabriel River. Although the majority of the water that is discharged into the San Gabriel River will contribute to groundwater recharge through the riverbed, LACSD does not consider this an active recycled water use. Table 4-14 lists the estimates of existing and projected volumes of treated effluent collected from the South San Gabriel System that will be discharged into the San Gabriel River.

Although much of the wastewater generated in the South San Gabriel System is recycled, all of the reuse sites are elsewhere in the LACSD system, and there are no existing uses of recycled water within the boundaries of the South San Gabriel service area. Therefore, Table 4-15 has intentionally been left blank.

Table 4-13: Estimates of Existing and Projected Wastewater Collection and Treatment in ac-ft/yr (mgd) for the South San Gabriel System

	2005(3)	2010(3)	2015	2020	2025	2030	2035
Projected population in service area(2)	28,140	28,715	29,414	30,065	30,710	31,332	31,932
Wastewater collected and treated in service area(4)	3,152 (2.81 mgd)	3,216 (2.87 mgd)	3,295 (2.94 mgd)	3,368 (3.01 mgd)	3,440 (3.07 mgd)	3,510 (3.13 mgd)	3,577 (3.19 mgd)
Quantity that meets recycled water standard	3,152 (2.81 mgd)	3,216 (2.87 mgd)	3,295 (2.94 mgd)	3,368 (3.01 mgd)	3,440 (3.07 mgd)	3,510 (3.13 mgd)	3,577 (3.19 mgd)

Notes:

1. This table is based on the DWR Guidebook Table 21.
2. For population projections see Section 2.3.
3. Based on calendar year.
4. Volumes of wastewater collected and treated are estimated based on the per capita generation factor. WW = population x 100 gal/day.

Table 4-14: Estimates of Existing and Projected Disposal of Non-Recycled Wastewater in ac-ft/yr (mgd) for the South San Gabriel System								
Method of Disposal	**Treatment Level**	**2005(2)**	**2010(2)**	**2015**	**2020**	**2025**	**2030**	**2035**
River Discharge	Tertiary	1,782 (1.59)	1,818 (1.62)	1,862 (1.66)	1,904 (1.70)	1,944 (1.74)	1,984 (1.77)	2,022 (1.80)

Notes:

1. This table is based on the DWR Guidebook Table 22.
2. Based on actual year.
3. Volumes of effluent discharged are estimated. For a description of the methodology, refer to the text.

Table 4-15: Existing Recycled Water Use in the South San Gabriel System		
Type of Use	**Treatment Level**	**2010 Use (ac-ft/yr)**
N/A	N/A	N/A

4.8.3 Potential and Projected Use

Although the wastewater generated in the South San Gabriel System is treated by the San Jose Creek and Whittier Narrows WRPs, the recycled water distribution networks from these two facilities do not extend to the South San Gabriel System. It is the responsibility of LACSD, as owner and operator of these facilities, to determine the feasibility of extending the recycled water distribution network to South San Gabriel. At this time, LACSD does not have plans to extend their distribution network.

In addition to LACSD, the Upper San Gabriel Municipal Water District (Upper District), a member agency of the Metropolitan Water District of Southern California, and a water provider for the GSWC, has developed a direct reuse project located in the vicinity of the South San Gabriel System. The Direct Reuse project will supply approximately 1,800 ac-ft/yr of recycled water to irrigation customers in the Whittier Narrows area in order to replace groundwater and imported potable water that historically has been used for irrigation at these customer locations. However, this project does not include GSWC customers within the South San Gabriel System.

Since no potential or projected recycled water use has been identified for the South San Gabriel System, Table 4-16 and Table 4-17 were intentionally left blank. In the 2005 UWMP for the South San Gabriel System there were no projections of recycled water by the year 2010, so Table 4-18 has also been left blank.

Table 4-16: Potential Future Recycled Water Uses in ac-ft/yr								
Type of Use	**Treatment Level**	**Description**	**Feasibility**	**2015**	**2020**	**2025**	**2030**	**2035**
N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A

Note:
This table is based on the DWR Guidebook Table 23.

Table 4-17: Projected Future Recycled Water Use in Service Area in ac-ft/yr					
Type of Use	**2015**	**2020**	**2025**	**2030**	**2035**
N/A	N/A	N/A	N/A	N/A	N/A

Table 4-18: Comparison of Recycled Water Uses—Year 2000 Projections versus 2005 Actual		
Type of Use	**2005 Projection for 2010**	**2010 Actual Use**
N/A	N/A	N/A

Note:
This table is based on the DWR Guidebook Table 24.

4.8.4 Optimization and Incentives for Recycled Water Use

If and when the LACSD and/or Upper District decide to extend the distribution of recycled water to South San Gabriel, where feasible, GSWC will support the projects by encouraging recycled water use among its customers. However, because no plans exist to provide recycled water to the South San Gabriel System, there are no actions in place at this time by which GSWC is encouraging the use of recycled water in this system. Therefore, Table 4-19 is not applicable for this system and has been intentionally left blank.

Table 4-19: Methods to Encourage Recycled Water Use and the Resulting Projected Use in ac-ft/yr					
Actions	**2015**	**2020**	**2025**	**2030**	**2035**
N/A	N/A	N/A	N/A	N/A	N/A

Note:
This table is based on the DWR Guidebook Table 25.

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Chapter 5: Water Quality

Section 10634 of the Act requires an analysis of water quality issues and their impact to supply reliability. The Act states as follows:

Section 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.

5.1 GSWC Measures for Water Quality Regulation Compliance

To facilitate full compliance with water quality laws and regulations, GSWC maintains an Environmental Quality Department that has independent lines of reporting authority within the organization. The Environmental Quality Department is headed by a company officer specifically assigned to oversee and manage the company's environmental and water quality programs. The Vice President of Environmental Quality has a staff of three managers, including two Water Quality Managers. The Water Quality Managers, in turn, manage a staff of Water Quality Engineers and Technicians that are assigned to district offices. Each district office is assigned one Water Quality Engineer and at least one Water Quality Technician to provide direct support to the local drinking water systems within the district.

The District Water Quality Engineer is the main point of contact for the California Department of Public Health (CDPH) as well as other regulatory agencies. The Water Quality Engineer also is responsible for coordinating compliance measures through scheduling required sample collection, preparing water quality related plans, maintaining a water quality database, providing training to operations, maintaining a cross connection control program, and preparing and submitting monitoring reports, permit applications and other regulatory related correspondence.

As a whole, the Environmental Quality Department monitors and participates in the implementation of new water quality related laws and regulations. Through routine department meetings and training, the District Water Quality Engineers are kept up to date with changing water quality regulations and related technology. These efforts contribute towards maintaining a pool of trained water quality professionals that can be utilized throughout the company. This provides the company the ability to respond to a wide variety of water quality issues or emergencies.

5.2 Water Quality Issues

The drinking water quality of the South San Gabriel System must comply with the Safe Drinking Water Act (SDWA), which is composed of primary and secondary drinking water standards regulated by the U.S. Environmental Protection Agency and CDPH. Water Quality sampling is performed at each well and within the distribution system to ensure compliance with the regulatory standards.

5.2.1 Surface Water Quality

Treated surface water purchased from the Upper San Gabriel Valley Municipal Water District (Upper District) enters the South San Gabriel System through a single inter-connection. Metropolitan and Upper District are responsible for meeting all drinking water standards as water leaves the surface water treatment plant and at all inter-connections with the South San Gabriel System.

5.2.2 Groundwater Quality Management

Significant groundwater contamination in the Main San Gabriel Basin has resulted from industrial solvents known as volatile organic compounds (VOCs) and agricultural practices which contribute nitrates to the groundwater. In an effort to create a coordinated response to the groundwater contamination issue and to minimize impacts to groundwater supply, Main Basin water agencies adopted a joint resolution in 1989. This resolution assigned the Main Basin Watermaster the responsibility of developing and maintaining a 5-Year Water Quality and Supply Plan, subject to review by the Los Angeles Regional Water Quality Control Board. The objective of the 5-Year Plan is to coordinate cleanup projects, and ensure that pumping does not lead to degradation of water quality in the Main Basin. The Upper District also maintains a basinwide groundwater quality management and remediation plan (Upper District, 2010). As a result of these coordinated efforts by the Main Basin Watermaster and Upper District, groundwater quality is carefully monitored and activities are regulated to ensure that the effect of contamination on producers, including GSWC, is minimized.

5.2.3 Groundwater Quality

Table 5-1 summarizes water quality issues and recommendations for wells within the water system. The groundwater wells in the South San Gabriel System meet all current California Title 22 drinking water standards before water is delivered to customers. The following discussion relates to contaminants with maximum contaminant levels (MCLs) that are either existing or have been proposed by the USEPA and/or CDPH.

Drinking water regulations pertaining to emerging contaminants of concern, such as chromium (VI), nitrosamines, and VOCs, and potential revisions to existing regulations are closely monitored by GSWC's Environmental Quality Department. The appropriate sampling and action will be taken on any affected water supply sources as monitoring requirements, new or revised MCLs are promulgated by the USEPA or CDPH. It is anticipated that it will take approximately 2 to 5 years from official adoption of a new or revised MCL to implement wellhead treatment or alternative approach for a source, including all steps from procuring CPUC funding approval to planning, permitting, design, and construction. There is typically adequate time allotted from regulatory approval to promulgation of a new drinking water standard to address localized treatment requirements; therefore no direct impacts to water supply reliability from future water quality regulations are anticipated at this time.

Portions of the groundwater basin are impacted by contaminants from improper waste disposal. The contaminants consist primarily of volatile organic compounds (VOCs) and perchlorate. The water system has been able to compensate for the loss of the contaminated wells and maintain its extractions from the basin by upgrading equipment at existing well sites, and making other system improvements.

The water system currently includes a total of seven wells, four of which have been taken off-line due to groundwater contamination. These wells and associated contaminants are:

- Earle Well – VOCs
- Garvey Wells No. 1 and No. 2 – VOCs
- San Gabriel Well No. 2 – VOCs, perchlorate and nitrate

Perchlorate. To date, perchlorate has impacted two wells, San Gabriel Wells Nos. 1 and 2. In 2010, perchlorate treatment was removed due to a sustained decline in perchlorate levels at San Gabriel Well No. 1. In addition, granular activated carbon treatment is being provided to remove VOCs. An expansion of the treatment process is underway to bring San Gabriel Well No. 2 on-line.

VOCs. Volatile organic compounds (VOCs) have impacted the five wells, including the San Gabriel No. 1 Well for which granular activated carbon treatment is being used. VOC monitoring and actions at the other wells include drilling replacement wells, well destruction, or installation of wellhead treatment systems.

Nitrate. Nitrate currently impacts San Gabriel Well No. 2. There is currently no treatment in place for nitrate, and the well has been taken offline.

1,4-Dioxane. Recently, 1,4-Dioxane has been detected in San Gabriel Well No. 1. The average concentration is below the Notification Limit of 1 µg/L. 1,4-Dioxane monitoring occurs on a more frequent basis.

Should additional treatment for the constituents listed above including perchlorate, VOCs, or 1,4 dioxane removal be required in the future, it is anticipated it would take approximately 2 to 5 years to implement a best available technology wellhead treatment system such as ion exchange, GAC, or advanced oxidation. Consideration will also be included for alternative water quality management strategies such as blending or supply replacement.

Radon. Radon has also been detected in many of the wells in the system. In 1999, the USEPA has proposed a radon MCL at 300 pCi/L, with an alternative standard of 4,000 pCi/L if the state has an approved Multimedia Mitigation program to reduce the indoor radon risk from soil and rocks underneath homes and buildings. While the proposed radon rule has not proceeded to promulgation, the effect of the proposed radon MCL would be widespread in groundwater wells throughout California.

Groundwater production from most of the active wells in this system will be impacted if the radon MCL is set at 300 pCi/L. Best available technologies for radon removal include Packed Tower Aeration (PTA) and Granular Activated Carbon (GAC). Due to some critical operation concerns with the use of GAC, PTA is the most common and effective method for radon removal. Installation of treatment facilities at some of the well sites in this system may be problematic due to lack of available space for treatment equipment. It is expected the state will develop an approved Multimedia Mitigation program thus allow the alternative MCL standard. If an MCL is promulgated, Multimedia mitigation would be recommended for these wells.

Table 5-1: Summary of Assessment					
Well	**Current Well Capacity (gpm)(1)**	**Status**	**Water Quality Issue/Concern**	**Existing Treatment**	**Recommendations**
Earle	0	Inactive	VOCs; Radon		Destroy
Garvey No. 1	0	Inactive	VOCs; Radon		Destroy
Garvey No. 2	0	Inactive	VOCs; Radon		Destroy
San Gabriel No. 1	1,200	Active	VOCs, Perchlorate & 1,4-Dioxane	GAC	Continue Treatment
San Gabriel No. 2	0	Inactive	VOCs perchlorate; nitrate, Radon		Provide Treatment; Future multimedia mitigation (radon)
Saxon No. 3	1,000	Active	Radon		Future Multimedia mitigation (radon)
Saxon No. 4	500	Active	Radon		Future Multimedia mitigation (radon)

Note:

1. Estimated annual average current well production capacity is provided; actual and design instantaneous pumping capacity may be greater for each well.

5.2.4 Distribution System Water Quality

Distribution system water quality monitoring is performed for several water quality parameters in the South San Gabriel System, including general physical parameters, presence of coliform bacteria, disinfectant and disinfection by-product levels. Corrosivity of the water is monitored by measuring lead and copper levels at customer water taps. The South San Gabriel System utilizes an approved Sample Siting Plan for the collection, recording, and reporting of all bacteriological analyses. All monitoring parameters and levels currently meet drinking water standards. The ability to continue to meet these standards is not expected to change in the foreseeable future. The South San Gabriel System has also established an aggressive cross-connection control program to reduce the hazard associated with backflow and back-siphonage. These programs are required to comply with DHS regulations on Waterworks Standards and Cross Connection Control. Drinking water standard levels for disinfection by-products will be lowered in the future in accordance with the Stage 2 D/DBP Rule. It is anticipated that the system will meet the new standard without treatment or operational changes.

5.3 Projected Water Quality Impacts

As the water system loses additional wells due to groundwater contamination (Table 5-2), evaluations will be made to determine replacement water supply, treatment options and/or drilling new wells in accordance with the requirements of the Upper District's groundwater quality management policies.

Table 5-2: Summary of Projected Water Supply Changes Due to Water Quality Issues

Water Source	Projected Change (ac-ft/yr)					
	2010	2015	2020	2025	2030	2035
Earle (to be destroyed)	(261)	0	0	0	0	0
Garvey No. 1 (to be destroyed)	(149)	0	0	0	0	0
Garvey No. 2 (to be destroyed)	(217)	0	0	0	0	0
San Gabriel No. 1	0	0	0	0	0	0
San Gabriel No. 2	0	0	0	0	0	0
Saxon No. 3	0	0	0	0	0	0
Saxon No. 4	0	0	0	0	0	0

Note:
Table format based on DWR Guidebook Table 30.

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Chapter 6: Water Supply Reliability

Sections 10631 and 10635 of the Act require that an assessment of water supply reliability for various climatic conditions be undertaken. The Act states:

Section 10631.

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

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

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

Section 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.

6.1 Reliability of Supply

The South San Gabriel System obtains its water supply from two sources: Metropolitan imported water obtained from the Upper District San Gabriel Valley Municipal Water District (Upper District), and groundwater from the Main San Gabriel Groundwater Basin. The majority of the imported water delivered from the Upper District to its sub-agencies is used for groundwater recharge (Upper District, 2011). Upper District is the agency identified in the Main Basin Judgment that is responsible for importing water into the basin for the South Arcadia and South San Gabriel Systems. The Upper District imports water from Metropolitan, therefore, conditions in local and distant areas can impact the reliability of supplies. In general, GSWC's supply is expected to be 100 percent reliable through 2035. This is a result of the projected reliability of the Upper District as a member of Metropolitan, both of which intend to provide 100 percent reliable imported water supplies. Groundwater reliability is based on GSWC's share of the projected Main San Gabriel Basin annual OSY and the numerous current and planned projects in the Main San Gabriel Basin designed to increase the reliability of the groundwater supply. The following is a summary of the basis of this reliability.

6.1.1 Metropolitan Supply Reliability

Metropolitan member agencies in the San Gabriel Valley, including Upper District, are largely pass-through entities that obtain nearly all their imported water from Metropolitan, directly or indirectly. Metropolitan's resource management plans are intended to optimize the use of its available resources during surpluses and shortages to minimize the probability of severe shortages and eliminate the possibility of extreme shortages and shortage allocations

This section presents a brief discussion of the source reliability of Metropolitan's primary water supply sources: imported water supply from the Colorado River and the State Water Project, and Metropolitan's plans to ensure a reliable water supply into the future. Metropolitan maintains a diverse portfolio of water sources including surface water supply, aquifer recharge and recovery, desalination, and recycled water. The two primary components of Metropolitan's water supplies are also the most variable:

- ***Colorado River Supply:*** Metropolitan owns and operates the Colorado River Aqueduct (CRA), which connects the Colorado River to the Metropolitan regional distribution system. The CRA has a capacity of 1.25 Million AFY (MAF) to transport Metropolitan's current contracted entitlement of 550 Thousand AFY (TAF) of Colorado River water. Metropolitan also holds a priority for an additional 662 TAF and 180 TAF when surplus flows are available.

- ***State Water Project (SWP) Supply:*** The original State Water Project Contract called for an ultimate delivery capacity of 4.2 MAF, with Metropolitan holding a contract for 1.9 MAF. Since that time there have been significant challenges to meeting those delivery goals. DWR released a Water Allocation Analysis in 2010 that has resulted in a Metropolitan estimated reduction in SWP supplies of 150 – 200 TAF for 2010 (Metropolitan Draft Regional UWMP, 2010).

As a result of the inherent uncertainty in Colorado River and SWP supplies given various hydrologic, environmental, and legal considerations, Metropolitan has undertaken several planning initiatives, summarized below, to broaden its water resources reliability. Metropolitan has documented that, consistent with Section 4202 of its Administrative Code, the agency is prepared to provide its member agencies with adequate supplies of water to meet expanding and increasing needs in the years ahead. When additional water resources are required to meet increasing needs, Metropolitan has stated that it will be prepared to deliver such supplies. In its 2010 Regional Urban Water Management Plan, Section II.4, Metropolitan also states that as a result of investments made in supply and storage, it has identified a resource management plan that should result in 100 percent reliability for non-discounted non-interruptible demands through 2035.

- **Integrated Resources Plan Updates (IRP):** Metropolitan's IRP updates completed in 1996 and updated in 2004 and 2010, included assessments of potential future regional demand projections based upon anticipated population and economic growth as well as conservation potential. The IRP also includes regional supply strategies and implementation plans to better manage resources, meet anticipated demand, and ensure overall system reliability. Metropolitan intends to implement the 2010 IRP to further support member agency local resource development as well as to investigate generating its own local resources for distribution to member agencies. The development of local resources, as well as the furthering of existing conservation goals to meet the Water Conservation Act of 2009 targets, is anticipated to provide a supply buffer for member agencies to rely upon in times of drought and long-term climatic changes.

- **1999 Water Surplus and Drought Management Plan (WSDM):** The WSDM provides the policy guidance to manage the region's water supplies to achieve the reliability goals of the IRP. This is achieved by integrating the operating activities of surplus and shortage supplies through a series of stages and principles.

- **2008 Water Supply Allocation Plan (WSAP):** The WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering the allocation. The need for the WSAP arose after the 2008 Bay-Delta biological opinions and rulings that limited SWP supplies to its contractors including Metropolitan. The WSAP formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies up to 50 percent.

  Since the 2008 Bay-Delta reductions, Metropolitan has been using the WSAP formulas to contend with the reduction in available imported supplies implementing a Stage 2 (Regional 10 percent reduction in supply allocation) of the WSAP from July 2009 to April 2011. During such allocations, Metropolitan institutes severe financial penalties should an entity request supply over their reduced allocation. This in effect, limits supply at the retail level. Although it is anticipated that the WSAP will continue to be in effect in the near–term, Metropolitan states in its 2010 Draft UWMP that there will be sufficient supply to meet member agency demands in single and multiple-dry years from 2015 through 2035. However, this is assuming that Metropolitan storage levels are at or above average levels prior to those cycles, and key programs come to fruition as assumed by Metropolitan in their projections. For example, Metropolitan assumes that a Delta conveyance solution will be in place by 2022. Also, Metropolitan has indicated that there is a 50 percent probability that storage levels will be lower than the assumption used. Based on the recent WSAP allocations and regulatory restrictions in the Delta. GSWC's conservative assumption is that Metropolitan's projections in their 2010 Draft UWMP may not be 100 percent reliable in all cases.

6.1.2 The Upper District's Water Supply Reliability

In addition to Metropolitan's reliability initiatives, the Upper District and GSWC participate in a variety of programs intended to enhance the reliability of regional water supply. These projects include surface water treatment plant improvements, percolation studies, recycled water, and groundwater cleanup. In addition, the Upper District is currently evaluating the expanded use of recycled water for groundwater recharge. See the Upper District's 2010 UWMP for details.

6.1.3 South San Gabriel System's Water Supply Reliability

Supply reliability for the South San Gabriel System depends upon the reliability of imported water and local groundwater pumping, as discussed above.

Under the Main San Gabriel Basin Judgment, the Watermaster is responsible for managing withdrawals from the Basin by monitoring groundwater levels at the Baldwin Park Key Well. The Judgment states that the Watermaster shall not spread replenishment water when the groundwater level at the Key Well exceeds 250 feet above mean sea level (msl). The Judgment also states that the Watermaster shall spread replacement water necessary to maintain the water level elevation above 200 feet msl. During the period of management under the Judgment, significant drought events have occurred from 1969 to 1977, 1983 to 1991, and 1998 to 2004. In each drought cycle the Main San Gabriel Basin was managed to maintain groundwater levels. Based on historic management practices, all pumpers from the Main San Gabriel Basin will have adequate supply over the next 25 years under single year and multiple year drought periods (Upper District, 2011). The Upper District's UWMP provides basin-wide details about the reliability of the Main San Gabriel Basin.

GSWC and other water producers participate with the responsible agency, Upper District, to ensure that the OSY is available to the pumpers in the Main San Gabriel Basin. The Upper District has a cyclic storage agreement with Metropolitan and the Main Basin Watermaster. Cyclic storage accounts have been used to increase storage in the basin since 1975. Metropolitan pre-delivers replenishment water to the Basin and later sells the stored water to the water districts at a reduced rate. Metropolitan can store up to 100,000 ac-ft of water for the Upper District. Currently, Metropolitan has 22,633 ac-ft of water in storage for Upper District (Main San Gabriel Basin Watermaster 2010).

The Main San Gabriel Groundwater Basin's pumping and reliability is subject to the OSY established each fiscal year by the Watermaster and the availability of replenishment water. Long-term cyclic storage provides a mechanism that allows the responsible agency to establish a buffer during droughts and periods of reduced OSY by allowing for storage recharge waters during times of available import supplies. Recharge in the basin occurs from percolation of precipitation, return flow of applied water, some septic system discharges, and stream flow. Recharge through streams and spreading basins is generated from runoff from surrounding mountains and imported water from the State Water Project and the Colorado River.

There are also pending amendments to the Judgment that would enhance groundwater reliability in the basin. The Watermaster has determined that its 1973 Judgment may require changes to reflect the current conditions and allow the Watermaster more flexibility in securing necessary supplemental supplies. The Watermaster expects proposed changes to be finalized and submitted to the Los Angeles Superior Court for approval after FY 2010-11 (Watermaster 2010). Some of the key proposed changes that would enhance basin groundwater reliability and reduce vulnerability to droughts and uncertain imported supplies include:

- Storage and export –allow for outside water to be stored and exported by agreement with Watermaster;
- Recycled water –remove the limit on recycled water that can be recharged in 1 year;
- Key Well –eliminate the 250-foot upper limit at the Key Well for spreading imported water;
- Assessments –provide a means for the Watermaster to levy assessments to support endeavors such as pre-purchasing Replacement Water, development of new supplemental water resources (such as the recycled water recharge project), and to buy supplemental water that may become available unexpectedly or on short notice.

In part, the Main Basin reliability may also be increased through the groundwater management and replenishment efforts of the other responsible agencies in the basin. For example, the Upper San Gabriel Municipal Water District will supply approximately 15,000 ac-ft/yr of recycled water to irrigation customers through the San Gabriel Valley Water Recycling Direct Reuse Project. This project will optimize the availability of Metropolitan's imported water supply, enhancing the reliability of regional water supplies. This project replaces untreated imported water used for groundwater replenishment and irrigation. There are four phases to this project, two of which have been completed in 2007. The remaining two phases include the following:

Phase IIA-Rosemead Extension expands Phase IIA-Whittier Narrows Project to provide recycled water in the near future to the Whittier Narrows Golf Course, several schools, parks and industrial complexes. The project began construction in September 2009 and is projected to be completed by summer of 2011. Pipeline construction is complete and retrofits are being designed. The facilities for Phase IIA-Rosemead Extension include an approximate 2.5-mile long pipeline. An approximate demand of 720 acre-feet per year of high-quality water is anticipated to be supplied from the Whittier Narrows Water Reclamation Plant. The 720 acre-feet will be available during an average year, single-dry year and multiple-dry years.

Phase IIB Industry Project is separated into packages. Phase IIB includes the construction of new joint and local conveyance, storage, and distribution facilities, providing improved and extended recycled water service to potential customers in the Cities of West Covina and Walnut. Construction began in 2010 and is projected to be constructed by summer 2013. Phase IIB will supply approximately 1,600 acre-feet per year of recycled water to several landfills, parks, schools, open areas and commercial establishments from the San Jose Creek and Whittier Narrows Water Reclamation Plants. The 1,600 acre-feet will be available during an average year, single-dry year and multiple-dry years.

Table 6-1 presents 2035 water supply projections for imported and groundwater sources during a normal year, a single-dry year, and multiple-dry years for the South San Gabriel System. The normal-year supply represents the expected supply under average hydrologic conditions, the dry-year supply represents the expected supply under the single driest hydrologic year, and the multiple-dry year supply represents the expected supply during a period of three consecutive dry years.

As described above, Metropolitan, which is the source of water to the Upper District, has indicated that it will maintain 100 percent reliability through 2035. GSWC bases its reliability projections for purchased supply beyond 2025 on Metropolitan's projections. The purchased water supply projections for a normal water year, single-dry year, and multiple-dry years are taken as the 2035 projection, which is equivalent to the imported water demand projected for 2035. It is assumed that the single-dry year and multiple-dry year supplies are the same as those for the normal years because the Upper District has stated that it will meet projected demands under all anticipated hydrologic conditions.

Table 6-1: Supply Reliability for the South San Gabriel System for Year 2035 in ac-ft/yr

Source	Normal Water Year	Single-Dry Water Year	Multiple-Dry Water Years		
			Year 1	Year 2	Year 3
Purchased water from USGVMWD	3,015	3,015	3,015	3,015	3,015
Groundwater	733	733	733	733	733
Total	3,748	3,748	3,748	3,748	3,748
Percent of Normal		100%	100%	100%	100%

Note:
Table format based on DWR Guidebook Table 28.

The San Gabriel Basin Watermaster adjusts the OSY annually to account for fluctuations in groundwater availability in the Main San Gabriel Groundwater Basin. The Upper District's 2010 UWMP states that all pumpers, including GSWC, will have adequate supply to meet their demands during normal year, single-dry year, and multiple-dry year periods (Upper District, 2010). Replenishment water is used to replace the water pumped beyond a producer's share of the OSY and to maintain groundwater levels in the Key Well above 200 feet msl. The replenishment water for the Main San Gabriel Basin will be supplied from imported water through the Upper District and Metropolitan. Metropolitan has provided its member agencies with a reliability analysis for imported water supplies, which indicates Metropolitan's plan to provide 100 percent reliability through 2035 (Metropolitan, 2010). Upper District has provided projections of up to 25,000 ac-ft/yr of untreated imported water and recycled water to be used for basin replenishment through Fiscal Year 2030-31 (Upper District, 2011).

The South San Gabriel System has pumped between 2,192 ac-ft/yr and 2,912 ac-ft/yr for the past 5 years. It is projected the South San Gabriel System will decrease pumping rates annually, pumping only 733 ac-ft/yr in 2035.

Table 6-2 lists single-dry year and multiple-dry year periods for groundwater supplies. The single-dry year and multiple-dry year periods are based on Upper District's and Metropolitan's analysis on the lowest average precipitation for a single year and consecutive multiple-year period, respectively. Metropolitan's estimates, based on average rainfall between 1922 and 2004, uses the average of these years for normal water year conditions. 1977 represents the single-dry year, and the years 1990-1992 represent the driest three consecutive years. Effective management by the Main San Gabriel Basin Watermaster is expected to ensure that the Basin will have sufficient storage to meet projected water demands for these periods, so the available supply is equal to the projected demands.

Table 6-2: Basis of Water Year Data

Water Year Type	Base Year(s)	Historical Sequence
Normal Water Year[(2)]	Average of 1922 - 2004	1922 - 2004
Single-Dry Water Year	1977	1922 - 2004
Multiple-Dry Water Years	1990 - 1992	1922 - 2004

Notes:
1. Based on Metropolitan Water District 2010 RUWMP analysis of climate data.
2. Normal Water Year calculated from average precipitation for 1922-2004.
3. Table format based on DWR Guidebook Table 27.

Again, the Main San Gabriel Basin storage is used and the basin is operated to store surplus waters (storm water, recycled water, and imported water) when these waters are available and then to draw down the basin in drier years to meet the requirements of the Watermaster established under the Main San Gabriel Basin Judgment. The Basin has proven to be very reliable under extreme climate conditions over the last 30+ years and is expected to remain reliable through 2035.

6.1.4 Factors Resulting in Inconsistency of Supply

Table 6-3 presents factors that could potentially result in inconsistency of supply for the South San Gabriel System.

Although there are no known factors that would results in an inconsistency in overall water supply, it should be noted that groundwater extractions in the San Gabriel Basin are regulated by the Watermaster. Annually, the Watermaster establishes basin-wide pumping limits based on local hydrologic conditions and groundwater levels within the basins. In dry years, when the operating safe yield (OSY) is low and GSWC's water right is correspondingly reduced, GSWC does have the option of leasing or purchasing water rights from other users in the basin and can thereby reliably meet all system demands. The adjudication for the Main San Gabriel Basin also permits a producer to pump more than its rights when replenishment water is available from the responsible agency. A replenishment fee is required for all production in excess of the allocated rights. As a result, GSWC does not foresee any inconsistency in its ability to supply the South San Gabriel System, and Table 6-3 is intentionally blank.

Table 6-3: Factors Resulting in Inconsistency of Supply

Name of Supply	Legal	Environmental	Water Quality	Climatic
USGVMWD	N/A	N/A	N/A	N/A
Groundwater, Main San Gabriel Groundwater Basin	N/A	N/A	N/A	N/A

Notes:

1. Table format based on DWR Guidebook Table 29.
2. N/A – Not Applicable.

6.2 Normal Water Year Analysis

Table 6-4 summarizes the service reliability assessment for a normal water year based on water supply and water demand projections.

Table 6-4: Comparison of Projected Normal Year Supply and Demand

	2015	2020	2025	2030	2035
Water Supply Total (ac-ft/yr)	3,410	3,509	3,595	3,678	3,748
Water Demand Total (ac-ft/yr)	3,410	3,509	3,595	3,678	3,748
Difference (supply minus demand)	0	0	0	0	0
Difference as Percent of Supply	0%	0%	0%	0%	0%
Difference as Percent of Demand	0%	0%	0%	0%	0%

Note:

Table format based on DWR Guidebook Table 32.

6.3 Single-Dry-Year Analysis

Table 6-5 demonstrates the reliability of water supplies to meet projected annual water demands for the South San Gabriel System in a single-dry year.

Table 6-5: Comparison of Projected Supply and Demand for Single-Dry Year

	2015	2020	2025	2030	2035
Supply Total (ac-ft/yr)	3,410	3,509	3,595	3,678	3,748
Demand Total (ac-ft/yr)	3,410	3,509	3,595	3,678	3,748
Difference (supply minus demand)	0	0	0	0	0
Difference as Percent of Supply	0%	0%	0%	0%	0%
Difference as Percent of Demand	0%	0%	0%	0%	0%

Note:
Table format based on DWR Guidebook Table 33.

6.4 Multiple-Dry-Year Analysis

Table 6-6 presents the projected multiple-dry year water supply and demand assessment. It is assumed that the multiple-dry year water supplies are the same as those for the normal years because Metropolitan (through Upper District) intends to meet projected purchased demands under all anticipated hydrologic conditions. The third year of the multiple-dry year water supply projection represents the end of each 3-year multiple-dry year period as required for the multiple-dry year analysis. Upper District has determined that they can meet projected water demands for multiple-dry years, so the water supply is projected to equal the demand.

Table 6-6 demonstrates that the water supplies are sufficient to meet the projected water demand for each multiple-dry year period because:

- Upper District determined that they can meet projected water demands for the multiple-dry year periods (see Chapter 3), and;

- Groundwater from the Main San Gabriel Groundwater Basin is expected to be 100 percent reliable in multiple-dry years.

It should be noted that the active connection capacity to deliver purchased water is significantly higher than the projected purchased water supply that is needed to meet these demands. Therefore, the purchased water supply is generally expected to be much greater than the expected projected water demands during multiple-dry years.

In summary, GSWC, Metropolitan, and Upper District have implemented and will continue to implement projects to ensure the purchased water demands can be met under normal year, single-dry year, and multiple-dry years.

Table 6-6: Projected Multiple-Dry Year Water Supply and Demand Assessment					
Year	**Supply (ac-ft/yr)**	**Demand (ac-ft/yr)**	**Difference**	**Difference as Percent of Supply**	**Difference as Percent of Demand**
2011					
2012					
2013	3,122	3,122	0	0%	0%
2014	3,266	3,266	0	0%	0%
2015	3,410	3,410	0	0%	0%
2016					
2017					
2018	3,470	3,470	0	0%	0%
2019	3,489	3,489	0	0%	0%
2020	3,509	3,509	0	0%	0%
2021					
2022					
2023	3,560	3,560	0	0%	0%
2024	3,577	3,577	0	0%	0%
2025	3,595	3,595	0	0%	0%
2026					
2027					
2028	3,644	3,644	0	0%	0%
2029	3,661	3,661	0	0%	0%
2030	3,678	3,678	0	0%	0%
2031					
2032					
2033	3,720	3,720	0	0%	0%
2034	3,734	3,734	0	0%	0%
2035	3,748	3,748	0	0%	0%

Notes:

1. This assessment is based on the 3-year multiple-dry year period ending in 2015, 2020, 2025, 2030, and 2035.
2. Table format based on DWR Guidebook Table 34.

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Chapter 7: Conservation Program and Demand Management Measures

This Chapter addresses the water conservation requirements of the Act for the South San Gabriel System and includes a summary of current and planned Demand Management Measure (DMM) implementation and an overview of the proposed program for compliance with SBX7-7, which requires 20 percent statewide reduction in urban water use by 2020. The DMM portions of the Act state the following:

Section 10631.

(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 (ULF) 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.*

(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by

complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

7.1 Conservation Program Background

In 1991, GSWC became a signatory to the MOU regarding water conservation in California and a member of the CUWCC, establishing a firm commitment to the implementation of the Best Management Practices (BMPs) or DMMs. The CUWCC is a consensus-based partnership of agencies and organizations concerned with water supply and conservation of natural resources in California. By becoming a signatory, GSWC committed to implement a specific set of locally cost-effective conservation practices in its service areas.

To facilitate efficient BMP reporting for water systems located in GSWC's three regions in California, GSWC established a number of BMP "Reporting Units" based on geographic proximity. GSWC's conservation program implementation for the San Gabriel Valley Reporting Unit includes the reporting of the South Arcadia and South San Gabriel systems. Therefore, this chapter includes the reporting for both systems.

As an investor-owned utility, GSWC's ability to obtain funding and implement conservation programs is contingent on approval of the General Rate Case by the CPUC. GSWC is currently in the process of reviewing and revising its existing conservation program as follows:

- In 2011, GSWC will be submitting a General Rate Case with the CPUC which will facilitate further development of cost-effective conservation programs, including compliance with SBX7-7.

- Subject to funding approval for each rate making area, GSWC will conduct a baseline water use efficiency assessment of each of its districts to identify the opportunities for cost-effective conservation. Results of the baseline assessment will be available by 2013 and will enable GSWC to define programs that target water savings in specific areas and meet DMM requirements.

- To the extent practicable, a companywide conservation program will then be implemented. Varying levels of program implementation will be scaled as appropriate for each district depending on funding availability, local wholesaler and regional participation levels, and SBX7-7 targets.

The MOU and associated BMPs were revised by the CUWCC in 2008, which is equated to the DMMs per Section 10631(j) of the Act. The revised BMPs now contain a category of "Foundational BMPs" that signatories are, for the first time and with few exceptions, expected to implement as a matter of their regular course of business. These include Utility Operations (metering, water loss control, pricing, conservation coordinator, wholesale agency assistance programs, and water waste ordinances) and Public Education (public outreach and school education programs). The remaining BMPs are called Programmatic BMPs and are divided into Residential, Large Landscape, and CII categories. These revisions are reflected in the CUWCC's BMP reporting database starting with reporting year 2009. The revised BMP organization is also reflected in the 2010 UWMP's DMM compliance requirements. A summary of the DMMs described in the Act and the current CUWCC BMP organization is presented in Table 7-1 for reference.

Table 7-1: CUWCC BMP and UWMP DMMs Organization and Names

CUWCC BMP Organization and Names (2009 MOU)				UWMP DMMs	
Type	Category	BMP #	BMP name	DMM #	DMM name
Foundational	Operations Practices	1.1.1	Conservation Coordinator	L	Water conservation coordinator
		1.1.2	Water Waste Prevention	M	Water waste prohibition
		1.1.3	Wholesale Agency Assistance Programs	J	Wholesale agency programs
		1.2	Water Loss Control	C	System water audits, leak detection, and repair
		1.3	Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections	D	Metering with commodity rates for all new connections and retrofit of existing connections
		1.4	Retail Conservation Pricing	K	Conservation pricing
	Education Programs	2.1	Public Information Programs	G	Public information programs
		2.2	School Education Programs	H	School education programs
Programmatic	Residential	3.1	Residential assistance program	A	Water survey programs for single-family residential and multi-family residential customers(1)
				B	Residential plumbing retrofit
		3.2	Landscape water survey	A	Water survey programs for single-family residential and multi-family residential customers(1)
		3.3	High-Efficiency Clothes Washing Machine Financial Incentive Programs	F	High-efficiency washing machine rebate programs
		3.4	WaterSense Specification (WSS) toilets	N	Residential ultra-low-flush toilet replacement programs
	Commercial, Industrial, and Institutional	4	Commercial, Industrial, and Institutional	I	Conservation programs for commercial, industrial, and institutional accounts
	Landscape	5	Landscape	E	Large landscape conservation programs and incentives

Note:

1. Components of DMM A (Water survey programs for single-family residential and multi-family residential customers) applies to both BMP 3.1 (Residential assistance program) and BMP 3.2 (Landscape water survey).

7.2 Implementation of BMPs/DMMs

This section provides a description of the various programs and conservation activities implemented in the San Gabriel Valley Reporting Unit water systems. Signatories to the MOU are permitted by Water Code Section 10631(j) to include their biennial CUWCC BMP reports in an UWMP to meet the requirements of the DMMs sections of the UWMP Act if the agency is meeting all provisions of the MOU. The San Gabriel Valley Reporting Unit BMP coverage report for 2009 through 2010 is attached as Appendix C and supplements the summary of BMP implementation activities provided in this chapter.

GSWC is progressing towards implementing all Foundational BMPs for these systems, as required in the revised MOU and UWMP Act. The Programmatic BMPs are currently being implemented through a BMP approach for the systems. The SBX7-7 conservation goals and proposed implementation plans are discussed further in Section 7.5.

GSWC plans to continue to implement and track conservation programs for systems in the San Gabriel Valley Reporting Unit. GSWC also partners on conservation activities with its wholesale water suppliers, including Metropolitan and Upper San Gabriel Valley Municipal Water District (Upper District). GSWC's customers are eligible for a number of conservation programs offered by Metropolitan, providing water savings to GSWC. Examples of programs offered by wholesale suppliers that are available to customers include High-Efficiency Clothes Washers (HECW) rebates, CII programs and rebates, and High-Efficiency Toilets (HET) rebates.

7.3 Foundational DMMs

7.3.1 Utility Operations

7.3.1.1 Conservation Coordinator

This BMP is implemented. GSWC maintains a fully staffed Conservation Department with a companywide Water Use Efficiency Manager, Water Conservation Analyst and one Water Conservation Coordinator for each of the three regions to administer conservation programs and support wholesaler programs which includes the San Gabriel Valley System. GSWC also employs a number of consultants to support program development and implementation.

7.3.1.2 Water Waste Prevention

Although GSWC does not have rule-making authority, it supports member agencies and local cities in efforts to adopt ordinances that will reduce water waste. This BMP is implemented through CPUC-approved rules provided in Appendix D, including Rule No. 14.1, the Water Conservation and Rationing Plan, and Rule 11, Discontinuance and Restoration of Service.

CPUC's methodology for water utilities to implement Rule 14.1 is documented in Standard Practice U-40-W, "Instructions for Water Conservation, Rationing, and Service Connection Moratoria." Rule No. 14.1 sets forth water use violation fines, charges for removal of flow restrictors, and the period during which mandatory conservation and rationing measures will be in effect. Water conservation restrictions include:

- Use of potable water for more than minimal landscaping.
- Use through a broken or defective water meter.

- Use of potable water which results in flooding or runoff in gutters or streets.
- Use of potable water for washing private cars or commercial aircrafts, cars, buses, boats, or trailers, except at a fixed location where water is properly maintained to avoid wasteful use.
- Use of potable water for washing buildings, structures, driveways, street cleaning or other hard-surfaced areas.
- Use of potable water to irrigate turf, lawns, gardens or ornamental landscaping.
- Use of potable water for construction purposes.
- Use of potable water for filling or refilling of swimming pools.

Rule No. 20 (approved in 1978) discourages wasteful use of water and promotes use of water saving devices. The stated purpose of the rule is to "ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water supply and service extend to the largest number of persons." Together, Rules 11, 14.1 and 20 prohibit negligent or wasteful use of water, create a process for mandatory conservation and rationing, and promote the use of water saving devices.

7.3.1.3 Water Loss Control

Unaccounted for water losses are monitored by the Water Loss Control Department (WLCD) by reviewing the Water Audit program's survey results for each system. If the amount of unaccounted for water exceeds the established tolerance levels, a Leak Detection Audit is performed. This is conducted by the Water Loss Control Technician with the most current leak detection technology, a Sonic Leak Detection Sound Amplification Instrument. To pinpoint leaks, the technician conducts a comprehensive survey of the system by making physical contact with all available main line valves, hydrant valves and all service connections.

For calendar year 2009, GSWC implemented the American Water Works Association (AWWA) M36 Standard Water Audit methodology. The approach consists of a component analysis of leaks for designation into "revenue" and "non-revenue" categories and an economic analysis of recoverable loss. Results of the analysis are included in the BMP coverage report in Appendix C.

Before the AWWA Standard Water Audit M36 methodology was implemented, prescreening for water losses was conducted by comparing the total volume of water sales and other verifiable uses against the total water supply into the system. A full audit was triggered if the total sales and verifiable uses was less than 90 percent of the total supply (i.e., unaccounted-for-water exceeded 10 percent). Table 7-2 summarizes prescreening results.

Table 7-2: Water Loss Control Evaluation Summary		
Report Year	**Prescreen Completed**	**Prescreen Result**
2006	No	-
2007	No	-
2008	Yes	93.20%
2009	Yes	97.70%

Note:
2010 Data Not applicable; M36 method implemented.

Implementation Steps and Schedule

Effective 2010, GSWC will continue to complete the Standard Audit and Water Balance worksheets following the AWWA M36 protocol for the next 4 years, taking measurable steps to improve data accuracy while cost-effectively reducing non-revenue water through repair of leaks and other measures.

GSWC used version 3.0 of the AWWA Water Audit software for its initial evaluation, and will use the current software for 2010 and all future evaluations. The current version includes metrics for evaluating the validity of the data. GSWC already has a work order system in place that documents leak locations and repair history.

7.3.1.4 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections

All customers in San Gabriel Valley Reporting Unit are metered and billed by volume on a monthly basis. A meter maintenance and repair plan has been submitted to the CUWCC. In addition, GSWC follows the requirements of CPUC General Order 103-A which prescribes minimum water system design, operation and maintenance standards for water utilities includes requirements for calibrating, testing frequency, and replacing water meters.

7.3.1.5 Retail Conservation Pricing

All metered customers in the San Gabriel Valley Reporting Unit are billed volumetrically. In addition, effective December 2010, GSWC has implemented a third tier of a conservation pricing rate structure for residential customers, as approved by the CPUC for Region III. The current rate structure for residential customers has a fixed charge as well as volumetric escalating pricing tiers, depending on customer usage. Non-residential customers have a fixed charge and a fixed volumetric charge. Implementation of this revised pricing policy is the result of GSWC's collaboration with CPUC to implement conservation tiered rates for residential customers of investor-owned utilities. Tiered rates are consistent with the CPUC's Water Action Plan.

Implementation Steps and Schedule

2009 and 2010 volumetric and fixed price revenue data for the San Gabriel Valley Reporting Unit are summarized in the BMP Coverage Report located in Appendix C. Since 2010, GSWC has been adding third tier pricing structures and increasing volumetric charges. In 2010, volumetric revenue consisted of 63.1 percent of San Gabriel Valley Reporting Unit's total revenue which is on track to meet the 2012 MOU goal of 70 percent.

As previously discussed, GSWC will be submitting a General Rate Case filing to the CPUC in 2011, which includes a proposed rate increase for volumetric charges for South San Gabriel System customers. If approved, this rate increase will allow GSWC to increase volumetric revenues and progress towards fulfilling the requirements of the Retail Conservation Pricing BMP by 2015.

7.3.1.6 Education

Public Information Programs

San Gabriel Valley Reporting Unit customers are notified of various conservation programs by the Community Education Department. GSWC had a 2010 annual budget of $6,100 for public outreach in the San Gabriel Valley Reporting Unit. GSWC provides marketing and outreach materials to their customers by issuing press releases, publishing quarterly newsletters and using door tags and bill inserts. Customers can learn about rebates and other conservation programs on GSWC's website, which provides links to Metropolitan's website for detailed information. Outreach activities completed between 2006 and 2010 are summarized in Table 7-3.

In addition, the Upper District promotes water conservation through its many public information programs. The Upper District offers conservation brochures and posters, activity booklets, public outreach displays, oral presentations, and workshops to inform the public of conservation efforts. The Upper District also raises awareness about water conservation through paid advertising, press releases, news ads, media events, and through the Speaker's Bureau. Annually, Upper District hosts a water awareness festival (Water Fest) to raise public awareness about water conservation, water quality and other water-related issues.

Table 7-3: Outreach Activities

Item	2006	2007	2008	2009	2010
Paid Advertising	3	2	4	4	4
Public Service Announcement	2	1	3	4	4
Bill Inserts / Newsletters / Brochures	2	4	3	8	8
Bill showing water usage in comparison to previous year's usage	Yes	Yes	Yes	Yes	Yes
Demonstration Gardens	0	0	0	1	1
Special Events, Media Events	2	1	4	2	2
Speaker's Bureau	0	0	1	0	0
Program to coordinate with other government agencies, industry, public interest groups and media	Yes	Yes	Yes	Yes	Yes

School Education Programs

GSWC sponsors a school education program in South San Gabriel elementary schools, as implemented by The Discovery Science Center (DSC)), with a 2010 annual budget of $39,000. Students learn about conservation practices and receive a free conservation kit that includes a water survey, 1.5-gpm low-flow shower head, 1.5-gpm kitchen sink aerator and 1.0-gpm bathroom aerators, leak detection dye tablets, a watering gauge, and step-by-step instructions. The students are given homework assignments to complete a water audit form and replace inefficient showerheads and aerators with water-saving devices provided in the kit. The program has been a very effective way for GSWC to reach a large number of customers and educate students, who in turn educate their parents about water use efficiency practices and low-flow plumbing devices.

Results from the program are tracked, and a comprehensive Program Summary Report is generated at the end of each school year. This report documents the estimated reduction in water usage that was achieved through the retrofits and provides data on the percentage of students who participated in the program. Table 7-4 provides a summary of program participation results between 2006 and 2010.

Table 7-4: School Education Activities

	2006	2007	2008	2009	2010
Presentations	12	3	-	-	-
Grade	4^{th} – 6^{th}	4^{th} – 6^{th}	4 – 6^{th}	-	-
Number of students	666	591	2,234	746	1,367

In addition, Upper District directly offers school education programs in an effort to raise awareness of water issues. Upper District started its school education programs in September 1992 and the materials and presentations meet state education framework requirements. The following is a list of Upper District's school educational programs.

- Water Awareness Art Contests
- Solar Cup Competition
- Water Education Grant Program
- Annual Art Poster Contest for grades K through 3^{rd} and 4^{th} through 6^{th}
- T-shirt Art Contest for grades 7^{th} through 12^{th}
- Water Resource Library

In addition to the DSC and partnering with wholesalers and other public agencies, GSWC implements Resource Action Programs (RAP) and the Science Discover (SD) program. During the 2009/2010 school year, GSWC conducted school conservation education programs for an estimated 15,525 students company-wide.

Implementation Steps and Schedule

GSWC recognizes the value in increased customer awareness of the various conservation programs that are available. To that end, GSWC will review opportunities to enhance its outreach program over the next two (2) years to supplement DSC's existing public education efforts. Public information measures that will be evaluated include additional direct mail fliers, increased outreach participation at community functions, and an improved conservation website.

Going forward, GSWC plans to continue to use the RAP, DSC, and SD and internal staff to conduct its school conservation programs. RAP and DSC's school conservation education programs will continue to include annual reports, classroom education and the distribution and installation of conservation kits that are part of the school education program.

7.3.1.7 Methods Used to Evaluate Effectiveness and Water Savings from Foundational BMPs

Effective implementation of the Foundational BMPs is critical to ensuring the long-term success of GSWC's conservation efforts. GSWC will utilize quantitative methods to assess the effectiveness of each BMP, to the extent practicable. The effectiveness of the Water Waste Prevention and Water Loss Control BMPs can be measured, in part, by completing the annual M36 water loss audits and documenting the year-over-year change in unaccounted-for water as well as the number of repair projects completed. GSWC will track the impact of new conservation pricing by using its upgraded billing system to carefully monitor consumption of residential customers.

The effectiveness of implementing Public Education BMPs will be measured by tracking the number of public outreach events and education programs where customers receive information on conservation. A successful public information program should encourage customers to take advantage of conservation incentives being offered by GSWC, Upper District, and Metropolitan as Programmatic DMMs.

There are no direct estimates of water savings applicable to the Foundational BMPs; however, these measures will continue to contribute to reducing San Gabriel Valley Reporting Unit's demand.

7.4 Programmatic DMMs

GSWC intends to continue to comply with the MOU using the BMP compliance approach for the San Gabriel Valley Reporting Unit. Implementation of the programmatic BMPs will continue to be a joint effort with Metropolitan and Upper District. The wholesalers are responsible for administering most of the Residential, Landscape, and CII BMPs currently being offered to San Gabriel Valley Reporting Unit customers. Additional detailed descriptions of wholesaler DMM implementation can also be found in Metropolitan's 2010 RUWMP, as well as Upper District's 2010 UWMP where appropriate. GSWC will continue to support Metropolitan activities and will focus on improving outreach to its customers and promoting awareness of the programs available to them.

Once the pending rate case is approved by the CPUC, GSWC will develop a prioritized water use efficiency program and implementation schedule for all customer service areas in the company focusing on systems with the highest SBX7-7 water use reduction targets, and those where specific conservation activities can be implemented that are locally cost-effective. Programs that are cost-effective to implement on a companywide basis will also be considered. At this time, all of the BMPs, are cost-effective for implementation in the San Gabriel Valley Reporting Unit, where the avoided cost of water is $926 per acre-foot.

7.4.1 Residential DMMs

7.4.1.1 Residential Assistance Programs

GSWC has an audit program targeting high-use single-family (SF) and multi-family (MF) residential customers. GSWC identifies these customers based on billing data and contacts them to offer free audits. Audits are also offered to walk-in customers at the local customer service area office. Additional home audits are conducted as part of the school education program (Section 7.3.1.6). The number of residential audits performed by GSWC and the number of low-flow devices that were distributed are summarized in Table 7-5. Low-flow devices are available for free to customers at the GSWC office and are distributed to students as part of the free conservation kits they receive in the school education program.

Table 7-5: Residential Surveys and Retrofits

	2006	2007	2008	2009	2010
Single-Family Accounts					
Surveys Offered	0	0	1,251	0	0
Surveys Completed	0	0	227	0	0
Multi-Family Accounts					
Surveys Offered	0	0	1,251	0	0
Surveys Completed	0	0	227	0	0
Devices					
Showerheads	569	0	2,234	0	0
Aerators	1,300	0	2,234	0	0

<u>Implementation Steps and Schedule</u>

Over the next 5 years, GSWC will continue distributing low flow showerheads and aerators to customers, and offering audits to high-use SF and MF customers until saturation requirements are satisfied for this BMP. It is estimated that 175 devices per year will need to be installed in SF and MF residences. Once saturation requirements are met, GSWC will continue to offer the programs as required by the MOU.

<u>Methods Used to Evaluate Effectiveness and Water Savings</u>

Effectiveness of implementation of this program is evaluated by GSWC by tracking customer participation rates in surveys and distribution of low flow showerheads. The following water savings estimates were developed using data provided by the CUWCC:

- Residential Assistance Surveys: According to the CUWCC, SF surveys are estimated to save 40 gpd and MF surveys are estimated to save 20 gpd. At 174 surveys per year, it is estimated that GSWC will save more than 300 ac-ft over the next 10 years.

- Plumbing Retrofit kits: Per the CUWCC, it is estimated that 7.7 gpd per unit is conserved from installation of low flow showerheads. At 75 percent saturation, the potential total savings is approximately 54 ac-ft over the next 10 years.

Program effectiveness and per capita use will continue to be monitored based on meter readings and billing data, and follow-up calls will be made to offer audits and other assistance to high-use customers. Implementation of the residential assistance programs BMP has no anticipated impacts on GSWC's ability to further reduce demands.

7.4.1.2 Landscape Water Surveys

GSWC offers landscape water surveys to high water-use SF and MF customers throughout the company. Since residential surveys include a landscape component, participation rates are included in the residential assistance program summary above. Introduction of the third tier of metered rates in late 2010 is expected to result in higher participation rates, and funding has been designated to improving program marketing.

<u>Implementation Steps and Schedule</u>

Residential assistance survey programs have a landscape component to them and are being implemented concurrently. A description of the proposed implementation strategy and schedule is provided in the section describing the Residential Assistance Program BMP.

<u>Methods Used to Evaluate Effectiveness and Water Savings</u>

See residential assistance programs description.

7.4.1.3 High-Efficiency Clothes Washers

GSWC customers are eligible to participate in the HECW rebate program provided by Metropolitan, which has been available since 2003. Metropolitan has supplemented its HECW rebate using state or federal grants whenever possible. The water efficiency of clothes washers is represented by the "water factor," which is a measure of the amount of water used to wash a standard load of laundry. Washers with a lower water factor save more water. Metropolitan has continued to transform the market by changing its program requirement to lower water factors. The program eligibility requirement is currently set at water factor 4.0, which saves more than 10,000 gallons per year per washer over a conventional top loading washer. GSWC does not contribute funds to the HECW rebate program. The GSWC conservation webpage advertises the rebates and provides a link to the Metropolitan website for full program details. A summary of the HECW Rebates received by GSWC customers in the San Gabriel Valley Reporting Unit is provided in Table 7-6.

Table 7-6: HECW Rebates

	2006	2007	2008	2009	2010	TOTAL
Rebates	44	0	149	0	282	475

Implementation Steps and Schedule

To comply with the BMP, rebates need to be issued to 104 customers per year in the San Gabriel Valley Reporting Unit until saturation requirements are met. GSWC intends to continue to participate in the HECW rebate program administered by Metropolitan and to increase program participation will increase marketing efforts to raise customer awareness that the program is being offered. GSWC will develop an updated conservation website, and prominently include HECW rebate incentive on future bill stuffers or other direct mail campaigns.

Methods Used to Evaluate Effectiveness and Water Savings

Metropolitan tracks customer participation in the HECW rebate program and estimates that 28 gallons per day are saved for each HECW installed. At the required implementation levels, it is estimated that GSWC will save a total of approximately 142 ac-ft from 104 annual HECW installations over the next 10 years. There are no anticipated impacts on GSWC's ability to further reduce demands.

7.4.1.4 WaterSense Specification (WSS) Toilets

GSWC customers have been eligible to participate in the HET rebate program administered by Metropolitan since 2008. Metropolitan has provided incentives for toilet programs since 1988, including ultra-low-flush toilet (ULFT) rebates. Currently, Metropolitan only provides funding for high-efficiency toilets (1.28 gallons per flush or less), which use 20 percent less than ultra-low-flush toilets (1.6 gallons per flush). ULFTs are the current standard defined by the plumbing code. Metropolitan uses the EPA's WaterSense list of tested toilets in its programs as qualifying models. The GSWC webpage for South San Gabriel advertises the rebates and provides a link to the Metropolitan website for full details. The number of rebates issued by Metropolitan to GSWC San Gabriel Valley Reporting Unit customers is provided in Table 7-7.

Table 7-7: Toilet Rebates and Replacements Received by San Gabriel Valley Reporting Unit Customers

Type	2006	2007	2008	2009	2010
Single-Family					
ULFT Rebate	350	0	11	0	0
HET Rebate	0	0	0	136	44
Multi-Family					
ULFT Rebate	0	0	9	0	0
HET Rebate	0	0	0	51	0

Implementation Steps and Schedule

To comply with the BMP, rebates need to be issued to 93 SF and 23 MF customers per year in the San Gabriel Valley Reporting Unit. GSWC intends to continue to participate in the HET rebate program administered by Metropolitan as described above. GSWC will also evaluate augmenting existing public outreach efforts through direct mail and enhanced website features to inform customers about current incentive opportunities and increase program participation.

Methods Used to Evaluate Effectiveness and Water Savings

Metropolitan tracks customer participation in the HET rebate program to measure effectiveness. According to the CUWCC research and evaluation committee, it is estimated that 21.1 and 26.6 gallons per day are saved for each HECW installed in SF and MF units, respectively. It is estimated that GSWC will save approximately 141 ac-ft from HET installations completed over the next 10 years at required implementation levels of 93 SF and 23 MF installations per year. There are no anticipated impacts on GSWC's ability to further reduce demands.

7.4.1.5 WaterSense Specification for Residential Development

Integration of WSS fixtures for new development will be accelerated by the 2010 California Green Building Standards Code (CAL Green Code), which became effective in January 2011. The CAL Green Code sets mandatory green building measures, including a 20 percent reduction in indoor water use, as well as dedicated meter requirements and regulations addressing landscape irrigation and design. Local jurisdictions, at a minimum, must adopt the mandatory measures; the CAL Green Code also identifies voluntary measures that set a higher standard of efficiency for possible adoption.

Implementation Exemption

GSWC is filing an exemption on implementation of the WSS specification for new developments due to lack of legal authority. As an investor-owned utility, GSWC does not have regulatory authority and cannot adopt ordinances or regulations; however, it does support standards that will achieve a reduction in indoor water use including implementation and use of WSS fixtures as well as adoption of the CAL Green Code by local jurisdictions, including Los Angeles County. GSWC will continue to support incentive programs for water efficient devices and standards.

The cost of implementing this BMP is non-quantifiable; therefore a cost-effectiveness evaluation was not completed.

7.4.1.6 Commercial, Industrial, and Institutional DMMs

The Commercial, Industrial, and Institutional (CII) programs are implemented by Metropolitan on behalf of GSWC. Table 7-8 provides a summary of CII program participation from GSWC's San Gabriel Valley Reporting Unit customers from 2006 to 2010. GSWC customers are eligible to participate in Upper District and Metropolitan's CII Save-A-Buck Program for Southern California businesses. Those who qualify are eligible for rebates to help encourage water efficiency and conservation. Devices available for rebates include: high efficiency toilets, zero water and ultra low water urinals, connectionless food steamers, air-cooled ice machines (Tier III), cooling tower and pH conductivity controllers, water brooms, dry vacuum pumps). Additionally, the Save-A-Buck program offers rebates for outdoor landscaping equipment such as: weather based irrigation controllers, central computer irrigation controllers, rotating spray nozzles retrofits, and high efficiency large rotary nozzle retrofits.

Table 7-8: CII Programs					
Program	**2006**	**2007**	**2008**	**2009**	**2010**
CII HET Rebates	0	0	2	0	0
CII ULFT Rebates	0	0	0	0	0
Dual Flush Toilets	0	0	0	0	0
CII Urinal Rebates	0	0	16	1	37
CII HECW Rebates	0	0	0	0	0
Cooling Tower Controllers	0	0	0	0	0
Cash for Grass	0	0	0	0	0

<u>Implementation Steps and Schedule</u>

GSWC's goal for the next 3 to 5 years is to focus on advertising and outreach programs, including CII rebates, as described elsewhere in this chapter. If, after additional advertising efforts it is determined that Metropolitan's program is not meeting coverage requirements, GSWC will evaluate augmenting Metropolitan's program. To meet BMP requirements for the required 10 percent water savings (about 94 ac-ft/yr) by 2020, GSWC will need to support or augment Metropolitan's program to encourage customers to participate in rebate incentive programs. GSWC will also evaluate implementing additional CII water savings programs, such as industrial process water use reductions.

<u>Methods Used to Evaluate Effectiveness and Water Savings</u>

Effectiveness of the CII program will be evaluated by tracking multiple parameters, including program participation, metered CII water use, high water users, and measuring water savings from of specific CII activities where practicable to show a water savings of at least 9 ac-ft per year. There are no anticipated impacts on GSWC's ability to further reduce demands.

7.4.1.7 Large Landscape

GSWC's large landscape program consists of identifying and contacting high-use customers, providing information and offering water use surveys, voluntary landscape water use budgets, and landscape training. The program is available to all large landscape customers free of charge. An increase in conservation pricing rates in 2011 is expected to prompt increased participation, and funding has been designated for improved program marketing.

Upper District's large landscape conservation program includes the Synthetic Turf Grant School Program. The Goal of the Synthetic Turf Grant Program is to assist schools with funding for retrofitting large landscaped areas with synthetic turf. Through this program, Upper District offers grants of up to $75,000 per site to assist with the cost of installing synthetic turf. Since the start of the program in fiscal year 2005-06, five schools have participated in this program. Based on an estimated service life of 10 years for synthetic turf, the total annual water savings for the 5 synthetic turf programs is estimated at 53 acre-feet.

Implementation Steps and Schedule

Implementation of this BMP will be improved by promoting existing incentive opportunities s and raising customer awareness about existing audit program offerings. For the next 4 to 5 years, GSWC will work to increase program participation at schools and other institutional accounts to establish landscape water budgets and decrease overall water use. Additionally, GSWC will discuss with Metropolitan specific measures that could be implemented to encourage broader interest in the multiple CII programs that are currently being offered.

In order to meet BMP coverage requirements, GSWC/Metropolitan/Upper District will need to develop evapotranspiration-based landscape water budgets for 9 accounts with dedicated irrigation meters per year. GSWC will also continue to offer landscape water use surveys to customers without dedicated irrigation meters. Devices such as weather based irrigation controllers (WBIC) and precision nozzles will also be distributed to mix-metered high water use customers who have been determined not to be water efficient.

Methods Used to Evaluate Effectiveness and Water Savings

GSWC will track increased customer participation in the CII large landscape water budgeting and rebate programs. At the implementation rate described above, it is estimated that as much as 279 AF could be conserved by 2020 (Table 7-9). There are no anticipated impacts on GSWC's ability to further reduce demands.

Table 7-9: Water Savings for Large Landscape Programs

Large Landscape Conservation Program	Units per Year	Water savings over next 10 Years (ac- ft)
CII WBIC Rebates	9	46
CII WBIC Direct Install	9	46
CII Precision Nozzles Distribution	1,330	85
Dedicated Irrigation Surveys	9	102
TOTAL	1,357	279

7.5 SBX7-7 Compliance Strategy

The SBX7-7 water use baseline for the South San Gabriel System is 105 gpcd, and the 2020 compliance goal is 100 gpcd, as detailed in Chapter 3. Several factors have contributed to a rapid reduction in gpcd over the past few years Including the economic recession, recent mild climate conditions, implementation of a residential tiered conservation pricing structure m and other conservation measures. Over the past 3 years, there has been a recent 13 percent decline in gpcd in the South San Gabriel System from 97 gpcd in 2008 to an estimated 84 gpcd in 2010. Therefore, the South San Gabriel System is on track to meet its SBX7-7 goals, and will remain focused on maintaining these savings over the next 10 years.

However, if the gpcd begins to increase to previous levels, GSWC's continued commitment to complying with the CUWCC MOU and implementation of all BMPs should provide sufficient water savings to meet the goal of 100 gpcd. GSWC will assess implementation of a suite of programs over the next 2 to 3 years to meet conservation targets companywide. Implementation levels and specific program offerings will vary by system depending on system goals, including existing implementation levels, demographics, and hydrologic characteristics.

GSWC is developing a companywide approach that will include assessment of options such as accelerating the current programs, and adding additional programmatic, regulatory and information-based activities to meet the requirements of SBX7-7. This systematic approach may allow GSWC to do more with less, in essence, administering overall conservation program operations from a centralized location while allowing local resources for direct implementation of BMPs and other water savings practices. Funding for all conservation activities is subject to approval by the CPUC before programs can be implemented. Some of the programs that may be considered by GSWC if needed to meet SBX7-7 requirements include financial incentives, regulatory approaches, and information elements. These efforts will be planned to build on existing programs and activities. Programs that may be implemented by 2014 on a companywide basis include the following:

Conservation Pricing

GSWC is in the process of filing a General Rate Case application to increase tiered rates in its systems for residential and CII metered customers. If approved, increased tiered rates are expected to significantly increase water savings and participation in conservation incentive programs in many of GSWC's systems.

Financial Incentives

Ongoing and/or additional financial incentives may be offered directly to customers by GSWC or in partnership with other agencies:

1. HECW rebates: Clothes washer rebates are already being implemented by Metropolitan on behalf of GSWC and will continue to provide measurable water savings.

2. Zero and low-flow urinal rebates: Rebates would include CII fixtures such as zero consumption and ultra-low volume urinals as well as CII specific HETs.

3. Expansion of fixture rebates to CII and MF customers in all systems: currently, the toilet rebate programs are only available to CII and MF customers in select systems. GSWC will evaluate expansion of the programs to all customers and there will be increased focus on marketing to large Home Owner Association accounts.

4. Larger variety of fixture rebates: This may include hot water distribution tanks, pressurized water brooms and high-pressure spray nozzles.

5. Cash-for-grass rebates: Customers will be provided with an incentive of up to $0.5 per square-foot of turf removed and replaced with landscape appropriate plants. The program is being considered for both residential and CII customers; it is currently being offered in select GSWC systems.

6. Expansion of large landscape program: GSWC will be evaluating the effectiveness of the current landscape program and making adjustments depending on the results. If the program is found to be successful at meeting reduction targets, the program may be accelerated and more devices will be offered, such as precision nozzles.

Building Code/New Standards

Although it does not have regulatory authority, GSWC supports adoption of new building standards, beyond those currently in code to enhance conservation. If all current code changes that improve the efficiency of fixtures and design are implemented, it could account for up to 60 percent of the expected reduction in demand. Some of the changes proposed will be captured in the CAL Green Code, adopted January 2011 as well as SB407 (Plumbing Retrofit on Resale) and standard updates for toilets and washers that are being phased in.

Information/Tracking

Information and tracking represents a new element to the existing programs focusing on collecting and processing information and ensuring that the programs are on track to meet the goals. These activities will also help in program design by providing more robust information about customers and their water use patterns. The immediate priorities include:

1. Automatic Meter Reading (AMR): GSWC currently follows the requirements of CPUC General Order 103-A, which prescribe minimum water system design, operation and maintenance standards for water utilities, and includes requirements for calibrating, testing frequency, and replacing water meters. GSWC will continue to follow this standard and consider the use of AMR in its systems as a priority to obtain real time data for water usage and identify customer-side leaks. This information can also help GSWC monitor the impacts of existing programs, make adjustments where necessary and develop new programs.

2. Water Use Tracking Tools: Another priority, GSWC will consider plans to design and develop database tracking tools for water savings associated with its conservation plans and increase flexibility in adding or changing program elements.

GSWC is developing a companywide approach that will include assessment of options such as accelerating the current programs, and adding additional programmatic, regulatory and information-based activities to meet the requirements of SBX7-7. This systematic approach may allow GSWC to do more with less, in essence, administering overall conservation program operations from a centralized location while allowing local resources for direct implementation of BMPs and other water savings practices. Funding for all conservation activities is subject to approval by the CPUC before programs can be implemented.

7.5.1 Consideration of Economic Impacts

Since funding for all conservation activities is subject to approval by the CPUC before programs can be implemented, the economic impacts of complying with SBX7-7 have not yet been fully determined. However, an economic analysis to help develop programs that avoid placing disproportionate burdens on any single sector will be prepared during development of the SBX7-7 water use efficiency program. The annual costs associated with implementing all traditional CUWCC programmatic BMPs cannot be determined because it represents the combined efforts of Metropolitan, Upper District, and GSWC, where funding levels, incentives and particular measures change from year to year. To continue benefiting customers, GSWC will take advantage of applicable partnership programs that will make conservation programs more efficient and cost effective.

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Chapter 8: Water Shortage Contingency Plan

Section 10632 of the Act details the requirements of the water-shortage contingency analysis. The Act states the following:

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

(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.

This chapter documents GSWC's Water Shortage Contingency Plan for the South San Gabriel System per requirements of Section 10632 of the Act. The Water Shortage Contingency Plan is based on Rule No. 14.1 Mandatory Water Conservation, Restrictions and Ratings Program adopted by GSWC and on file with CPUC. Appendix D contains the full text of the rule.

The purpose of the Water Shortage Contingency Plan is to provide a plan of action to be followed during the various stages of a water shortage. The plan includes the following elements: action stages, estimate of minimum supply available, actions to be implemented during a catastrophic interruption of water supplies, prohibitions, penalties and consumption reduction methods, revenue impacts of reduced sales, and water use monitoring procedures.

8.1 Action Stages

The Act requires documentation of actions to be undertaken during a water shortage. GSWC has developed actions to be undertaken in response to water supply shortages, including up to a 50 percent reduction in water supply. Implementation of the actions is dependent upon approval of the CPUC, especially for implementing mandatory water use restriction. CPUC has jurisdiction over GSWC because GSWC is an investor-owned water utility. Section 357 of the California Water Code requires that suppliers subject to regulation by the CPUC secure its approval before imposing water consumption regulations and restrictions required by water supply shortage emergencies.

GSWC has grouped the actions to be taken during a water shortage into four stages, I through IV, that are based on the water supply conditions. Table 8-1 describes the water supply shortage stages and conditions. The stages will be implemented during water supply shortages according to shortage level, ranging from 5 percent shortage in Stage I to 50 percent shortage in Stage IV. A water shortage declaration will be made by the American State Water Company Board. The water shortage stage determination during a water supply shortage will be made by the Regional Vice President Customer Service.

Table 8-1: Water Supply Shortage Stages and Conditions

Stage No.	Water Shortage Supply Conditions	Shortage Percent
I	Minimum	5 - 10
II	Moderate	10 - 20
III	Severe	20 - 35
IV	Critical	35 - 50

Note:
This table is based on the DWR Guidebook Table 35.

The actions to be undertaken during each stage include, but are not limited to, the following:

Stage I (5 - 10 percent shortage) – Water alert conditions are declared and voluntary conservation is encouraged. The drought situation is explained to the public and governmental bodies. GSWC explains the possible subsequent water shortage stages in order to forecast possible future actions for the customer base. The activities performed by GSWC during this stage include, but are not limited to:

- Public information campaign consisting of distribution of literature, speaking engagements, website updates, bill inserts, and conversation messages printed in local newspapers
- Educational programs in area schools
- Conservation Hotline, a toll-free number with trained Conservation Representatives to answer customer questions about conservation and water use efficiency

Stage II (10 - 20 percent shortage) – Stage II will include actions undertaken in Stage I. In addition, GSWC may propose voluntary conservation allotments and/or require mandatory conservation rules. The severity of actions depends upon the percent shortage. The level of voluntary or mandatory water use reduction requested from the customers is also based on the severity. It needs to be noted that prior to implementation of any mandatory reductions, GSWC must obtain approval from CPUC. If necessary, GSWC may also support passage of drought ordinances by appropriate governmental agencies.

Stage III (20 - 35 percent shortage) – Stage III is a severe shortage that entails or includes allotments and mandatory conservation rules. This phase becomes effective upon notification by the GSWC that water usage is to be reduced by a mandatory percentage. GSWC implements mandatory reductions after receiving approval from CPUC. Rate changes are implemented to penalize excess usage. Water use restrictions are put into effect, i.e. prohibited uses can include restrictions of daytime hours for watering, excessive watering resulting in gutter flooding, using a hose without a shutoff device, use of non-recycling fountains, washing down sidewalks or patios, unrepaired leaks, etc. GSWC monitors production weekly for compliance with necessary reductions. Use of flow restrictors is implemented if abusive practices are documented.

Stage IV (35 - 50 percent shortage) – This is a critical shortage that includes all steps taken in prior stages regarding allotments and mandatory conservation. All activities are intensified and production is monitored daily by GSWC for compliance with necessary reductions.

8.2 Minimum Supply

The Act requires 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 GSWC's existing water supply sources.

Table 8-2 summarizes the minimum volume of water available from each existing source during the next three-years based on multiple-dry water years and normal water year. The driest three-year historic sequence is provided in Chapter 6. The water supply quantities for 2011 to 2013 are calculated by linearly interpolating between the projected water supplies of 2010 and 2015 for normal years. The water supplies for 2010 and 2015 are presented in Chapter 4.

It is assumed that the multiple-dry year supplies will be the same as those for the normal years because purchased water supplies will meet projected imported water demands under all anticipated hydrologic conditions.

GSWC's supply for the South San Gabriel System is expected to be 100 percent reliable from 2011 to 2013. This reliability is a result of

- Adjudicated groundwater rights in the Main San Gabriel Basin,
- anticipated benefits of groundwater replenishment provisions and conjunctive use storage programs, and
- the projected reliability of Metropolitan water supplies purchased through USGVMWD, which are expected to be 100 percent reliable.

Table 8-2: Three-Year Estimated Minimum Water Supply in ac-ft/yr				
Source	**2011**	**2012**	**2013**	**2010 Average Year**
Purchased water from USGVMWD	689	1,041	1,393	337
Groundwater	2,144	1,936	1,729	2,352
Recycled water	-	-	-	0
Total	2,833	2,978	3,122	2,689

Note:
This table is based on the DWR Guidebook Table 31.

8.3 Catastrophic Supply Interruption Plan

The Act requires documentation of actions to be undertaken by the water supplier to prepare for, and implement during, a catastrophic interruption of water supplies. A catastrophic interruption constitutes a proclamation of a water shortage and could result from any event (either natural or man-made) that causes a water shortage severe enough to classify as either a Stage III or Stage IV water supply shortage condition.

In order to prepare for catastrophic events, GSWC has prepared an Emergency Response Plan (ERP) in accordance with other state and federal regulations. The purpose of this plan is to design actions necessary to minimize the impacts of supply interruptions due to catastrophic events.

The ERP coordinates overall company response to a disaster in any and all of its districts. In addition, the ERP requires each district to have a local disaster plan that coordinates emergency responses with other agencies in the area. The ERP also provides details on actions to be undertaken during specific catastrophic events. Table 8-3 provides a summary of actions cross-referenced against specific catastrophes for three of the most common possible catastrophic events: regional power outage, earthquake, and malevolent acts.

In addition to specific actions to be undertaken during a catastrophic event, GSWC performs maintenance activities, such as annual inspections for earthquake safety, and budgets for spare items, such as auxiliary generators, to prepare for potential events.

Table 8-3: Summary of Actions for Catastrophic Events	
Possible Catastrophe	**Summary of Actions**
Regional power outage	• Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water. • Establish water distribution points and ration water if necessary. • If water service is restricted, attempt to provide potable water tankers or bottled water to the area. • Make arrangements to conduct bacteriological tests, in order to determine possible contamination. • Utilize backup power supply to operate pumps in conjunction with elevated storage.
Earthquake	• Assess the condition of the water supply system. • Complete the damage assessment checklist for reservoirs, water treatment plants, wells and boosters, system transmission and distribution. • Coordinate with Cal EMA utilities group or fire district to identify immediate fire fighting needs. • Isolate areas that will take the longest to repair and/or present a public health threat. Arrange to provide emergency water. • Prepare report of findings, report assessed damages, advise as to materials of immediate need and identify priorities including hospitals, schools and other emergency operation centers. • Take actions to preserve storage. • Determine any health hazard of the water supply and issue any “Boil Water Order” or “Unsafe Water Alert” notification to the customers, if necessary. • Cancel the order or alert information after completing comprehensive water quality testing. • Make arrangements to conduct bacteriological tests, in order to determine possible contamination.
Malevolent acts	• Assess threat or actual intentional contamination of the water system. • Notify local law enforcement to investigate the validity of the threat. • Get notification from public health officials if potential water contamination • Determine any health hazard of the water supply and issue any “Boil Water Order” or “Unsafe Water Alert” notification to the customers, if necessary. • Assess any structural damage from an intentional act. • Isolate areas that will take the longest to repair and or present a public health threat. Arrange to provide emergency water.

8.4 Prohibitions, Penalties, and Consumption Reduction Methods

The Act requires an analysis of mandatory prohibitions, penalties, and consumption reduction methods against specific water use practices which may be considered excessive during water shortages. Given that GSWC is an investor-owned entity, it does not have the authority to pass any ordinance enacting specific prohibitions or penalties. In order to enact or rescind any prohibitions or penalties, GSWC would seek approval from CPUC to enact or rescind Rule No. 14.1, Mandatory Conservation and Rationing, which is included in Appendix D. When Rule No. 14.1 has expired or is not in effect, mandatory conservation and rationing measures will not be in force.

Rule No. 14.1 details the various prohibitions and sets forth water use violation fines, charges for removal of flow restrictors, as well as establishes the period during which mandatory conservation and rationing measures will be in effect. The prohibitions on various wasteful water uses, include, but are not limited to, the hose washing of sidewalks and driveways using potable water, and cleaning for filling decorative fountains. Table 8-4 summarizes the various prohibitions and the stages during which the prohibition becomes mandatory.

Table 8-4: Summary of Mandatory Prohibitions

Examples of Prohibitions	Stage When Prohibition Becomes Mandatory
Uncorrected plumbing leaks	II, III, IV
Watering which results in flooding or run-off in gutters, waterways, patios, driveway, or streets	II, III, IV
Washing aircraft, cars, buses, boats, trailers, or other vehicles without a positive shut-off nozzle on the outlet end of the hose	II, III, IV
Washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas in a manner which results in excessive run-off	II, III, IV
Irrigation of non-permanent agriculture	II, III, IV
Use of water for street watering with trucks or for construction purposes unless no other source of water or other method can be used	II, III, IV
Use of water for decorative fountains or the filling or topping off of decorative lakes or ponds	II, III, IV
Filling or refilling of swimming pools	II, III, IV

Note:
This table is based on the DWR Guidebook Table 36.

In addition to prohibitions during water supply shortage events requiring a voluntary or mandatory program, GSWC will make available to its customers water conservation kits as required by GSWC's Rule No. 20. GSWC will notify all customers of the availability of conservation kits.

In addition to prohibitions, Rule No. 14.1 provides penalties and charges for excessive water use. The enactment of these penalties and charges is contingent on approval of Rule 14.1 implementation by the CPUC. When the rule is in effect, violators receive one verbal and one written warning after which a flow-restricting device may be installed in the violator's service for a reduction of up to 50 percent of normal flow or 6 ccf per month, whichever is greater. Table 8-5 summarizes the penalties and charges and the stage during which they take effect.

Table 8-5: Summary of Penalties and Charges for Excessive Use

Penalties or Charges	Stage When Penalty Takes Effect
Penalties for not reducing consumption	III, IV
Charges for excess use	III, IV
Flat fine; Charge per unit over allotment	III, IV
Flow restriction	III, IV
Termination of service	III, IV

Note:
This table is based on the DWR Guidebook Table 38.

In addition to prohibitions and penalties, GSWC can use other consumption reduction methods to reduce water use up to 50 percent. Based on the requirements of the Act, Table 8-6 summarizes the methods that can be used by GSWC in order to enforce a reduction in consumption, where necessary.

Table 8-6: Summary of Consumption Reduction Methods		
Consumption Reduction Method	**Stage When Method Takes Effect**	**Projected Reduction Percentage**
Demand reduction program	All Stages	N/A
Reduce pressure in water lines; Flow restriction	III, IV	N/A
Restrict building permits; Restrict for only priority uses	II, III, IV	N/A
Use prohibitions	II, III, IV	N/A
Water shortage pricing; Per capita allotment by customer type	II, IV	N/A
Plumbing fixture replacement	All Stages	N/A
Voluntary rationing	II	N/A
Mandatory rationing	III, IV	N/A
Incentives to reduce water consumption; Excess use penalty	III, IV	N/A
Water conservation kits	All Stages	N/A
Education programs	All Stages	N/A
Percentage reduction by customer type	III, IV	N/A

Note:
This table is based on the DWR Guidebook Table 37.

8.5 Revenue Impacts of Reduced Sales

Section 10632(g) of the Act requires an analysis of the impacts of each of the actions taken for conservation and water restriction on the revenues and expenditures of the water supplier. Because GSWC is an investor-owned water utility and, as such, is regulated by the CPUC, the CPUC authorizes it to establish memorandum accounts to track expenses and revenue shortfalls caused by both mandatory rationing and voluntary conservation efforts. Utilities with CPUC-approved water management plans are authorized to implement a surcharge to recover revenue shortfalls recorded in their drought memorandum accounts. Table 8-7 provides a summary of actions with associated revenue reductions; while Table 8-8 provides a summary of actions and conditions that impact expenditures. Table 8-9 summarizes the proposed measures to overcome revenue impacts. Table 8-10 provides a summary of the proposed measures to overcome expenditure impacts.

Table 8-7: Summary of Actions and Conditions that Impact Revenue	
Type	**Anticipated Revenue Reduction**
Reduced sales	Reduction in revenue will be based on the decline in water sales and the corresponding quantity tariff rate
Recovery of revenues with CPUC-approved surcharge	Higher rates may result in further decline in water usage and further reduction in revenue

Table 8-8: Summary of Actions and Conditions that Impact Expenditures	
Category	**Anticipated Cost**
Increased staff cost	Salaries and benefits for new hires required to administer and implement water shortage program
Increased O&M cost	Operating and maintenance costs associated with alternative sources of water supply
Increased cost of supply and treatment	Purchase and treatment costs of new water supply

Table 8-9: Proposed Measures to Overcome Revenue Impacts	
Names of Measures	**Summary of Effects**
Obtain CPUC-approved surcharge	Allows for recovery of revenue shortfalls brought on by water shortage program
Penalties for excessive water use	Obtain CPUC approval to use penalties to offset portion of revenue shortfall

Table 8-10: Proposed Measures to Overcome Expenditure Impacts	
Names of Measures	**Summary of Effects**
Obtain CPUC-approved surcharge	Allows for recovery of increased expenditures brought on by water shortage program
Penalties for excessive water use	Obtain CPUC approval to use penalties to offset portion of increased expenditures

8.6 Water-Use Monitoring Procedures

The Act asks for an analysis of mechanisms for determining actual reduction in water use when the Water Shortage Contingency Plan is in effect. Table 8-11 lists the possible mechanisms used by GSWC to monitor water use and the quality of data expected.

Table 8-11: Water-Use Monitoring Mechanisms

Mechanisms for Determining Actual Reductions	Type and Quality of Data Expected
Customer meter readings	Hourly/daily/monthly water consumption data for a specific user depending on frequency of readings
Production meter readings	Hourly/daily/monthly water production depending on frequency of readings; correlates to water use plus system losses

In addition to the specific actions that GSWC can undertake to verify level of conservation, GSWC can monitor long-term water use through regular bi-monthly meter readings, which give GSWC the ability to flag exceptionally high usage for verification of water loss or abuse.

Chapter 9: References

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Appendix A

Urban Water Management Planning Act

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

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

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

WATER CODE
SECTION 10610-10610.4

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10611-10617

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10620-10621

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10630-10634

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

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

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

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

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

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

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

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

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

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

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

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

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

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

(I) Agricultural.

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

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

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

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

(B) Residential plumbing retrofit.

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

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

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

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

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

(2) Include a cost-benefit analysis, identifying total benefits and total costs.

(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.

(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.

(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

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

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

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

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

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

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

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

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

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

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

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

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

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

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

(i) Compliance on an individual basis.

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

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

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

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

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

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

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

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

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

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

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

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

sequence for the agency's water supply.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE SECTION 10635

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

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

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

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

WATER CODE
SECTION 10640-10645

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

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

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

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

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

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

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

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

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

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

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

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

WATER CODE
SECTION 10650-10656

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

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

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

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

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

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

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

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

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

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

Appendix B

Public Hearing Notices, Notifications, and Meeting Minutes

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Arcadia
Corkran W. Nicholson
Planning Services Manager
240 W. Huntington Drive
Arcadia, CA 91006

Subject: ***REVISED***-Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Corkran:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review prior one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011,* and take place at:

San Dimas/Senior Community Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Arcadia
Philip A. Wray
City Engineer
240 W. Huntington Drive
Arcadia, CA 91006

Subject: ***REVISED***- Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP)Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Phillip:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas/Senior Community Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Claremont
Chris Veirs
City Planner
P.O. Box 880
Claremont, CA 91711

Subject: ***REVISED***-Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Chris:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, July 19, 2011* and take place at:

San Dimas/Senior Community Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

May 17, 2011

City of Covina
Michael A. Marquez
Community Development Director
125 E. College Street
Covina, CA 91723

Subject: Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – San Dimas, Claremont, San Gabriel and South Arcadia Water Systems.

Dear Michael:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

San Dimas, Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review prior to the public hearing and can be reviewed during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plan at:

San Dimas Customer Service Office
121 Exchange Place
San Dimas, CA 91773

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP will be held at 6:00 p.m., on Tuesday, July 19, 2011 and take place at:

San Dimas Community Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

July 19, 2011

City of El Monte
James Troyer
Planning Services Manager
11333 Valley Blvd.
El Monte, Ca 91732

Subject: ***REVISED***-Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear James:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Irwindale
Tonya Pace
Director of Planning
5050 North Irwindale Ave.
Irwindale, CA 91706

Subject: ***REVISED-*** Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP)Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Tonya:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

May 17, 2011

City of La Verne
Hal Fredericksen
Community Development Director
3660 D Street
La Verne, CA 91723

Subject: Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – San Dimas, Claremont, San Gabriel and South Arcadia Water Systems.

Dear Hal:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

San Dimas, Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review prior to the public hearing and can be reviewed during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plan at:

San Dimas Customer Service Office
121 Exchange Place
San Dimas, CA 91773

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP will be held at 6:00 p.m., on Tuesday, July 19, 2011 and take place at:

San Dimas Community Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

July 19, 2011

City of Monrovia
Alice Griselle
Community Development Director
415 South Ivy Avenue
Monrovia, CA 91016

Subject: ***REVISED-*** Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Alice:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

July 19, 2011

City of Montclair
Steve Lustro
Community Development Director
5111 Bento Street
Montclair, CA 91763

Subject: ***REVISED-*** Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Steve:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Monterey Park
Ray Hamada
Planning Manager
320 West Newmark Avenue
Monterey Park, CA 91754

Subject: ***REVISED***- Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – Claremont, San Gabriel and South Arcadia Water Systems.

Dear Ray:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Pomona
Mark Laccaretto
Planning Division
505 South Garey Avenue
Pomona, CA 91766

Subject: ***REVISED-*** Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – Claremont, San Gabriel and South Arcadia Water Systems.

Dear Mark:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Rosemead
Bradford Johnson
Planning Director
8838 Valley Blvd.
Rosemead, CA 91770

Subject: ***REVISED***- Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – Claremont, San Gabriel and South Arcadia Water Systems.

Dear Bradford:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

May 17, 2011

City of San Dimas
Dan Coleman
Planning Manager
245 East Bonita Avenue
San Dimas, CA 91773

Subject: Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – San Dimas, Claremont, San Gabriel and South Arcadia Water Systems.

Dear Dan:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

San Dimas, Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review prior to the public hearing and can be reviewed during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plan at:

San Dimas Customer Service Office
121 Exchange Place
San Dimas, CA 91773

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP will be held at 6:00 p.m., on Tuesday, July 19, 2011 and take place at:

San Dimas Community Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of San Gabriel
Carol Banet
Planning Manager
425 South Mission Drive
San Gabriel, CA 91776

Subject: ***REVISED-*** Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Carol:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

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110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

Golden State
Water Company
A Subsidiary of American States Water Company

July 19, 2011

City of Temple City
Joseph Lambert
Community Development Director
9701 Las Tunas Drive
Temple City, CA 91780

Subject: ***REVISED-*** Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Joseph:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

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110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

July 19, 2011

City of Upland
Jeffrey Bloom
Planning Director
460 North Euclid Avenue
Upland, CA 91786

Subject: ***REVISED***-Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

Dear Jeffrey:

Golden State Water Company (GSWC) is providing you this notice pursuant to Water Code, section 10621, subdivision (b) of the Act, which requires an urban water supplier to notify any city or county within which it provides water that it is reviewing its plan and considering changes to the plan for the following water systems:

Claremont, San Gabriel and South Arcadia

The UWMP's will be available for public review one week prior to the public hearing during normal business hours. Please call 1-800-999-4033 to make an appointment to view the plans at the following locations:

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

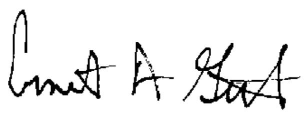
Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

A public hearing to solicit comments on the draft UWMP's will be held at 6:00 p.m., on *Thursday, August 18, 2011* and take place at:

San Dimas Community/Senior Center
201 E. Bonita Avenue
San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY



Ernest A. Gisler
Planning Manager

Golden State Water Company
A Subsidiary of American States Water Company

May 17, 2011

City of Walnut
Tom Wiener
Director of Community Development
21201 La Puente Road
Walnut, CA 91789

Subject: Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – San Dimas, Claremont, San Gabriel and South Arcadia Water Systems.

Dear Tom:

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121 Exchange Place
San Dimas, CA 91773

San Gabriel Customer Service Center
110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Center
689 West Foothill Blvd., Suite D
Claremont, CA 91711

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San Dimas, CA 91773

If you have any questions please contact me at (916) 853-3612.

Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

May 17, 2011

Country of Los Angeles
Richard Brudckner
Director Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company – San Dimas, Claremont, San Gabriel and South Arcadia Water Systems.

Dear Richard:

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Very truly yours,
GOLDEN STATE WATER COMPANY

Ernest A. Gisler
Planning Manager

July 19, 2011

Country of Los Angeles
Richard Brudckner
Director Department of Regional Planning
320 West Temple Street
Los Angeles, CA 90012

Subject: ***REVISED***- Notification of Public Hearing for the 2010 Urban Water Management Plan (UWMP) Golden State Water Company –Claremont, San Gabriel and South Arcadia Water Systems.

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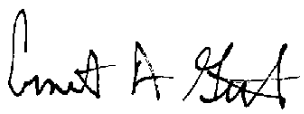

Ernest A. Gisler
Planning Manager

(Space below for use of County Clerk only)

SAN GABRIEL VALLEY TRIBUNE

Affiliated with
SGV Newspaper Group
1210 N. Azusa Canyon Road
West Covina, CA 91790

PROOF OF PUBLICATION
(2015.5 C.C.P.)

STATE OF CALIFORNIA

County of Los Angeles

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 printer of **SAN GABRIEL VALLEY TRIBUNE**, a newspaper of general circulation which has been adjudicated as a newspaper of general circulation by the Superior Court of the County of Los Angeles, State of California, on the date of September 10, 1957, Case Number 684891. 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:

6/15/11, 6/22/11

I declare under penalty of perjury that the foregoing is true and correct.

Executed at West Covina, LA Co. California
This 22nd day of June, 2011

Signature

12/22/9

A000002258060

Proof of Publication of

Golden State
Water Company
A Subsidiary of American States Water Company

Notice of Public Hearing

In conformance with the California Urban Water Management Planning Act, Golden State Water Company (GSWC) is hosting a public hearing on July 19, from 6 p.m. to 7 p.m. at the San Dimas Community Center, 201 East Bonita Avenue, San Dimas, to solicit comments on the Urban Water Management Plans (UWMPs) for the company's San Dimas, Claremont, San Gabriel and South Arcadia water systems.

GSWC's San Dimas Water System serves customers in San Dimas and portions of Charter Oaks, Covina, Glendora, La Verne, and Walnut.

The company's Claremont Water System serves customers in Claremont and portions of Montclair, Pomona, and Upland.

GSWC's San Gabriel and South Arcadia Water Systems serve customers in portions of Arcadia, El Monte, Irwindale, Monrovia, Monterey Park, Rosemead, San Gabriel, and Temple City.

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110 East Live Oak
Arcadia, CA 91006

Claremont Customer Service Office
689 West Foothill Blvd., Ste. D
Claremont, CA 91711

For more information about Golden State Water Company, visit www.gswater.com.

Published: June 15, 22, 2011
San Gabriel Valley Tribune Ad#42810

2115207

SAN GABRIEL VALLEY TRIBUNE

affiliated with
SGV Newspaper Group
1210 N. Azusa Canyon Road
West Covina, CA 91790

PROOF OF PUBLICATION

(2015.5 C.C.P.)

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County of Los Angeles

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5/17/11

I declare under penalty of perjury that the foregoing is true and correct.

Executed at West Covina, LA Co. California
this 17 day of MAY, 20 11

signature

Proof of Publication of

Golden State
Water Company

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Claremont, CA 91711

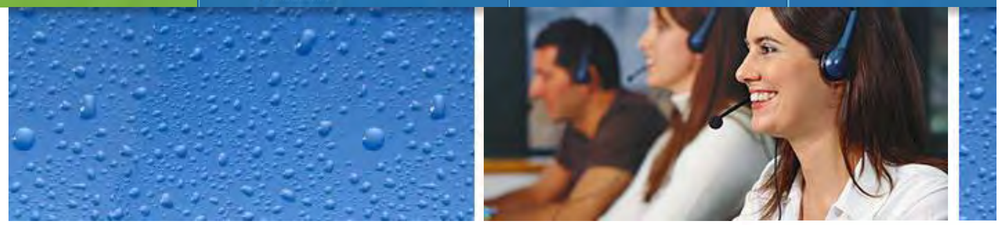
For more information about Golden State Water Company, visit www.gswater.com.

CNS-2102177
Published: May 17, 2011
San Gabriel Valley Tribune

Ad#201573

A000002245389

Golden State Water Company
A Subsidiary of American States Water Company



For 24-hour customer service or emergency please call

1-800-999-4033
24 hours, 7 days a week

877-933-9533
TTY (hearing impaired)

San Gabriel Valley Customer Service Area

WATER CONSERVATION TIPS

Don't use the toilet as a wastebasket and save up to 200 gallons of water a month.

Areas Serviced
This Customer Service Area serves approximately 12,200 customers in portions of Arcadia, El Monte, Irwindale, Monrovia, Monterey Park, Rosemead, San Gabriel, and Temple City

Office Location
San Gabriel CSA
110 East Live Oak
Arcadia, CA 91006

24 hour Customer Service and Emergency
800-999-4033 (24 hours, 7 days a week)
877-933-9533 (TTY hearing impaired)
Email: customerservice@gswater.com

Urban Water Management Plan
Public Meeting Notice

Golden State Water Company (GSWC) is in the process of updating its existing Urban Water Management Plan and is seeking public input. The plan is expected to be available for review one week prior to the meeting date.

See public notice for more information.

Golden State Water Company (GSWC) Files a Cost of Capital Application

A Cost of Capital application was filed May 2, 2011 with the the California Public Utilities Commission (CPUC). The CPUC regulates GSWC to ensure adequate levels of service are provided at the lowest reasonable costs.

In this filing, GSWC is requesting for the CPUC to review and authorize an increase in the cost of capital reflected in rates for 2012, 2013, and 2014. A decision is expected in December 2011.

A copy of the application is here.

New Rates Established in San Gabriel Valley Customer Service Area for 2011 and 2012

The CPUC issued a final decision on the company's 2008 General Rate Case on Nov. 19, 2010. The decision established rates for GSWC to charge customers for 2010, 2011 and 2012 in its Region III, which includes the San Gabriel Valley Customer Service Area.

Fact Sheet

RATES, SCHEDULES & TARIFFS

Residential Metered Service
Non-Residential Metered Service
Mandatory Conservation-Rationing (Schedule 14.1)

CLICK HERE to view all our rates, tariffs and advice letters

Third Tier Added to Tiered Rates for San Gabriel Valley Customer Service Area to Encourage Water Use Efficiency

GSWC residential customers in the utility's San Gabriel Valley Customer Service Area (CSA) had a third tier added to their tiered rates to promote water use efficiency.

The change, approved by the California Public Utilities Commission, began in December 2010. GSWC will not exceed CPUC authorized revenues as a result of tiered rates.

Here's how tiered rates work. Customers get charged for each unit of water they use. A unit is equal to one hundred cubic feet of water, or Ccf (748 gallons). In the San Gabriel Valley CSA, residential customers will pay the lowest rate for each Ccf they use in tier one, up to 13 Ccf. For every unit of water used in tier two, which is 14-21 Ccf, customers will pay a 15 percent higher rate. In tier three, customers will pay an additional 15 percent for every unit of water from 22 Ccf and above.

The top of the first tier is based on the average winter month usage for the service area. The top of second tier is based on the midpoint between the annual average usage and the average summer month usage for the service area. The per unit price differential between each tier is approximately 15 percent, a sufficient amount to encourage water use efficiency.

For more information, see our Residential Metered Service tariff in the article above.

LOW INCOME PROGRAM
California Alternate Rates for Water (CARW)

Golden State Water Company offers a discount through the California Alternate Rates for Water (CARW) program to eligible customers. The amount of the discount is $8 per month, which is equal to 15 percent of the average bill in your customer service area.

If you qualify for a rate discount on your electricity, you may be eligible for a discount on your water bill. Qualifications are based on the number of people living in your home and your total household income, including wages, government checks and benefits, and other financial support you and members of your family receive.

For further information, see the application below or contact our CARW hotline at (866) 360-CARW (2279).

Application (English)
Application (Spanish)

Visit Golden State Water Company's Demonstration Garden


Golden State Water Company's demonstration garden which features over 25 different California-friendly plants, drought tolerant turf, and a water-wise smart irrigation system recently received the California Landscape Contractors Association (CLCA) state-wide trophy award for sustainability.

The CLCA trophy awards recognize companies, institutions, municipalities and residents for their interest in preserving and maintaining a beautiful California. The first of an inaugural award to be given by the CLCA, the award was designed to recognize those projects containing sustainable installation elements, including: water management, planting and plant selection, sustainable construction methods.

Since the completion of the project, Golden State Water Company has exceeded a 56-month return on investment goal of 40 percent water savings.

Golden State Water Company's Water Shortage Plan for San Gabriel Valley Customers

Golden State Water Company (GSWC) developed a water shortage plan (Schedule 14.1) for its San Gabriel Customer Service Area that asks customers to voluntarily reduce their usage based on historical averages. Read additional plan details here. Each water allocation is based on the customer's average historical usage in 2004, 2005, and 2006, minus 10 percent.

Additionally, water use restrictions are now in place. GSWC may issue fines to customers who are involved in water wasting activities such as using water in any manner that results in run-off in gutters, waterways, patios, driveways or streets. Repeated violations could lead to the installation of flow restrictors at the customer's cost and suspension of service. See list of restrictions.

Should a mandatory allocation stage be implemented, exception forms will be available for customers to request an allocation adjustment. For example, if a household added several people since 2006, or if customers require additional water for medical needs, they may be eligible for a higher water budget. Water conservation practices and devices may be evaluated as part of the exception evaluation process. Since the targeted reductions in the current stage for San Gabriel customers are voluntary, allocation forms will not be processed at this time.

For more information, see our list of frequently asked questions about the water shortage plan, or call 1-800-999-4033.

Golden State has Invested More Than $19.7 Million in the San Gabriel Customer Service Area Since 2000

Golden State is continually improving its water infrastructure to ensure its supply, distribution, and storage systems are adequate. From 2000 to 2009, Golden State spent more than $19.7 million on improvements in the San Gabriel Customer Service Area, which includes portions of Arcadia, El Monte, Irwindale, Monrovia, Monterey Park, Rosemead, San Gabriel, and Temple City.

"To make high quality water readily available to all of our customers, we must continually invest in our water facilities, installing new infrastructure," said GSWC's Foothill District Manager Benjamin Lewis.

Golden State Water Company is regulated by the California Public Utilities Commission, which established a Water Action Plan. One of the objectives of the plan is to promote water infrastructure investment. Nationally, leaking pipes lose an estimated seven billion gallons of clean drinking water a day, according to the American Society of Civil Engineers.

WATER CONSERVATION REBATE PROGRAMS

Golden State Water Company partners with other agencies to offer various rebate programs as an incentive for customers to purchase water-efficient products. Here are some programs created for San Gabriel Valley Customer Service Area customers. Funding is limited.

High-Efficiency Clothes Washer (HECW) Rebates
For single-family homes call 1-888-376-3314 or visit www.socalwatersmart.com.
Up to $85 rebate for those who qualify.

High-Efficiency Toilet (HET) Rebates
Up to $125 for qualifying customers. Click here for application or call 1-800-999-4033.

Rotating Nozzles and Pressure Regulating Sprinkler Heads
Single-family homes, call 888-376-3314 or visit www.socalwatersmart.com.
Up to $4 per set rebate for those who qualify.

Weather-based Irrigation Controller (SmarTimer)
Single-family homes and multi-family buildings up to four units, call 888-376-3314 or visit www.socalwatersmart.com.
Up to $25 rebate per station for those who qualify.

SmarTimer rebates for multi-family buildings with more than four units are currently no longer available due to overwhelming public response.

To learn more about any of our current rebate programs, please call customer service at 800-999-4033.

WATER QUALITY ANNUAL REPORT

South Arcadia
South San Gabriel

Terms of Use | Privacy Policy

Home Page | About Golden State Water Company | Customer Service | Find Your Local Office | Understanding Your Bill
Conservation Information and Rebate Programs | Rates, Schedules and Tariffs | Water Quality | Contact Us

For 24-hour emergency and customer service, please call: 1-800-999-4033 or 877-933-9533 TTY (hearing impaired)
customerservice@gswater.com

Website design by NetPilot Web Solutions

AUGUST 18, 2011

2010 UWMP PUBLIC MEETING MINUTES FOR CLAREMONT, SOUTH ARCADIA & SOUTH SAN GABRIEL

GSWC ATTENDEES: ADRIAN COMBES, BEN LEWIS, TOM TRAFFAS, DIANE PINNICK

MEETING CALLED TO ORDER 6:02pm

SEE COMMENT CARDS FOR ALL QUESTIONS AND COMMENTS

MEETING ADJOURNED 7:06pm

Golden State
Water Company
A Subsidiary of American States Water Company

Comment Card
Claremont, South Arcadia, South San Gabriel
UWMP Public Hearing
Aug. 18, 2011

Name Richard Haskell

Service Address 421 Baughman Avenue

City Claremont

Question regarding future use of reclaimed waste water:

Does GSW have a vision for the use of reclaimed water in the Claremont community? How can GSW collaborate with Three Valleys, LACSD, & the City to provide reclaimed water for landscape irrigation? The section on reclaimed water is very disappointing.

Golden State
Water Company
A Subsidiary of American States Water Company

Comment Card
Claremont, South Arcadia, South San Gabriel
UWMP Public Hearing
Aug. 18, 2011

Name Marilee Scaff

Service Address 640 Alden Rd

City Claremont

Question Read comments

Response2010 Urban Water Management Plan for CLAREMONT
Hearing at San Dimas Community Center, August 18, 2011

From: Marilee K. Scaff 640 Alden Road Apt 2, Claremont, Ca 91711
C0Chair of the Water Task Force of League of Women Voters of Claremont Area

Golden State Water Company and Kennedy/Jenks Consultants are to be commended for the 2011 Revision of their Urban Water Management Plan for Claremont. It is comprehensive and detailed, and outlines well the current situation of water supplies for Pomona Valley.

However, there are errors and omissions and important issues not addressed which if corrected might make the Plan even more useful, and improve its function as a guide for future operations. I wpu ld like to call attention to the following:

1. Page vii. First, may I point out that advance notices of this public hearing are quite inadequate for inviting comment from citizens of Claremont. A notice in a newspaper in Covina is completely inaccessible to the reading public of Claremont; *Inland Valley Daily Bulletin* published in Pomona and *Claremont Courier* are the papers people in Pomona Valley read. Also you should remember that a great many of your clientele --several thousand college students, plus all residents of retirement communities, all persons living in multi-family housing and renters in single family homes never see their water bills, as they pay for water through their rents. Yet all of them should be concerned about their water supply.

2. Chapter 2. Demographics relies entirely on year 2000 population figures and uses these for projections. By the time the period covered by the report comes to an end, your figures will be 20 years out of date, and hence inadequate for planning.

One thing is sure: The next 20 years will not be like the last 20. Global warming, population increase, diminishing water availability from Sierra snow pack, changes in State Water Plan—all these and more will need to be taken into account.

As the 2010 Census figures are already available, a really useful plan must take the extra time and effort to put those into its calculations.

3. Claremont's population, furthermore, is quite unusual for a town of its size, and depending on SCAG's population projections do not fit this population. As a small town with eight colleges enrolling something like 14,000 students a majority of whom live in Residence Halls, plus four retirement communities with another 1,500 members, nearly half of the total population does not fit the expected pattern of household and employment projections adopted from 2008 RTP data. So your methodology for 2.3. section is inappropriate and will not give you reliable data.

This same problem infects your population projection of 39,015 by the year 2015 (Table 2.2). Claremont is essentially "built out"; there is almost no open space for normal community growth. Surely there must be other communities which do not fit this paradigm of never-ending growth. It certainly will affect planning and water distribution. This same inaccuracy I note in all your longer-range water use projections. You would more reasonably revise these projections.

4. May I commend the core of this report: Chapter 3 on historical water use, the present efforts at conservation, and future targets for reduction in per capita use. Claremont's "Sustainable City " Plan is in full agreement with GSWC on this subject and we all applaud both the data and your efforts.

However, one does note the inconsistency of amounts of water used by the residents, (Table 3-3) with per capita daily use varying between 269 and 345 in the last 6 years. Therefore, I am astonished that in face of this, you can we even speak of a target reduction of 50% to 142 by the year 2020? Is thata reasonable?

5. Affordable Housing/ Disadvantages resi8dents
Section 3-18 - Disadvantaged Community Water Projections implies that Claremont has no need of provision of affordable housing. This s not accurate. Claremont City lists at least the following:

Courier Village (City sponsored) is under construction on S. College for 45 seniors and 40 families (I'm less sure of the numbers)
Access Village (City sponsored) on N. Mountain for handicapped adults
Claremont Villa (City sponsored) on Indian Hill Blvd. for seniors, some affordable units.
Bonita Terrace for seniors
Claremont Village Green for seniors
Mountain Village for seniors
Emerson Village in Pomona, (to which Claremont refers seniors.)
Plus some Section 8 voucher-accepting commercial housing.

6. Ch 4.8 - 4.15 on Recycled water: thank you for the summary of the current situation about Recycled water. The Claremont College Consortium does expect to go ahead with recycling water for their own multiple-campus irrigation, which we hope will become a model for small scale recycling and that in the next 10 years there will be others.

7.One final addition: The State Water Plan calls for Southern California to seek to improve their reliance on local water supplies. What does GSWC plan about a possible **Water Emergency**, either because of a catastrophe on the delivery system of the State Water Project, or because of extended drought or damage to the Delta? The public should hear what kinds of thinking GSWC and MWD and TVMWD are doing in preparation for this really long-range possibility.

8. Finally, The League of Women Voters has a Water Task Force working for the last six years on water issues in the Claremont Area. This public-interest group has shared all our material with Golden State Water Company and all the other component users of water in Pomona Valley. Our aim has been to improve storm water spreading in Thompson Creek. We have a Feasibility Study, funded by Prop 84 bonds through the Los Angeles and San Gabriel Rivers and Mountains Conversancy which estimates that we could increase storm water spreading there by 30% to 150%. In addition the City of Claremont is willing to add this land to the Claremont Hills Wilderness Park, and manage it for the free usage by people from all over this region. Floyd Wicks as CEO of Golden State Water offered encouragement and support to this project. We urge Golden State Water Company to continue leadership in this project which would benefit the health and welfare of citizens all over this great Valley

how

Golden State
Water Company
A Subsidiary of American States Water Company

Comment Card
Claremont, South Arcadia, South San Gabriel
UWMP Public Hearing
Aug. 18, 2011

Name Freeman Allen

Service Address 394 Blaisdell Dr,

City Claremont

Question Written

Comments on the draft 2010 urban Water Management Plan - Claremont
August 18, 2011

The Urban Water Management Plan for Claremont contains a wealth of information, and is well written. The following comments address aspects that should be strengthened

1.1 Background

Solicitation of active participation of the population within the service area was minimal, and should be enhanced in the future.

Page 1-6. According to the Urban Water Management Plan Act:

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

In fact:

- Notice of the Hearings on July 19 and August 18 were not published in Claremont. The population in this part of the service area was not encouraged to be involved.
- No notice of the Hearing was posted in the Claremont office of Golden States Water. Upon inquiry as to the time and location of the Hearing the customer representative referred to the GSW web site for the information. The Notice of public Hearing printed from the web site instructs the customer to "call 1-800-999-4033 to make an appointment to view the plan at the (Claremont office)". At that number it was difficult to find anyone who knew of the Hearing. The information provided was to "contact the local office; no appointment is necessary".
- At the local office, earlier today, the only information offered about the Plan was reference to the web site.

I attended the July 19 hearing and suggested that the August 18 Heating be publicized in the local newspaper, the Claremont Courier, and that copies of the Plan be made easily accessible at locations such as the Claremont Public Library. That was not done.

Clearly involvement of the population in the service area has not been encouraged. This appears to be contrary to the intent of the Act, and an opportunity lost to involve the public in cooperative planning for the future of their water supply.

The relevant population should be involved and encouraged to participate. Golden States Water carries out a very active and well-publicized program encouraging water conservation. I suggest a similar active program be used to encourage involvement in water management planning.

If the Plan is to be relied on by the CPUC in regulatory decision-making accuracy and completeness will be important. The following comments relate to these features.

2.2 Demographics

Affordable housing units are presently being constructed. This Plan says they "may be implemented".

2.3 Population, Housing and Employment

It was apparently not possible to use the latest census data. More accurate and up-to-date data should be used in regulatory decisions.

4.1. Water Sources

The reference to the Covina Irrigation Company does not seem relevant.

Table 4.4.

Pumping for 2006 and 2007 appears to exceed pumping rights. Are these figures correct?

4.8.3 Potential and Projected Use (of recycled water).

Planning for a scalping plant at the Claremont Colleges is correctly stated to be in the preliminary stages. However, it now seems likely this plant will be constructed and in operation within a few years. If so, the recycled water used for irrigation will amount to about 5% of Claremont's total usage and similarly reduce the need for more expensive imported water. This should be a consideration in CPUC regulatory decisions.

6.1.3 Water Supply

PVPA also owns and operates the Thompson Creek Spreading Grounds. This source of water is much smaller than the San Antonio Spreading Grounds but it does provide water for the Six Basins Aquifer from the San Gabriel River watershed.

8.3 Catastrophic Supply Interruption Plan

This section should specifically address the possibility of disruption of the State Water System for long periods of time. The Sacramento/San Joaquin river delta is notably vulnerable.

C. Freeman Allen, PhD
Professor Emeritus Chemistry, Pomona College
Co-Chair, Sustainable Claremont
Director for Sustainability, League of Women Voters of the Claremont Area

Golden State Water Company
A Subsidiary of American States Water Company

Urban Water Management Planning Meeting
Sign-In Sheet
Claremont, South San Gabriel, South Arcadia Systems
Aug. 18, 2011

Name	Address	Phone	Email
Jim Pedroza	580 Cinderella Dr	909 864-2047	
Richard Haskell	421 Baughman Ave Claremont	909-625-2223	richard_haskell@hmc.edu
CHRIS VEIRS	PO BOX 880 CLAREMONT	(909) 399-5486	CVEIRS@ci.CLAREMONT.CA.US
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Appendix C

Council Annual Reports for Demand Management Measures

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: **Golden State Water Company** **District Name:** **San Gabriel Valley** **CUWCC Unit #:** **5045**
Retail

Primary Contact John Turner **Telephone** (909) 394-3600 Ext **Email:** johnturner@gswater.com

Compliance Option Chosen By Reporting Agency:
(Traditional, Flex Track or GPCD)
GPCD if used:

GPCD in 2010	**144**
GPCD Target for 2018	152

Year	Report	Target		Highest Acceptable Bound	
		% Base	GPCD	% Base	GPCD
2010	1	96.4%	179	100%	185
2012	2	92.8%	172	96%	179
2014	3	89.2%	165	93%	172
2016	4	85.6%	159	89%	165
2018	5	82.0%	152	82%	152

Not on Track if 2010 GPCD is ≥ than target

GPCD in 201 **144**
Highest Acceptable GPCD for **185**

On Track

Agency: **Golden State Water Company** District Name: **San Gabriel Valley** CUWCC Unit #: **5045**
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Foundational BMPs

BMP 1.1 Operational Practices

Conservation Coordinator provided with necessary resources to implement BMPs?

		2009	2010
1.Conservation Coordinator provided with necessary resources to implement BMPs?	Name	Albert Frias	Albert Frias
	Title	Water Conservation Coordinator	Water Conservation Coordinator
	Email		
		On Track	On Track

2. Water waste prevention documentation

Descriptive File	Rule 20 = Water Conservation. Rule 11B = Discontinuance of Service based upon Water Wastage. R
Descriptive File 2010	
URL	Where negligent or wasteful use of water exists on customer's premises, the utility may discontinue the service if such practices are not remedied within five days after it has given the customer written notice to such effect.
URL 2010	http://www.aswater.com/Organization/Rates_and_Regulations/Rates_and_Tariffs/Rule_11.pdf
Describe Ordinance Terms	

On Track if any one of the 6 ordinance actions done, plus documentation or links provided

On Track On Track

Agency: **Golden State Water Company** **District Name:** **San Gabriel Valley** **CUWCC Unit #:** **5045**
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

BMP 1.2 Water Loss Control

	2009		
Complete a prescreening Audit			On Track if Yes
Metered Sales	**6,081**		
Verifiable Other Uses	**143**		
Total Supply	**6,511**		
(Metered Sales + System uses)/ Total Supply >0.89	0.96	**On Track**	On Track if =>.89, Not on Track if No
If ratio is less than 0.9, complete a full scale Audit in 2009?	**No**		On Track if Yes
Verify Data with Records on File?	**Yes**	**On Track**	On Track if Yes
Operate a system Leak Detection Program?	**Yes**	**On Track**	On Track if Yes

		2010		
Compile Standard Water Audit using AWWA Software?		Yes	**On Track**	On Track if Yes, Not on Track if No
AWWA file provided to CUWCC?	Yes		**On Track**	On Track if Yes, Not on Track if No
AWWA Water Audit Validity Score?		84		Info only until 2012
Completed Training in AWWA Audit Method?		Yes		
Completed Training in Component Analysis Process?		No		Info only until 2012
Complete Component Analysis?		No		Info only until 2012
Repaired all leaks and breaks to the extent cost effective?		Yes	**On Track**	On Track if Yes, Not on Track if No
Locate and repair unreported leaks to the extent cost effective.		Yes	**On Track**	On Track if Yes, Not on Track if No
Maintain a record-keeping system for the repair of reported leaks, including time of report, leak location, type of leaking pipe segment or fitting, and leak running time from report to repair.		Yes		Info only until 2012

Provided 7 types of Water Loss Control Info

Leaks Repaired	Value Real Losses	Value Apparent Losses	Miles Surveyed	Press Reduction	Cost of Interventions	Water Saved
18	$1,540.00	$1,540.00	38			41

Info only until 2012

Agency: **Golden State Water Company** District Name: **San Gabriel Valley** CUWCC Unit #: **5045**
Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

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

		2009		2010		
Exemption or 'At least as Effective As' accepted by CUWCC						If signed MOU prior to 31 Dec 1997, On Track if all connections metered; If signed after 31 Dec 1997, complete meter installations by 1 July 2012 or within 6 yrs of signing and 20% biannual reduction of unmetered connections.
Numbered Unmetered Accounts	2008	0	On Track	0	On Track	On Track if no unmetered accounts
Metered Accounts billed by volume of use		Yes	On Track	Yes	On Track	Volumetric billing required for all connections on same schedule as metering
Number of CII accounts with Mixed Use meters		120		120		Info only
Conducted a feasibility study to assess merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?		No		No		Info only until 2012
Feasibility Study provided to CUWCC?		No	On Track until 2012	No	On Track until 2012	On Track if Yes, Not on Track if No
Completed a written plan, policy or program to test, repair and replace meters		Yes	On Track	Yes	On Track	On Track if Yes, Not on Track if No

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Agency: **Golden State Water Company** **District Name:** **San Gabriel Valley** **CUWCC Unit #:** **5045**
Retail

Primary Contact John Turner **Email:** johnturner@gswater.com

1.4 Retail Conservation Pricing

Metered Water Rate Structure

On Track if: Increasing Block, Uniform, Allocation, Standby Service; Not on Track if otherwise

Customer Class	2009 Rate Type	Conserving Rate?	Customer Class	2010 Rate Type	Conserving Rate?
Single-Family	Increasing Block	Yes	Single-Family	Increasing Block	Yes
Multi-Family	Increasing Block	Yes	Multi-Family	Increasing Block	Yes
Commercial	Uniform	Yes	Commercial	Uniform	Yes
Industrial	Uniform	Yes	Industrial	Uniform	Yes
Institutional	Uniform	Yes	Institutional	Uniform	Yes
	On Track			On Track	

Year Volumetric Rates began for Agencies with some Unmetered Accounts

Info only

Agencies with Partially Metered Service Areas: If signed MOU prior to 31 Dec. 1997, implementation starts no later than 1July 2010. If signed MOU after 31 Dec. 1997, implementation starts no later than 1July 2013, or within seven years of signing the MOU,

Agency: **Golden State Water Company** **District Name:** **San Gabriel Valley** **CUWCC Unit #:** **5045**

Retail

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

Adequacy of Volumetric Rates) for Agencies with No Unmetered Accounts

Customer Class	2009 Rate Type	2009 Volumetric Revenues $1000s	2010 Rate Type	2010 Volumetric Revenues $1000s
Single-Family	Increasing Block	$ 2,994	Single-Family	$ 2,930
Multi-Family	Increasing Block	$ 370	Multi-Family	$ 362
Commercial	Uniform	$ 1,791	Commercial	$ 1,753
Industrial	Uniform	$ 26	Industrial	$ 26
Institutional	Uniform	$ 375	Institutional	$ 366
Dedicated Irrigation		$ 136		$ 133
Other		$ 35		$ 34
Total Revenue Commodity Charges (V):		$ 5,728		$ 5,605
Total Revenue Fixed Charges (M):		$ 3,343		$ 3,271
Calculate: V / (V + M):		63%		63%
		Info Only untill 2011		Info Only untill 2011

Agency Choices for rates:

A) Agencies signing MOU prior to 13 June2007, implementation starts 1 July2007: On Track if (V / (V + M) ≥ 70% x .8 = **56% for 2009** and 70%x0.90 = **63% for 2010**; Not on track if (V / (V + M)) < 70%;

B) Use Canadian model. Agencies signing MOU after 13June2007, implementation starts July 1 of year following signing.

Canadian Water & Wastewater Rate Design Model Used and Provided to CUWCC — 2009: **No** (Info Only untill 2011) — 2010: **No** (Info Only untill 2011)

If Canadian Model is used, was 1 year or 3 year period applied?

Wastewater Rates

	2009	2010
Does Agency Provide Sewer Service?	**No**	**No**

If 'No', then wastewater rate info not required.

Customer Class	2009 Rate Type	Conserving Rate?	Customer Class	2010 Rate Type	Conserving Rate?
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
		Yes			Yes
	On Track			**On Track**	

On Track if: 'Increasing Block', 'Uniform', 'based on long term marginal cost' or 'next unit of capacity'

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

BMP 2. EDUCATION PROGRAMS

BMP 2.1 Public Outreach Actions Implemented and Reported to CUWCC

	2009	2010	
Does a wholesale agency implement Public Outrach Programs for this unility's benefit?	Yes	**Yes**	Yes/No
Names of Wholesale Agencies	**Upper San Gabriel Valley Munipal Water District and MWD Los angeles**	**Upper San Gabriel Valley Munipal Water District and MWD Los angeles**	
1) Contacts with the public (minimum = 4 times per year)	18	18	
2) Water supplier contacts with media (minimum = 4 times per year, i.e., at least quarterly).	8	8	
3) An actively maintained website that is updated regularly (minimum = 4 times per year, i.e., at least quarterly).	Yes	Yes	All 6 action types implemented and reported to CUWCC to be 'On Track')
4) Description of materials used to meet minimum requirement.	Newspaper contacts Television contacts	Newspaper contacts Television contacts	
5) Annual budget for public outreach program.	$ 6,100	$ 6,100	
6) Description of all other outreach programs	Full description will be online in the BMP reporting database	Full description will be online in the BMP reporting database	
	On Track	**OnTrack**	

CUWCC BMP RETAIL COVERAGE REPORT 2009-2010

Foundation Best Management Practices for Urban Water Efficiency

2.2 School Education Programs Implemented and Reported to CUWCC

	2009	2010	
Does a wholesale agency implement School Education Programs for this unility's benefit?	No	No	
Name of Wholesale Supplier?	Description available in the online BMP reporting system when available.	Description available in the online BMP reporting system when available.	
3) Materials Distributed to K-6?	Yes	Yes	
Materials distributed to 7-12 students?	No	No	Info Only
	On Track	On Track	

Appendix D

CPUC Water Conservation and Rationing Rules and Regulations

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE

A. Customer's Request for Discontinuance of Service

1. A customer may have service discontinued by giving not less than two day's advance notice thereof to the utility. Charges for service may be required to be paid until the requested date of discontinuance or such later date as will provide not less than the required two days' advance notice.

2. When such notice is not given, the customer will be required to pay for service until two days after the utility has knowledge that the customer has vacated the premises or otherwise has discontinued water service.

B. Discontinuance of Service by Utility

1. For Nonpayment of Bills

a. Past-Due Bills. When bills are rendered monthly or bimonthly, they will be considered past due if not paid within 19 days from the date of mailing. The utility shall allow every residential customer at least 19 days from the date of mailing its bill for services, postage prepaid, to make payment of the bill. The utility may not discontinue residential service for nonpayment of a delinquent account unless the utility first gives notice of the delinquency and impeding discontinuance, at least 10 days prior to the proposed discontinuance, by means of a notice mailed, postage prepaid, to the customer to whom the service is provided if different than to whom the service is billed, not earlier than (T) 19 days from the date of mailing the utility's bill for services. The 10-day discontinuance of service notice shall not commence until five days after the mailing of the notice.

b. When a bill for water service has become past due and a 10-day discontinuance of residential service notice or a 7-day discontinuance of residential service notice for nonpayment has been issued, service may be discontinued if bill is not paid within the time required by such notice. The customer's service, however, will not be discontinued for nonpayment until the amount of any deposit made to establish credit for that service has been fully absorbed.

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Discontinuance of Services by Utility (Continued)

1. For Nonpayment of Bills (Continued)

c. Any customer, residential as well as nonresidential, who has initiated a billing complaint or requested an investigation within 5 days of receiving a disputed bill or who has, before discontinuance of service made a request for extension of the payment period of a bill asserted to be beyond the means of the customer to pay in full within the normal period for payment, shall not have residential water service discontinued for nonpayment during the pendency of an investigation by the utility of such customer complaint or request and shall be given an opportunity for review of the complaint, investigation, or request by a review manager of the utility. The review shall include consideration of whether a residential customer shall be permitted to make installment payments on any unpaid balance of the delinquent account over a reasonable period of time, not to exceed 12 months. Such service shall not be discontinued for nonpayment for any customer complying with an installment payment agreement entered into with the utility, provided the customer also keeps current his account for water service as charges accrue in each subsequent billing period. If a residential customer fails to comply with an installment payment agreement, the utility will give a 10-day discontinuance of service notice before discontinuing such service, but such notice shall not entitle the customer to further investigation by the utility.

d. Any customer whose complaint or request for an investigation pursuant to subdivision (c) has resulted in an adverse determination by the utility may appeal the determination to the Commission. Any subsequent appeal of the dispute or complaint to the Commission shall be in accordance with the Commission adopted Rules of Practice and Procedure.

e. Service to a residential water customer will not be discontinued for nonpayment when the customer has previously established to the satisfaction of the utility that:

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Discontinuance of Services by Utility (Continued)

1. For Nonpayment of Bills (Continued)

e. (Continued)

(1) The customer is elderly (age 62 or over) or handicapped,* or upon certification of a licensed physical or surgeon that to discontinue water will be life threatening to the customer; and

*Proof of age must be supported by certificate of birth, driver's license, passport or other reliable document. Proof of handicap must be by certification from a licensed physician, surgeon, public health nurse or social worker.

(2) The customer is temporarily unable to pay for such service in accordance with the provisions of the utility's tariffs; and

(3) The customer is willing to arrange installment payments satisfactory to the utility, over a period not to exceed 12 months, including arrangements for prompt payment of subsequent bills.

However, service may be discontinued to any customer who does not comply with an installment payment agreement or keep current his account for water service as charges accrue in each subsequent billing period.

(f) A customer's residential service may be discontinued for nonpayment of a bill for residential service previously rendered him at any location served by the utility.

A nonresidential service may be discontinued for nonpayment of a bill for residential as well as nonresidential service previously rendered him at any location served by the utility.

The discontinuance of service notice as set forth in subdivision (b) will be given in both cases stated above before discontinuance of service takes place.

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Discontinuance of Services by Utility (Continued)

1. For Nonpayment of Bills (Continued)

f. (Continued)

Residential services will not, however, be discontinued for nonpayment of bills for separate nonresidential service.

g. Service will not be discontinued by reason of delinquency in payment for service on any Saturday, Sunday, legal holiday, or at any time during which the business offices of the utility are not open to the public.

h. Where water service is provided to residential users in a multi-unit residential structure, mobilehome park, or permanent residential structures in a labor camp, where the owner, manager, or operator is listed by the utility as the customer of record, the utility will make every good faith effort to inform the users, when the account is in arrears, that service will be dicontinued. Notice will be in as prescribed in subdivision (a) above, and in Rules Nos. 5 and 8. (T)

(T)

(1) Where said users are individually metered. (N)

The utility is not required to make service available to these users unless each user agrees to the terms and conditions of service and meets the requirement of the law and the utility's rules and tariffs. However, if one or more users are willing and able to assume responsibility for subsequent charges by these users to the account to the satisfaction of the utility, and if there is a practical physical means, legally available to the utility of selectively providing services to these users who have met the requirements of the utility's rules and tariffs, the utility will make service available to these users. For these selected users establishment of credit will be as prescribed in Rule No. 6, except that where prior service for a period of time is a condition for establishing credit with the utility, proof that is acceptable to the utility of residence and prompt payment of rent or other credit obligation during that period of time is a satisfactory equivalent.

(N)

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Discontinuance of Services by Utility (Continued)

1. For Nonpayment of Bills (Continued)

h. (Continued)

(2) Where said users are master metered. (N)

The utility is not required to make service available to these users unless each user agrees to the terms and conditions of service, and meets the requirements of the law and the utility's rules and tariffs and the following:

The same Rule 11, item B.1.h. (1) above which applies to individually metered users also applies to master metered users, except a representative may act on the behalf of a master metered user, and the utility will not discontinue service in any of the following situations:

(a) During the pendency of an investigation by the utility of a master-meter customer dispute or complaint.

(b) When the master-metered customer has been granted an extension of the period for repayment of a bill.

(c) For an indebtedness owned by the master metered customer to any other person or corporation or when the obligation represented by the delinquent account or any other indebtedness was incurred with a person or corporation other than the utility demanding payment therefor.

(d) When a delinquent account relates to another property owned, managed, or operated by the master-metered customer.

(e) When a public health or building officer certifies that determination would result in a significant threat to the health or safety of the residential occupants or the public. Proof of age or handicap are described in Rule 11.B.1.e. (N)

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Discontinuance of Services by Utility (Continued)

1. For Nonpayment of Bills (Continued)

i. A reasonable attempt must be made by the utility to personally contact an adult person on the residential customer's premises either by telephone, or in person, at hours prior to discontinuance. For elderly or (C)
handicapped residential customers, the utility shall provide at least 48 hours' notice by telephone or in person. For these customers, if telephone or personal contact cannot be made, a notice of discontinuance of service shall be posted in a conspicuous location at the service address at least 48 hours prior to discontinuance. Such notice shall be (N)
independent of and in addition to, other notices(s) as may be prescribed (N)
in the utility's tariffs. (N)

j. Residential Customer's Remedies Upon Receipt of Discontinuance Notice.

(1) If upon receipt of a 10 day discontinuance notice, a residential customer is unable to pay, he must contact the utility before discontinuance of service to make payment arrangements to avoid discontinuance of service.

(2) If, after contacting the utility, the residential customer alleges to the Commission an inability to pay and that he is unable to make payment arrangements with the utility he should write to the Commission's Consumer Affairs Branch (CAB) to make an informal complaint. This action must be taken within the 10-day discontinuance of service notice.

(3) The CAB's resolution of the matter will be reported to the utility and the residential customer within ten business days after receipt of the informal complaint. If the customer is not satisfied with such resolution, he must file, within ten business days after the date of the CAB's letter, a formal complaint with the Commission under Public Utilities Code Section 1702 on a form provided by the CAB.

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Discontinuance of Services by Utility (Continued)

1. For Nonpayment of Bills (Continued)

j. Residential Customer's Remedies Upon Receipt of Discontinuance Notice.

(4) Failure of the residential as well as the nonresidential customer to observe these time limits shall entitle the utility to insist upon payment or, upon failure to pay, to discontinue the customer's service.

k. Designation of a Third-Party Representative (Elderly or Handicapped only)

(1) Customer must inform utility if he desires that a third party receive discontinuance or other notices on his behalf.

(2) Utility must be advised of name, address and telephone number of third party with a letter from third party accepting this responsibility.

(3) Only customers who certify that they are elderly or handicapped are entitled to third-party representation.*

2. For Noncompliance with Rules

The utility may discontinue service to any customer for violation of these rules after it has given the customer at least five days' written notice of such intention. Where safety of water supply is endangered, service may be discontinued immediately without notice.

3. For Waste of Water

a. Where negligent or wasteful use of water exists on customer's premises, the utility may discontinue the service if such practices are not remedied within five days after it has given the customer written notice to such effect.

(Continued)

* Proof of age must be supported by certificate of birth, driver's license, passport or other reliable document. Proof of handicap must be by certification from a licensed physician, public health nurse or social worker.

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

B. Continuance of Services by Utility (Continued)

3. For Waste of Water (Continued)

b. In order to protect itself against serious and unnecessary waste or misuse of water, the utility may meter any flat rate service and apply the regularly established meter rates where the customer continues to misuse or waste water beyond five days after the utility has given the customer written notice to remedy such practices.

4. For Unsafe Apparatus or Where Service is Detrimental or Damaging to the Utility or its Customers

If an unsafe or hazardous condition is found to exist on the customer's premise, or if the use of water thereon by apparatus, appliances, equipment or otherwise is found to be detrimental or damaging to the utility or its customers, the service may be shutoff without notice. The utility will notify the customer immediately of the reasons for the discontinuance and the corrective action to be taken by the customer before service can be restored.

5. For Fraudulent Use of Service

When the utility has discovered that a customer has obtained service by fraudulent means, or has diverted the water service for unauthorized use, the service to that customer may be discontinued without notice. The utility will not restore service to such customer until that customer has complied with all filed rules and reasonable requirements of the utility and the utility has been reimbursed for the full amount of the service rendered and the actual cost to the utility incurred by reason of the fraudulent use.

C. Restoration of Service

1. Reconnection Charge

Where service has been discontinued for violation of these rules or for nonpayment of bills, the utility may charge $25.00 for reconnection of service during regular working hours or $37.50 (I)
for reconnection of service at other than regular working hours when the customer has requested that the reconnection be made at other than regular working hours.

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

C. Restoration of Service (Continued)

2. To be Made During Regular Working Hours

The utility will endeavor to make reconnections during regular working hours on the day of the request, if the conditions permit; otherwise reconnections will be made on the regular working day following the day the request is made.

3. To Be Made at Other Than Regular Working Hours

When a customer has requested that the reconnection be made at other than regular working hours, the utility will reasonably endeavor to so make the reconnection if practicable under the circumstances.

4. Wrongful Discontinuance

A service wrongfully discontinued by the utility, must be restored without charge for the restoration to the customer within 24 hours.

D. Refusal to Serve

1 Conditions for Refusal

The utility may refuse to serve an applicant for service under the following conditions:

a. If the applicant fails to comply with any of the rules as filed with the Public Utilities Commission.

b. If the intended use of the service is of such a nature that it will be detrimental or injurious to existing customers.

c. If, in the judgment of the utility, the applicant's installation for utilizing the service is unsafe or hazardous, or of such nature that satisfactory service cannot be rendered.

(Continued)

Rule No. 11

DISCONTINUANCE AND RESTORATION OF SERVICE
(Continued)

C. Restoration of Service (Continued)

1. Conditions for Refusal (Continued)

d. Where service has been discontinued for fraudulent use, the utility will not serve an applicant until it has determined that all conditions of fraudulent use or practice has been corrected.

2. Notification to Customers

When an applicant is refused service under the provisions of this rule, the utility will notify the applicant promptly of the reason for the refusal to service and of the right of applicant to appeal the utility's decision to the Public Utilities Commission.

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION

(N)

1. If water supplies are projected to be insufficient to meet normal customer demand, and are beyond the control of the utility, the utility may elect to implement voluntary conservation using the portion of this plan set forth in Section A of this Rule, after notifying the Director of the Commission's Division of Water and Audits of its intent, via a letter in both hard-copy and e-mailed formats.

2. Prior to declaration of mandatory rationing, a utility may request authorization of a Schedule 14.1 – Staged Mandatory Water Conservation and Rationing tariff, via a Tier 2 advice letter.

3. If, in the opinion of the utility, more stringent water measures are required, the utility shall request Commission authorization to implement the staged mandatory conservation and rationing measures set forth in Sections B through E.

4. The utility shall file a Tier 1 advice letter to request activation of a particular stage of Schedule 14.1 – Staged Mandatory Water Conservation and Rationing tariff.

   a. If a Declaration of Mandatory Rationing is made by utility or governing agency, or

   b. If the utility is unable to address voluntary conservation levels set by itself, supplier, or governing agency, or

   c. If the utility chooses to subsequently activate a different stage

5. When Schedule 14.1 is in effect and the utility determines that water supplies are again sufficient to meet normal demands, and mandatory conservation and rationing measures are no longer necessary, the utility shall seek Commission approval via a Tier 1 advice letter to de-activate the particular stage of mandatory rationing that had been authorized.

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION (Continued) (N)

6. In the event of a water supply shortage requiring a voluntary or mandatory program, the utility shall make available to its customers water conservation kits as required by its version of Rule 20. The utility shall notify all customers of the availability of conservation kits via a bill insert or direct mailers.

A. CONSERVATION - NON-ESSENTIAL OR UNAUTHORIZED WATER USE

No customer shall use utility-supplied water for non-essential or unauthorized uses, including but not limited to:

1. Use of potable water for more than minimal landscaping, as defined in the landscaping regulated of the jurisdiction or as described in Article 10.8 of the California Government Code in connection with new construction;
2. Use through any meter when the company has notified the customer in writing to repair a broken or defective plumbing, sprinkler, watering or irrigation system and the customer has failed to effect such repairs within five business days;
3. Use of potable water which results in flooding or runoff in gutters or streets;
4. Individual private washing of cars with a hose except with the use of a positive action shut-off nozzle. Use of potable water for washing commercial aircraft, cars, buses, boats, trailers, or other commercial vehicles at any time, except at commercial or fleet vehicle or boat washing facilities operated at a fixed location where equipment using water is properly maintained to avoid wasteful use;
5. Use of potable water washing buildings, structures, , driveways, patios, parking lots, tennis courts, or other hard-surfaced areas, except in the cases where health and safety are at risk;
6. Use of potable water to irrigate turf, lawns, gardens, or ornamental landscaping by means other than drip irrigation, or hand watering without quick acting positive action shut-off nozzles, on a specific schedule, for example: 1) before 8:00 a.m. and after 7:00 p.m.; 2) every other day; or 3) selected days of the week; (N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

GENERAL INFORMATION (Continued)

(N)

7. Use of potable water for watering streets with trucks, except for initial wash-down for construction purposes (if street sweeping is not feasible), or to protect the health and safety of the public;
8. Use of potable water for construction purposes, such as consolidation of backfill, dust control, or other uses unless no other source of water or other method can be used.
9. Use of potable water for construction purposes unless no other source of water or other method can be used;
10. Use of potable water for street cleaning;
11. Operation of commercial car washes without recycling at least 50% of the potable water used per cycle;
12. Use of potable water for watering outside plants, lawn, landscape and turf areas during certain hours if and when specified in Schedule No. 14.1 when the schedule is in effect;
13. Use of potable water for decorative fountains or the filling or topping off of decorative lakes or ponds. Exceptions are made for those decorative fountains, lakes, or ponds which utilize recycled water;
14. Use of potable water for the filling or refilling of swimming pools.
15. Service of water by any restaurant except upon the request of a patron; and
16. Use of potable water to flush hydrants, except where required for public health or safety.

B. STAGED MANDATORY RATIONING OF WATER USAGE

1. Prior to declaration of mandatory rationing, a utility may request authorization of a Schedule 14.1 – Staged Mandatory Water Conservation and Rationing tariff, via a Tier 2 advice letter, with full justification. The utility may not institute Schedule 14.1 until it has been authorized to do so by the Commission.

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

(N)

STAGED MANDATORY RATIONING OF WATER USAGE (Continued)

a. A staged Schedule 14.1 that has been authorized by the Commission shall remain dormant until triggered by specific conditions detailed in the Schedule 14.1 tariff and utility has requested and received authorization for activating a stage by Commission.

b. Notice of the Tier 2 advice letter (example shown in Appendix C) and associated public participation hearing shall be provided to customers under General Order (GO) 96-B rules.

c. Utility shall comply with all requirements of Sections 350-358 of the California Water Code.

d. The Tier 2 advice letter requesting institution of a Schedule 14.1 shall include but not be limited to:

   i. Proposed Schedule 14.1 tariff, which shall include but not be limited to:

      1. Applicability,
      2. Territory applicable to,
      3. A detailed description of each Stage of Rationing,
      4. A detailed description of the Trigger that Activates each Stage of Rationing,
      5. A detailed description of each water use restriction for each stage of rationing.
      6. Water use violation levels, written warning levels, associated fines, and exception procedures,

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

STAGED MANDATORY RATIONING OF WATER USAGE (Continued) Page 5

7. Conditions for installation of a flow restrictor, (N)
8. Charges for removal of flow restrictors, and
9. Special Conditions

ii. Justification for, and documentation and calculations in support of plan, including but not limited to each item in B.1.d.i above.

2. Number of Stages requested by each utility/district may vary, depending on specifics of water shortage event.
3. The utility shall file a Tier 1 advice letter to request activation of a particular stage of Schedule 14.1 – Staged Mandatory Water Conservation and Rationing tariff.
   a. If a Declaration of Mandatory Rationing is made by utility or governing agency,
   b. If the utility is unable to address voluntary conservation levels set by itself or governing agency, or
   c. If the utility chooses to subsequently activate a different stage.
   d. The Tier 1 advice letter requesting activation of a Schedule 14.1 shall include but not be limited to:
      i. Justification for activating this particular stage of mandatory rationing, as well as period during which this particular stage of mandatory conservation and rationing measures will be in effect.
      ii. When the utility requests activation of a particular Stage, it shall notify its customers as detailed in Section E, below.
4. All monies collected by the utility through water use violation fines shall not be accounted for as income.
5. All expenses incurred by utility to implement Rule 14.1 and Schedule 14.1 that have not been considered in a General Rate Case or other proceeding, shall be recoverable by utility if determined to be reasonable by Commission.

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

STAGED MANDATORY RATIONING OF WATER USAGE (Continued) Page 6

(N)

a. These monies shall be accumulated by the utility in a separate memorandum account for disposition as directed or authorized from time to time by the Commission.

C. ENFORCEMENT OF STAGED MANDATORY CONSERVATION AND RATIONING

1. The water use restrictions of the conservation program, in Section A of this rule, become mandatory when the authorized Schedule 14.1-Staged Mandatory Rationing Program is triggered, the utility files a Tier 1 advice letter requesting activation of a particular stage, and authorization is received from the Commission.
   a. In the event a customer is observed to be using water for any nonessential or unauthorized use as defined in Section A of this rule, the utility may charge a water use violation fine in accordance with Schedule No. 14.1.

2. The utility may, after one written warning and one non-essential or unauthorized use violation notice , install a flow-restricting device on the service line of any customer observed by utility personnel to be using water for any non-essential or unauthorized use as defined in Section A above.

3. A flow restrictor shall not restrict water delivery by greater than 50% of normal flow. The restricting device may be removed only by the utility, only after a three-day period has elapsed, and only upon payment of the appropriate removal charge as set forth in Schedule No. 14.1.

4. After the removal of the restricting device, if any non-essential or unauthorized use of water shall continue, the utility may install another flow-restricting device. This device shall remain in place until water supply conditions warrant its removal and until the appropriate charge for removal has been paid to the utility.

5. Any tampering with flow restricting device by customer can result in fines or discontinuation of water use at the utility's discretion.

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

ENFORCEMENT OF STAGED MANDATORY CONSERVATION AND RATIONING
(Continued)

(N)

6. If, despite installation of such flow-restricting device pursuant to the provisions of the previous enforcement conditions, any such non-essential or unauthorized use of water shall continue, then the utility may discontinue water service to such customer. In such latter event, a charge as provided in Rule No. 11 shall be paid to the utility as a condition to restoration of service.

7. All monies collected by the utility through water use violation fines shall not be accounted for as income. All expenses incurred by utility to implement Rule 14.1 and Schedule 14.1 that have not been considered in a General Rate Case or other proceeding, shall be recoverable by utility if determined to be reasonable by Commission. These additional monies shall be accumulated by the utility in a separate memorandum account for disposition as directed or authorized from time to time by the Commission.

8. The charge for removal of a flow-restricting device shall be in accordance with Schedule No. 14.1.

D. APPEAL PROCEDURE

1. Any customer who seeks a variance from any of the provisions of this water conservation and rationing plan shall notify the utility in writing, explaining in detail the reason for such a variation. The utility shall respond to each such request in writing.

2. Any customer not satisfied with the utility's response may file an appeal with the staff of the Commission. The customer and the utility will be notified of the disposition of such appeal by letter from the Executive Director of the Commission.

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

APPEAL PROCEDURE (Continued)

(N)

3. If the customer disagrees with such disposition, the customer shall have the right to file a formal complaint with the Commission. Except as set forth in this Section, no person shall have any right or claim in law or in equity, against the utility because of, or as a result of, any matter or thing done or threatened to be done pursuant to the provisions of this water conservation and rationing plan.

E. PUBLICITY

1. As stated under Section B.1.b and c, when a utility requests authorization of a Schedule 14.1 – Staged Mandatory Water Conservation and Rationing tariff, via a Tier 2 advice letter, it shall provide notice of the Tier 2 advice letter (example shown in Attachment C) and associated public meeting provided to customers, under General Order (GO) 96-B rules, and shall comply with all requirements of Sections 350-358 of the California Water Code (CWC), including but not limited to the following:
   a. In order to be in compliance with both the GO and CWC, the utility shall provide notice via both newspaper and bill insert/direct mailing.
   b. Utility shall file one notice for each advice letter filed, that includes both notice of the filing of the Tier 2 advice letter as well as the details of the public meeting (date, time, place, etc).
   c. The public meeting shall be held after the utility files the Tier 2 advice letter, and before the Commission authorizes implementation of the tariff.
   d. Utility shall consult with Division of Water and Audits staff prior to filing advice letter, in order to determine details of public meeting.
2. In the event that a Schedule 14.1-Staged Mandatory Rationing Plan is triggered, and an utility requests activation through the filing of a Tier 1 advice letter, the utility shall notify its customers and provide each customer with a copy of Schedule 14.1 by means of bill insert or direct mailing. Notification shall take place prior to imposing any fines associated with this plan.

(N)

(Continued)

RULE 14.1
WATER CONSERVATION AND RATIONING PLAN

PUBLICITY (Continued)

(N)

3. During the period that a stage of Schedule 14.1 is activated, the utility shall provide customers with updates in at least every other bill, regarding its water supply status and the results of customers' conservation efforts.

(N)

Rule No. 20

WATER CONSERVATION (N)

A. Purpose

The purpose of this rule is to ensure that water resources available to the utility are put to a reasonable beneficial use and that the benefits of the utility's water water supply and service extend to the largest number of persons.

B. Waste of Water Discouraged

Refer to Rule 11 B. (3).

C. Use of Water-Saving Devices and Practices

Each customer of the utility is urged to install devices to reduce the quantity of water to flush toilets and to reduce the flow rate of showers.
Each customer is further urged to adopt such other water usage and reusage practices and procedures as are feasible and reasonable.

D. Water-Saving Kits

The utility will make available, without initial cost to the customer, for use in each residence receiving water service from the utility, a water-saving kit containing the following:

(1) A device or devices for reducing toilet flush water requirements;

(2) A device or devices for reducing shower flow rates;

(3) A dye tablet or tablets for determining if a toilet tank leaks;

(4) Other devices from time to time approved by the utility;

(5) Installation and other instructions and information pertinent to conservation of water. (N)

Appendix E

DMM Supporting Documents

Schedule No. R3-1-R
Region 3 Customer Service Areas
RESIDENTIAL METERED SERVICE

APPLICABILITY

Applicable to all residential metered water services provided to single-family residential customers.

TERRITORY

Barstow and vicinity, San Bernardino County, the City of Claremont, portions of Montclair, Pomona, Upland, within the area north of Thompson Creek and the Padua Hills Service Area, and adjacent unincorporated territory in Los Angeles and San Bernardino Counties, the City of Calipatria and community of Niland, and the adjacent territory in Imperial County, the vicinity of Victorville and Lucerne, San Bernardino County, all or portions of the Cities of Cypress, La Palma, Los Alamitos, Placentia, Seal Beach, Stanton, Yorba-Linda and vicinity, Cowan Heights, Orange County; San Dimas, Charter Oak and vicinity, Los Angeles County; and portions of the Cities of Arcadia, El Monte, Irwindale, Monrovia, Monterey Park, Rosemead, San Gabriel, Temple City and vicinity, Los Angeles County.

RATES

Quantity Rate:

First 1,300 cu. Ft., per 100 cu. ft.	$ 2.673
Next 800 cu. Ft., per 100 cu. ft.	$ 3.074
Over 2,100 cu. Ft., per 100 cu. ft.	$ 3.535

Service Charges:	Per Meter Per Month
For 5/8 x 3/4-inch meter	$ 15.15
For 3/4-inch meter	22.70
For 1-inch meter	37.80
For 1 1/2 inch meter	75.65
For 2-inch meter	121.00
For 3-inch meter	227.00
For 4-inch meter	378.00
For 6-inch meter	756.00
For 8-inch meter	1,210.00
For 10-inch meter	1,739.00
Sprinkler System Services	$16.65

The Service Charge is a readiness-to-serve charge applicable to all metered service and to which is added the charge for water used computed at the Quantity Rate.

SPECIAL CONDITIONS

1. All bills are subject to the reimbursement fee set forth on Schedule No. UF.
2. Residential customers are defined as all single family customers with one dwelling unit that are individually metered.
3. As authorized by the California Public Utilities Commission, an amount of $0.156 per Ccf for Tier 1, $0.180 per Ccf for Tier 2 and $0.207 per Ccf for Tier 3 is to be added to the Quantity Rate for a period of 24 months, beginning on the effective date of Advice Letter 1381-W, which is March 21, 2010. This surcharge will apply to all customers covered by the WRAM in 2009 which includes metered customers in Barstow, Claremont, San Gabriel, Los Alamitos, Placentia, San Dimas and Calipatria customers who were billed at the metered rate as of December 31, 2009
4. As authorized by the California Public Utilities Commission, an amount of $0.0735 per Ccf for Tier 1, $0.0845 per Ccf for Tier 2 and $0.0972 per Ccf for Tier 3 is to be added to the Quantity Rate for a period of 12 months, beginning on the effective date of Advice Letter 1401-W, which is June 7, 2010. This surcharge will recover the undercollection in the CARW Balancing Account, as of December 31, 2009.
5. Pursuant to Decision 10-11-035, a surcharge of $0.0035 per Ccf will be applied to all metered customers bills excluding customers that are receiving the CARW credit, beginning on the effective date of Advice Letter 1417-W. This surcharge will offset the CARW credits and CARW administrative program costs recorded in the CARW Balancing Account.
6. As authorized by the California Public Utilities Commission in D. 10-11-035, an amount of $0.20214 per Ccf is to be added to the Quantity Rate for a period of 24 months, beginning on January 1, 2011. This surcharge recovers the difference between the interim rates and final rates for the period of January 1, 2010 through December 1, 2010.
7. As authorized by the California Public Utilities Commission, an amount of $0.0053 per Ccf for Tier 1 and $0.0061 per Ccf (N)
for Tier 2 is to be added to the Quantity Rate for a period of 12 months, beginning on the effective date of Advice Letter (N)
1408-WA. This surcharge will recover the undercollection in the Orange County Annexation Memorandum Account, as of March (N)
31, 2010. (N)

Schedule No. R3-1-NR
Region 3 Customer Service Areas
NON-RESIDENTIAL METERED SERVICE

APPLICABILITY

Applicable to all metered water service except those covered under R3-1-R.

TERRITORY

Barstow and vicinity, San Bernardino County, the City of Claremont, portions of Montclair, Pomona, Upland, within the area north of Thompson Creek and the Padua Hills Service Area, and adjacent unincorporated territory in Los Angeles and San Bernardino Counties, the City of Calipatria and community of Niland, and the adjacent territory in Imperial County, the vicinity of Victorville and Lucerne, San Bernardino County, all or portions of the Cities of Cypress, La Palma, Los Alamitos, Placentia, Seal Beach, Stanton, Yorba-Linda and vicinity, Cowan Heights, Orange County; San Dimas, Charter Oak and vicinity, Los Angeles County; and portions of the Cities of Arcadia, El Monte, Irwindale, Monrovia, Monterey Park, Rosemead, San Gabriel, Temple City and vicinity, Los Angeles County.

RATES

Quantity Rate:

For all water delivered, per 100 cu. ft.. $ 2.489

Service Charges:	Per Meter Per Month
For 5/8 x 3/4-inch meter	$ 21.45
For 3/4-inch meter	32.15
For 1-inch meter	53.55
For 1 1/2 inch meter	107.00
For 2-inch meter	171.00
For 3-inch meter	321.00
For 4-inch meter	536.00
For 6-inch meter	1,071.00
For 8-inch meter	1,714.00
For 10-inch meter	2,464.00

The Service Charge is a readiness-to-serve charge applicable to all metered service and to which is added the charge for water used computed at the Quantity Rate.

SPECIAL CONDITIONS

1. All bills are subject to the reimbursement fee set forth on Schedule No. UF.
2. As authorized by the California Public Utilities Commission, an amount of $0.154 per Ccf is to be added to the Quantity Rate for a period of 24 months, beginning on the effective date of Advice Letter 1381-W, which is March 21, 2010. This surcharge will apply to all customers covered by the WRAM in 2009 which includes metered customers in Barstow, Claremont, San Gabriel, Los Alamitos, Placentia, San Dimas and Calipatria customers who were billed at the metered rate as of December 31, 2009.
3. As authorized by the California Public Utilities Commission, an amount of $0.06879 per Ccf is to be added to the Quantity Rate for a period of 12 months, beginning on the effective date of Advice Letter 1401-W, which is June 7, 2010. This surcharge will recover the undercollection in the CARW Balancing Account, as of December 31, 2009.
4. Pursuant to Decision 10-11-035, a surcharge of $0.0035 per Ccf will be applied to all metered customers bills excluding customers that are receiving the CARW credit, beginning on the effective date of Advice Letter 1417-W. This surcharge will offset the CARW credits and CARW administrative program costs recorded in the CARW Balancing Account.
5. As authorized by the California Public Utilities Commission in D. 10-11-035, an amount of $0.20214 per Ccf is to be added to the Quantity Rate for a period of 24 months, beginning on January 1, 2011. This surcharge recovers the difference between the interim rates and final rates for the period of January 1, 2010 through December 1, 2010.
6. As authorized by the California Public Utilities Commission, an amount of $0.0047 per Ccf is to be added to the Quantity Rate (N)
for a period of 12 months, beginning on the effective date of Advice Letter 1408-WA. This surcharge will recover the (N)
undercollection in the Orange County Annexation Memorandum Account, as of March 31, 2010. (N)

AWWA WLCC Water Audit Software: Reporting Worksheet

 WASv3.0

Back to Instructions

? Click to access definition

Water Audit Report for: Golden State Water Company - South San Gabriel
Reporting Year: 2008

Please enter data in the white cells below. Where possible, metered values should be used; if metered values are unavailable please estimate a value. Indicate this by selecting a choice from the gray box to the left, where M = measured (or accurately known value) and E = estimated.

All volumes to be entered as: ACRE-FEET PER YEAR

WATER SUPPLIED

Volume from own sources:	M	2,866.000	acre-ft/yr
Master meter error adjustment:		0.000	under-registered acre-ft/yr
Water imported:	M	295.000	acre-ft/yr
Water exported:		0.000	acre-ft/yr
WATER SUPPLIED:		3,161.000	acre-ft/yr

AUTHORIZED CONSUMPTION

Click here: ? for help using option buttons below

				Pcnt:	Value:
Billed metered:	M	2,982.000	acre-ft/yr		
Billed unmetered:		0.000	acre-ft/yr		
Unbilled metered:	M	76.600	acre-ft/yr		
Unbilled unmetered:		39.513	acre-ft/yr	1.25%	
AUTHORIZED CONSUMPTION:		3,098.113	acre-ft/yr		

Use buttons to select percentage OR value

WATER LOSSES (Water Supplied - Authorized Consumption) 62.888 acre-ft/yr

Apparent Losses

				Pcnt:	Value:
Unauthorized consumption:		7.903	acre-ft/yr	0.25%	
Customer metering inaccuracies:		62.420	acre-ft/yr	2.00%	
Systematic data handling errors:		0.000	acre-ft/yr		
Apparent Losses:		70.323	acre-ft/yr		

Check above input values; APPARENT LOSSES should be less than WATER LOSSES

Real Losses

Real Losses = (Water Losses - Apparent Losses): -7.435 acre-ft/yr

WATER LOSSES: 62.888 acre-ft/yr

NON-REVENUE WATER

NON-REVENUE WATER: 179.000 acre-ft/yr

SYSTEM DATA

Length of mains:	M	35.0	miles
Number of active AND inactive service connections:	M	5,054	
Connection density:		144	conn./mile main
Average length of customer service line:	E	30.0	ft (pipe length between curbstop and customer meter or property boundary)
Average operating pressure:	M	62.8	psi

COST DATA

Total annual cost of operating water system:		$1,988,855	$/Year
Customer retail unit cost (applied to Apparent Losses):		$25.44	$/100 cubic feet (ccf)
Variable production cost (applied to Real Losses):		$549.00	$/acre-ft/yr

DATA REVIEW - Please review the following information and make changes above if necessary:

- Input values should be indicated as either measured or estimated. You have entered:
  - **7 as measured values**
  - **1 as estimated values**
  - **2 as default values**
  - **7 without specifying measured, estimated or default**
- Water Supplied Data: No problems identified
- Unbilled unmetered consumption: No problems identified
- Unauthorized consumption: No problems identified
- It is important to accurately measure the master meter - you have entered the measurement type as: measured
- Cost Data: No problems identified

PERFORMANCE INDICATORS

Financial Indicators

Non-revenue water as percent by volume:	5.7%	
Non-revenue water as percent by cost:	42.2%	
Annual cost of Apparent Losses:	$779,295	
Annual cost of Real Losses:	-$4,082	

Operational Efficiency Indicators

Apparent Losses per service connection per day:	12.42	gallons/connection/day
Real Losses per service connection per day*:	-1.31	gallons/connection/day
Real Losses per length of main per day*:	N/A	
Real Losses per service connection per day per psi pressure:	-0.02	gallons/connection/day/psi
Unavoidable Annual Real Losses (UARL):	26.65	million gallons/year
Infrastructure Leakage Index (ILI) [Real Losses/UARL]:	-0.09	

* only the most applicable of these two indicators will be calculated

Appendix F

Groundwater Basin Water Rights Stipulation/Judgment

SUPERIOR COURT OF THE STATE OF CALIFORNIA

FOR THE COUNTY OF LOS ANGELES

UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT Plaintiff,	No. 924128
vs.	AMENDED JUDGMENT
CITY OF ALHAMBRA, et al, Defendants.	(and Exhibits Thereto),

Honorable Florence T. Pickard
Assigned Judge Presiding

Original Judgment
Signed and Filed: December 29, 1972;
Entered: January 4, 1973
Book 6741, Page 197

JUDGMENT AS AMENDED AUGUST 24, 1989

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Suite 214
4605 Lankershim Boulevard
North Hollywood, CA 91602
Telephone (818) 769-2002

Attorney for Watermaster

SUPERIOR COURT OF CALIFORNIA, COUNTY OF LOS ANGELES

UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT, Plaintiff, vs. CITY OF ALHAMBRA, et al., Defendants.	No. 924128 AMENDED JUDGMENT (And Exhibits Thereto)

HONORABLE FLORENCE T. PICKARD

Assigned Judge Presiding

DEPARTMENT 38

August 24, 1989

AMENDED JUDGMENT
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61. Entry of Judgment . .(New) 39

EXHIBITS

"A" -- Map entitled "San Gabriel River Watershed Tributary to Whittier Narrows"

<u>Exhibits Continued</u>

"B" -- Boundaries of Relevant Watershed

"C" -- Table Showing Base Annual Diversion Rights of Certain Diverters

"D" -- Table Showing Rights and Pumper's Share of Each Pumper

"E" -- Table Showing Production Rights of Each Integrated Producer

"F" -- Table Showing Special Category Rights

"G" -- Table Showing Non-consumptive Users

"H" -- Watermaster Operating Criteria

"J" -- Puente Narrows Agreement

"K" -- Overlying Rights

"L" -- List of Producers and Their Designees (New)

"M" -- Watermaster Members, Officers, and Staff Including Calendar Year 1989 (New)

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SUPERIOR COURT OF CALIFORNIA, COUNTY OF LOS ANGELES

UPPER SAN GABRIEL VALLEY MUNICIPAL WATER DISTRICT, Plaintiff, vs. CITY OF ALHAMBRA, et al., Defendants.	No. 924128 AMENDED JUDGMENT Hearing: August 24, 1989 Department 38, 9:00 A.M.

The Petition of the MAIN SAN GABRIEL BASIN WATERMASTER for this AMENDED JUDGMENT herein, came on regularly for hearing in this Court before the HONORABLE FLORENCE T. PICKARD, ASSIGNED JUDGE PRESIDING, on August 24, 1989; Ralph B. Helm appeared as attorney for Watermaster - Petitioner; and good cause appearing, the following ORDER and AMENDED JUDGMENT are, hereby, made:

I. INTRODUCTION

1. Pleadings, Parties, and Jurisdiction. The complaint herein was filed on January 2, 1968, seeking an adjudication of water rights. By amendment of said complaint and dismissals of certain parties, said adjudication was limited to the Main San Gabriel Basin and its Relevant Watershed. Substantially all

defendants and the cross-defendant have appeared herein, certain defaults have been entered, and other defendants dismissed. By the pleadings herein and by Order of this Court, the issues have been made those of a full <u>inter se</u> adjudication of water rights as between each and all of the parties. This Court has jurisdiction of the subject matter of this action and of the parties herein.

2. <u>Stipulation for Entry of Judgment.</u> A substantial majority of the parties, by number and by quantity of rights herein Adjudicated, Stipulated for entry of a Judgment in substantially the form of the original Judgment herein.

3. <u>Lis Pendens.</u> (New) A <u>Lis Pendens</u> was recorded August 20, 1970, as Document 2650, in Official Records of Los Angeles County, California, in Book M 3554, Page 866.

4. <u>Findings and Conclusions.</u> (Prior Judgment Section 3) Trial was had before the Court, sitting without a jury, John Shea, Judge Presiding, commencing on October 30, 1972, and Findings of Fact and Conclusions of Law have been entered herein.

5. <u>Judgment.</u> (New) Judgment (and Exhibits Thereto), Findings of Fact and Conclusions of Law (and Exhibits thereto), Order Appointing Watermaster, and Initial Watermaster Order were signed and filed December 29, 1972, and Judgment was entered January 4, 1973, in Book 6791, Page 197.

6. <u>Intervention After Judgment.</u> (New) Certain defendants have, pursuant to the Judgment herein and the Court's continuing jurisdiction, intervened and appeared herein after entry of Judgment.

7. Amendments to Judgment. (New) The original Judgment herein was previously amended on March 29, 1979, by: (1) adding definition (r [1]) thereto, (2) amending definition (bb) therein, (3) adding Exhibit "K" thereto, (4) adding Sections 14.5 and 16.5 thereto, and (5) amending Sections 37(b), 37(c), 37(d), and Section 47 therein; it was again amended on December 21, 1979, by amending Section 38(c) thereof; again amended on February 21, 1980, by amending Section 24 thereof; again amended on September 12, 1980, by amending Sections 35(a), 37(a), and 38(a); again amended on December 22, 1987, by adding Section 37(e) thereto; and last amended on July 22, 1988 by amending Section 37(e) thereof and Ordering an Amended Judgment herein.

8. Transfers. (New) Since the entry of Judgment herein there have been numerous transfers of Adjudicated water rights. To the date hereof, said transfers are reflected in Exhibits "C", "D", and "E".

9. Producers and Their Designees. (New) The current status of Producers and their Designees is shown on Exhibit "L".

10. Definitions. (Prior Judgment Section 4) As used in this Judgment, the following terms shall have the meanings herein set forth:

(a) Base Annual Diversion Right -- The average annual quantity of water which a Diverter is herein found to have the right to Divert for Direct Use.

(b) Direct Use --Beneficial use of water other than for spreading or Ground Water recharge.

(c) Divert or Diverting -- To take waters of any surface stream within the Relevant Watershed.

(d) Diverter -- Any party who Diverts.

(e) Elevation -- Feet above mean sea level.

(f) Fiscal Year -- A period July 1 through June 30, following.

(g) Ground Water -- Water beneath the surface of the ground and within the zone of saturation.

(h) Ground Water Basin -- An interconnected permeable geologic formation capable of storing a substantial Ground Water supply.

(i) Integrated Producer -- Any party that is both a Pumper and a Diverter, and has elected to have its rights adjudicated under the optional formula provided in Section 18 of this Judgment.

(j) In-Lieu Water Cost -- The differential between a Producer's non-capital cost of direct delivery of Supplemental Water and the cost of Production of Ground Water (including depreciation on Production facilities) to a particular Producer who has been required by Watermaster to take direct delivery of Supplemental Water in lieu of Ground Water.

(k) Key Well -- Baldwin Park Key Well, being elsewhere designated as State Well No. 1S/10W-7R2, or Los Angeles County Flood Control District Well No. 3030-F. Said well has a ground surface Elevation of 386.7.

(l) Long Beach Case -- Los Angeles Superior Court Civil Action No. 722647, entitled, "Long Beach, et al., v. San Gabriel Valley Water Company, et al."

(m) Main San Gabriel Basin or Basin -- The Ground Water Basin underlying the area shown as such on Exhibit "A".