



2010

City of Lynwood  
Urban Water Management Plan

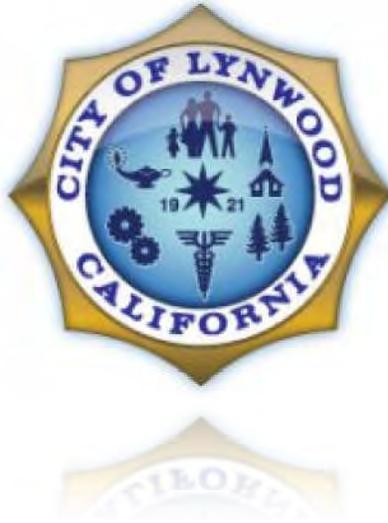


July, 2011

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# 2010

## URBAN WATER MANAGEMENT PLAN



**City of Lynwood**

**JULY 2011**

**Prepared by:**



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# SECTION 1: INTRODUCTION

## 1.1 PURPOSE AND SUMMARY

This is the 2010 Urban Water Management Plan ("UWMP" or "Plan") for the City of Lynwood ("City"). This plan has been prepared in compliance with the Urban Water Management Planning Act ("Act"), which has been codified at California Water Code sections 10610 through 10657 and can be found in Appendix B to this 2010 Plan.

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

The Act requires "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually, to prepare and adopt, in accordance with prescribed requirements, an urban water management plan." Urban water suppliers must file these plans with the California Department of Water Resources (DWR) every five years describing and evaluating reasonable and practical efficient water uses, reclamation, and conservation activities. (*See generally* Wat. Code § 10631.)

The Act has been amended on several occasions since its initial passage in 1983. New requirements of the Act due to SBx7-7 state that per capita water use within an urban water supplier's service area must decrease by 20% by the year 2020 in order to receive grants or loans administered by DWR or other state agencies. The legislation sets an overall goal of reducing per capita urban water use by 20% by December 31, 2020. The state shall make incremental progress towards this goal by reducing per capita water use by at least 10% by December 31, 2015. Each urban retail water supplier shall develop water use targets and an interim water use target by July 1, 2011. Effective 2016, urban retail water suppliers who do not meet the water conservation requirements established by this bill are not eligible for state water grants or loans.

An urban retail water supplier shall include in its water management plan due July 2011 the baseline daily per capita water use, water use target, interim water use target, and compliance daily per capita water use. The Department of Water Resources, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part. These new requirements are included in **Section 4: Water Demands**

## 1.2 COORDINATION

In preparing this 2010 Plan, the City has encouraged broad community participation. Copies of the draft Plan were made available for public review at City Hall and the local



public libraries in the City. The City noticed a public meeting. The notice of the public hearing was published in the local press and mailed to City Clerk. On June 8, 2011, the City held a noticed public forum to review and accept comments on the draft plan. Notice of the public forum was published in the local press. On June 21, 2011, the City held a public hearing to adopt the Plan. Following the consideration of public comments received prior to and at the public

hearing, the City adopted the 2010 Plan on June 21, 2011. A copy of the City Council resolution approving the 2010 Plan is included in **Appendix D**.

As required by the Act, this Plan is provided by the City to the California Department of Water Resources, the California State Library, the local City Library, the City Clerk, and the Public Works Department and is available to the public.

**Table 1.1**  
**Coordination and Public Involvement**

Entity	Participated in Plan Preparation	Contacted for Assistance	Made Comments on Draft	Notified of Public Hearing	Attended Public Hearing
City Public Works Dept/Utilities Division	x	x	x	x	x
City Manager's Dept		x		x	x
Lynwood City Clerk		x		x	x
Lynwood Public Library		x		x	
Lynwood City Mayor		x		x	x
Lynwood City Pro Tem		x		x	x
Lynwood City Council Members		x		x	x
Metropolitan Water District		x		x	
Dept of Water Resources (Glendale Office)		x		x	
Los Angeles Department of Water and Power		x		x	
LA County Board of Supervisors		x		x	
LA County Dept of Public Works		x		x	
Sanitation Districts of LA County		x		x	
Central Basin Municipal Water District		x		x	
LA Regional Water Quality Control Board		x		x	
Water Replenishment District		x		x	
CA State Public Health Dept (Glendale Office)		x		x	
City of Compton		x		x	
City of Paramount		x		x	
City of South Gate		x		x	
Golden State Water Company		x		x	
Park Water Company		x		x	
Interested General Public		x	x	x	x



### 1.3 FORMAT OF THE PLAN

The chapters in this 2010 Plan correspond to the items presented in the Act and are as follows:

#### **Section 1 - Introduction**

This chapter describes the UWMP Act background, new amendments to the Act, City's planning and coordination process, the history of the development of the City's water supply system, a description of its existing service area, the local climate, population served and the City's water distribution system.

#### **Section 2 - Water Sources & Supplies**

This chapter describes the existing water supplies available to the City, including imported water purchased from the Central Basin Municipal Water District (CBMWD), local groundwater extracted from the Central Groundwater Basin, and recycled water provided by CBMWD. In addition, this chapter discusses potential future water supplies, including transfers and exchanges, recycled water, and desalinated water.

#### **Section 3 – Water Quality**

This chapter discuss water quality issues with the City's imported and groundwater sources and the effect of water quality on management strategies and supply reliability.

#### **Section 4 – Water Demands**

This chapter describes past, current and projected water usage within the City's service area prior to the implementation of future demand management measures.

#### **Section 5 – Reliability Planning**

This chapter presents an assessment of the reliability of the City's water supplies by comparing projected water demands with expected water supplies under three different hydrologic conditions: a normal year; a single dry year; and multiple dry years. This 2010 Plan concludes that if projected imported and local supplies are available as anticipated, no water shortages are anticipated in the City's service area during the planning period.

#### **Section 6 – Demand Management**

This chapter addresses the City's implementation of the current Best Management Practices (BMPs). The BMPs correspond to the 14 Demand Management Measures (DMMs) listed in the UWMP Act and are described in this section.

#### **Section 7 – Contingency Planning**

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

#### **Appendices**

The appendices contain references and specific documents for the data used to prepare this 2010 Plan.



## 1.4 WATER SYSTEM HISTORY

The City of Lynwood was founded in the early 1800s by Don Antonio Lugo. The Lugo family later deeded the land. The land was eventually developed and opened as a suburban home site in 1913. To sustain the development of the land, the City's water system began to take shape. The City was later incorporated in 1921, and the City began to drill wells for groundwater production. Well No. 5, drilled in 1932, has remained in operation to this day. As the City continued to grow as a residential and industrial community, the City realized the need to supplement its water sources and

began to receive imported water between 1960-1970. The City is located in the Central Basin Municipal Water District (CBMWD) which is a member agency of the Metropolitan Water District (MWD). MWD was originally founded in 1928 to build the Colorado River Aqueduct to supplement the water supplies of the original founding members. In 1972, MWD augmented its supplies to include deliveries from the State Water Project via the California Aqueduct. Today the City continues to receive imported water on an as-needed basis.

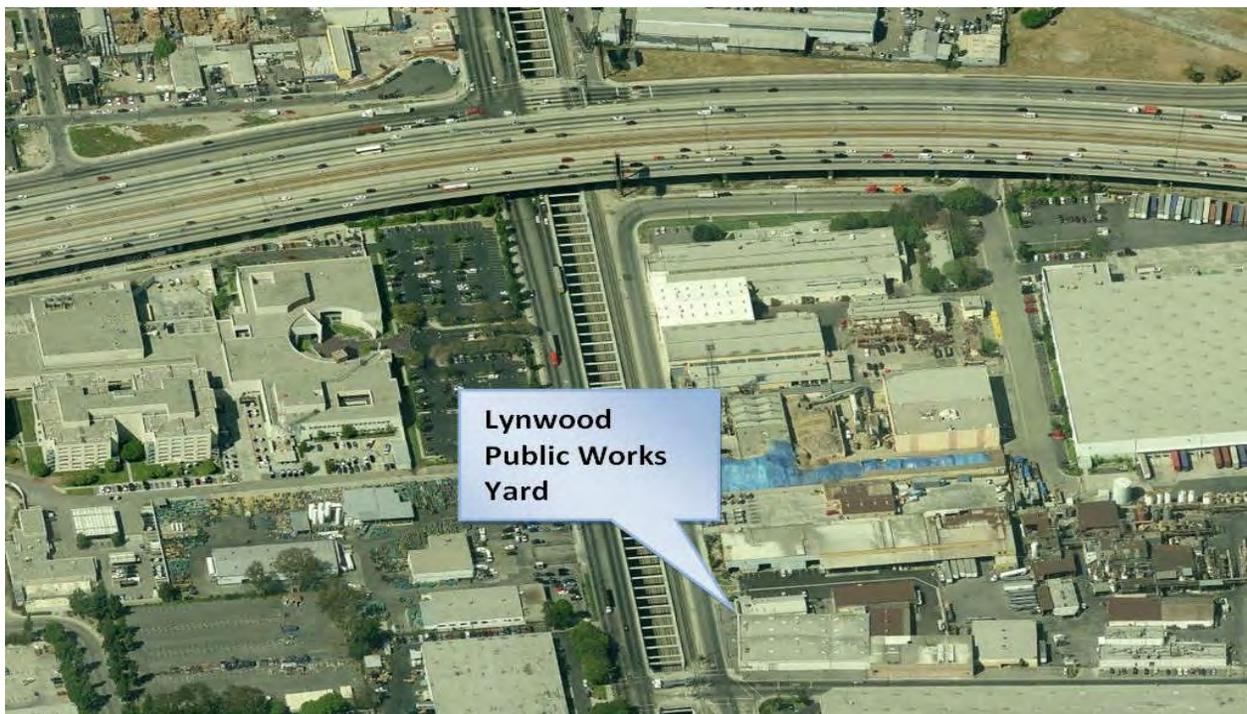


Figure 1.1: Lynwood Public Works Yard (Water Utility)

## 1.5 CITY WATER SERVICE AREA

The City of Lynwood is approximately 4.7 square miles in size and its water system serves about 90 percent of the land within City limits. The Park Water Company provides water service to the remaining 10% in the southeast section of the City.

**Figure 1.3** shows the City's water service area. Topographically, the City is bounded on the North by the City of South Gate, on the East by the City of Paramount, on the South by the City of Compton, and on the West by the City of Los Angeles and the



unincorporated County of Los Angeles (Florence/Willowbrook area).

Land use within the service area is principally composed of single and multi-family residences, business and commercial districts, and some institutional and industrial areas. Since the area is in a built-out condition, additional growth may result from re-development of existing lots.

### 1.6 CLIMATE

The City has a Mediterranean climate with moderate, dry summers with an average temperature of about 70°F and cool, wet winters with an average temperature of 58°F. The average rainfall for the region is approximately 14 inches. Evapotranspiration (ETo) in the region averages 49.7 inches annually. **Table 1.1** lists the average ETo, and rainfall for the City.

**Table 1.1**  
**Lynwood Climate Characteristics**

Month	Temp (F)	Rainfall (in)	ETo (in)
Jan	55.9	2.6	1.9
Feb	57.0	2.9	2.2
Mar	58.3	2.2	3.4
Apr	60.8	1.1	4.8
May	63.3	0.2	5.6
Jun	66.7	0.1	6.3
Jul	70.9	0.0	6.5
Aug	71.8	0.1	6.2
Sep	70.5	0.3	4.8
Oct	66.7	0.4	3.7
Nov	62.1	1.6	2.4
Dec	57.6	2.4	1.9
<b>Totals:</b>	<b>63.5</b>	<b>14.0</b>	<b>49.7</b>

Overall, the City's service area climate characteristics are comparable to other cities within the region.

### 1.7 POPULATION

According to the most recent population figures from the California Department of Finance, the current 2010 resident population of the City is approximately 73,295 persons. Since the City's service area accounts for about 90% of the City's total residents, the total current resident population served by the City's water system is approximately 65,965 persons. Population growth over the past 10 years is approximately 0.48%. Population projections in accordance with an annual growth rate of 0.48% over the next 25 years are shown in **Table 1.2**:

**Table 1.2**  
**Population Projections**

Year	Service Area Population	Citywide Population
2015	67,580	75,089
2020	69,234	76,927
2025	70,929	78,810
2030	72,665	80,739
2035	74,444	82,715

Since the City is not a major commercial center for the region, daytime population estimates are not significantly higher than the City's resident population.

### 1.8 WATER SYSTEM

The City's Public Works Department manages the City's infrastructure and natural resources, including the City's Public Water Utility. The Public Water Utility consists of efforts from various Public Works sections: Water Utility Division, CIP Division, and Engineering Division. The



Water Utility Division is responsible for providing high quality drinking water through the operation and maintenance of water production, distribution treatment, and storage facilities. The CIP Division is responsible for the Capital Improvement Program which consists of the development and replacement of water system infrastructure. The Utility Division, along with management, is responsible for acting as the liaison with outside agencies, most notable the State and County Health Departments, water districts and other regulatory agencies. In addition, the Engineering Division, along with management functions as an advisor to the City Council. Additional Administrative Services responsibilities include developing and monitoring the Operations budget; monitoring the Capital Improvement budget and water rates; and providing customer service.

### ***Water Supply & Operations***

The City of Lynwood has five active groundwater wells (Well Nos. 5, 8, 9, 11, and 19) located throughout the City for groundwater production. The wells range in capacity from 550 to 2,000 gallons per minute (gpm) with a total pumping capacity of 5,650 gpm. The City is also scheduled to complete equipping of its Well No. 22 (capacity of 2,500 gpm) later this year.

The City also receives imported water from its connection to CBMWD, with a 12 CFS connection capacity of 5,376 gpm. Although the City previously used its imported connection to supplement its groundwater supply, the City has recently decided to use imported water only on an as-needed basis. Over the past six years, groundwater has accounted for the majority of the City water supply, providing about 90% of the City's total water supply.

In addition to imported water and groundwater, recycled water is also used in the City by Caltrans to irrigate landscapes along the Interstate 105 and State 710 freeways, and by the City to irrigate 9-acre Burke-Ham Park. Recycled water, however, is not conveyed as part of the City's distribution system infrastructure.



**Figure 1.2: Lynwood Well No. 8**

The City's day-to-day water operations and maintenance are conducted in its Public Works Yard Building, which houses the Engineering, Street Maintenance, Building Maintenance, Grounds Maintenance, and Water Operations staff along with equipment and vehicles necessary to perform its services. The Public Works Yard is located on the western side of the City at 11750 Alameda Street as shown in **Figure 1.1**.

### ***Distribution System***

The City distributes its water to approximately 9,000 service customers through a 90 mile network of distribution mains with pipelines sizes ranging from 4-inches to 16-inches. The water system consists of one (1) pressure zone that provide sufficient water pressure to customers. The City also maintains a booster pump station consisting of 3 pumps that can deliver up to 3,600 gpm. The City of Lynwood water service area map is shown in **Figures 1.3** on the following page:

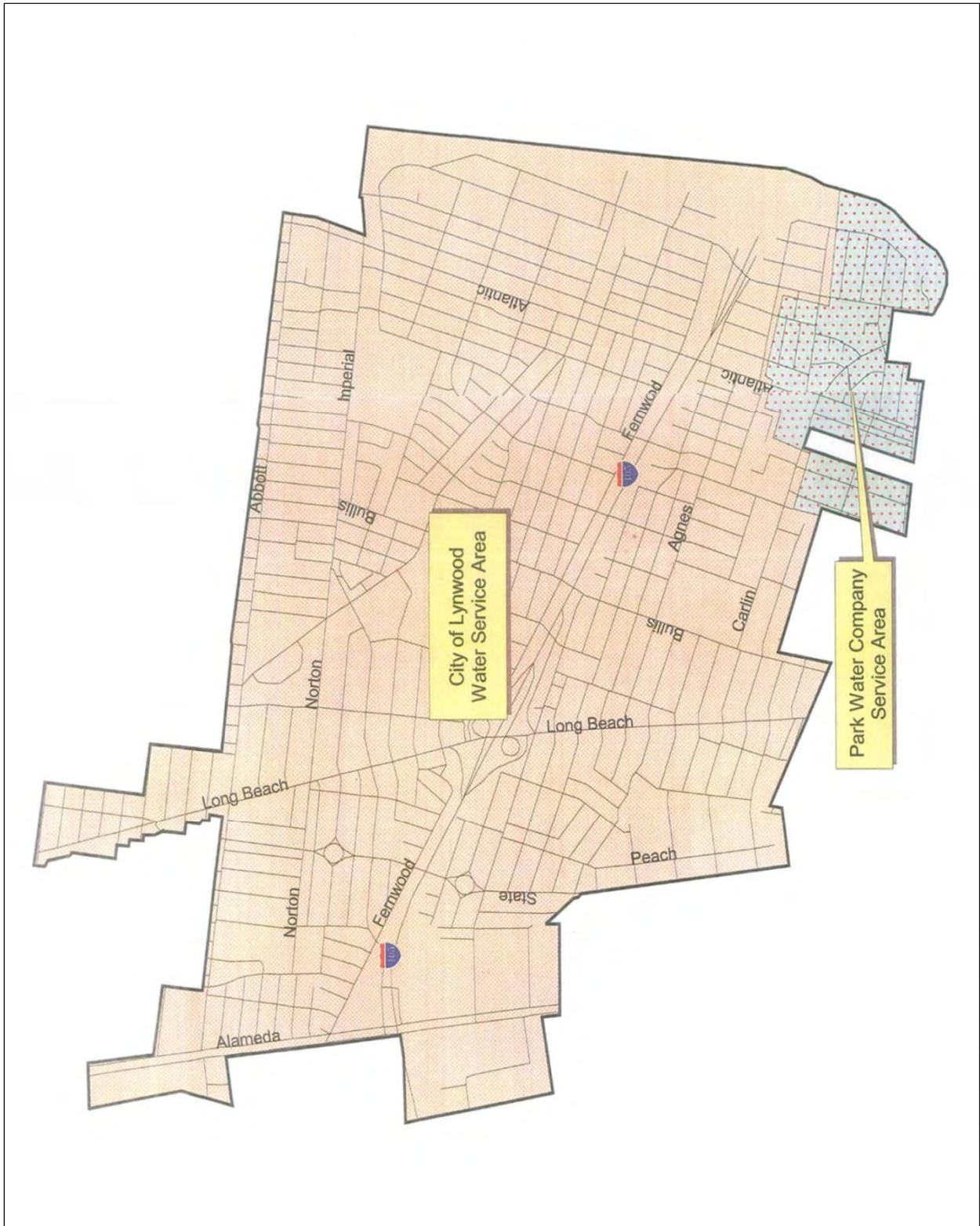


FIGURE 1.3: City Water Service Area Map



### ***Water Storage***

For storage and fire flow needs, the City maintains one water storage reservoir with a capacity of 3 million gallons (MG). The reservoir is partially underground and is

located adjacent to the City's Well No. 8 and booster pump station just West of City Hall along Bullis Road. The reservoir is shown below in **Figure 1.4**:



**Figure 1.4: 3.0 MG City Reservoir**

### ***Emergency Interconnections***

In addition to imported water and groundwater, the City's water supply system also includes four 8-inch emergency interconnections with the City of Compton and one 8-inch connection with the City of South Gate. The four connections with the City of Compton are manual, two-way connections capable of transferring water for the mutual benefit of both agencies. The one connection with the City of South Gate

is an automatic, two-way connection capable of transferring water for the mutual benefit of both agencies. The connections to the Cities of Compton and South Gate are located on the Southerly and Northerly portions of the City's limits, respectively.



## SECTION 2: WATER SOURCES & SUPPLIES

### 2.1 INTRODUCTION

The City's water supply sources consist of imported water from the Metropolitan Water District (MWD) via the Central Basin Municipal Water District (CBMWD), and groundwater produced from the Central Ground Water Basin.

### 2.2 WATER SUPPLY SOURCES

#### Imported Water

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

The Colorado River supplies California with 4.4 MAF annually for agricultural and urban uses with approximately 3.85 MAF used for agriculture in Imperial and Riverside Counties. The remaining unused portion (600,000 - 800,000 AF) is used for urban purposes in MWD's service area.



Figure 2.1: Parker Dam at Colorado River

In addition to the Colorado River, the Sacramento-San Joaquin River Delta provides a significant amount of supply annually to Southern California. The Delta

is located at the confluence of the Sacramento and San Joaquin Rivers east of the San Francisco Bay and is the West Coast's largest estuary. The Delta supplies Southern California with over 1 MAF of water annually.



Figure 2.2: Sacramento-San Joaquin Delta

The use of water from the Colorado River and the Sacramento-San Joaquin Delta continues to be a critical issue. In particular, Colorado River water allotments have been debated among the seven basin states and various regional water agencies at both the federal and state levels. The use of Delta water has been debated as competing uses for water supply and ecological habitat have jeopardized the Delta's ability to meet either need and have threatened the estuary's ecosystem.

In order to provide Southern California with imported water, MWD utilizes two separate aqueduct systems (one for each source of supply) to obtain its supplies. These two aqueduct systems convey water from each source into two separate reservoirs whereupon MWD pumps the water to one of its five treatment facilities. One of these



aqueduct systems is known as the Colorado River Aqueduct (CRA). The CRA was constructed as a first order of business shortly after MWD's incorporation in 1928. The CRA is 242 miles long and carries water from the Colorado River to Lake Matthews and is managed by MWD.



Figure 2.3: Colorado River Aqueduct

In addition to the CRA, MWD receives water from northern California via the California Aqueduct. Also known as the State Water Project, the California Aqueduct is 444 miles long and carries water from the Delta to Southern California and is operated by the Department of Water Resources.



Figure 2.4: California Aqueduct

The previously mentioned aqueducts supply Southern California with a significant amount of its water and are crucial to its sustainability. In addition to these two water systems, there are also several other

aqueducts that are vital to the State. The major aqueducts in California are shown in **Figure 2.5** on page 2-3.

**Imported Water Purchases**

As a wholesale agency, MWD distributes imported water to 26 member agencies throughout Southern California as shown in **Figure 2.6** on Page 2-4. CBMWD is one of 11 wholesale agencies served by MWD. CBMWD distributes water to its retail agencies, including the City of Lynwood, as shown in **Figure 2.7**. The City has an imported connection to CBMWD with a 12 CFS capacity of 5,376 gpm (about 8,670 AFY). The interconnection supplements the City's groundwater supplies as necessary.

**Table 2.1** presents the City's six-year historic imported water purchases from 2005 to 2010:

**Table 2.1**  
**Imported Water Supply 2005-2010**  
**(Purchases from CBMWD)**

Year	Purchases (AF)
2010	262
2009	584
2008	614
2007	564
2006	1,449
2005	1,076
<b>Average:</b>	<b>758</b>

Although the City's imported connection capacity is 8,670 AFY, the amount of imported water available to the City is dependent on CBMWD's supplies from MWD. In 2005, CBMWD's Tier 1 limit from MWD was 72,360 AFY and in 2010 the limit was 72,361 AFY.



Figure 2.5: Aqueduct Systems in California

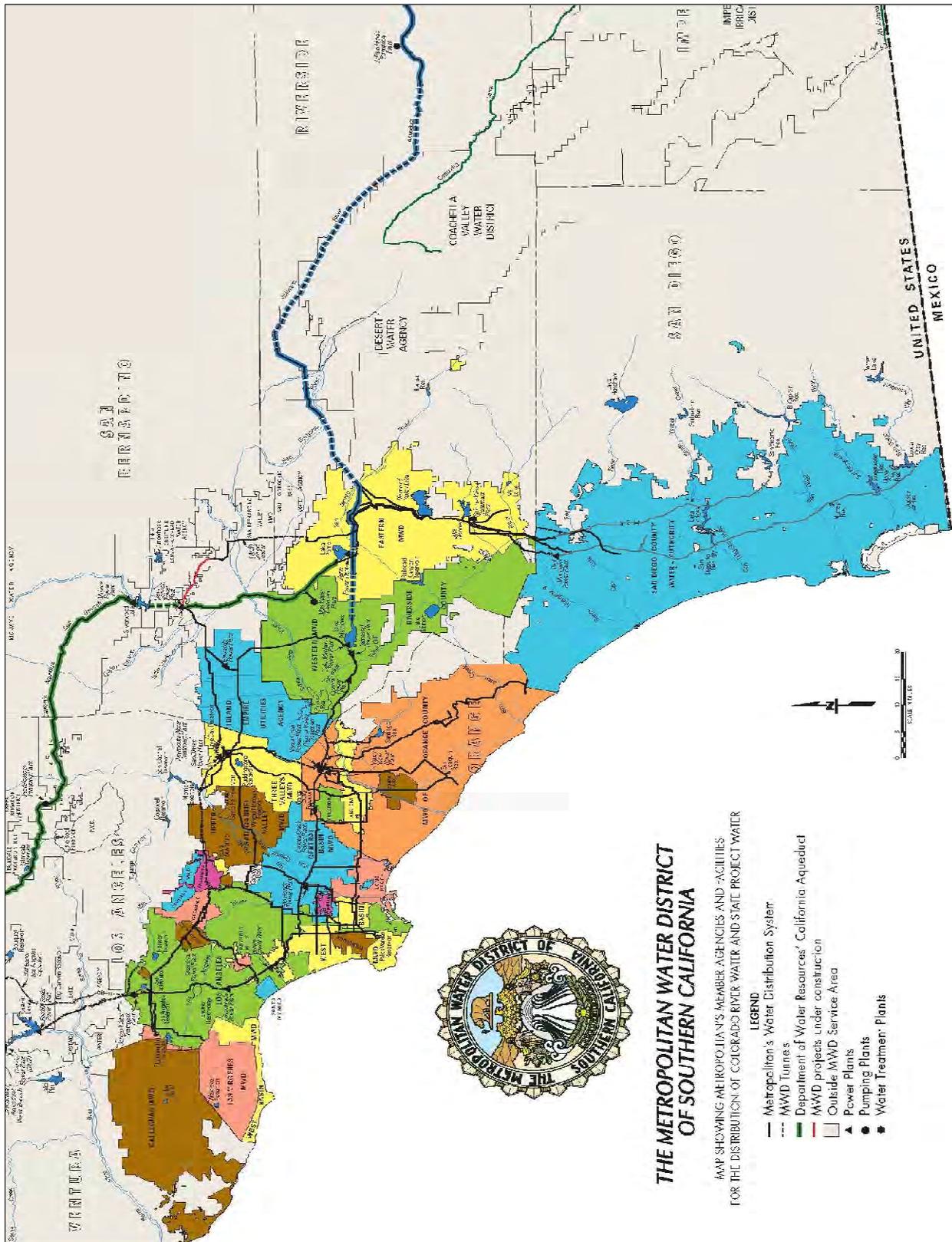


Figure 2.6: MWD Service Area Map

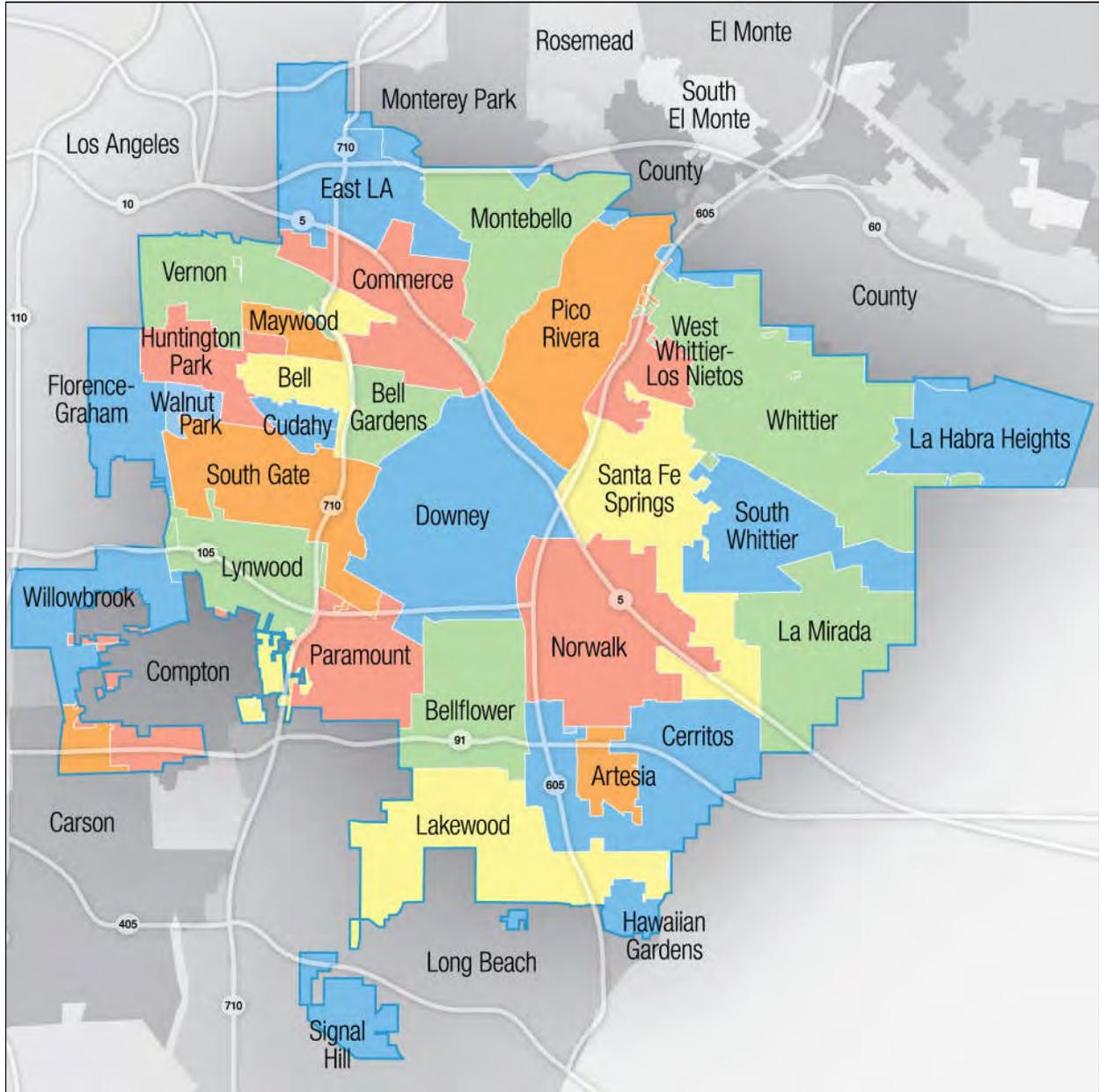


Figure 2.7: CBMWD Service Area Map





Groundwater in the Basin is replenished naturally by percolation from precipitation, (receiving about 14 inches of rain annually), by subsurface inflows from the San Gabriel Basin through the Whittier Narrows, and by surface flows from local rivers and streams. Since the basin is mostly urbanized and soil surfaces have been paved to construct roads, buildings, and flood channels, natural replenishment to the basin's water-bearing formations is limited to only a small portion of basin soils. However, the Basin receives additional replenishment from the San Gabriel and Rio Hondo Spreading Basins, which receive a blend of storm water runoff, imported water and recycled water.

Groundwater in the Basin naturally and historically flows from the recharge areas in the Northeast (through the Whittier Narrows) towards the West Coast Basin and into Pacific Ocean in the Southwest. The Newport Inglewood fault provides a restrictive barrier on the flow of groundwater in the Basin.



Figure 2.9: Rio Hondo Spreading Grounds

The total storage in the basin is estimated to be approximately 13.8 MAF. Unused storage is estimated to be about 1.1 MAF. The natural safe yield of the Basin (natural replenishment only) is estimated to be about 125,805 AFY. As a result of artificial recharge activities, however, the allowable pumping allocation exceeds this amount.

Groundwater levels in the basin are generally at or above mean sea level (MSL), although low water levels in portions of aquifers adjacent to the Pacific Ocean allow for seawater intrusion to occur. When water levels are low, seawater seeps into the West Coast Basin and into the Central Basin near the Long Beach area of the West Coast Basin.



Figure 2.10: Whittier Narrows

Due to past seawater intrusion, the Water Replenishment District (WRD) maintains the Alamitos Seawater Barrier Project to prevent seawater intrusion and to protect the Basin's groundwater supplies. The Alamitos Barrier consists of 43 injection wells and 239 observation wells over a 2.2 mile course. The injection wells inject a blend of imported and recycled water to build up water pressure in the aquifers below and block seawater intrusion. In 2008, the Alamitos Barrier Project injected approximately 6,000 AF into the Basin's aquifers.

The Central Basin is an adjudicated basin and the management of water resources and operations in the basin is provided by DWR, WRD, the LA County Department of Public Works, the Sanitation Districts of LA County, and the Regional Water Quality Control Board. The DWR serves as Watermaster. The California Department of Health Services provides additional



oversight of the Basin's groundwater quality and help monitor contaminant levels. The adjudicated pumping rights of 267,000 AFY are shared among basin agencies at a not-to-exceed allowable pumping allocation (APA) of 217,367 AFY.

The key characteristics of the Central Basin are summarized below in **Table 2.2**:

**Table 2.2**  
**Central Basin**  
**Summary of Characteristics**

Item	Amount
Max. Depth to Groundwater	2,200 ft.
Thickness of Groundwater Table	180-800 ft.
Storage	13.8 MAF
Natural Safe Yield	125,805 AFY
Adjudicated Rights	267,900 AFY
Allowable Pumping Allocation	217,367 AFY
Spreading Basins (Total)	3
Seawater Intrusion Barriers	1

**Groundwater Production**

As of April 2011, the City maintains a total of five active wells (Well Nos. 5, 8, 9, 11, and 19) for groundwater extraction. Prior to 2005, the City previously extracted groundwater from its Well No. 15. Since 2005, however, Well No. 15 has been deactivated and is no longer in service.

The City's existing groundwater wells have capacities ranging from 550 gallons per minute (gpm) to 2,000 gpm with a combined production capacity of 5,650 gpm (9,600

AFY). The City's groundwater production well characteristics are displayed in **Table 2.3** below:

**Table 2.3**  
**City Groundwater Wells**

Well No.	Capacity (gpm)
5	550
8	1,100
9	1,200
11	800
19	2,000
<b>Total Capacity:</b>	<b>5,650</b>

The City has adjudicated rights to the Central Basin and has an allowable pumping allocation of 5,337 AFY. In addition, the City recently leased 700 AFY of groundwater rights from another pumper in the Basin for five years. Thus, the City's current combined pumping rights stand at 6,037 AFY.



**Figure 2.11: Well No. 9**

As a result of increasing costs of imported water, the City intends to achieve 100% sustainability from local groundwater sources. Due to this goal, the City is pursuing additional wells to maximize its groundwater potential and to provide additional reliability of its groundwater well



system. The City is currently in the process of developing an additional well (Well No. 22) at the City's Lynwood Park site. Well No. 22 has recently been drilled and the construction documents for the well facility and connection to the City's distribution

system are currently being prepared. Well No. 22 is anticipated to be completed later this year. Once complete, Well No. 22 will have a capacity of 2,500 gpm. The location of Well No. 22 is shown below in **Figure 2.12**.



**Figure 2.12: Well No. 22 Site**

To monitor the City's groundwater extraction, each of the City's wells are equipped with flowmeters to measure well production. Well production is recorded monthly by City water staff and reported annually to the Department of Water Resources (DWR). The City completes DWR's Form No. 38 (Public Water System Statistics) on an annual basis as part of their reporting and documentation efforts. Data

records from the past six years indicates that Well No. 19 (capacity of 2,000 gpm) has been the most productive well for the City. Well No. 19 is located in the Western portion of the City just southwest of the Public Works Yard. Well No. 19 was drilled in 1971 by primary reverse circulation (a modern drilling technique) and has a total depth of about 1,000 ft. In 2008, Well No. 19 was measured to have a pumping rate of



about 2,000 gpm. Well No. 5, on the other hand is the City's least productive well with a recently measured pumping rate of 550 gpm. Well No. 5 was drilled in 1932 by the conventional (cable tool) method and has a total depth of 751 ft.

The total groundwater production since 2005 is shown below in **Table 2.4**:

**Table 2.4**  
**Groundwater Production (2005-2010)**  
**(Well Nos. 5, 8, 9, 11, and 19)**

Year	Production (AF)
2010	5,559
2009	5,371
2008	5,982
2007	5,570
2006	4,675
2005	5,366
<b>Average:</b>	<b>5,421</b>

The groundwater production totals shown in **Table 2.4** represent the majority of the City's water supply since 2005. Overall, groundwater has accounted for about 90% of the City's total water supply for the past six years (an increase of nearly 10% from 2000-2005).

### 2.3 WATER SUPPLY SUMMARY

Over the past six years, the City's water supply has consisted of imported water and groundwater. In 2005, imported water accounted for 17% of the City's water supply. In 2010, imported water accounted for only 2% of the City's water supply (the lowest total in the City's water history). Imported water purchases have declined

from previous years (prior to 2005) due to increases in groundwater pumping. The City's pursuit of groundwater not only has added to its supply reliability (as groundwater is considered to be drought-proof over the short term), but has also offset some of the recent and future economic burdens of purchasing imported water at ever-increasing rates.

### 2.4 PROJECTED SUPPLY OUTLOOK

As population and land-use densities increase, the City understands the need to discover and support local water supply projects to augment imported supplies. As part of this process, the City intends to continue to upgrade its existing groundwater supply facilities and also intends to pursue the addition of new wells to add to or replace existing wells in the City. Continued upgrades will help the City's groundwater capacity to be maintained at or near their combined pumping rights of 6,037 AFY. As a result of these improvements, the City expects to reduce their dependency on imported water to an as-needed basis, although the City expects both MWD and CBMWD to raise imported water rates in the near future. Through conservation efforts, the use of groundwater is expected to meet all or most of future demands for the next five years.

Overall, the City's supply reliability is expected to increase through the implementation of planned improvements to its groundwater facilities and through continued access to imported water, and through the potential uses of alternative water supplies as discussed in the following section. The City will also continue to benefit indirectly from regional conservation efforts and also through MWD's efforts to augment its supplies and improve storage capacities. **Section 5: Reliability Planning**



discusses reliability issues and compares the City's projected water supplies to projected demands for normal, dry, and multiple dry years through the year 2035.

## 2.5 ALTERNATE WATER SOURCES

This section provides an overview of alternative water sources (non-potable supplemental supplies) and their potential uses. Alternative water sources including recycled water, recycled stormwater, graywater, and desalinated water.

### Recycled Water

Although the City does not currently have the capability to construct a wastewater recycling facility within its limits, the City currently benefits from the use of recycled water in the CBMWD region, including the use of recycled water by the City at Burke-Ham Park and by Caltrans along the Interstate 105 and 710 freeways in the City limits. If the City were to expand its use of recycled water, the City would receive additional benefit.



Figure 2.13: Clarifier Treating Wastewater

### **Wastewater Collection & Treatment System**

The City of Lynwood maintains a local sewer system that collects wastewater. The local sewer mains transfer sewage to County Sanitation District of Los Angeles County (CSD) trunk lines where the sewage is received at the Joint Water Pollution Control Plant (JWPCP) in the City of Carson for treatment. Treated effluent is then discharged into the Ocean. The JWPCP does

not produce recycled water. Recycled water is produced at the Los Coyotes Water Reclamation Plant in Cerritos and provided to the City via CBMWD.

### **Recycled Water Use**

Currently the City benefits from the use of groundwater, imported water, and recycled



water at the Burke-Ham Park including landscaped areas and dual-plumbed buildings. Caltrans also used recycled water for irrigation along the Interstate 105 and 710 freeways in the City limits.

### **Potential Uses of Recycled Water**

Since the City uses recycled water, the City has identified potential recycled water users. Typical recycled water uses in the City would include landscape irrigation, dual-plumbing in buildings, and industrial uses. If the City were to expand its use of recycled water, the City could benefit as a number of parks, schools, medians, and dual-plumbed buildings could use recycled water. The City, however, currently lacks the infrastructure required to serve additional potential customers.

### **Future Plans for Recycled Wastewater**

The City expects the use of recycled water in the CBMWD service area to increase. Additionally, recycled water use by Caltrans for irrigation purposes is expected to continue. The City does not have any formal plans in place to expand recycled water use, but expects to increase recycled water use in the near future.

### **Graywater**

Graywater systems have been used in California to provide a source of water supply for subsurface irrigation and also as a means to reduce overall water use. Graywater consists of water discharged from sinks, bathtubs, dishwashers, and clotheswashers. Graywater systems consist of an underground tank and pumping system. Graywater is currently legal for subsurface irrigation in the State of California. However, strict regulations and high installation costs have impeded

installation of professional graywater systems and has the unintended consequence of undocumented and noncompliant use of graywater.

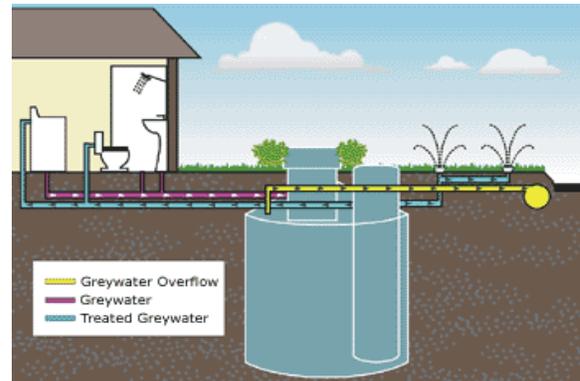


Figure 2.13: Graywater System

The promotion of graywater systems as a means to reduce the City's overall water use is not recommended since the use of graywater is currently limited to subsurface irrigation and therefore the overall Citywide reduction in water use (in AF) would be minimal at best. With the recent passage of SB 1258, however, graywater use is expected to be expanded to include use for toilet flushing, and may have its place as a potential water supply.

### **Desalinated Seawater**

Seawater desalination is a process whereby seawater is treated to remove salts and other contents to develop both potable and non-potable supplies. There are over 10,000 desalination facilities worldwide that produce over 13 million AFY. Desalinated water can add to Southern California's supply reliability by diversifying its water supply sources and mitigating against potential supply reductions. With its Seawater Desalination Program (SDP), the MWD facilitates progress and provides financial incentives for the development of seawater desalination facilities within its service area.



A total of five member agencies submitted projects totaling 142,000 AFY. In 2004, MWD adopted an Integrated IRP update which included a desalination goal of 150,000 AFY by the year 2025. Currently, the five member agency projects are in various levels of development.



Figure 2.3: Seawater Desalination Plant

Since the City is not located adjacent to the ocean, there are no plans to incorporate desalinated seawater into its supply sources.

## 2.6 TRANSFERS OR EXCHANGES

The City owns rights to extract 5,337 AF of groundwater annually. Due to a lease from another pumper in the region, the City currently maintains an allowable pumping allocation of 6,037 AFY. This current agreement will last for five years and highlights the ability of the sharing of water rights among pumpers in the Central Basin. The City may, at any period when its pumping capacity is reduced due to aging infrastructure or changes in water quality standards, lease a portion of its water rights to another pumper in the region to offset some of the economic burdens of purchasing imported water.

The City also maintains five emergency inter-connections to adjacent water purveyor systems. These connections have the ability to transfer water into the City's distribution

system during an emergency. There are four 8-inch connections to the City of Compton, and one 8-inch connection to the City of South Gate. Each has a two-way interconnection, allowing water transfers to and from the City, depending on the emergency situation.

## 2.7 PLANNED SUPPLY PROJECTS

The City continually reviews practices that will provide its customers with adequate and reliable supplies. Trained staff continues to ensure the water quality is safe and the water supply will meet present and future needs in an environmentally and economically responsible manner. The City's water demand within its service area could remain relatively constant over the next 20 years due to minimal growth combined with water use efficiency measures and the potential use of recycled water. Any new water supply sources will be to replace or upgrade insufficient wells rather than to support population growth and new development. Once the City completes its Well No. 22, the City intends to construct another well (Well No. 23) at a site to be determined. The City will also identify specific means of achieving their sustainability goals from local sources which will likely include the drilling of additional wells, alternative water supply projects, and additional leasing of groundwater rights to meet demand.



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## SECTION 3: WATER QUALITY

### 3.1 WATER QUALITY SUMMARY

In 1974, Congress passed the Safe Drinking Water Act in order to protect public health by regulating the nation's drinking water supply. As required by the Safe Drinking Water Act, the City provides annual Water Quality Reports to its customers. Currently all of the water that the City distributes to its customers meet federal EPA standards and California Department of Health Services (CDHS) Standards.

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

### 3.2 QUALITY OF SOURCES

#### Imported Water

The City receives imported water from MWD via CBMWD in order to supplement its groundwater supplies and for blending needs to meet Federal and CDHS standards. Imported water obtained from the SWP and the CRA contain specific contaminants which are characteristic of the Bay Delta and the Colorado River regions. Some of the contaminants of concern include: salinity, biological loads, disinfection by-products, perchlorate, uranium, and arsenic. MWD's 2010 RUWMP discusses the water quality concerns of its supplies.

To provide safe drinking water to its customers, MWD treats its water supply at

five (5) separate treatment plants, three of which blend a mixture of SWP and CRA water and it is tested regularly. Of the five plants that serve Southern California, the City has access to treated effluent from the Weymoth Treatment Plant via MWD's Middle Feeder pipeline.



Figure 3.1: Weymoth Treatment Plant

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

#### Central Basin Groundwater

In addition to imported water quality concerns, the City is also concerned with groundwater quality pumped from the Central Ground Water Basin. In general, groundwater in the Basin is of good quality, with average total dissolved solids (TDS) concentrations around 500 mg/L, particularly in the key producing deeper aquifers of the Basin. Localized areas of marginal to poor water quality exist,



primarily on the basin margins and in the shallower and deeper aquifers impacted by seawater intrusion.

As part of the Basin's groundwater quality monitoring, WRD and the U.S. Geological Survey (USGS) began a cooperative study in 1995 to improve the understanding of the geohydrology and geochemistry of the Central and West Coast Basins. Out of this effort came WRD's geographic information system (GIS) and the Regional Groundwater Monitoring Program. Twenty-one depth-specific, nested monitoring wells located throughout the basin allow water quality and groundwater levels to be evaluated on an aquifer-specific basis. Regional Groundwater Monitoring Reports are published by WRD for each water year. Constituents monitored include: TDS, iron, manganese, nitrate, TCE, PCE, arsenic, chromium including hexavalent chromium, MTBE, and perchlorate.

### ***City Groundwater Constituents of Concern***

The local aquifer systems beneath the City contain groundwater which mostly meets federal and state maximum contaminant levels (MCLs) for water quality constituents without having to undergo special treatment. The City's groundwater mostly has a calcium bi-carbonate character with high total hardness (TH) concentrations (180-620 mg/L) which place the water in the very hard range (above 180 mg/L). The pH of the groundwater ranges from 7.46 to 8.1, which indicates that the water is slightly basic or alkaline.

The City routinely monitors its groundwater to meet primary and secondary water quality standards. Among the general mineral constituents that are detected in the City's groundwater are sulfate, chloride, fluoride, and nitrate. All constituent concentrations

that are monitored are below the secondary MCL as required by the Safe Drinking Water Act. Chloride, fluoride, and nitrate concentrations in the City's wells have been under the applicable primary and secondary MCLs for all reported sampling of all of the City Wells in operation.



**Figure 3.2: Hard Water Leaves Mineral Residue**

Inorganic trace metal constituents detected in the City's groundwater include aluminum, arsenic, barium, boron, chromium, copper, iron, manganese, and zinc. All of the trace metal constituents concern are well below the applicable primary or secondary MCLs with the exception of iron and manganese. Iron (Fe) has been detected in concentrations of up to 1,500  $\mu\text{g/L}$  and manganese (Mn) has been detected in concentrations of up to 1,200  $\mu\text{g/L}$ , well above the Secondary MCLs of 300  $\mu\text{g/L}$  and 50  $\mu\text{g/L}$ , respectively.

Whenever the indicators exceed the maximum contaminant level (MCL), the City reported the test results to the State Public Health Department which then permitted the Well to be returned to service (operation) under a specified plan for up to a 6 month period. Should frequent testing during the 6 month period indicate no further exceedence of the MCL then the Well was approved for continued operation



either under a set of methods or under regular operational procedures.

Overall, there are four major constituents of concern for the City: iron, manganese, PCE, and TCE. Of the City's active wells, Well Nos.

8 and 19 experience high concentrations of both iron and manganese, while Well No. 9 experiences high iron concentrations. None of the City's active wells have high PCE or TCE concentrations. **Table 3.1** summarizes the City's Constituents of concern:

**Table 3.1**  
**City of Lynwood**  
**Groundwater Constituents of Concern**

Constituent Analyzed	Units	Maximum Contaminant Level	WELL NO. 5	WELL NO. 8	WELL NO. 9	WELL NO. 11	WELL NO. 19
General Perforation Interval:			650-720	154-824	322-790	310-924	250-950
Year(s) of Record>>>			1989-2008	1987-2008	1981-2008	1998-2008	1987-2006
<b>General Physical Constituents</b>							
Turbidity	NTU	5	0-0.9	0-1.8	0-1.7	0-0.23	0-0.6
Specific Conductance	µmhos/cm	900, 1600, 2200(1)	675-997	640-780	470-830	672-780	560-708
pH	units	6.5 to 8.5	7.55-7.9	7.55-8.06	7.5-8.04	7.57-8.0	7.62-8.01
Color	CU	15	ND	ND-30(2)(19)	ND-10(2)	ND	ND-5(2)(2006)
Odor	TON	3	ND-1	ND-2	ND-2	ND-1	1-3
<b>General Mineral Constituents</b>							
Total Dissolved Solids	mg/L	500, 1000, 1500(1)	423-470	383-480	338-470	402-470	368-437
Total Hardness		None	260-310	248-293	204-270	240-360	218-254
Calcium		None	70-100	64-100	55-84	65-105	52-89
Magnesium		None	16-22	3-10	10-19	14-37	6-16
Sodium		None	32-44	32-44	32-40	36-42	40-53
Potassium		None	2.7-3.1	2.3-4.6	2.4-4.0	2.9-3.7	2.3-4.7
Bicarbonate (HCO <sub>3</sub> )		None	180-236	190-264	180-230	180-246	190-230
Sulfate		250, 500, 600(1)	100-111	75-120	72-113	100-126	85-100
Chloride		250, 500, 600(1)	42-52	37-52	27-43	40-49	28-43



Constituent Analyzed	Units	Maximum Contaminant Level	WELL NO. 5	WELL NO. 8	WELL NO. 9	WELL NO. 11	WELL NO. 19
Fluoride(1)		2	0.35-0.41	0.3-1.4	0.2-0.39	0.3-0.7	0.2-0.39
Nitrate as NO3		45	3.1-8.7	ND-13.5	ND-4	3.5-9.1	ND-4.3
<b>Detected Inorganic Constituents</b>							
Aluminum	µg/L	200	ND	ND-0.12	ND	ND-0.12	ND
Arsenic		10	2.7-7.3	2.6-4.5	4.8-7.9	2-3.1	2.4-3.6
Barium		1000	ND-140	ND-150	ND-140	ND-130	ND-110
Boron		1000 (NL)	ND-100	ND	ND-210	ND	ND-120
Chromium (Total)		50	1.6, 6.5	ND	ND	ND	ND
Copper		1300	3.4	ND-2.6	2.4,3.8	ND	2, 2.2
Iron		300	ND-39	ND-1280	ND-950	ND	ND-360
Manganese		50	ND-16	ND-215	2.9-54	ND-4	ND-1200
Selenium		50	ND	ND	3.5(2)	ND	ND
Zinc		5000	ND-125	ND-55	ND-52	ND	ND
<b>Detected Volatile Organic Compounds</b>							
1,2,3-Trichloropropane (TCP)	µg/L	ND	ND	ND	ND	ND	0.41(2) (2001)
Total Trihalomethanes (THMs)		80-100	ND-36.8	ND-6.5(2)	ND-0.92(2)	ND-1.1(2)	ND
Tetrachloroethylene (PCE)		5	ND-2.8	ND-3.3	ND-0.93	ND-6.7	0.7-1.9
Trichloroethylene (TCE)		5	ND	ND	ND-0.55	ND	ND

### 3.4 WATER QUALITY EFFECTS

The previous section discussed water quality issues affecting the City's imported water supply and the City's groundwater supplies pumped from the Central Basin. Due to the mitigation actions undertaken by MWD and the City, the City does not anticipate any reductions in its overall water supplies due to water quality issues. Future regulatory

changes enacted by the EPA and/or the State legislature will be met through additional mitigation actions in order to meet the standards and to maintain water supply to the City's customers. Thus, the City does not expect water quality to be a major factor in its supply reliability considerations



## SECTION 4: WATER DEMANDS

### 4.1 INTRODUCTION

Water use within the City is variable and depends on a number of factors which range from irrigation to industrial use and from inefficient plumbing to water losses. Changes in residential plumbing fixtures and customer usage habits can significantly affect water usage for most agencies. This section explores the water usage trends within the City and quantifies total usage per customer type. In addition, the provisions of the Water Conservation Act of 2009 are explored in detail.

### 4.2 URBAN GROWTH

The City of Lynwood, like most of Southern California, began as small, suburban town with plenty of room for residential, commercial, and industrial development. Previous land uses in the City at that time comprised mostly of a mixture of residential and industrial uses.



Figure 4.1: Early Lynwood

In the early 1800s the community of Lynwood was founded and in 1921 the City was officially incorporated. The City's water and land resources provided an opportunity for growth and development. As result, the City has supported significant residential,

commercial, and industrial growth over the past 90 years. Among the significant commercial centers in the City is Plaza Mexico, which is located adjacent to the Interstate 105 freeway.



Figure 4.2: Lynwood Today

Through urbanization, the City has become one of the key central basin cities in Los Angeles County. The City's location along the Alameda Corridor allows for railroad dependent industrial activity to occur. In addition, the City provides a unique opportunity for sustainable residential, commercial, and institutional development due to its commitment to utilize its resources efficiently, which has over the years contributed to the City's population and economic growth. Due to current "built-out" conditions, additional growth is expected to occur mainly through re-development.

### 4.3 CURRENT CITY WATER NEEDS

The City's image as a residential, industrial and commercial friendly City is due in part to its dedication to conserving its resources while maintaining the beauty of its parks, schools, and recreational facilities both in the private and in the public sector.



Since the City is zoned primarily for residential use, the City has a significant number of residential lots which require consistent irrigation to maintain landscapes. The City therefore has ordinances to ensure landscapes are irrigated efficiently the proper time in order to avoid water waste.



Figure 4.3: Residential Irrigation

In addition to water demand for residential irrigation purposes, there are a number of other significant water demands within the City's service area. These include commercial and industrial properties in addition to municipal properties such as schools and parks.



Figure 4.4: Lynwood City Park

The City's socio-economic stature is comparable to many cities in the CBMWD service area, and overall water use characteristics within the City's service area are lower than regional averages in Southern California. The City's water consumption

rates are typical of many Central Basin agencies, and are less than half of high-end communities such as Beverly Hills.

#### 4.4 HISTORIC WATER DEMAND

Water demands within the City's service area over the past five years are met by groundwater from the Central Ground Water Basin and imported water from CBMWD. Annual water use since 2005 has ranged from about 5,821 AFY to 6,596 AF as shown below in **Table 4.1**:

**Table 4.1**  
**Five-Year Historic Total Water Consumption**

Year	Consumption (AF)
2010	5,821
2009	5,955
2008	6,596
2007	6,134
2006	6,124
2005	6,442
<b>Average:</b>	<b>6,179</b>

As indicated by **Table 4.1** above, annual water use fluctuates each year and is dependent on climatologic conditions.

#### 4.5 WATER USE STATISTICS

##### *Water Service Connections*

The City maintains records of water consumption and bills its customers on a bi-monthly basis for its water service. The City maintains approximately 9,000 service connections with a mixture of residential, commercial, institutional, and industrial customers. The City maintains records of its single family accounts.



Multi-family accounts are combined with commercial and institutional accounts. However, for billing purposes, does not separate water use by sector. The City records water use per service connection only and bills customers based on a single water rate structure. Water sales data is

compiled by City water staff and recorded on DWR's Form No. 38 (Public Water System Statistics) and submitted to DWR annually. The total number of service connections and total water consumption since 2005 is shown below in **Tables 4.2** and **4.3**:

**Table 4.2**  
**Number of Service Connections 2005-2010**

Sector	2005	2006	2007	2008	2009	2010
Single Family Residential	7,415	7,421	7,440	7,440	7,445	7,602
Multi-Family Residential/ Commercial/ Instiitutional	1,546	1,588	1,588	1,590	1,590	1,408
<b>Total Connections:</b>	<b>8,961</b>	<b>9,009</b>	<b>9,028</b>	<b>9,030</b>	<b>9,035</b>	<b>9,010</b>

**Table 4.3**  
**Water Sales 2005-2010**

Sector	2005	2006	2007	2008	2009	2010
Total Sales	5,798	6,036	6,021	6275	5,631	5,167
Unaccounted for Water	644	322	113	321	324	654
<b>Water Production</b>	<b>6,442</b>	<b>6,358</b>	<b>6,134</b>	<b>6,596</b>	<b>5,955</b>	<b>5,821</b>

As indicated by **Table 4.3** above, the City's unaccounted for water ranged from 113 to 486 AF (1.4% to 8.6%). Unaccounted for water consists of routine flushing, unmetered use, and water losses. Although water losses at or near the 10% range (not untypical of many water agencies), have

cost impacts on water agencies, they cannot be prevented entirely. Instead, effort is given to controlling the quantity of water losses (to a cost-effective extent) in order to reduce the cost impact of water losses on water operations.



## 4.6 WATER CONSERVATION ACT

### SBx7-7 Background

Due to reductions of water in the San Joaquin Delta, the Legislature drafted the Water Conservation Act of 2009 (SBx7-7) to protect statewide water sources. The new legislation called for a 20% reduction in water use in California by the year 2020. The new legislation amended the Water Code to call for reporting changes

in the 2010 Urban Water Management Plans and allows the Department of Water Resources (DWR) to enforce compliance to the new water use standards. The new reporting requirements allow provisions for agencies located within different Hydrologic Regions to satisfy the requirements of the new legislation.



Figure 4.5: California's 2020 Water Conservation Goals

In addition to an overall statewide 20% water use reduction, the objective of SBx7-7 is to reduce water use within each hydrologic region in accordance with the agricultural and urban water needs of each region. Currently, the Department of Water Resources (DWR) recognizes 10

separate hydrologic regions in California as shown in **Figure 4.5**. Each hydrologic region has been established for planning purposes and corresponds to the State's major drainage areas. The City of Lynwood is located in the South Coast Hydrologic Region (HR), which includes



all of Orange County, most of San Diego and Los Angeles Counties, parts of Riverside, San Bernardino, and Ventura counties, and a small amount of Kern and Santa Barbara Counties. The South Coast HR is shown below in **Figure 4.6**. Per capita water use, measured in gallons per capita per day (GPCD), in the South Coast HR varies between different water agencies, depending on the geographic and economic

conditions of the agency's service area. Regions with more affluence, such as Beverly Hills, typically consume more water and therefore have higher per capita water use numbers. The South Coast Hydrologic Region has an overall baseline per capita water use of 180 GPCD and DWR has established a regional target of 149 GPCD for the region as a compliance target to satisfy SBx7-7 legislation.

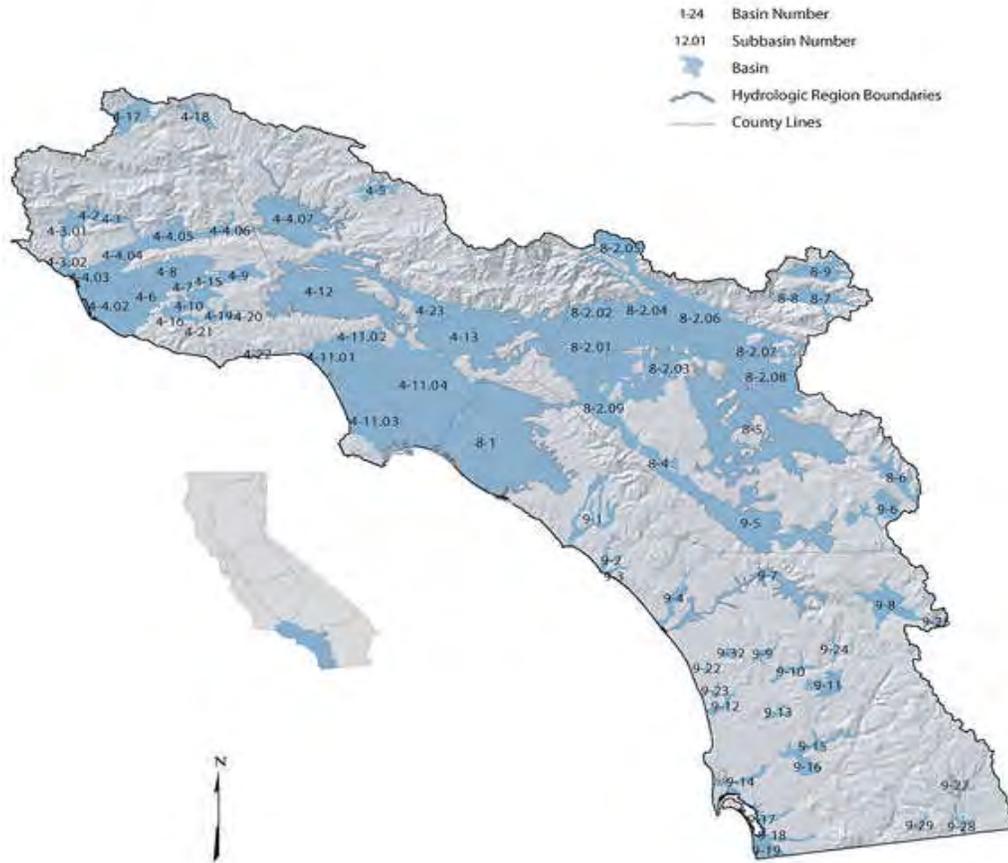
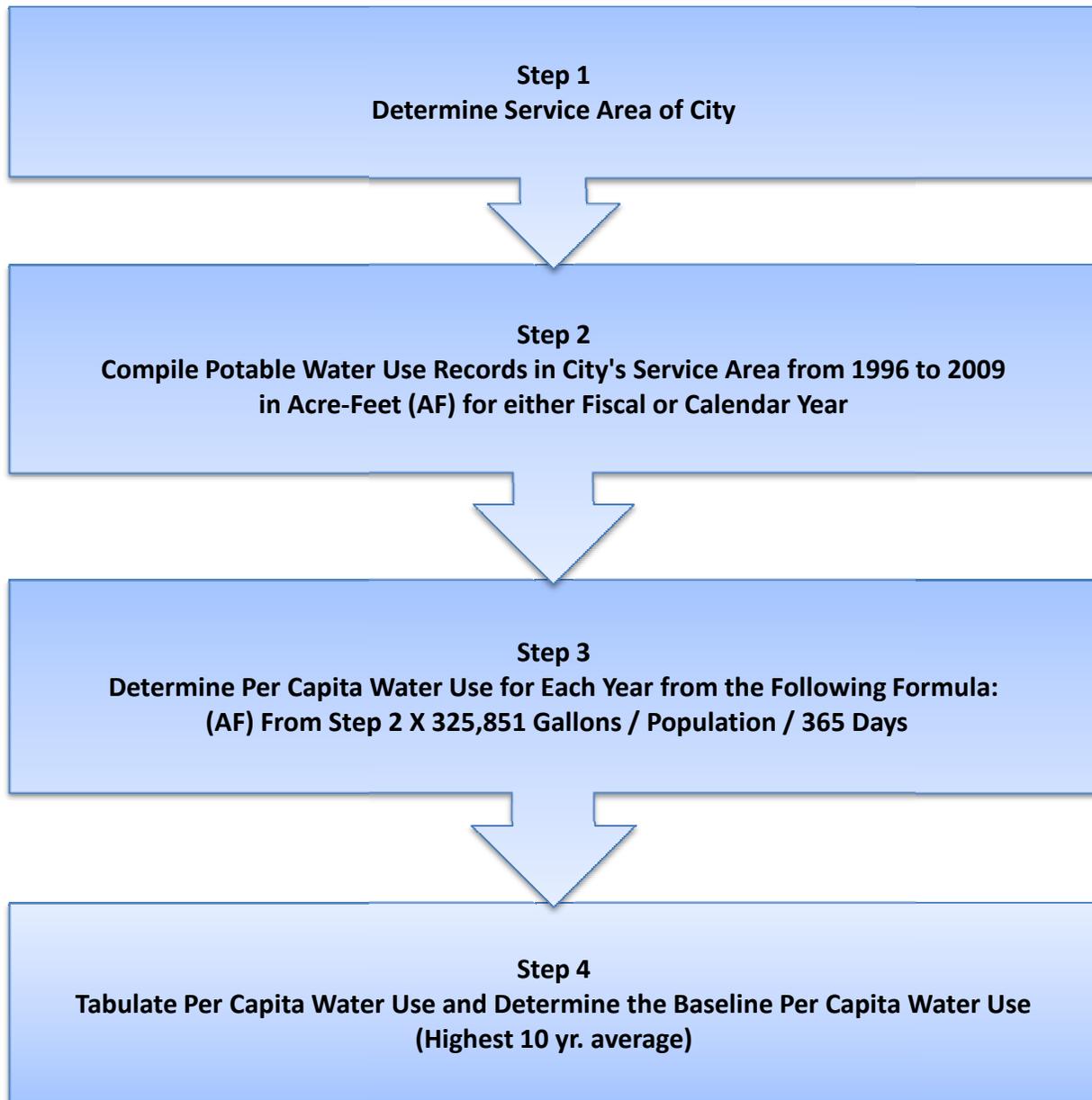


Figure 4.6: South Coast Hydrologic Region

**SBx7-7 Methodologies**

To satisfy the provisions of SBx7-7, the City must establish a per capita water use target for the year 2020 as well as an interim target. DWR has provided guidelines for determining these targets in its *Methodologies for Calculating Baseline and*

*Compliance Urban Per Capita Water Use* and also in the 2010 UWMP Guidebook (Section D). The City's baseline water use is based on the City's historic water use and is determined by the procedure on the following page:



**Figure 4.7: Procedure for Determining Baseline Per Capita Water Use**

In the same fashion, the City is responsible for determining a five-year baseline water use in accordance with DWR's guidelines. The *Methodologies* guidebook makes provisions which allow a water supplier to meet the target requirements by achieving any one of a number of target requirements, provided that the water supplier's per capita water

use is low enough relative to the region within which it supplies water. The basic options include a minimum reduction requirement of 5% (Water Code § 10620), a 5% Reduction from the Regional (South Coast HR) target (Water Code § 10608.20 (b) (3)), or a strict 20% reduction.

These options have been established in order

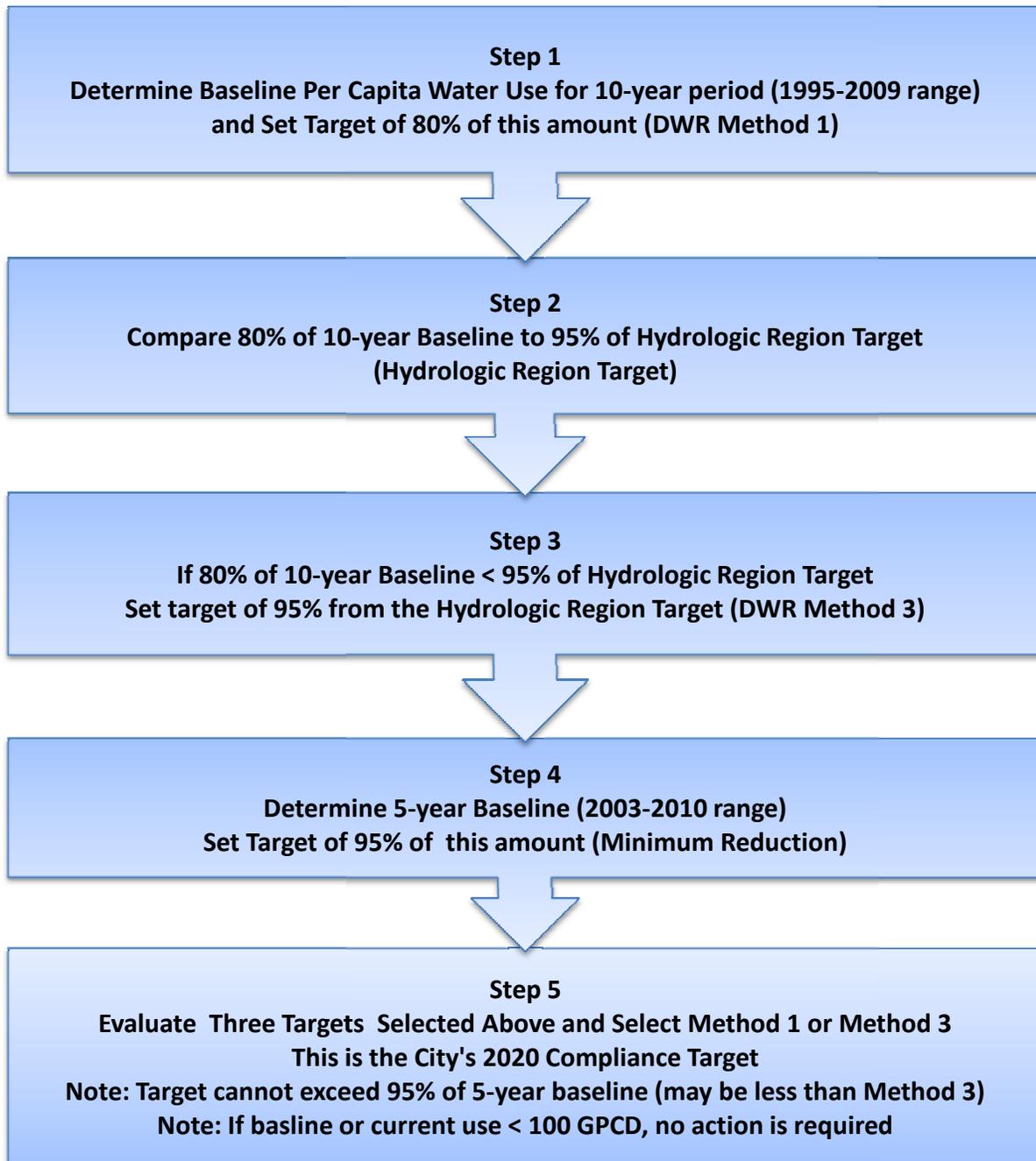


Figure 4.8: Procedure for Determining 2020 Water Use Target

to avoid placing any undue hardship on water agencies that have already been implementing water conservation measures for some time. The basic procedure for determining the applicable water reduction target is illustrated below by **Figure 4.8** above. If an agency's 10-year baseline is

slightly higher than the Hydrologic Region's Target, that agency still must achieve a 5% reduction from its 5-yr. baseline. If an agency has a per capita water use of 100 GPCD or less, that agency will not have to adhere to any reduction targets as that agency is already water efficient.



**SBx7-7 Targets**

Due to the options available to water agencies, some neighbor agencies within the South Coast HR with moderate water usages, such as Los Angeles, (baseline of 150.6 GPCD) will not have to adhere to stringent reduction requirements. **Table 4.4** below shows an example of these options available to the City of Los Angeles:

**Table 4.4**  
**Reduction Example for Los Angeles**  
**(Baseline = 150.6 GPCD)**

Min. Reduction Requirement (5% of 5-year baseline) (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
143.07	120.5	141.5
<b>2020 Per Capita Target:</b>		<b>141.5</b>
<b>Interim (2015) Target:</b>		<b>146.1</b>

As indicated by the above table, the City of Los Angeles cannot select a minimum reduction requirement of 143.07 GPCD (5% from its baseline) as this amount is greater than 141.5 GPCD (5% reduction from the South Coast HR's regional target). However, since Los Angeles's 20% reduction target (120.5 GPCD) is less than the minimum reduction requirement that is required by DWR (141.5 GPCD), it is feasible to select 141.5 GPCD as its 2020 water use target.

Like the City of Los Angeles, water consumption characteristics in the City are low to moderate due to socio-economic conditions and a commitment to efficient water use. This indicates that the City will not have to adhere to the strict provisions of SBx7-7.

To determine the City of Lynwood's historic per capita water use and to set 10-yr. and 5-yr. baselines, water use data was gathered from 1996-2010 and the City's baseline was determined as shown below in **Table 4.5**:

**Table 4.5**  
**City of Lynwood**  
**Historic GPCPD Water Use**

Year	Total Potable Consumption (AF)	Per Capita (GPCD)
2010	5,821	78
2009	5,955	81
2008	6,596	90
2007	6,134	84
2006	6,124	83
2005	6,442	88
2004	6,791	93
2003	6,708	92
2002	6,745	93
2001	6,713	94
2000	6,771	96
1999	6,704	97
1998	6,991	103
1997	7,265	109
1996	7,226	109
1995	7,107	107
<b>10 yr. Baseline (1995-2004) (SB7: 10608.20)</b>		<b>99</b>
<b>5 yr. Baseline (2003-2007) (SB7: 10608.22)</b>		<b>88</b>
<b>South Coast HR:</b>		<b>180</b>

As indicated by Table 4.5 above, the City's 10-year and 5-year baseline water use is under 100 GPCD. The City's current (2010) water use is also under 100 GPCD. Therefore, the City is already in compliance with the provisions of SBx7-7 and is not required to reduce consumption.



Per SBx7-7 legislation and DWR's *Methodologies* guidebook, the legal stipulations applicable to the City are shown below in **Table 4.6**:

**Table 4.6**  
**City of Lynwood**  
**SBx7-7 2020 Water Use Targets**

Min. Reduction Requirement (10608.22)	20% Target (10608.20) (b)(1)	5% Reduction from Regional Target (10608.20) (b)(3)
N/A	N/A	N/A
<b>2020 Per Capita Target:</b>		<b>N/A</b>
<b>Interim (2015) Target:</b>		<b>N/A</b>
<b>2009 Per Capita Water Use:</b>		<b>81</b>
<b>Current (2010) Per Capita Water Use:</b>		<b>78</b>

As indicated by the above table, the City is already in compliance with SBx7-7 and is neither required to establish nor adhere to 2020 compliance targets in order to be eligible for State grants and loans. In the City's 2015 UWMP, the City will need to document that consumption rates are still under 100 GPCD.

**SBx7-7 Impacts**

By maintaining low consumption rates and achieving 100% local sustainability, the City can participate in Statewide efforts to conserve Sacramento-San Joaquin Bay-Delta Water and to protect the ecological habitat of the region. Although ecological motives are debatable, ensuring a reliable supply of water for human use is a top priority. Through conservation measures and the use of renewable, local groundwater supplies, the City can reduce demand for Bay-Delta water.

With increased public awareness of conservation requirements, it is likely that the public will begin to understand the importance of water conservation and will begin to use water even more efficiently.



**Figure 4.9: Bay-Delta Water Must Be Preserved**

**4.7 PROJECTED WATER DEMAND**

Future water use projections must consider significant factors on water demand, such as development and/or redevelopment, and climate patterns, among other less significant factors which affect water demand. Although redevelopment is expected to be an ongoing process, it is not expected to significantly impact water use since the City is already in a "built-out" condition. Rainfall, however, will continue to be a major influence on demand as drought conditions will increase demand at a time when these supplies are limited and may therefore result in water use restrictions in accordance with the City's Water Conservation Program (Ordinance 1618). As the City's population continues to grow and as water conservation measures continue to be implemented, the City should experience moderate increases in its water consumption due mostly to population increases. Per capita consumption rates, however, should be expected to remain under 100 gpcd (in accordance with water use trends in the City).



Although the City does not segregate water usage by sector, the City does maintain a record of residential service connections. Future demand projections in the City include low-income housing units as the Housing Element for the City lists 123 low and very low income housing units to meet the City's Housing Needs Assessment. The estimated residential per unit water demand is 0.65 AF/unit/year and thus 80 AFY is needed to supply these projected lower income housing units. These water demands are included in the total future water demand projections listed in **Table 4.7** below:

**Table 4.7**  
**Projected Water Consumption**

Year	Consumption (AF)
2015	6,329
2020	6,482
2025	6,639
2030	6,800
2035	6,965

Demand and Supply projections are compared for normal, single dry, and multiple dry water years and included as part of the City's reliability analysis in **Section 5: Reliability Planning**.



## SECTION 5: RELIABILITY PLANNING

### 5.1 INTRODUCTION

Drought conditions continue to be a critical issue for Southern California's water supply. As the population of Southern California continues to increase and as environmental regulations restrict imported and local water supplies, it is important that each agency manage its water consumption in the face of drought. Even during times of seasonal drought, each agency ought to anticipate a surplus of supply. This can be accomplished through conservation and supply augmentation, and additionally through prohibitions under penalty of law during times of seasonal or catastrophic shortage in accordance with local ordinances.

This section discusses local and regional efforts to ensure a reliable supply of water and compares projected supply to projected demand. Demand and supply projections are provided in **Tables 5.4- 5.10**.

### 5.2 HISTORIC DROUGHTS

Climate data has been recorded in California since 1858. Since then, California has experienced several periods of severe drought: 1928-34, 1976-77 and 1987-91, and most recently in 2007-2009. California has also experienced several periods of less severe drought. The year 1977 is considered to be the driest year of record in the Four Rivers Basin by DWR. These rivers flow into the Delta and are the source of water for the SWP. Southern California sustained few adverse impacts from the 1976-77 drought, but the 1987-91 drought created considerably more concern.

As a result of previous droughts, the State legislature has enacted, among other things,

the Urban Water Management Planning Act, which requires the preparation of this plan. Subsequent amendments to the Act have been made to ensure the plans are responsive to drought management. In 1991, several water agencies came together to form the California Urban Water Conservation Council (CUWCC) to manage the impacts of drought through the promotion of water conservation.



Figure 5.1: Lake Oroville: Drought Conditions

The recent drought of 2007-2009 has resulted in significant impacts on the State's water supplies. The Water Conservation Act of 2009 (SBx7-7) was signed into law by Gov. Schwarzenegger which requires mandatory water conservation up to 20% by 2020.

At the local level, water agencies have enacted their own ordinances to deal with the impacts of drought. In 2009, the City enacted a Water Conservation Ordinance (No. 1618), which manages the City's water supply during droughts. Compliance ranges from voluntary to mandatory depending on the drought severity.



### 5.3 REGIONAL SUPPLY RELIABILITY

As a result of continued challenges to its water supplies, MWD understands the importance of reliable water supplies. MWD strives to meet the water needs of Southern California by developing new projects to increase the capacity of its supplies while encouraging its member agencies to develop

local supply project to meet the needs of its customers. Also, MWD is committed to developing and maintaining high-capacity storage reservoirs, such as Diamond Valley Lake, to meet the needs of the region during times of drought and emergency.



**Figure 5.2: MWD's 800,000 AF Diamond Valley Lake**

MWD operates Diamond Valley Lake, an 800,000 AF reservoir, to avoid the repercussions of reduced supplies from the SWP and CRA. In addition, MWD operates several additional storage reservoirs in Riverside, San Bernardino, and San Diego Counties to store water obtained from the SWP and the CRA. Storage reservoirs like these are a key component of MWD's supply capability and are crucial to MWD's ability to meet projected demand without having to

implement the Water Supply Allocation Plan (WSAP). This is crucial since the SWP and CRA have become more restricted which could render the City's supplies more vulnerable to shortage.

#### ***Colorado River Aqueduct Reliability***

Water supply from the CRA continues to be a critical issue for Southern California as MWD competes with several agricultural



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

MWD recognizes that due to competition from other states and other agencies within California has decreased the CRA's supply reliability. In 2003, the Quantification Settlement Agreement (QSA) was signed which facilitated the transfer of water from agricultural agencies to urban uses.

### **State Water Project Reliability**

The reliability of the SWP impacts Metropolitan's member agencies' ability to plan for future growth and supply. DWR's Bulletin 132-03, December 2004, provides certain SWP reliability information, and in 2002, the DWR Bay-Delta Office prepared a report specifically addressing the reliability of the SWP.<sup>35</sup> This report, The State Water Project Delivery Reliability Report, provides information on the reliability of the SWP to deliver water to its contractors assuming historical precipitation patterns.

On an annual basis, each of the 29 SWP contractors including Metropolitan request an amount of SWP water based on their anticipated yearly demand. In most cases, Metropolitan's requested supply is equivalent to its full Table A Amount. After receiving the requests, DWR assesses the amount of water supply available based on precipitation, snow pack on northern California watersheds, volume of water in storage, projected carry over storage, and Sacramento-San Joaquin Bay Delta regulatory requirements. For example, the

SWP annual delivery of water to contractors has ranged from 552,600 AFY in 1991 to 3.5 MAF in 2000. Due to the uncertainty in water supply, contractors are not typically guaranteed their full Table A Amount, but instead a percentage of that amount based on the available supply.

Each December, DWR provides the contractors with their first estimate of allocation for the following year. As conditions develop throughout the year, DWR revises the allocations.



Figure 5.3: State Water Project (SWP)

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

## **5.4 CURRENT RESERVOIR LEVELS**

Statewide, storage reservoir levels rise and fall due to seasonal climate changes which induce increase in demand. During periods of drought, reservoir levels can drop significantly and can limit the amount of supplies available. As a result, both DWR and MWD monitor their reservoir levels regularly. In 2009, conditions of several key reservoirs indicated drought conditions. Currently, reservoir levels are high as indicated by **Figures 5.4 and 5.5:**

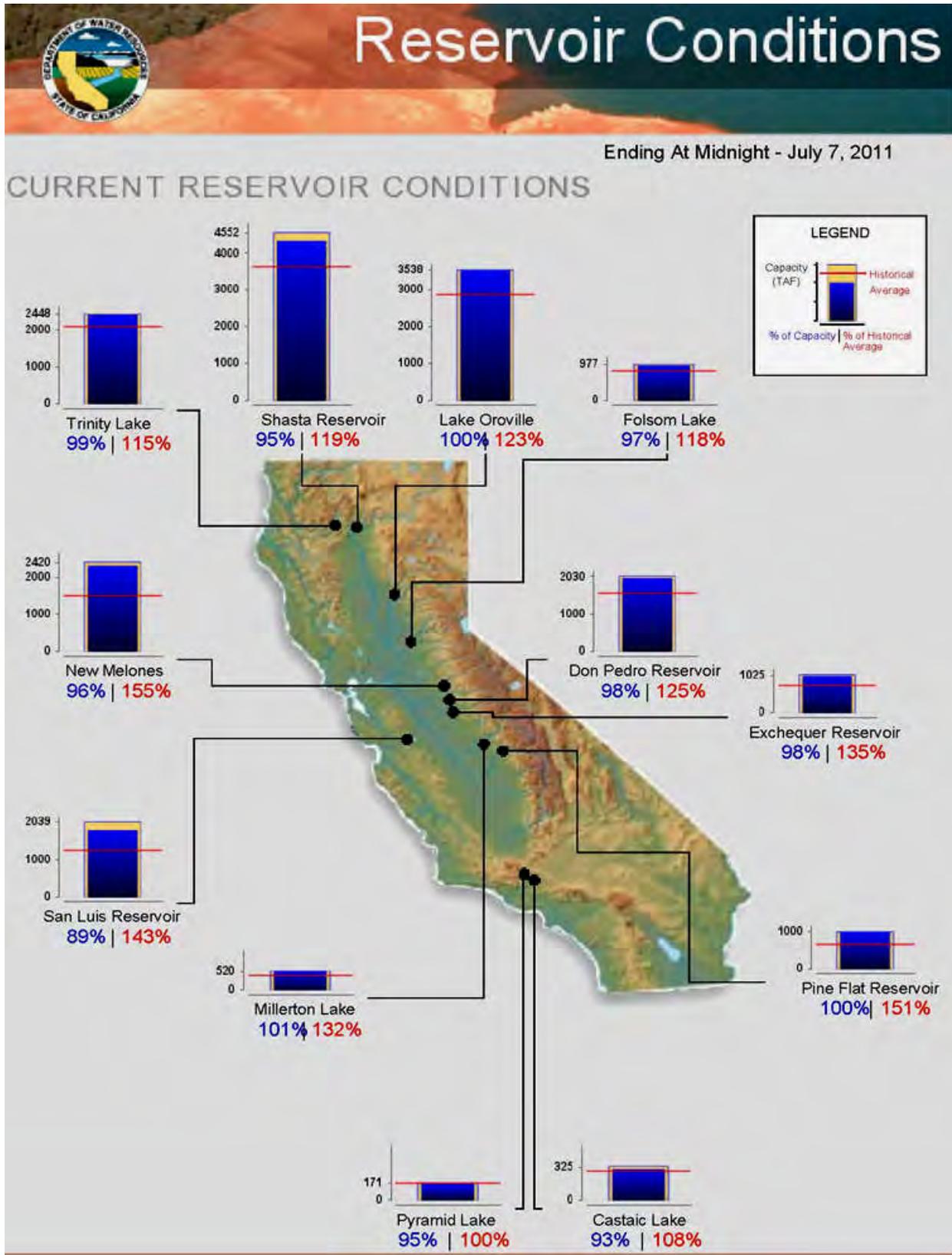


Figure 5.4: California State Reservoir Levels

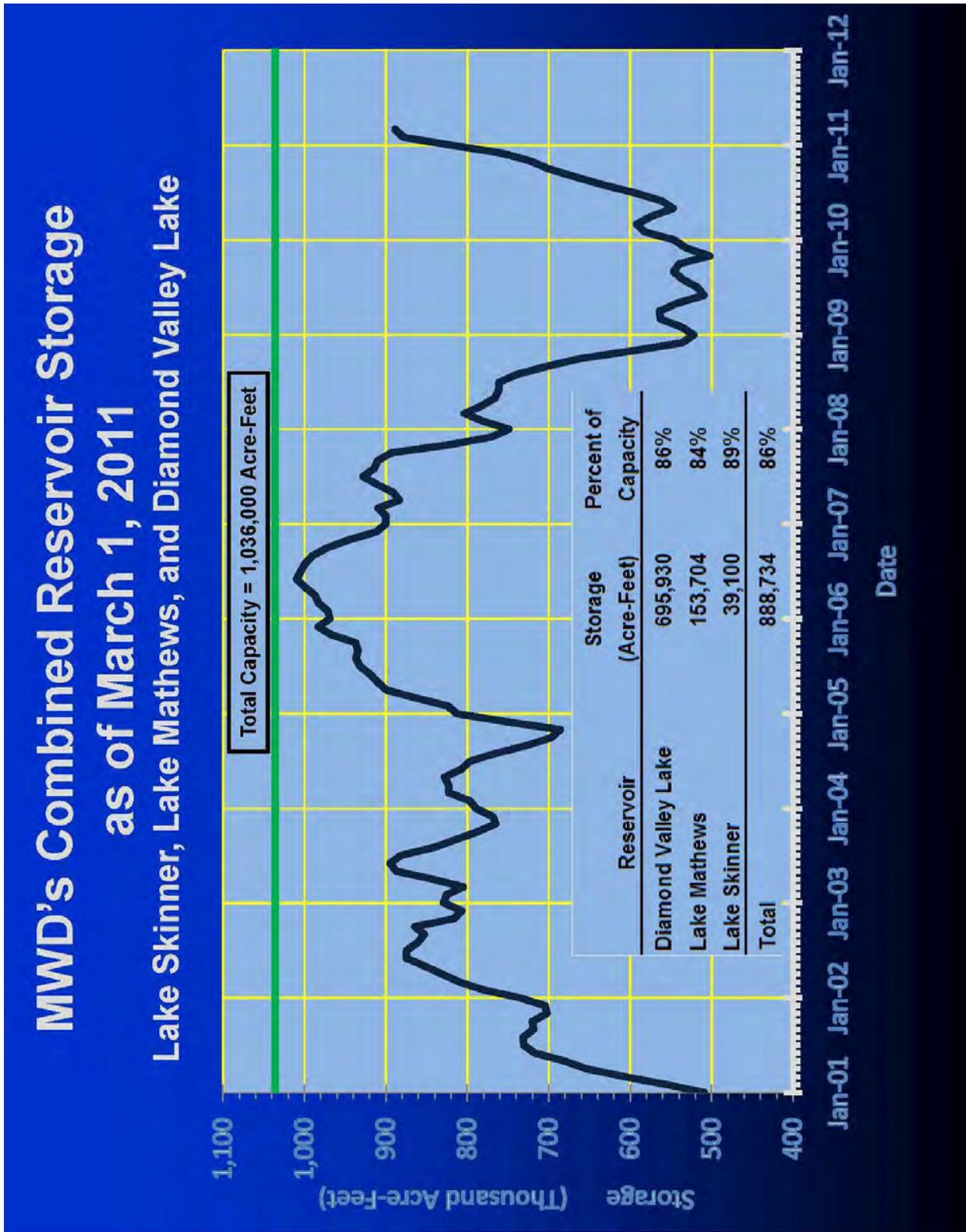


Figure 5.5: MWD Reservoir Levels



**5.5 SUPPLY VS. DEMAND**

As the City obtains its water sources from local groundwater, imported water, and recycled water, the City's water supply reliability is based on the capacity and vulnerability of its infrastructure in addition to the seasonal demand changes brought about by periods of drought. MWD's reliability of supply has direct impact on the City. Population growth will also continue to be a factor in future reliability projections. Since the City is pursuing 100% local groundwater sustainability, having continued access to imported water increases the City's supply reliability.

**Regional Supply Reliability**

Southern California is expected to experience an increase in regional demands in the years 2015 through 2035 as a result of population growth. Although increases in demand are expected, they are limited due to the requirements of SBx7-7 which provides a cap on water consumption rates (i.e. per capita water use). It can be reasonably expected that the majority of agencies will be at or near their compliance targets by 2020 and thereafter as conservation measures are more effectively enforced.

**Tables 2.9-2.11** of MWD's 2010 RUWMP (see Appendix G) shows supply reliability projections for average and single dry years through the year 2035. The data in these tables is important to effectively project and analyze supply and demand over the next 25 years for many regional agencies. It is noteworthy that Projected Supplies During a Single Dry Year and Multiple Dry Years indicates MWD's projected supply will exceed its projected single dry year and multiple dry year demands in all years. Likewise, for average years, MWD supply exceeds projected demands for all years.

The data contained in these tables has an indirect effect on the City's imported supply capacity and thus this data will also be used to develop the City's projected supply and demand over the next 25 years. **Tables 5.2 and 5.3** show MWD's supply reliability

**City Supply Reliability**

To project future supply and demand comparisons, it will be assumed that demand will increase annually based on population growth and a constant of 84 GPCD in accordance with recent water use trends. **Table 5.1** contains the projected populations that will be used to project demand:

**Table 5.1  
City of Lynwood  
Service Area Population Projections**

Year	Population
2015	67,580
2020	69,234
2025	70,929
2030	72,665
2035	74,444
<b>Demand = Population x GPCD Rate</b>	

During times of drought, demand will increase at a time when supply will decrease. To project demands during drought periods, the following factors measured from actual demand data from 2002-2004 will be assumed:

- **Single Dry Year Demand Increase:** 103% of Normal
- **Multiple Dry Year Demand Increases (Years 1, 2, & 3):** 102%, 101%, 103% of Normal



**Table 5.2**  
**MWD Regional Imported Water Supply Reliability Projections**  
**Average and Single Dry Years**

Row	Region Wide Projections	2015	2020	2025	2030	2035
<b>Supply Information</b>						
<b>A</b>	Projected Supply During an Average Year[1]	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
<b>B</b>	Projected Supply During a Single Dry Year[1]	2,457,000	2,782,000	2,977,000	2,823,000	2,690,000
<b>C = B/A</b>	Projected Supply During a Single Dry Year as a % of Average Supply	<b>70.5%</b>	<b>73.0%</b>	<b>72.8%</b>	<b>71.5%</b>	<b>70.5%</b>
<b>Demand Information</b>						
<b>D</b>	Projected Demand During an Average Year	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
<b>E</b>	Projected Demand During a Single Dry Year	2,171,000	2,162,000	2,201,000	2,254,000	2,319,000
<b>F = E/D</b>	Projected Demand During a Single Dry Year as a % of Average Demand	<b>108.2</b>	<b>111.8</b>	<b>110.9</b>	<b>110.0</b>	<b>110.1</b>
<b>Surplus Information</b>						
<b>G = A-D</b>	Projected Surplus During an Average Year	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
<b>H = B-E</b>	Projected Surplus During a Single Dry Year	286,000	620,000	776,000	569,000	371,000
<b>Additional Supply Information</b>						
<b>I = A/D</b>	Projected Supply During an Average Year as a % of Demand During an Average Year	<b>173.7</b>	<b>197.1</b>	<b>206.0</b>	<b>192.6</b>	<b>181.1</b>
<b>J = A/E</b>	Projected Supply During an Average Year as a % of Demand During Single Dry Year	<b>160.5</b>	<b>176.2</b>	<b>185.8</b>	<b>175.1</b>	<b>164.5</b>
<b>K = B/E</b>	Projected Supply During a Single Dry Year as a % of Single Dry Year Demand (including surplus)	<b>113.2</b>	<b>128.7</b>	<b>135.3</b>	<b>125.2</b>	<b>116.0</b>



**Table 5.3**  
**MWD Regional Imported Water Supply Reliability Projections**  
**Average and Multiple Dry Years**

Row	Region Wide Projections	2015	2020	2025	2030	2035
<b>Supply Information</b>						
<b>A</b>	Projected Supply During an Average Year[1]	3,485,000	3,810,000	4,089,000	3,947,000	3,814,000
<b>B</b>	Projected Supply During Multiple Dry Year Period*	2,248,000	2,417,000	2,520,000	2,459,000	2,415,000
<b>C = B/A</b>	Projected Supply During Multiple Dry Year as a % of Average Supply	<b>64.5</b>	<b>63.4</b>	<b>61.6</b>	<b>62.3</b>	<b>63.3</b>
<b>Demand Information</b>						
<b>D</b>	Projected Demand During an Average Year	2,006,000	1,933,000	1,985,000	2,049,000	2,106,000
<b>E</b>	Projected Demand During Multiple Dry Year Period[2]	2,236,000	2,188,000	2,283,000	2,339,000	2,399,000
<b>F = E/D</b>	Projected Demand During Multiple Dry Year Period as a % of Average Demand	<b>111.5</b>	<b>113.2</b>	<b>115.0</b>	<b>114.2</b>	<b>113.9</b>
<b>Surplus Information</b>						
<b>G = A-D</b>	Projected Surplus During an Average Year	1,479,000	1,877,000	2,104,000	1,898,000	1,708,000
<b>H = B-E</b>	Projected Surplus During Multiple Dry Year Period	12,000	229,000	237,000	120,000	16,000
<b>Additional Supply Information</b>						
<b>I = A/D</b>	Projected Supply During an Average Year as a % of Demand During an Average Year	<b>173.7</b>	<b>197.1</b>	<b>206.0</b>	<b>192.6</b>	<b>181.1</b>
<b>J = A/E</b>	Projected Supply During an Average Year as a % of Demand During Multiple Dry Year	<b>155.9</b>	<b>174.1</b>	<b>179.1</b>	<b>168.7</b>	<b>159.0</b>
<b>K = B/E</b>	Projected Supply During a Multiple Dry Year as a % of Multiple Dry Year Demand (including surplus)	<b>100.5</b>	<b>110.5</b>	<b>110.4</b>	<b>105.1</b>	<b>100.7</b>



**Table 5.4**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Normal Water Year**

Water Sources	2015	2020	2025	2030	2035
<b>Available Supply</b>					
Imported Water	3,000	3,741	4,270	4,339	4,413
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Supply</b>	<b>8,337</b>	<b>9,078</b>	<b>9,607</b>	<b>9,676</b>	<b>9,750</b>
% of Normal Year	100%	100%	100%	100%	100%
<b>Demand</b>					
Imported Water	1,727	1,898	2,073	2,253	2,437
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Demand</b>	<b>7,064</b>	<b>7,235</b>	<b>7,410</b>	<b>7,590</b>	<b>7,774</b>
% of 2005-2009 Avg. Demand (6,151)	114.84%	117.62%	120.47%	123.39%	126.39%
<b>Supply/Demand Comparison</b>					
Supply/ Demand Difference	1,273	1,843	2,197	2,086	1,976
Difference as % of Supply	15.27%	20.30%	22.87%	21.56%	20.27%
Difference as % of Demand	18.02%	25.47%	29.65%	27.49%	25.42%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Imported Water Supply represents supply available to City, if needed, based on Imported demand multiplied by Table 5.2 Row I
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



**Table 5.5**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Single Dry Year\***

Water Sources	2015	2020	2025	2030	2035
<b>Available Supply</b>					
Imported Water	2,195	2,722	3,106	3,106	3,097
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Supply</b>	<b>7,532</b>	<b>8,059</b>	<b>8,443</b>	<b>8,443</b>	<b>8,434</b>
Normal Year Supply	8,337	9,078	9,607	9,676	9,750
% of Normal Year	90%	89%	88%	87%	87%
<b>Demand</b>					
Imported Water	1,939	2,115	2,295	2,481	2,670
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Demand</b>	<b>7,276</b>	<b>7,452</b>	<b>7,632</b>	<b>7,818</b>	<b>8,007</b>
Normal Year Demand	7,064	7,235	7,410	7,590	7,774
% of Normal Year	103%	103%	103%	103%	103%
<b>Supply/Demand Comparison</b>					
Supply/Demand Difference	256	607	810	625	427
Difference as % of Supply	3.40%	7.53%	9.60%	7.40%	5.07%
Difference as % of Demand	3.52%	8.15%	10.62%	8.00%	5.34%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Single Dry Year Imported Water Supply represents supply available to City, if needed, based on Table 5.2 Row K
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



**Table 5.6**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Multiple Dry Years (2011-2015) \***

<b>Water Sources</b>	<b>2011</b>	<b>2012</b>	<b>2013</b>	<b>2014</b>	<b>2015</b>
<b>Available Supply</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	1,550	1,608	1,105	1,068	1,245
Groundwater	6,037	6,037	6,037	6,037	6,037
<b>Total Supply</b>	<b>7,587</b>	<b>7,645</b>	<b>7,142</b>	<b>7,105</b>	<b>7,282</b>
Normal Year Supply	7,587	7,645	7,703	7,762	7,820
% of Normal Year	100%	100%	93%	92%	93%
<b>Demand</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	893	926	1,099	1,063	1,238
Groundwater	6,037	6,037	6,037	6,037	6,037
<b>Total Demand</b>	<b>6,930</b>	<b>6,963</b>	<b>7,136</b>	<b>7,100</b>	<b>7,275</b>
Normal Year Demand	6,930	6,963	6,996	7,030	7,064
% of Normal Year	100%	100%	102%	101%	103%
<b>Supply/Demand Comparison</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Supply/Demand Difference	658	682	5	5	6
Difference as % of Supply	8.67%	8.93%	0.08%	0.07%	0.09%
Difference as % of Demand	9.49%	9.80%	0.08%	0.07%	0.09%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Table 5.3 Row K
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



**Table 5.7**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Multiple Dry Years (2016-2020) \***

Water Sources	2016	2017	2018	2019	2020
<b>Available Supply</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	3,470	3,537	2,179	2,138	2,337
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Supply</b>	<b>8,807</b>	<b>8,874</b>	<b>7,516</b>	<b>7,475</b>	<b>7,674</b>
Normal Year Supply	8,807	8,874	8,942	9,009	9,077
% of Normal Year	100%	100%	84%	83%	85%
<b>Demand</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	1,760	1,795	1,972	1,935	2,115
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Demand</b>	<b>7,097</b>	<b>7,132</b>	<b>7,309</b>	<b>7,272</b>	<b>7,452</b>
Normal Year Demand	7,097	7,132	7,166	7,200	7,235
% of Normal Year	100%	100%	102%	101%	103%
<b>Supply/Demand Comparison</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Supply/Demand Difference	1,709	1,743	207	203	222
Difference as % of Supply	19.41%	19.64%	2.76%	2.72%	2.89%
Difference as % of Demand	24.09%	24.43%	2.83%	2.79%	2.98%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Table 5.3 Row K
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



**Table 5.8**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Multiple Dry Years (2021-2025) \***

Water Sources	2021	2022	2023	2024	2025
<b>Available Supply</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	3,981	4,053	2,373	2,331	2,534
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Supply</b>	<b>9,318</b>	<b>9,390</b>	<b>7,710</b>	<b>7,668</b>	<b>7,871</b>
Normal Year Supply	9,318	9,390	9,462	9,535	9,608
% of Normal Year	100%	100%	81%	80%	82%
<b>Demand</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	1,932	1,967	2,149	2,111	2,295
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Demand</b>	<b>7,269</b>	<b>7,304</b>	<b>7,486</b>	<b>7,448</b>	<b>7,632</b>
Normal Year Demand	7,269	7,304	7,339	7,375	7,410
% of Normal Year	100%	100%	102%	101%	103%
<b>Supply/Demand Comparison</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Supply/Demand Difference	2,048	2,085	224	220	239
Difference as % of Supply	21.98%	22.21%	2.90%	2.86%	3.03%
Difference as % of Demand	28.18%	28.55%	2.99%	2.95%	3.13%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Table 5.3 Row K
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



**Table 5.9**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Multiple Dry Years (2026-2030)\***

<b>Water Sources</b>	<b>2026</b>	<b>2027</b>	<b>2028</b>	<b>2029</b>	<b>2030</b>
<b>Available Supply</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	4,061	4,130	2,449	2,409	2,607
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Supply</b>	<b>9,398</b>	<b>9,467</b>	<b>7,786</b>	<b>7,746</b>	<b>7,944</b>
Normal Year Supply	9,398	9,467	9,536	9,606	9,676
% of Normal Year	100%	100%	82%	81%	82%
<b>Demand</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	2,109	2,144	2,331	2,292	2,480
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Demand</b>	<b>7,446</b>	<b>7,481</b>	<b>7,668</b>	<b>7,629</b>	<b>7,817</b>
Normal Year Demand	7,446	7,481	7,517	7,553	7,590
% of Normal Year	100%	100%	102%	101%	103%
<b>Supply/Demand Comparison</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Supply/Demand Difference	1,953	1,986	119	117	126
Difference as % of Supply	20.78%	20.97%	1.53%	1.51%	1.59%
Difference as % of Demand	26.22%	26.54%	1.55%	1.53%	1.62%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Table 5.3 Row K
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



**Table 5.10**  
**City of Lynwood Water Supply Availability & Demand Projections**  
**Multiple Dry Years (2031-2035) \***

Water Sources	2031	2032	2033	2034	2035
<b>Available Supply</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	4,145	4,212	2,534	2,494	2,688
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Supply</b>	<b>9,482</b>	<b>9,549</b>	<b>7,871</b>	<b>7,831</b>	<b>8,025</b>
Normal Year Supply	9,482	9,549	9,615	9,682	9,750
% of Normal Year	100%	100%	82%	81%	82%
<b>Demand</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Imported Water	2,289	2,326	2,516	2,477	2,670
Groundwater	5,337	5,337	5,337	5,337	5,337
<b>Total Demand</b>	<b>7,626</b>	<b>7,663</b>	<b>7,853</b>	<b>7,814</b>	<b>8,007</b>
Normal Year Demand	7,626	7,663	7,699	7,736	7,774
% of Normal Year	100%	100%	102%	101%	103%
<b>Supply/Demand Comparison</b>					
	<b>Normal Years</b>		<b>Multiple Dry Years</b>		
Supply/Demand Difference	1,856	1,886	18	17	19
Difference as % of Supply	19.58%	19.75%	0.22%	0.22%	0.23%
Difference as % of Demand	24.34%	24.61%	0.22%	0.22%	0.23%

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

1. Total Demand based on 84 GPCD (2005-2010 average) multiplied by population projections
2. Multiple Dry Year Imported Water Supply represents supply available to City, if needed, based on Table 5.3 Row K
3. Groundwater Supply/Demand based on City's adjudicated right of 5,337 AFY
4. Recycled Water accounts for less than 0.1% of the City's overall supply/water use and is not considered to be a significant factor of the City's water system

\*This Table not intended to be a projection of City's actual groundwater production. City intends to lease additional groundwater rights with other agencies in future years.



Based on the data contained in **Tables 5.4-5.10**, the City can expect to meet future demands through 2035 for all climatologic classifications. Projected groundwater supply capacities are not expected to be significantly affected during times of low rainfall and over short term dry periods of up to three years. However, during prolonged periods of drought, the City's imported water supply capacities may potentially be reduced significantly due to reductions in MWD's storage reservoirs resulting from increases in regional demand.

## 5.6 VULNERABILITY OF SUPPLY

Due to the semi-arid nature of the City's climate and as a result of past drought conditions, the City is vulnerable to water shortages due to its climatic environment and seasonally hot summer months. While the data shown in **Tables 5.5** through **5.10** identifies water availability during single and multiple dry year scenarios, response to a future drought would follow the water use efficiency mandates of the City's Water Conservation Plan along with implementation of the appropriate stage of regional plans such as the WSDM Plan (MWD). These programs are discussed in Section 7.

## 5.7 WATER SUPPLY OPPORTUNITIES

### *City Projects*

The City continually reviews practices that will provide its customers with adequate and reliable supplies. Once the City completes its Well No. 22, the City intends to construct another well (Well No. 23) at a site to be determined. The City will also identify specific means of achieving their sustainability goals from local sources which will likely include alternative water supply projects or the sharing of

groundwater rights to meet demand.

### *Regional Projects (MWD)*

MWD is implementing water supply alternative strategies for the region and on behalf of member agencies to ensure available water in the future. Some of these strategies include:

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

MWD has made investments in conservation and supply augmentation as part of its long-term water management strategy. MWD's approach to a long-term water management strategy was to develop an Integrated Resource Plan (IRP) to include many supply sources. A brief description of the various programs implemented by MWD to improve reliability is included **Table 5.11** below:



**Table 5.11**  
**MWD IRP 2010 Regional Resources Status**

Supply	Description	
<b>Colorado River Aqueduct (CRA)</b>	Metropolitan holds a basic apportionment of Colorado River water and has priority for an additional amount depending on availability of surplus supplies. Water management programs supplement these apportionments.	
<b>State Water Project (SWP)</b>	Metropolitan receives water delivered under State Water Contract provisions, including Table A contract supplies, use of carryover storage in San Luis Reservoir, and Article 21 interruptible supplies.	
<b>Conservation</b>	Metropolitan and the member agencies sponsor numerous conservation programs in the region that involve research and development, incentives, and consumer behavior modification.	
	<i>Code-Based Conservation</i>	Water savings resulting from plumbing codes and other institutionalized water efficiency measures.
	<i>Active Conservation</i>	Water saved as a direct result of programs and practices directly funded by a water utility, e.g., measures outlined by the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMPs). Water savings from active conservation completed through 2008 will decline to zero as the lifetime of those devices is reached. This will be offset by an increase in water savings for those devices that are mandated by law, plumbing codes or other efficiency standards.
	<i>Price Effect Conservation</i>	Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water.
<b>Local Resources</b>	<i>Groundwater</i>	Member-agency produced groundwater from the groundwater basins within the service area.
	<i>Groundwater Recovery</i>	Locally developed and operated, groundwater recovery projects treat contaminated groundwater to meet potable use standards. Metropolitan offers financial incentives to local and member agencies through its Local Resources Program for recycled water and groundwater recovery. Details of the local resources programs are provided in <b>Appendix A.6</b> .
	<i>Los Angeles Aqueduct (LAA)</i>	A major source of imported water is conveyed from the Owens Valley via the LAA by Los Angeles Department of Water and Power (LADWP). Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled by a local agency.
	<i>Recycling</i>	Recycled water projects recycle wastewater for M&I use.
	<i>Surface Water</i>	Surface water used by member agencies comes from stream diversions and rainwater captured in reservoirs.
<b>Groundwater Conjunctive Use Storage Programs</b>	Metropolitan sponsors various groundwater storage programs, including, cyclic storage programs, long-term replenishment storage programs, and contractual conjunctive use programs. Details of the groundwater storage programs are provided in <b>Appendix A.4</b> .	
<b>Surface Water Storage</b>	Metropolitan reservoirs (Diamond Valley Lake, Lake Mathews, Lake Skinner) and flexible storage in California Department of Water Resources (DWR) reservoirs (Castaic Lake, Lake Perris). Details of the surface storage reservoirs are provided in <b>Appendix A.5</b> .	
<b>Central Valley Storage &amp; Transfers</b>	Central Valley storage programs consist of partnerships with Central Valley water districts to allow Metropolitan to store SWP supplies in wetter years for return in drier years. Metropolitan's Central Valley transfer programs consist of partnerships with Central Valley Project and SWP settlement contractors to allow Metropolitan to purchase water in drier years. Details of the Central Valley Storage and Transfer programs are provided in <b>Appendix A.3</b> .	



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## SECTION 6: CONSERVATION MEASURES

### 6.1 INTRODUCTION

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

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

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

### 6.2 DMM IMPLEMENTATION

The City encourages its customers to practice water-wise conservation methods and is committed to maximizing its local water resources. Although the City is not a member of the CUWCC, the City works in conjunction with CBMWD which has been a member since 1992. The City recognizes that these measures are important for the

reliability of its water sources and has made continued efforts to comply with all DMMs required by the Act. These efforts have enabled the City to maintain total water consumption over the past 15 years in spite of increases in population throughout its service area.



Figure 6.1: Water Waste is Prohibited by City Code

In accordance with the UWMP Act, the 14 DMMs are abbreviated as follows:

1. Water Survey Programs
2. Residential Plumbing Retrofit
3. Water Audits/Leak Detection
4. Metering with Commodity Rates
5. Large Landscape Conservation
6. H-E Washing Machine Rebates
7. Public Information Programs
8. School Education Programs
9. Commercial/Industrial Conservation
10. Wholesale Agency Programs
11. Conservation Pricing
12. Water Conservation Coordinator
13. Water Waste Prohibition
14. Ultra-Low-Flush Toilet Replacement

The City's commitment to these measures is described in **Section 6.3**.



### 6.3 OVERVIEW OF CITY DMMs

The City has continued to work with CBMWD toward implementing its conservation measures as follows:

#### ***DMM No. 1: Residential Surveys***

For many water agencies, residential surveys are conducted on an informal basis by customer request through a high water bill complaint or meter reading that indicate higher than normal usage. When such a request is made, a staff member will review past bills for the account in question and compare them with the current bill.



**Figure 6.1: Residential Water Survey**

Typically, the staff member will then visit the customer's residence and review the information with them. A copy of the historical water usage pattern (usually two years) is then provided to the customer. If it appears that a significant recent increase has occurred, staff will first look for signs of possible on-site leakage. They will also question the customer about possible internal plumbing problems (leaking faucets, running toilets) and make recommendations to maximize landscape irrigation efficiency where appropriate. Meter accuracy tests are provided upon request to verify that recorded consumption is correct. In addition, indoor conservation kits and literature is

provided to customers to inform them of current rebates on low water using fixtures and proper water use management. MWD's promotes the Protector del Agua program which includes landscape instructional classes to the residential sector. A portion of these classes focuses on residential landscape audits. Future MWD Protector del Agua classes will provide additional emphasis on how customers can identify, quantify, and control their outdoor water use.

The City currently meets its water conservation goals through implementation of other programs and does not employ the Residential Survey Program at this time.

#### ***DMM No. 2: Residential Plumbing Retrofit***

Residential Plumbing Retrofit programs include distribution of conservation kits consisting of showerhead flow restrictors, toilet tank displacement devices, dye tablets for use in detecting toilet leaks, and brochures on conservation measures.



**Figure 6.2: Low-Flow Showerhead**

Since 1991, low flow showerheads have been distributed, free of charge, to single family and multi-family customers throughout Southern California.



The City currently meets its water conservation goals through implementation of other programs and does not employ the Residential Plumbing Retrofit Program at this time.

**DMM No. 3: Leak Detection & Repair**

The City repairs main breaks, hydrant leaks or breaks, and meter leaks as they occur. A team of water service workers are available to permanently repair main or hydrant breaks, and promptly restore water service. Both proactive and “inform and response” approaches are utilized for water meter leaks. Water meters that are identified to be leaking are investigated and repaired promptly. The City also annually replaces deteriorated water mains. As a result, the incidence of water main breaks has declined.



Figure 6.3: Leak Detection

The City intends to implement all facets of this DMM not currently implemented as described to reduce system losses to a minimum level.

**DMM No. 4: Metering With Commodity Rates**

The City has universal metering for water accounts in its service area. Customer usage is recorded using water meters. There are no unmetered service connections in the Municipal service area and construction

meters are issued for the temporary use of Municipal water supplies.



Figure 6.4: Water Meter

Metering allows the City to conserve a total of 20 to 30 percent of the water demand overall, and up to 40 percent savings during peak demand periods, as estimated by the CUWCC’s BMP Costs and Savings Study (December 2003).

**DMM No. 5: Large Landscape Programs**

The City does not have any large landscape service connections. All service connections are billed at the same rate and the City does separately track the use of water at its park facilities.



Figure 6.5: Landscape Irrigation

Additionally, due to the socio-economic conditions of the City, the City does not have any large private residential or commercial landscapes. However, the City



Council has adopted City Landscape Ordinance No. 1623 which is a vehicle to promote the use of drip irrigation and smart timers as a method of water use efficiency.

#### ***DMM No. 6: HE Washing Machines***

Through CBMWD, the High Efficiency Washing Machine (HEWM) Program includes a rebate program for customers that install approved HEWMs.



**Figure 6.6: HE Washing Machines**

HEWM water savings can be estimated at an average of 85 to 109 gallons per week per machine, with 14.4 to 28.7 gpd/machine for single family residences. Based on CUWCC estimates, the mean savings of 5,085.6 gallons per year may be applied to each HEWM. Local participation in this program is anticipated through 2035. Success of this program is encouraged and will be jointly promoted with other City conservation programs.

#### ***DMM No. 7: Public Information Programs***

In coordination with CBMWD and MWD, a variety of water conservation public information programs are available to the public. MWD's Protector del Agua program offers classes in landscape design, maintenance and irrigation systems to professionals and residents.

Through MWD's External Affairs Group, conservation-related activities are offered to

the public, including residents of the City's service area. The programs include the Speaker's Bureau, which provides speakers for organizations, service clubs, churches, and businesses and other community groups and associations. An estimated 15,000 to 20,000 people attend the presentations annually. The Community Relations program organizes and conducts an average of 80 Board Director-sponsored inspection trips for MWD's distribution system annually for elected officials, community leaders and members of the public. Approximately 3,000 people learn about MWD's conservation and water management policies and practices each year through these trips. The education curriculum and program activities engage an average of 150,000 students per year. MWD's Media and Publications group conducts editorial briefings and media field trips, assembles press packet; prepares and disseminates news releases, speeches, videos, fact sheets, brochure, articles and editorials describing water management objectives and programs. The government relations sector provides elected officials, public agencies, businesses and organizations with information about MWD's water management objectives and programs.

#### ***DMM No. 8: School Education Programs***

Through MWD, water education programs are available to children attending elementary schools through high school. Programs are either supplemental or curriculum-based which include classroom presentation, audio-visual programs, hands-on activities, take-home materials for students, and workbooks.

The following provides a summary of the programs offered: Admiral Splash for Grade 4 (started in 1983), All About Water for



grades K-3 (started in 1991), Geography of Water for grades 4-8 (started in 1993), Water Politics for grades 9-12 (started in 1994), Water Ways for grade 5 (started in 1995), Water Quality for grades 7-12 (started in 2001), Water Works for grades 7-12 (started in 2001), and Water Times for grade 6 (started in 2005). A multi-faceted program has been created called Living Wise. The program meets state education framework requirements and concentrates on water education, water resource management and conservation, along with energy and other resource conservation in other sectors.



Figure 6.7: Regional School Programs

The City currently meets its water conservation goals through implementation of other programs and currently does not employ the School Education Program but relies on MWD and CBMWD to implement this DMM.

**DMM No. 9: Commercial, Industrial, Institutional Programs**

The City actively participates in the Commercial, Industrial and Institutional (CII) Program, which CBMWD and MWD are sponsoring along with its member agencies. The program primarily contains financial rebates to achieve water efficiency for commercial and industrial customers. These programs include:

- Cooling Tower Conductivity Controller (CTCC) Rebate Program – A \$625 installation rebate is offered to commercial and industrial customers who install conductivity controllers that would save 800,000 gallons of water per year.
- Commercial High Efficiency Toilets (HET) & Zero Water Urinals (ZWU) Rebate Program – A \$60 rebate is offered for each zero water urinal and \$50 for each high efficiency toilet.
- Water Broom Rebate Program – A \$110 rebate will be provided to commercial and industrial customers who purchase a water-pressurized broom and replace old hose nozzles.
- Dry Vacuum Pump Rebate Program - A \$125 rebate is offered for dental, medical, manufacturing facilities and other businesses that purchase a dry vacuum pump.



Figure 6.8: Zero-Water Urinals

Weather Basin Irrigation Controller (WBIC) and Central Computer Irrigation Controller (CCIC) Rebate Program – Rebates incentives vary by agency. These weather-based “smart” controllers are available to avoid over-watering and excessive run-off by scheduling the amount of irrigation based on the type of landscape and current weather conditions.



### ***DMM No. 10: Wholesale Agency Programs***

As the City's wholesale agency, CBMWD actively provides assistance through implementation of conservation programs within the City's service area, as well as guidance for the City staff in implementation of a variety of conservation programs, as described throughout this section. Through coordination with CBMWD the City has participated in Wholesale Agency Programs and will continue to do so in the future.

### ***DMM No. 11: Conservation Pricing and Billing Procedures***

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

The City will be actively investigating the development and implementation of a conservation-based water rate structure. The

study will assess a number of factors, including alternative rate designs, including block rate structures, baseline rates, cost of service, impacts on customers and realization of water management and water conservation objectives.

### ***DMM No. 12: Conservation Coordinator***

The City has assigned the Public Works Director as its Conservation Coordinator to implement conservation programs within its service area. The Conservation Coordinator also works collaboratively with other cities and water agencies within the region, including MWD's Conservation Coordinator, to enhance water conservation.

### ***DMM No. 13: Water Waste Prohibition***

The City Council of Lynwood passed Ordinance No. 1618 and 1623, which authorized the Water Conservation Program and Water Waste Prohibitions during times of water shortage as well as establishing landscape efficiency standards.



**Figure 6.9: Water Waste is prohibited in the City**

Ordinance 1618 is arranged into phases, in which City Council declares a specific phase to enact during an emergency. During each phase, all water customers are to abide to conservation requirements as mandated by the City Council.



***DMM No. 14: Ultra-Low-Flush Toilet Replacement Program***

The ultra low-flush toilet (ULFT) or high-efficiency toilet (HET) program involves the use of a toilet which uses 1.6 gallons of water per flush or less as opposed to old toilets that use at least 5 gallons per flush.



**Figure 6.10: High-Efficiency Toilet**

In the past the City has participated in CBMWD's HET programs and will continue to do so in the future.

**6.6 DMM IMPLEMENTATION**

The City and CBMWD monitor the status of its conservation and DMM programs, which include a qualitative status of some (i.e. low-flow showerhead distribution), and a qualitative status of others (public education). The results of the conservation programs are analyzed over recent years is analyzed to measure the effectiveness of the programs. The City relies on CBMWD to aid in the analysis of DMM effectiveness. The City does not aggressively maintain data regarding its conservation activities as the City is already one of the most water-efficient agencies throughout Southern California.



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## SECTION 7: CONTINGENCY PLANNING

### 7.1 INTRODUCTION

Water supplies may be interrupted or reduced significantly in a number of ways including droughts, earthquakes, and power outages which hinder a water agencies ability to effectively delivery water. Drought impacts increase with the length of a drought, as carry-over supplies in reservoirs are depleted and water levels in groundwater basins decline. The ability to manage water supplies in times of drought or other emergencies is an important part of water resources management for a community. Although the City's water supply is produced locally, the City's response to an emergency will be a coordinated effort of its own staff in conjunction with other local and regional water agencies

During water shortage emergencies, the City will implement its water conservation plan, which imposes up to a 40 percent mandatory reduction in water use (to maintain a minimum 60 percent supply). The City will also work in conjunction with MWD to implement water shortage plans and supply allocations on a regional level.

### 7.2 CITY RESPONSE PLAN

In 2009, the Lynwood City Council adopted a Water Conservation Ordinance (Ordinance 1618), which establishes three stages of water shortage severity based on predicted or actual water supply reductions. The City implements certain initiatives to optimize water supply during water shortages or drought conditions. In the event of a water shortage, the City Council will implement the appropriate water conservation stage by resolution.

The objectives of the response plan are to:

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

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

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



**Stages of Action**

The City has a legal responsibility to provide for the health and safety water needs of the community. The City will manage water supplies to minimize the social and economic impacts of water shortages. The Water Conservation Ordinance is designed to provide a minimum of 60 percent of normal supply during a severe or extended water shortage. The City's two potable water

sources are local groundwater and Metropolitan deliveries through Central Basin MWD. Rationing stages may be triggered by a shortage in one source or a combination of sources, and shortages may trigger a stage at any time. **Table 7.1** shows the stages of action the City will take in the case of an emergency water shortage, as declared by Ordinance No. 1618.

**Table 7.1  
Water Shortage Reduction Targets**

Shortage Stage	Restriction Type	Total Water Supply Reduction Percentage
Level 1	Voluntary	10%
Level 2	Mandatory	15%
Level 3	Mandatory	40%

The City Council may declare by resolution that a Level 1, 2, or 3 Water Supply Shortage exists and that the actions outlined in the Conservation Ordinance are necessary. The type of event which may prompt the City Council to declare a Level 1, 2, or 3 Water Supply Shortage may include, among other factors, drought, state or local emergency, a natural disaster that critically impacts the water treatment or water distribution system, a localized event that critically impacts the water supply, water quality, water treatment or water distribution system, the City's wholesale water agency requests extraordinary water conservation efforts in order to avoid mandatory water allocations in accordance with the Water Supply Allocation Plan (WSAP).

**Metropolitan WSDM Plan**

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

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



reliability. It identifies the expected sequence of resource management actions MWD will take during surpluses and shortages of water to minimize the probability of severe shortages that require curtailment of full-service demands.

Mandatory allocations are avoided to the extent practicable, however, in the event of an extreme shortage an allocation plan will be implemented in accordance with the principles of the WSAP.



**Figure 7.1: Severe Droughts Highlight the Importance of Conservation Ordinances**

### 7.3 THREE-YEAR MINIMUM SUPPLY

Due to the surface inflows from natural percolation and the local rivers and streams, subsurface inflows from adjacent basins, and artificial recharge activities, (including the Rio Hondo and San Gabriel spreading grounds ), the Central Basin has moderate dry season groundwater supply protection. Additionally, due to the leasing of groundwater rights from other agencies, the City may exceed its annual adjudicated right of 5,337 AFY. This has significant water supply reliability benefits for the City during dry seasons that may occur during the course of the City's lease. Furthermore,

since the City will continue to have access to imported water, the City may import water to meet demand, if necessary. Imported water supplies, like groundwater, are subject to demand increases and reduced supplies during dry years. However, MWD modeling in its 2010 Regional UWMP, as referenced in **Tables 5.2 through 5.10 in Section 5**, results in 100 percent reliability for full-service demands through the year 2035 for all climatic conditions. Based on the conditions described above, the City anticipates the ability to meet water demand for all climatic conditions for the near



future. **Table 7.2** displays the minimum water supply available to the City based on a three-year dry period for the next three years:

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

Source	Yr. 1	Yr. 2	Yr. 3
Imported	1,601	1,634	1,808
Ground	6,037	6,037	6,037
<b>Total</b>	<b>7,638</b>	<b>7,671</b>	<b>7,845</b>

Based on the above analysis, the City should expect 100% supply reliability during a three year drought period over the next three years.

Under the worst-case supply scenario, MWD would curtail deliveries of potable water to the City by about 30 percent for three years consecutively, according to Stage VI of the mandatory rationing schedule found in the Metropolitan modified 1995 Incremental Interruption and Conservation Program. This level of curtailment would be quite significant for the City and would mean significant shortages if groundwater supply is reduced. These shortages would be managed through the City’s Emergency Water Conservation Program.

**7.4 CATASTROPHIC INTERRUPTIONS**

A water shortage emergency could be a catastrophic event such as result of drought, failures of transmission facilities, a regional power outage, earthquake, flooding, supply contamination from chemical spills, or other adverse conditions.

During a disaster, the City will work cooperatively with Metropolitan through their Member Agency Response System

(MARS) to facilitate the flow of information and requests for mutual-aid within Metropolitan’s 5,100-square mile service area. In the event of groundwater supply loss, all supply could be imported from Metropolitan, and it is confirmed that the necessary capacity is available to do so.

Additional emergency services in the State of California include the Master Mutual Aid Agreement, California Water Agencies Response Network (WARN) and Plan Bulldozer. The Master Mutual Aid Agreement includes all public agencies that have signed the agreement and is planned out of the California Office of Emergency Services. WARN includes all public agencies that have signed the agreement to WARN and provides mutual aid assistance. It is managed by a State Steering Committee. Plan Bulldozer provides mutual aid for construction equipment to any public agency for the initial time of disaster when danger to life and property exists.

**7.5 PROHIBITIONS**

***Mandatory Prohibitions***

In accordance with the Water Conservation Ordinance, the City has enacted several water use restrictions which are enacted during times of shortage as part of the City's Municipal Code. Restrictions are based on severity of shortage include, but are not limited to, the following:

- Limits on Watering Days
- No filling of ornamental lakes/ponds
- No washing down of driveways
- No filling of swimming pools
- Limits on washing of vehicles

The City's prohibitions on water use during Levels 1 to 3 can be found in the City municipal code.



**Penalties or Charges**

Violation of the regulations and restrictions on water use in accordance with Ordinance 1618 will result in penalties punishable by fees and additional water restrictions:

- **First Violation:**  
City will deliver written notice of violation via mail.
- **Second Violation**  
The City will issue a fine of \$100 or as established by Resolution of City Council, whichever is greater.
- **Third Violation:**  
The City will issue a fine of \$250 or as established by Resolution of City Council, whichever is greater.
- **Fourth and Subsequent Violation:**  
The City will issue a fine of \$500 or as established by Resolution of City Council, whichever is greater. In addition, the City may install a flow restriction device restricting flow to one gallon per minute for water services for not less than 48 hours.

1. Reduce the current fiscal year operation and maintenance expenses.
2. Reduce future projected operation and maintenance expenses.
3. Prioritize and defer selected capital construction projects.
4. Increase the fixed readiness-to-serve charge to establish a substantial firm revenue base.
5. Increase commodity charge and water adjustment rate to cover revenue requirements.

A combination of the measures outlined above may be used to offset or diminish the effects of lost revenues. Capital construction projects may be deferred, as appropriate. The base water rate could be increased to cover the general operation, maintenance, system upgrades, and capital expenditures. An increase in the base rate would be temporarily employed and then return to pre-shortage rates when conditions improve.

**7.6 FISCAL IMPACTS**

As water consumption decreases, the revenue generated through water sales also decreases. To continue operation, the City must generate sufficient revenue when faced with decreasing water sales revenue. Based on the City's total water revenue and operating expenses, demand reductions will result in negative net cash provided by operating activities. As a result, rate increases may be imposed.

Other than rate increases, other measures to overcome impacts of reduced water supply and consequential revenue shortfall will include the following:

**7.7 COUNCIL ORDINANCE**

On the 15th of September, 2009, the City Council adopted Ordinance No. 1618, which replaced Section 14-11 (Water Conservation) of the Lynwood Municipal Code in its entirety. The Ordinance addresses water conservation, establishes a water conservation program, and the stages for declaring emergency conditions. The Ordinance establishes a phased approach to water conservation and enforcement, and consists of three conservation phases in increasing order of severity. Ordinance No. 1618 is included in Appendix G.

Additionally, during an extended water shortage, the City Council will adopt by resolution the water shortage stage.



## 7.8 MECHANISMS TO DETERMINE ACTUAL REDUCTIONS IN WATER USE

The City may use multiple measures to determine the actual water consumption reductions, as follows:

- Normalized/averaged water use baseline
- More frequent review of production
- More frequent meter reading at customer location
- More frequent leak detection and repair.
- More frequent meter checking and repair
- System water audit
- Automated sensors and telemetry
- Monitor utility actions
- Penalties for customers

Possible leak detection at customer's premises through Automated Meter Reading system.



## **Appendix A: References**

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**City of Lynwood 2010 Urban Water Management Plan**

## References

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1. City of Lynwood "2005 Urban Water Management Plan"
2. Metropolitan Water District of Southern California. "2010 MWD Regional Urban Water Management Plan (RUWMP)" December, 2010
3. Metropolitan Water District of Southern California. "2010 MWD Integrated Resources Plan (IRP) Update" July, 2010
4. <http://www.worldclimate.com/> "Weather, rainfall, and temperature data" June, 2011
5. Metropolitan Water District of Southern California. "Chapter IV - Groundwater Basin Reports Los Angeles Coastal Plain Basins - Central Basin" September, 2007
6. California Department of Water Resources. "Central Groundwater Basin" (Bulletin 118) February, 2004
7. California Department of Water Resources. "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan" February, 2011
8. City of Lynwood. "Water Conservation Ordinance" Ordinance No. 1618
9. City of Lynwood: "Efficient Landscape Ordinance" Ordinance No. 1623
10. City of Lynwood: Water Production/Purchases/Sales Data



## **Appendix B: UWMP Act**

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**City of Lynwood 2010 Urban Water Management Plan**

**Established:** [AB 797, Klehs, 1983](#)

**Amended:** [AB 2661, Klehs, 1990](#)

[AB 11X, Filante, 1991](#)

[AB 1869, Speier, 1991](#)

[AB 892, Frazee, 1993](#)

[SB 1017, McCorquodale, 1994](#)

[AB 2853, Cortese, 1994](#)

[AB 1845, Cortese, 1995](#)

[SB 1011, Polanco, 1995](#)

[AB 2552, Bates, 2000](#)

[SB 553, Kelley, 2000](#)

[SB 610, Costa, 2001](#)

[AB 901, Daucher, 2001](#)

[SB 672, Machado, 2001](#)

[SB 1348, Brulte, 2002](#)

[SB 1384, Costa, 2002](#)

[SB 1518, Torlakson, 2002](#)

[AB 105, Wiggins, 2004](#)

[SB 318, Alpert, 2004](#)

[SB 1087, Florez, 2005](#)

[SBX7 7, Steinberg, 2009](#)

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

### **CHAPTER 1. GENERAL DECLARATION AND POLICY**

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

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

- (1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.
- (2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.
- (3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

- (4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.
- (5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.
- (6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.
- (7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
- (8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
- (9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.

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

10610.4. The Legislature finds and declares that it is the policy of the state as follows:

- (a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
- (b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
- (c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

## **CHAPTER 2. DEFINITIONS**

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

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

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

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

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

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

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

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

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

### **CHAPTER 3. URBAN WATER MANAGEMENT PLANS**

#### **Article 1. General Provisions**

10620.

- (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).
- (b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.
- (c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.
- (d)
  - (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.
  - (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.
- (e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.
- (f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

- (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.
- (b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.
- (c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

## Article 2. Contents of Plans

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

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

- (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.
- (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:
  - (1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.
  - (2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.

For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

- (3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the

past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

- (4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.
- (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:
- (1) An average water year.
  - (2) A single dry water year.
  - (3) Multiple dry water years.

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

- (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.
- (e)
- (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:
    - (A) Single-family residential.
    - (B) Multifamily.
    - (C) Commercial.
    - (D) Industrial.
    - (E) Institutional and governmental.
    - (F) Landscape.
    - (G) Sales to other agencies.
    - (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
    - (I) Agricultural.

- (2) The water use projections shall be in the same five-year increments described in subdivision (a).
- (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:
  - (1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:
    - (A) Water survey programs for single-family residential and multifamily residential customers.
    - (B) Residential plumbing retrofit.
    - (C) System water audits, leak detection, and repair.
    - (D) Metering with commodity rates for all new connections and retrofit of existing connections.
    - (E) Large landscape conservation programs and incentives.
    - (F) High-efficiency washing machine rebate programs.
    - (G) Public information programs.
    - (H) School education programs.
    - (I) Conservation programs for commercial, industrial, and institutional accounts.
    - (J) Wholesale agency programs.
    - (K) Conservation pricing.
    - (L) Water conservation coordinator.
    - (M) Water waste prohibition.
    - (N) Residential ultra-low-flush toilet replacement programs.
  - (2) A schedule of implementation for all water demand management measures proposed or described in the plan.

- (3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
  - (4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
- (g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
- (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
  - (2) Include a cost-benefit analysis, identifying total benefits and total costs.
  - (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
  - (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
- (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.

- (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
- (j) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).
- (k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c), including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.

10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.

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

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

- (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.
- (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
- (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
- (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.
- (f) Penalties or charges for excessive use, where applicable.
- (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.
- (h) A draft water shortage contingency resolution or ordinance.
- (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

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

- (a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.
- (b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

- (c) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.
- (d) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.
- (e) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.
- (f) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.
- (g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

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

### **Article 2.5 Water Service Reliability**

10635.

- (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled

pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

- (b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.
- (c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.
- (d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

### **Articl 3. Adoption and Implementation of Plans**

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

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

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

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

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

10644.

- (a) An urban water supplier shall file with the department and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department and any city or county within which the supplier provides water supplies within 30 days after adoption.
- (b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

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

#### **CHAPTER 4. MISCELLANEOUS PROVISIONS**

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

- (a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.
- (b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

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

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

supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

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

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

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

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

10657.

- (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.
- (b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.



## **Appendix C: DWR UWMP Checklist**

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**City of Lynwood 2010 Urban Water Management Plan**

**Table I-1 Urban Water Management Plan checklist, organized by legislation number**

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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		<b>Section 4.5</b>
2	<i>Wholesalers:</i> Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. <i>Retailers:</i> 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	Retailer and wholesalers have slightly different requirements	<b>Section 1.2</b> <b>Appendix D</b>
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not applicable	Standardized form not yet available	<b>Not Applicable</b>
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		<b>Section 1.2</b> <b>Appendix D</b>
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 . . .		<b>Section 2</b> <b>Section 4</b> <b>Section 5</b> <b>Section 7</b>
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 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.	10621(b)	Plan Preparation		<b>Section 1.2</b> <b>Appendix D</b>
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		<b>Section 1.1</b> <b>Section 1.2</b> <b>Appendix D</b>
8	Describe the service area of the supplier	10631(a)	System Description		<b>Section 1.5</b> <b>Figure 1.3</b>
9	(Describe the service area) climate	10631(a)	System Description		<b>Section 1.6</b>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	<b>Section 1.7</b> Projections based on most recent US Census and City's growth rate.
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	<b>Section 1.7</b>
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		<b>Section 1.7</b> City does not have significant daytime populations.
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	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.	<b>Section 2</b> Groundwater Imported Water Recycled Water (less than 1%)

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . . ?	10631(b)	System Supplies	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	<b>Section 2</b> Yes groundwater is a source of supply
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 any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies		<b>Groundwater Management Plan is not available.</b>
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies		<b>Section 2.2 "Groundwater"</b>
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		<b>Appendix H</b>
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		<b>City may pump up to 5,337 AFY</b>
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		<b>Not Applicable</b>
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		<b>Section 2.2 "Groundwater"</b> <b>Groundwater Production</b>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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	Provide projections for 2015, 2020, 2025, and 2030.	<b>Section 2.2 "Groundwater" (Description)</b> <b>Section 5 Tables 5.4-5.10 (analysis)</b>
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 . . .		<b>Section 5 (Tables 5.4-5.10)</b>
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 . . .		<b>Section 5; Section 7</b> During times of groundwater or imported supply interruption, City will import or extract water and implement its Conservation Plan
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies		<b>Section 2.6</b>
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) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; (I) Agricultural.	10631(e)(1)	System Demands	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.	<b>Section 4</b>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
26	<p>(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 ultra-low-flush toilet replacement programs.</p>	10631(f)(1)	DMMs	<p>Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.</p>	<a href="#">Section 6</a>
27	<p>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.</p>	10631(f)(3)	DMMs		<a href="#">Section 6</a>
28	<p>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.</p>	10631(f)(4)	DMMs		<a href="#">Section 6</a>
29	<p>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.</p>	10631(g)	DMMs	<p>See 10631(g) for additional wording.</p>	<a href="#">Not Applicable (See Section 6)</a>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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		<a href="#">Section 2.7</a> <a href="#">Section 5.6</a>
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		<a href="#">Section 2.5</a> No plans for desalination.
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	Signers of the MOU that submit the annual reports are deemed compliant with items 28 and 29.	<a href="#">Not Applicable/Section 6</a>
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 Demands	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	<a href="#">Section 2</a> <a href="#">Section 5.4</a> Tables 5.4-5.10 deal with imported water supply available from MWD. Groundwater supply is also shown up 2035.

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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		<b>Section 4.7</b>
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)	Water Supply Reliability . . .		<b>Section 7.2</b> <b>Stages of Action</b>
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)	Water Supply Reliability . . .		<b>Section 7.3</b>
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)	Water Supply Reliability . . .		<b>Section 7.4</b>
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)	Water Supply Reliability . . .		<b>Section 7.5</b>
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)	Water Supply Reliability . . .		<b>Section 7.5</b>
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Water Supply Reliability . . .		<b>Section 7.5</b>
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 reserves and rate adjustments.	10632(g)	Water Supply Reliability . . .		<b>Section 7.6</b>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Water Supply Reliability . . .		<a href="#">Section 7.7 Appendix F</a>
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Water Supply Reliability . . .		<a href="#">Section 7.8</a>
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		<a href="#">Section 2</a>
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)	System Supplies		<a href="#">Section 2</a>
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		<a href="#">Section 2</a>
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		<a href="#">Section 2</a>
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		<a href="#">Section 2</a>
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		<a href="#">Section 2</a> <a href="#">Section 5</a>
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		<a href="#">Section 2</a>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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		<b>Section 2</b>
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 . . .	For years 2010, 2015, 2020, 2025, and 2030	<b>Section 3</b>
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 . . .		<b>Section 5</b>
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		<b>To be performed</b>
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		<b>Section 1.2 Appendix D</b>

No.	UWMP requirement <sup>a</sup>	Calif. Water Code reference	Subject <sup>b</sup>	Additional clarification	UWMP location
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		Section 1.2 Appendix D
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation		Section 1.2 Appendix D
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		Section 1.1
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 performed
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 performed

<sup>a</sup> 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.

<sup>b</sup> 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 D: Coordination, Public Notice, & City Council Resolution Adopting 2010 UWMP**

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**City of Lynwood 2010 Urban Water Management Plan**



MARIA QUIÑONEZ  
CITY CLERK

City of  
**LYNWOOD**

Incorporated 1921  
11330 Bullis Road, Lynwood, CA 90262  
(310) 603-0220 x 210

EXCERPT  
MINUTES OF THE CITY COUNCIL OF  
THE CITY OF LYNWOOD, CALIFORNIA

The City Council meeting of the CITY OF LYNWOOD met in regular session on June 21, 2011, at 5:11 p.m., in the Council Chambers of City Hall, 11330 Bullis Rd., Lynwood, CA.

COUNCIL MEMBERS PRESENT: Mayor Castro, Mayor Pro Tem Morton, Council Member Flores, Council Member Rodriguez and Council Member Santillan

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PUBLIC HEARING

Item #13. ADOPTION OF THE 2010 URBAN WATER MANAGEMENT PLAN

Director of Public Works, Dan Ojeda introduced the item regarding the adoption of the 2010 Urban Water Management Plan.

It was moved by Council Member Rodriguez, seconded by Mayor Castro, to open the public hearing.

Harry Gibbens stated that the staff report for Item #13 was illegible due to poor copy quality. He asked that in the future, more attention is paid to the copy quality to make sure that residents will be able to read the agendas.

It was moved by Mayor Pro Tem Morton, seconded by Council Member Flores, to close the public hearing.

It was moved by Council Member Flores, seconded by Council Member Rodriguez, to approve staff recommendation.

**RESOLUTION NO. 2011.140 ENTITLED:**

A RESOLUTION OF THE CITY COUNCIL OF THE CITY OF LYNWOOD ADOPTING THE CITY'S 2010 URBAN WATER MANAGEMENT PLAN MANDATED BY THE STATE DEPARTMENT OF WATER RESOURCES

AYES: COUNCIL MEMBERS FLORES, RODRIGUEZ, SANTILLAN, MORTON  
AND CASTRO  
NOES: NONE  
ABSTAIN: NONE  
ABSENT: NONE

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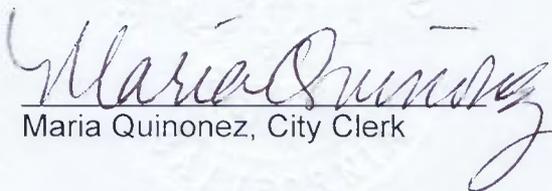
ADJOURNMENT: The Mayor declared the meeting adjourned at 7:05 p.m.

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STATE OF CALIFORNIA        }  
  }  
COUNTY OF LOS ANGELES    }        **ss.**

I, Maria Quinonez, City Clerk, of the City of Lynwood, California, do hereby certify the above agenda item was approved by the City Council of the City of Lynwood, California, in a regular meeting duly held on June 21, 2011.

IN WITNESS WHEREOF, I hereby affix my hand and official seal of the City of Lynwood, California this 7<sup>th</sup> day of July, 2011.

  
\_\_\_\_\_  
Maria Quinonez, City Clerk

May 2, 2011

Mr. Willie Norfleet, City Manager  
City of Compton  
205 S. Willowbrook Avenue  
Compton, CA 90220

**RE:** Notice of Preparation of the City of Lynwood's 2010 Urban Water Management Plan

Dear Mr. Norfleet:

In accordance with the State of California Urban Water Management Act, this notice is to advise you that the City of Lynwood is preparing the 2010 update to its *Urban Water Management Plan* (UWMP). A public forum will be held on Wednesday, June 8, 2011, between the hours of 6:00 P.M. to 8:00 P.M. in Bateman Hall at Room 2, and a hearing will be held by the City Council of the City of Lynwood on Tuesday, June 21, 2011 at 5:00 P.M. to receive public comments on the 2010 update. All times shown are Pacific Daylight Time.

A copy of the draft 2010 UWMP will be available on or after May 10, 2011 for your review at the City Clerk's Office, Lynwood City Hall or at the County of Los Angeles Lynwood Public Library at 11320 Bullis Road, Lynwood, California 90262. The UWMP may also be viewed on the City's website: <http://www.lynwood.ca.us> on or after May 10, 2011. Please see the attached advertisement for your review.

Should you have any questions regarding any of the aforementioned, please contact José Molina, Utilities Service Manager, at (310) 603-0220, ext. 801.

Sincerely,

G. Daniel Ojeda, P.E.  
Director of Public Works / City Engineer

GDO: Attachment



## **Appendix E: SBx7-7 Baseline & Target Spreadsheet**

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**City of Lynwood 2010 Urban Water Management Plan**

**City of Lynwood, CA**  
**SBx7-7 Baseline & Target Calculations**

Yr.	Total Potable Consumption	Service Area Population (90% of City)	GPCD
95	7,107	59,296	107
96	7,226	59,183	109
97	7,265	59,503	109
98	6,991	60,594	103
99	6,704	61,700	97
00	6,771	62,966	96
01	6,713	63,755	94
02	6,745	64,748	93
03	6,708	65,093	92
04	6,791	65,189	93
05	6,442	65,353	88
06	6,124	65,869	83
07	6,134	65,191	84
08	6,596	65,428	90
09	5,955	65,633	81
10	5,653	64,701	78
<b>Baseline (FY 1996-2005)</b>			<b>99</b>
<b>2020 Target</b>			<b>N/A</b>
<b>Recent (FY 2010) Use</b>			<b>78</b>

**City is exempt from the provisions of SBx7-7 as the City's baseline and current water use is under 100 GPCD.**



## **Appendix F: Conservation Ordinance 1618**

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**City of Lynwood 2010 Urban Water Management Plan**

**ORDINANCE NO. 1618**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF LYNWOOD REPLACING SECTION 14-11 (WATER CONSERVATION), OF CHAPTER 14, OF THE LYNWOOD MUNICIPAL CODE IN ITS ENTIRETY**

**WHEREAS**, the purpose of this ordinance is to modify water conservation regulations and water shortage contingency measures consistent with the State law; and

**WHEREAS**, California is entering its third consecutive year of drought; and

**WHEREAS**, the City's policy is to promote conservation and efficient use of water; and

**WHEREAS**, mandatory conservation will begin replacing voluntary efforts at the local government level; and

**WHEREAS**, cities must begin implementing local efforts through partnerships, ordinances, and tiered rate systems in order to meet pending state requirements and qualify for much-needed funding through the Metropolitan Water District; and

**WHEREAS**, The Metropolitan Water District (MWD) Board of Directors has adopted a policy requiring cities in its jurisdiction to have a water conservation ordinance in place by June 30, 2009, as a prerequisite for funding through the Public Sector Program (PSP) and Enhanced Conservation Program (ECP); and

**WHEREAS**, this ordinance has been determined to be Categorical Exempt pursuant to Section 15308, Class 8 of the California Environmental Quality Act (CEQA);

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LYNWOOD DOES HEREBY ORDAIN AS FOLLOWS:**

**SECTION 14-11 (WATER CONSERVATION)**

**Sub Sections:**

- 14-11.1 Title.**
- 14-11.2 Findings.**
- 14-11.3 Declaration of Purpose and Intent.**
- 14-11.4 Definitions.**
- 14-11.5 Application.**
- 14-11.6 Permanent Water Conservation Requirements – Prohibition Against Waste.**
- 14-11.7 Level 1 Water Supply Shortage.**
- 14-11.8 Level 2 Water Supply Shortage.**
- 14-11.9 Level 3 Water Supply Shortage – Emergency Condition.**

- 14-11.10**      **Procedures for Determination/Notification of Water Supply Shortage.**
- 14-11.11**      **Level 3 Alternate Provisions.**
- 14-11.12**      **Hardship Waiver.**
- 14-11.13**      **Penalties and Violations.**
- 14-11.14**      **Severability.**

**Section 1.** Section 14-11 (Water Conservation), of Chapter 14 of the Lynwood Municipal Code is replaced in its entirety to read as follows:

**14-11.1**      **Title.**

This section will be known as the City of Lynwood Water Conservation and Water Supply Shortage Program.

**14-11.2**      **Findings.**

A. A reliable minimum supply of potable water is essential to the public health, safety and welfare of the people and economy of the City of Lynwood and Southern California region.

B. Southern California is a semi-arid region and is largely dependent upon imported water supplies. A growing population, climate change, environmental concerns, and other factors in other parts of the State of and western United States, make the region highly susceptible to water supply reliability issues.

C. Careful water management that includes active water conservation measures not only in times of drought, but at all times, is essential to ensure a reliable minimum supply of water to meet current and future water supply needs.

D. Article XI, Section 7 of the California Constitution declares that a City or County may make and enforce within its limits all local, police, sanitary and other ordinances and regulations not in conflict with general laws.

E. Article X, Section 2 of the California Constitution declares that the general welfare requires that water resources be put to beneficial use, waste or unreasonable use or unreasonable method of use of water be prevented, and conservation of water be fully exercised with a view to the reasonable and beneficial use thereof.

F. California Water Code Section 375 authorizes water suppliers to adopt and enforce a comprehensive water conservation program to reduce water consumption and conserve supplies.

G. The adoption and enforcement of a water conservation and supply shortage program is necessary to manage the City's potable water supply in the short and long-term and to avoid or minimize the effects of drought and shortages within the City. Such program is essential to ensure a reliable and sustainable minimum supply of water for the public health, safety and welfare.

**14-11.3**      **Declaration of Purpose and Intent.**

A. The purpose of this section is to establish a water conservation and supply shortage program that will reduce water consumption within the City of Lynwood through conservation, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, and maximize the efficient use of water

within the City of Lynwood to avoid and minimize the effect and hardship of water shortage to the greatest extent possible.

B. This section establishes permanent water conservation standards intended to alter behavior related to water use efficiency for non-shortage conditions and further establishes three levels of water supply shortage response actions to be implemented during times of declared water shortage or declared water shortage emergency, with increasing restrictions on water use in response to worsening drought or emergency conditions and decreasing supplies.

#### **14-11.4 Definitions.**

A. The following words and phrases whenever used in this chapter have the meaning defined in this section:

1. "City" means the City of Lynwood.
2. "Person" means any natural person or persons, corporation, public or private entity, governmental agency or institution, or any other user of water provided by the City.
3. "Landscape Irrigation System" means an irrigation system with pipes, hoses, spray heads, or sprinkling devices that are operated by hand or through an automated system.
4. "Large Landscape Areas" means a lawn, landscape, or other vegetated area, or combination thereof, equal to more than one (1) acre of irrigable land.
5. "Single Pass Cooling Systems" means equipment where water is circulated only one to cool equipment before being disposed.
6. "Potable Water" means water which is suitable for drinking.
7. "Recycled Water" means the reclamation and reuse of non-potable water for beneficial use.
8. "Billing Unit" means the unit of water used to apply water rates for purposes of calculating water charges for a persons water usage and equals one hundred (100) cubic feet or seven hundred forty-eight (748) gallons of water.

#### **14-11.5 Application.**

A. The provisions of this section apply to any person in the use of any potable water provided by the City.

B. The provisions of this section do not apply to uses of water necessary to protect public health and safety or for essential government services, such as police, fire and other similar emergency services.

C. The provisions of this section do not apply to the use of recycled water, with the exception of subsection 14-11.6 (A).

D. The provisions of this section do not apply to the use of water by commercial nurseries and commercial growers to sustain plants, trees, shrubs, crops or other vegetation intended for commercial sale.

E. This section is intended solely to further the conservation of water. It is not intended to implement any provision of federal, state, or local statues, ordinances, or regulations relating to protection of water quality or control of drainage or runoff. Refer to the local jurisdiction or Regional Water Quality Control Board for information on any storm water ordinances and storm water management plan.

**14-11.6 Permanent Water Conservation Requirements- Prohibition Against Waste.**

The following water conservation requirements are effective at all times and are permanent. Violations of this subsection will be considered waste and an unreasonable use of water.

A. Limits on Watering Hours: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited between the hours of 9 a.m. and 6 p.m. Pacific Standard Time on any day, except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

B. Limit on Watering Duration: Watering or irrigating of lawn, landscape or other vegetated area with potable water using a landscape irrigation system or a watering device that is not continuously attended is limited to no more than fifteen (15) minutes watering per day per station. This part B of subsection 14-11.6 does not apply to landscape irrigation systems that exclusively use very low-flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour and weather based controllers or stream rotor sprinklers that meet a 70% efficiency standard.

C. No Excessive Water Flow or Runoff: Watering or irrigating of any lawn, landscape or other vegetated area in a manner that causes or allows excessive water flow or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch is prohibited.

D. No Washing Down Hard or Paved Surfaces: Washing down hard or paved surfaces, including but not limited to sidewalks, walkways, driveways, parking areas, tennis courts, patios or alleys, is prohibited except when necessary to alleviate safety or sanitary hazards, and then only by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off device or a low-volume, high pressure cleaning machine equipped to recycle any water used.

E. Obligation to Fix Leaks, Breaks or Malfunctions: Excessive use, loss or escape of water through breaks, leaks or other malfunctions in the water user's plumbing or distribution system for any period of time after such escape of water should have reasonable been discovered and corrected and in no event more than 3 days of receiving notice from the City is prohibited.

F. Re-circulating Water Required for Water Fountains and Decorative Water Features: Operating a water fountain or other decorative water feature that does not use re-circulated water is prohibited.

G. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to any automobile, truck, van, bus, motorcycle, boat or trailer, whether motorized or not is prohibited, except by use of a hand-held bucket or similar container or a hand-held hose equipped with a positive self-closing water shut-off nozzle or device. This part G of subsection of 14-11.6 does not apply to any commercial car washing facility.

H. **Drinking Water Served Upon Request Only:** Eating or drinking establishments, including but not limited to a restaurant, hotel, café, cafeteria, bar, club or other public place where food or drinks are sold, served, or offered for sale, are prohibited from providing drinking water to any person unless expressly requested.

I. **Commercial Lodging Establishments Must Provide Option to Not Launder Linen Daily:** Hotels, motels, and other commercial lodging establishments must provide customers the option of not having towels and linen laundered daily. Commercial lodging establishments must prominently display notice of this option in each bathroom using clear and easily understood language.

J. **No Installation of Single Pass Cooling Systems:** Installation of single pass cooling systems is prohibited in buildings requesting new water service.

K. **No Installation of Non-re-circulating in Commercial Car Wash and Laundry Systems:** Installation of no-re-circulating water systems is prohibited in new commercial conveyor car wash and new commercial laundry systems.

L. **Restaurants Required to Use Water Conserving Dish Wash Spray Valves:** Food preparation establishments, such as restaurants or cafes, are prohibited from using non-water conserving dish wash spray valves.

#### **14-11.7 Level 1 Water Supply Shortage.**

A. A Level 1 Water Supply Shortage exists when the City determines, in its sole discretion, that due to drought or other water supply reductions, a water supply shortage exists and a consumer demand reduction of up to 10% is necessary to make more efficient use of water and appropriately respond to existing water conditions. Upon the declaration by the City of a Level 1 Water Supply Shortage condition, the City will implement the mandatory Level 1 conservation measures identified in this subsection. The type of event that may prompt the City to declare a Level 1 Water Supply Shortage may include, among other factors, a finding that its wholesale water provider calls for extraordinary water conservation.

B. **Additional Water Conservation Measures:** In addition to the prohibited uses of water identified in subsection 14-11.6, the following water conservation requirements apply during a declared Level 1 Water Supply Shortage:

1. **Limits on Watering Days:** Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to three days per week on a schedule established and posted by the City. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within

seventy-two (72) hours of notification by the City unless other arrangements are made with the City.

3. Other Prohibited Uses: The City may implement other prohibited water uses as determined by the City, after notice to customers.

#### **14-11.8 Level 2 Water Supply Shortage.**

A. A Level 2 Water Supply Shortage exists when the City determines, in its sole discretion, that due to drought or other supply reductions, a water supply shortage exists and a consumer demand reduction of up to 15% is necessary to make more efficient use of water and respond to existing water conditions. Upon the declaration by the City of a Level 2 Water Supply Shortage condition, the City will implement the mandatory Level 2 conservation measures identified in this subsection.

B. Additional Conservation Measures: In addition to the prohibited uses of water identified in subsections 14-11.6 and 14-11.7, the following additional water conservation requirements apply during a declared Level 2 Water Supply Shortage.

1. Watering Days: Watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to two days per week on a schedule established and posted by the City. During the months of November through March, watering or irrigating of lawn, landscape or other vegetated area with potable water is limited to no more than one day per week on a schedule established and posted by the City. This provision does not apply to landscape irrigation zones that exclusively use very low flow drip type irrigation systems when no emitter produces more than two (2) gallons of water per hour. This provision also does not apply to watering or irrigating by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or for very short periods of time for the express purpose of adjusting or repairing an irrigation system.

2. Obligation to Fix Leaks, Breaks or Malfunctions: All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within forty-eight (48) hours of notification by the city unless other arrangements are made with the City.

3. Limits on Filling Ornamental Lakes or Ponds: Filling or re-filling ornamental lakes or ponds is prohibited, except to the extent needed to sustain aquatic life, provided that such animals are of significant value and have been actively managed within the water feature prior to declaration of a supply shortage level under this ordinance.

4. Limits on Washing Vehicles: Using water to wash or clean a vehicle, including but not limited to, any automobile, truck, van, bus motorcycle, boat or trailer, whether motorized or not, is prohibited except by use of a hand-held bucket or similar container, a hand-held hose equipped with a positive self-closing water shut-off nozzle or device, by high pressure/low volume wash systems, or at a commercial car washing facility that utilizes a re-circulating water system to capture or reuse water.

5. Limits on Filling Residential Swimming Pools and Spas: Refilling of more than one foot and initial filling of residential swimming pools or outdoor spas with potable water is prohibited.

6. Other Prohibited Uses: The City may implement other prohibitions on water uses as determined by the City, after notice to customers.

C. Other Conservation Measures\_at Level 2. The City, in its discretion and in accordance with applicable laws, may implement the following conservation measures for a Level 2 Water Supply Shortage in addition to those set forth in Subsection 14-11.8 (B) above:

1. Water Allocations/ Water Budget: The City may establish a water allocation for property served by the City using a method that does not penalize persons for the implementation of conservation methods or the installation of water saving devices. The City must provide notice of the allocation by including it in the regular billing statement for the fee or charge or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for on-going water service.

Following the effective date of the water allocation as established by the City, any person that uses water in excess of the allocation will be subject to a penalty in the amount of \$2.50 for each billing unit of water in excess of the allocation or an amount established by the Resolution of City Council whichever is greater. The penalty for excess water usage will be cumulative to any other remedy or penalty that may be imposed for violation of this Ordinance.

2. Water Supply Shortage Rates: During a Level 2 Water Supply Shortage condition, the City may increase water rates, other than Tier 1 Lifeline rates of 15 units per residential household.

3. Mandatory Percentage Use Reductions: During a Level 2 Water Supply Shortage condition, all customers will be required to reduce water consumption by a percentage determined by the City.

#### **14-11.9 Level 3 Water Supply Shortage- Emergency Condition.**

A. A Level 3 Water Supply Shortage condition is also referred to as an "Emergency" condition. A Level 3 condition exists when the City declares a water shortage emergency condition pursuant to California Water Code Section 350 and notifies its residents and businesses that more than a 40% consumer demand reduction in consumer demand is necessary to make more efficient use of water and respond to existing water conditions to ensure sufficient supplies for human consumption, sanitation and fire protection. Upon the declaration of a Level 3 Water Supply Shortage Emergency condition, the City will implement the mandatory Level 3 conservation measures identified in this subsection. The City must declare a Water Supply Shortage Emergency in the manner and on the grounds provided in California Water Code Section 350.

B. Additional Conservation Measures: In addition to the prohibited uses of water identified in subsections 14-11.6, 14-11.7, and 14-11.8, the following water conservation requirements apply during a declared Level 3 Water Supply Shortage Emergency:

1. No Watering or Irrigating: Watering or irrigating of lawn, landscape or other vegetated area with potable water is prohibited. This restriction does not apply to the

following categories of use unless the City has determined that recycled water is available and may be lawfully applied to the use:

- i. Maintenance of vegetation, including trees and shrubs, that are watered using a hand-held bucket or similar container, hand-held hose equipped with a positive self-closing water shut-off nozzle or device, or a very low-flow drip type irrigation system when no emitter produces more than two (2) gallons of water per hour subject to the hour restrictions in subsection 14-11.6 (A);
- ii. Maintenance of existing landscape necessary for fire protection;
- iii. Maintenance of existing landscape for soil erosion control;
- iv. Maintenance of plant materials identified to be rare or essential to the well being of rare animals;
- v. Maintenance of landscape within active public parks and playing fields, day care centers, school grounds, cemeteries, and golf course greens, provided that such irrigation does not exceed two (2) days per week according to the schedule established in subsection 14-11.8 (B) (1) and time restrictions in subsection 14-11.6 (A) and (B)
- vi. Public Works projects and actively irrigated environmental mitigation projects.

2. **Obligation to Fix Leaks, Breaks or Malfunctions:** All leaks, breaks, or other malfunctions in the water user's plumbing or distribution system must be repaired within twenty four (24) hours of notification by the City unless other arrangements are made with the City.

3. **No new Potable Water Service:** Upon declaration of a Level 3 Water Supply Shortage Emergency condition, no new potable water service will be provided, no new temporary meters or permanent meters will be provided, and no statements of immediate ability to serve or provide potable water service (such as, will serve letters, certificates, or letters of availability) will be issued, except under the following circumstances:

- a. A valid, unexpired building permit has been issued for the project; or
- b. The project is necessary to protect the public's health, safety, and welfare; or
- c. The applicant provides substantial evidence of an enforceable commitment that water demands for the project will be offset prior to the provision of a new water meter(s) to the satisfaction of the City.

This provision does not preclude the resetting or turn-on of meters to provide continuation of water service or the restoration of service that has been interrupted for a period of one year or less.

d. **Discontinue Service:** The City, in its sole discretion, may discontinue service to consumers who willfully violate provisions of this section.

e. **Other Prohibited Uses:** The City may implement other prohibited water uses as determined by the City, after notice to customers.

**14-11.10 Procedures for Determination/Notification of Water Supply Shortage.**

A. Declaration and Notification of Level 1 and 2 Water Supply Shortage: The existence of Level 1 and Level 2 Water Supply Shortage conditions may be declared by resolution of the City adopted at a regular or special public meeting held in accordance with State law. The mandatory conservation requirements applicable to Level 1 or Level 2 conditions will take effect on the tenth day after the date the shortage level is declared. Within five days following the declaration of the shortage level, the City must publish a copy of the resolution in a newspaper used for publication of official notices. If the City establishes a water allocation, it must provide notice of the allocation by including it in the regular billing statement for fees or charges for ongoing water service. A water allocation will be effective on the fifth day following the date of mailing or at such later date as specified in the notice.

B. Declaration and Notification of Level 3 Water Supply Shortage: The existence of a Level 3 Water Supply Shortage Emergency condition may be declared in accordance with the procedures specified in Water Code Sections 351 and 352. The mandatory conservation requirements applicable to the Level 3 conditions will take effect on the tenth day after the date the shortage level is declared. Within five days following the declaration of the shortage level, the City must publish a copy of the Resolution in a newspaper used for the publication of official notices. If the City establishes a water allocation, it will provide notice of the allocation by including it in the regular billing statement or by any other mailing to the address to which the City customarily mails the billing statement or by any other mailing to the address to which the City customarily mails the billing statement for fees or charges for ongoing water service. A water allocation will be effective on the fifth day following the date of mailing or at such later date as specified in the notice.

**14-11.11 Level 3 Alternate Provisions.**

A. Commercial Car Wash Systems: Effective on January 1, 2011, all commercial conveyor car wash systems must have installed and operational re-circulating water systems, or must have secured a waiver of this requirement from the City.

B. Large Landscape Areas- Rain Sensors: Large landscape areas, such as parks, cemeteries, golf courses, school grounds, and playing fields, that use landscape irrigation systems to water or irrigate, must use landscape irrigation systems with rain sensors that automatically shut off such systems during periods of rain or irrigation timers which automatically use information such as evapotranspiration sensors to set an efficient water use schedule.

C. Construction Purposes: Recycled or non-potable water must be used for construction purposes when available.

D. No New Annexations: Upon the declaration of a Level 3 Water Supply Shortage condition, the City will suspend consideration of annexations to its service area. This subsection does not apply to boundary corrections and annexations that will not result in any increased use of water.

E. Limits on Building Permits: The City may limit or withhold the issuance of building permits which require new or expanded water service, except to protect the

public health, safety and welfare, or in cases which meet the City's adopted conservation offset requirements.

F. **Water Recycling Required if Alternative Available:** The use of potable water, other than recycled water, is prohibited for specified uses after the City has provided to the customer an analysis showing that recycled water is a cost-effective alternative to potable water for such uses and the customer has had a reasonable time, as determined by the City Manager, to make the conversion to recycled water.

G. **Water Recycling- New Service:** Prior to the connection of any new water service, an evaluation must be done by the City to determine whether recycled water exists to supply all or some of the water needed and recycled water must be utilized to the extent feasible.

H. **City Conservation Reports:** Upon request of the City Manager, City Departments must prepare and submit quarterly reports on their water conservation efforts. The reports will be consolidated by the City Manager and reported to the City Council at a minimum of once a year.

I. **Customer Water Conservation Reports:** The City may, by written request, require all commercial, residential and industrial customers using twenty five thousand (25,000) or more billing units per year to submit a water conservation plan and to submit quarterly progress reports on such plan. The conservation plan must include recommendations for increased water savings, including increased water recycling based on feasibility, and the reports must include progress to date on implementation of such recommendations.

J. **Reporting Mechanism- Hotline:** The City will establish a water waste hotline for residents to report violation of this chapter.

#### **14-11.12 Hardship Waiver**

A. **Undue and Disproportionate Hardship:** if, due to unique circumstances, a specific requirement of this section would result in undue hardship to a person 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 users, then the person may apply for a waiver to the requirements as provided in this subsection.

B. **Written Finding:** The waiver may be granted or conditionally granted only upon a written finding of the existence of facts demonstrating an undue hardship to a person 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 use due to specific and unique circumstances of the user or the user's property.

1. **Application:** Application for a waiver must be on a form prescribed by the City and accompanied by a non-refundable processing fee in an amount of five hundred dollars (\$500) or as established by the Resolution by the City Council whichever is greater.

2. **Supporting Documentation:** The application must be accompanied by photographs, maps, drawings, and other information, including a written statement of the applicant.

3. **Required Findings for Waiver:** An application for a waiver will be denied unless the Director of Public Works finds, based on the information provided in the

application, supporting documents, or such additional information as may be requested, and on water use information for the property as shown by the records of the City or its Agent, all of the following:

- i. That the waiver does not constitute a grant of special privilege inconsistent with the limitations upon other residents and businesses;
- ii. That because of special circumstances applicable to the property or its use, the strict application of this section would have a disproportionate impact on the property or use that exceeds the impacts to residents and businesses generally;
- iii. That the authorizing of such waiver will not be of substantial detriment to adjacent properties, and will not materially affect the ability of the City to effectuate the purpose of this section and will not be detrimental to the public interest; and
- iv. That the condition or situation of the subject property or the intended use of the property for which the waiver is sought is not common, recurrent or general in nature.

4. **Approval Authority:** The City Manager or the Director of Public Works must act upon any completed application no later than ten (10) business days after submittal and may approve, conditionally approve, or deny the waiver. The applicant requesting the waiver must be promptly notified in writing of any action taken. Unless specified otherwise at the time a waiver is approved, the waiver will apply to the subject property during the period of the mandatory water supply shortage condition. The decision of the City Manager or Water Division Manager will be final.

#### **14-11.13 Penalties and Violations.**

A. **Misdemeanor:** Any violation of this section may be prosecuted as a misdemeanor punishable by imprisonment in the county jail for not more than thirty (30) days, or by a fine not exceeding one thousand dollars (\$1,000) or as established by Resolution of the City Council whichever is greater, or by both.

B. **Civil Penalties:** Civil penalties for failure to comply with any provisions of the Ordinance are as follows:

1. **First Violation:** The City will issue a written warning and deliver a copy of this Ordinance by certified mail.

2. **Second Violation:** A second violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed one hundred dollars (\$100) or as established by Resolution of the City Council whichever is greater.

3. **Third Violation:** A third violation within the preceding twelve (12) calendar months is punishable by a fine not to exceed two hundred and fifty (\$250) or as established by Resolution of the City Council whichever is greater.

4. **Fourth and Subsequent Violations:** A fourth and any subsequent violation is punishable by a fine not to exceed five hundred (\$500) or as established by Resolution of the City Council whichever is greater

- i. **Water Flow Restrictor:** In addition to any fines, the City may install a services water flow restrictor device of approximately one gallon

per minute capacity for services up to one and one-half inch size and comparatively sized restrictors for larger services after written notice of intent to install a flow restrictor for a minimum of forty eight (48) hours.

- ii. Termination of Service: In addition to any fines and the installation of a water flow restrictor, the City may disconnect and/or terminate a customer's water service.

C. Cost of Flow Restrictor and Disconnecting Service: A person or entity that violates this Ordinance is responsible for payment of the City's charges for installing and/or removing any flow restricting device and for disconnecting and/or reconnecting service per the City's schedule of charges then in effect. This charge for installing or removing a flow restriction device will be set at one hundred dollars (\$100) each or as established by Resolution of the City Council whichever is greater. The charge for installing and/or removing any flow restricting device must be paid to the City before the device is removed. Nonpayment will be subject to the same remedies as nonpayment of basic water rates.

D. Separate Offenses: Each day that violation of this Ordinance occurs is a separate offense.

E. Notice and Hearing:

1. The City will issue a Notice of Violation by certified mail or personal delivery at least ten (10) days before taking enforcement action. Such notice must describe the violation and the date by which corrective action must be taken. A customer may appeal the Notice of Violation by filing a written notice of appeal with the City no later than the close of business on the day before the date scheduled for enforcement action. Any Notice of Violation not timely appealed will be final. Upon receipt of a timely appeal, a hearing on the appeal will be scheduled, and the City will mail written notice of the hearing date to the customer at least ten (10) days before the date of the hearing.

2. Pending receipt of a written appeal or pending a hearing pursuant to an appeal, the City may take appropriate steps to prevent the unauthorized use of water as appropriate to the nature and extent of the violations and the current declared water Level condition.

#### **14-11.14 Severability.**

If any subsection, sentence, clause or phrase in this section is for any reason held invalid, the validity of the remainder of the section will not be affected. The City Council hereby declares it would have passed this section and each subsection, sentence, clause or phrase thereof, irrespective of the fact that one or more subsections, sentences, clauses, or phrases or is declared invalid.

**Section 2.** This Ordinance shall take effect thirty (30) days after its final passage by the City Council.

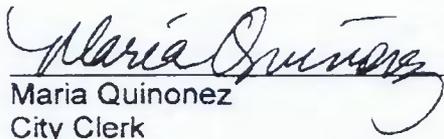
**Section 3.** The City Clerk of the City of Lynwood is hereby directed to certify to the passage and adoption of this Ordinance and to cause it to be published or posted as required by law.

First read at a regular meeting of the City Council held on the 1<sup>st</sup> day of September, 2009 and adopted and ordered published at a regular meeting of said Council on the 15<sup>th</sup> day of September, 2009.

**PASSED, APPROVED and ADOPTED this 15<sup>th</sup> day of September, 2009.**

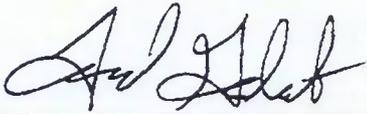
  
\_\_\_\_\_  
Maria T. Santillan  
Mayor

**ATTEST:**

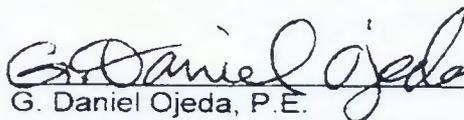
  
\_\_\_\_\_  
Maria Quinonez  
City Clerk

  
\_\_\_\_\_  
Roger L. Haley  
City Manager

**APPROVED AS TO FORM:**

  
\_\_\_\_\_  
Fred Galante  
City Attorney

**APPROVED AS TO CONTENT:**

  
\_\_\_\_\_  
G. Daniel Ojeda, P.E.  
Director of Public Works/City  
Engineer

STATE OF CALIFORNIA            )  
  ) §  
COUNTY OF LOS ANGELES        )

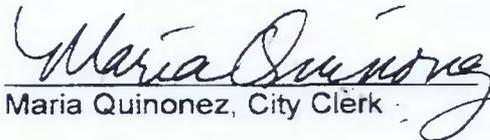
I, the undersigned, City Clerk of the City of Lynwood, do hereby certify that the above and foregoing Ordinance was duly adopted by the City Council of the City of Lynwood at its regular meeting held on the 15<sup>th</sup> day of **September, 2009**.

**AYES:           COUNCIL MEMBERS MORTON, RODRIGUEZ, CASTRO AND SANTILLAN**

**NOES:**

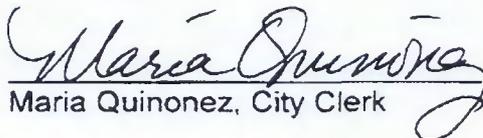
**ABSTAIN:**

**ABSENT:       COUNCIL MEMBER FLORES**

  
\_\_\_\_\_  
Maria Quinonez, City Clerk

STATE OF CALIFORNIA            )  
  ) §  
COUNTY OF LOS ANGELES        )

I, the undersigned, City Clerk of the City of Lynwood, and Clerk of the City Council of said City, do hereby certify that the above and foregoing is a full, true and correct copy of Ordinance No. **1618** in my office and that said Ordinance was adopted on the date and by the vote therein stated. Dated this 15<sup>th</sup> day of **September, 2009**.

  
\_\_\_\_\_  
Maria Quinonez, City Clerk



## **Appendix G: Efficient Landscape Ordinance 1623**

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**City of Lynwood 2010 Urban Water Management Plan**

**ORDINANCE NO. 1623**

**AN ORDINANCE OF THE CITY COUNCIL OF THE CITY OF LYNWOOD ADDING, CHAPTER 25 – ARTICLE 45 (WATER EFFICIENT LANDSCAPE ORDINANCE) TO THE LYNWOOD MUNICIPAL CODE**

**WHEREAS**, the State of California has mandated by AB 1881 of the 2006 Legislative Session that a City by January 1, 2010 adopt a Water Efficient Landscape Ordinance; and

**WHEREAS**, the City has an existing Landscape Ordinance (Ord. No 1589) which Ordinance is somewhat similar to the form required by AB 1881 but does not meet the requirements of AB 1881 for the State Mandated Ordinance.

**WHEREAS**, the City is given the option of either adopting the State's Model Ordinance or adopting a City Ordinance similar and of equal terms; and

**WHEREAS**, the City has decided to adopt an Ordinance based on the State's Model Ordinance to replace the existing Ordinance No 1589 and to comply with the State Mandated Ordinance; and

**WHEREAS**, the purpose of said new Ordinance is to conserve water usage for irrigation of landscaping and to permit landscaping appropriate for the urban City of Lynwood; and

**NOW, THEREFORE, THE CITY COUNCIL OF THE CITY OF LYNWOOD DOES HEREBY FIND, PROCLAIM, ORDER, AND RESOLVE AS FOLLOWS:**

**Chapter 25 – Article 45 Water Efficient Landscape Ordinance**

**Section 25.45.1 Short Title.**

This Article 45 of Chapter 25 shall be known and may be referred to herein as the Water Efficient Landscape Ordinance (Ordinance # 1623). Upon adoption of this Ordinance, the City's existing Ordinance No. 1589 shall hereby be rescinded.

**Section 25.45.2 Purpose.**

- (a) The State Legislature has found:
- (1) That the waters of the state are of limited supply and are subject to ever increasing demands;
  - (2) That the continuation of California's economic prosperity is dependent on the availability of adequate supplies of water for future uses;
  - (3) That it is the policy of the State to promote the conservation and efficient use of water and to prevent the waste of this valuable resource;

- (4) That landscapes are essential to the quality of life in California by providing areas for active and passive recreation and as an enhancement to the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development; and
- (5) That landscape design, installation, maintenance and management can and should be water efficient; and
- (6) That Section 2 of Article X of the California Constitution specifies that the right to use water is limited to the amount reasonably required for the beneficial use to be served and the right does not and shall not extend to waste or unreasonable method of use.

(b) Consistent with these legislative findings, the purpose of this ordinance is to:

- (1) Promote the values and benefits of landscapes while recognizing the need to invest water and other resources as efficiently as possible;
- (2) Establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects;
- (3) Establish provisions for water management practices and water waste prevention for existing landscapes;
- (4) Use water efficiently without waste by setting a Maximum Applied Water Allowance as an upper limit for water use and reduce water use to the lowest practical amount;
- (5) Promote the benefits of consistent landscape ordinances with neighboring local and regional agencies;
- (6) Encourage water purveyors to use economic incentives that promote the efficient use of water; and
- (7) Establish guidelines, rules and regulations for use by the several departments which review development and redevelopment in the City as to landscaping and the efficient use of potable water to irrigate and maintain the landscaping;
- (8) Demonstrate that the City supports the purposes of AB 1881 by adoption of this Ordinance.
- (9) Provide such guidelines, rules, and regulations to replace existing City Ordinance No 1589 and to compliment other existing City Ordinances;
- (10) Assist property owners in developing their property with landscaping that is water use efficient.

#### **Section 25.45.3 Applicability.**

- (a) As of January 1, 2010, this ordinance shall apply to all of the following landscape projects:
  - (1) New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or

- greater than 2,500 square feet requiring a building or landscape permit, plan check or design review;
- (2) New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check, or design review;
  - (3) New construction landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check or design review;
  - (4) Existing landscapes limited to Sections 25.45.23, 25.45.24 & 25.45.25; and
  - (5) Cemeteries. Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are limited to Sections 25.45.9, 25.45.16, and 25.45.17; and existing cemeteries are limited to Sections 25.45.23, 25.45.24, and 25.45.25.
- (b) This ordinance does not apply to:
- (1) Registered local, state or federal historical sites;
  - (2) Ecological restoration projects that do not require a permanent irrigation system;
  - (3) mined-land reclamation projects that do not require a permanent irrigation system; or
  - (4) Plant collections, as part of botanical gardens and arboretums open to the public.
- (c) Administration: This Ordinance shall be administered by the Development Services Department of the City. Wherever the "City" is referred to herein this shall be interpreted to mean the City Development Services Department. The City Public Works Department is to provide technical information to the Development Services Department upon request of the Development Services Department. To assist applicants the City has compiled a library of various landscape books and other printed information such as the Sunset Western Landscape Book and the several publications listed herein.
- (d) The City of Lynwood has previously adopted a Water Conservation Ordinance (Ordinance No. 1618) and a Landscape Ordinance (Ordinance No 1589). This Water Efficient Landscape Ordinance is to compliment the Water Conservation Ordinance and to replace the existing City Landscape Ordinance (Ordinance No 1589).

#### **Section 25.45.4 Definitions.**

The terms used in this ordinance have the meaning set forth below:

- (a) "Affidavit" means a notarized certification by the applicant under this Ordinance that states that the applicants project was constructed as approved by the City. The form of the Affidavit will be provided by the City.
- (b) "Applicant" means the owner of a property in the City and or his/her representative who applies to the City for approval for a landscape development and or landscape redevelopment pursuant to the requirements of this Ordinance. The applicant may complete the application or use the services of professionals or technicians or contractors to complete the application and to prepare the various documents needed to complete an application and to carry out the project. However, the applicant must complete any and all affidavits required for processing of the application and completion of the landscape project.
- (c) "Applied water" means the portion of water supplied by the irrigation system to the landscape.
- (d) "automatic irrigation controller" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.
- (e) "backflow prevention device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system. Requirements therefor are given in the City Water and Sewer Ordinance (Ord. No's 1305 and 1316).
- (f) "Affidavit of Completion/Compliance" means the document required under Section 25.45.14
- (g) "certified irrigation designer" means a person certified to design irrigation systems by an accredited academic institution a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation designer certification program and Irrigation Association's Certified Irrigation Designer program.
- (h) "certified landscape irrigation auditor" means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.
- (i) "check valve" or "anti-drain valve" means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.
- (j) "common interest developments" means community apartment projects, condominium projects, planned developments, and stock cooperatives per California Civil Code Section 1351.
- (k) "conversion factor (0.62)" means the number that converts acre-inches per acre per year to gallons per square foot per year
- (l) "drip irrigation" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

- (m) "ecological restoration project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.
- (n) "effective precipitation" or "usable rainfall" (Eppt) means the portion of total precipitation which becomes available for plant growth.
- (o) "emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.
- (p) "established landscape" means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.
- (q) "establishment period of the plants" means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.
- (r) "Estimated Total Water Use" (ETWU) means the total water used for the landscape as described in Section 25.45.9
- (s) "ET adjustment factor" (ETAF) means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape.  
A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is  $(0.7) = (0.5/0.71)$ . ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.
- (t) "evapotranspiration rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.
- (u) "flow rate" means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.
- (v) "hardscapes" means any durable material (pervious and non-pervious).
- (w) "homeowner-provided landscaping" means any landscaping either installed by a private individual for a single family residence or installed by a licensed contractor hired by a homeowner. A homeowner, for purposes of this ordinance, is a person who occupies the dwelling he or she owns. This excludes speculative homes, which are not owner-occupied dwellings.
- (x) "hydrozone" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.
- (y) "infiltration rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).
- (z) "invasive plant species" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "Noxious weeds" means any weed designated by the Weed Control Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained

at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

- (aa) "irrigation audit" means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.
- (bb) "irrigation efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this ordinance is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.
- (cc) "irrigation survey" means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to: inspection, system test, and written recommendations to improve performance of the irrigation system.
- (dd) "irrigation water use analysis" means an analysis of water use data based on meter readings and billing data.
- (ee) "landscape architect" means a person who holds a license to practice landscape architecture in the state of California Business and Professions Code, Section 5615.
- (ff) "landscape area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).
- (gg) "landscape contractor" means a person licensed by the State of California to construct, maintain, repair, install, or subcontract the development of landscape systems.
- (hh) "Landscape Documentation Package" means the documents required under Section 25.45.8. The City will provide to applicant and to the public sample materials that will be required to be completed by an applicant to obtain City approval of a landscape project subject to this ordinance.
- (ii) "landscape project" means total area of landscape in a project as defined in "landscape area" for the purposes of this ordinance, meeting requirements under Section 25.45.3.
- (jj) "lateral line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.
- (kk) "local water purveyor" means the City of Lynwood Utility Services Division which provide retail potable water service to about 90% of the City and the Park Water Company which provides potable water services to about 10% of the City area in the Southeast part of the City.

- (ll) "low volume irrigation" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.
- (mm) "main line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.
- (nn) "Maximum Applied Water Allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Sub-Section 14-14.9. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.
- (oo) "microclimate" means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.
- (pp) "mined-land reclamation projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.
- (qq) "mulch" means any organic material such as leaves, bark, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.
- (rr) "new construction" means, for the purposes of this ordinance, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.
- (ss) "operating pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.
- (tt) "overhead sprinkler irrigation systems" means systems that deliver water through the air (e.g., spray heads and rotors).
- (uu) "overspray" means the irrigation water which is delivered beyond the target area.
- (vv) "permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.
- (ww) "pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.
- (xx) "plant factor" or "plant water use factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this ordinance, the plant factor range for low water use plants is 0 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this ordinance are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".

- (yy) "precipitation rate" means the rate of application of water measured in inches per hour.
- (zz) "project applicant" means the individual or entity submitting a Landscape Documentation Package required under Section 25.45.8, to request a permit, plan check, or design review from the City. A project applicant may be the property owner or his or her designee.
- (aaa) "rain sensor" or "rain sensing shutoff device" means a component which automatically suspends an irrigation event when it rains.
- (bbb) "record drawing" or "as-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor or persons performing the landscape and irrigation system construction.
- (ccc) "recreational area" means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.
- (ddd) "recycled water", "reclaimed water", or "treated sewage effluent water" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.
- (eee) "reference evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per month, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated. The ETo for the City of Lynwood in inches per month is as follows:

January	2.2
February	2.7
March	3.7
April	4.7
May	5.5
June	5.8
July	6.2
August	5.9
September	5.0
October	3.9
November	2.6
December	1.9
Annual Total	50.1

- (fff) "rehabilitated landscape" means any re-landscaping project that requires a permit, plan check, or design review, meets the requirements of Sub-Section 14-14.3, and the modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

- (ggg) "runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.
- (hhh) "Soil Management Report" means the applicant will need to obtain information and data on the condition of the soil which is to be landscaped and to provide this information to the City in this report. The requirements of this report are identified in the City's Landscaped Documentation Package that will be provided by the City to applicants and the public.
- (iii) "soil moisture sensing device" or "soil moisture sensor" means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.
- (jjj) "soil texture" means the classification of soil based on its percentage of sand, silt, and clay.
- (kkk) "Special Landscape Area" (SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.
- (lll) "sprinkler head" means a device which delivers water through a nozzle.
- (mmm) "static water pressure" means the pipeline or municipal water supply pressure when water is not flowing. The information about static water pressure can be obtained by contacting the respective local water purveyor, the City of Lynwood Utility Services Division or the Park Water Company.
- (nnn) "station" means a landscape area served by one valve or by a set of valves that operate simultaneously.
- (ooo) "swing joint" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.
- (ppp) "turf" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.
- (qqq) "valve" means a device used to control the flow of water in the irrigation system.
- (rrr) "water conserving plant species" means a plant species identified as having a low plant factor. The City will provide to applicant and to the public upon request landscape documentation packages with various required forms, worksheets, charts, affidavit form and related information.
- (sss) "Water Efficient Landscape Worksheet" see Section 25.45.8 for form and listing of information thereon. The City will provide to applicant and to the public upon request a Landscape Documentation Package with various required forms, worksheets, charts, affidavit forms and related information. The City will provide compiled examples of worksheets.
- (ttt) "water feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use

hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

- (uuu) "watering window" means the time of day irrigation is allowed.
- (vvv) "WUCOLS" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

#### **Section 25.45.5 Provisions for New Construction or Rehabilitated Landscapes.**

The City may designate another agency, such as a water purveyor, to implement some or all of the requirements contained in this ordinance. The City may collaborate with water purveyors to define each entity's specific responsibilities relating to this ordinance.

#### **Section 25.45.6 Compliance with Landscape Documentation Package.**

- (a) Prior to construction, the City shall:
  - (1) Provide the project applicant with the ordinance, guidelines, information, and procedures for permits, plan checks, or design reviews;
  - (2) Review the Landscape Documentation Package submitted by the project applicant;
  - (3) Approve or deny the Landscape Documentation Package;
  - (4) Issue a permit or approve the plan check or design review for the project applicant; and
  - (5) Upon approval of the Landscape Documentation Package, submit a copy of the Water Efficient Landscape Worksheet to the local water purveyor.
- (b) Prior to construction, the project applicant shall:
  - (1) Submit a Landscape Documentation Package to the City.
- (c) Upon approval of the Landscape Documentation Package by the City, the project applicant shall:
  - (1) Receive a permit or approval of the plan check or design review and record the date of the permit in the Affidavit of Completion/Compliance;
  - (2) Submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee; and
  - (3) Submit a copy of the Water Efficient Landscape Worksheet to the local water purveyor.

#### **Section 25.45.7 Enforcement.**

- (a) The City may establish and administer rules of enforcement to obtain compliance with the ordinance to the extent permitted by law.

**Section 25.45.8 Elements of the Landscape Documentation Package.**

- (a) The Landscape Documentation Package shall include the following six (6) elements:
- (1) Project information;
    - (A) Date
    - (B) Names, addresses, mailing addresses, telephone numbers of the project applicant and property owner if different from the applicant.
    - (C) Project address (if available, parcel and/or lot number(s)) and assessors parcel no.
    - (D) Total landscape area (square feet)
    - (E) Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed)
    - (F) water supply type (e.g., potable, recycled, well) and identify the local retail water purveyor if the applicant is not served by a private well
    - (G) Checklist of all documents in Landscape Documentation Package
    - (H) Project contacts to include contact information for the project applicant and property owner
    - (I) applicant signature and date with statement, "I agree to comply with the requirements of the Water Efficient Landscape Ordinance and submit a complete Landscape Documentation Package".
  - (2) Water Efficient Landscape Worksheet;
    - (A) Hydrozone information table
    - (B) Water budget calculations
      1. Maximum Applied Water Allowance (MAWA)
      2. Estimated Total Water Use (ETWU)
  - (3) Soil management report;
  - (4) Landscape design plan;
  - (5) Irrigation design plan; and
  - (6) Grading design plan.

**Section 25.45.9 Water Efficient Landscape Worksheet.**

- (a) A project applicant shall complete the Water Efficient Landscape Worksheet which contains two sections:
- (1) A hydrozone information for the landscape project; and
  - (2) A water budget calculation for the landscape project. For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, a project applicant shall use the ETo value given in Section 25.45.4 (eee).

- (b) Water budget calculations shall adhere to the following requirements:
- (1) The plant factor used shall be from WUCOLS. The plant factor ranges from 0 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, and from 0.7 to 1.0 for high water use plants.
  - (2) All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.
  - (3) All Special Landscape Areas shall be identified and their water use calculated as described below.
  - (4) ETAF for Special Landscape Areas shall not exceed 1.0.

(c) Maximum Applied Water Allowance

The Maximum Applied Water Allowance shall be calculated using the equation:

$$MAWA = (ET_o) (0.62) [(0.7 \times LA) + (0.3 \times SLA)]$$

The  $ET_o$  value to be used in these calculations is from Section 25.45.4 (eee) as given herein for planning purposes only. For actual irrigation scheduling, automatic irrigation controllers are required and shall use current reference evapotranspiration data, such as from the California Irrigation Management Information System (CIMIS), other equivalent data, or soil moisture sensor data.

$$MAWA = (ET_o) (0.62) [(0.7 \times LA) + (0.3 \times SLA)]$$

MAWA = Maximum Applied Water Allowance (gallons per year)

$ET_o$  = See Sub-Section 14-14.4 (ccc)

0.62 = Conversion Factor (to gallons)

0.7 = ET Adjustment Factor (ETAF)

LA = Landscape Area including SLA (square feet)

0.3 = Additional Water Allowance for SLA

SLA = Special Landscape Area (square feet)

(d) Estimated Total Water Use.

The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

$$ETWU = (ET_o)(0.62) \left( \frac{PF \times HA}{IE} + SLA \right)$$

Where:

ETWU = Estimated Total Water Use per year (gallons)

$ET_o$  = See Sub-Section 14-14.4

PF = Plant Factor from WUCOLS

HA = Hydrozone Area [high, medium, and low water use areas] (square feet)

SLA = Special Landscape Area (square feet)  
0.62 = Conversion Factor  
IE = Irrigation Efficiency (minimum 0.71)

#### **Section 25.45.10 Soil Management Report.**

- (a) In order to reduce runoff and encourage healthy plant growth, a soil management report shall be completed by the project applicant, or his/her designee, as follows:
- (1) Submit soil samples to a laboratory for analysis and recommendations.
    - (A) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.
    - (B) The soil analysis may include:
      1. Soil texture;
      2. Infiltration rate determined by laboratory test or soil texture infiltration rate table;
      3. pH;
      4. Total soluble salts;
      5. Sodium;
      6. Percent organic matter; and
      7. Recommendations.
  - (2) The project applicant, or his/her designee, shall comply with one of the following:
    - (A) If significant mass grading is not planned, the soil analysis report shall be submitted to the City as part of the Landscape Documentation Package; or
    - (B) If significant mass grading is planned, the soil analysis report shall be submitted to the City as part of the Affidavit of Completion/Compliance.
  - (3) The soil analysis report shall be made available, in a timely manner, to the persons preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.
  - (4) The project applicant, or his/her designee, shall submit documentation verifying implementation of soil analysis report recommendations to City with Affidavit of Completion/Compliance.

#### **Section 25.45.11 Landscape Design Plan.**

- (a) For the efficient use of water, a landscape shall be carefully designed and planned for the intended function of the project. A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.
- (1) Plant Material —

- (A) Any plant may be selected for the landscape, providing the Estimated Total Water Use in the landscape area does not exceed the Maximum Applied Water Allowance. To encourage the efficient use of water, the following is highly recommended:
    - 1. Protection and preservation of native species and natural vegetation;
    - 2. Selection of water-conserving plant and turf species;
    - 3. Selection of plants based on disease and pest resistance;
    - 4. Selection of trees based on applicable City tree ordinance or tree shading guidelines; and
    - 5. Selection of plants from local and regional landscape program plant lists.
  - (B) Each hydrozone shall have plant materials with similar water use, with the exception of hydrozones with plants of mixed water use, as specified in Section 25.45.12 (G) (2) (D)
  - (C) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site. To encourage the efficient use of water, the following is highly recommended:
    - 1. Use the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate;
    - 2. Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; and
    - 3. Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.
  - (D) Turf is not allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape and where 25% means 1 foot of vertical elevation change for every 4 feet of horizontal length (rise divided by run x 100 = slope percent).
  - (E) A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per State of California Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.
  - (F) The use of invasive and/or noxious plant species is strongly discouraged.
  - (G) The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.
- (2) Water Features

- (A) Recirculating water systems shall be used for water features.
  - (B) Where available, recycled water shall be used as a source for decorative water features.
  - (C) Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.
  - (D) Pool and spa covers are highly recommended.
- (3) Mulch and Amendments
- (A) A minimum two inch (2") layer of mulch shall be applied on all exposed soil surfaces of planting areas except in turf areas, creeping or rooting groundcovers, or direct seeding applications where mulch is contraindicated.
  - (B) Stabilizing mulching products shall be used on slopes.
  - (C) The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.
  - (D) Soil amendments shall be incorporated according to recommendations of the soil report and what is appropriate for the plants selected. See Section 25.45.5
- (b) The landscape design plan, at a minimum, shall:
- (1) delineate and label each hydrozone by number, letter, or other method;
  - (2) identify each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;
  - (3) identify recreational areas;
  - (4) identify areas permanently and solely dedicated to edible plants;
  - (5) identify areas irrigated with recycled water;
  - (6) identify type of mulch and application depth;
  - (7) identify soil amendments, type, and quantity;
  - (8) identify type and surface area of water features;
  - (9) identify hardscapes (pervious and non-pervious);
  - (10) identify location and installation details of any applicable stormwater best management practices that encourage on-site retention and infiltration of stormwater. Stormwater best management practices are encouraged in the landscape design plan and examples include, but are not limited to:
    - (A) infiltration beds, swales, and basins that allow water to collect and soak into the ground;
    - (B) constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and
    - (C) pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.
  - (11) identify any applicable rain harvesting or catchment technologies (e.g., rain gardens, cisterns, etc.);

- (12) an affidavit containing the following statement: "I have complied with the criteria of the ordinance and applied them for the efficient use of water in the landscape design plan"; and
- (13) bear the signature of a licensed landscape architect, licensed landscape contractor, or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

#### **Section 25.45.12 Irrigation Design Plan.**

- (a) For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.
  - (1) System
    - (A) Dedicated landscape water meters are highly recommended on landscape areas smaller than 5,000 square feet to facilitate water management and are required for areas over 5,000 square feet.
    - (B) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.
    - (C) The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.
      - 1. If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.
      - 2. Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.
    - (D) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for climatic conditions. Irrigation should be avoided during windy or cold weather or during rain.

- (E) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.
- (F) Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system. A project applicant shall refer to the City Water and Sewer Ordinance for additional backflow prevention requirements.
- (G) High flow sensors that detect and report high flow conditions created by system damage or malfunction are recommended.
- (H) The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.
- (I) Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.
- (J) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.
- (K) The irrigation system must be designed and installed to meet, at a minimum, the irrigation efficiency criteria as described in Section 25.45.9 regarding the Maximum Applied Water Allowance.
- (L) It is highly recommended that the project applicant inquire with the local water purveyor about peak water operating demands (on the water supply system) or water restrictions that may impact the effectiveness of the irrigation system.
- (M) In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.
- (N) Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.
- (O) Head to head coverage is recommended. However, sprinkler spacing shall be designed to achieve the highest possible distribution uniformity using the manufacturer's recommendations.
- (P) Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.
- (Q) Check valves or anti-drain valves are required for all irrigation systems.
- (R) Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.
- (S) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. The setback area may be planted or

unplanted. The surfacing of the setback may be mulch, gravel, or other porous material. These restrictions may be modified if:

1. the landscape area is adjacent to permeable surfacing and no runoff occurs; or
  2. the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or
  3. the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package and clearly demonstrates strict adherence to irrigation system design criteria in Section 25.45.12 (a) (1) (H). Prevention of overspray and runoff must be confirmed during the irrigation audit.
- (T) Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.75 inches per hour. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

(2) Hydrozone

- (A) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.
- (B) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.
- (C) Where feasible, trees shall be placed on separate valves from shrubs, groundcovers, and turf.
- (D) Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if:
  1. plant factor calculation is based on the proportions of the respective plant water uses and their plant factor; or
  2. the plant factor of the higher water using plant is used for calculations.
- (E) Individual hydrozones that mix high and low water use plants shall not be permitted.
- (F) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table. This table can also assist with the irrigation audit and programming the controller.

(b) The irrigation design plan, at a minimum, shall contain:

- (1) location and size of separate water meters for landscape;
- (2) location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, and backflow prevention devices;
- (3) static water pressure at the point of connection to the water supply system;
- (4) flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;
- (5) recycled water irrigation systems as specified in Sub-Section 14-14.19;
- (6) the following statement: "I have complied with the criteria of the ordinance and applied them accordingly for the efficient use of water in the irrigation design plan"; and
- (7) the signature of a licensed landscape architect, certified irrigation designer, licensed landscape contractor, or any other person authorized to design an irrigation system. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

**Section 25.45.13 Grading Design Plan.**

- (a) For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A comprehensive grading plan prepared by a civil engineer for other City permits satisfies this requirement.
  - (1) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:
    - (A) Height of graded slopes;
    - (B) Drainage patterns;
    - (C) Pad elevations;
    - (D) Finish grade; and
    - (E) Stormwater retention improvements, if applicable.
  - (2) To prevent excessive erosion and runoff, it is highly recommended that project applicants:
    - (A) grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;
    - (B) avoid disruption of natural drainage patterns and undisturbed soil; and
    - (C) avoid soil compaction in landscape areas.
  - (3) The grading design plan package shall contain the following affidavit: "I have complied with the criteria of the ordinance and applied them

accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

**Section 25.45.14 Affidavit of Completion/Compliance.**

(a) The Affidavit of Completion/Compliance shall include the following six (6) elements:

- (1) Project information sheet that contains:
  - (A) Date;
  - (B) Project name;
  - (C) Project applicant name, telephone, and mailing address;
  - (D) Project address and location, Assessor Parcel No;
  - (E) Property owner name, telephone, and mailing address;
- (2) An Affidavit by the owner and either the signer of the landscape design plan, the signer of the irrigation design plan, or the licensed landscape contractor that the landscape project has been installed per the approved Landscape Documentation Package; where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;
- (3) Irrigation scheduling parameters used to set the controller; (see Section 25.45.15)
- (4) Landscape and irrigation maintenance schedule; (see Section 25.45.16)
- (5) Irrigation audit report (see Section 25.45.17); and
- (6) Soil analysis report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations.

(b) The project applicant shall:

- (1) Submit the signed Affidavit of Completion/Compliance of owner to the City for review;
- (2) Ensure that copies of the approved Affidavit of Completion/Compliance are submitted to the local water purveyor.

(c) The City shall:

- (1) Receive the signed Affidavit of Completion/Compliance from the project applicant;
- (2) Approve or deny the Affidavit of Completion/Compliance. If the Affidavit of Completion/Compliance is denied, the City shall provide information to the project applicant regarding reapplication, appeal, or other assistance.

**Section 25.45.15 Irrigation Scheduling.**

- (a) For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:
- (1) Irrigation scheduling shall be regulated by automatic irrigation controllers and in accordance with the City Water Conservation Ordinance No 1618.
  - (2) Overhead irrigation shall be scheduled pursuant to the City Water Conservation Ordinance unless weather conditions prevent it. If allowable hours of irrigation differ from that allowed by the local water purveyor, the stricter of the two shall apply. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
  - (3) For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data or soil moisture sensor data.
  - (4) Parameters used to set the automatic controller shall be developed and submitted for each of the following:
    - (A) The plant establishment period;
    - (B) The established landscape; and
    - (C) Temporarily irrigated areas.
  - (5) Each irrigation schedule shall consider for each station all of the following that apply:
    - (A) Irrigation interval (days between irrigation);
    - (B) Irrigation run times (hours or minutes per irrigation event to avoid runoff);
    - (C) Number of cycle starts required for each irrigation event to avoid runoff;
    - (D) Amount of applied water scheduled to be applied on a monthly basis;
    - (E) Application rate setting;
    - (F) Root depth setting;
    - (G) Plant type setting;
    - (H) Soil type;
    - (I) Slope factor setting;
    - (J) Shade factor setting; and
    - (K) Irrigation uniformity or efficiency setting.

**Section 25.45.16 Landscape and Irrigation Maintenance Schedule.**

- (a) Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Affidavit of Completion/Compliance.
- (b) A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.
- (c) Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.
- (d) A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance.

**Section 25.45.17 Irrigation Audit, Irrigation Survey, and Irrigation Water Use Analysis.**

- (a) All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.
- (b) For new construction and rehabilitated landscape projects installed after January 1, 2010, as described in Section 25.45.3:
  - (1) the project applicant shall submit an irrigation audit report with the Affidavit of Completion/Compliance to the City that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule;
  - (2) the City shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

**Section 25.45.18 Irrigation Efficiency.**

For the purpose of determining Maximum Applied Water Allowance, average irrigation efficiency is assumed to be 0.71. Irrigation systems shall be designed, maintained, and managed to meet or exceed an average landscape irrigation efficiency of 0.71.

**Section 25.45.19 Recycled Water.**

- (a) The installation of recycled water irrigation systems shall allow for the current and future use of recycled water, unless a written exemption has been granted as described in Section 25.45.19(b).
- (b) Irrigation systems and decorative water features shall use recycled water unless a written exemption has been granted by the local water purveyor stating that recycled water meeting all public health codes and standards is not available and will not be available for the foreseeable future.

- (c) All recycled water irrigation systems shall be designed and operated in accordance with all applicable City rules and regulations, County of Los Angeles Health Department regulations, State of California Department of Public Health regulations and of the purveyor of the recycled water.
- (d) Landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0.

#### **Section 25.45.20 Storm Water Management.**

- (a) Stormwater management practices to minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration are encouraged.
- (b) Project applicants shall refer to the City Public Works Department or local Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.
- (c) Rain gardens, cisterns, and other landscapes features and practices that increase rainwater capture and create opportunities for infiltration and/or onsite storage are recommended.

#### **Section 25.45.21 Public Education.**

- (a) Publications. Education is a critical component to promote the efficient use of water in landscapes. The use of appropriate principles of design, installation, management and maintenance that save water is encouraged in the City.
  - (1) The City will provide information to owners of new, developed properties and to owners of existing landscaped properties considering redevelopment of landscaped areas regarding the design, installation, management, and maintenance of water efficient landscapes.
- (b) Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this ordinance.
  - (1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme.
  - (2) Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

#### **Section 25.45.22 Environmental Review.**

The landscape project must comply with the California Environmental Quality Act (CEQA), as appropriate.

#### **Section 25.45.23 Provisions for Existing Landscapes.**

STATE OF CALIFORNIA       )  
  ) §  
COUNTY OF LOS ANGELES    )

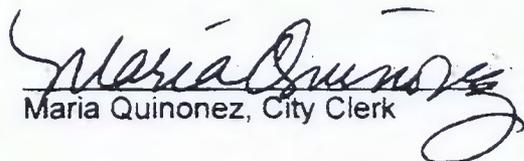
I, the undersigned, City Clerk of the City of Lynwood, do hereby certify that the foregoing Resolution was passed and adopted by the City Council of the City of Lynwood at a regular meeting held on the 1<sup>st</sup> day of **December, 2009**.

AYES:       **COUNCIL MEMBERS FLORES, MORTON, RODRIGUEZ, CASTRO,  
                  AND SANTILLAN**

NOES:       **NONE**

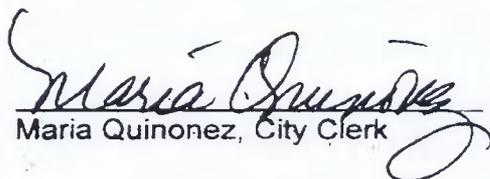
ABSENT:     **NONE**

ABSTAIN:    **NONE**

  
Maria Quinonez, City Clerk

STATE OF CALIFORNIA       )  
  ) §  
COUNTY OF LOS ANGELES    )

I, the undersigned, City Clerk of the City of Lynwood, and Clerk of the City Council of said City, do hereby certify that the above and foregoing is a full, true and correct copy of Ordinance No. **1623** in my office and that said Ordinance was adopted on the date and by the vote therein stated. Dated this 1<sup>st</sup> day of **December, 2009**.

  
Maria Quinonez, City Clerk



## **Appendix H: Central Basin Judgment**

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**City of Lynwood 2010 Urban Water Management Plan**

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LAGERLOF, SENEAL, DRESCHER & SWIFT  
301 North Lake Avenue, 10th Floor  
Pasadena, California 91101  
(818) 793-9400 or (213) 385-4345

SUPERIOR COURT OF THE STATE OF CALIFORNIA  
FOR THE COUNTY OF LOS ANGELES

CENTRAL AND WEST BASIN WATER	)	No. 786,656
REPLENISHMENT DISTRICT, etc.,	)	<u>SECOND AMENDED</u>
	)	<u>JUDGMENT</u>
Plaintiff,	)	
	)	
v.	)	(Declaring and establishing
	)	water rights in Central Basin
	)	and enjoining extractions
CHARLES E. ADAMS, et al.,	)	therefrom in excess of
	)	specified quantities.)
Defendants.	)	
	)	
<hr/> CITY OF LAKEWOOD, a municipal	)	
corporation,	)	
	)	
Cross-Complainant,	)	
	)	
v.	)	
	)	
CHARLES E. ADAMS, et al.,	)	
	)	
Cross-Defendants.	)	
<hr/>	)	

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,

1 MARTIN E. WHELAN, JR., and EDWIN H. VAIL, JR., and cross-  
2 complainant was represented by its attorney JOHN S. TODD.  
3 Various defendants and cross-defendants were also represented at  
4 the trial. Evidence both oral and documentary was introduced.  
5 The trial continued from day to day on May 17, 18, 19, 20, 21 and  
6 24, 1965, at which time it was continued by order of Court for  
7 further trial on August 25, 1965, at 10:00 a.m. in Department 73  
8 of the above-entitled Court; whereupon, having then been  
9 transferred to Department 74, trial was resumed in Department 74  
10 on August 25, 1965, and then continued to August 27, 1965 at  
11 10:00 a.m. in the same Department. On the latter date, trial was  
12 concluded and the matter submitted. Findings of fact and conclu-  
13 sions of law have heretofore been signed and filed. Pursuant to  
14 the reserved and continuing jurisdiction of the court under the  
15 judgment herein, certain amendments to said judgment and  
16 temporary orders have heretofore been made and entered.  
17 Continuing jurisdiction of the court for this action is currently  
18 assigned to HON. FLORENCE T. PICKARD. Motion of Plaintiff herein  
19 for further amendments to the judgment, notice thereof and of the  
20 hearing thereon having been duly and regularly given to all  
21 parties, came on for hearing in Department 38 of the above-  
22 entitled court on MAY 6, 1991 at 8:45 a.m. before said HONORABLE  
23 PICKARD. Plaintiff was represented by its attorneys LAGERLOF,  
24 SENEAL, DRESCHER & SWIFT, by William F. Kruse. Various  
25 defendants were represented by counsel of record appearing on the  
26 Clerk's records. Hearing thereon was concluded on that date.  
27 The within "Second Amended Judgment" incorporates amendments and  
28 orders heretofore made to the extent presently operable and

1 amendments pursuant to said last mentioned motion. To the extent  
2 this Amended Judgment is a restatement of the judgment as  
3 heretofore amended, it is for convenience in incorporating all  
4 matters in one document, is not a readjudication of such matters  
5 and is not intended to reopen any such matters. As used  
6 hereinafter the word "judgment" shall include the original  
7 judgment as amended to date. In connection with the following  
8 judgment, the following terms, words, phrases and clauses are  
9 used by the Court with the following meanings:

10           "Administrative Year" means the water year until  
11 operation under the judgment is converted to a fiscal year  
12 pursuant to Paragraph 4, Part I, p. 53 hereof, whereupon it  
13 shall mean a fiscal year, including the initial 'short fiscal  
14 year' therein provided.

15           "Allowed Pumping Allocation" is that quantity in acre  
16 feet which the Court adjudges to be the maximum quantity which a  
17 party should be allowed to extract annually from Central Basin as  
18 set forth in Part I hereof, which constitutes 80% of such party's  
19 Total Water Right.

20           "Allowed Pumping Allocation for a particular Administra-  
21 tive year" and "Allowed Pumping Allocation in the following  
22 Administrative year" and similar clauses, mean the Allowed  
23 Pumping Allocation as increased in a particular Administrative  
24 year by any authorized carryovers pursuant to Part III, Subpart A  
25 of this judgment and as reduced by reason of any over-extractions  
26 in a previous Administrative year.

27           "Artificial Replenishment" is the replenishment of Central  
28 Basin achieved through the spreading of imported or reclaimed

1 water for percolation thereof into Central Basin by a govern-  
2 mental agency.

3 "Base Water Right" is the highest continuous extractions of  
4 water by a party from Central Basin for a beneficial use in any  
5 period of five consecutive years after the commencement of over-  
6 draft in Central Basin and prior to the commencement of this  
7 action, as to which there has been no cessation of use by that  
8 party during any subsequent period of five consecutive years. As  
9 employed in the above definition, the words "extractions of water  
10 by a party" and "cessation of use by that party" include such  
11 extractions and cessations by any predecessor or predecessors in  
12 interest.

13 "Calendar Year" is the twelve month period commencing  
14 January 1 of each year and ending December 31 of each year.

15 "Central Basin" is the underground water basin or reservoir  
16 underlying Central Basin Area, the exterior boundaries of which  
17 Central Basin are the same as the exterior boundaries of Central  
18 Basin Area.

19 "Central Basin Area" is the territory described in Appendix  
20 "1" to this judgment, and is a segment of the territory  
21 comprising Plaintiff District.

22 "Declared water emergency" shall mean a period commencing  
23 with the adoption of a resolution of the Board of Directors of  
24 the Central and West Basin Water Replenishment District declaring  
25 that conditions within the Central Basin relating to natural and  
26 imported supplies of water are such that, without implementation  
27 of the water emergency provisions of this Judgment, the water  
28 resources of the Central Basin risk degradation. In making such

1 declaration, the Board of Directors shall consider any  
2 information and requests provided by water producers, purveyors  
3 and other affected entities and may, for that purpose, hold a  
4 public hearing in advance of such declaration. A Declared Water  
5 Emergency shall extend for one (1) year following such  
6 resolution, unless sooner ended by similar resolution.

7 "Extraction", "extractions", "extracting", "extracted", and  
8 other variations of the same noun and verb, mean pumping, taking,  
9 diverting or withdrawing ground water by any manner or means  
10 whatsoever from Central Basin.

11 "Fiscal Year" is the twelve (12) month period July 1 through  
12 June 30 following.

13 "Imported Water" means water brought into Central Basin Area  
14 from a non-tributary source by a party and any predecessors in  
15 interest, either through purchase directly from The Metropolitan  
16 Water District of Southern California or by direct purchase from  
17 a member agency thereof, and additionally as to the Department of  
18 Water and Power of the City of Los Angeles, water brought into  
19 Central Basin Area by that party by means of the Owens River  
20 Aqueduct.

21 "Imported Water Use Credit" is the annual amount, computed  
22 on a calendar year basis, of imported water which any party and  
23 any predecessors in interest, who have timely made the required  
24 filings under Water Code Section 1005.1, have imported into  
25 Central Basin Area in any calendar year and subsequent to July 9,  
26 1951, for beneficial use therein, but not exceeding the amount by  
27 which that party and any predecessors in interest reduces his or  
28 their extractions of ground water from Central Basin in that

1 calendar year from the level of his or their extractions in the  
2 preceding calendar year, or in any prior calendar year not  
3 earlier than the calendar year 1950, whichever is the greater.

4 "Natural Replenishment" means and includes all processes  
5 other than "Artificial Replenishment" by which water may become a  
6 part of the ground water supply of Central Basin.

7 "Natural Safe Yield" is the maximum quantity of ground  
8 water, not in excess of the long term average annual quantity of  
9 Natural Replenishment, which may be extracted annually from  
10 Central Basin without eventual depletion thereof or without  
11 otherwise causing eventual permanent damage to Central Basin as a  
12 source of ground water for beneficial use, said maximum quantity  
13 being determined without reference to Artificial Replenishment.

14 "Overdraft" is that condition of a ground water basin  
15 resulting from extractions in any given annual period or periods  
16 in excess of the long term average annual quantity of Natural  
17 Replenishment, or in excess of that quantity which may be  
18 extracted annually without otherwise causing eventual permanent  
19 damage to the basin.

20 "Party" means a party to this action. Whenever the  
21 term "party" is used in connection with a quantitative water  
22 right, or any quantitative right, privilege or obligation, or in  
23 connection with the assessment for the budget of the Watermaster,  
24 it shall be deemed to refer collectively to those parties to whom  
25 are attributed a Total Water Right in Part I of this judgment.

26 "Person" or "persons" include individuals, partner-  
27 ships, associations, governmental agencies and corporations, and  
28 any and all types of entities.

1           "Total Water Right" is the quantity arrived at in the  
2 same manner as in the computation of "Base Water Right", but  
3 including as if extracted in any particular year the Imported  
4 Water Use Credit, if any, to which a particular party may be  
5 entitled.

6           "Water" includes only non-saline water, which is that  
7 having less than 1,000 parts of chlorides to 1,000,000 parts of  
8 water.

9           "Water Year" is the 12-month period commencing Octo-  
10 ber 1 of each year and ending September 30th of the following  
11 year.

12           In those instances where any of the above-defined  
13 words, terms, phrases or clauses are utilized in the definition  
14 of any of the other above-defined words, terms, phrases and  
15 clauses, such use is with the same meaning as is above set forth.  
16

17           NOW THEREFORE, IT IS ORDERED, DECLARED, ADJUDGED AND  
18 DECREED WITH RESPECT TO THE ACTION AND CROSS-ACTION AS FOLLOWS:

19           I.   DECLARATION AND DETERMINATION OF WATER RIGHTS OF  
20 PARTIES; RESTRICTION ON THE EXERCISE THEREOF.<sup>1</sup>

21           1.   Determination of Rights of Parties.

22           (a) Each party, except defendants, The City of Los  
23 Angeles and Department of Water and Power of the City of Los  
24 Angeles, whose name is hereinafter set forth in the tabulation at  
25 the conclusion of Subpart 3 of Part 1, and after whose name there  
26

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27           <sup>1</sup>Headings in the judgment are for purposes of reference and  
28 the language of said headings do not constitute, other than for  
such purpose, a portion of this judgment.

1 appears under the column "Total Water Right" a figure other than  
2 "0", was the owner of and had the right to extract annually  
3 groundwater from Central Basin for beneficial use in the quantity  
4 set forth after that party's name under said column "Total Water  
5 Right" pursuant to the Judgment as originally entered herein.  
6 Attached hereto as Appendix "2" and by this reference made a part  
7 hereof as though fully set forth are the water rights of parties  
8 and successors in interest as they existed as of the close of the  
9 water year ending September 30, 1978 in accordance with the  
10 Watermaster Reports on file with this Court and the records of  
11 the Plaintiff. This tabulation does not take into account  
12 additions or subtractions from any Allowed Pumping Allocation of  
13 a producer for the 1978-79 water year, nor other adjustments not  
14 representing change in fee title to water rights, such as leases  
15 of water rights, nor does it include the names of lessees of  
16 landowners where the lessees are exercising the water rights.  
17 The exercise of all water rights is subject, however, to the  
18 provisions of this Judgment as hereinafter contained. All of  
19 said rights are of the same legal force and effect and are  
20 without priority with reference to each other. Each party whose  
21 name is hereinafter set forth in the tabulation set forth in  
22 Appendix "2" of this judgment, and after whose name there appears  
23 under the column "Total Water Right" the figure "0" owns no  
24 rights to extract any ground water from Central Basin, and has no  
25 right to extract any ground water from Central Basin.

26 (b) Defendant The City of Los Angeles is the owner of  
27 the right to extract fifteen thousand (15,000) acre feet per  
28 annum of ground water from Central Basin. Defendant Department

1 of Water and Power of the City of Los Angeles has no right to  
2 extract ground water from Central Basin except insofar as it has  
3 the right, power, duty or obligation on behalf of defendant The  
4 City of Los Angeles to exercise the water rights in Central Basin  
5 of defendant The City of Los Angeles. The exercise of said  
6 rights are subject, however, to the provisions of this judgment  
7 hereafter contained, including but not limited to, sharing with  
8 other parties in any subsequent decreases or increases in the  
9 quantity of extractions permitted from Central Basin, pursuant to  
10 continuing jurisdiction of the Court, on the basis that fifteen  
11 thousand (15,000) acre feet bears to the Allowed Pumping  
12 Allocations of the other parties.

13 (c) No party to this action is the owner of or has any  
14 right to extract ground water from Central Basin except as herein  
15 affirmatively determined.

16 2. Parties Enjoined as Regards Quantities of Extractions.

17 (a) Each party, other than The State of California and The  
18 City of Los Angeles and Department of Water and Power of The City  
19 of Los Angeles, is enjoined and restrained in any Administrative  
20 year commencing after the date this judgment becomes final from  
21 extracting from Central Basin any quantity of Water greater than  
22 the party's Allowed Pumping Allocation as hereinafter set forth  
23 next to the name of the party in the tabulation appearing in  
24 Appendix 2 at the end of this Judgment, subject to further  
25 provisions of this judgment. Subject to such further provisions,  
26 the officials, agents and employees of The State of California  
27 are enjoined and restrained in any such Administrative year from  
28 extracting from Central Basin collectively any quantity of water

1 greater than the Allowed Pumping Allocation of The State of  
2 California as hereinafter set forth next to the name of that  
3 party in the same tabulation. Each party adjudged and declared  
4 above not to be the owner of and not to have the right to extract  
5 ground water from Central Basin is enjoined and restrained in any  
6 Administrative year commencing after the date this judgment  
7 becomes final from extracting any ground water from Central  
8 Basin, except as may be hereinafter permitted to any such party  
9 under the Exchange Pool provisions of this judgment.

10 (b) Defendant The City of Los Angeles is enjoined and  
11 restrained in any Administrative year commencing after the date  
12 this judgment becomes final from extracting from Central Basin  
13 any quantity of water greater than fifteen thousand (15,000) acre  
14 feet, subject to further provisions of this judgment, including  
15 but not limited to, sharing with other parties in any subsequent  
16 decreases or increases in the quantity of extractions permitted  
17 from Central Basin by parties, pursuant to continuing  
18 jurisdiction of the Court, on the basis that fifteen thousand  
19 (15,000) acre feet bears to the Allowed Pumping Allocations of  
20 the other parties. Defendant Department of Water and Power of  
21 The City of Los Angeles is enjoined and restrained in any  
22 Administrative year commencing after the date this judgment  
23 becomes final from extracting from Central Basin any quantity of  
24 water other than such as it may extract on behalf of defendant  
25 The City of Los Angeles, and which extractions, along with any  
26 extractions by said City, shall not exceed that quantity  
27 permitted by this judgment to that City in any Administrative  
28 year. Whenever in this judgment the term "Allowed Pumping

1 Allocation" appears, it shall be deemed to mean as to defendant  
 2 The City of Los Angeles the quantity of fifteen thousand (15,000)  
 3 acre feet.

	<u>Name</u> <sup>2</sup>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
8	J. P. Abbott, Inc.	21	17
10	Charles E. Adams (Corty Van Dyke, tenant) (see additional listing below for Charles E. Adams)	8	6
12	Charles E. Adams and Rhoda E. Adams	5	4
14	Juan Aguayo and Salome Y. Aguayo	1	1
16	Aguiar Dairy, Inc.	33	26
17	Airfloor Company of California, Inc.	1	1
19	J. N. Albers and Nellie Albers	98	78
21	Jake J. Alewyn and Mrs. Jake J. Alewyn aka Normalie May Alewyn (see listing under name of Victor E. Gamboni)		
23	Tom Alger and Hilda Alger	9	7
25	Clarence M. Alvis and Doris M. Alvis	0	0
27	American Brake Shoe Company	52	42

<sup>2</sup>Parties and Rights as originally adjudicated

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	American Pipe and Construction Co.	188	150
4	Anaconda American Brass Company	0	0
5	Gerrit Anker (see listing under name of Agnes De Vries)		
6			
7	Archdiocese of Los Angeles Education & Welfare Corporation	8	6
8			
9	George W. Armstrong and Ruth H. Armstrong (Armstrong Poultry Ranch, tenant)	28	22
10	Artesia Cemetery District	30	24
11	Artesia Milling Company (see listing under name of Dick Zuidervaart)		
12			
13	Artesia School District	51	41
14	Arthur Land Co., Inc.	13	10
15	Charles Arzouman and Neuart Arzouman	1	1
16			
17	Associated Southern Investment Company (William R. Morris, George V. Gutierrez and Mrs. Socorro Gutierrez, tenants and licensees)	16	13
18			
19	The Atchison, Topeka and Santa Fe Railway Co.	124	99
20			
21	Atkinson Brick Company	11	9
22	Arthur Atsma (see listing under name of Andrew De Voss)		
23			
24	B.F.S. Mutual Water Company	183	146
25	Henry Baar (see listing under name of Steve Stefani, Sr.)		
26			
27	Vernon E. Bacon (see listing under name of Southern California Edison Company)		
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Adolph Bader and Gesine Bader (Fred Bader, tenant)	14	11
4			
5	K. R. Bailey and Virginia R. Bailey	1	1
6	Dave Bajema (see listing under name of Peter Dotinga)		
7	Donald L. Baker and Patsy Ruth Baker	5	4
8	Allen Bakker	0	0
9	Sam Bangma and Ida Bangma	17	14
10	Bank of America National Trust and Savings Association, as Trustee of Trust created by Will of Tony V. Freitas, Deceased (Frank A. Gonsalves, tenant)	29	23
11			
12			
13	Emma Barbaria, as to undivided 1/2 interest; John Barbaria, Jr. and Lorraine Barbaria as to undivided 1/4 interest; and Frank Barbaria as to undivided 1/4 interest (John Barbaria & Sons Dairy, tenant)	27	22
14			
15			
16	Antonio B. Barcellos and Manuel B. Barcellos	12	10
17	John Barcelos and Guilhermina Barcelos	16	13
18	Sam Bartsma and Birdie Bartsma	34	27
19	Bateson's School of Horticulture, Inc. (see listing under name of John Brown Schools of California, Inc.)		
20			
21	Bechard Mutual Water Corporation	4	4
22	Beck Tract Water Company, Inc.	29	23
23	Iver F. Becklund	1	1
24	Margaret E. Becklund	1	1
25	P. T. Beeghly (International Carbonic, Inc., tenant)	1	1
26	Doutzen Bekendam and Hank Bekendam	0	0
27	John Bekendam	0	0
28	Tillie Bekendam	0	0

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Bell Trailer City (see listing under name of Bennett E. Simmons)	1	1
4	E. F. Bellenbaum and Marie P. Bellenbaum	32	26
5	Bellflower Christian School	243	194
6	Bellflower Home Garden Water Company	111	89
7	Bellflower Unified School District	2,109	1,687
8	Bellflower Water Company	11	9
9	Belmont Water Association	0	0
10	Tony Beltman	0	0
11	Berlu Water Company, Inc.	32	26
12	Jack R. Bettencourt and Bella Bettencourt	151	121
13	Bigby Townsite Water Co.		
14	Siegfried Binggeli and Trina L. Binggeli (see listing under name of Paul H. Lussman, Jr.)	0	0
15	Fred H. Bixby Ranch Company		
16	Delbert G. Black and Lennie O. Black as to undivided one-half; and Harley Lee, as to undivided one-half	40	32
17	Bloomfield School District	11	9
18	Adrian Boer and Julia Boer	5	4
19	Gerard Boere and Rosalyn Boer		
20	Henry Boer and Annie Boer (William Offinga & Son, including Sidney Offinga, tenants as to 33 acre feet of water right and 26 acre feet of allowed pumping allocation)	34	27
21		30	24
22	John Boere, Jr. and Mary J. Boere	30	24
23	John Boere, Sr. and Edna Boere (John Boere, Jr., tenant)	30	24
24	John Boere, Jr. (see also listing under name of Leonard A. Grenier)		
25			
26			
27			
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Frank Boersma and Angie Boersma	31	25
4	Gerrit Boersma and Jennie Boersma (George Boersma, tenant)	8	6
5	Jack Boersma	0	0
6	Sam Boersma and Berdina Boersma	42	34
7	Jan Bokma (see listing under name of August Vandenberg)		
8			
9	Jacob Bollema	0	0
10	James C. Boogerd (see listing under name of Jake Van Leeuwen, Jr.)		
11			
12	Bernard William Bootsma, Carrie Agnes Van Dam and Gladys Marie Romberg	12	10
13	Michel Bordato and Anna M. Bordato (Charlie Vander Kooi, tenant)	12	10
14			
15	John Borges and Mary Borges, aka Mrs. John Borges (Manuel B. Ourique, tenant)	14	11
16	Mary Borges, widow of Manuel Borges (Manuel Borges, Jr., tenant)	7	6
17			
18	Gerrit Bos and Margaret Bos	88	70
19	Jacob J. Bosma (see listing under name of Sieger Vierstra)		
20	Peter Bothof	6	5
21	William Bothof and Antonette Bothof	7	6
22	Frank Bouma and Myron D. Kolstad	3	3
23	Ted Bouma and Jeanette Bouma	21	17
24	Sam Bouman (Arie C. Van Leeuwen, tenant)	8	6
25	John Brown Schools of California, Inc. (Bateson's School of Horticulture, Inc., tenant)	2	2
26			
27	M. J. Brown, Jr. and Margaret Brown	0	0
28	Adrian Bulk and Alice Bulk	20	16

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Duke Buma and Martha Buma	8	6
4	Miles A. Burson and Rose Burson	7	6
5	Calavar Corporation (see listing under name of H R M Land Company)		
6			
7	California Cotton Oil Corporation	101	81
8	California Portland Cement Company	0	0
9	California Rendering Company, Ltd.	149	119
10	California Water and Telephone Company	2,584	2,067
11	California Water Service Company (Base Water Right - 13,477)	14, 717	11,774
12	Candlewood Country Club	184	147
13	V. Capovilla and Mary Capovilla	0	0
14	Carmenita School District	9	7
15	Carson Estate Company	139	111
16	Paul Carver	0	0
17	Catalin Corporation of America	13	10
18	Center City Water Co.	86	69
19	Central Manufacturing District, Inc. (Louis Guglielmana and Richard Wigboly, tenants)	825	660
20			
21	Century Center Mutual Water Association	317	254
22	Century City Mutual Water Company, Ltd.	62	50
23	Cerritos Junior College District	119	95
24	Cerritos Park Mutual Water Company	77	62
25	Challenge Cream & Butter Association	146	117
26	Chansall Mutual Water Company	101	81
27	Maynard W. Chapin, as Executor of the Estate of Hugh L. Chapin, deceased	36	29
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Cherryvale Water Users' Association	14	11
4	Shigeru Chikami and Jack Chikami doing		
5	business as Chikami Bros. Farming		
6	(see also listing under name of		
7	Southern California Edison Company)	10	8
8	John Christoffels and Effie Christoffels	14	11
9	Citrus Grove Heights Water Company	277	222
10	City Farms Mutual Water Company No. 1	37	30
11	City Farms Mutual Water Company No. 2	15	12
12	City of Artesia	30	24
13	City of Bellflower	60	48
14	City of Compton	6,511	5,209
15	City of Downey	5,713	4,570
16	City of Huntington Park	4,788	3,830
17	City of Inglewood (Base Water		
18	Right - 629)	1,118	894
19	City of Lakewood	10,631	8,505
20	City of Long Beach (Base Water		
21	Right - 29,876)	33,538	26,830
22	City of Los Angeles (see paragraph 2		
23	above of this Part I for water		
24	rights and restrictions on the		
25	exercise thereof of said defendant.		
26	See also such reference with		
27	respect to Department of Water and		
28	Power of the City of Los Angeles.)		
	City of Lynwood	6,238	4,990
	City of Montebello	260	208
	City of Norwalk	613	490
	City of Santa Fe Springs	505	404
	City of Signal Hill	1,675	1,340

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	City of South Gate	9,942	7,954
4	City of Vernon	9,008	7,206
5	City of Whittier	776	621
6	Allan Clanton and Ina Clanton	80	64
7	Claretian Jr. Seminary (see listing under name of Dominguez Seminary)		
8			
9	Dr. Russell B. Clark (see listing under name of Research Building Corporation)		
10	Jacob Cloo and Grace Cloo	16	13
11	Clougherty Packing Company	80	64
12	Coast Packing Company	426	341
13	Coast Water Company	588	470
14	Joe A. Coelho, Jr. and Isabel Coelho	5	4
15	J. H. Coito, Jr.	0	0
16	John H. Coito and Guilhermina Coito (Zylstra Bros., a partnership consisting of Lammert Zylstra and William Zylstra, tenant)	17	14
17			
18	J. E. Collinsworth	15	12
19			
20	Compton Union High School District	48	38
21	Conservative Water Company (Base Water Right - 4,101)	133	3,306
22	Container Corporation of America	323	1,058
23	Nicholas C. Contoas and P. Basil Lambros (Vehicle Maintenance & Painting Corporation, tenant)	1	1
24			
25	Continental Can Company, Inc.	946	757
26	Contractors Asphalt Products Company, Inc.	16	13
27			
28	R. M. Contreras	8	6

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Copp Equipment Company, Inc. and Humphries Investments Incorporated	7	6
4			
5	Mary Cordeiro and First Western Bank & Trust Company, as Trustee pursuant to last will and testament of Tony Cordeiro, deceased	46	37
6			
7	Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter Day Saints (Ray Mitchell, tenant)	39	31
8			
9	Harry Lee Cotton and Doris L. Cotton	5	4
10	County of Los Angeles	737	590
11	County Water Company	280	224
12	Cowlitz Amusements, Inc. (La Mirada Drive-In Theater, tenant)	4	4
13			
14	Pete Coy	28	22
15	Crest Holding Corporation	20	16
16	Katherine M. Culbertson	2	2
17	Orlyn L. Culp and Garnetle Culp	21	17
18	Everett Curry and Marguerite Curry	2	2
19	D. V. Dairy (see listing under name of Frank C. Leal)		
20	Dairymen's Fertilizer Co-op, Inc.	1	1
21	Noble G. Daniels (see listing under name of Harold Marcroft)		
22			
23	John A. Davis	0	0
24	Henry De Bie, Jr. and Jessie De Bie	17	14
25	Clifford S. Deeth	0	0
26	Ernest De Groot and Dorothy De Groot	81	65
27	Pete de Groot	15	12
28	Pier De Groot and Fay De Groot	21	17

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Martin De Hoog and Adriana De Hoog	12	10
4	Edward De Jager and Alice De Jager	37	30
5	Cornelius De Jong and Grace De Jong	13	10
6	Jake De Jong and Lena De Jong (Frank A. Gonsalves, tenant as to 8 acre-feet of water right)	21	17
7			
8	William De Kriek (see listing under name of Gerrit Van Dam)		
9			
10	Del Amo Dairy (see listing under name of Ed Haakma)		
11	Del Amo Estate Company	0	0
12	Joe De Marco and Concetta De Marco	1	1
13	Louis F. De Martini (see listing under name of Southern California Edison Company)		
14			
15	Mary A. De Mello	16	13
16	John Den Hollander (see listing under name of James Dykstra)		
17			
18	Department of Water and Power of The City of Los Angeles, by reason of charter provisions, has the manage- ment and control of water rights owned by the City of Los Angeles (see listing under name of City of Los Angeles)		
19			
20			
21			
22	Ruth E. Dever (Orange County Nursery, Inc., tenant)	0	0
23	Andrew De Voss and Alice De Voss (Arthur De Voss and Arthur Atsma, tenants)	36	29
24			
25	Agnes De Vries (Gerrit Anker, tenant)	16	13
26	Dick De Vries and Theresa De Vries	10	8
27	Gerrit De Vries and Claziena De Vries	18	14
28	Gerrit Deyager and Dena Deyager	0	0

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Lloyd W. Dinkelspiel, Jr. (see listing under name of Florence Hellman Ehrman)		
4			
5	District VII, Division of Highways of the State of California Department of Public Works (see listing under name of State of California)		
6			
7	Dominguez Estate Company	0	0
8	Dominguez Seminary and Claretian Jr. Seminary	111	89
9			
10	Dominguez Water Corporation	8,012	6,410
11	Peter Dotinga and Tena Dotinga (Dave Bajema, tenant)	9	7
12	Robert L. Dougherty	0	0
13	Downey Cemetery District	21	17
14	Downey Fertilizer Co. (see listing under name of Downey Land Company)		
15			
16	Downey Land Company (Downey Fertilizer Co., tenant)	101	81
17	Downey Valley Water Company	87	70
18	Jim Drost	0	0
19	James Dykstra and Dora Dykstra (John Den Hollander, tenant)	6	5
20			
21	John Dykstra and Wilma Dykstra	52	42
22	Cor Dyt and Andy Dyt	6	5
23	Eagle Picher Company	141	113
24	Gail H. Eagleton	67	54
25	Florence Hellman Ehrman; I. W. Hellman, Jr.; Frederick J. Hellman; Marco F. Hellman; Clarence E. Heller; Alfred Heller, Elizabeth Heller; Clarence E. Heller, Elinor R. Heller and Wells Fargo Bank, as co-executors of the Estate of Edward H. Heller, deceased; Lloyd W. Dinkelspiel, Jr., William H.		
26			
27			
28			

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
	Green and Wells Fargo Bank, as co-executors of the Estate of Lloyd W. Dinkelspiel, deceased; Wells Fargo Bank, as Trustee under the trust created by the Will of Florence H. Dinkelspiel, deceased. (Union Oil Company of California, Lessee as to 190 acre-feet of right and as to 152 acre-feet of allowed pumping allocation)	555	444
	El Rancho Unified School District	69	55
	Berton Elson (see listing under name of D. P. Winslow)		
	John H. Emoto and Shizuko Emoto	0	0
	Addie L. Enfield (see listing under name of James L. Stamps)		
	John W. England and Consuello England (see listing under name of Jenkins Realty Mutual Water Co.)		
	Emma Engler (Morris Weiss, tenant)	10	8
	Anthony F. Escobar and Eva M. Escobar (Henry Kampen, tenant)	14	11
	Excelsior Union High School District	381	305
	Kenneth A. Farris and Wanda Farris	1	1
	Federal Ice and Cold Storage Company	92	74
	Fred Fekkes (see listing under name of Steve Stefani, Sr.)		
	Julius Felsenthal and Mrs. Julius Felsenthal, aka Marga Felsenthal	1	1
	Tony Fernandes (see listing under name of U. Stewart Jones)		
	Joe C. Ferreira and Carolina Ferreira (Joe C. Ferreira and Joe C. Ferreira, Jr., operators of well facility)	37	30

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Mary A. Ferreira (Joe Lucas, tenant)		
4	(see also listing under name of Jack Gonsalves)	1	1
5	John Feuz, Jr.	0	0
6	Fibreboard Paper Products Corporation	1,521	1,217
7	Abe Fien	0	0
8	Alfred Fikse, Jr. and Aggie Fikse	2	2
9	Henry Fikse and Jennie Fikse	4	4
10	Filtrol Corporation	570	456
11	The Firestone Tire & Rubber Co.	1,536	1,229
12	First Western Bank & Trust Co. (see listing under name of Mary Cordeiro)		
13			
14	Clare Fisher	0	0
15	Elizabeth Flesch, James Flesch, Margaret Flesch, Theodore Flesch, Ernest D. Roth and Eva Roth, doing business as Norwalk Mobile Lodge	18	14
16			
17	The Flintkote Company	2,567	2,054
18	Ford Motor Company	11	9
19	Robert G. Foreman (see listing under name of Lakewood Pipe Co.)		
20			
21	Guisseppi Franciosi and Alice Franciosi	2	2
22	Tony V. Freitas (see listing under name of Bank of America, etc.)		
23	S. Fujita	0	0
24	Jun Fukushima (see listing under name of Chige Kawaguchi)		
25			
26	Paul Fultheim and Helga Fultheim	5	4
27	Fumi Garden Farms, Inc. (see listing under name of Southern California Edison Company and also under name of George Yamamoto)		
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Gabby Louise, Inc. (Arthur Gilbert & Associates, tenant)	58	46
4			
5	Victor E. Gamboni and Barbara H. Gamboni (Jake J. Alewyn and Mrs. Jake J. Alewyn also known as Normalie May Alewyn, tenants as to 13 acre feet of water right and 10 acre feet of allowed pumping allocation)	27	22
6			
7			
8	Nick Gandolfo and Palmera Gandolfo	5	4
9	Freddie A. Garrett and Vivian Marie Garrett	6	5
10			
11	Martha Gatz	15	12
12	General Dynamics Corporation	675	540
13	General Telephone Company of California	2	2
14	Alfred Giacomi and Jennie Giacomi	58	46
15	Arthur Gilbert & Associates (see listing under name of Gabby Louise Inc.)		
16	Mary Godinho	0	0
17	Pauline Godinho (Joe C. Godinho and John C. Godinho, Jr., doing business as Godinho Bros. Dairy, tenants)	31	25
18			
19	Harry N. Goedhart, Henry Otto Goedhart, Hilbrand John Goedhart, John Goedhart, Otto Goedhart, Jr., Peter Goedhart, and Helen Goedhart Van Eik (Paramount Farms, tenant)	21	17
20			
21	Reimer Goedhart	12	10
22			
23	Golden Wool Company	223	178
24	Albert S. Gonsalves and Caroline D. Gonsalves	10	8
25			
26	Frank A. Gonsalves (see listing under name of Bank of America National Trust and Savings Association, etc.; and also under name of Jake De Jong)		
27			
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Jack Gonsalves, Joe Lucas, Pete Koopmans,		
4	Manuel M. Souza, Sr., Manuel M. Souza,		
5	Jr., Frank M. Souza, Louie J. Souza,	55	44
6	and Mary A. Ferreira		
7	Jack Gonsalves and Mary Gonsalves	31	25
8	Joaquin Gonsalves and Elvira Gonsalves	27	22
9	Joe A. Gonsalves and Virginia Gonsalves	12	10
10	The B. F. Goodrich Company	519	415
11	The Goodyear Tire & Rubber Company	1,141	913
12	Eric Gorden and Hilde Gorden	2	2
13	Fern Ethyl Gordon as to an undivided		
14	1/2 interest; Fay G. Tawzer and		
15	Lawrence R. Tawzer, as to an undivided		
16	1/2 interest	17	14
17	Huntley L. Gordon (appearing by and		
18	through United California Bank, as		
19	Conservator of the Estate of		
20	Huntley L. Gordon)	41	33
21	Robert E. Gordon	5	4
22	Joe Gorzeman and Elsie Gorzeman	13	10
23	Florence M. Graham	7	6
24	Marie Granger	0	0
25	Great Western Malting Company	448	358
26	William H. Green (see listing under name		
27	of Florence Hellman Ehrman)		
28	Greene-Howard Petroleum Corporation (see		
	listing under name of Hathaway Company)		
	John H. Gremmius and Henry W. Gremmius		
	dba Henry and John Gremmius	0	0
	Leonard A. Grenier and Marie Louise		
	Grenier (John Boere, Jr., tenant)	10	8
	Florence Guerrero	2	2

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Louis Guglielmana (see listing under		
4	name of Central Manufacturing		
	District, Inc.)		
5	George V. Gutierrez and Mrs. Socorro		
6	Gutierrez (see listing under name of		
	Associated Southern Investment Company)		
7	Salvatore Gutierrez (see listing under		
8	name of Southern California Edison		
	Company)		
9	H. J. S. Mutual Water Co.	63	50
10	H R M Land company (Harron, Rickard &		
11	McCone Company of Southern California		
	and Calavar Corporation, tenants)	3	3
12	Gerrit Haagsma and Mary Haagsma	10	8
13	Ed Haakma and Sjana Haakma (Del Amo Dairy,		
14	tenant; Ed Haakma and Pete Vander Kooi,		
	being partners of said Del Amo Dairy)	28	22
15	Verney Haas and Adelyne Haas	4	4
16	William H. Hadley and Grace Hadley	4	4
17	Henry C. Haflinger and Emily Haflinger	10	8
18	Clarence Theodore Halburg	3	3
19	Fred Hambarian	2	2
20	Henry Hamstra and Nelly Hamstra	33	26
21	Raymond Hansen and Mary Hansen	12	10
22	Earl Haringa; Evert Veenendaal and		
23	Gertrude Veenendaal	22	18
24	Antoine Harismendy and Claire Harismendy	0	0
25	Harron, Rickard & McCone Company of		
26	Southern California (see listing		
	under name of H R M Land Company)		
27	Jack D. Hastings	0	0
28	Kameko Hatanaka	9	7

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Kazuo Hatanaka (Minoru Yoshijima, tenant)	10	8
4	Masakazu Hatanaka, Isao Hatanaka, and Kenichi Hatanaka	5	4
5	Mrs. Motoye Hatanaka	0	0
6			
7	Hathaway Company, Richard F. Hathaway, Julian I. Hathaway, and J. Elwood Hathaway (Greene-Howard Petroleum Corporation, tenant utilizing less than 1 acre foot per year)	70	56
8			
9			
10	Clarence E. Heller; Alfred Heller; Elizabeth Heller; Clarence E. Heller; Elinor R. Heller, as co-executors of the Estate of Edward H. Heller, deceased (see listing under name of Florence Hellman Ehrman)		
11			
12			
13	I. W. Hellman, Jr.; Frederick J. Hellman; Marco F. Hellman (see listing under name of Florence Hellman Ehrman)		
14			
15	Ralph Hicks	0	0
16	Alfred V. Highstreet and Evada V. Highstreet	10	8
17			
18	John Highstreet and Eileen M. Highstreet	9	7
19	Bob Hilarides and Maaike Hilarides (Frank Hilarides, tenant)	51	41
20	John Hilarides and Maria Hilarides	26	21
21	Hajime Hirashima (see listing under name of Masaru Uyeda)		
22			
23	Willis G. Hix	1	1
24	Henry H. Hoffman and Apolonia Hoffman	12	10
25	Dick Hofstra	0	0
26	Andrew V. Hohn and Mary G. Hohn	1	1
27	Kyle R. Holmes and Grace Ellen Holmes	20	16
28	Home Water Company	35	28

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Manuel L. Homen	17	14
4	Mrs. Paul Y. Homer (see listing under name of Mrs. Paul Y. Homer (King).)		
5	Cornelis Hoogland and Alice Hoogland	15	12
6	Art Hop, Jr.	0	0
7	Art Hop, Sr. and Johanna Hop (G. A. Van Beek, tenant)	5	4
8	Andrew Hop, Jr. and Muriel Hop	33	26
9	Theodore R. Houseman and Leona M. Houseman	14	11
10	Humphries Investments Incorporated (see listing under name of Copp Equipment Company, Inc.)		
11	Albert Huyg and Marie Huyg	22	18
12	Hygenic Dairy Farms, Inc.	0	0
13	Pete W. Idsinga and Annie Idsinga	13	10
14	Miss Alice M. Imbert	1	1
15	Industrial Asphalt of California, Inc.	116	93
16	Inglewood Park Cemetery Association	285	228
17	International Carbonic, Inc. (see listing under name of P. T. Beeghly)		
18	Jugora Ishii and Mumeno Ishii (Ishii Brothers, tenant)	10	8
19	Robert J. Jamison and Betty Jamison	7	6
20	Jenkins Realty Mutual Water Co. (Clyde H. Jenkins, Minnie R. Jenkins, Mary Wilcox, Ruby F. Marchbank, Robert B. Marchbank, John W. England, and Consuello England, shareholders)	10	8
21	John-Wade Co.	1	1
22	Henry S. Jones and Madelynne Jones	1	1
23			
24			
25			
26			
27			
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	U. Stewart Jones and Dorothy E. Jones (Tony Fernandes, tenant)	1	1
4			
5	Harold Jongsma and Mary N. Jongsma	65	52
6	W. P. Jordan (see listing under name of Henry Van Ruiten)		
7	Dave Jorritsma and Elizabeth Jorritsma	27	22
8	Christine Joseph (see listing under name of Helen Wolfsberger)		
9			
10	Junior Water Co., Inc.	737	590
11	Kal Kan Foods, Inc.	120	96
12	Kalico, Inc.	4	4
13	Hagop Kalustian (11 acre feet of total water right attributable to well located at 6629 South Street, Lake- wood and reported to plaintiff under Producer No. 3925. 2 acre feet of total water right attributable to portion of property not sold to State of California formerly served by well located at 10755 Artesia Blvd., Artesia, the production of which well was reported to plaintiff under Producer No. 4030)	13	10
14			
15			
16			
17			
18			
19	Fritz Kampen and Clare Kampen	14	11
20	William Kamstra and Bertha Kamstra	35	28
21	Henry Kampen (see listing under name of Anthony Escobar)		
22			
23	L. Kauffman Company, Inc. (see listing under name of Lorraine K. Meyberg)		
24	Chige Kawaguchi and Masao Kawaguchi (Jun Fukushima, tenant)	4	4
25			
26	King Kelley Marmalade Co. (see listing under name of Roberta M. Magnusson)		
27	Mrs. Paul Y. Homer (King)	17	14
28	Jacob R. Kimm and Bonnie Kimm	36	29

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Mrs. Oraan Kinne (Nicholaas J. Moons, tenant)	11	9
4			
5	Morris P. Kirk & Son, Inc.	77	62
6	Jake Knevelbaard and Anna Knevelbaard	50	40
7	Willie Knevelbaard and Joreen Knevelbaard	1	1
8	Simon Knorringa	12	10
9	John Koetsier, Jr.	0	0
10	Myron D. Kolstad (see listing under name of Frank Bouma)		
11			
12	Yoshio Kono and Barbara Kono (see listing under name of George Mimaki)		
13	Louis Koolhaas	13	10
14	Simon Koolhaas and Sophie Grace Koolhaas	9	7
15	Pete Koopmans (see listing under name of Jack Gonsalves)		
16			
17	Nick P. Koot (see listing under name of Mary Myrndahl)		
18	Kotake, Inc. (Masao Kotake, Seigo Kotake, William Kotake, dba Kotake Bros., tenants)	83	66
19			
20	Masao Kotake	0	0
21	Walter G. Kruse and Mrs. Walter G. Kruse, aka Vera M. Kruse	11	9
22	Laguna-Maywood Mutual Water Company No. 1	1,604	1,283
23			
24	La Habra Heights Mutual Water Company	3,044	2,435
25	La Hacienda Water Company	46	37
26	Lakewood Pipe Co., a partnership composed of Robert G. Foreman, Frank W. Tybus and June E. Tybus		
27	(Lakewood Pipe Service Co., tenant)	12	10
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	P. Basil Lambros (see listing under name of Nicholas C. Conteas)		
4			
5	La Mirada Drive-in Theater (see listing under name of Cowlitz Amusements, Inc.)		
6	La Mirada Water Company	0	0
7	Calvin E. Langston and Edith Langston	1	1
8	S. M. Lanting and Alice Lanting	15	12
9	Henry Lautenbach and Nellie H. Lautenbach	16	13
10	Norman Lautrup, as Executor of the Estate of Nels Lautrup, deceased; and Minnie Margaret Lautrup		
11		30	24
12	Frank C. Leal and Lois L. Leal (D. V. Dairy, tenant)		
13		15	12
14	Eugene O. LeChasseur and Lillian P. LeChasseur (R. A. LeChasseur, tenant)		
15		2	2
16	Lee Deane Products, Inc.	0	0
17	Harley Lee (see listing under name of Delbert G. Black)		
18	Le Fiell Manufacturing Company	0	0
19	Armand Lescoulie (see listing under name of Southern California Edison Company)		
20	Liberty Vegetable Oil Company	14	11
21	Little Lake Cemetery District	17	14
22	Little Lake School District	0	0
23	Loma Floral Company (see listing under name of George Mimaki)		
24			
25	Melvin L. Long and Stella M. Long	2	2
26	Nick J. Loogman (see listing under name of William Smoorenburg)		
27	Frank Lorenz (see listing under name of Ralph Oosten)		
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Los Angeles County Waterworks District No. 1 (Base Water Right 22)	113	90
4			
5	Los Angeles County Waterworks District No. 10	842	674
6	Los Angeles County Waterworks District No. 16	412	330
7			
8	Los Angeles Paper Box and Board Mills	321	257
9	Los Angeles Union Stockyards Company	0	0
10	Los Nietos Tract 6192 Water Co.	49	39
11	Alden Lourenco (see listing under name of A. C. Pinheiro)		
12	Lowell Joint School District	0	0
13	Joe Lucas (see listings under names of Mary A. Ferreira and Jack Gonsalves)		
14			
15	Luer Packing Co. (see listing under name of Sam Perricone)		
16	Jake J. Luetto (Orange County Nursery, Inc., tenant)	13	10
17			
18	Lunday-Thagard Oil Co.	265	212
19	Joe Luond (Frieda Roethlisberger, tenant as to portion of rights)	7	6
20	John Luscher and Frieda Luscher	13	10
21	Paul H. Lussman, Jr. and Ann Lussman, Siegfried Binggeli and Trina L. Binggeli (Paul's Dairy, tenant)	8	6
22			
23	Lynwood Gardens Mutual Water Company	205	164
24	Lynwood Park Mutual Water Company	278	222
25	Jerome D. Mack and Joyce Mack (see listing under name of D. S. Moss)		
26			
27	Roberta M. Magnusson (King Kelly Marmalade Co., tenant)	15	12
28	Anthony Mancebo	0	0

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Robert B. Marchbank and Ruby F. Marchbank		
4	(see listing under name of Jenkins Realty Mutual Water Co.)		
5	Harold Marcroft and Marjorie Marcroft		
6	(Noble G. Daniels, tenant)	7	6
7	Floyd G. Marcusson (see listing under name of Sykes Realty Co.)		
8	Walter Marlowe and Edna Marlowe	1	1
9	Marshburn, Inc. (see listing under name of Mel, Inc.)		
10			
11	The Martin Bros. Container & Timber Products Corp.	7	6
12	Mary Martin	35	28
13	Antonio Mathias and Mary Mathias	16	13
14	Mausoleum Park, Inc. and Sun Holding Corporation	4	4
15			
16	Maywood Mutual Water Company No. 1	926	741
17	Maywood Mutual Water company No. 2	1,007	806
18	Maywood Mutual Water Company No. 3	1,407	1,126
19	Mel, Inc. (Marshburn, Inc., tenant)	67	54
20	G. Mellano	12	10
21	Wilbur Mellema and Mary Mellema (see listing under name of Elmo D. Murphy)		
22	Wilbur Mellema (see listing under name of Morris Weiss)		
23			
24	Memorial Parks, Inc.	42	34
25	Lyman B. Merrick and Gladys L. Merrick	17	24
26	Metropolitan State Hospital of the State of California Department of Mental Hygiene (see listing under name of State of California)		
27			
28	F. N. Metzger	0	0

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Lorraine K. Meyberg (L. Kauffman Company, Inc., tenant)	81	65
4	Midland Park Water trust	71	57
5	Midway Gardens Mutual Association	59	47
6	Harry C. Miersma and Dorothy L. Miersma	12	10
7	Henry Miersma and Susan M. Miersma	7	6
8	Willis L. Miller	0	0
9			
10	George Mimaki, Mitsuko Mimaki, Yoshio Kono and Barbara Kono (Loma Floral Company, tenant)	2	2
11			
12	Ray Mitchell (see listing under name of Corporation of the Presiding Bishop of the Church of Jesus Christ of Latter Day Saints; and also listing under name of Frank Ruggieri)		
13			
14	Fumiko Mitsuuchi, aka Mary Mitsuuchi (Z. Van Spanje, tenant as to one acre foot)	14	11
15			
16	Yoneichi Miyasaki	0	0
17	Glenn Miyoshi, Yosaku Miyoshi, Masayo Miyoshi, Haruo Miyoshi, and Masaru Miyoshi, dba Miyoshi Bros.	10	8
18			
19	Jean Mocho and Michel Plaa	11	9
20	Modern Imperial Company	71	57
21	Montebello Land and Water Company	1,990	1,592
22	Monterey Acres Mutual Water Company	128	102
23	Nicholaas J. Moons (see listing under name of Mrs. Oraan Kinne)		
24			
25	Alexander Moore and Betty L. Moore	16	13
26	Neal Moore	0	0
27	Alyce Mooschekian	0	0
28	Reuben Mooschekian	15	12

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	William R. Morris	1	1
4	(see also listing under name of Associated Southern Investment Company)		
5	D. S. Moss, Lillian Moss, Jerome D. Mack, and Joyce Mack	5	4
6			
7	Mountain View Dairies, Inc.	68	54
8			
9	Kiyoshi Murakawa and Shizuko Murakawa	0	0
10			
11	Daisaku Murata, Fui Murata, Hatsuye Murata, Kenji Murata, Setsuko Murata, and Takeo Murata	15	12
12			
13	Kenji Murata (see listing under name of Southern California Edison Company)		
14	Elmo D. Murphy and Evelene B. Murphy (Morris Weiss, Bessie Weiss, Wilbur Mellema, and Mary Mellema, tenants)	23	18
15			
16	Murphy Ranch Mutual water company	576	461
17			
18	Etta Murr	3	3
19			
20	R. B. Murray and Gladys J. Murray	0	0
21			
22	Tony G. Mussachia and Anna M. Mussachia	10	8
23			
24	Mary Myrndahl (Nick P. Koot, tenant)	11	9
25			
26	Sam Nakamura and Tokiko Nakamura	2	2
27			
28	Leo Nauta (see listing under name of John Osinga)		
29			
30	Pete Nauta (see listing under name of Jacob Vandenberg)		
31			
32	Fred C. Nelles School for Boys of the State of California Department of the Youth Authority (see listing under name of State of California)		
33			
34	Otelia Nelson and Robert Nelson (Shelter Superior Dairy, tenant)	14	11
35			
36	Simon S. Niekerk and Rose Niekerk (Niekerk Hay Company, tenant)	3	3
37			
38			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Norris-Thermador Corporation	172	138
4	North Gate Gardens Water Co.	60	48
5	Norwalk-La Mirada City School District	360	288
6	Norwalk Mobile Lodge (see listing under name of Elizabeth Flesch)		
7			
8	Mabel E. Nottingham (Leslie Nottingham, tenant)	25	20
9	William Offinga & Son, including Sidney Offinga (see listing under name of Henry Boer)		
10			
11	Olive Lawn Memorial Park, Inc.	14	11
12	John Oord	0	0
13	Marinus Oosten and Anthonia Oosten	16	13
14	Ralph Oosten and Caroline Oosten (Frank Lorenz, tenant as to 13 acre feet of water right and 10 acre feet of allowed pumping allocation)	51	41
15			
16	Orange County Nursery, Inc. (see also: listing under name of Ruth E. Dever; listing under name of Jake J. Luetto; and listing under name of Mary Ravera)	16	13
17			
18	Orchard Dale County Water District (Base Water Right - 1,382)	1,384	1,107
19			
20	Orchard Park Water Club, Inc.	50	40
21	Oriental Foods, Inc.	34	27
22			
23	Orla Company (John D. Westra, tenant)	7	6
24	Viva Ormonde (see listing under name of Hank Van Dam)		
25			
26	Pablo Oropeza and Aurelia G. Oropeza (Pablo Oropeza, Jr., tenant) (see also listing under name of Tarr and McComb Oil Company, Ltd.)		
27			
28	John Osinga (Leo Nauta, tenant)	6	5

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Manuel B. Ourique (see listing under name of John Borges)		
4	Owl Constructors	20	16
5	Pacific Electric Railway Company (Gerrit Van Leeuwen of 15405 Shoemaker Road, Norwalk, tenant as to 11 acre feet of right and 9 acre feet of allowed pumping allocation)	15	12
6			
7			
8	Packers Mutual Water Company	43	34
9	Edward G. Paddison and Grace M. Paddison	17	14
10			
11	Paramount Farms (see listing under name of Harry N. Goedhart)		
12	Paramount County Water District	2,967	2,374
13	Paramount Unified School District	58	46
14	Park Water Company	24,592	19,674
15	W. J. Parsonson	0	0
16	Rudolph Pasma and Frances C. Pasma	10	8
17	Paul's Dairy (see listing under name of Paul H. Lussman, Jr.)		
18	Mrs. La Verne Payton	1	1
19	Peerless Land & Water Co., Inc.	1,232	986
20	J. C. Pereira, Jr. and Ezaura Pereira	34	27
21	Sam Perricone and Louis Romoff (Luer Packing Co., tenant)	107	86
22	Peterson Manufacturing Co., Inc.	73	58
23	Phelps Dodge Copper Products Corporation	390	312
24	Pico County Water District	3,741	2,993
25	Piedmont Heights Water Club	7	6
26	Lucille C. Pimental (Richard Pimental and Pimental Dairy, tenants)	16	13
27			
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Joe Pine (see listing under name of A. C. Pinheiro)		
4			
5	A. C. Pinheiro and Mary M. Pinheiro (Alden Lourenco, tenant as to 9 acre feet of water right and 7 acre feet of allowed pumping right; and Joe Pine, tenant as to 13 acre feet of water right and 10 acre feet of allowed pumping right)	128	102
6			
7			
8	Fred Pinto and Mary Pinto	5	4
9			
10	Frank Pires (see listing under name of Frank Simas)		
11	Tony C. Pires and Laura C. Pires	31	25
12	Michel Plaa (see listing under name of Jean Mocho)		
13			
14	Donald R. Plunkett	53	42
15	Pomering Tract Water Association	32	26
16	Clarence Pool	24	19
17	Garret Porte and Cecelia Porte	35	28
18	Veronica Postma	16	13
19	C. H. Powell	1	1
20	Powerine Oil Company	784	627
21	John Preem	0	0
22	Ralph Pylman and Ida Pylman	13	10
23	Quality Meat Packing Company	38	30
24	Ralphs Grocery Company	0	0
25	Arthur D. Ramsey and James A. Ramsey	5	4
26	Rancho Santa Gertrudes Mutual Water System	48	38
27	Mary Ravera (Orange County Nursery, Inc., tenant	39	31
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Zelma Ravera	2	2
4	Rawlins Investment Corporation (Rockview Milk Farms, Inc., tenant)	66	53
5	Hal Rees	0	0
6	Reeves Tract Water Company	36	29
7	Clarence Reinalda	0	0
8	Reliance Dairy Farms	122	98
9	Research Building Corporation (Dr. Russell B. Clark, tenant)	11	9
10	Richfield Oil Corporation	71	57
11	Richland Farm Water Company	216	173
12	George Rietkerk and Cornelia Rietkerk	7	6
13	Rio Hondo Country Club (see listing under name of James L. Stamps)		
14	Erasmus Rios (see listing under name of Esther Salcido)		
15	Jesus Rios (see listing under name of Esther Salcido)		
16	Frank J. Rocha, Jr. and Elsie M. Rocha	13	10
17	Rockview Milk Farms, Inc. (see listing under name of Rawlins Investment Corporation)		
18	John Rodrigues, Emily S. Rodrigues, and John Rodrigues, Jr. (see also below)	5	4
19	John Rodrigues and John Rodrigues Jr.	1	1
20	Frieda Roethlisberger (see listing under name of Joe Luond)		
21	Patricia L. Davis Rogers, aka Patricia L. Davis	2	2
22	The Roman Catholic Archbishop of Los Angeles, a corporation sole	426	341
23			
24			
25			
26			
27			
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Gladys Marie Romberg (see listing under name of Bernard William Bootsma)		
4			
5	Alois M. Rombout	0	0
6	Louis Romoff (see listing under name of Sam Perricone)		
7	Elvira C. Rosales	3	3
8	Frank J. Ross	2	2
9	Ernest D. Roth and Eva Roth (see listing under name of Elizabeth Flesch)		
10			
11	Ed Roukema	0	0
12	Herbert N. Royden	31	25
13	Ruchti Brothers	31	25
14	Frank Ruggieri and Vada Ruggieri (see additional listing below)	1	1
15	Frank Ruggieri and Vada Ruggieri; David Seldeen and Fay Seldeen (Ray Mitchell, tenant)		
16		23	18
17	Thomas S. Ryan and Dorothy J. Ryan	19	15
18	Sam Rypkema and Tena Rypkema	8	6
19	St. John Bosco School	53	42
20	James H. Saito and Yoshino Saito	2	2
21	Esther Salcido and Jesus Rios (Erasmus Rios, tenant)		
22		3	3
23	San Gabriel Valley Water Company	6,828	5,462
24	Joe Santana and Palmira Santana	10	8
25	Sasaki Bros. Ranch, Inc.	32	26
26	Sativa L. A. County Water District	592	474
27	Ben Schilder, Jr. and Anna Schilder	28	22
28	Carl Schmid and Olga Schmid	18	14

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Mrs. A. Schuur	0	0
4	John Schuurman and Isabel Schuurman (James Sieperda, tenant)	15	12
5			
6	David Seldeen and Fay Seldeen (see listing under name of Frank Ruggieri)		
7	Maurice I. Sessler	8	6
8	Chris Shaffer and Celia I. Shaffer	8	6
9	Shayman & Wharram, a partnership, consisting of John W. Shayman and Francis O. Wharram	2	2
10			
11	Shell Oil Company (see listing under name of Margaret F. Slusher)		
12			
13	Shelter Superior Dairy (see listing under name of Otelia Nelson)		
14	Tadao Shiba and Harume Shiba, Susumu Shiba, and Mitsuko Shiba	7	6
15			
16	Yahiko Shiozaki and Kiyoko Shiozaki; Ken Shiozaki and Grace Shiozaki	6	5
17	Shore-Plotkin Enterprises, Inc. (Shore-Calnevar, Inc., tenant)	0	0
18			
19	J. E. Siemon	15	12
20	James Sieperda (see listing under name of John Schuurman)		
21	Sierra Restaurant Corporation	0	0
22	Frank Simas and Mabel Simas (Frank Pires, tenant)	11	9
23			
24	Bennett E. Simmons and Alice Lorraine Simmons, George K. Simmons and Doris June Simmons (Bell Trailer City, tenant)	41	33
25			
26	Margaret F. Slusher (Shell Oil Company, tenant)	7	6
27	Lester W. Smith and Donald E. Smith (Lester W. Smith Dairy, tenant)	20	16
28			

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Wirt Smith	14	11
4	William Smoorenburg and Nick J.		
5	Loogman (Smoorenburg & Loogman, a		
6	partnership of William Smoorenburg		
7	and Nick J. Loogman, operating well		
8	facility)	21	17
9	Leo Snozzi and Sylvia Snozzi	52	42
10	Socony Mobil Oil Company, Inc.	172	138
11	Somerset Mutual Water Company	2,744	2,195
12	South Montebello Irrigation District	1,238	990
13	Southern California Edison Company		
14	(Vernon Bacon; Chikami Bros. Farming,		
15	consisting of Jack Chikami and		
16	Shigeru Chikami; Louis F. De Martini;		
17	Armand Lescoulie; C. D. Webster; Kenji		
18	Murata; Glenn F. Spiller and Jean H.		
19	Spiller; George Yamamoto and Alice		
20	Yamamoto, conducting business as Fumi		
21	Garden Farms, Inc.; and Salvatore		
22	Gutierrez, tenants and licenses)	816	653
23	Southern California Water Company	18,937	15,150
24	Southern Service Company, Ltd.	81	65
25	Henrietta Southfield	4	4
26	John Southfield	0	0
27	Southwest Water Company	2,895	2,316
28	Manuel M. Souza, Sr.; Manuel M.		
29	Souza, Jr.; Frank M. Souza and		
30	Louie J. Souza (see listing under		
31	name of Jack Gonsalves)		
32	Nelson Souza and Mary Souza	12	10
33	Glenn F. Spiller and Jean H. Spiller		
34	(see also listing under name of		
35	Southern California Edison company)	24	19
36	Farah Sprague	3	3

1	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
2			
3	Herman F. Staat and Charlotte H. Staat	2	2
4	James L. Stamps, as to an undivided 80% interest; Addie L. Enfield, as 5 to an undivided 20% interest (Rio 6 Hondo Country Club, tenant)	443	354
7	Standard Oil Company of California	118	94
8	J. F. Standley and Myrtle M. Standley	1	1
9	Star Dust Lands, Inc.	85	68
10	State of California (included herein are 11 water rights of Fred C. Nelles School 12 for Boys of the State of California 13 Department of the Youth Authority; 14 Metropolitan State Hospital of the 15 State of California Department of 16 Mental Hygiene; and District VII, 17 Division of Highways of the State of 18 California Department of Public Works)	757	606
15	Stauffer Chemical Company	181	145
16	John Steele and Clara D. Steele	4	4
17	Steve Stefani, Jr.	0	0
18	Steve Stefani, Sr., and Dora Stefani (Henry Baar and Fred Fekkes, tenants)	38	30
19	Andrew Stellingwerf	0	0
20	Henry Stellingwerf and Jeanette 21 Stellingwerf	14	11
22	Henry Sterk and Betty S. Sterk	114	91
23	V. C. Stiefel	3	3
24	Sophia J. Stockmal and John F. Stockmal	3	3
25	William Thomas Stover and Gertrude D. 26 Stover	3	3
27	Louis Struikman and Alice Struikman (Louis 28 Struikman and Pete Struikman dba Louis Struikman and Son, tenants as to 43 acre feet of water right and 34 acre feet of allowed pumping allocation; and Sidney		

1	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
2			
3	Van Dyke, tenant as to 10 acre feet of water right and 8 acre feet of allowed pumping allocation) (see also below)	53	42
4			
5	Louis Struikman and Peter Struikman	3	3
6	Cornelius Struikmans and Ida Struikmans	9	7
7	Henry Struikmans and Nellie Struikmans	13	10
8	Henry Struikmans, Jr.	0	0
9	Suburban Mutual Water Co.	0	0
10	Suburban Water Systems	3,666	2,933
11	Kazuo Sumida	2	2
12	Sun Coast Development Company	0	0
13	Sun Holding Corporation (see listing under name of Mausoleum Park, Inc.)		
14			
15	Sunnyside Mausoleum Company	60	48
16	Sunset Cemetery Association	26	21
17	E. A. Sutton and Ramona Sutton	39	31
18	Swift & Company	2,047	1,638
19	Roy Sybrandy and Anne Sybrandy	29	23
20	Sykes Realty Co., Floyd G. Marcusson and Albert C. Sykes	2	2
21			
22	Andy Sytsma and Dorothy Sytsma (Albert Sytsma and Robert Sytsma, doing business as Sytsma Bros., tenants)	20	16
23	Tarr and McComb Oil Company, Ltd. (Pablo Oropeza, tenant)	86	69
24			
25	Roy Tashima and Shigeo Tashima	1	1
26	Fay G. Tawzer and Lawrence R. Tawzer (see listing under name of Fern Ethyl Gordon)		
27	Dorothy Taylor	0	0
28	Quentin D. Taylor	0	0

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Carl Teixeira and Evelyn Teixeira	11	9
4	George S. Teixeira and Laura L. Teixeira	17	14
5	Harm Te Velde and Zwaantina Te Velde	253	202
6	Theo Hamm Brewing Co.	150	120
7	Thirty-Three Forty-Five East Forty-Fifth Street, Inc.	17	14
8			
9	O. T. Thompson and Drusilla Thompson	20	16
10	Tract Number One Hundred and Eighty Water Company	1,526	1,221
11	Tract 349 Mutual Water Company	529	423
12	Fred Troost and Annie Troost	53	42
13	Frank W. Tybus and June E. Tybus (see listing under name of Lakewood Pipe Co.)		
14			
15	Uehling Water Company, Inc.	846	677
16	Union Development Co., Inc.	12	10
17	Union Oil Company of California (see listing under name of Florence Hellman Ehrman)		
18			
19	Union Pacific Railroad Company	656	525
20	Union Packing Company	100	80
21	United California Bank (see listing under name of Huntley L. Gordon)		
22	United Dairymen's Association	1	1
23	United States Gypsum Company	1,581	1,265
24	United States Rubber Company	820	656
25	United States Steel Corporation	176	141
26	Masaru Uyeda, Hajime Hirashima, and Tadashi Uyeda	12	10
27			
28	G. A. Van Beek (see listing under name of Art Hop, Sr.)		

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Bas Van Dam (see listing under name of Gertrude Van Dam)		
4			
5	Carrie Agnes Van Dam (see listing under name of Bernard William Bootsma)		
6	Cornelius A. Van Dam and Florence Van Dam	24	19
7			
8	Dick Van Dam, Jr.	0	0
9	Gerrit Van Dam and Grace Van Dam (William De Kriek, tenant)	13	10
10	Gertrude Van Dam (Bas Van Dam, tenant as to 29 acre feet of water right and 23 acre feet of allowed pumping right; and Henry Van Dam, tenant as to 19 acre feet of water right and 15 acre feet of allowed pumping right)	48	38
11			
12			
13			
14	Hank Van Dam and Jessie Van Dam (Viva Ormonde, tenant)	22	18
15	Henry Van Dam (see listing under name of Gertrude Van Dam)		
16			
17	Jacob Vandenberg and Anna Vandenberg (Pete Nauta, tenant)	8	6
18	August Vandenburg, Ben W. Vandenburg, and Andrew W. Vandenburg (Jan Bokma, tenant)	6	5
19			
20	John Van Den Raadt	4	4
21	M. Vander Dussen and Aletta C. Vander Dussen	12	10
22			
23	Sybrand Vander Dussen and Johanna Vander Dussen	23	18
24	Helen Goedhart Van Eik (see listing under name of Harry N. Goedhart)		
25			
26	Cornelius Vander Eyk, aka Case Vander Eyk, and Nelly Vander Eyk, aka Nellie Vander Eyk	7	6
27			
28	George Van Der Ham and Alice Van Der Ham	10	8

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Huibert Vander Ham and Henrietta Vander Ham	33	26
4			
5	Joe Vanderham and Cornelia Vanderham	13	10
6	John Vanderham and Nell M. Vanderham	20	16
7	Charlie Vander Kooi and Lena Mae Vander Kooi (see also listing under name of Michel Bordato)	13	10
8			
9	Pete Vander Kooi (see listing under name of Ed Haakma)		
10	Bert Vander Laan and Stella Vander Laan	10	8
11	Matt Vander Sys and Johanna Vander Sys	13	10
12	Bill Vander Vegt and Henny Vander Vegt	18	14
13	George Vander Vegt and Houjke Vander Vegt	12	10
14	Harry J. Vander Wall and Marian E. Vander Wall	12	10
15			
16	Bert Vande Vegte and Lillian Vande Vegte	1	1
17	Anthony Van Diest	0	0
18	Jennie Van Diest, as to undivided 1/3 interest; Ernest Van Diest and Rena Van Diest, as to undivided 1/3 interest; and Cornelius Van Diest and Anna Van Diest, as to undivided 1/3 interest. (Van Diest Dairy, tenant)	20	16
19			
20			
21			
22	Katrena Van Diest and/or Margaret Van Diest	92	74
23	Henry W. Van Dyk (see listing under name of Henrietta Veenendaal)		
24			
25	Wiechert Van Dyk and Jennie Van Dyk	13	10
26	Corty Van Dyke (see listing under name of Charles E. Adams)		
27	Sidney Van Dyke (see listing under name of Louis Struickman)		
28			

1	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
2			
3	William Van Foeken	0	0
4	Jake Van Haaster and Gerarda Van Haaster	0	0
5	Arie C. Van Leeuwen (see listing under name of Sam Bouman)		
6			
7	Gerrit Van Leeuwen of 15405 Shoemaker Road, Norwalk (see listing under name of Pacific Electric Railway Company)		
8			
9	Henry Van Leeuwen and Caroline P. Van Leeuwen; Gerrit Van Leeuwen of 5948 Lorelei Street, Bellflower, and Ellen Van Leeuwen	1	1
10			
11	Jake Van Leeuwen, Jr. and Cornelia J. Van Leeuwen (James C. Boogerd and Jake Van Leeuwen, Jr. dba Van Leeuwen & Boogerd, tenants)	9	7
12			
13			
14	Anthony R. Van Loon (see listing under name of Henry Van Ruiten)		
15			
16	John Van Nierop and Lily E. Van Nierop	0	0
17			
18	Henry Van Ruiten and Mary A. Van Ruiten, as to undivided 1/2 interest; and Jake Van Ruiten and Jacoba Van Ruiten, as to undivided 1/2 interest (W. P. Jordan, Anthony R. Van Loon, and Jules Wesselink, tenants)	88	70
19			
20	Pete Van Ruiten and Mary Van Ruiten (for purposes of clarification, this Mary Van Ruiten is also known as Mrs. Pete Van Ruiten and is not the same individual as sued herein as Mary A. Van Ruiten, who is also known as Mrs. Henry G. Van Ruiten)	38	30
21			
22			
23			
24	Z. Van Spanje (see listing under name of Fumiko Mitsuuchi)		
25			
26	Evert Veenendaal and Gertrude Veenendaal (see listing under name of Earl Haringa)		
27			
28	Henrietta Veenendaal (Henry W. Van Dyk, tenant)	10	8

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Henry Veenendaal and Henrietta Veenendaal	8	6
4	Joe H. Veenendaal and Margie Veenendaal	34	27
5	John Veenendaal	0	0
6	Vehicle Maintenance & Painting Corporation (see listing under name of Nicholas		
7	C. Contreas)		
8	Salvador Velasco	16	13
9	Mike Veldhuis	0	0
10	Albert Veldhuizen and Helen Veldhuizen	23	18
11	Jack Verbree	0	0
12	Mrs. Klaasje Verburg (Leon Verburg to extent of interest under contract		
13	to purchase)	12	10
14	John C. Verhoeven and Sadie Verhoeven	25	20
15	Joseph C. Vierra and Caroline Vierra (Joseph C. Vierra and William J.		
16	Vierra, doing business as Vierra & Vierra, tenants)	13	10
17	Sieger Vierstra and Nellie G. Vierstra (Jacob J. Bosma, tenant)	12	10
18			
19	Virginia Country Club of Long Beach	340	272
20	Roy Visbeek	0	0
21	Louis Visser	9	7
22	Vista Hill Psychiatric Foundation	39	31
23	Louie Von Ah	0	0
24	Walnut Irrigation District	154	123
25	Walnut Park Mutual Water Co.	1,245	996
26	C. D. Webster	1	1
27	(see also listing under name of Southern California Edison Company)		
28			

1	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
2			
3	Morris Weiss and Bessie Weiss (Wilbur Mellema, tenant)	20	16
4	(also see listings under names of Elmo D. Murphy and Emma Engler)		
5			
6	Wells Fargo Bank as Executor of Estate of Edward H. Heller, Deceased, and as Executor of Estate of Lloyd W.		
7	Dinkelspiel, Deceased, and as Trustee under Trust created by the Will of		
8	Florence H. Dinkelspiel, Deceased (see listing under name of Florence		
9	Hellman Ehrman)		
10	Jules Wesselink (see listing under name of Henry Van Ruiten)		
11			
12	West Gateway Mutual Water Co.	105	84
13	Henry Westra and Hilda Westra	40	32
14	John D. Westra (see listing under name of Orla Company)		
15			
16	Francis O. Wharram (see listing under name of Shayman & Wharram)		
17			
18	Whittier Union High School District	125	100
19	Arend Z. Wier	14	11
20			
21	H. Wiersema, aka Harm Wiersema and Pearl Wiersema	16	13
22			
23	William Wiersma and Elbra Wiersma	7	6
24			
25	Richard Wigboly (see listing under name of Central Manufacturing District, Inc.)		
26			
27	Mary Wilcox (see listing under name of Jenkins Realty Mutual Water Co.)		
28			
29	Ralph P. Williams and Mary Williams	14	11
30			
31	Wilshire Oil Company of California	1,795	1,436
32			
33	Melvin L. Wilson and Marie Wilson	1	1
34			
35	D. P. Winslow and Dorothy C. Winslow (Berton Elson, tenant)	15	12

	<u>Name</u>	<u>Total Water Right</u>	<u>Allowed Pumping Allocation</u>
1			
2			
3	Helene K. Winters	1	1
4	Fred E. Wiseman and Grayce Anna Wiseman	2	2
5	Helen Wolfsberger and Christine Joseph	2	2
6	Volney Womack	0	0
7	Cho Shee Woo (Hong Woo and Ngorn Seung		
8	Woo, as agents of property for Cho Shee Woo)	20	16
9	Gerrit Wybenga and Rena Wybenga	10	8
10	George Yamamoto and Alice Yamamoto,		
11	also known as Fumi Yamamoto (Fumi Garden Farms, Inc., tenant)	17	14
12	(see also listing under name of Southern California Edison Company)		
13	Paul N. Yokota and Miyo Yokota	4	4
14	Minoru Yoshijima (see listing under name of Kazuo Hatanaka)		
15			
16	Frank Yoshioka	0	0
17	Maxine Young	3	3
18	Mrs. A. Zandvliet also known as Anna A. Zandvliet	8	6
19	Arnold Zeilstra and Nellie Zeilstra	6	5
20	George Zivelonghi and Antonio Zivelonghi	121	97
21	Dick Zuidervaart and Janna Zuidervaart (Artesia Milling Company, tenant)	1	1
22			
23	Andy Zylstra	0	0
24	Zylstra Bros. a partnership consisting of Lammert Zylstra and William Zylstra (see listing under name of John H. Coito)		
25			
26	John Zylstra and Leonard J. Zylstra, doing business as The Zylstra Dairy	22	18
27	Leonard Zylstra (not the same person as Leonard J. Zylstra	0	0
28			

1           4.   Transition in Administrative Year - Application.

2   "Year" and "Administrative Year" as used throughout this judgment  
3 shall mean the water year; provided that with the first fiscal  
4 year (July 1 - June 30) commencing at least four months after the  
5 "Amended Judgment" became final, and thereafter, said words shall  
6 mean the fiscal year. Since this will provide a transitional  
7 Administrative year of nine months, October 1 - June 30, ("short  
8 year" hereafter), notwithstanding the finding and determinations  
9 in the annual Watermaster report for the then last preceding  
10 water year, the Allowed Pumping Allocations of the parties and  
11 the quantity which Defendant City of Los Angeles is annually  
12 permitted to extract from Central Basin for said short year shall  
13 be based on three-quarters of the otherwise allowable quantity.  
14 During said short year, because of hardships that might otherwise  
15 result, any overextractions by a party shall be deemed pursuant  
16 to paragraph 2, Subpart B of Part III of this judgment (p. 61),  
17 and it shall be deemed that the Watermaster has made the  
18 determination of unreasonable hardship to which reference is  
19 therein made.

20           II.   APPOINTMENT OF WATERMASTER; WATERMASTER ADMINI-  
21 STRATION PROVISIONS. Department of Water Resources of the State  
22 of California is hereby appointed Watermaster, for an indefinite  
23 term, but subject to removal by the Court, to administer this  
24 judgment and shall have the following powers, duties and  
25 responsibilities:

26           1.   Duties, Powers and Responsibilities of Watermaster.

27 In order to assist the Court in the administration and enforce-  
28 ment of the provisions of this judgment and to keep the Court

1 fully advised in the premises, the Watermaster shall have the  
2 following duties, powers and responsibilities in addition to  
3 those before or hereafter provided in this judgment:

4 (a) Watermaster May Require Reports, Information and  
5 Records. To require of parties the furnishing of such reports,  
6 information and records as may be reasonably necessary to  
7 determine compliance or lack of compliance by any party with the  
8 provisions of this judgment.

9 (b) Requirement of Measuring Devices. To require all  
10 parties or any reasonable classification of parties owning or  
11 operating any facilities for the extraction of ground water from  
12 Central Basin to install and maintain at all times in good  
13 working order at such party's own expense, appropriate measuring  
14 devices at such times and as often as may be reasonable under the  
15 circumstances and to calibrate or test such devices.

16 (c) Inspections by Watermaster. To make inspections  
17 of ground water production facilities and measuring devices at  
18 such times and as often as may be reasonable under the circum-  
19 stances and to calibrate or test such devices.

20 (d) Annual Report. The Watermaster shall prepare,  
21 file with the Court and mail to each of the parties on or before  
22 the 15th day of the fourth month following the end of the  
23 preceding Administrative year, an annual report for such year,  
24 the scope of which shall include but not be limited to the  
25 following:

- 26 1. Ground Water Extractions
- 27 2. Exchange Pool Operation
- 28 3. Use of Imported Water

- 1 4. Violations of Judgment and Corrective Action Taken
- 2 5. Change of Ownership of Total Water Rights
- 3 6. Watermaster Administration Costs
- 4 7. Recommendations, if any.

5 (e) Annual Budget and Appeal Procedure in Relation  
6 Thereto. The Watermaster shall annually prepare a tentative  
7 budget for each Administrative year stating the anticipated  
8 expense for administering the provisions of this judgment. The  
9 Watermaster shall mail a copy of said tentative budget to each of  
10 the parties hereto at least 60 days before the beginning of each  
11 Administrative year. For the first Administrative year of  
12 operation under this judgment, if the Watermaster is unable to  
13 meet the above time requirement, the Watermaster shall mail said  
14 copies as soon as possible. If any party hereto has any  
15 objection to said tentative budget, it shall present the same in  
16 writing to the Watermaster within 15 days after the date of  
17 mailing of said tentative budget by the Watermaster. If no  
18 objections are received within said period, the tentative budget  
19 shall become the final budget. If objections are received, the  
20 Watermaster shall, within 10 days thereafter, consider such  
21 objections, prepare a final budget and mail a copy thereof to  
22 each party hereto, together with a statement of the amount  
23 assessed to each party. Any party may apply to the Court within  
24 15 days after the mailing of such final budget for a revision  
25 thereof based on specific objections thereto. The parties hereto  
26 shall make the payments otherwise required of them to the  
27 Watermaster even though such a request for revision has been  
28 filed with the Court. Upon any revision by the Court the

1 Watermaster shall either remit to the parties their prorata  
2 portions of any reduction in the budget, or credit their accounts  
3 with respect to their budget assessments for the next ensuing  
4 Administrative year, as the Court shall direct.

5 The amount to be assessed to each party shall be  
6 determined as follows: If that portion of the final budget to be  
7 assessed to the parties is equal to or less than \$20.00 per party  
8 then the cost shall be equally apportioned among the parties. If  
9 that portion of the final budget to be assessed to parties is  
10 greater than \$20.00 per party then each party shall be assessed a  
11 minimum of \$20.00. The amount of revenue expected to be received  
12 through the foregoing minimum assessments shall be deducted from  
13 that portion of the final budget to be assessed to the parties  
14 and the balance shall be assessed to the parties having Allowed  
15 Pumping Allocations, such balance being divided among them  
16 proportionately in accordance with their respective Allowed  
17 Pumping Allocations.

18 Payment of the assessment provided for herein, subject  
19 to adjustment by the Court as provided, shall be made by each  
20 such party prior to beginning of the Administrative year to which  
21 the assessment relates, or within 40 days after the mailing of  
22 the tentative budget, whichever is later. If such payment by any  
23 party is not made on or before said date, the Watermaster shall  
24 add a penalty of 5% thereof to such party's statement. Payment  
25 required of any party hereunder may be enforced by execution  
26 issued out of the Court, or as may be provided by order herein-  
27 after made by the Court, or by other proceedings by the  
28 Watermaster or by any party hereto on the Watermaster's behalf.

1 Any money unexpended at the end of any Administrative  
2 year shall be applied to the budget of the next succeeding  
3 Administrative year.

4 Notwithstanding the above, no part of the budget of the  
5 Watermaster shall be assessed to the Plaintiff District or to any  
6 party who has not extracted water from Central Basin for a period  
7 of two successive Administrative years prior to the Administra-  
8 tive year in which the tentative budget should be mailed by the  
9 Watermaster under the provisions of this subparagraph (e).

10 (f) Rules. The Watermaster may adopt and amend  
11 from time to time such rules as may be reasonably necessary to  
12 carry out its duties, powers and responsibilities under the  
13 provisions of this judgment. The rules shall be effective on  
14 such date after the mailing thereof to the parties as is  
15 specified by the Watermaster, but not sooner than 30 days after  
16 such mailing.

17 2. Use of Facilities and Data Collected by Other  
18 Governmental Agencies. The Watermaster is directed not to  
19 duplicate the collection of data relative to conditions of the  
20 Central Basin which is then being collected by one or more  
21 governmental agencies, but where necessary the Watermaster may  
22 collect supplemental data. Where it appears more economical to  
23 do so, the Watermaster is directed to use such facilities of  
24 other governmental agencies as are available to it under either  
25 no cost or cost agreements with respect to the receipt of  
26 reports, billings to parties, mailings to parties, and similar  
27 matters.

28

1                   3. Appeal from Watermaster Decisions Other Than With  
2 Respect to Budget. Any party interested therein who has  
3 objection to any rule, determination, order or finding made by  
4 the Watermaster, may make objection thereto in writing delivered  
5 to the Watermaster within 30 days after the date the Watermaster  
6 mails written notice of the making of such rule, determination,  
7 order or finding, and within 30 days after such delivery the  
8 Watermaster shall consider said objection and shall amend or  
9 affirm his rule, determination, order or finding and shall give  
10 notice thereof to all parties. Any such party may file with the  
11 Court within 30 days from the date of said notice any objection  
12 to such rule, determination, order or finding of the Watermaster  
13 and bring the same on for hearing before the Court at such time  
14 as the Court may direct, after first having served said objection  
15 upon all other parties. The Court may affirm, modify, amend or  
16 overrule any such rule, determination, order or finding of the  
17 Watermaster. The provisions of this paragraph shall not apply to  
18 budgetary matters, as to which the appellate procedure has  
19 heretofore been set forth. Any objection under this paragraph  
20 shall not stay the rule, determination, order or finding of the  
21 Watermaster. However, the Court, by ex parte order, may provide  
22 for a stay thereof on application of any interested party on or  
23 after the date that any such party delivers to the Watermaster  
24 any written objection.

25                   4. Effect of Non-Compliance by Watermaster With Time  
26 Provisions. Failure of the Watermaster to perform any duty,  
27 power or responsibility set forth in this judgment within the  
28 time limitation herein set forth shall not deprive the

1 Watermaster of authority to subsequently discharge such duty,  
2 power or responsibility, except to the extent that any such  
3 failure by the Watermaster may have rendered some otherwise  
4 required act by a party impossible.

5 III. PROVISIONS FOR PHYSICAL SOLUTION TO MEET THE WATER  
6 REQUIREMENTS IN CENTRAL BASIN. In order to provide flexibility  
7 to the injunction set forth in Part I of the judgment, and to  
8 assist in a physical solution to meet water requirements in  
9 Central Basin, the injunction so set forth is subject to the  
10 following provisions.

11 A. Carryover of Portion of Allowed Pumping Allocation.

12 (1) Each party adjudged to have a Total Water  
13 Right or water rights and who, during a particular  
14 Administrative year, does not extract from Central Basin a  
15 total quantity equal to such party's Allowed Pumping  
16 Allocation for the particular Administrative year, less any  
17 allocated subscriptions by such party to the Exchange Pool,  
18 or plus any allocated requests by such party for purchase of  
19 Exchange Pool water, is permitted to carry over (the "One  
20 Year Carryover") from such Administrative year the right to  
21 extract from Central Basin in the next succeeding  
22 Administrative year so much of said total quantity as it did  
23 not extract in the particular Administrative year, not to  
24 exceed 20% of such party's Allowed Pumping Allocation, or 20  
25 acre feet, whichever of said 20% or 20 acre feet is the  
26 larger.

27 (2) Following the declaration of a Declared Water  
28 Emergency and until the Declared Water Emergency ends either

1 by expiration or by resolution of the Board of Directors of  
2 the Central and West Basin Water Replenishment District,  
3 each party adjudged to have a Total Water Right or water  
4 rights and who, during a particular Administrative year,  
5 does not extract from Central Basin a total quantity equal  
6 to such party's Allowed Pumping Allocation for the  
7 particular Administrative year, less any allocated  
8 subscriptions by such party to the Exchange Pool, or plus  
9 any allocated requests by such party for purchase of  
10 Exchange Pool water, is permitted to carry over (the  
11 "Drought Carryover") from such Administrative year the right  
12 to extract from Central Basin so much of said total quantity  
13 as it did not extract during the period of the Declared  
14 Water Emergency, to the extent such quantity exceeds the One  
15 Year Carryover, not to exceed an additional 35% of such  
16 party's Allowed Pumping Allocation, or additional 35 acre  
17 feet, whichever of said 35% or 35 acre feet is the larger.  
18 Carryover amounts shall first be allocated to the One Year  
19 Carryover and any remaining carryover amount for that year  
20 shall be allocated to the Drought Carryover.

21 (3) No further amounts shall be added to the  
22 Drought Carryover following the end of the Declared Water  
23 Emergency, provided however that in the event another  
24 Declared Water Emergency is declared, additional Drought  
25 Carryover may be added, to the extent such additional  
26 Drought Carryover would not cause the total Drought  
27 Carryover to exceed the limits set forth above.  
28

1 (4) The Drought Carryover shall be supplemental  
2 to and shall not affect any previous drought carryover  
3 acquired by a party pursuant to previous order of the court.

4 B. When Over-extractions May be Permitted.

5 1. Underestimation of Requirements for Water. Any  
6 party hereto having an Allowed Pumping Allocation and not in  
7 violation of any provision of this judgment may extract in an  
8 Administrative year an additional quantity of water not to  
9 exceed: (a) 20% of such party's Allowed Pumping Allocation or 20  
10 acre feet, whichever is greater, and (b) any amount in addition  
11 thereto which may be approved in advance by the Watermaster.

12 2. Reductions in Allowed Pumping Allocations in  
13 Succeeding Years to Compensate for Permissible Overextractions.  
14 Any such party's Allowed Pumping Allocation for the following  
15 Administrative year shall be reduced by the amount over-extracted  
16 pursuant to paragraph 1 above, provided that if the Watermaster  
17 determines that such reduction in the party's Allowed Pumping  
18 Allocation in one Administrative year will impose upon such a  
19 party an unreasonable hardship, the said reduction in said  
20 party's Allowed Pumping Allocation shall be prorated over a  
21 period of five (5) Administrative years succeeding that in which  
22 the excessive extractions by the party occurred. Application for  
23 such relief to the Watermaster must be made not later than the  
24 40th day after the end of the Administrative year in which such  
25 excessive pumping occurred. Watermaster shall grant such relief  
26 if such over-extraction, or any portion thereof, occurred during  
27 a period of Declared Water Emergency.  
28

1                   3. Reductions in Allowed Pumping Allocations for the  
2 Next Succeeding Administrative Year to Compensate for  
3 Overpumping. Whenever a party over-extracts in excess of 20% of  
4 such party's Allowed Pumping Allocation, or 20 acre feet,  
5 whichever is greater, and such excess has not been approved in  
6 advance by the Watermaster, then such party's Allowed Pumping  
7 Allocation for the following Administrative year shall be reduced  
8 by an amount equivalent to its total over-extractions in the  
9 particular Administrative year in which it occurred.

10                   4. Reports of Certain Over-extractions to the Court.  
11 Whenever a party over-extracts in excess of 20% of such party's  
12 Allowed Pumping Allocation, or 20 acre feet, whichever is  
13 greater, without having obtained prior approval of the  
14 Watermaster, such shall constitute a violation of the judgment  
15 and the Watermaster shall make a written report to the Court for  
16 such action as the Court may deem necessary. Such party shall be  
17 subject to such injunctive and other processes and action as the  
18 Court might otherwise take with regard to any other violation of  
19 such judgment.

20                   5. Effect of Over-extractions on Rights. Any  
21 party who over-extracts from Central Basin in any Administrative  
22 year shall not acquire any additional rights by reason of such  
23 over-extractions; nor, shall any required reductions in  
24 extractions during any subsequent years reduce the Total Water  
25 Right or water rights of any party to the extent said over-  
26 extractions are in compliance with paragraph 1 above.

27                   6. Pumping Under Agreement With Plaintiff During  
28 Periods of Emergency. Plaintiff overlies Central Basin and

1 engages in activities of replenishing the ground waters thereof.  
2 Plaintiff by resolution has appropriated for use during  
3 emergencies the quantity of 17,000 acre feet of imported and  
4 reclaimed water replenished by it into Central Basin, and  
5 pursuant to such resolution Plaintiff reserves the right to use  
6 or cause the use of such quantity during such emergency periods.

7 (a) Notwithstanding any other provision of this  
8 judgment, parties who are water purveyors (including successors  
9 in interest) are authorized to enter into agreements with  
10 Plaintiff under which such water purveyors may exceed their  
11 respective Allowed Pumping Allocations for the particular  
12 administrative year when the following conditions are met:

13 (1) Plaintiff is in receipt of a resolution of the  
14 Board of Directors of the Metropolitan Water District  
15 of Southern California ("MWD") that there is an actual  
16 or immediately threatened temporary shortage of MWD's  
17 imported water supply compared to MWD's needs, or a  
18 temporary inability to deliver MWD's imported water  
19 supply throughout its area, which will be alleviated by  
20 overpumping from Central Basin.

21 (2) The Board of Directors of both Plaintiff and  
22 Central Basin Municipal Water District by resolutions  
23 concur in the resolution of MWD's Board of Directors,  
24 and the Board of Directors of Plaintiff finds in its  
25 resolution that the average minimum elevation of water  
26 surface among those wells in the Montebello Forebay of  
27 the Central Basin designated as Los Angeles County  
28 Flood Control District Wells Nos. 1601T, 1564P, 1615P,

1 and 1626L, is at least 43.7 feet above sea level. This  
2 computation shall be based upon the most recent "static  
3 readings" taken, which shall have been taken not more  
4 than four weeks prior. Should any of the wells  
5 designated above become destroyed or otherwise be in a  
6 condition so that readings cannot be made, or the owner  
7 prevent their use for such readings the Board of  
8 Directors of the Plaintiff may, upon appropriate  
9 engineering recommendation substitute such other well  
10 or wells as it may deem appropriate.

11 (3) In said resolution, Plaintiff's Board of Directors  
12 sets a public hearing, and notice of the time, place  
13 and date thereof (which may be continued from time to  
14 time without further notice) is given by First Class  
15 Mail to the current designees of the parties, filed and  
16 served in accordance with Part V, paragraph 3 of this  
17 Judgment. Said notice shall be mailed at least five  
18 (5) days before the scheduled hearing date.

19 (4) At said public hearing, parties (including succes-  
20 sors in interest) are given full opportunity to be  
21 heard, and at the conclusion thereof the Board of  
22 Directors of Plaintiff by resolution decides to proceed  
23 with agreements under this Part III-B.

24 (5) For purposes of this Part III-B, "water purveyors"  
25 mean those parties (and successors in interest) which  
26 sell water to the public whether regulated public  
27 utilities, mutual water companies or public entities,  
28 which have a connection or connections for the taking

1 of imported water of MWD, or access to imported water  
2 of MWD through a connection, and which normally supply  
3 part of their customer's needs with such imported  
4 water.

5 (b) All such agreements shall be subject to the fol-  
6 lowing requirements, and such others as Plaintiff's Board of  
7 Directors shall require:

8 (1) They shall be of uniform content except as to  
9 quantity involved, and any special provisions  
10 considered necessary or desirable with respect to local  
11 hydrological conditions or good hydrologic practice.

12 (2) They shall be offered to all water purveyors,  
13 excepting those which Plaintiff's Board of Directors  
14 determine should not over pump because such over  
15 pumping would occur in undesirable proximity to a sea  
16 water barrier project designed to forestall sea water  
17 intrusion, or within or in undesirable proximity to an  
18 area within Central Basin wherein groundwater levels  
19 are at an elevation where over pumping is under all the  
20 circumstances then undesirable.

21 (3) The maximum terms for the agreements shall be four  
22 months, which agreements shall commence on the same  
23 date and end on the same date (and which may be  
24 executed at any time within the four month period),  
25 unless an extension thereof is authorized by the Court,  
26 under Part IV of this judgment.

27 (4) They shall contain provisions that the water  
28 purveyor executing the agreement pay to the Plaintiff a

1 price in addition to the applicable replenishment  
2 assessment determined on the following formula. The  
3 normal price per acre-foot of Central Basin Municipal  
4 Water District's (CBMWD) treated domestic and municipal  
5 water, as "normal" price of such category of water is  
6 defined in Part C, paragraph 10 (price to be paid for  
7 Exchange Pool Water) as of the beginning of the  
8 contract term less the deductions set forth in said  
9 paragraph 10 for the administrative year in which the  
10 contract term commences. The agreement shall provide  
11 for adjustments in the first of said components for any  
12 proportional period of the contract term during which  
13 the CBMWD said normal price is changed, and if the  
14 agreement straddles two administrative years, the said  
15 deductions shall be adjusted for any proportionate  
16 period of the contract term in which the amount thereof  
17 or of either subcomponent changes for purposes of said  
18 paragraph 10. Any price for a partial acre-foot shall  
19 be computed prorata. Payments shall be due and payable  
20 on the principle that over extractions under the  
21 agreement are of the last water pumped in the fiscal  
22 year, and shall be payable as the agreement shall  
23 provide.

24 (5) They shall contain provisions that:

25 (a) All of such agreements (but not less than all)  
26 shall be subject to termination by Plaintiff if, in the  
27 Judgment of Plaintiff's Board of Directors, the  
28 conditions or threatened conditions upon which they

1 were based have abated to the extent over extractions  
2 are no longer considered necessary; and (b) that any  
3 individual agreement or agreements may be terminated if  
4 the Plaintiff's Board of Directors finds that adverse  
5 hydrologic circumstances have developed as a result of  
6 over extractions by any water purveyor or purveyors  
7 which have executed said agreements, or for any other  
8 reason that Plaintiff's Board of Directors finds good  
9 and sufficient.

10 (c) Other matters applicable to such agreements and  
11 over pumping thereunder are as follows, without need for express  
12 provisions in the agreements;

13 (1) The quantity of over pumping permitted shall be  
14 additional to that which the water purveyor could  
15 otherwise over pump under this Judgment.

16 (2) The total quantity of permitted over pumping under  
17 all said agreements during said four months shall not  
18 exceed Seventeen thousand (17,000) acre feet, but the  
19 individual water purveyor shall not be responsible or  
20 affected by any violation of this requirement. That  
21 total is additional to over extractions otherwise  
22 permitted under this Judgment.

23 (3) Only one four month period may be utilized by  
24 Plaintiff in entering into such agreements, as to any  
25 one emergency or continuation thereof declared by MWD's  
26 Board of Directors under paragraph 6(a).

27 (4) Plaintiff may utilize the ex parte provisions of  
28 Part IV of this Judgment in lieu of the authority

1 contained herein (which ex parte provisions are not  
2 limited as to time, nature of relief, or terms of any  
3 agreements), but neither Plaintiff nor any other party  
4 shall utilize both as to any one such emergency or  
5 continuation thereof.

6 (5) If any party claims it is being damaged or  
7 threatened with damage by the over extractions by any  
8 party to such an agreement, the first party or the  
9 Watermaster may seek appropriate action of the Court  
10 for termination of any such agreement upon notice of  
11 hearing to the party complaining, to the party to said  
12 agreement, to the plaintiff, and to any parties who  
13 have filed a request for special notice. Any  
14 termination shall not affect the obligation of the  
15 party to make payments under the agreement for over  
16 extractions which did occur thereunder.

17 (6) Plaintiff shall maintain separate accounting of  
18 the proceeds from payments made pursuant to agreements  
19 entered into under this part. Said fund shall be  
20 utilized solely for purposes of replenishment in  
21 replacement of waters in Central Basin and West Basin.  
22 Plaintiff shall as soon as practicable cause replenish-  
23 ment in Central Basin by the amounts to be overproduced  
24 pursuant to this Paragraph 6 commencing at Page 63,  
25 whether through spreading, injection, or in lieu  
26 agreements.

27 (7) Over extractions pursuant to the agreements shall  
28 not be subject to the "make up" provisions of the

1 Judgment as amended, provided that if any party fails  
2 to make payments as required by the agreement,  
3 Plaintiff may require such "make up" under Paragraph 3,  
4 Subpart B, Part III of the Judgment (Page 62).

5 (8) Water Purveyor under any such agreement may, and  
6 is encouraged to enter into appropriate arrangements  
7 with customers who have water rights in Central Basin  
8 under or pursuant to this Judgment whereby the Water  
9 Purveyor will be assisted in meeting the objectives of  
10 the agreement.

11 (9) Nothing in this Paragraph 6 limits the exercise of  
12 the reserved jurisdiction of the court except as  
13 provided in subparagraph (c) (4) above.

14 7. Exemption for Extractors of Contaminated  
15 Groundwater. Any party herein may petition the Replenishment  
16 District for a Non-consumptive Water Use Permit as part of a  
17 project to remedy or ameliorate groundwater contamination. If  
18 the petition is granted as set forth in this part, the petitioner  
19 may extract the groundwater as permitted hereinafter, without the  
20 production counting against the petitioner's production rights.

21 (a) If the Board of the Replenishment District  
22 determines by Resolution that there is a problem of groundwater  
23 contamination that a proposed program will remedy or ameliorate,  
24 an operator may make extractions of groundwater to remedy or  
25 ameliorate that problem without the production counting against  
26 the petitioner's production rights if the water is not applied to  
27 beneficial surface use, its extractions are made in compliance  
28 with all the terms and conditions of the Board Resolution, and

1 the Board has determined in the Resolution either of the  
2 following:

3 (1) The groundwater to be extracted is unusable and  
4 cannot be economically treated or blended for use with  
5 other water.

6 (2) The proposed program involves extraction of usable  
7 water in the same quantity as will be returned to the  
8 underground without degradation of quality.

9 (b) The Resolution may provide those terms and  
10 conditions the Board deems appropriate, including, but not  
11 limited to, restrictions on the quantity of the extractions to be  
12 so exempted, limitations on time, periodic reviews, requirement  
13 of submission of test results from a Board-approved laboratory,  
14 and any other relevant terms or conditions.

15 (c) Upon written notice to the operator involved, the  
16 Board may rescind or modify its Resolution. The rescission or  
17 modification of the Resolution shall apply to groundwater  
18 extractions occurring more than ten days after the rescission or  
19 modification. Notice of rescission or modification shall be  
20 either mailed first class mail, postage prepaid, at least two  
21 weeks prior to the meeting of the Board at which the rescission  
22 or modification will be made to the address of record of the  
23 operator or personally delivered two weeks prior to the meeting.

24 (d) The Board's decision to grant, deny, modify or  
25 revoke a permit or to interrupt or stop a permitted project may  
26 be appealed to this court within thirty days of the notice  
27 thereof to the applicant and upon thirty days notice to the  
28 designees of all parties herein.

1 (e) The Replenishment District shall monitor and  
2 periodically inspect the project for compliance with the terms  
3 and conditions for any permit issued pursuant to these  
4 provisions.

5 (f) No party shall recover costs from any other party  
6 herein <sup>in</sup> ~~on~~ connection with <sup>determinations</sup> ~~determinators~~ made with respect to this  
7 part.

8 C. Exchange Pool Provisions.

9 (1) Definitions.

10 For purposes of these Exchange Pool provisions, the  
11 following words and terms have the following meanings:

12 (a) "Exchange Pool" is the arrangement hereinafter set  
13 forth whereby certain of the parties, ("Exchangees") may,  
14 notwithstanding the other provisions of the judgment, extract  
15 additional water from Central Basin to meet their needs, and  
16 certain other of the parties ("Exchangors"), reduce their  
17 extractions below their Allowed Pumping Allocations in order to  
18 permit such additional extractions by others.

19 (b) "Exchangor" is one who offers, voluntarily or  
20 otherwise, pursuant to subsequent provisions, to reduce its  
21 extractions below its Allowed Pumping Allocation in order to  
22 permit such additional extractions by others.

23 (c) "Exchangee" is one who requests permission to  
24 extract additional water from Central Basin.

25 (d) "Undue hardship" means unusual and severe economic  
26 or operational hardship, other than that arising (i) by reason of  
27 any differential in quality that might exist between water  
28 extracted from Central Basin and water available for importation

1 or (ii) by reason of any difference in cost to a party in  
2 subscribing to the Exchange Pool and reducing its extractions of  
3 water from Central Basin in an equivalent amount as opposed to  
4 extracting any such quantity itself.

5 2. Parties Who May Purchase Water Through the Exchange  
6 Pool. Any party not having existing facilities for the taking of  
7 imported water as of the beginning of any Administrative year,  
8 and any party having such facilities as of the beginning of any  
9 Administrative year who is unable, without undue hardship, to  
10 obtain, take, and put to beneficial use, through its distribution  
11 system or systems existing as of the beginning of the particular  
12 Administrative year, imported water in a quantity which, when  
13 added to its Allowed Pumping Allocation for that particular  
14 Administrative year, will meet its estimated needs for that  
15 particular Administrative year, may purchase water from the  
16 Exchange Pool, subject to the limitations contained in this  
17 Subpart C of this Part III (Subpart "C" hereinafter).

18 3. Procedure for Purchasing Exchange Pool Water. Not  
19 later than the 40th day following the commencement of each  
20 Administrative year, each such party desiring to purchase water  
21 from the Exchange Pool shall file with the Watermaster a request  
22 to so purchase, setting forth the amount of water in acre feet  
23 that such party estimates that it will require during the then  
24 current Administrative year in excess of the total of:

25 (a) Its Allowed Pumping Allocation for that particular  
26 Administrative year; and

27 (b) The imported water, if any, which it estimates it  
28 will be able, without undue hardship, to obtain, take and put to

1 beneficial use, through its distribution system or systems  
2 existing as of the beginning of that particular Administrative  
3 year.

4 Any party who as of the beginning of any Administrative  
5 year has existing facilities for the taking of imported water and  
6 who makes a request to purchase from the Exchange Pool must  
7 provide with such request substantiating data and other proof  
8 which, together with any further data and other proof requested  
9 by the Watermaster, establishes that such party is unable without  
10 undue hardship, to obtain, take and put to beneficial use through  
11 its said distribution system or systems a sufficient quantity of  
12 imported water which, when added to its said Allowed Pumping  
13 Allocation for the particular Administrative year, will meet its  
14 estimated needs. As to any such party, the Watermaster shall  
15 make a determination whether the party has so established such  
16 inability, which determination shall be subject to review by the  
17 court under the procedure set forth in Part II of this judgment.  
18 Any party making a request to purchase from the Exchange Pool  
19 shall either furnish such substantiating data and other proof, or  
20 a statement that such party had no existing facilities for the  
21 taking of imported water as of the beginning of that  
22 Administrative year, and in either event a statement of the basis  
23 for the quantity requested to be purchased.

24 4. Subscriptions to Exchange Pool.

25 (a) Required Subscription. Each party having existing  
26 facilities for the taking of imported water as of the beginning  
27 of any Administrative year hereby subscribed to the Exchange Pool  
28 for purposes of meeting Category (a) requests thereon, as more

1 particularly defined in paragraph 5 of this Subpart C, twenty  
2 percent (20%) of its Allowed Pumping Allocation, or the quantity  
3 of imported water which it is able, without undue hardship, to  
4 obtain, take and put to beneficial use through its distribution  
5 system or systems existing as of the beginning of the particular  
6 Administrative year in addition to such party's own estimated  
7 needs for imported water during that water year, whichever is the  
8 lesser. A party's subscription under this subparagraph (a) and  
9 subparagraph (b) of this paragraph 4 is sometimes hereinafter  
10 referred to as a 'required subscription'.

11 (b) Report to Watermaster by Parties with Connections  
12 and Unable to Subscribe 20%. Any party having existing  
13 facilities for the taking of imported water and estimating that  
14 it will be unable, without undue hardship, in that Administrative  
15 year to obtain, take and put to beneficial use through its  
16 distribution system or systems existing as of the beginning of  
17 that Administrative year, sufficient imported water to further  
18 reduce its extractions from the Central Basin by twenty percent  
19 (20%) of its Allowed Pumping Allocation for purposes of providing  
20 water to the Exchange Pool must furnish not later than the 40th  
21 day following the commencement of such Administrative year sub-  
22 stantiating data and other proof which, together with any further  
23 data and other proof requested by the Watermaster, establishes  
24 said inability or such party shall be deemed to have subscribed  
25 twenty percent (20%) of its Allowed Pumping Allocation for the  
26 purpose of providing water to the Exchange Pool. As to any such  
27 party so contending such inability, the Watermaster shall make a  
28 determination whether the party has so established such

1 inability, which determination shall be subject to review by the  
2 Court under the procedure set forth in Part II of this judgment.

3 (c) Voluntary Subscriptions. Any party, whether or  
4 not having facilities for the taking of imported water, who  
5 desires to subscribe to the Exchange Pool a quantity or further  
6 quantity of its Allowed Pumping Allocation, may so notify the  
7 Watermaster in writing of the quantity of such offer on or prior  
8 to the 40th day following the commencement of the particular  
9 Administrative year. Such subscriptions are referred to  
10 hereinafter as "voluntary subscriptions." Any Exchangor who  
11 desires that any part of its otherwise required subscription not  
12 needed to fill Category (a) requests shall be available for  
13 Category (b) requests may so notify the Watermaster in writing on  
14 or prior to said 40th day. If all of that Exchangor's otherwise  
15 required subscription is not needed in order to fill Category (a)  
16 requests, the remainder of such required subscription not so  
17 used, or such part thereof as such Exchangor may designate, shall  
18 be deemed to be a voluntary subscription.

19 5. Limitations on Purchases of Exchange Pool Water and  
20 Allocation of Requests to Purchase Exchange Pool Water Among  
21 Exchangors.

22 (a) Categories of Requests. Two categories of  
23 Exchange Pool requests are established as follows:

24 (1) Category (a) requests. The quantity requested by  
25 each Exchangee, whether or not that Exchangee has an Allowed  
26 Pumping Allocation, which quantity is not in excess of 150% of  
27 its Allowed Pumping Allocation, if any, or 100 acre feet,  
28 whichever is greater. Requests or portions thereof within the

1 above criteria are sometimes hereinafter referred to as "Category  
2 (a) requests."

3 (2) Category (b) requests. The quantity requested by  
4 each Exchangee having an Allowed Pumping Allocation to the extent  
5 the request is in excess of 150% of that Allowed Pumping Alloca-  
6 tion or 100 acre feet, whichever is greater, and the quantity  
7 requested by each Exchangee having no Allowed Pumping Allocation  
8 to the extent the request is in excess of 100 acre feet.

9 Portions of requests within the above criteria are sometimes  
10 hereinafter referred to as "Category (b) requests."

11 (b) Filling of Category (a) Requests. All Exchange  
12 Pool subscriptions, required and voluntary, shall be available to  
13 fill Category (a) requests. Category (a) requests shall be  
14 filled first from voluntary subscriptions, and if voluntary  
15 subscriptions should be insufficient to fill all Category (a)  
16 requests required subscriptions shall be then utilized to fill  
17 Category (a) requests. All Category (a) requests shall be first  
18 filled before any Category (b) requests are filled.

19 (c) Filling of Category (b) Requests. To the extent  
20 that voluntary subscriptions have not been utilized in filling  
21 Category (a) requests, Category (b) requests shall be filled only  
22 out of any remaining voluntary subscriptions. Required subscrip-  
23 tions will then be utilized for the filling of any remaining  
24 Category (b) requests.

25 (d) Allocation of Requests to Subscriptions When  
26 Available Subscriptions Exceed Requests. In the event the  
27 quantity of subscriptions available for any category of requests  
28 exceeds those requests in that category, or exceeds the remainder

1 of those requests in that category, such requests shall be filled  
2 out of such subscriptions proportionately in relation to the  
3 quantity of each subscription.

4 (e) Allocation of Subscriptions to Category (b)  
5 Requests in the Event of Shortage of Subscriptions. In the event  
6 available subscriptions are insufficient to meet Category (b)  
7 requests, available subscriptions shall be allocated to each  
8 request in the proportion that the particular request bears to  
9 the total requests of the particular category.

10 6. Additional Voluntary Subscriptions. If subscrip-  
11 tions available to meet the requests of Exchangees are insuffi-  
12 cient to meet all requests, additional voluntary subscriptions  
13 may be solicited and received from parties by the Watermaster.  
14 Such additional subscriptions shall be allocated first to  
15 Category (a) requests to the extent unfilled, and next to  
16 Category (b) requests to the extent unfilled. All allocations  
17 are to be otherwise in the same manner as earlier provided in  
18 paragraph 5 (a) through 5 (e) inclusive.

19 7. Effect if Category (a) Requests Exceed Available  
20 Subscriptions, Both Required and Voluntary. In the event that  
21 the quantity of subscriptions available to fill Category (a)  
22 requests is less than the total quantity of such requests, the  
23 Exchangees may, nonetheless, extract the full amount of their  
24 Category (a) requests otherwise approved by the Watermaster as if  
25 sufficient subscriptions were available. The amounts received by  
26 the Watermaster on account of that portion of the approved  
27 requests in excess of the total quantities available from  
28 Exchangors shall either be paid by the Watermaster to Central &

1 West Basin Water Replenishment District in trust for the purpose  
2 of purchasing imported water and spreading the same in Central  
3 Basin for replenishment thereof, or credited to an account of  
4 said Plaintiff District on the books of the Watermaster, at the  
5 option of said Plaintiff District. Thereafter said Plaintiff  
6 District may, at any time, withdraw said funds or any part  
7 thereof so credited in trust for the aforesaid purpose, or may by  
8 the 40th day of any Administrative year notify the Watermaster  
9 that it desires all or any portion of said funds to be expended  
10 by the Watermaster for the purchase of water available from  
11 subscriptions by Exchangors in the event the total quantity of  
12 such subscriptions exceeds the total quantity of approved  
13 requests by parties to purchase Exchange Pool water. To the  
14 extent that there is such an excess of available subscriptions  
15 over requests and to the extent that the existing credit in favor  
16 of Plaintiff District is sufficient to purchase such excess  
17 quantity at the price established for Exchange Pool purchases  
18 during that Administrative year, the account of the Plaintiff  
19 District shall be debited and the money shall be paid to the  
20 Exchangors in the same manner as if another party had made such  
21 purchase as an Exchangee. The Plaintiff District shall not  
22 extract any such Exchange Pool water so purchased.

23 8. Additional Pumping by Exchangees Pursuant to  
24 Exchange Pool Provisions. An Exchangee may extract from Central  
25 Basin in addition to its Allowed Pumping Allocation for a  
26 particular Administrative year that quantity of water which it  
27 has requested to purchase from the Exchange Pool during that  
28 Administrative year and which has been allocated to it pursuant

1 to the provisions of paragraphs 5, 6 and 7. The first pumping by  
2 an Exchangee in any Administrative year shall be deemed to be  
3 pumping of the party's allocation of Exchange Pool water.

4 9. Reduction in Pumping by Exchangors. Each Exchangor  
5 shall in each Administrative year reduce its extractions of water  
6 from Central Basin below its Allowed Pumping Allocation for the  
7 particular year in a quantity equal to the quantity of Exchange  
8 Pool requests allocated to it pursuant to the provisions of  
9 paragraphs 4, 5, 6 and 7 of this Subpart C.

10 10. Price to be Paid for Exchange Pool Water. The  
11 price to be paid by Exchangees and to be paid to Exchangors per  
12 acre foot for required and voluntary subscriptions of Exchangors  
13 utilized to fill requests on the Exchange Pool by Exchangees  
14 shall be the dollar amount computed as follows by the Watermaster  
15 for each Administrative year. The "normal" price as of the  
16 beginning of the Administrative year charged by Central Basin  
17 Municipal Water District (CBMWD) for treated MWD (Metropolitan  
18 Water District of Southern California) water used for domestic  
19 and municipal purposes shall be determined, and if on that date  
20 there are any changes scheduled during that Administrative year  
21 in CBMWD's "normal" price for such category of water, the  
22 weighted daily "normal" CBMWD price shall be determined and used  
23 in lieu of the beginning such price; and there shall be deducted  
24 from such beginning or weighted price, as the case may be, the  
25 "incremental cost of pumping water in Central Basin" at the  
26 beginning of the Administrative year and any then current rate or  
27 rates, of assessments levied on the pumping of ground water in  
28 Central Basin by Plaintiff District and any other governmental

1 agency. The "normal" price charged by CBMWD shall be the highest  
2 price of CBMWD for normal service excluding any surcharge or  
3 higher rate for emergency deliveries or otherwise failing to  
4 comply with CBMWD rates and regulations relating to earlier  
5 deliveries. The "incremental cost of pumping water in Central  
6 Basin" as of the beginning of the Administrative year shall be  
7 deemed to be the Southern California Edison Company Schedule No.  
8 PA-1 rate per kilowatt-hour, including all adjustments and all  
9 uniform authorized additions to the basic rate, multiplied by 560  
10 kilowatt-hours per acre-foot, rounded to the nearest dollar  
11 (which number of kilowatt-hours has been determined to represent  
12 the average energy consumption to pump an acre-foot of water in  
13 Central Basin). In applying said PA-1 rate the charge per  
14 kilowatt-hour under the schedule shall be employed and if there  
15 are any rate blocks then the last rate block shall be employed.  
16 Should a change occur in Edison schedule designations, the  
17 Watermaster shall employ that applicable to motors used for  
18 pumping water by municipal utilities.

19 11. Carry-over of Exchange Pool Purchases by  
20 Exchangees. An Exchangee who does not extract from Central Basin  
21 in a particular Administrative year a quantity of water equal to  
22 the total of (a) its Allowed Pumping Allocation for that  
23 particular Administrative year, reduced by any authorized amount  
24 of carry-over into the next succeeding Administrative year  
25 pursuant to the provisions of Subpart A of Part III of this  
26 judgment, and (b) the quantity that it purchased from the  
27 Exchange Pool for that particular Administrative year, may carry  
28 over into the next succeeding Administrative year the right to

1 extract from Central Basin a quantity equal to the difference  
2 between said total and the quantity actually extracted in that  
3 Administrative year, but not exceeding the quantity purchased  
4 from the Exchange Pool for that Administrative year. Any such  
5 carry-over shall be in addition to that provided in said Subpart  
6 A of Part III.

7 If the 'Basinwide Average Exchange Pool Price' in  
8 the next succeeding Administrative year exceeds the 'Exchange  
9 Pool Price' in the previous Administrative year any such  
10 Exchangee exercising such carry-over rights hereinabove provided  
11 shall pay to the Watermaster, forthwith upon the determination of  
12 the 'Exchange Pool Price' in said succeeding Administrative year,  
13 and as a condition to such carry-over rights, an additional  
14 amount determined by multiplying the number of acre feet of  
15 carry-over by the difference in 'Exchange Pool Price' as between  
16 the two Administrative years. Such additional payment shall be  
17 miscellaneous income to the Watermaster which shall be applied by  
18 him against that share of the Watermaster's budget to be paid by  
19 the parties to this Agreement for the second Administrative year  
20 succeeding that in which the Exchange Pool water was so  
21 purchased.

22 12. Notification by Watermaster to Exchangors and  
23 Exchangees of Exchange Pool Requests and Allocations Thereof and  
24 Price of Exchange Pool Water. Not later than the 65th day after  
25 the commencement of each Administrative year, the Watermaster  
26 shall determine and notify all Exchangors and Exchangees of the  
27 total of the allocated requests for Exchange Pool water and shall  
28 provide a schedule divided into categories of requests showing

1 the quantity allocated to each Exchangee and a schedule of the  
2 allocation of the total Exchange Pool requirements among the  
3 Exchangors. Such notification shall also advise Exchangors and  
4 Exchangees of the prices to be paid to Exchangors for  
5 subscriptions utilized and the Exchange Pool Price for that  
6 Administrative year as determined by the Watermaster. The  
7 determinations of the Watermaster in this regard shall be subject  
8 to review by the Court in accordance with the procedure set forth  
9 in Part II of this judgment.

10 13. Payment by Exchangees. Each Exchangee shall, on  
11 or prior to last day of the third month of each Administrative  
12 year, pay to the Watermaster one-quarter of said price per acre-  
13 foot multiplied by the number of acre feet of such party's  
14 approved request and shall, on or before the last day of each of  
15 the next succeeding three months, pay a like sum to the  
16 Watermaster. Such amounts must be paid by each Exchangee  
17 regardless of whether or not it in fact extracts or uses any of  
18 the water it has requested to purchase from the Exchange Pool.

19 14. Payments to Exchangors. As soon as possible after  
20 receipt of moneys from Exchangees, the Watermaster shall remit to  
21 the Exchangors their prorata portions of the amount so received  
22 in accordance with the provisions of paragraph 10 above.

23 15. Delinquent Payments. Any amounts not paid on or  
24 prior to any due date above shall carry interest at the rate of  
25 1% per month or any part of a month. Any amounts required to be  
26 so paid may be enforced by the equitable powers of the Court,  
27 including, but not limited to, the injunctive process of the  
28 Court. In addition thereto, the Watermaster, as Trustee for the

1 Exchangors, may enforce such payment by any appropriate legal  
2 action, and shall be entitled to recover as additional damages  
3 reasonable attorneys' fees incurred in connection therewith. If  
4 any Exchangee shall fail to make any payments required of it on  
5 or before 30 days after the last payment is due, including any  
6 accrued interest, said party shall thenceforward not be entitled  
7 to purchase water from the Exchange Pool in any succeeding  
8 Administrative year except upon order of the Court, upon such  
9 conditions as the Court may impose.

10 IV. CONTINUING JURISDICTION OF THE COURT.

11 The Court hereby reserves continuing jurisdiction and  
12 upon application of any interested party, or upon its own motion,  
13 may review and redetermine the following matters and any matters  
14 incident thereto:

15 (a) Its determination of the permissible level of  
16 extractions from Central Basin in relation to achieving a  
17 balanced basin and an economic utilization of Central Basin for  
18 ground water storage, taking into account any then anticipated  
19 artificial replenishment of Central Basin by governmental  
20 agencies for the purpose of alleviating what would otherwise be  
21 annual overdrafts upon Central Basin and all other relevant  
22 factors.

23 (b) Whether in accordance with applicable law any  
24 party has lost all or any portion of his rights to extract ground  
25 water from Central Basin and, if so, to ratably adjust the  
26 Allowed Pumping Allocations of the other parties and ratably  
27 thereto any remaining Allowed Pumping Allocation of such party.  
28

1 (c) To remove any Watermaster appointed from time to  
2 time and appoint a new Watermaster; and to review and revise the  
3 duties, powers and responsibilities of the Watermaster and to  
4 make such other and further provisions and orders of the Court  
5 that may be necessary or desirable for the adequate admini-  
6 stration and enforcement of the judgment.

7 (d) To revise the price to be paid by Exchangees and  
8 to Exchangors for Exchange Pool purchases and subscriptions.

9 (e) In case of emergency or necessity, to permit  
10 extractions from Central Basin for such periods as the Court may  
11 determine: (i) ratably in excess of the Allowed Pumping  
12 Allocations of the parties; or (ii) on a non-ratable basis by  
13 certain parties if either compensation or other equitable  
14 adjustment for the benefit of the other parties is provided.  
15 Such overextractions may be permitted not only for emergency and  
16 necessity arising within Central Basin area, but to assist the  
17 remainder of the areas within The Metropolitan Water District of  
18 Southern California in the event of temporary shortage or  
19 threatened temporary shortage of its imported water supply, or  
20 temporary inability to deliver the same throughout its area, but  
21 only if the court is reasonably satisfied that no party will be  
22 irreparably damaged thereby. Increased energy cost for pumping  
23 shall not be deemed irreparable damage. Provided, however, that  
24 the provisions of this subparagraph will apply only if the  
25 temporary shortage, threatened temporary shortage, or temporary  
26 inability to deliver was either not reasonably avoidable by the  
27 Metropolitan Water District, or if reasonably avoidable, good  
28 reason existed for not taking the steps necessary to avoid it.

1 (f) To review actions of the Watermaster.

2 (g) To assist the remainder of the areas within The  
3 Metropolitan Water District of Southern California within the  
4 parameter set forth in subparagraph (e) above.

5 (h) To provide for such other matters as are not  
6 contemplated by the judgment and which might occur in the future,  
7 and which if not provided for would defeat any or all of the  
8 purposes of this judgment to assure a balanced Central Basin  
9 subject to the requirements of Central Basin Area for water  
10 required for its needs, growth and development.

11 The exercise of such continuing jurisdiction shall be  
12 after 30 days notice to the parties, with the exception of the  
13 exercise of such continuing jurisdiction in relation to  
14 subparagraphs (e) and (g) above, which may be ex parte, in which  
15 event the matter shall be forthwith reviewed either upon the  
16 Court's own motion or the motion of any party upon which 30 days  
17 notice shall be so given. Within ten (10) days of obtaining any  
18 ex parte order, the party so obtaining the same shall mail notice  
19 thereof to the other parties. If any other party desires Court  
20 review thereof, the party obtaining the ex parte order shall bear  
21 the reasonable expenses of mailing notice of the proceedings, or  
22 may in lieu thereof undertake the mailing. Any contrary or  
23 modified decision upon such review shall not prejudice any party  
24 who relied on said ex parte order.

25 V. GENERAL PROVISIONS.

26 1. Judgment Constitutes Inter Se Adjudication. This  
27 judgment constitutes an inter se adjudication of the respective  
28 rights of all parties, except as may be otherwise specifically

1 indicated in the listing of the rights of the parties at pages 12  
2 through 52 of this judgment, or in Appendix "2" hereof.

3 2. Assignment, Transfer, Etc., of Rights. Subject to  
4 the other provision of this judgment, and any rules and  
5 regulations of the Watermaster requiring reports relative  
6 thereto, nothing herein contained shall be deemed to prevent any  
7 party hereto from assigning, transferring, licensing or leasing  
8 all or any portion of such water rights as it may have with the  
9 same force and effect as would otherwise be permissible under  
10 applicable rules of law as exist from time to time.

11 3. Service Upon and Delivery to Parties of Various  
12 Papers. Service of the judgment on those parties who have  
13 executed that certain Stipulation and Agreement for Judgment or  
14 who have filed a notice of election to be bound by the Exchange  
15 Pool provisions shall be made by first class mail, postage  
16 prepaid, addressed to the designee and at the address designated  
17 for that purpose in the executed and filed Counterpart of the  
18 Stipulation and Agreement for Judgment or in the executed and  
19 filed "Notice of Election to be Bound by Exchange Pool  
20 Provisions", as the case may be, or in any substitute designation  
21 filed with the Court.

22 Each party who has not heretofore made such a  
23 designation shall, within 30 days after the judgment shall have  
24 been served upon that party, file with the Court, with proof of  
25 service of a copy upon the Watermaster, a written designation of  
26 the person to whom and the address at which all future notices,  
27 determinations, requests, demands, objections, reports and other  
28

1 papers and processes to be served upon that party or delivered to  
2 that party are to be so served or delivered.

3 A later substitute designation filed and served in the  
4 same manner by any party shall be effective from the date of  
5 filing as to the then future notices, determinations, requests,  
6 demands, objections, reports and other papers and processes to be  
7 served upon or delivered to that party.

8 Delivery to or service upon any party by the  
9 Watermaster, by any other party, or by the Court, or any item  
10 required to be served upon or delivered to a party under or  
11 pursuant to the judgment may be by deposit in the mail, first  
12 class, postage prepaid, addressed to the designee and at the  
13 address in the latest designation filed by that party.

14 4. Judgment Does Not Affect Rights, Powers, Etc., of  
15 Plaintiff District. Nothing herein constitutes a determination  
16 or adjudication which shall foreclose Plaintiff District from  
17 exercising such rights, powers, privileges and prerogatives as it  
18 may now have or may hereafter have by reason of provisions of  
19 law.

20 5. Continuation of Order Under Interim Agreement. The  
21 order of Court made pursuant to the "Stipulation and Interim  
22 Agreement and Petition for Order" shall remain in effect through  
23 the water year in which this judgment shall become final (subject  
24 to the reserved jurisdiction of the Court).

25 6. Effect of: Extractions by Exchangees; Reductions  
26 in Extractions. With regard to Exchange Pool purchases, the  
27 first extractions by each Exchangee shall be deemed the  
28 extractions of the quantities of water which that party is

1 entitled to extract pursuant to his allocation from the Exchange  
2 Pool for that Administrative year. Each Exchangee shall be  
3 deemed to have pumped his Exchange Pool request so allocated for  
4 and on behalf of each Exchangor in proportion to each Exchangor's  
5 subscription to the Exchange Pool which is utilized to meet  
6 Exchange Pool requests. No Exchangor shall ever be deemed to  
7 have relinquished or lost any of its rights determined in this  
8 judgment by reason of allocated subscriptions to the Exchange  
9 Pool. Each Exchangee shall be responsible as between Exchangors  
10 and that Exchangee, for any tax or assessment upon the production  
11 of ground water levied for replenishment purposes by the Central  
12 and West Basin Water Replenishment District or by any other  
13 governmental agency with respect to water extracted by such  
14 Exchangee by reason of Exchange Pool allocations and purchases.  
15 No Exchangor or Exchangee shall acquire any additional rights,  
16 with respect to any party to this action, to extract waters from  
17 Central Basin pursuant to Water Code Section 1005.1 by reason of  
18 the obligations pursuant to and the operation of the Exchange  
19 Pool.

20 7. Judgment Binding on Successors, Etc. This judgment  
21 and all provisions thereof are applicable to and binding upon not  
22 only the parties to this action, but as well to their respective  
23 heirs, executors, administrators, successors, assigns, lessees,  
24 licensees and to the agents, employees and attorneys in fact of  
25 any such persons.

26 8. Costs. No party shall recover its costs herein as  
27 against any other party.  
28





## **Appendix I: MWD RUWMP Sections II & IV**

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**City of Lynwood 2010 Urban Water Management Plan**

# Planning for the Future

## 2

The purpose of this section is to show how Metropolitan plans to meet Southern California's water supply needs in the future. In its role as supplemental supplier to the Southern California water community, Metropolitan faces ongoing challenges in meeting the region's needs for water supply reliability and quality. Increased environmental regulations and competition for water from outside the region have resulted in changes in delivery patterns and timing of imported water supply availability. At the same time, the Colorado River watershed has experienced a protracted drought since 1999 while total water demand continues to rise within the region because of population and economic growth.

As described in the previous chapter, the water used in Southern California comes from a number of sources. About one-third comes from local sources, and the remainder is imported from three sources: the Colorado River, the Sacramento-San Joaquin River Delta (via the State Water Project), and the Owens Valley and Mono Basin (through the Los Angeles Aqueducts).<sup>1</sup>

Because of competing needs and uses associated with these resources, and because of concerns related to regional water operations, Metropolitan has undertaken a number of planning initiatives over the past fifteen years. This Regional Urban Water Management Plan summarizes these efforts, which include the Integrated Resources Plan (IRP), two IRP Updates, the Water Surplus and Drought Management Plan, the Water Supply Allocation Plan, and the Long-term Conservation Plan. Collectively, they provide a policy framework with guidelines and resource targets for Metropolitan to follow into the future.

While Metropolitan coordinates regional water supply planning for the region through its inclusive integrated planning processes, Metropolitan's member agencies also conduct their own planning analyses – including their own urban water management plans – and may develop projects independently of Metropolitan. Appendix A.5 shows a list of these potential local projects provided to Metropolitan by its member agencies.

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<sup>1</sup> Although the water from the Los Angeles Aqueduct is imported, Metropolitan considers it a local source because it is managed by the Los Angeles Department of Water and Power and not by Metropolitan.

## 2.1 Integrated Resource Planning

### *The 1996 IRP Process*

Acknowledging the importance of water to the economic and social well-being of Southern California, Metropolitan has gradually shifted roles from an exclusive supplier of imported water to a regional water planner working in collaboration with its member agencies. After the drought of 1987-1992, Metropolitan recognized the changed conditions and the need to develop a long-term water resources strategy to fulfill the agency's mission of providing a high-quality reliable water supply to its service area. This planning process that was undertaken is now known as the Integrated Resources Plan (IRP). The first IRP was adopted by Metropolitan's Board in 1996 and guided by six objectives established early in the process:

1. Ensuring Reliability
2. Ensuring Affordability
3. Ensuring Water Quality
4. Maintaining Diversity
5. Ensuring Flexibility
6. Acknowledging Environmental and Institutional Constraints.

One of the fundamental outcomes of the IRP was the recognition that regional water supply reliability could be achieved through the implementation of a diverse portfolio of resource investments and conservation measures. The resulting IRP strategy was a balance between demand management and supply augmentation. For example, in its dry year profile, the resource framework counted on almost equal proportion of water conservation and recycled water as withdrawal from storage and water transfers. The IRP also balanced between the use of local resources and imported supplies. In a dry year, about 55 percent of the region's water resources come from local resources and conservation. Additionally, through the IRP process Metropolitan found solutions that offer long-term reliability at the lowest possible cost to the region as a whole.

The 1996 IRP, as a blueprint to resource program implementation, also established the "Preferred Resource Mix that would provide the Metropolitan region with reliable and affordable water supplies through 2020.

The IRP provided details on the Preferred Resource Mix and guidelines to established broad resource targets for each of the major supplies available to the region including:

- Conservation
- Local Resources - Water Recycling, Groundwater Recovery and Desalination
- Colorado River Supplies and Transfers
- State Water Project Improvement
- In-Region Surface Reservoir Storage
- In-Region Groundwater Storage

### *The 2004 IRP Update*

In 2004, the Metropolitan Board adopted an updated IRP. Various legislative issues concerning population growth and water supply called for further planning considerations of these changed conditions. This IRP Update had three objectives:

1. Review the goals and achievements of the 1996 IRP
2. Identify the changed conditions for water resource development
3. Update resource development targets through 2025

The 2004 IRP process fulfilled the new objectives and updated the long-term plan to account for new water planning legislation. The updated plan contained resource development targets through 2025, which reflected changed conditions; particularly increased conservation savings, planned increases in local supplies and uncertainties. The 2004 IRP also explicitly recognized the need to handle uncertainties inherent in any planning process. For the water industry, some of these uncertainties are the level of population and economic growth which directly drive water demands, water quality regulations, new chemicals

found to be unhealthful, endangered species affecting sources of supplies, and periodic and new changes in climate and hydrology. As a result, a key component of the Updated Plan was the addition of a 10 percent planning buffer. The planning buffer provided for the identification of additional supplies, both imported and locally developed, that can be implemented to address uncertainty in future supplies and demands.

### ***2010 Integrated Water Resources Plan Update***

Metropolitan and its member agencies face increasing uncertainties and challenges as they plan for future water supplies. The 1996 and 2004 IRP resource strategies emphasized the need for a diverse and adaptable water supply strategy to cope with changing circumstances and conditions. Recent history and events have highlighted several emerging trends that need to be addressed in the context of the region's water supply planning and reliability. These trends cover a wide range of considerations including climate change, energy use and greenhouse gas emissions, endangered species protection and conveyance needs in the Sacramento-San Joaquin River Delta system. These trends point strongly to the importance of updating the region's Integrated Resources Plan, and to the need to solidify adaptive strategies to address additional challenges into the long-term future.

The basic objectives of the current IRP process are to:

1. Review the achievements of the 1996 IRP and the 2004 Update
2. Identify changing conditions affecting water resource development
  - Attention will be given to emerging factors and considerations, such as the current drought, climate change, energy use, and changes in Delta pumping operations

3. Update resource development targets through 2030
  - Discussion will focus on adaptation to future uncertainties, and potential alternatives for further diversifying Metropolitan's water resource portfolio and increasing supply reliability in the face of changing circumstances

### ***Public Process***

The current IRP Update process has sought input from member agencies, retail water agencies, other water and wastewater managers, environmental, business and community interests. In the fall of 2008, Metropolitan's senior management, Board of directors, member agency managers, elected officials, and community groups collectively discussed strategic direction and regional water solutions at a series of four stakeholder forums; nearly 600 stakeholders participated in the forums.

Similar types of ideas and issues were raised by the participants at all the forums, emphasizing the importance of local resources development and resolving issues with the Delta. Participants suggested that Metropolitan should take a leadership position in several areas including:

- Providing outreach to legislators concerning needs for water supply reliability and quality improvements
- Developing brine lines to enhance recycled water use
- Fostering partnerships with energy utilities
- Building relationships with environmental community
- Participating in research and development of new technologies
- Providing assistance to retail agencies in designing "correct" tiered rate structures

### *Technical Workgroup Process*

Following the stakeholder forums, Metropolitan embarked upon a Technical Workgroup Process to further explore some of the issues and opportunities identified by forum participants. To facilitate the workgroup process, the technical discussions were grouped into six resource areas:

- Conservation
- Graywater
- Groundwater
- Recycled water
- Stormwater / Urban Runoff
- Seawater Desalination

The Technical Workgroup process provided a forum for review of the issues associated with each area, and in-depth discussions with area experts. The workgroups included member agency and retail agency staff, other non-governmental organizations, and staff from wastewater and stormwater management agencies, as well as Metropolitan staff and consultants.

### *Strategic Policy Review*

As part of the current IRP update process, Metropolitan's Board initiated a Strategic Policy Review. This Review examined the ramifications of alternative roles for Metropolitan, member agencies and local retail agencies in future development of water resources. The process explored three alternative policy cases:

1. Current approach – continuation of IRP policies and partnerships with member agencies
2. Imported focus – Metropolitan focuses on addressing Delta issues, imported supplies and water transfers and leaves local supply development entirely to member agencies
3. Enhanced Regional focus – Metropolitan examines new approaches, up to and including development and ownership for implementing large regional scale water

recycling, groundwater recharge and seawater desalination

A study of water supply reliability and cost impacts associated with these approaches found that it is in the region's best interest for Metropolitan to continue to explore ways of increasing regional reliability and not limiting itself to singular areas like addressing Delta issues. The study results under this process was a broader view of Metropolitan's role in comprehensive planning and implementation for regional reliability; adopting an adaptive resource development plan for the future may provide the most benefit for the region. In this adaptive approach, Metropolitan may need to take on an enhanced role in local supply development, in order to best adapt and respond to changing regional conditions and lay a solid foundation for future reliability. This role could include the creation of partnership with local agencies or Metropolitan's direct ownership of local projects to ensure regional reliability. The adaptive approach would be incorporated into the 2010 IRP for Board consideration.

### *Uncertainty Analysis*

A major component of the current IRP update effort is to explicitly reflect uncertainty in Metropolitan's future water management environment. This involves evaluating a wider range of water management strategies, and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, will be incorporated in to the update and accounted for. A key evolution from the 2004 IRP will be the identification of vulnerabilities and contingency actions that will extend the concept of a Planning Buffer into tangible actions that will enable construction and implementation of contingency supplies if they are needed.

### *Adaptive Planning Implementation*

Regional water supply reliability largely depends on Metropolitan’s preparedness to adapt to supply uncertainties. An adaptive management approach was utilized in developing a strategy that will prepare the region to deal with unforeseen supply shortages. An important step in this approach is identifying where additional water supply will come from. Four local water sources were considered:

- Stormwater
- Recycled Water
- Graywater
- Seawater

The stakeholder groups established during the IRP process evaluated the viability of using one or more of these resources to supplement existing water supply in the region. The stakeholders (e.g., member agencies, retail agencies, and industry experts) gathered important information on each resource such as regional development status, yield potential, and implementation challenges.

Another key aspect of this strategy is determining what actions are required to eliminate or mitigate the implementation challenges in developing these resources. The adaptive approach essentially provides a blueprint on how to address these challenges and develop supply within each resource.

The most important aspect of this strategy is the adaptive management approach used in responding to potential water supply shortage. The implementation elements identified within each blueprint can be executed at varying levels of urgency. Under the adaptive approach, Metropolitan developed three alternative implementation schedules for each resource:

- Status Quo
- Proactive
- Aggressive

Status Quo entails delaying action until a trigger is met. A trigger sets the point in time at which a potential shortage is identified and when deliberate action is taken to mitigate that shortage. The Proactive schedule implements low-risk actions early-on regardless of whether a trigger occurs. Implementing these low-risk actions shortens the overall time required to complete the implementation schedule. The Aggressive option implements both low-risk and medium-to-high risk actions that may require significant investment (e.g. land acquisition). By initiating these actions early-on, the overall implementation time can be shortened significantly. Table 2-1 highlights the differences between each schedule.

**Table 2-1  
Schedule Options**

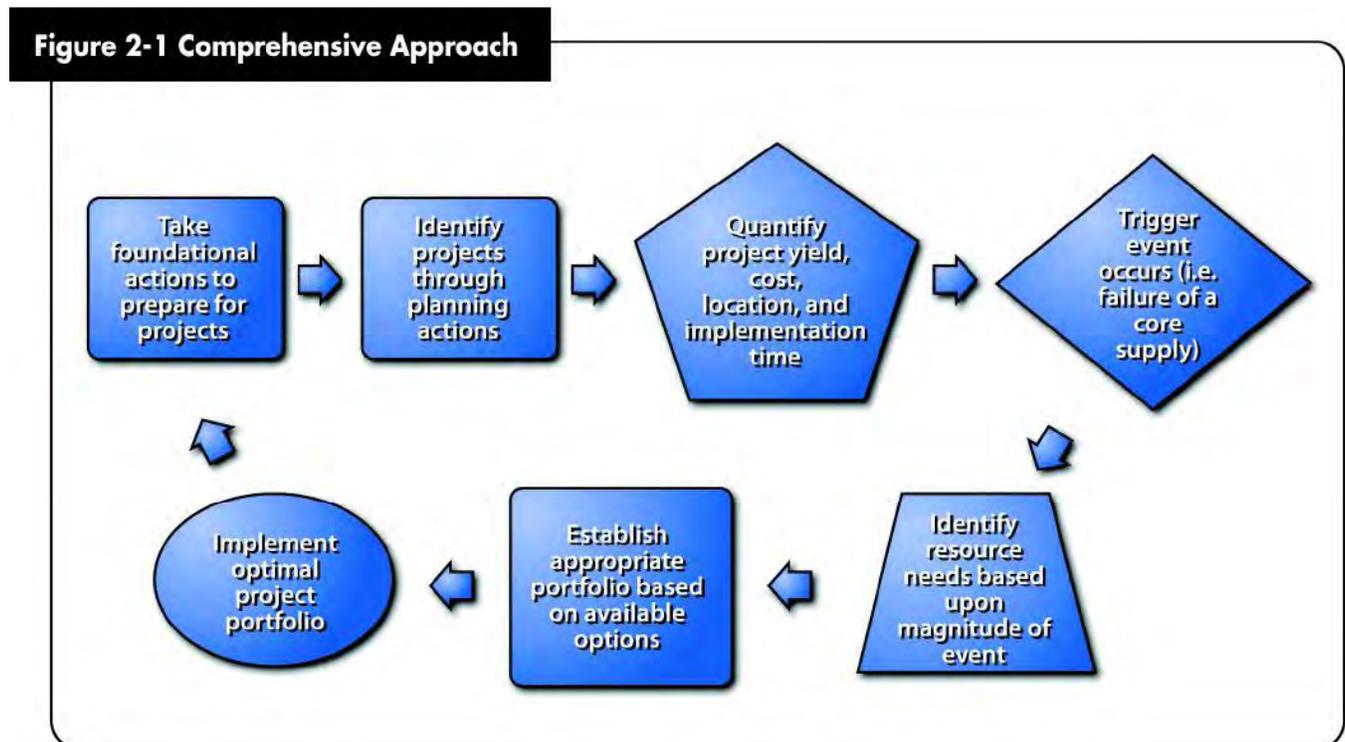
Schedule Option	Brief Description	Timeframe from Trigger to Production Yield	Financial Risk
Status Quo	Delay action until the adaptive management trigger occurs	Long	Low
Proactive	Begin planning actions (generally lower cost) before the adaptive management trigger occurs	Medium	Medium
Aggressive	Perform project implementation actions, such as land acquisition, before the adaptive management trigger occurs	Short	High

This strategy also utilizes an adaptive approach for determining an optimal project mix, or portfolio, used to meet a supply gap. The portfolio can comprise of projects from any of the four resources. Project drivers such as cost, yield, implementation time, and location of the project will be used to create customized portfolios that could address specific needs. For example, if a water supply shortage is occurring in a specific area, the portfolio could contain projects that serve that area. Another example might entail selecting projects that have the shortest implementation time in order to expedite supply development. Yet another example might involve selecting the most cost-efficient projects (\$/AF) regardless of implementation time or location if minimizing costs is of highest priority. Furthermore, the number of projects within a portfolio is scalable based on the level of shortage at hand. This comprehensive approach is illustrated in Figure 2-1.

Metropolitan’s adaptive approach is basically organized into four individual sections referred to as Foundational Studies.

These individual studies discuss in detail the implementation challenges and recommended action for each resource. The first step in developing planning actions is categorizing the implementation challenges within each resource. In most cases the categories represent common themes such as establishing funding projects (Funding) or garnering legislative support (Legislative). The next step in developing planning actions is identifying implementation elements that mitigate the implementation challenges. This step involves identifying specific actions that are needed to support each implementation element. The last step in this process is developing of timelines and implementation schedules. Three alternative implementation schedules are developed for each resource.

Tables 2-2 through 2-5 summarize the categories and implementation elements for each resource. Detailed actions and schedules can be found in the foundational studies.



**Table 2-2  
Stormwater Issue Categories and Implementation Elements**

Category	Implementation Element
Data Management	Regional Water Supply Project Database
Legislative/Regulatory/Education	Regional Synergy Task Force
Procedural	Regional Implementation Partnerships
Technical	Regional Feasibility Study
Funding	Funding Strategy Plan
Operational	Local Resource Baseline Plan
Implementation Planning	Alternatives Analysis Plan
Project Implementation	Incentive Programs Land Acquisition Advanced Planning Design Construction
Post Construction	O&M Performance Monitoring

**Table 2-3  
Recycled Water Issue Categories and Implementation Elements**

Category	Implementation Element
Public Perception	Recycled Marketing Campaign Recycled Water Educational Campaign
Legislative	Recycled Water Legislative Task Force
Funding	Regional Recycled Water Finance Committee
Procedural	Regional Recycled Water Permitting and Inspection JPA Regional Recycled Water Policy Task Force
Operational	Regional Salt Management Plan Regional Basin Management Plan Recycled Water Blue Ribbon Panel (SWRCB) Regional Recycled Water Facility Plan
Facility	Regional Project (CIP) Implementation Joint Groundwater Replenishment Project

**Table 2-4  
Graywater Issue Categories and Implementation Elements**

Category	Implementation Element
Public Perception	Graywater Marketing Campaign Graywater Educational Campaign
Legislative	Graywater Legislative Task Force
Technical	Regional Graywater Feasibility Study
Funding	Regional Graywater Finance Committee
Procedural	Regional Graywater Permitting and Inspection Regional Graywater Policy Task Force
Operational	Regional Graywater Management Plan
Construction	Regional Project Implementation

**Table 2-5  
Desalination Issue Categories and Implementation Elements**

Category	Implementation Element
Data Management	Regional Water Supply Project Database
Legislative/Regulatory/Education	Regional Synergy Task Force
Procedural	Regional Implementation Partnerships
Technical	Regional Feasibility Study
Funding	Funding Strategy Plan
Operational	Local Resource Baseline Plan
Project Implementation	Incentive Programs Alternatives Analysis Plan Land Acquisition Advanced Planning Design Construction
Post Construction	O&M Performance Monitoring

Innovative approaches are critical to meeting the water supply needs of Southern California. Maintaining reliable water supplies given regulatory uncertainty, competing uses of groundwater and surface water, and overall variability in water supply is a growing

challenge. An adaptive regional approach that develop, promote, and practice integrated regional water management of both traditional and emerging supplies may be the key to continued regional reliability.

## 2.2 Evaluating Supply Reliability

The Urban Water Management Plan Act requires that three basic planning analyses be conducted to evaluate supply reliability. The first is a water supply reliability assessment requiring development of a detailed evaluation of the supplies necessary to meet projected demands over at least a 20-year period. This analysis is to consider average, single-year and multi-year drought conditions. The second is a water shortage contingency plan which documents the actions that would be implemented in addressing up to a 50 percent reduction in an agency's supplies. Finally, a plan must be developed specifying the steps that would be taken under a catastrophic interruption in water supplies.

To address these three requirements, Metropolitan developed estimates of future demands and supplies from local sources and from Metropolitan. Supply and demand analyses for the single- and multi-year drought cases were based on conditions affecting the SWP. For this supply source, the single driest year was 1977 and the three-year dry period was 1990-1992. The SWP is the appropriate point of reference for these analyses since it is Metropolitan's largest and most variable supply. For the "average" year analysis 83 years of historic hydrology (1922-2004) were used to estimate supply and demand.

### *Estimating Demands on Metropolitan*

Metropolitan developed its demand forecast by first estimating total retail demands for its service area and then factoring out water savings attributed to conservation.<sup>2</sup> Projections of local supplies then were derived using data on current and expected local supply programs and the IRP Local Resource Program Target. The resulting difference between total demands net of conservation and local supplies is the expected regional demands on Metropolitan supplies. These various estimates are shown in

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<sup>2</sup> Information generated as part of this analysis are contained in Appendix A-1.

Tables 2-6 through 2-8. Major categories used in these tables are defined below.

### *Total Demands*

Total demand is the sum of retail demand for M&I and agricultural, seawater barrier demand, and replenishment demand. Total demand represents the total amount of water needed by the member agencies. Total demands include:

- Retail Municipal and Industrial (M&I) — Retail Municipal and Industrial (M&I) demands represent the full spectrum of urban water use within the region. These include residential, commercial, industrial, institutional and un-metered water uses. To forecast urban water demands Metropolitan used the MWD-MAIN Water Use Forecasting System (MWD-Main), consisting of econometric models that have been adapted for conditions in Southern California. The demographic and economic data used in developing these forecasts were taken from the Southern California Association of Government's (SCAG) 2007 Regional Transportation Plan and from the San Diego County Association of Government's (SANDAG) Series 12: 2050 Regional Growth Forecast (Feb 2010). The SCAG and SANDAG regional growth forecasts are the core assumptions that drive the estimating equations in Metropolitan's MWD-MAIN demand forecasting model. SCAG and SANDAG's projections undergo extensive local review and incorporate zoning information from city and county general plans and are backed by Environmental Impact Reports.

Impacts of potential annexation are not included in the demand projections for the 2010 RUWMP. However, Metropolitan's Review of Annexation Procedures concluded that the impacts of annexation within the service area beyond 2020 would not exceed 2 percent of overall demands.

- Retail Agricultural Demand — Retail agricultural demands consist of water use for irrigating crops. Member agencies estimate agricultural water use based on many factors, including farm acreage, crop types, historical water use, and land use conversion. Each member agency estimates their agricultural demand differently, depending on the availability of information. Metropolitan relies on member agencies' estimates of agricultural demands for the 2010 RUWMP
- Seawater Barrier Demand— Seawater barrier demands represent the amount of water needed to hold back seawater intrusion into the coastal groundwater basins. Groundwater management agencies determine the barrier requirements based on groundwater levels, injection wells, and regulatory permits.
- Replenishment Demand — Replenishment demands represent the amount of water member agencies plan to use to replenish their groundwater basins. For the 2010 RUWMP, replenishment deliveries are not included as part of firm demands.

### *Conservation Adjustment*

The conservation adjustment subtracts estimated conservation from total retail demand. The conservation estimates consist of three types:

- Code-Based Conservation — Water savings resulting from plumbing codes and other institutionalized water efficiency measures.
- Active Conservation — Water saved as a direct result of programs and practices directly funded by a water utility (e.g., measures outlined by the California Urban Water Conservation Council's "Best Management Practices"). Water savings from active conservation currently completed will decline to zero as the lifetime of those devices is reached. This will be offset by an increase in water savings for those devices that are

mandated by law, plumbing codes or other efficiency standards.

- Price Effect Conservation — Reductions in customer use attributable to changes in the real (inflation adjusted) cost of water.

### *Water Use Reduction Target*

On November 10, 2009, the state Legislature passed Senate Bill 7 as part of the Seventh Extraordinary Session, referred to as SBX7-7. This new law is the water conservation component of the historic Delta legislative package, and seeks to achieve a 20 percent statewide reduction in urban per capita water use in California by December 31, 2020. According to Water Code §10608.36, wholesale agencies are required to include in their UWMPs an assessment of present and proposed future measures, programs, and policies that would help achieve the water use reductions required under SBX7-7. Urban wholesale water suppliers are not required to comply with the target-setting and reporting requirements of SBX7-7. Additional discussion of the water reduction target is included in Section 3.7.

Based on Metropolitan's analysis of population and demand and the methodologies for setting targets described in the legislation, compliance with 20x2020 on an individual agency basis throughout the region would result in reduced potable demand of 380 TAF in 2020 through additional conservation and/or recycling. This estimated amount is reflected in the projected demand tables under 20x2020 Retail Compliance.

### *Local Supplies*

Local supplies represent a spectrum of water produced by the member agencies to meet their total demands. Local supplies are a key component in determining how much Metropolitan supply is needed to supplement member agencies local supplies to meet their total demand. Projections of local supplies relied on information gathered from a number of sources including past urban water management plans, Metropolitan's annual local production surveys, and

communications between Metropolitan and member agency staff. Local supplies include:

- Groundwater and Surface Water — Groundwater production consists of extractions from local groundwater basins. Surface water comes from stream diversions and rainwater captured in reservoirs.
- The Los Angeles Aqueduct — A major source of imported water is conveyed from the Owens Valley via the Los Angeles Aqueduct (LAA) by LADWP. Although LADWP imports water from outside of Metropolitan's service area, Metropolitan classifies water provided by the LAA as a local resource because it is developed and controlled by a local agency.
- Seawater desalination — Seawater desalinated for potable use.
- Groundwater Recovery and Recycled Water — Locally developed and operated, groundwater recovery projects treat contaminated groundwater to meet potable use standards. Recycled water projects recycle wastewater for municipal and industrial use.
- Non-Metropolitan Imports — Water supplies imported by member agencies from sources outside of the Metropolitan service area.

The local supply projections presented in demand tables include existing projects that are currently producing water and projects that are under construction. Appendix A.5 contains a complete list of existing, under construction, fully designed with appropriated funds, feasibility, and conceptual projects that are within the service area.

### *Firm Demands*

After calculating the expected regional demands on Metropolitan supplies, projected firm demands were calculated based on Metropolitan's established reliability goal. For the purposes of reliability planning, the 1996 IRP established a reliability goal that states that full service demands at the retail level would be satisfied under all "foreseeable hydrologic" conditions through 2020. This principle has been retained in the current update.

This goal allows for intermittent interruptions to non-firm, discounted rate supplies sold under the Replenishment and Interim Agricultural Water Programs. Thus, firm demand on Metropolitan equals Full Service demands (Tier I and Tier II). For the purpose of analysis, "foreseeable hydrologic conditions" is understood to mean under "historical hydrology," which presently covers the range of historical hydrology spanning the years 1922 through 2004. Tables 2-6 through 2-8 show estimates of firm demands on Metropolitan for single dry-year, multiple dry-year, and average year.

**Table 2-6**  
**Metropolitan Regional Water Demands**  
**Single Dry Year**  
**(Acre-Feet)**

	2015	2020	2025	2030	2035
<b>A. Total Demands<sup>1</sup></b>	<b>5,480,000</b>	<b>5,662,000</b>	<b>5,804,000</b>	<b>5,961,000</b>	<b>6,101,000</b>
Retail Municipal and Industrial	5,000,000	5,194,000	5,354,000	5,515,000	5,653,000
Retail Agricultural	231,000	213,000	193,000	186,000	186,000
Seawater Barrier	71,000	72,000	72,000	72,000	72,000
Groundwater Replenishment	177,000	184,000	186,000	188,000	191,000
<b>B. Total Conservation</b>	<b>936,000</b>	<b>967,000</b>	<b>1,033,000</b>	<b>1,096,000</b>	<b>1,156,000</b>
Existing Active (through 2009) <sup>2</sup>	97,000	46,000	16,000	2,000	0
Code-based and Price-Effect	589,000	671,000	766,000	844,000	906,000
Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
<b>C. SBx7-7 Water Conservation</b>	<b>190,000</b>	<b>380,000</b>	<b>380,000</b>	<b>380,000</b>	<b>380,000</b>
20% by 2020 Retail-Level Compliance	190,000	380,000	380,000	380,000	380,000
<b>D. Total Local Supplies</b>	<b>2,260,000</b>	<b>2,322,000</b>	<b>2,366,000</b>	<b>2,405,000</b>	<b>2,419,000</b>
Groundwater	1,457,000	1,395,000	1,407,000	1,423,000	1,416,000
Surface Water	98,000	97,000	97,000	97,000	97,000
Los Angeles Aqueduct	66,000	66,000	66,000	66,000	66,000
Groundwater Recovery	101,000	108,000	114,000	120,000	126,000
Total Recycling	348,000	375,000	394,000	410,000	426,000
Other Imported Supplies	190,000	281,000	288,000	288,000	288,000
<b>E. Total Metropolitan Demands (E=A-B-C-D)</b>	<b>2,094,000</b>	<b>1,993,000</b>	<b>2,025,000</b>	<b>2,080,000</b>	<b>2,146,000</b>
Full Service (Tier I and Tier II)	1,991,000	1,889,000	1,921,000	1,974,000	2,039,000
Replenishment Service <sup>3</sup>	103,000	103,000	104,000	106,000	107,000
Interim Agricultural Water Program <sup>4</sup>	0	0	0	0	0
<b>3 Firm Demands on Metropolitan<sup>5</sup></b>	<b>1,991,000</b>	<b>1,889,000</b>	<b>1,921,000</b>	<b>1,974,000</b>	<b>2,039,000</b>

Notes:

All units are acre-feet unless specified, rounded the nearest thousand.

Totals may not sum due to rounding.

<sup>1</sup> Growth projections are based on SCAG 2007 Regional Transportation Plan and SANDAG Series 12 2050 Regional Growth Forecast (Feb 2010).

<sup>2</sup> Includes code-based, price-effect and existing active savings through 2009; does not include future active conservation savings. 1990 is base year.

<sup>3</sup> Replenishment Service as defined in MWD Administrative Code Section 4114. Replenishment service includes direct and in-lieu replenishment.

<sup>4</sup> IAWP deliveries will be phased out by 2013.

<sup>5</sup> Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands.

**Table 2-7**  
**Metropolitan Regional Water Demands**  
**Multiple Dry Year**  
**(Acre-Feet)**

	2015	2020	2025	2030	2035
<b>A. Total Demands<sup>1</sup></b>	<b>5,478,000</b>	<b>5,702,000</b>	<b>5,862,000</b>	<b>6,017,000</b>	<b>6,161,000</b>
Retail Municipal and Industrial	5,004,000	5,232,000	5,409,000	5,572,000	5,715,000
Retail Agricultural	231,000	214,000	195,000	185,000	184,000
Seawater Barrier	71,000	71,000	72,000	72,000	72,000
Groundwater Replenishment	172,000	184,000	187,000	188,000	190,000
<b>B. Total Conservation</b>	<b>936,000</b>	<b>967,000</b>	<b>1,033,000</b>	<b>1,096,000</b>	<b>1,156,000</b>
Existing Active (through 2009) <sup>2</sup>	97,000	46,000	16,000	2,000	0
Code-based and Price-Effect	589,000	671,000	766,000	844,000	906,000
Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
<b>C. SBx7-7 Water Conservation</b>	<b>190,000</b>	<b>380,000</b>	<b>380,000</b>	<b>380,000</b>	<b>380,000</b>
20% by 2020 Retail-Level Compliance	190,000	380,000	380,000	380,000	380,000
<b>D. Total Local Supplies</b>	<b>2,171,000</b>	<b>2,305,000</b>	<b>2,343,000</b>	<b>2,378,000</b>	<b>2,402,000</b>
Groundwater	1,386,000	1,389,000	1,389,000	1,397,000	1,396,000
Surface Water	91,000	91,000	91,000	91,000	91,000
Los Angeles Aqueduct	63,000	67,000	71,000	75,000	78,000
Groundwater Recovery	100,000	107,000	113,000	119,000	125,000
Total Recycling	340,000	370,000	390,000	407,000	423,000
Other Imported Supplies	191,000	282,000	288,000	288,000	288,000
<b>E. Total Metropolitan Demands (E=A-B-C-D)</b>	<b>2,154,000</b>	<b>2,049,000</b>	<b>2,106,000</b>	<b>2,163,000</b>	<b>2,224,000</b>
Full Service (Tier I and Tier II)	2,056,000	1,947,000	2,003,000	2,059,000	2,119,000
Replenishment Service <sup>3</sup>	97,000	102,000	103,000	104,000	104,000
Interim Agricultural Water Program <sup>4</sup>	0	0	0	0	0
<b>F. Firm Demands on Metropolitan<sup>5</sup></b>	<b>2,056,000</b>	<b>1,947,000</b>	<b>2,003,000</b>	<b>2,059,000</b>	<b>2,119,000</b>

Notes:

All units are acre-feet unless specified, rounded the nearest thousand.

Totals may not sum due to rounding.

<sup>1</sup>Growth projections are based on SCAG 2007 Regional Transportation Plan and SANDAG Series 12 2050 Regional Growth Forecast (Feb 2010).

<sup>2</sup>Includes code-based, price-effect and existing active savings through 2009; does not include future active conservation savings. 1990 is base year.

<sup>3</sup>Replenishment Service as defined in MWD Administrative Code Section 4114. Replenishment service includes direct and in-lieu replenishment.

<sup>4</sup>IAWP deliveries will be phased out by 2013.

<sup>5</sup>Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands.

**Table 2-8**  
**Metropolitan Regional Water Demands**  
**Average Year**  
**(Acre-Feet)**

	2015	2020	2025	2030	2035
<b>A. Total Demands<sup>1</sup></b>	<b>5,449,000</b>	<b>5,632,000</b>	<b>5,774,000</b>	<b>5,930,000</b>	<b>6,069,000</b>
Retail Municipal and Industrial	4,978,000	5,170,000	5,330,000	5,491,000	5,627,000
Retail Agricultural	222,000	205,000	186,000	179,000	180,000
Seawater Barrier	71,000	72,000	72,000	72,000	72,000
Groundwater Replenishment	178,000	185,000	187,000	189,000	191,000
<b>B. Total Conservation</b>	<b>936,000</b>	<b>967,000</b>	<b>1,033,000</b>	<b>1,096,000</b>	<b>1,156,000</b>
Existing Active (through 2009) <sup>2</sup>	97,000	46,000	16,000	2,000	0
Code-based and Price-Effect	589,000	671,000	766,000	844,000	906,000
Pre-1990 Conservation	250,000	250,000	250,000	250,000	250,000
<b>C. SBx7-7 Water Conservation</b>	<b>190,000</b>	<b>380,000</b>	<b>380,000</b>	<b>380,000</b>	<b>380,000</b>
20% by 2020 Retail-Level Compliance	190,000	380,000	380,000	380,000	380,000
<b>D. Total Local Supplies</b>	<b>2,395,000</b>	<b>2,522,000</b>	<b>2,553,000</b>	<b>2,581,000</b>	<b>2,603,000</b>
Groundwater	1,429,000	1,430,000	1,429,000	1,431,000	1,431,000
Surface Water	103,000	102,000	102,000	102,000	102,000
Los Angeles Aqueduct	224,000	225,000	226,000	229,000	230,000
Groundwater Recovery	101,000	108,000	114,000	120,000	126,000
Total Recycling	348,000	375,000	394,000	410,000	426,000
Other Imported Supplies	190,000	281,000	288,000	288,000	288,000
<b>E. Total Metropolitan Demands (E=A-B-C-D)</b>	<b>1,928,000</b>	<b>1,763,000</b>	<b>1,808,000</b>	<b>1,874,000</b>	<b>1,931,000</b>
Full Service (Tier I and Tier II)	1,826,000	1,660,000	1,705,000	1,769,000	1,826,000
Replenishment Service <sup>3</sup>	102,000	103,000	103,000	104,000	105,000
Interim Agricultural Water Program <sup>4</sup>	0	0	0	0	0
<b>F. Firm Demands on Metropolitan<sup>5</sup></b>	<b>1,826,000</b>	<b>1,660,000</b>	<b>1,705,000</b>	<b>1,769,000</b>	<b>1,826,000</b>

Notes:

All units are acre-feet unless specified, rounded the nearest thousand.

Totals may not sum due to rounding.

<sup>1</sup> Growth projections are based on SCAG 2007 Regional Transportation Plan and SANDAG Series 12 2050 Regional Growth Forecast (Feb 2010).

<sup>2</sup> Includes code-based, price-effect and existing active savings through 2009; does not include future active conservation savings. 1990 is base year.

<sup>3</sup> Replenishment Service as defined in MWD Administrative Code Section 4114. Replenishment service includes direct and in-lieu replenishment.

<sup>4</sup> IAWP deliveries will be phased out by 2013.

<sup>5</sup> Firm demand on Metropolitan equals Full Service demands plus 70% of the Interim Agricultural Water Program demands.

## 2.3 Water Supply Reliability

After estimating demands for single dry year, multiple dry years, and average years the water reliability analysis requires urban water suppliers to identify projected supplies to meet these demands. Table 2-9 summarizes the sources of supply for the single dry year (1977 hydrology), while Table 2-10 shows the region's ability to respond in future years under a repeat of the 1990-92 hydrology. Table 2-10 provides results for the average of the three dry years rather than a year-by-year detail, because most of Metropolitan's dry-year supplies are designed to provide equal amounts of water over each year of a three-year period. These tables show that the region can provide reliable water supplies under both the single driest year and the multiple dry year hydrologies. Table 2-11 reports the expected situation on average over all of the historic hydrologies. Appendix A.3 contains detailed justifications for the sources of supply used for this analysis.

Metropolitan's supply capabilities are evaluated using the following assumptions:

### *Colorado River Aqueduct Supplies*

Colorado River Aqueduct supplies include supplies that would result from existing and committed programs and from implementation of the Quantification Settlement Agreement (QSA) and related agreements. The QSA, which is the subject of current litigation, is a component of the California Plan and establishes the baseline water use for each of the agreement parties and facilitates the transfer of water from agricultural agencies to urban uses. A detailed discussion of the QSA is included in Section 3. Colorado River transactions are potentially available to supply additional water up to the CRA capacity of 1.25 MAF on an as-needed basis.

### *State Water Project Supplies*

State Water Project (SWP) supplies are estimated using the draft 2009 SWP Delivery Reliability Report distributed by DWR in December 2009. The draft 2009 reliability

report presents the current DWR estimate of the amount of water deliveries for current (2009) conditions and conditions 20 years in the future. These estimates incorporate restrictions on SWP and Central Valley Project (CVP) operations in accordance with the biological opinions of the U.S. Fish and Wildlife Service and National Marine Fishery Service issued on December 15, 2008, and June 4, 2009, respectively. Under the 2009 draft reliability report, the delivery estimates for the SWP for current (2009) conditions as percentage of maximum Table A amounts, are seven percent, equivalent to 134 TAF, under a single dry-year (1977) condition and 60%, equivalent to 1.15 MAF, under long-term average condition.

In dry, below-normal conditions, Metropolitan has increased the supplies received from the California Aqueduct by developing flexible Central Valley storage and transfer programs. Over the last two years under the pumping restrictions of the SWP, Metropolitan has worked collaboratively with the other contractors to develop numerous voluntary Central Valley storage and transfer programs. The goal of this storage/transfer programs is to develop additional dry-year supplies that can be conveyed through the available Banks pumping capacity to maximize deliveries through the California Aqueduct during dry hydrologic conditions and regulatory restrictions.

### *Delta Improvements*

The listing of several fish species as threatened or endangered under the federal or California Endangered Species Acts (ESAs) have adversely impacted operations and limited the flexibility of the SWP. In response to court decisions related to the Biological Opinions for fish species listed under the ESAs, DWR altered the operations of the SWP. This resulted in export restrictions and reduced SWP deliveries. In June 2007, Metropolitan's Board approved a Delta Action Plan that provides a framework for staff to pursue actions with other agencies and stakeholders to build a sustainable Delta and reduce conflicts between water supply conveyance

and the environment. The Delta Action Plan aims to prioritize immediate short-term actions to stabilize the Delta while an ultimate solution is selected, and mid-term steps to maintain the Bay-Delta while the long-term solution is implemented.

In the near-term, the physical and operational actions in the Bay-Delta being developed include measures that protect fish species and reduce supply impacts with the goal of reducing conflicts between water supply conveyance and environmental needs. The potential for increased supply due to these near-term fixes is included in the 2010 RUWMP as a 10 percent increase in water supplies obtained from the SWP allocation for the year. In evaluating the supply capabilities for the 2010 RUWMP, additional supplies from this interim fix are assumed to materialize by 2013. Also included as a possible near-term fix for the Bay-Delta is the proposed Two-Gate System demonstration program, which would provide movable barriers on the Old and Middle Rivers to modify flows and prevent fish from being drawn toward the Bay-Delta pumping plants. The Two-Gate System is anticipated to protect fish and increase SWP supplies.

Operational constraints likely will continue until a long-term solution to the problems in the Bay-Delta is identified and implemented. State and federal resource agencies and various environmental and water user entities are currently engaged in the development of the Bay Delta Conservation Plan (BDCP), which is aimed at addressing the basic elements that include the Delta ecosystem restoration, water supply conveyance, and flood control protection and storage development. In dealing with these basic issues, the ideal solutions sought are the ones that address both the physical changes required as well as the financing and governance. In evaluating the supply capabilities for the 2010 RUWMP, Metropolitan assumed a new Delta conveyance is fully operational by 2022 that would return supply

reliability similar to 2005 condition, prior to supply restrictions imposed due to the Biological Opinions. This assumption is consistent with Metropolitan's long-term Delta Action Plan that recognizes the need for a global, comprehensive approach to the fundamental issues and conflicts to result in a sustainable Bay-Delta, sufficient to avoid biological opinion restrictions on planned SWP deliveries to Metropolitan and the other SWP Contractors. Further, recently passed state legislation included pathways for establishing governance structures and financing approaches to implement and manage the identified elements.

### *Storage*

A key component of Metropolitan's water supply capability is the amount of water in Metropolitan's storage facilities. Storage is a major component of Metropolitan's dry-year resource management strategy. Metropolitan's likelihood of having adequate supply capability to meet projected demands, without implementing the Water Supply Allocation plan (WSAP), is dependent on its storage resources.

In developing the supply capabilities for the 2010 RUWMP, Metropolitan assumed a simulated median storage level going into each of five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used. All storage capability figures shown in the 2010 RUWMP reflect actual storage program conveyance constraints. It is important to note that under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet demands.

**Table 2-9**  
**Single Dry-Year**  
**Supply Capability<sup>1</sup> and Projected Demands**  
**Repeat of 1977 Hydrology**  
 (acre-feet per year)

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

<sup>1</sup> Represents Supply Capability for resource programs under listed year type.

<sup>2</sup> California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

<sup>3</sup> Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

<sup>4</sup> Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

<sup>5</sup> Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

**Table 2-10**  
**Multiple Dry-Year**  
**Supply Capability<sup>1</sup> and Projected Demands**  
**Repeat of 1990-1992 Hydrology**  
**(acre-feet per year)**

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

<sup>1</sup> Represents Supply Capability for resource programs under listed year type.

<sup>2</sup> California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

<sup>3</sup> Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

<sup>4</sup> Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

<sup>5</sup> Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

**Table 2-11**  
**AverageYear**  
**Supply Capability<sup>1</sup> and Projected Demands**  
**Average of 1922-2004 Hydrologies**  
(acre-feet per year)

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

<sup>1</sup> Represents Supply Capability for resource programs under listed year type.

<sup>2</sup> California Aqueduct includes Central Valley transfers and storage program supplies conveyed by the aqueduct.

<sup>3</sup> Colorado River Aqueduct includes water management programs, IID-SDCWA transfers and canal linings conveyed by the aqueduct.

<sup>4</sup> Maximum CRA deliveries limited to 1.25 MAF including IID-SDCWA transfers and canal linings.

<sup>5</sup> Firm demands are adjusted to include IID-SDCWA transfers and canal linings. These supplies are calculated as local supply, but need to be shown for the purposes of CRA capacity limit calculations without double counting.

## 2.4 Water Shortage Contingency Analysis

In addition to the Water Supply Reliability analysis addressing average year and drought conditions, the Act requires agencies to document the stages of actions that it would undertake in response to water supply shortages, including up to a 50 percent reduction in its water supplies. Metropolitan has captured this planning in its Water Surplus and Drought Management Plan (WSDM Plan) which guides Metropolitan's planning and operations during both shortage and surplus conditions. Furthermore, Metropolitan developed the WSAP which provides a standardized methodology for allocating supplies during times of shortage.

### *Water Surplus and Drought Management Plan*

In April 1999, Metropolitan's Board adopted the Water Surplus and Drought Management Plan (WSDM Plan)<sup>3</sup>, included in Appendix A.4. 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 Metropolitan will execute during surpluses and shortages to minimize the probability of severe shortages and reduce the possibility of extreme shortages and shortage allocations. Unlike Metropolitan's previous shortage management plans, the WSDM Plan recognizes the link between surpluses and shortages, and it integrates planned operational actions with respect to both conditions.

### *WSDM Plan Development*

Metropolitan and its member agencies jointly developed the WSDM Plan during 1998 and 1999. This planning effort included more than a dozen half-day and full-day workshops and more than three dozen meetings between Metropolitan and member agency staff. The result of the planning effort is a consensus plan that addresses a broad range of

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<sup>3</sup> Metropolitan Water District of Southern California. *Water Surplus and Drought Management Plan*, Report No. 1150, August, 1999.

regional water management actions and strategies.

### WSDM Plan Principles and Goals

The guiding principle of the WSDM plan is to manage Metropolitan's water resources and management programs to maximize management of wet year supplies and minimize adverse impacts of water shortages to retail customers. From this guiding principle came the following supporting principles:

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

The WSDM plan also declared that if mandatory import water allocations become necessary, they would be calculated on the basis of need, as opposed to any type of historical purchases. The WSDM plan contains the following considerations that would go into an equitable allocation of imported water:

- Impact on retail consumers and regional economy
- Investments in local resources, including recycling and conservation
- Population growth
- Changes and/or losses in local supplies
- Participation in Metropolitan's Non-firm (interruptible) programs
- Investment in Metropolitan's facilities

### *WSDM Plan Implementation*

Each year, Metropolitan evaluates the level of supplies available and existing levels of water in storage to determine the appropriate management stage. Each stage is associated with specific resource

management actions designed to (1) avoid an Extreme Shortage to the maximum extent possible and (2) minimize adverse impacts to retail customers if an Extreme Shortage occurs. The current sequencing outlined in the WSDM Plan reflects anticipated responses based on detailed modeling of Metropolitan's existing and expected resource mix.

#### Surplus Stages

Metropolitan's supply situation is considered to be in surplus as long as net annual deliveries can be made to water storage programs. The WSDM Plan further defines five surplus management stages that guide the storage of surplus supplies in Metropolitan's storage portfolio. Deliveries for storage in the DVL and in the SWP terminal reservoirs continue through each surplus stage provided there is available storage capacity. Withdrawals from DVL for regulatory purposes or to meet seasonal demands may occur in any stage. Deliveries to other storage facilities may be interrupted, depending on the amount of the surplus.

#### Shortage Stages

The WSDM Plan distinguishes between Shortages, Severe Shortages, and Extreme Shortages. Within the WSDM Plan, these terms have specific meaning relating to Metropolitan's ability to deliver water to its customers.

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

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

*Extreme Shortage:* Metropolitan 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 Metropolitan'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 Metropolitan 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, Metropolitan will meet demands by withdrawing water from storage. At shortage stages 5 through 7, Metropolitan 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 2-2 shows the actions under surplus and shortage stages when an 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 Metropolitan will implement its Water Supply Allocation Plan<sup>4</sup> (WSAP) to allocate available supply fairly and efficiently to full-service customers.

#### ***Water Supply Allocation Plan***

In February 2008 Metropolitan's Board adopted the WSAP. The WSAP includes the specific formula for calculating member agency supply allocations and the key implementation elements needed for administering an allocation.

The WSAP was developed in consideration of the principles and guidelines described in the

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<sup>4</sup> Metropolitan Water District of Southern California, Water Supply Allocation Plan, June 2009.

WSDM Plan, with the objective of creating an equitable needs-based allocation. The WSAP formula seeks to balance the impacts of a shortage at the retail level while maintaining equity on the wholesale level for shortages of Metropolitan supplies of up to 50 percent. The formula takes into account growth, local investments, changes in supply conditions and the demand hardening aspects of non-potable recycled water use and the implementation of conservation savings programs.

#### *Water Supply Allocation Plan Development*

Between July 2007 and February 2008, Metropolitan staff worked jointly with Metropolitan's member agencies to develop the WSAP. Throughout the development process Metropolitan's Board was provided with regular progress reports on the status of the WSAP. The WSAP was adopted at the February 12, 2008 Board meeting.

#### The WSAP Formula

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

#### *Step 1: Base Period Calculations*

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

#### *Step 2: Allocation Year Calculations*

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

#### *Step 3: Supply Allocation Calculations*

The final step is calculating the water supply allocation for each member agency based on the allocation year water needs identified in Step 2. Each element and its application in the allocation formula is discussed in detail in Metropolitan's Water Supply Allocation Plan.<sup>5</sup>

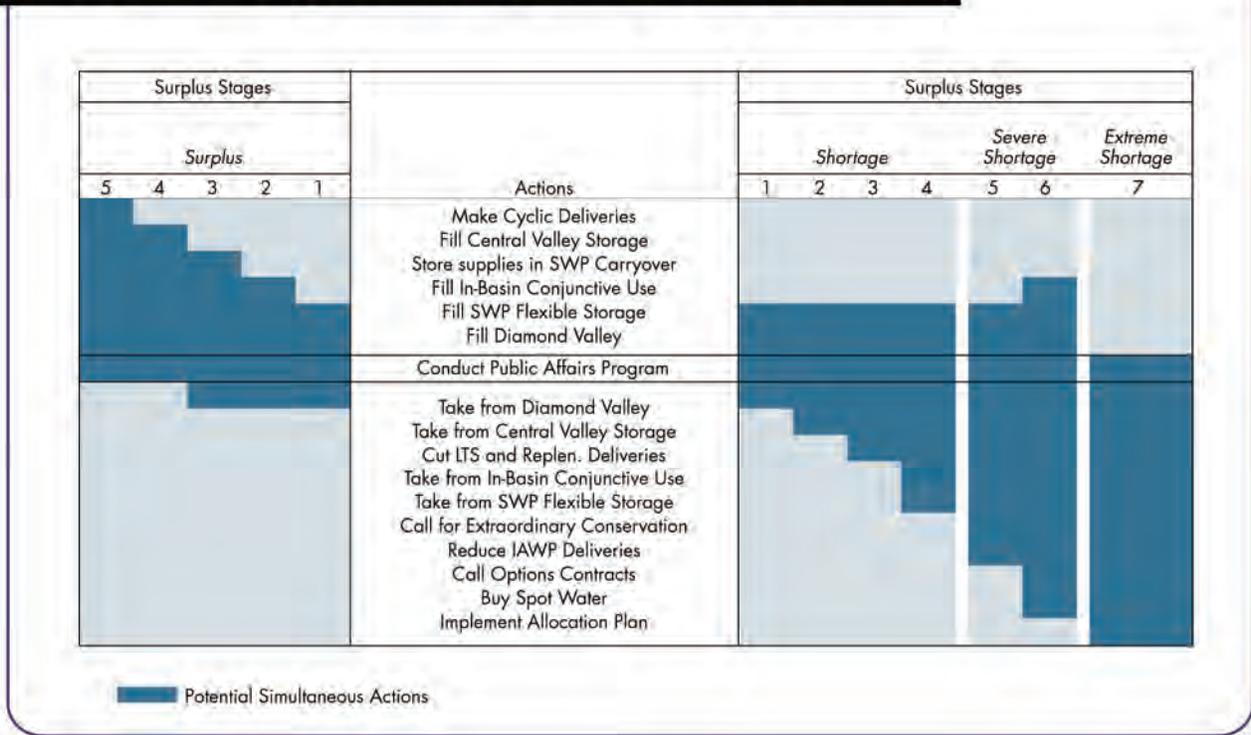
#### Annual Reporting Schedule on Supply/Demand Conditions

Managing Metropolitan's water supply resources to minimize the risk of shortages requires timely and accurate information on changing supply and demand conditions throughout the year. To facilitate effective resource management decisions, the WSDM Plan includes a monthly schedule for providing supply/demand information to Metropolitan's senior management and Board, and for making resource allocation decisions. Table 2-12 shows this schedule.

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<sup>5</sup> Metropolitan Water District of Southern California, Water Supply Allocation Plan, June 2009.

**Figure 2-2 Resource Stages, Anticipated Actions, And Supply Declarations**



**Table 2-12  
Schedule of Reporting and Resource Allocation Decision-Making**

Month	Information Report/Management Decision
January	Initial supply/demand forecasts for year
February - March	Update supply/demand forecasts for year
April - May	Finalize supply/demand forecasts Management decisions re: Contractual Groundwater and Option Transfer Programs Board decision re: Need for Extraordinary Conservation
October - December	Report on Supply and Carryover Storage
October	Management decisions re: Delivery Interruptions for the Replenishment and Interim Agricultural Water Programs

## 2.5 Catastrophic Supply Interruption Planning

The third type of planning needed to evaluate supply reliability is a catastrophic supply interruption plan that documents the actions necessary for a catastrophic interruption in water supplies. For Metropolitan this planning is captured in the analysis that went into developing the Emergency Storage Requirements.

### *Emergency Storage Requirements*

Metropolitan established its criteria for determining emergency storage requirements in the October 1991 Final Environmental Impact Report for the Eastside Reservoir, which is now named Diamond Valley Lake. These criteria were again discussed in the 1996 IRP. Metropolitan's Board has approved both of these documents.

Emergency storage requirements are based on the potential of a major earthquake damaging the aqueducts that transport Southern California's imported water supplies (SWP, CRA, and Los Angeles Aqueduct). The adopted criteria assume that damage from such an event could render the aqueducts out of service for six months. Therefore, Metropolitan has based its planning on a 100 percent reduction in its supplies for a period of six months, which is a greater shortage than required by the Act.

To safeguard the region from catastrophic loss of water supply, Metropolitan has made substantial investments in emergency storage. The emergency plan outlines that under such a catastrophe, non-firm service deliveries would be suspended, and firm supplies to member agencies would be restricted by a mandatory cutback of 25 percent from normal-year demand levels. At the same time, water stored in surface reservoirs and groundwater basins under Metropolitan's interruptible program would be made available, and Metropolitan would draw on its emergency storage, as well as other available storage. Metropolitan has reserved up to half of DVL storage to meet

such an emergency, while the remainder is available for dry-year and seasonal supplies. In addition, Metropolitan has access to emergency storage at its other reservoirs, at the SWP terminal reservoirs, and in its groundwater conjunctive use storage accounts. With few exceptions, Metropolitan can deliver this emergency supply throughout its service area via gravity, thereby eliminating dependence on power sources that could also be disrupted by a major earthquake. The WSDM Plan shortage stages will guide Metropolitan's management of available supplies and resources during the emergency to minimize the impacts of the catastrophe.

### *Electrical Outages*

Metropolitan has also developed contingency plans that enable it to deal with both planned and unplanned electrical outages. These plans include the following key points:

- In event of power outages, water supply can be maintained by gravity feed from regional reservoirs such as DVL, Lake Mathews, Castaic Lake and Silverwood Lake.
- Maintaining water treatment operations is a key concern. As a result, all Metropolitan treatment plants have backup generation sufficient to continue operating in event of supply failure on the main electrical grid.
- Valves at Lake Skinner can be operated by the backup generation at the Lake Skinner treatment plant.
- Metropolitan owns mobile generators that can be transported quickly to key locations if necessary.

## 2.6 Other Supply Reliability Risks

Metropolitan provides water to a broad and heterogeneous service area with water supplies from a variety of sources and geographic regions. Each of these demand areas and supplies has its own unique set of benefits and challenges. Among the challenges Metropolitan faces are the following:

### *Supplies*

- The region and Colorado River Basin have been experiencing drought conditions for multiple years.
- Endangered species protections and conveyance needs in the Sacramento-San Joaquin River Delta System have resulted in operational constraints particularly important because pumping restrictions impact many water resource programs – SWP supplies and additional voluntary transfers, Central Valley storage and transfers, in-region groundwater storage and in-region surface water storage.
- Changing climate patterns are predicted to shift precipitation patterns and possibly affect water supply.
- Difficulty and implications of environmental review, documentation, and permitting for multi-year transfer agreements, recycled water projects and seawater desalination plants.
- Public perception of recycled water use for replenishment.

### *Operations and Water Quality*

- The cost and use of energy and greenhouse gas emissions.
- Water quality regulations and issues like the quagga mussels within the Colorado River Aqueduct. Controlling the spread and impacts of the quagga mussels will require more extensive maintenance and reduced operational flexibility.

- Salt and concentrate balance from variety of sources.

### *Demand*

- Uncertain population and economic growth
- Uncertain location of growth
- Uncertain housing stock and density

The challenges posed by continued population growth, environmental constraints on the reliability of imported supplies, and new uncertainties imposed by climate change demand that Metropolitan assert the same level of leadership and commitment to taking on large-scale regional solutions to providing water supply reliability. New solutions are available in the form of dramatically improved water-use efficiency, indirect potable use of recycled water, and large-scale application of ocean desalination.

### *Climate Change*

Climate change adds its own new uncertainties to the challenges of planning. Metropolitan's water supply planning has been fortunate in having almost one-hundred years of hydrological data regarding weather and water supply. This history of rainfall data has provided a sound foundation for forecasting both the frequency and the severity of future drought conditions, as well as the frequency and abundance of above-normal rainfall. But, weather patterns can be expected to shift dramatically and unpredictably in a climate driven by increased concentrations of carbon dioxide in the atmosphere, as experienced in Australia. These changes in weather significantly affect water supply planning, irrespective of the debate associated with the sources and cause of increasing concentrations of greenhouse gasses. As a major steward of the region's water supply resources, Metropolitan is committed to performing its due diligence with respect to climate change.

### *Potential Impacts*

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

- Reduction in Sierra Nevada snowpack;
- Increased intensity and frequency of extreme weather events; and
- Rising sea levels resulting in
  - Increased risk of damage from storms, high-tide events, and the erosion of levees; and
  - Potential pumping cutbacks on the SWP and Central Valley Project (CVP).

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

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

### *Metropolitan's Activities Related to Climate Change Concerns*

An extended Colorado River drought put climate change on Metropolitan's radar screen in the mid-1990s. In 2000, Metropolitan's Board received a briefing on the potential impacts of climate change on water supply by leading experts in the field. Metropolitan then hosted a California Water Plan meeting on climate change and a held Drought Preparedness Workshop on similar issues. In March 2002, the Board adopted policy principles on global climate change as related to water resource planning. The

Principles stated in part that 'Metropolitan 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.'

### Knowledge Sharing and Research Support

Metropolitan is an active and founding member of the Water Utility Climate Alliance (WUCA). WUCA consists of ten nationwide water providers collaborating on climate change adaptation and green house gas mitigation issues. As a part of this effort, WUCA pursues a variety of activities on multiple fronts.

WUCA monitors development of climate change-related research, technology, programs and federal legislation. Activities to date include such things as:

- 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

In addition to supporting federal and regional efforts, WUCA released a white paper entitled "Options for Improving Climate Modeling to Assist Water Utility Planning for Climate Change" in January 2010. The purpose of this paper was to assess Global Circulation Models, identify key aspects for water utility planning and make seven initial recommendations for how climate modeling

and downscaling techniques can be improved so that these tools and techniques can be more useful for the water sector.

In order to address water provider-specific needs, WUCA has focused not only on climate change science and Global Circulation Models, but on how best to incorporate that knowledge into water planning. This was explored more thoroughly in a second January 2010 white paper on decision support methods for incorporating climate change uncertainty into water planning. This paper assessed five known decision support approaches for applicability in incorporating Climate Change uncertainty in water utility planning and identified additional research needs in the area of decision support methodologies.

In addition to these efforts, the member agencies of WUCA annually share individual agency actions to mitigate greenhouse gas emissions to facilitate further implementation of these programs. At a September 2009 summit at the Aspen Global Change Institute WUCA, members met with global climate modelers, along with federal agencies, academic scientists, and climate researchers to establish collaborative directions to progress climate science and modeling efforts. WUCA continues to pursue these opportunities and partnerships with water providers, climate scientists, federal agencies, research centers, academia and key stakeholders.

Metropolitan also continues to pursue knowledge sharing and research support activities outside of WUCA. Metropolitan regularly provides input and direction on California legislation related to climate change issues. Metropolitan is active in collaborating with other state and federal agencies, as well as non-governmental organizations on climate change related

planning issues. The following list provides a sampling of entities that Metropolitan has recently worked with on a collaborative basis:

- U.S. Bureau of Reclamation
- U.S. Army Corps of Engineers
- American Water Works Association Research Foundation
- National Center for Atmospheric Research
- California Energy Commission
- California Department of Water Resources

#### Quantification of Current Research

Metropolitan continues to incorporate current climate change science into its planning efforts. A major component of the current IRP update effort is to explicitly reflect uncertainty in Metropolitan's future water management environment. This involves evaluating a wider range of water management strategies, and seeking robust and adaptive plans that respond to uncertain conditions as they evolve over time, and that ultimately will perform adequately under a wide range of future conditions. The potential impacts and risks associated with climate change, as well as other major uncertainties and vulnerabilities, will be incorporated into the update and accounted. Overall, Metropolitan's planning activities strive to support the Board adopted policy principles on climate change by:

- Supporting reasonable, economically viable, and technologically feasible management strategies for reducing impacts on water supply
- Supporting flexible "no regret" solutions that provide water supply and quality benefits while increasing the ability to manage future climate change impacts, and

- Evaluating staff recommendations regarding climate change and water resources against the California Environmental Quality Act (CEQA) to avoid adverse effects on the environment.

#### Implementation of Programs and Policies

Metropolitan has made great efforts to implement greenhouse gas mitigation programs and policies for its facilities and operations. To date, these programs and policies have focused on:

- Exploring water supply/energy relationships and opportunities to increase efficiencies;
- Joining the California Climate Action Registry;
- Acquiring “green” fleet vehicles, and supporting an employee Rideshare program;

- Developing solar power at the Skinner water treatment plant; and
- Identifying and pursuing development of “green” renewable water and energy programs that support the efficient and sustainable use of water.

Metropolitan also continues to be a leader in efforts to increase regional water use efficiency. Metropolitan has worked to increase the availability of incentives for local conservation and recycling projects, as well as supporting conservation Best Management Practices for industry and commercial businesses.

## 2.7 Pricing and Rate Structures

### *Revenue Management*

A high proportion of Metropolitan's revenues come from volumetric water rates; during the last five fiscal years through 2008-09, water sales revenues were approximately 75 percent of Metropolitan's total revenues. As a result, Metropolitan's revenues vary according to regional weather and the availability of statewide water supplies. In dry years, local demands increase and Metropolitan may receive higher than anticipated revenues due to increased sales volumes. In contrast, in wet years demands decrease, and revenues drop due to lower sales volumes. In addition, statewide supply shortages such as those in 1991 and 2009 also affect Metropolitan's revenues. Such revenue surpluses and shortages could cause instability in water rates. To mitigate this risk, Metropolitan maintains financial reserves, with a minimum and maximum balance, to stabilize water rates during times of reduced water sales. The reserves hold revenues collected during times of high water sales and are used to offset the need for revenues during times of low sales.

Another way to mitigate rate increases is by generating a larger portion of revenues from fixed sources. Metropolitan currently has two fixed charges, the Readiness-to-Serve Charge and the Capacity Charge. Metropolitan also collects tax revenue from taxable property within its boundaries. For the last five fiscal years the revenues from fixed charges generated almost 18 percent of all Metropolitan revenues. RTS revenues have been increasing gradually, from \$80 million in 2007, to \$114 million in 2010, \$125 million in 2011, and \$146 million in 2012.

Finally, Metropolitan generates a significant amount of revenue from interest income, hydroelectric power sales, and miscellaneous income such as rents and leases. For the last five fiscal years, these averaged almost 7 percent of all Metropolitan revenues. These internally generated revenues are referred to as revenue offsets and reduce the amount of

revenue that has to be collected from rates and charges.

### *Elements of Rate Structure*

This section provides an overview of Metropolitan's rate structure. The different elements of the rate structure are discussed below and summarized in Table 2-13.

#### *System Access Rate (SAR)*

The SAR is a volumetric system-wide rate levied on each acre-foot of water that moves through the Metropolitan system. All system users (member agency or third party) pay the SAR to use Metropolitan's conveyance and distribution system. The SAR recovers the cost of providing conveyance and distribution capacity to meet average annual demands.

#### *Water Stewardship Rate (WSR)*

The WSR recovers the costs of providing financial incentives for existing and future investments in local resources including conservation and recycled water. These investments or incentive payments are identified as the "demand management" service function in the cost of service process. The WSR is a volumetric rate levied on each acre-foot of water that moves through the Metropolitan system.

#### *System Power Rate (SPR)*

The SPR recovers the costs of energy required to pump water to Southern California through the SWP and Colorado River Aqueduct. The cost of power is recovered through a uniform volumetric rate. The SPR is applied to all deliveries to member agencies.

#### *Treatment Surcharge*

The treatment surcharge recovers the costs of providing treated water service through a uniform, volumetric rate. The treatment surcharge recovers all costs associated with providing treated water service, including commodity, demand and standby related costs.

### *Capacity Charge*

The capacity charge is levied on the maximum summer day demand placed on the system between May 1 and September 30 for a three-calendar year period. Demands measured for the purposes of billing the capacity charge include all firm demand and agricultural demand, including wheeling service and exchanges. Replenishment service is not included in the measurement of peak day demand for purposes of billing the capacity charge.

The capacity charge is intended to pay for the cost of peaking capacity on Metropolitan's system, while providing an incentive for local agencies to decrease their use of the Metropolitan system to meet peak day demands and to shift demands into lower use time periods. Over time, a member agency will benefit from local supply investments and operational strategies that reduce its peak day demand on the system in the form of a lower total capacity charge.

### *Readiness-To-Serve Charge (RTS)*

The costs of providing standby service, including emergency storage and those standby costs related to the conveyance and aqueduct system, are recovered by the RTS.

The RTS is allocated to the member agencies based on each agency's proportional share of a ten-year rolling average of all firm deliveries (including water transfers and exchanges that use Metropolitan system capacity). The ten-year rolling average does not include replenishment service and interim agricultural deliveries because these deliveries will be the first to be curtailed in the event of an emergency. A ten-year rolling average leads to a relatively stable RTS allocation that reasonably represents an agency's potential long-term need for standby service under different demand conditions. Member agencies may choose to have a portion of their total RTS obligation offset by standby charge collections levied by Metropolitan on behalf of the member agency. These standby charges are assessed

on parcels of land within the boundaries of a given member agency.

### *Tier 1 Supply Rate*

The costs of maintaining existing supplies and developing additional supplies are recovered through a two-tiered pricing approach. The Tier 1 Supply Rate recovers the majority of the supply costs and reflects the cost of existing supplies. Each member agency has a predetermined amount of water that can be purchased at the lower Tier 1 Supply Rate in a calendar year. Purchases in excess of this limit will be made at the higher Tier 2 Supply Rate.

The Tier 1 Supply rate includes a Delta Supply Surcharge of \$69 per AF in 2010, \$51 per AF in 2011 and \$58 per AF in 2012. This surcharge reflects the impact on Metropolitan's water supply rates due to lower deliveries from the SWP as a result of pumping restrictions designed to protect endangered fish species. The Delta Supply Surcharge will remain in effect until a long-term solution for the delta was achieved or until interim facility improvements restore SWP yield.

### *Tier 2 Supply Rate*

The Tier 2 Supply Rate reflects Metropolitan's cost of developing long-term firm supplies. The Tier 2 Supply Rate recovers a greater proportion of the cost of developing additional supplies from member agencies that have increasing demands on the Metropolitan system.

### *Replenishment Program and Agricultural Water Program*

Metropolitan currently administers two pricing programs that make surplus system supplies (system supplies in excess of what is needed to meet consumptive municipal and industrial demands) available to the member agencies at a discounted water rate. The Replenishment Program provides supplies, when available, for the purpose of replenishing local storage. The Interim Agricultural Water Program (IAWP) makes surplus water available for agricultural purposes. In October 2008, the Board

approved a phase out of the IAWP by 2013. Because of the critically dry conditions and uncertainty about future supply, discounted replenishment deliveries have been curtailed for the past three years. If water supply conditions improve and surplus water

becomes available, Metropolitan could make Replenishment service available to its member agencies at discounted rates, subject to meeting Metropolitan's storage objectives to meet full service demands.

**Table 2-13  
Rate Structure Components**

Rate Design Elements	Service Provided/ Costs Recovered	Type of Charge
System Access Rate	Conveyance/Distribution (Average Capacity)	Volumetric (\$/AF)
Water Stewardship Rate	Conservation/Local Resources	Volumetric (\$/AF)
System Power Rate	Power	Volumetric (\$/AF)
Treatment Surcharge	Treatment	Volumetric (\$/AF)
Capacity Charge	Peak Distribution Capacity	Fixed/Volumetric (\$/cfs)
Readiness-To-Serve Charge	Conveyance/Distribution/Emergency Storage(Standby Capacity)	Fixed (\$Million)
Tier 1 Supply Rate	Supply	Volumetric/Fixed (\$/AF)
Tier 2 Supply Rate	Supply	Volumetric (\$/AF)
Surplus Water Rates	Replenishment/Agriculture	Volumetric (\$/AF)

The following tables provide further information regarding Metropolitan's rates. Table 2-14 summarizes the rates and charges effective January 1, 2010, January 1, 2011, and January 1, 2012. Average costs by member agency will vary depending upon an agency's RTS allocation, Capacity Charge and relative proportions of treated and untreated Tier 1, Tier 2, replenishment, and agricultural water purchases. Table 2-15 provides the details of the Capacity Charge, calculated for calendar year 2011.

Table 2-16 provides the details of the Readiness-to-Serve Charge calculation for calendar year 2011 broken down by member agency. Table 2-17 provides the current Purchase Order commitment quantities that member agencies will purchase from Metropolitan over the 10-year period starting January 2003 through December 2012. Tier 1 limits for each member agency are also shown in this table.

**Table 2-14  
Metropolitan Water Rates and Charges**

Effective	Jan 1, 2010	Jan 1, 2011	Jan 1, 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 Rate Untreated (\$/AF)	\$366	\$409	\$442
Interim Agricultural Water Program 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 Rate (\$/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

**Table 2-15  
Capacity Charge Detail**

Agency	Peak Day Demand (cfs) (May 1 through September 30) Calendar Year				Calendar Year 2011 Capacity Charge (\$7,200/cfs)
	2007	2008	2009	3-Year Peak	
Anaheim	37.9	36.1	40.7	40.7	\$ 293,040
Beverly Hills	33.9	32.9	31.0	33.9	244,080
Burbank	33.7	34.2	21.6	34.2	246,240
Calleguas	260.8	250.0	192.8	260.8	1,877,760
Central Basin	125.9	102.7	94.7	125.9	906,480
Compton	7.1	4.9	5.9	7.1	51,120
Eastern	303.0	263.1	227.8	303.0	2,181,600
Foothill	25.4	21.5	24.3	25.4	182,880
Fullerton	36.9	27.1	37.4	37.4	269,280
Glendale	54.6	55.7	56.0	56.0	403,200
Inland Empire	176.2	125.8	106.1	176.2	1,268,640
Las Virgenes	45.3	45.3	42.7	45.3	326,160
Long Beach	61.3	68.1	67.2	68.1	490,320
Los Angeles	768.5	821.9	698.2	821.9	5,917,680
MWDOC	469.2	453.7	489.5	489.5	3,524,400
Pasadena	58.5	55.6	50.2	58.5	\$421,200
San Diego <sup>1</sup>	1278.4	1039.9	1055.3	1278.4	9,204,480
San Fernando	6.5	0.1	0.0	6.5	\$46,800
San Marino	5.2	5.2	3.5	5.2	\$37,440
Santa Ana	29.7	14.5	16.4	29.7	213,840
Santa Monica	27.6	26.2	25.0	27.6	198,720
Three Valleys	171.4	168.1	132.7	171.4	1,234,080
Torrance	41.6	35.5	39.3	41.6	299,520
Upper San Gabriel	63.8	36.9	27.6	63.8	459,360
West Basin	262.3	243.3	221.3	262.3	1,888,560
Western	289.1	271.4	219.9	289.1	2,081,520
<b>Total</b>	<b>4,673.8</b>	<b>4,239.7</b>	<b>3,927.1</b>	<b>4,759.5</b>	<b>\$ 34,268,400</b>

Totals may not foot due to rounding

**Table 2-16**  
**Readiness-to-Serve Charge (by Member Agency)**  
**Calendar Year 2011 RTS charge**

Member Agency	Rolling Ten-Year Average Firm Deliveries (Acre-Feet) FY1999/00 - FY2008/09	RTS Share	12 months @ \$125 million per year (1/11-12/11)
Anaheim	20,966	1.11%	\$ 1,382,122
Beverly Hills	12,737	0.67%	839,692
Burbank	12,908	0.68%	850,938
Calleguas MWD	113,610	5.99%	7,489,554
Central Basin MWD	63,256	3.34%	4,170,058
Compton	3,146	0.17%	207,408
Eastern MWD	92,013	4.85%	6,065,789
Foothill MWD	11,570	0.61%	762,706
Fullerton	9,694	0.51%	639,087
Glendale	24,150	1.27%	1,592,015
Inland Empire Utilities Agency	61,205	3.23%	4,034,823
Las Virgenes MWD	23,282	1.23%	1,534,813
Long Beach	36,970	1.95%	2,437,211
Los Angeles	314,757	16.60%	20,749,798
Municipal Water District of Orange County	231,692	12.22%	15,273,878
Pasadena	23,397	1.23%	1,542,428
San Diego County Water Authority	491,238	25.91%	32,384,010
San Fernando	119	0.01%	7,819
San Marino	1,001	0.05%	65,963
Santa Ana	12,743	0.67%	840,028
Santa Monica	12,794	0.67%	843,429
Three Valleys MWD	73,095	3.85%	4,818,678
Torrance	20,742	1.09%	1,367,401
Upper San Gabriel Valley MWD	15,631	0.82%	1,030,447
West Basin MWD	141,522	7.46%	9,329,606
Western MWD	71,906	3.79%	4,740,301
<b>MWD Total</b>	<b>1,896,143</b>	<b>100.00%</b>	<b>\$ 125,000,000</b>

Totals may not foot due to rounding

**Table 2-17**  
**Purchase Order Commitments and Tier 1 Limits**  
**(by Member Agency)**

	2011 Tier 1 Limit with Opt-outs	Purchase Order Commitment (acre-feet)
Anaheim	22,240	148,268
Beverly Hills	13,380	89,202
Burbank	16,336	108,910
Calleguas	110,249	692,003
Central Basin	72,361	482,405
Compton	5,058	33,721
Eastern	87,740	504,664
Foothill	10,997	73,312
Fullerton	11,298	75,322
Glendale	26,221	174,809
Inland Empire	59,792	398,348
Las Virgenes	21,087	137,103
Long Beach	39,471	263,143
Los Angeles	304,970	2,033,132
MWDOC	228,130	1,486,161
Pasadena	21,180	141,197
San Diego	547,239	3,342,571
San Fernando	630	-
San Marino	1,199	-
Santa Ana	12,129	80,858
Santa Monica	11,515	74,062
Three Valleys	70,474	469,331
Torrance	20,967	139,780
Upper San Gabriel	16,512	110,077
West Basin	156,874	1,045,825
Western	69,720	391,791
<b>Total</b>	<b>1,957,768</b>	<b>12,495,995</b>

Totals may not foot due to rounding.

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# Water Quality

## 4

Metropolitan’s planning efforts have recognized the importance of the quality of its water supplies. To the extent possible, Metropolitan responds to water quality concerns by concentrating on protecting the quality of the source water and developing water management programs that maintain and enhance water quality. Contaminants that cannot be sufficiently controlled through protection of source waters must be handled through changed water treatment protocols or blending. These practices can increase costs and/or reduce operating flexibility and safety margins. In addition, Metropolitan has developed enhanced security practices and policies in response to national security concerns.

### Background

Implementing the major components of Metropolitan’s planning efforts – groundwater storage, recycled water, and minimized impacts on the Delta – requires meeting specific water quality targets for imported water. Metropolitan has two major sources of water: the Colorado River and the State Water Project (SWP). Groundwater inflows are also received into the SWP through groundwater banking programs in the Central Valley. Each source has specific quality issues, which are summarized in this section. To date, Metropolitan has not identified any water quality risks that cannot be mitigated. As described in this section, the only potential effect of water quality on the level of water supplies based on current knowledge could result from increases in the salinity of water resources. If diminished water quality caused a need for membrane treatment, Metropolitan could experience losses of up

to 15 percent of the water processed. However, Metropolitan would only process a small proportion of the affected water and would reduce total salinity by blending the processed water with the remaining unprocessed water. Thus, Metropolitan anticipates no significant reductions in water supply availability from these sources due to water quality concerns over the study period.

### *Colorado River*

High salinity levels represent a significant issue associated with Colorado River supplies. In addition, Metropolitan has been engaged in efforts to protect its Colorado River supplies from threats of uranium, perchlorate and Chromium VI, which are discussed later in this chapter. Metropolitan has also been active in efforts to protect these supplies from potential increases in nutrient loading due to urbanization, as well as investigating the sources and occurrence of constituents of emerging concern, such as N-nitrosodimethylamine (NDMA) and pharmaceuticals and personal care products (PPCPs). Metropolitan fully expects its source water protection efforts to be successful, so the only foreseeable water quality constraint to the use of Colorado River water will be the need to blend (mix) it with SWP supplies to meet the adopted salinity standards.

### *State Water Project*

The key water quality issues on the SWP are disinfection byproduct precursors, in particular, total organic carbon and bromide. Metropolitan is working to protect the water quality of this source, but it has needed to upgrade its water treatment

plants to deal adequately with disinfection byproducts. Disinfection byproducts result from total organic carbon and bromide in the source water reacting with disinfectants at the water treatment plant, and they may place some near term restrictions on Metropolitan's ability to use SWP water. Metropolitan expects these treatment restrictions to be overcome through the addition of ozone disinfection at its treatment plants. Arsenic is also of concern in some groundwater storage programs. Groundwater inflows into the California Aqueduct are managed to comply with regulations and protect downstream water quality while meeting supply targets. Additionally, nutrient levels are significantly higher in the SWP system than within the Colorado River, leading to the potential for algal related concerns that can affect water management strategies. Metropolitan is engaged in efforts to protect the quality of SWP water from potential increases in nutrient loading from wastewater treatment plants. Also, as in the Colorado River watershed, Metropolitan is active in studies on the occurrence, sources, and fate and transport of constituents of emerging concern, such as NDMA and PPCPs.

#### *Local Agency Supplies and Groundwater Storage*

New standards for contaminants, such as arsenic, and other emerging standards may add costs to the use of groundwater storage and may affect the availability of local agency groundwater sources. These contaminants are not expected to affect the availability of Metropolitan supplies, but they may affect the availability of local agency supplies, which could in turn affect the level of demands on Metropolitan supplies if local agencies abandon supplies in lieu of treatment options. Metropolitan has not analyzed the effect that many of these water quality issues could have on local agency supply availability. There have, however, been some investigations into the supply impacts of perchlorate groundwater

contamination as indicated later in this section.

In summary, the major regional concerns include the following:

- Salinity
- Perchlorate
- Total organic carbon and bromide (disinfection byproduct precursors)
- Nutrients (as it relates to algal productivity)
- Arsenic
- Uranium
- Chromium VI
- N-nitrosodimethylamine (NDMA)
- Pharmaceuticals and personal care products (PPCPs)

Metropolitan has taken several actions and adopted programs to address these contaminants and ensure a safe and reliable water supply. These actions, organized by contaminant, are discussed below. Another constituent previously identified in the 2005 RUWMP as a regional concern, methyl tertiary-butyl ether (MTBE), is now a decreasing concern due to the elimination of this chemical as a gasoline additive in California. This is also further discussed below, along with other water quality programs that Metropolitan has been engaged in to protect its water supplies.

#### **Issues of Concern**

##### *Salinity*

Imported water from the Colorado River has high salinity levels, so it must be blended (mixed) with lower-salinity water from the SWP to meet salinity management goals. Higher salinity levels in either Colorado River water or groundwater would increase the proportion of SWP supplies required to meet the adopted imported water salinity objectives. Metropolitan adopted an imported water salinity goal because higher salinity could increase costs and reduce operating flexibility. For example,

1. If diminished water quality causes a need for membrane treatment, the process typically results in losses of up to 15 percent of the water processed. These losses result both in an increased requirement for additional water supplies and environmental constraints related to brine disposal. In addition, the process is costly. However, only a portion of the imported water would need to be processed, so the possible loss in supplies is small.
2. High total dissolved solids (TDS) in water supplies leads to high TDS in wastewater, which lowers the usefulness and increases the cost of recycled water.
3. Degradation of imported water supply quality could limit the use of local groundwater basins for storage because of standards controlling the quality of water added to the basins.

In addition to the link between water supply and water quality, Metropolitan has identified economic benefits from reducing the TDS concentrations of water supplies. Estimates show that a simultaneous reduction in salinity concentrations of 100 milligrams per liter (mg/L) in both the Colorado River and SWP supplies will yield economic benefits of \$95 million per year within Metropolitan's service territory.<sup>1</sup> This estimate has added to Metropolitan's incentives to reduce salinity concentrations within the region's water supplies.

For all of these reasons, Metropolitan's Board approved a Salinity Management Policy on April 13, 1999. The policy set a goal of achieving salinity concentrations in delivered water of less than 500 mg/L TDS. The Salinity Management Policy is further discussed later in this section.

Within Metropolitan's service area, local water sources account for approximately half of the salt loading, and imported water

accounts for the remainder. All of these sources must be managed appropriately to sustain water quality and supply reliability goals. The following sections discuss the salinity issues relevant to each of Metropolitan's major supply sources.

#### Colorado River

Water imported via the Colorado River Aqueduct (CRA) has the highest level of salinity of all of Metropolitan's sources of supply, averaging around 630 mg/L since 1976. Concern over salinity levels in the Colorado River has existed for many years. To deal with the concern, the International Boundary and Water Commission approved Minute No. 242, Permanent and Definitive Solution to the International Problem of the Salinity of the Colorado River in 1973, and the President approved the Colorado River Basin Salinity Control Act in 1974. High TDS in the Colorado River as it entered Mexico and the concerns of the seven basin states regarding the quality of Colorado River water in the United States drove these initial actions. To foster interstate cooperation on this issue, the seven basin states formed the Colorado River Basin Salinity Control Forum (Forum).

The salts in the Colorado River system are indigenous and pervasive, mostly resulting from saline sediments in the Basin that were deposited in prehistoric marine environments. They are easily eroded, dissolved, and transported into the river system. The Colorado River Basin Salinity Control Program is designed to prevent a portion of this abundant salt supply from moving into the river system. The program targets the interception and control of non-point sources, such as surface runoff, as well as wastewater and saline hot springs.

The Forum proposed, the states adopted, and the U. S. Environmental Protection Agency (USEPA) approved water quality standards in 1975, including numeric criteria and a plan for controlling salinity increases. The standards require that the plan ensure that the flow-weighted average annual salinity remain at or below the 1972 levels,

<sup>1</sup> Metropolitan Water District of Southern California and U.S. Bureau of Reclamation, Salinity Management Study: Final Report (June 1999)

while the Basin states continue to develop their 1922 Colorado River Compact-apportioned water supply. The Forum selected three stations on the main stream of the lower Colorado River as appropriate points to measure the river's salinity. These stations and numeric criteria are (1) below Hoover Dam, 723 mg/l; (2) below Parker Dam, 747 mg/l; and (3) at Imperial Dam, 879 mg/l. The numeric criteria are flow-weighted average annual salinity values.

By some estimates, concentrations of salts in the Colorado River cause approximately \$353 million in quantified damages in the lower Basin each year. The salinity control program has proven to be very successful and cost-effective. Salinity control projects have reduced salinity concentrations of Colorado River water on average by over 100 mg/L or \$264 million per year (2005 dollars) in avoided damages.

During the high water flows of 1983-1986, salinity levels in the CRA dropped to a historic low of 525 mg/L. However, during the 1987-1992 drought, higher salinity levels of 600 to 650 mg/L returned. TDS in Lake Havasu was measured at 628 mg/L in November 2009.

### State Water Project

Water supplies from the SWP have significantly lower TDS concentrations than the Colorado River, averaging approximately 250 mg/L in water supplied through the East Branch and 325 mg/L on the West Branch over the long-term, with short term variability as a result of hydrologic conditions.<sup>2</sup> Because of this lower salinity, Metropolitan blends SWP water with high salinity CRA water to reduce the salinity concentrations of delivered water. However, both the supply and the TDS concentrations of SWP water can vary significantly in response to hydrologic conditions in the Sacramento-San Joaquin watersheds.

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<sup>2</sup> The higher salinity in the West Branch deliveries is due to salt loadings from local streams, operational conditions, and evaporation at Pyramid and Castaic Lakes.

As indicated above, the TDS concentrations of SWP water can vary widely over short periods of time. These variations reflect seasonal and tidal flow patterns, and they pose an additional problem for use of blending as a management tool to lower the higher TDS from the CRA supply. For example, in the 1977 drought, the salinity of SWP water reaching Metropolitan increased to 430 mg/L, and supplies became limited. During this same event, salinity at the SWP's Banks pumping plant exceeded 700 mg/L. Under similar circumstances, Metropolitan's 500 mg/L salinity objective could only be achieved by reducing imported water from the CRA. Thus, it may not always be possible to maintain both the salinity objective and water supply reliability unless salinity concentrations of source supplies can be reduced.

A federal court ruling and a resulting biological opinion issued through consultation with U.S. Fish and Wildlife Service addressing the effects of the water supply pumping operations on Delta smelt has limited SWP exports at specified times of the year since December 2007. These restrictions have increased reliance on higher salinity Colorado River water, impacting the ability at times to meet Metropolitan's goal of 500 mg/L TDS at its blend plants. Drought conditions leading to lower SWP water supply allocations in recent years also affects Metropolitan's ability to meet its salinity goal.

TDS objectives in Article 19 of the SWP Water Service Contract specify a ten-year average of 220 mg/L and a maximum monthly average of 440 mg/L. These objectives have not been met, and Metropolitan is working with DWR and other agencies on programs aimed at reducing salinity in Delta supplies. These programs aim to improve salinity on the San Joaquin River through modifying agricultural drainage and developing comprehensive basin plans. In addition, studies are underway to evaluate the benefits in reduced salinity of modifying levees in Franks Tract and other flooded islands in the Delta, or by placing operable gates in

strategic locations to impede transport of seawater derived salt.

### Recycled Water

Wastewater flows always experience significantly higher salinity concentrations than the potable water supply. Typically, each cycle of urban water use adds 250 to 400 mg/L of TDS to the wastewater. Salinity increases tend to be higher where specific commercial or industrial processes add brines to the discharge stream or where brackish groundwater infiltrates into the sewer system.

Where wastewater flows have high salinity concentrations, the use of recycled water may be limited or require more expensive treatment. Landscape irrigation and industrial reuse become problematic at TDS concentrations of over 1,000 mg/L. Some crops are particularly sensitive to high TDS concentrations, and the use of high-salinity recycled water may reduce yields of these crops. In addition, concern for the water quality in groundwater basins may lead to restrictions on the use of recycled water on lands overlying those basins.

These issues are exacerbated during times of drought, when the salinity of imported water supplies increases because of increased salinity in wastewater flows and recycled water. Basin management plans and recycled water customers may restrict the use of recycled water at a time when its use would be most valuable. To maintain the cost-effectiveness of recycled water, therefore, the salinity level of the region's potable water sources and wastewater flows must be controlled.

In May 2009, the State Water Resources Control Board (SWRCB) adopted a Recycled Water Policy<sup>3</sup> to help streamline the permitting process and help establish uniform statewide criteria for recycled water projects. This policy promotes the development of watershed- or basin-wide salt management

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<sup>3</sup> [http://www.swrcb.ca.gov/water\\_issues/programs/water\\_recycling\\_policy/docs/recycledwaterpolicy\\_approved.pdf](http://www.swrcb.ca.gov/water_issues/programs/water_recycling_policy/docs/recycledwaterpolicy_approved.pdf)

plans (to then be adopted by the respective Regional Boards) to meet water quality objectives and protect beneficial uses, rather than imposing project-by-project restrictions. The Recycled Water Policy identifies several criteria to guide recycled water irrigation or groundwater recharge project proponents in developing a salt (and nutrient) management plan.

### Groundwater Basins

Increased TDS in groundwater basins occurs either when basins near the ocean are overdrafted, leading to seawater intrusion, or when agricultural and urban return flows add salts to the basins. Much of the water used for agricultural or urban irrigation infiltrates into the aquifer, so where irrigation water is high in TDS or where the water transports salts from overlying soil, the infiltrating water will increase the salinity of the aquifer. In addition, wastewater discharges in inland regions may lead to salt buildup from fertilizer and dairy waste. In the 1950s and 1960s, Colorado River water was used to recharge severely overdrafted aquifers and prevent saltwater intrusion. As a result, the region's groundwater basins received more than 3.0 MAF of this high-TDS imported water, significantly impacting salt loadings.

In the past, these high salt concentrations have caused some basins within Metropolitan's service area to be unsuitable for municipal uses if left untreated. The Arlington Basin in Riverside and the Mission Basin in San Diego required demineralization before they could be returned to municipal service. The capacity of the larger groundwater basins makes them better able to dilute the impact of increasing salinity. While most groundwater basins within the region still produce water of acceptable quality, this resource must be managed carefully to minimize further degradation. Even with today's more heightened concern regarding salinity, approximately 600,000 tons of salts per year accumulate within the region, leading to ever-increasing salinity concentrations in many groundwater basins.

Table 4-1 shows the salinity from existing productive groundwater wells within the region, and Figure 4-1 shows the distribution of those salinity concentrations. To protect the quality of these basins, regional water quality control boards often place restrictions on the salinity concentrations of water used for basin recharge or for irrigation of lands overlying the aquifers. Those situations may restrict water reuse and aquifer recharge, or they may require expensive mitigation measures.

Metropolitan has participated with water and wastewater agencies and the Santa Ana Regional Water Quality Control Board (Regional Board) in a coordinated program to develop water quality data for local and imported supplies used to recharge groundwater basins in the Santa Ana River watershed.<sup>4</sup> In January 2008, this workgroup submitted its "Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin" to the Santa Ana Regional Board. This initial agreement addresses nitrogen and TDS and includes the following tasks:

1. Prepare a projection of ambient water quality in each groundwater management zone at six-year intervals for the subsequent 20 years.
2. Determine the impacts of foreseeable recharge projects and compare to baseline ambient water quality with salinity objectives.

3. Compare current water quality in each groundwater management zone with the ambient water quality projection made six years earlier, together with an evaluation of the reason(s) for any differences.

#### The Salinity Management Policy

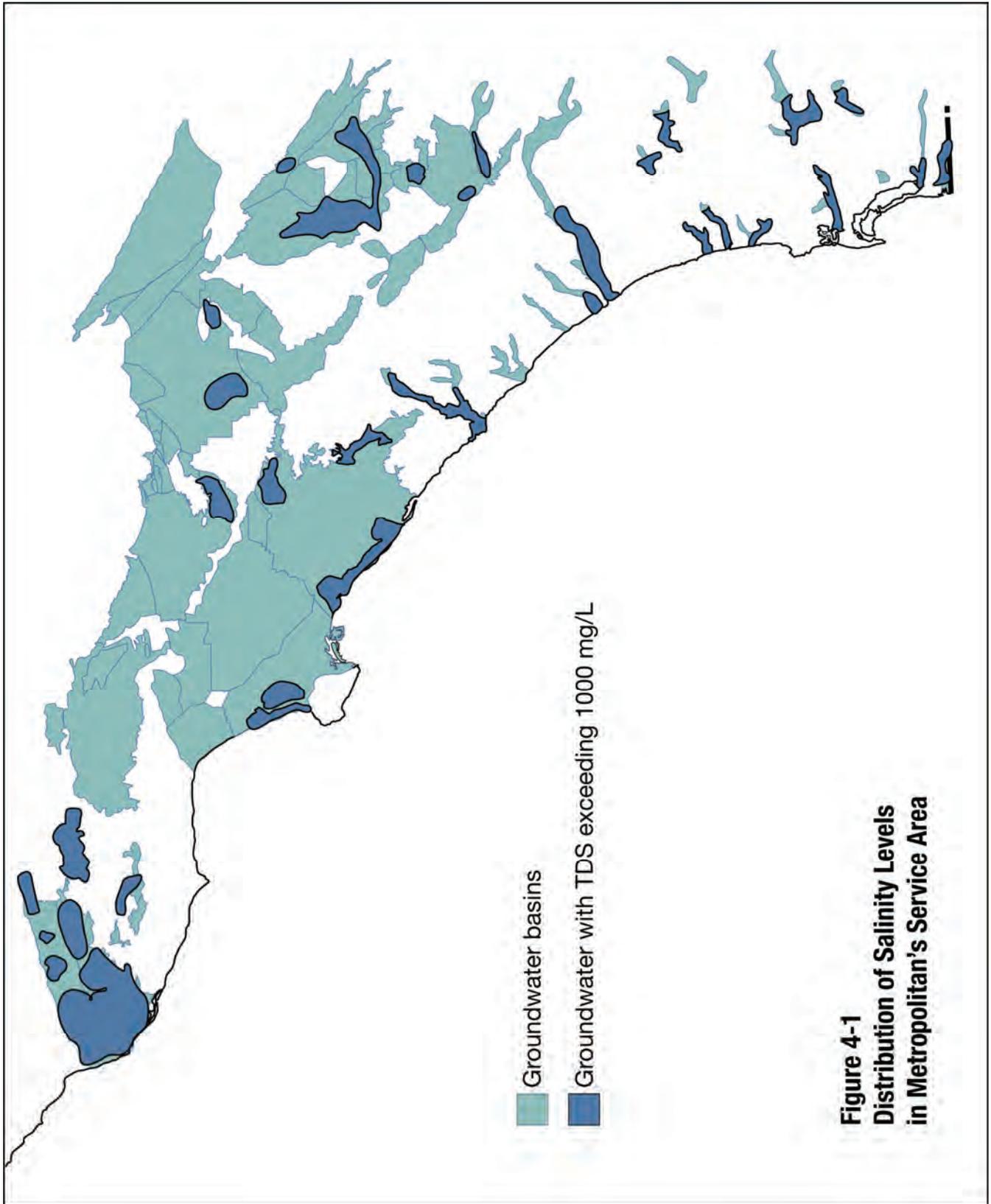
The Salinity Management Policy adopted by Metropolitan's Board specified a salinity objective of 500 mg/L for blended imported water. It also identified the need for both local and imported water sources to be managed comprehensively to maintain the ability to use recycled water and groundwater. To achieve these targets, SWP water supplies are blended with Colorado River supplies. Using this approach, the salinity target could be met in seven out of ten years. In the other three years, hydrologic conditions would result in increased salinity and reduced volume of SWP supplies. Metropolitan has alerted its local agencies that such conditions are inevitable, and that despite its best efforts, high salinity could be a concern at such times. Metropolitan has also urged its member agencies to structure the operation of their local projects and groundwater so they are prepared to mitigate the effect of higher salinity levels in imported waters. In addition, Metropolitan will concentrate on obtaining better quality water in the spring/summer months (April through September) to maximize the use of recycled water in agriculture.

**Table 4-1  
Salinity Levels at Productive Groundwater Wells**

TDS Concentration (mg/L)	Annual Production (Million Acre-Feet)	Percent of Production
Less than 500	1.06	78
500 to 1,000	0.15	11
Greater than 1,000	0.15	11
<b>Total</b>	<b>1.36</b>	<b>100</b>

Source: Metropolitan Water District of Southern California, Salinity Management Study, Final Report, June 1999.

<sup>4</sup> [http://www.swrcb.ca.gov/rwqcb8/board\\_decisions/adopted\\_orders/orders/2008/08\\_019.pdf](http://www.swrcb.ca.gov/rwqcb8/board_decisions/adopted_orders/orders/2008/08_019.pdf)



**Figure 4-1**  
**Distribution of Salinity Levels**  
**in Metropolitan's Service Area**

## *Perchlorate*

Perchlorate compounds are used as a main component in solid rocket propellant, and are also found in some types of munitions and fireworks. Perchlorate compounds quickly dissolve and become highly mobile in groundwater. Unlike many other groundwater contaminants, perchlorate neither readily interacts with the soil matrix nor degrades in the environment. Conventional drinking water treatment (as utilized at Metropolitan's water treatment plants) is not effective in removing perchlorate.

The primary human health concern related to perchlorate is its effects on the thyroid. Perchlorate interferes with the thyroid's ability to produce hormones required for normal growth and development. Pregnant women who are iodine deficient and their fetuses, infants and small children with low dietary iodide intake and individuals with hypothyroidism may be more sensitive to the effects of perchlorate.

The California Department of Public Health (CDPH) established a primary drinking water standard for perchlorate with an MCL of 6 micrograms per liter ( $\mu\text{g}/\text{L}$ )<sup>5</sup> effective October 18, 2007. There is currently no federal drinking water standard for perchlorate, but the USEPA is in the process of making its final regulatory determination for this contaminant. A regulatory determination would be the first step toward developing a national drinking water standard.

Metropolitan has offered comments to USEPA during this regulatory process, focusing on the need to protect the Colorado River and to address cleanup of impacted water supplies as a result of federal institutions within its service area. In essence, Metropolitan urged for necessary actions to ensure expedited cleanup in areas that a California drinking water standard could not be enforced.

Perchlorate was first detected in Colorado River water in June 1997 and was traced

back to Las Vegas Wash. The source of contamination was found to be emanating from a chemical manufacturing facility in Henderson, Nevada, now owned by Tronox, Inc. Tronox is currently responsible for the ongoing perchlorate remediation of the site. Another large perchlorate groundwater plume is also present in the Henderson area from a second industrial site, and although not known to have reached Las Vegas Wash yet, remediation activities are ongoing for cleanup of that plume by American Pacific Corporation (AMPAC).

Following the detection of perchlorate in the Colorado River, Metropolitan, along with USEPA and agencies in Nevada including the Nevada Division of Environmental Protection (NDEP), organized the forces necessary to successfully treat and decrease the sources of perchlorate loading. Under NDEP oversight, remediation efforts began in 1998 and treatment operations became fully operational in 2004. These efforts have reduced perchlorate loading into Las Vegas Wash from over 1000 lbs/day (prior to treatment) to 60-90 lbs/day since early 2007. This has resulted in over 90 percent reduction of the perchlorate loading entering the Colorado River system. In January 2009, Tronox filed for Chapter 11 bankruptcy protection citing significant environmental liabilities taken from the previous site owner. Tronox has continued operating its remediation system during the bankruptcy proceedings.

Perchlorate levels in Colorado River water at Lake Havasu have decreased significantly in recent years from its peak of 9  $\mu\text{g}/\text{L}$  in May 1998 as a result of the aggressive clean-up efforts. Levels have remained less than 6  $\mu\text{g}/\text{L}$  since October 2002, and have been typically less than 2  $\mu\text{g}/\text{L}$  since June 2006.

Metropolitan routinely monitors perchlorate at 34 locations within its system and levels currently remain at non-detectable levels (below 2  $\mu\text{g}/\text{L}$ ). Metropolitan has not detected perchlorate in the SWP since monitoring began in 1997.

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<sup>5</sup> 1 microgram per liter is equivalent to 1 part per billion

Perchlorate has also been found in groundwater basins within Metropolitan's service area, largely from local sources. The vast majority of locations where perchlorate has been detected in the groundwater are associated with the manufacturing or testing of solid rocket fuels for the Department of Defense and the National Aeronautics and Space Administration (NASA), or with the manufacture, storage, handling, or disposal of perchlorate (such as Aerojet in Azusa in the Main San Gabriel Basin and the Jet Propulsion Laboratory/NASA in the Raymond Basin). Past agricultural practices using fertilizers laden with naturally occurring perchlorate have also been implicated in some areas.

Metropolitan has conducted several surveys to determine the impact of perchlorate on its member and retail agencies. As of October 2007, 18 member agencies have detected perchlorate in their service areas at levels greater than 4 µg/L, while 11 have detected levels greater than 6 µg/L in at least 101 out of 1337 wells (7.6 percent). Member and retail agencies have shut down 32 wells over the years due to perchlorate contamination, losing more than 52.5 TAF per year of their groundwater production. Many of these agencies have built new wells, blended their water, or installed ion exchange treatment systems to reduce perchlorate levels, thus lowering their potential additional demand for Metropolitan water supplies to about 15 TAF per year.

Metropolitan has investigated technologies to mitigate perchlorate contamination. Perchlorate cannot be removed using conventional water treatment. Nanofiltration and reverse osmosis do work effectively but at a very high cost. Aerojet has implemented biological treatment through fluidized bed reactors (FBR) in Rancho Cordova and is re-injecting the treated water into the ground. Tronox also utilizes an FBR process train for the cleanup of their Henderson site. A number of sites in Southern California have successfully installed ion exchange systems to treat perchlorate impacted groundwater. The city of Pasadena has been using ion exchange

treatment at one well site and, in November 2009, completed a study of biological treatment for perchlorate removal in groundwater. Funding for this study was provided through a Congressional mandate from USEPA to Metropolitan.

Treatment options are available to recover groundwater supplies contaminated with perchlorate. However, it is very difficult to predict whether treatment will be pursued to recover all lost production because local agencies will make decisions based largely on cost considerations, ability to identify potentially responsible parties for cleanup, and the availability of alternative supplies.

#### *Total Organic Carbon and Bromide*

Disinfection byproducts (DBPs) form when source water containing high levels of total organic carbon (TOC) and bromide is treated with disinfectants such as chlorine or ozone. Studies have shown a link between certain cancers and DBP exposure. In addition, some studies have shown an association between reproductive and developmental effects and chlorinated water. While many DBPs have been identified and some are regulated under the Safe Drinking Water Act, there are others that are not yet known. Even for those that are known, the potential adverse health effects may not be fully characterized.

Water agencies began complying with new regulations to protect against the risk of DBP exposure in January 2002. This rule, known as the Stage 1 Disinfectants and Disinfection Byproducts (D/DBP) Rule, required water systems to comply with new MCLs and a treatment technique to improve control of DBPs. USEPA then promulgated the Stage 2 D/DBP Rule in January 2006 that makes regulatory compliance more challenging as compliance is based on a locational basis, rather than on a distribution system-wide basis.

Existing levels of TOC and bromide in Delta water supplies present significant concern for Metropolitan's ability to maintain safe drinking water supplies and comply with regulations. Levels of these constituents in SWP water

increase several fold due to agricultural drainage and seawater intrusion as water moves through the Delta. One of Metropolitan's primary objectives for the CALFED Bay-Delta process is protection and improvement of the water quality of its SWP supplies to ensure compliance with current and future drinking water regulations. Source water protection of SWP water supplies is a necessary component of meeting these requirements cost effectively.

The CALFED Record of Decision released in August 2000 adopted the following water quality goals for TOC and bromide:

- Average concentrations at Clifton Court Forebay and other southern and central Delta drinking water intakes of 50 µg/L bromide and 3.0 mg/L total organic carbon, or
- An equivalent level of public health protection using a cost-effective combination of alternative source waters, source control, and treatment technologies.

CALFED's Bay-Delta Program calls for a wide array of actions to improve Bay-Delta water quality, ranging from improvements in treatment technology to safeguarding water quality at the source. These actions include conveyance improvements, alternative sources of supply, changes in storage and operations, and advanced treatment by water supply agencies.

Source water quality improvements must be combined with cost-effective water treatment technologies to ensure safe drinking water at a reasonable cost. Metropolitan has five treatment plants: two that receive SWP water exclusively, and three that receive a blend of SWP and Colorado River water. In 2003 and 2005, Metropolitan completed upgrades to its SWP-exclusive water treatment plants, Mills and Jensen, respectively, to utilize ozone as its primary disinfectant. This ozonation process avoids the production of certain regulated disinfection byproducts that would otherwise

form in the chlorine treatment of SWP water. The non-ozone plants utilizing blended water have met federal guidelines for these byproducts through managing the blend of SWP and Colorado River water. To maintain the byproducts at a level consistent with federal law, Metropolitan limits the percentage of water from the SWP used in each plant. In mid 2010, Metropolitan anticipates ozone at the Skinner water treatment plant to come online.

Metropolitan's Board has also adopted plans to install ozonation at its other two blend plants with a total estimated ozone retrofit program cost of \$1.2 billion for all five plants.

### *Nutrients*

Elevated levels of nutrients (phosphorus and nitrogen compounds) can stimulate nuisance algal and aquatic weed growth that affects consumer acceptability, including the production of noxious taste and odor compounds and algal toxins. In addition to taste and odor toxin concerns, increases in algal and aquatic weed biomass can impede flow in conveyances, shorten filter run times and increase solids production at drinking water treatment plants, and add to organic carbon loading. Further, nutrients can provide an increasing food source that may lead to the proliferation of quagga and zebra mussels, and other invasive biological species. Studies have shown phosphorus to be the limiting nutrient in both SWP and Colorado River supplies. Therefore, any increase in phosphorus loading has the potential to stimulate algal growth, leading to the concerns identified above.

SWP supplies have significantly higher nutrient levels than Colorado River supplies. Wastewater discharges, agricultural drainage, and nutrient-rich soils in the Delta are primary sources of nutrient loading to the SWP. Metropolitan and other drinking water agencies receiving Delta water have been engaged in efforts to minimize the effects of nutrient loading from Delta wastewater plants. Metropolitan reservoirs receiving SWP water have experienced numerous taste and

odor episodes in recent years. For example, in 2005, Metropolitan reservoirs experienced 12 taste and odor events requiring treatment. A taste and odor event can cause a reservoir to be bypassed and potentially have a short-term effect on the availability of that supply. Metropolitan has a comprehensive program to monitor and manage algae in its source water reservoirs. This program was developed to provide an early warning of algae related problems and taste and odor events to best manage water quality in the system.<sup>6</sup>

Although phosphorus levels are much lower in the Colorado River than the SWP, this nutrient is still of concern. Despite relatively low concentrations (Colorado River has been considered an oligotrophic, or low-productivity, system), any additions of phosphorus to Colorado River water can result in increased algal growth. In addition, low nutrient Colorado River water is relied upon by Metropolitan to blend down the high nutrient SWP water in Metropolitan's blend reservoirs. With population growth expected to continue in the future (e.g., Las Vegas area), ensuring high levels of treatment at wastewater treatment plants to maintain existing phosphorus levels will be critical in minimizing the operational, financial, and public health impacts associated with excessive algal growth and protect downstream drinking water uses. In addition, Metropolitan continues its involvement with entities along the lower Colorado River seeking to enhance wastewater management (and therefore better manage nutrient impacts) within river communities.

Although current nutrient loading is of concern for Metropolitan and is anticipated to have cost implications, with its comprehensive monitoring program and response actions to manage algal related issues, there should be no impact on

availability of water supplies. Metropolitan's source water protection program will continue to focus on preventing increases in future nutrient loading as a result of urban and agricultural sources.

### *Arsenic*

Arsenic is a naturally occurring element found in rocks, soil, water, and air. It is used in wood preservatives, alloying agents, certain agricultural applications, semi-conductors, paints, dyes, and soaps. Arsenic can get into water from the natural erosion of rocks, dissolution of ores and minerals, runoff from agricultural fields, and discharges from industrial processes. Long-term exposure to elevated levels of arsenic in drinking water has been linked to certain cancers, skin pigmentation changes, and hyperkeratosis (skin thickening).

The MCL for arsenic in domestic water supplies was lowered to 10 µg/L, with an effective date of January 2006 in the federal regulations, and an effective date of November 2008 in the California regulations. The standard impacts both groundwater and surface water supplies. Historically, Metropolitan's water supplies have had low levels of this contaminant and would not require treatment changes or capital investment to comply with this new standard. However, some of Metropolitan's water supplies from groundwater storage programs are at levels near the MCL. These groundwater storage projects are called upon to supplement flow only during low SWP allocation years. Metropolitan has had to restrict flow from one program to limit arsenic increases in the SWP. Implementation of a pilot arsenic treatment facility by one groundwater banking partner has also resulted in increased cost. Moreover, Metropolitan has invested in solids handling facilities and implemented operational changes to manage arsenic in the solids resulting from the treatment process.

In April 2004, California's Office of Environmental Health Hazard Assessment (OEHHA) set a public health goal for arsenic

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<sup>6</sup> William D. Taylor et al., *Early Warning and Management of Surface Water Taste-and-Odor Events*, Project No. 2614 (Denver, CO: American Water Works Association Research Foundation, 2006)

of 0.004 µg/L, based on lung and urinary bladder cancer risk. Monitoring results submitted to CDPH in 2001-2003 showed that arsenic is ubiquitous in drinking water sources, reflecting its natural occurrence. They also showed that many sources have arsenic detections above the 10 µg/L MCL. Southern California drinking water sources that contain concentrations of arsenic over 10 µg/L include San Bernardino (64 sources), Los Angeles (48 sources), Riverside (26 sources), Orange (4 sources), and San Diego (5 sources).<sup>7</sup>

The state detection level for purposes of reporting (DLR) of arsenic is 2 µg/L. Between 2001 and 2008, arsenic levels in Metropolitan's water treatment plant effluents ranged from not detected (< 2 µg/L) to 2.9 µg/L. For Metropolitan's source waters, levels in Colorado River water have ranged from not detected to 3.5 µg/L, while levels in SWP water have ranged from not detected to 4.0 µg/L. Increasing coagulant doses at water treatment plants can reduce arsenic levels for delivered water.

Some member agencies may face greater problems with arsenic compliance. A 1992 study for Central Basin Municipal Water District, for example, indicated that some of the Central Basin wells could have difficulty in complying with a lowered standard.<sup>8</sup> Water supplies imported by the Los Angeles Department of Water and Power may also contain arsenic above the MCL. The cost of arsenic removal from these supplies could vary significantly.

### *Uranium*

A 16-million-ton pile of uranium mill tailings near Moab, Utah lies approximately 750 feet

from the Colorado River. Due to the proximity of the pile to the Colorado River, there is a potential for the tailings to enter the river as a result of a catastrophic flood event or other natural disaster. In addition, contaminated groundwater from the site is slowly seeping into the river. The U.S. Department of Energy (DOE) is responsible for remediating the site, which includes removal and offsite disposal of the tailings and onsite groundwater remediation.

Previous investigations have shown uranium concentrations contained within the pile at levels significantly above the California MCL of 20 picocuries per liter (pCi/L). Metropolitan has been monitoring for uranium in the Colorado River Aqueduct and at its treatment plants since 1986. Monitoring at Lake Powell began in 1998. Uranium levels measured at Metropolitan's intake have ranged from 1-6 pCi/L, well below the California MCL. Conventional drinking water treatment, as employed at Metropolitan's water treatment plants, can remove low levels of uranium, however these processes would not be protective if a catastrophic event washed large volumes of tailings into the Colorado River. Public perception of drinking water safety is also of particular concern concerning uranium.

Remedial actions at the site since 1999 have focused on removing contaminated water from the pile and groundwater. Through 2009, over 2,700 pounds of uranium in contaminated groundwater have been removed. In July 2005, DOE issued its Final Environmental Impact Statement with the preferred alternative of permanent offsite disposal by rail to a disposal cell at Crescent Junction, Utah, located approximately 30 miles northwest of the Moab site.

Rail shipment and disposal of the uranium mill tailings pile from the Moab, Utah site began in April 2009. Through March 2010, DOE has shipped over 1 million tons of mill tailings to the Crescent Junction disposal cell. Using American Recovery and Reinvestment Act (ARRA) 2009 funding, DOE has increased shipments in order to meet its ARRA project

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<sup>7</sup> From the CDPH web site: <http://www.cdph.ca.gov/certlic/drinkingwater/Pages/Arsenic.aspx>. Note that the numbers reported there may change because the website is frequently updated.

<sup>8</sup> *Summary Review on the Occurrence of Arsenic in the Central Groundwater Basin, Los Angeles County, California*, prepared by Richard C. Slade & Associates, Sept. 7, 1993.

commitment to ship an additional 2 million tons of mill tailings by September 2011 and accelerate overall clean-up of the site. DOE estimates completing movement of the tailings pile by 2025, with a goal of 2019 should additional funding be secured. Metropolitan continues to track progress of the remediation efforts, provide the necessary legislative support for rapid cleanup, and work with Congressional representatives to support increased annual appropriations for this effort.

Another uranium-related issue began receiving attention in 2008 due to a renewed worldwide interest in nuclear energy and the resulting increase in uranium mining claims filed throughout the western United States. Of particular interest were thousands of mining claims filed near Grand Canyon National Park and the Colorado River. Metropolitan has since sent letters to the Secretary of Interior to highlight source water protection and consumer confidence concerns related to uranium exploration and mining activities near the Colorado River, and advocate for close federal oversight over these activities. In 2009, Secretary of Interior Ken Salazar announced the two-year hold on new mining claims on 1 million acres adjacent to the Grand Canyon to allow necessary scientific studies and environmental analyses to be conducted. In 2009, H.R. 644 – Grand Canyon Watersheds Protection Act was introduced and if enacted, would permanently withdraw areas around the Grand Canyon from new mining activities.

### *Chromium VI*

Chromium is a naturally occurring element found in rocks, soil, plants, and animals. Chromium III is typically the form found in soils and is an essential nutrient that helps the body use sugar, protein, and fat. Chromium VI is used in electroplating, stainless steel production, leather tanning, textile manufacturing, dyes and pigments, wood preservation and as an anti-corrosion agent. Chromium occurs naturally in deep aquifers and can also enter drinking water

through discharges of dye and paint pigments, wood preservatives, chrome plating liquid wastes, and leaching from hazardous waste sites. In drinking water, Chromium VI is very stable and soluble in water, whereas chromium III is not very soluble. Chromium VI is the more toxic species and is known to cause lung cancer in humans when inhaled, but the health effects in humans from ingestion are still in question. There is evidence that when Chromium VI enters the stomach, gastric acids may reduce it to chromium III. However, recent studies conducted by the National Toxicology Program have shown that Chromium VI can cause cancer in animals when administered orally.

Currently, there are no drinking water standards for Chromium VI. Total chromium (including chromium III and Chromium VI) is regulated in California with an MCL of 50 µg/L. On August 20, 2009, OEHHA released a draft public health goal (PHG) of 0.06 µg/L for Chromium VI in drinking water. The PHG is a health-protective, non-regulatory level that will be used by CDPH in its development of an MCL. CDPH will set the MCL as close to the PHG as technically and economically feasible.

Metropolitan utilizes an analytical method with a minimum reporting level of 0.03 µg/L, which is less than the State detection level for purposes of reporting (DLR) of 1 µg/L. The results from all of Metropolitan's source and treated waters are less than the State DLR of 1 µg/L (except for one detection of 1 µg/L at the influent to the Mills water treatment plant). The following summarizes Chromium VI levels found in Metropolitan's system:

- In the past 10 years, results of source and treated water monitoring for Chromium VI indicate: Levels in Colorado River water are mostly not detected (<0.03 µg/L) but when detected range from 0.03 – 0.08 µg/L. SWP levels range from 0.03 – 0.8 µg/L. Treated water levels range from 0.03 – 0.7 µg/L.

- There is a slight increase in Chromium VI in the treated water from the oxidation (chlorination and ozonation) of natural background chromium (total) to Chromium VI.
- Colorado River monitoring results upstream and downstream of the Topock site (discussed below) have ranged from not detected (<0.03 µg/L) to 0.06 µg/L.
- Chromium VI in Metropolitan's groundwater pump-in storage programs in the Central Valley has ranged from not detected (< 1 µg/L) to 9.1 µg/L with the average for the different programs from 1.4 to 5.0 µg/L.
- Chromium VI has been detected in a groundwater aquifer on the site of a Pacific Gas and Electric (PG&E) gas compressor station located along the Colorado River near Topock, Arizona.

PG&E used Chromium VI as an anti-corrosion agent in its cooling towers from 1951 to 1985. Wastewater from the cooling towers was discharged from 1951 to 1968 into a dry wash next to the station. Monitoring wells show the plume concentration has peaked as high as 16,000 µg/L. PG&E operates an interim groundwater extraction and treatment system that is protecting the Colorado River. Quarterly monitoring of the river has shown levels of Chromium VI less than 1 µg/L, which are considered background levels. The California Department of Toxic Substances Control and the U. S. Department of Interior are the lead state and federal agencies overseeing the cleanup efforts. Metropolitan participates through various stakeholder workgroups and partnerships that include state and federal regulators, Indian tribes, and other stakeholders (e.g., Colorado River Board) involved in the corrective action process. In 2010, it is anticipated that a final treatment alternative will be selected, and an Environmental Impact Report will be released for the recommended cleanup alternative.

The federal- and state-approved technologies for removing total chromium from drinking water include coagulation/

filtration, ion exchange, reverse osmosis, and lime softening. Potential treatment technologies for Chromium VI in drinking water may include reduction/chemical precipitation, an ion exchange, or reverse osmosis. For several years, the cities of Glendale, Burbank, and Los Angeles have been voluntarily limiting Chromium VI levels in their drinking water to 5 µg/L, an order of magnitude lower than the current statewide total chromium standard of 50 µg/L. The experience of these agencies in the treatment of water containing Chromium VI will be helpful in CDPH's evaluations of treatment technologies and associated costs, which are required as part of a proposed MCL regulation package.

#### *N-Nitrosodimethylamine*

N-Nitrosodimethylamine (NDMA) is part of a family of organic chemicals called nitrosamines and is a byproduct of the disinfection of some natural waters with chloramines. Metropolitan utilizes chloramines as a secondary disinfectant at its treatment plants. Wastewater treatment plant effluent and agricultural runoff can contribute organic material into source waters which react to form NDMA at water treatment plants. Certain polymers can also contribute NDMA precursor materials. Some NDMA control measures or removal technologies may be required to avoid adverse impacts on Southern California drinking water supplies. Metropolitan is involved in several projects to understand the watershed sources and occurrence of NDMA precursors in Metropolitan source waters, and to develop treatment strategies to minimize NDMA formation in drinking water treatment plants and distribution systems. Special studies conducted at Metropolitan have shown removal of NDMA using advanced oxidation processes. Other treatment process such as biological, membrane, and carbon adsorption need to be evaluated for NDMA removal.

USEPA considers NDMA to be a probable human carcinogen. USEPA placed NDMA in the Unregulated Contaminant Monitoring

Regulation 2 (UCMR2) and on the Contaminant Candidate List 3 (CCL3). CDPH also considers NDMA to be a probable human carcinogen. CDPH has not established a MCL for NDMA. However, in 1998 CDPH established a notification level of 0.01 µg/L. Occurrences of NDMA in treated water supplies at concentrations greater than 0.01 µg/L are recommended to be included in the utility's annual Consumer Confidence Report. In December 2006, OEHHA set a public health goal for NDMA of 0.003 µg/L. Metropolitan has monitored its source waters (at treatment plant influents) and treated waters on a quarterly basis since 1999. Test results for the presence of NDMA in Metropolitan's system have ranged from non-detect (reporting limit of 0.002 µg/L) to 0.014 µg/L. Preliminary data from UCMR2 confirm that the presence of NDMA is not limited to Metropolitan waters, but is widespread. NDMA, or a broader class of nitrosamines, may likely be the next disinfection byproduct(s) to be regulated by USEPA.

#### *Pharmaceuticals and Personal Care Products*

Pharmaceuticals and personal care products (PPCPs) are a growing concern to the water industry. Numerous studies have reported the occurrence of these emerging contaminants in treated wastewater, surface water, and sometimes, in finished drinking water in the United States and around the world. The sources of PPCPs in the aquatic environment include (but may not be limited to) treated wastewater and industrial discharge, agricultural run-off, and leaching of municipal landfills. Currently, there is no evidence of human health risks from long-term exposure to the low concentrations (low ng/L; parts per trillion) of PPCPs found in some drinking water. Furthermore, there are no regulatory requirements for PPCPs in drinking water. In October 2009, USEPA included 13 PPCPs on the CCL3; however, currently there are no standardized analytical methods for these compounds.

In 2007, Metropolitan implemented a monitoring program to determine the occurrence of PPCPs and other organic wastewater contaminants in Metropolitan's treatment plant effluents and selected source water locations within the Colorado River and SWP watersheds. Some PPCPs have been detected at very low ng/L levels, which is consistent with reports from other utilities. However, analytical methods are still being refined and more work is required to fully understand occurrence issues. Metropolitan has been actively involved in various studies related to PPCPs, including analytical methods improvements, and characterization of drinking water sources in California.

Metropolitan has participated with water and wastewater agencies and the Santa Ana Regional Board in a coordinated program to address emerging constituents relevant to local and imported supplies used to recharge groundwater basins in the Santa Ana River watershed. As part of the Regional Board-adopted "Cooperative Agreement to Protect Water Quality and Encourage the Conjunctive Uses of Imported Water in the Santa Ana River Basin", there are provisions for the workgroup to initiate development of monitoring for emerging unregulated constituents. Metropolitan, Orange County Water District, and the National Water Research Institute provided substantial input to the workgroup through its two-year monitoring study of emerging constituents in waters found throughout watersheds of the SWP, Colorado River, and Santa Ana River. In April 2009, the workgroup completed its Phase I Report summarizing its findings and recommendations regarding investigation into emerging constituents in water supplies. In December 2009, the workgroup submitted its proposed 2010/11 plan for monitoring of emerging constituents in imported and local waters. The workgroup also provided input to a Blue Ribbon Panel convened by the State Water Resources Control Board to review the emerging science of unregulated chemicals as it relates to the use of recycled water for irrigation and groundwater recharge.

## *Decreasing Concerns*

### *Methyl Tertiary-Butyl Ether*

Methyl tertiary-butyl ether (MTBE) was the primary oxygenate in virtually all the gasoline used in California, prior to the discovery that MTBE had contaminated groundwater supplies and was also found in surface water supplies. MTBE was banned in California as of December 31, 2003, although the concentration of MTBE in gasoline blends was voluntarily reduced beginning in January 2003. MTBE has subsequently been replaced by ethanol which is now the primary oxygenate in use. CDPH has adopted a primary MCL of 13 µg/L for MTBE based on carcinogenicity studies in animals. MTBE also has a California secondary MCL of 5 µg/L, which was established based on taste and odor concerns.

MTBE was introduced into surface water bodies from the motor exhausts of recreational watercraft. At Diamond Valley Lake and Lake Skinner, Metropolitan has taken steps to reduce the potential for MTBE contamination. In 2003, Metropolitan's Board authorized a non-polluting boating program for these reservoirs that calls for specific boat requirements (MTBE-free fuel and clean burning engines) and a monitoring program that will show if MTBE or other gasoline contaminants appear at the lake. Metropolitan regularly monitors its water supply for contamination from MTBE and other oxygenates. In recent years, MTBE testing results in source waters have remained at non-detectable levels (below 3 µg/L).

MTBE still presents a significant problem to local groundwater basins. Leaking underground storage tanks and poor fuel-handling practices in the past at local gas stations may provide a large source of MTBE. MTBE is very soluble in water and has low affinity for soil particles, so it moves quickly into the groundwater. Within Metropolitan's service area, local groundwater producers have been forced to close some of their wells due to MTBE contamination. MTBE is also resistant to chemical and microbial

degradation in water, making treatment more difficult than the treatment of other gasoline components. A combination of an advanced oxidation process (typically ozone and hydrogen peroxide) followed by granular activated carbon has been found to be effective in reducing the levels of these contaminants.

Although some groundwater supplies remain contaminated with this highly soluble chemical, contamination of Metropolitan's surface water supplies are no longer a problem. Further, improved underground storage tank requirements and monitoring, and the phase-out of MTBE as a fuel additive, will decrease the likelihood of MTBE groundwater problems in the future.

### *Other Water Quality Programs*

In addition to monitoring for and controlling specific identified chemicals in the water supply, Metropolitan has undertaken a number of programs to protect the quality of its water supplies. These programs are summarized below.

#### *Source Water Protection*

Source water protection is the first step in a multi-barrier approach to provide safe and reliable drinking water. In accordance with California's Surface Water Treatment Rule, Title 22 of the California Code of Regulations, 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 Metropolitan's water sources were completed in 2005 and 2006.<sup>9</sup> The next Sanitary Surveys for the watersheds of the

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<sup>9</sup> Metropolitan Water District of Southern California, *Colorado River Watershed Sanitary Survey, 2005 Update*. For the State Water Project, the sanitary survey report was prepared on behalf of the State Water Project Contractors Authority, in 2006, and was titled *California State Water Project Watershed Sanitary Survey, 2006 Update*.

Colorado River and the SWP will report on water quality issues and monitoring data through 2010. Metropolitan has an active source water protection program and continues to advocate on behalf of numerous SWP and Colorado River water quality protection issues.

#### *Support SWP Water Quality Programs*

Metropolitan supports DWR policies and programs aimed at maintaining or improving the quality of SWP water delivered to Metropolitan. In particular, Metropolitan supported the DWR policy to govern the quality of non-project water conveyed by the California Aqueduct. In addition, Metropolitan has supported the expansion of DWR's Municipal Water Quality Investigations Program beyond its Bay-Delta core water quality monitoring and studies to include enhanced water quality monitoring and forecasting of the Delta and SWP. These programs are designed to provide early warning of water quality changes that will affect treatment plant operations both in the short-term (hours to weeks) and up to seasonally. The forecasting model is currently suitable for use in a planning mode. It is expected that with experience and model refinement, it will be suitable to use as a tool in operational decision making.

#### *Water Quality Exchanges*

Metropolitan has implemented selective withdrawals from the Arvin-Edison storage program and exchanges with the Kern Water Bank to improve water quality. Although these programs were initially designed to provide dry-year supply reliability, they can also be used to store SWP water at periods of better water quality so the stored water may

be withdrawn at times of lower water quality, thus diluting SWP water deliveries. Although elevated arsenic levels has 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 TOC levels (as well as lower bromide and TDS, in some programs).

#### *Water Supply Security*

The change in the national and international security situation has led to increased concerns about protecting the nation's water supply. In coordination with its member agencies, Metropolitan added new security measures in 2001 and continues to upgrade and refine procedures. Changes have included an increase in the number of water quality tests conducted each year (Metropolitan now conducts over 300,000 analytical tests on samples collected within our service area and source waters), as well as contingency plans that coordinate with the Homeland Security Office's multicolored tiered risk alert system.

