# PADRE DAM MUNICIPAL WATER DISTRICT

# URBAN WATER MANAGEMENT PLAN

# December 2005

Prepared For:

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Municipal Water District
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## Abbreviations

| | |
|---|---|
| AF | Acre feet |
| AFY | Acre feet per year |
| BMP | Best Management Practice |
| Caltrans | California Department of Transportation |
| CUWCC | California Urban Water Conservation Council |
| CIMIS | California Irrigation Management Information Systems |
| CIP | Capital Improvement Plan |
| DWR | California Department of Water Resources |
| ESA | Eastern Service Area |
| ESP | Emergency Storage Project |
| FCF | Flow Control Facility |
| GIS | Geographic Information System |
| gpd | Gallons per day |
| gpm | Gallons per minute |
| IFP | Integrated Facilities Plan |
| IICP | Incremental Interruption and Conservation Program |
| MAF | Million of acre-feet |
| MAFY | Million of acre-feet per year |
| MG | Million gallons |
| MGD | Million gallons per day |
| MGRA | Major Geographical Regional Area |
| MOU | Memorandum of Understanding |
| MWD | Metropolitan Water District of Southern California |
| NA | Not Applicable |
| PDMWD | Padre Dam Municipal Water District |
| PL4 | Second Aqueduct Pipeline 4 |
| psi | Pounds per square inch |
| ROW | Right-of-Way |
| SANDAG | San Diego Association of Governments |
| SANGIS | San Diego Geographic Information System |
| SDCWA | San Diego County Water Authority |
| SPA | Specific Plan Area |
| ULFT | Ultra-Low-Flush Toilet |
| WD | Water District |
| WRF | Water Recycling Facility |
| WRO | Water Reclamation Ordinance |
| WSA | Western Service Area |
| WTP | Water Treatment Plant |

## Terms

| | |
|---|---|
| Act | Urban Water Management Planning Act of 1983, including amendments |
| Board | Padre Dam Municipal Water District's Board of Directors |
| Contingency Plan | Water Shortage Contingency Plan |
| County | County of San Diego |
| District | Padre Dam Municipal Water District |
| Master Plan | Water Reclamation Master Plan |
| Plan | Urban Water Management Plan |
| Santee | City of Santee |

# 1. Introduction

## 1.1 California Urban Water Management Planning Act

The California Urban Water Management Planning Act of 1983 (Act) states,

> "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."

The Act, which comprises sections 10610 through 10657 of the California Water Code, requires all urban water suppliers in the state to prepare and adopt an urban water management plan (Plan) and update it every five years, to assure the efficient use of urban water supplies and their reliability during normal, dry and multiple dry water years. The full text of the Act is contained in **Appendix A**.

## 1.2 Padre Dam's 2005 Urban Water Management Plan

This report is the 2005 update of Padre Dam's 2000 Urban Water Management Plan. In accordance with the Act, Padre Dam coordinated its planning efforts with the San Diego County Water Authority, its wholesale water supplier, to ensure that supply and demand data and issues are presented accurately. The checklist provided by the California Department of Water Resources was also utilized to assure that the Plan meets all requirements. Padre Dam's completed DWR checklist is included in **Appendix B**.

Prior to adoption, Padre Dam provided the 2005 Plan to its key stakeholders for review, including the San Diego County Water Authority, City of Santee, City of El Cajon, Lakeside Water District, Riverview Water District, Alpine Planning Commission and County of San Diego. On November 22, 2005, Padre Dam's Board of Directors held a public hearing and adopted the 2005 Plan. A copy of the resolution adopting the 2005 Plan is in **Appendix C**.

## 1.3 History of Padre Dam

| | |
|---|---|
| **1955** | Lakeside Irrigation District, Riverview Mutual Water Company, Lakeside Farms Mutual Water Company and a group of Santee Valley residents formed Rio San Diego Municipal Water District to secure an entitlement to imported Colorado River water. |
| **1956** | Santee County Water District formed to provide water service, and three years later, wastewater collection and treatment service, to the rapidly growing Santee community. |
| **1960** | Blossom Valley, Flinn Springs, Alpine, Mountain Top and Harbison Canyon joined Rio San Diego Municipal Water District to access imported Colorado River water. |
| **1961** | Santee County Water District opened Santee Lakes, a model project utilizing recycled water to provide boating, fishing and swimming. |
| **1976** | In a voter approved merger, Rio San Diego and Santee County became Padre Dam Municipal Water District. |
| **1985** | Crest joined Padre Dam. |

## 1.4 Service Area

### 1.4.1 Geography

Padre Dam's service area spans 85 square miles and is divided into the Eastern and Western Service Areas, as shown in **Figure 1-1**. The District's water service area currently includes the Lakeside Water District and Riverview Water District; however, by 2006, the District expects these water districts to separate and operate independently. Water service is provided to the City of Santee, parts of the City of El Cajon, and to the unincorporated areas of Lakeside, Flinn Springs, Harbison Canyon, Blossom Valley, Alpine, Dehesa and Crest. A 2,300 foot elevation gain from Padre Dam's wholesale water connection from the San Diego County Water Authority to its Viejas Mountain Reservoir in its Eastern Service Area requires 10 pumping stations, making Padre Dam's water distribution system a Grade 5 system and one of the most complex in San Diego County.

### 1.4.2 Climate

Padre Dam's customers enjoy a Mediterranean climate. While winter temperatures can dip below freezing and summer temperatures can exceed 100 degrees, the average annual high and low temperatures are 78 degrees and 52 degrees. Annual precipitation is approximately 12 inches and over 80% of the precipitation occurs between December and March.

### 1.4.3 Population

Padre Dam currently serves 24,305 accounts, 13,140 of which receive both water and sewer service, while 9,533 receive water service only, 1,450 receive sewer service only and 182 receive recycled water service. Population projections for Padre Dam's service area are available from the San Diego Association of Governments (SANDAG) 2030 Cities/Counties Forecast and are presented in **Table 1-1**.

**Table 1-1**
**Current and Projected Service Area Population[1]**

| | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|---|
| Service Area Population | 130,199 | 135,100 | 140,000 | 144,900 | 149,800 | 154,734 |

[1] Current population is based on SDCWA 2004 Rate Survey, 2030 population projection is based on SANDAG 2030 Cities/Counties Forecast (corresponds with 2002 IFP forecast for buildout population), and interim years are interpolated; these projections will require adjustment once Lakeside Water District and Riverview Water District are removed from the District's service area.

## 1.5 Physical Water Delivery System

### 1.5.1 Water System Specifications

Padre Dam's water distribution system is a Grade 5 system including 357 miles of potable water mains, 26 potable water reservoir tanks with a total storage capacity of 104.9 million gallons, and 15 pumping stations. Padre Dam's recycled water system includes 32 miles of mains and a 1.5 million gallon reservoir tank.

Figure 1-1

### 1.5.2 Integrated Facilities Plan

In 2002, Padre Dam's Board of Directors approved the Integrated Facilities Plan, a strategic planning document addressing infrastructure maintenance, replacement and expansion through 2030, assuring Padre Dam's ability to meet existing and future demands on its water, wastewater and recycled water systems.

### 1.5.3 Capital Improvement Program

Padre Dam reviews its capital improvement program on an annual basis to provide flexibility and responsiveness as needed within the longer timeframe of the Integrated Facilities Plan.

# 2. Water Demands

The District currently supplies approximately 20,000 AFY of potable water to its wholesale and retail customers. The entire potable water supply is imported from the SDCWA and conveyed via major potable water infrastructure including 357 miles of water pipelines, 26 water storage tanks and 15 pump stations.

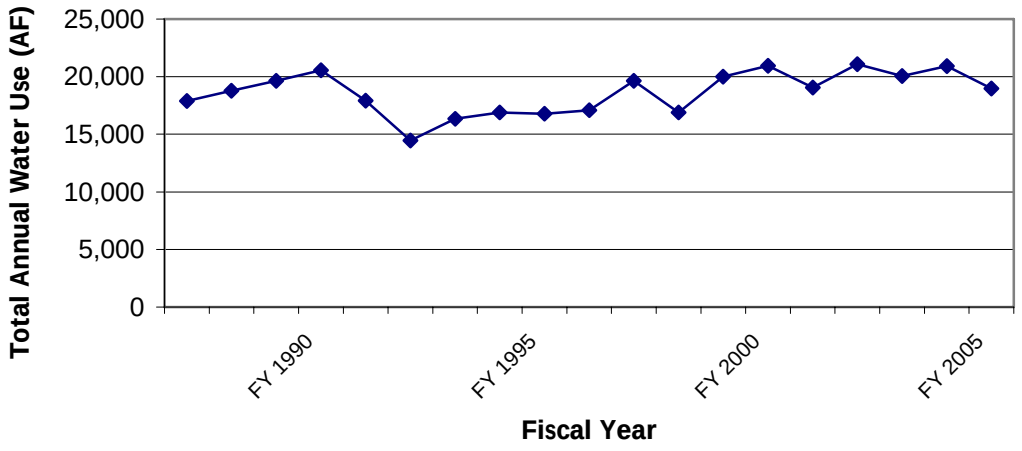
## 2.1 Historic and Projected Water Use

Water demands within the District's service area vary according to the types of land uses. As development within the District's service area continues, improvement and/or expansion of existing water facilities will be required to accommodate the projected demand increases. The impacts of future conservation and proposed recycled water use were considered when developing the projected water demands.

### 2.1.1 Historic Water Use

**Figure 2-1** provides historic annual District water use. The history of the District shows a decline in water use during the early 1990s when water conservation measures were adopted, followed by a gradual increase to about 20,000 AFY, which has generally remained steady for the last five years in spite of population increases.

**Figure 2-1**
**Annual District Water Use**




### 2.1.2 Projected Water Use

Table 2-1 provides past, current, and projected water deliveries to the District. A jump in water use is shown between 2005 and 2010 because 2005 was an unusually wet year with lower demands. It also represents a forecasted increase in demand due to expected new construction.

Currently, the District's demand (excluding Lakeside and Riverview Water Districts and Santee Lakes recharge) is approximately 59 percent single family; 13 percent multifamily; 9 percent commercial, industrial, and institutional; 4 percent landscape; 7 percent agriculture; and 8 percent other, including construction meters and fire service. The projected demand by land use category for 2025 is expected to be similar; a graphical representation of water use by land use category is provided in **Figure 2-2**.

**Table 2-1**
**Past, Current, and Projected Water Deliveries**

| Year | Water Use Sectors | Single Family | Multi-Family | Comm/Inst | Landscape | Ag/Rural | Other[1] | Recycled Water[2] | Lakeside/ Riverview | System Losses[3] | TOTAL[4] |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | No. of Accounts | 18,299 | 1,591 | 932 | 228 | 24 | 36 | 140 | | | 21,250 |
| | Deliveries (AF/Y) | 9,947 | 2,511 | 1,605 | 926 | 859 | 98 | 565 | 5,000 | 838 | 22,349 |
| 2005[5] | No. of Accounts | 18,875 | 1,600 | 1,020 | 257 | 19 | 79 | 175 | | | 22,025 |
| | Deliveries (AF/Y) | 8,880 | 1,940 | 1,327 | 619 | 1,098 | 176 | 998 | 4,200 | 730 | 19,968 |
| 2010 | No. of Accounts | 21,839 | 2,341 | 1,092 | 286 | 19 | 79 | 175 | | | 25,831 |
| | Deliveries (AF/Y) | 13,082 | 3,673 | 1,836 | 801 | 1,200 | 200 | 1,000 | 0 | 872 | 22,663 |
| 2015 | No. of Accounts | 22,468 | 2,341 | 1,093 | 286 | 19 | 79 | 175 | | | 26,461 |
| | Deliveries (AF/Y) | 14,143 | 3,837 | 1,837 | 801 | 1,200 | 200 | 1,000 | 0 | 921 | 23,939 |
| 2020 | No. of Accounts | 23,097 | 2,350 | 1,094 | 290 | 19 | 100 | 195 | | | 27,145 |
| | Deliveries (AF/Y) | 14,930 | 4,133 | 1,839 | 812 | 1,200 | 200 | 1,200 | 0 | 973 | 25,287 |
| 2025 | No. of Accounts | 23,500 | 2,360 | 1,095 | 290 | 19 | 100 | 195 | | | 27,559 |
| | Deliveries (AF/Y) | 16,490 | 4,455 | 1,840 | 820 | 1,200 | 200 | 1,200 | 0 | 1,048 | 27,253 |
| 2030 | No. of Accounts | 24,000 | 2,370 | 1,096 | 290 | 19 | 100 | 195 | | | 28,070 |
| | Deliveries (AF/Y) | 17,673 | 5,034 | 1,842 | 820 | 1,200 | 200 | 1,200 | 0 | 1,119 | 29,088 |

[1] Other water deliveries includes fire services and construction meters.

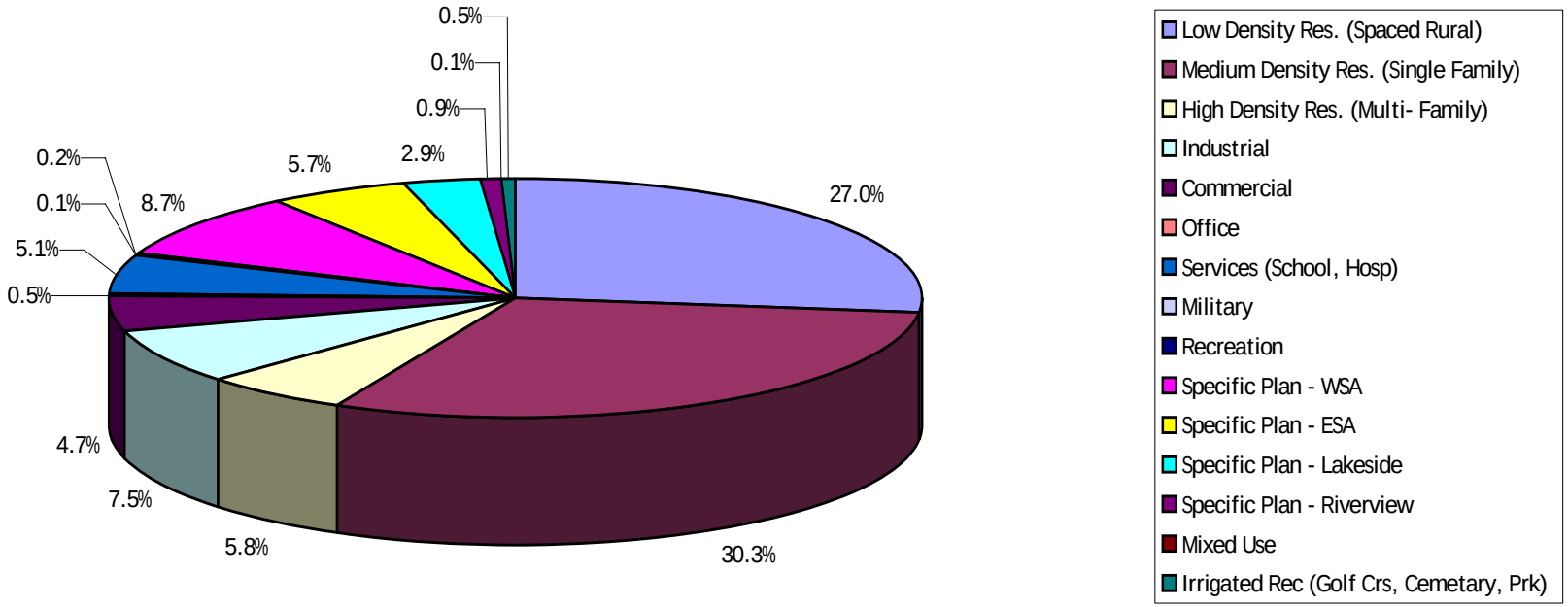
[2] Recycled water includes landscape use only (excludes replenishment of Santee Lakes).

[3] System losses are 838 AFY for 2000, 730 AFY for 2005 per District records, and estimated at 4% for future years.

[4] 2010 through 2030 projections are based on the District's estimated new accounts, but single family and multi-family projections are adjusted to correlate with SDCWA projections.

[5] 2005 data was estimated using both FY05 data and calendar year 2004 records.

**Figure 2-2**
**Projected 2025 Demands by Land Use Category**



# 3. Water Demand Management

## 3.1 Description

Demand management, better known as water conservation, comprises a number of methods to reduce the demand for water in San Diego County. The water saved through conservation can be used to offset the demand on other water sources, which is why water conservation is a critical part of the long term strategy of the San Diego County Water Authority to provide a diversified and reliable water supply for San Diego County's future population and economy.

## 3.2 Best Management Practices

In 1991, during the fourth year of a severe drought in Southern California, a Memorandum of Understanding Regarding Urban Water Conservation in California (MOU) formed the California Urban Water Conservation Council (CUWCC) and water conservation Best Management Practices (BMPs) intended to reduce long-term urban water demand statewide. These BMPs are listed in **Table 3-1** as follows:

**Table 3-1**
**BMPS for Urban Water Conservation in California**

| BMP # | Description |
|---|---|
| 1 | Residential Surveys |
| 2 | Residential Planning Retrofit |
| 3 | Distribution System Water Audits |
| 4 | Metering with Commodity Rates |
| 5 | Large Landscape Program and Incentives |
| 6 | High-Efficiency Clothes Washer Rebates |
| 7 | Public Information Programs |
| 8 | School Education Programs |
| 9 | Commercial, Industrial & Institutional Water Conservation |
| 10 | Wholesale Agency Assistance Programs |
| 11 | Conservation Pricing |
| 12 | Water Conservation Coordinator |
| 13 | Water Waste Prohibition |
| 14 | Residential Ultra Low-Flush Toilet Replacement Program |

Padre Dam was an immediate signatory of the MOU (Board Resolution 91-91 included in **Appendix E**), and submits a biennial report to the CUWCC regarding BMP implementation and compliance. Padre Dam's 2003-2004 BMP Annual Report and Coverage Report is included in **Appendix D**.

In accordance with the BMPs, Padre Dam provides each of its customer groups with a variety of water conservation programs, as shown in **Table 3-2**.

**Table 3-2**
**Water Conservation Programs**

| Residential Programs | Commercial Programs | Educational Programs |
|---|---|---|
| Public Information<br>• New customer packet<br>• Customer newsletter<br>• Website and brochures<br>• Santee Lakes events<br>• Newspaper column<br>• Newspaper advertising<br>• Speakers bureau<br><br>Conservation Pricing<br><br>Voucher Programs<br>• ULFTs<br>• HEWs<br>• Residential surveys<br>• WBICs<br><br>Water Conservation Garden<br>• Sponsorship<br>• Promotion | Public Information<br>• New customer packet<br>• Customer newsletter<br>• Website and brochures<br>• Newspaper column<br>• Newspaper advertising<br>• Speakers bureau<br><br>Conservation Pricing<br><br>CII Voucher Programs<br>• Indoor<br>• Landscape<br><br>Water Conservation Garden<br>• Sponsorship<br>• Promotion | SDCWA Classroom Presentations/Activities<br><br>Padre Dam Classroom Activities<br><br>SplashLab school visits<br><br>Santee Lakes events<br><br>Water Recycling Facility tours<br><br>Water Conservation Garden tours |

## 3.3 Effectiveness of Conservation Measures

The District is committed to promoting water conservation among its customers to reduce the consumption of potable water. From 2000 to 2005, the District's water consumption has remained steady at 1990 consumption levels, while the population within the District's service area has grown substantially. Estimates of the District's conservation savings attributed to various best management practices is provided in **Table 3-3**.

**Table 3-3**
**Conservation Savings Estimates for Padre Dam Municipal Water District**

| BMP No. | BMP | Annual Program Totals (AF)[1] | | | | | |
|---|---|---|---|---|---|---|---|
| | | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
| 1 | Residential Surveys | 11 | 11 | 11 | 11 | 11 | 11 |
| 2 | Residential Retrofits | 30 | 30 | 30 | 30 | 30 | 30 |
| 3 | Main Line Leak Detection | 405 | 410 | 431 | 454 | 492 | 527 |
| 5 | Large Landscape Audits | 147 | 421 | 654 | 654 | 774 | 893 |
| 6 | Clothes Washer Incentives | 26 | 39 | 51 | 51 | 51 | 51 |
| 9 | Commercial/Industrial Inst. | 102 | 162 | 221 | 281 | 340 | 400 |
| 14 | ULFT Incentives | 639 | 730 | 730 | 730 | 730 | 730 |
| | Subtotal | 1,360 | 1,803 | 2,128 | 2,210 | 2,428 | 2,642 |
| Potential New | Efficiency Standards | 130 | 186 | 288 | 369 | 530 | 645 |
| Potential New | Greywater | 0 | 1 | 1 | 2 | 2 | 2 |
| Potential New | On Demand Water Heaters | 0 | 0 | 0 | 1 | 1 | 1 |
| | Subtotal | 130 | 187 | 290 | 371 | 533 | 648 |
| | Totals | 1,491 | 1,990 | 2,418 | 2,581 | 2,960 | 3,290 |

[1] Data was developed by the District and SDCWA.

# 4. Water Supply

## 4.1 Water Sources

The District purchases all of its potable water from SDCWA, which buys it from MWD. MWD, in turn, imports water through the Colorado River Aqueduct and facilities of the State Water Project (SWP). SDCWA imports 90 percent of the water used by county residents; the remaining 10 percent is from local sources, such as water recycling and local runoff. Critical issues in water resources planning, such as the County's rapidly growing population, limited storage capacity, water transmission facilities, uncertainties over water imported from northern California, and the loss of water imported from the Colorado River, are requiring SDCWA to develop long-range plans for meeting future water demands.

### 4.1.1 Wholesale Water Projections

Existing District water supply sources include the connections to the SDCWA potable water infrastructure, groundwater pumped by and used by Lakeside and Riverview Water Districts, the District's two wholesale customers, and recycled water used for irrigation. In accordance with the Act, the District provided water use projections to SDCWA, and SDCWA provided a draft UWMP for incorporation in the District's UWMP. Existing and planned SDCWA supply provided to the District are as shown in **Table 4-1.**

**Table 4-1**
**Existing and Planned SDCWA Supply Provided to District (AFY)[1]**

| Water Supply Sources | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|---|
| SDCWA | 18,970 | 21,663 | 22,939 | 24,087 | 26,053 | 27,888 |
| Groundwater | 775 | 0 | 0 | 0 | 0 | 0 |
| Recycled Water (landscape use only) | 998 | 1,000 | 1,000 | 1,200 | 1,200 | 1,200 |
| TOTAL | 20,743 | 22,663 | 23,939 | 25,287 | 27,253 | 29,088 |

[1] Data was developed by the District and SDCWA.

### 4.1.2 Imported Water Connections

The primary source of potable water for the District is through two SDCWA connections. The water is provided to the District from Pipeline 4 (PL4) of the Second Aqueduct and from the Helix WD's Levy WTP. The PL4 source, identified as SDCWA No. 4 Connection, is located west of the District boundary near the intersection of Mission Gorge Road and the Second Aqueduct. The SDCWA No. 4 Connection is rated at 26 MGD, but the pressure class and capacity of the El Capitan pipeline limits the supply to 19.4 MGD.

The Helix WD, through an agreement with the SDCWA, provides water supplied through the SDCWA's No. 6 Connection. The Helix WD treats raw water, stored at Lake Jennings, at its Levy WTP, which is located just to the south of the District's boundary. The water is drawn from the Helix WD transmission main and pumped by the El Capitan Booster Pump Station into the District's wholesale water supply system, the El Capitan Pipeline.

SDCWA has a capacity right of 26 MGD in the Levy WTP that is used to supply both the District and the Otay WD. This supply is nominally allocated as 18 MGD for the District and 8 MGD for Otay WD. In addition to this capacity right, based on recent agreements executed with the SDCWA, the SDCWA can purchase and deliver an additional 6 MGD from the Levy WTP.

### 4.1.3 Groundwater

While the District's service area overlies the Santee and El Monte groundwater basins, the District imports 100% of its water supply, as noted in Section 4.1, from the San Diego County Water Authority. Because the District does not rely on any groundwater for its water supply, the District does not prepare a Groundwater Management Plan. Lakeside and Riverview Water Districts, which are located within the District's service area and are the District's two wholesale customers of imported water from the SDCWA, do utilize groundwater for their water supply. Lakeside Water District prepares its own Urban Water Management Plan, but not a Groundwater Management Plan, because the basin is not adjudicated by the State of California or under a groundwater management authority. Riverview Water District is exempt from the California Urban Water Management Planning Act because of its small size, but is proactively meeting all groundwater management standards included in the forthcoming SB 820.

#### Groundwater Basins

Two primary aquifers exist within the District's service area. The first and most important of these aquifers is the Santee-El Monte Alluvial Aquifer. Underlying the Santee-El Monte aquifer is an aquifer comprised of fractured sedimentary, metamorphic and igneous rock. The availability of groundwater within this fractured rock aquifer is limited, and well yields are typically low (on the order of several gallons per minute). Because of low storage and well yield characteristics, this underlying fractured rock aquifer offers little potential for developing municipal water supplies.

The Santee-El Monte aquifer is comprised of loose alluvial sediments that extend along the San Diego River and major tributaries. The Santee-El Monte Alluvial Aquifer provides significant groundwater storage capacity, and has excellent recharge characteristics. Well yields within the Santee-El Monte Alluvial Aquifer are good (typically on the order of hundreds of gallons per minute). The Santee-El Monte alluvial groundwater aquifer covers an area of approximately 4,600 acres. The aquifer stretches approximately 11 miles along the San Diego River from the eastern portion of the community of Lakeside to the western portions of the City of Santee.

The Santee-El Monte Basin consists of three distinct subbasins. The Santee Subbasin comprises the western half of the basin, and extends along the broad San Diego River flood plain downstream from the intersection of San Vicente Creek and the San Diego River. The Moreno Valley subbasin extends downstream from San Vicente Reservoir to the San Diego River. The El Monte Subbasin comprises the eastern portion of the Santee-El Monte Basin. The El Monte Subbasin is situated in the relatively narrow river valley along the San Diego River upstream from the river's confluence with San Vicente Creek.

#### Hydrogeology and Water Use

**Table 4-2** summarizes hydrogeologic parameters for the three subbasins that comprise the Santee-El Monte Alluvial Aquifer. As shown in the table, hydrogeologic conditions vary widely within the three subbasins. In general, however, groundwater storage coefficients, hydraulic conductivities, and well yields are higher in the upstream reaches of the basin.

Past studies have reported a wide range of estimates for the groundwater storage capacity of the overall basin. (These estimates range from approximately 50,000 acre-feet (AF) to 100,000 AF.) The best available information, however, indicates that overall combined storage in the three subbasins of the Santee-El Monte Alluvial Aquifer is on the order of 70,000 AF. Hydraulic conductivity values in the subbasins (as reported in past studies) range from approximately 25 feet per day to 125 feet per day.

**Table 4-2**
**Summary of Hydrogeologic Characteristics**
**Santee-El Monte Alluvial Aquifer**

| Parameter | Santee Subbasin | Moreno Subbasin | El Monte Subbasin |
|---|---|---|---|
| Principal Surface Watercourse | San Diego River | San Vicente Creek | San Diego River |
| Location | Santee | Moreno Valley | Lakeside |
| Basin Length [1] | 6 miles | 2 miles | 5 miles |
| Average Basin Width [1] | 4,500 feet | 2,000 feet | 2,500 feet |
| Basin Elevation [1] | 300 – 400 feet MSL[2] | 400-500 ft MSL[2] | 400 – 800 ft MSL[2] |
| Primary Aquifer Type [3] | Unconfined alluvium | Unconfined alluvium | Unconfined alluvium |
| Aquifer Composition [3] | Medium to coarse grained sand, and gravel | Medium to coarse grained sand and gravel | Medium to coarse grained sand and gravel |
| TDS [4] | 800-2500 mg/L | 500 – 800 mg/L | 300 – 800 mg/L |
| Hydraulic Conductivity [4,] | 25 - 100 ft/day<br>50 ft/day average | 25-125 ft/day<br>75 ft/day average | 50-125 ft/day<br>100 ft/day average |
| Specific Yield [4] | 5 percent-20 percent range<br>13 percent average | 5 percent-22 percent range<br>13 percent average | 10 percent-22 percent range<br>15 percent average |
| Average Basin Hydraulic Gradient [1] | 0.003 ft/ft | 0.009 ft/ft | 0.015 ft/ft |
| Estimated Basin Storage [4] | 30,000–50,000 AF | 5,000-8,000 AF | 20,000-30,000 AF |
| Aquifer Thickness [4] | 200 feet maximum<br>100 feet average | 150 feet maximum<br>100 feet average | 200 feet maximum<br>100 feet average |
| Current Estimated Pumping [4] | 400 AFY [5] | 200 AFY [5] | 4,000 AFY [5] |
| Approximate Well Pumping Capacity[4,6] | 200 - 1000 gpm | 200 – 1000 gpm | 800 – 1600 gpm |
| Areas of Greatest Surface Infiltration [4] | Along the San Diego river channel | Upper reaches of basin; along San Vicente Creek channel | Along San Diego River channel |

1 Measured or estimated from USGS topographic maps for the El Cajon, San Vicente, and Alpine quads.
2 Elevations listed in feet above mean sea level (MSL).
3 From USGS (1985) and NBS/Lowry (1995).
4 Estimate based on information presented in State of California Department of Water Resources (1984), USGS (1985), SDCWA (1987), Luke-Dudek (1987), Clean Water Program for Greater San Diego (1990), NBS/Lowry (1995), and Welch & SDCWA (1997). In general, storage coefficients and hydraulic conductivity are higher in the upstream (El Monte and San Vicente) subbasins. Highest well yields occur in the El Monte Subbasin.
5 Estimate based on well surveys conducted by Clean Water Program for Greater San Diego (1990) and NBS/Lowry (1995).
6 Based on large-diameter irrigation wells. Maximum pumping rates from small diameter private domestic wells within the subbasins may be on the order of 100 (gallons per minute) gpm or less. (See NBS/Lowry (1995).

Streamflow infiltration comprises the dominant source of recharge within the Santee-El Monte Basin. Much of this streamflow infiltration recharge is believed to occur in the El Monte Subbasin. Because of

limited groundwater pumping within the Moreno and Santee Subbasins, these subbasins typically remain filled or nearly filled with groundwater. Thus, while the potential for significant streamflow infiltration exists within the Moreno and Santee Subbasins, streamflow infiltration is typically limited by a lack of available groundwater basin capacity.

Infiltration from agricultural and urban surface runoff also is a key component of groundwater recharge within the overall Santee-El Monte Alluvial Aquifer. Infiltrating applied waters, infiltrating precipitation, septic tank discharges, and subsurface inflow also contribute to groundwater recharge within the Santee-El Monte Alluvial Aquifer.

The Clean Water Program for Greater San Diego (1990) and NBS/Lowry (1995) conducted detailed well surveys of the Santee-El Monte Basin. These surveys show that groundwater use within the Santee Subbasin has decreased substantially within the past several decades (probably due to water quality limitations). While more than 20 historic wells existed within the Santee Subbasin, only a few wells remain active. Current groundwater use within the Santee Subbasin is on the order of several hundred acre-feet per year. The surveys report that many wells (over 20) are still active within the Moreno subbasin. Total existing groundwater use within the Moreno subbasin was estimated to be on the order of approximately 200 AFY.

A significant majority of the overall groundwater use within the Santee-El Monte Basin occurs within the El Monte Subbasin. A total of more than 50 active irrigation and domestic wells exist within this basin. Based on the 2002 IFP, total pumping within the El Monte Basin was estimated at approximately 4,000 AFY (NBS/Lowry, 1995). Groundwater users include private landowners and public entities. Although the 2002 IFP documented that the Riverview Water District derives approximately 350 AFY of potable supply from the El Monte Subbasin, and the Lakeside Water District develops approximately 1,000 AFY of supply from the basin (Welch & SDCWA, 1997), more recent estimates from SDCWA (included in their 2005 UWMP) indicated that the District currently withdraws only 775 AFY of groundwater from the basin.

**Basin Water Balance**

Streamflow infiltration represents a key source of recharge to the Santee-El Monte Alluvial Aquifer. Infiltrating storm and urban runoff, percolating precipitation, percolating applied waters, septic tank discharges, and groundwater inflow from adjoining aquifers provide additional recharge to the aquifer. Once recharged to the basin, groundwater may exit the basin through groundwater pumping, withdrawal by phreatophytes (deep-rooted vegetation), surfacing groundwater, and subsurface outflow.

The quantity of basin recharge and discharge varies with hydrologic conditions, changes in land use, and changes in local water use. While depths to groundwater fluctuate in response to these factors, over a long period of time, overall basin and recharge and discharge are balanced. The recharge and discharge terms of this balance offer insight to appropriate strategies for developing additional water supply within the basin. Overall water balance estimates for the Santee-El Monte Basin have been presented in several previous studies, including DMJM and Lowry & Associates (1978), USGS (1985), NBS/Lowry (1994) and Bundy/Huntley/SDSU (2001). Differences exist between the studies in the manner in which individual recharge/discharge terms are defined and estimated. Even taking these differences into account, however, water balances presented in previous studies demonstrate that excess recharge capacity exists within the Santee-El Monte basin. (That is to say, increased pumping within the basin results in increased streamflow infiltration.)

Using information from these past studies to develop a water balance, the District's IFP concluded that current long-term streamflow infiltration totals within the Santee-El Monte Basin are limited by the fact that the basins are typically too "full" to accept infiltrating streamflows. As a result, streamflow that would normally infiltrate into the basin flows out to the ocean.

### 4.1.4 Recycled Water

The current recycled water supply is provided by the District's Water Recycling Facility (WRF), which has a capacity of 2.0 MGD (2,240 AFY). The District projects an annual average recycled water demand of approximately 1,800 AF by its customers by the year 2020. To provide this quantity of recycled water, the WRF capacity must be increased to serve the maximum-day demand, or seasonal storage to supplement the peak season supply must be provided. Additional information about the recycled water supply is provided in Section 4.3.

### 4.1.5 Transfer and Exchange Opportunities

The District's wholesale supplier, SDCWA, secured a water transfer as part of the Quantification Settlement Agreement for the Colorado River in October 2003. This agreement provides California a transition period to implement water transfers and supply programs that will reduce California's over-dependence upon the Colorado River and reduce the state's draw to its 4.4 million acre-foot basic annual apportionment. This agreement includes a water transfer from Imperial Irrigation District to SDCWA, ramping up to 200,000 AFY from IID to SDCWA for up to 75 years. It also includes lining of the All-American and Coachella canals, with the 77,700 AF of water saved annually going to the SDCWA for 110 years.

### 4.1.6 Development of Desalinated Water

The District's wholesale water supplier, SDCWA, is working on developing a desalinated water supply. It is expected to provide 6 to 15 percent of the region's supply by the year 2020. Additional detail may be found in the Water Authority's 2005 UWMP.

## 4.2 Reliability of Water Supply

Since the District imports all of its potable water, water supply reliability issues are largely determined by the reliability of SDCWA and MWD supply systems. The supply reliability of SDCWA and MWD systems and the probable effect of a three-year dry period on the District's ability to meet demands are discussed in this Chapter.

### 4.2.1 SDCWA Supply Reliability

MWD is the primary supplier of potable water to SDCWA. The SDCWA is working to diversify its supply and decrease its dependence on MWD over the next 20 years. SDCWA has also implemented an Emergency Storage Project (ESP), a system of reservoirs, interconnected pipelines and pumping stations designed to make water available to all communities in the San Diego region in the event of a disaster that would interrupt imported water deliveries.

The SDCWA's 2005 UWMP describes the SDCWA's plans to supplement or replace water sources that may not be available at a consistent level of use with alternative sources or water-use efficiency measures. The SDCWA plans to provide reliable supply in average, dry, and multiple dry year conditions.

### 4.2.2 District Supply Reliability

Single and multiple dry years do not lead to a reduction in local supplies. The SDCWA is planning on the use of dry year options and transfers to meet the shortage scenarios without impacting reliability. **Table 4-3** presents the projected supply and demand comparison in AFY. **Table 4-4** provides the District's estimated water supply projections associated for a single dry year and multiple dry years. Supply and demand comparisons using maximum day capacity to assess service reliability can be found in Chapter 5.

**Table 4-3**
**Projected Supply and Demand Comparison (AFY)**

| Description | Water Supplies by Year (AFY) | | | | |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Imported Water Supply | 21,663 | 22,939 | 24,087 | 26,053 | 27,888 |
| Lakeside/Riverview Groundwater Wells[5] | 0 | 0 | 0 | 0 | 0 |
| Recycled Water | 1,000 | 1,000 | 1,200 | 1,200 | 1,200 |
| Supply Total | 22,663 | 23,939 | 25,287 | 27,253 | 29,088 |
| Projected Demand | 22,663 | 23,939 | 25,287 | 27,253 | 29,088 |
| Difference (Supply – Demand) | 0 | 0 | 0 | 0 | 0 |
| Ratio of Supply/Demand | 100% | 100% | 100% | 100% | 100% |

[5] Lakeside and Riverview Water Districts are expected to be detached from the District in 2006.

**Table 4-4**
**District Supply Reliability (AFY)**

| Supply Source | Normal Year (2004)[1] | Single Dry (2004)[2] | Multiple Dry Water Years (AFY) | | |
|---|---|---|---|---|---|
| | | | 2006 | 2007 | 2008 |
| SDCWA Imported[3] | 20,909 | 22,073 | 21,063 | 21,743 | 22,444 |
| Groundwater[4] | 775 | 775 | 0 | 0 | 0 |
| Recycled Water | 1,600 | 1,600 | 1,600 | 1,600 | 1,600 |
| Total Supply | 23,284 | 24,448 | 22,663 | 23,343 | 24,044 |
| Demand | 23,284 | 24,448 | 22,663 | 23,343 | 24,044 |

[1] 2004 water supply and demand are shown because 2005 was an unusually wet year.

[2] Demand for a single dry year assumes a 5% increase in demand; multiple dry years assume increased demand due to growth but a 10% decrease resulting from water rationing.

[3] The Water Authority's 2005 UWMP indicates that enough imported water will be available to meet multiple dry year demands.

[4] Lakeside and Riverview Water Districts are included in 2004, although they are expected to be detached from the District in 2006.

### 4.2.3 Water Quality Impacts on Reliability

Since the SDCWA provides nearly all of the District's water supply and SDCWA is providing treated water, any changes to water quality and resulting reliability over the next 20 years is overseen by SDCWA. Based on the SDCWA's UWMP, no changes to water supply reliability as a result of water quality are expected for the next 20 years.

Water quality is tested at the Lake Skinner Treatment Plan and Helix's Levy Treatment Plant, where water is treated before it is supplied to the District. Based on the District's 2005 Water Quality Report, all primary and secondary standards showed both ranges and averages for all tested parameters to be within the maximum contaminant levels (MCL) required by the U.S. EPA and California Department of Health Services.

## 4.3 Potential Projects to Increase Water Supply

The District is undertaking two projects to improve or increase water supply as follows:

- East County Regional Treated Water Improvement Program/Eastern Service Area (ESA) Secondary Supply Connection Project
- Expansion of the Water Recycling Facility (WRF)

The East County Regional Treated Water Improvement Program is a comprehensive integrated program of capital improvements and usage guarantees involving the District, the SDCWA, Helix Water District, Lakeside Water District, and Otay Water District. This program is intended to improve the regional treatment capacity in the East San Diego County, including the District's service area, by maximizing the use of the treatment capacity in Helix Water District's Levy Water Treatment Plant. Although it will not create a new supply, this program will reduce treated water demand from SDCWA and will provide a more reliable water supply to the District because the source of the raw water is locally stored imported water.

The ESA Secondary Supply Connection Project is the District's portion of the capital improvements required to convey the additional treated water supply secured by the agreements made under the East County Regional Treated Water Improvement Program to the District. Facilities anticipated to be constructed as part of this project include a new flow control facility (FCF No. 7), approximately 4,000 linear feet of 24- to 27-inch pipeline, a new forebay reservoir with about 2 MG storage capacity, and a new 12-MGD pump station. These facilities are anticipated to be constructed by 2010.

The District is currently undertaking a study to evaluate the technical and financial feasibility to expand the Water Recycling Facility. The District would like to expand the WRF to a rated capacity of 4.0 MGD, with an interim high-rating capacity of 2.7 MGD. The District expects to complete the feasibility study in 2005. The expansion is expected to result in an additional 200 AFY of supply and corresponding demand by 2020.

## 4.4 Recycled Water

The District is committed to water recycling. The District's Board passed Resolution No. 91-7 (included in **Appendix E**) on January 22, 1991, adopting the Water Reclamation Master Plan (Dudek & Associates, 1990), which set forth the District's plan for expansion and identification of recycled water markets. The Board also adopted a Water Reclamation Ordinance (included in **Appendix E**) on November 14, 1989, which mandates the use of recycled water for appropriate and approved uses. This section presents the District's water reclamation facilities and water recycling demands.

### 4.4.1 Recycled Water Facilities

The District has 32 miles of recycled water mains, one recycled water reservoir, and one recycled water pump station to support the use of recycled water within the WSA. There are no recycling facilities within the ESA.

The Padre Dam Water Recycling Facility (WRF) began operations in 1961 with a 1.0 MGD facility. The WRF treated wastewater collected within the system and discharged a portion of the recycled water to the Santee Lakes for aquatic recreational purposes such as boating and fishing. The District holds a wastewater discharge permit to discharge the lake overflow to the San Diego River and Sycamore Canyon Creek. The Santee Lakes Recreation Preserve is owned and operated by the District.

The District upgraded the WRF in 1997 and expanded its capacity to 2.0 MGD. Therefore, 2.0 MGD of the 5.2 MGD collected within the District's sewage system is treated at the WRF and the remaining sewage is transferred to the City of San Diego's transmission/treatment facilities. The WRF is a full Title 22 tertiary treatment facility using a biological nutrient removal system (Bardenpho process) for removal of phosphorus and nitrogen as part of the treatment process. The District is currently evaluating the feasibility of expanding the WRF to 4.0 MGD to accommodate higher peak flows.

The District's recycled water distribution system will also have to be expanded to meet future demands. The District plans to connect the potential new users in two phases. In the first phase, the District intends to provide recycled water service to all existing and future customers within the existing recycled water system sphere of influence. In the second phase, the goal is to expand the system to serve other customers within the WSA.

### 4.4.2 Recycled Water Demand

The current total demand for recycled water within the District's service area is approximately 1,600 AFY. The total demand includes approximately 600 AFY of recycled water used for replenishment of the Santee Lakes. In addition to replenishment of the Santee Lakes, recycled water is currently used for landscape and median irrigation. The actual recycled water use is about twice what was projected in the 2000 UWMP.

As previously discussed, the District is undergoing a feasibility study to evaluate the possibility of high rating the Water Recycling Facility to approximately 2.7 MGD or expanding it to 4.0 MGD. The water recycling use projections assume that the increased capacity and corresponding demand will occur by 2020.

**Table 4-5** provides current and projected recycled water use. All recycled water is treated to Title 22 disinfected tertiary standards.

**Table 4-5**
**Current and Projected Recycled Water Use (AFY)**

| Type of Use | 2000 Projection for 2005 | 2005 Actual Use | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|---|---|
| Landscape[1] | 563 | 998 | 1,000 | 1,000 | 1,200 | 1,200 | 1,200 |
| Replenishment of Santee Lakes | 296 | 583 | 600 | 600 | 600 | 600 | 600 |
| TOTAL | 859 | 1,581 | 1,600 | 1,600 | 1,800 | 1,800 | 1,800 |

[1]The projections, based on the 2005 Draft WRF Feasibility Study, assume that expansion of the WRF and corresponding demand will be available in 2020.

**Future Demand – WSA:** In addition to those currently being served recycled water, additional irrigation customers that are currently using potable water were identified in the 2002 IFP. These potential customers are located in the proximity of the existing recycled water distribution system, and only minimal facilities would be required to expand the existing recycled water system to serve them. The most likely recycled water customers with large amounts of water consumption were identified as the following:

- Large irrigation users including golf courses, schools, parks, and landfills
- Freeway Landscaping/Right-of-Way (ROW)/Interchanges
- New Developments
- Commercial/Industrial Facilities

Irrigation of District and County parks and schools within the District's service area offers a significant market for recycled water. The Santee Lakes Recreation Preserve currently uses treated effluent to meet irrigation demands and for lake replenishment for recreational use. Two additional parks within the WSA are under consideration for recycled water use in the future.

New developments offer an opportunity to coordinate recycled water systems prior to construction. More cost-effective than retrofit systems, they provide an opportunity to increase the District's recycled water use and expand the District's recycled water system. The District will require new developments to install dual piping to accommodate use of recycled water for irrigation purposes, where cost effective.

Water use by California Department of Transportation (Caltrans) for irrigation of landscape along freeways within San Diego County offers a potential market for the District's recycled water. Potential areas of landscaping along the freeways within the District's boundary include medians, right-of-ways, and interchanges of Interstate 67 and the proposed State Routes 125 and 52. Currently, the District provides recycled water for irrigation of landscaped medians on Mast Boulevard, Carlton Hills Boulevard, Mission Gorge Road, and Town Center Parkway, all of which are located within the WSA.

The use of recycled water for industrial purposes remains an undeveloped market within San Diego County. Though use of recycled water for industrial processes requires treatment of wastewater to meet the specific needs of the industry, it provides a use of recycled water that generally does not vary seasonally. The majority of the existing industrial facilities in or near the District are located in El Cajon near Gillespie Field.

**Future Demand – ESA:** The District completed an investigation on recycled water demands in the ESA as part of the IFP in 2002. The ESA consists of several unincorporated communities including Harbison Canyon, Blossom Valley, Alpine, Dehesa, Crest, and a small portion of the City of El Cajon. The total potential recycled water demand for the ESA was estimated at approximately 1,430 AFY. However, the potential recycled water customers are remotely located and very dispersed and recycled water service to the ESA would require a significant amount of new infrastructure. It was concluded that providing recycled water service to the ESA is not economically feasible.

**Customers Outside District:** The District is interested in serving customers located outside District boundaries. Potential customers include the Lakeside and Riverview Water Districts, the City of San Diego's Mission Trails Regional Park and the Navy's Admiral Baker Golf Course. In addition, the District may potentially annex a portion of the East Elliott area, primarily for residential development purposes.

### 4.4.3 Recycled Water Use Optimization

The District currently administers several programs and policies to increase recycled water use in future years, although quantification of the expected results is difficult. The District's recycled water optimization policies and programs are as follows:

**Financial Incentives:** On June 13, 1995, the District passed Ordinance 95-5 (included in **Appendix E**), which established the commodity rate charged for recycled water use at 85 percent of the Standard I potable water rate. Currently, the District receives financial incentives from MWD and SDCWA for recycled water use, but these incentives may not be available in the future.

**Mandated Use of Recycled Water:** The District passed the Water Reclamation Ordinance 89-13 on November 14, 1989, mandating the use of recycled water when appropriate. It is anticipated to be in effect for the foreseeable future.

**Dual Piping for New Construction:** Water Reclamation Ordinance 89-13 also requires developers to install dual piping for new construction. The dual piping requirement is directed primarily toward large landscape areas such as schoolyards, multi-family residences, parks, and roadway landscaping. It is a possibility that this policy will be extended to front and backyard irrigation for single family homes in the future.

**Subsidized Irrigation Retrofits:** On August 13, 1996, the District authorized the General Manager to approve up to $500,000 in expenditures to help pay for customer retrofits to irrigation systems. In 1998, the District authorized an additional $323,000. This program supported the initial users who were converting from conventional irrigation supply and typical retrofits included marking and identifying fixtures and sprinkler heads, posting signs, and ensuring separation of the potable water from the recycled water system. At this time, most new additions to the system are expected to be new construction; the District does not plan to extend the distribution system into areas that will need to be retrofitted.

# 5. Water Service Reliability

## 5.1 Projected Normal Year Supply and Demand

**Table 5-1** presents the projected supply and demand comparison by capacity (MGD). This table indicates that in average precipitation years, the District has sufficient water to meet its customers' needs, through 2030. This is based on continued commitment to conservation programs and additional recycled water supply becoming available.

**Table 5-1**
**Projected Supply and Demand Comparison (MGD)**

| Description | Water Supplies by Year (MGD) | | | | |
|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 |
| Imported Water Supply | | | | | |
| No. 4 Connection[1] | 15.0 | 15.5 | 18.7 | 18.7 | 18.7 |
| No. 6 Connection[2,4] | 18.0 | 23.0 | 23.0 | 23.0 | 23.0 |
| No. 7 Connection[3,4] | 12.0 | 12.0 | 12.0 | 12.0 | 12.0 |
| Lakeside/Riverview Groundwater Wells[5] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Recycled Water (max day) | 2.0 | 2.0 | 2.7 | 2.7 | 2.7 |
| Supply Total | 47.0 | 52.5 | 56.4 | 56.4 | 56.4 |
| Projected Maximum Day Demand[6] | 40.4 | 42.7 | 45.1 | 48.6 | 51.9 |
| Difference (Supply – Demand) | 6.6 | 9.8 | 11.3 | 7.8 | 4.5 |
| Ratio of Supply/Demand | 116% | 123% | 125% | 116% | 109% |

[1] No. 4 Connection is filtered water with no local storage.
[2] No. 6 Connection is from local storage of imported water and runoff.

[3] No. 7 Connection is from local storage of imported water and runoff.

[4] Imported water supplies are shown by capacity (actual use shown in Chapter 4). Interim year supply scenario is based on the East County Treated Water Distribution Study prepared for SDCWA by MWH (May 2004).

[5] Lakeside and Riverview Water Districts are expected to be detached from the District in 2006.

[6] Projected max day demands to 2030 are adjusted from Integrated Facilities Plan prepared for Padre Dam Municipal Water District by PBS&J (2002) to correlate with SDCWA's 2005 UWMP projections.

## 5.2 Projected Dry Year and Multiple Dry Year Supply and Demand

**Table 5-2** presents a supply and demand comparison for a single dry year and multiple dry years from 2004 through 2008. 2004 was used as the normal water year instead of 2005 because 2005 was an unusually wet year. The District's ability to meet its customer demands in dry years is based on SDCWA's ability to provide a reliable water supply. SDCWA has documented its plans to provide a reliable water supply to the region, even in multiple dry years, in its 2003 Water Master Plan, 2004 Water Supply Report, and 2005 Urban Water Management Plan.

**Table 5-2**
**Projected Dry Year and Multiple Dry Year Supply and Demand (2006-2009)**

| Description | Normal Year (MGD) (2004)[1] | Single Dry Year (MGD) (2004) | Multiple Dry Water Years (MGD) | | |
|---|---|---|---|---|---|
| | | | 2006 | 2007 | 2008 |
| Imported Water Supply[2] | | | | | |
| No. 4 Connection | 19.4 | 19.4 | 19.4 | 19.4 | 19.4 |
| No. 6 Connection | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| No. 7 Connection | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Lakeside/Riverview Groundwater Wells[3] | 1.2 | 1.2 | 1.2 | 1.2 | 1.2 |
| Recycled Water (max day) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Supply Total | 40.6 | 40.6 | 40.6 | 40.6 | 40.6 |
| Projected Maximum Day Demand[4] | 37.3 | 39.2 | 36.3 | 37.4 | 38.5 |
| Difference (Supply – Demand) | 3.3 | 1.4 | 4.3 | 3.2 | 2.1 |
| Ratio of Supply/Demand | 109% | 104% | 112% | 109% | 105% |

[1] 2004 water supply and demand are shown because 2005 was an unusually wet year.

[2] Imported water supplies are shown by capacity. The Water Authority's 2005 UWMP indicates that enough imported water will be available to meet these multiple dry year demands. Interim year supply capacity scenario is based on the East County Treated Water Distribution Study prepared for SDCWA by MWH (May 2004).

[3] Lakeside and Riverview Water Districts are included in the supply and demand comparison, although they are expected to be detached from the District in 2006.

[4] Projected max day demands for a single dry year assumes a 5% increases in demand; multiple dry years assume increased demand due to growth but a 10% decrease resulting from water rationing.

**Table 5-3** presents a supply and demand comparison for a single dry year and multiple dry years from 2010 through 2013, incorporating a new imported water connection through the No. 7 Pipeline, which is to be completed by 2010.

**Table 5-3**
**Projected Dry Year and Multiple Dry Year Supply and Demand (2010-2013)**

| Description | Normal Year (MGD) (2010) | Single Dry Year (MGD) (2010) | Multiple Dry Water Years (MGD) | | |
|---|---|---|---|---|---|
| | | | 2011 | 2012 | 2013 |
| Imported Water Supply[1] | | | | | |
| No. 4 Connection | 15.0 | 19.4 | 19.4 | 19.4 | 19.4 |
| No. 6 Connection | 18.0 | 18.0 | 18.0 | 18.0 | 18.0 |
| No. 7 Connection | 12.0 | 9.7 | 9.7 | 9.7 | 9.7 |
| Lakeside/Riverview Groundwater Wells[2] | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 |
| Recycled Water (max day) | 2.0 | 2.0 | 2.0 | 2.0 | 2.0 |
| Supply Total | 47.0 | 49.1 | 49.1 | 49.1 | 49.1 |
| Projected Maximum Day Demand[3] | 40.4 | 42.5 | 43.7 | 45.1 | 46.4 |
| Difference (Supply – Demand) | 6.6 | 6.6 | 5.4 | 4.0 | 2.7 |
| Ratio of Supply/Demand | 116% | 116% | 112% | 109% | 106% |

[1] Imported water supplies are shown by capacity. The Water Authority's 2005 UWMP indicates that enough imported water will be available to meet these multiple dry year demands. Interim year supply capacity scenario is based on the East County Treated Water Distribution Study prepared for SDCWA by MWH (May 2004).

[2] Lakeside and Riverview Water Districts are expected to be detached from the District in 2006.

[3] Projected max day demands for a single dry year assumes a 5% increases in demand; multiple dry years assume increased demand due to growth and no decrease resulting from water rationing.

# 6. Water Shortage Contingency Plan

To prepare for potable water shortages due to natural disasters or drought, the District prepared and adopted Resolution 92-4, the Water Shortage Contingency Plan on January 14, 1992 (see **Appendix E**). The elements of the 1992 Contingency Plan were fully coordinated with SDCWA, and appropriate state and federal assistance agencies. This section summarizes the key features of the existing contingency plan. The SDCWA and its member agencies are developing a new Drought Management Plan that is scheduled for completion in 2006.

## 6.1 Emergency Storage

As previously described, the District is dependent on both the SDCWA and the Helix Water District facilities to supply its potable water needs. The SDCWA adopted Ordinance No. 91-6 (included in **Appendix E**) on June 25, 1991, which "…establishes rules, regulations, and restrictions so that available water supplies are allocated among member agencies for the greatest public interest and benefit." Included in this ordinance is a list of water use restrictions that can be imposed upon all retailers within the SDCWA's service area in the event of an emergency or long-term supply reduction.

The following sections present a synopsis of the emergency storage infrastructure in the region operated by MWD, SDCWA, and the District.

### 6.1.1 SDCWA Emergency Storage Project

The SDCWA currently does not have sufficient emergency water storage to supply its member agencies during an extended period. Although several member agencies of the SDCWA own and operate their own emergency reservoirs; in general, these reservoirs can only service specific isolated areas.

The SDCWA has initiated an Emergency Storage Project (ESP) for catastrophic failure of the aqueduct system. The intent of the ESP is to provide additional storage within the county and construct facilities that will convey emergency storage water to member agencies. Considering both local storage within member agencies and additional ESP storage, it is anticipated that upon completion of ESP facilities, 75 percent of the average day demands during the summer can be supplied for a two-month period.

### 6.1.2 District Emergency Storage

As mentioned previously, the District does not have natural reservoirs or groundwater sources, and hence, is totally reliant on SDCWA Connections No. 4 and No. 6. In the event that the treated water supply at Connection No. 4 was interrupted, the District would have to rely on the operational storage contained in its 26 potable water reservoirs and Connection No. 6. However, Connection No. 6 can currently supply less than one-half of the normal day demands. The District's 2.0 MGD WRF would continue to be able to supply recycled water for irrigation.

If the District were to have supplies reduced by 50 percent for a lengthy duration, as might result from a severe drought, compensatory reductions in potable water consumption would need to occur. Therefore, a 50 percent reduction in the District's supply would be matched by a 50 percent reduction in consumption throughout the District.

The current combined total potable emergency water storage of 104.9 MG available in District reservoirs can provide approximately three days use under existing maximum day demand and two days under year 2020 maximum day demands. With a 50 percent reduction in customer maximum day demand, this reserve could last for 5-6 days under existing maximum day demands and 4 days under year 2020 maximum day demands. By 2020, there will be additional reservoir capacity that will be built with new developments (2002 IFP).

It should also be noted that the potable water provided through Connection No. 6 is supplied from the Levy WTP which treats raw water stored in nearby Lake Jennings. This local storage of raw water

provides additional reliability. In addition, the Water Authority has completed construction of the Moreno-Lakeside Pipeline, a raw water pipeline, providing additional system reliability.

## 6.2 Remedial Actions by District and Other Responsible Entities

During an emergency water shortage event that results in a 50 percent reduction in supply, the District and its suppliers intend to take the following actions.

### 6.2.1 Supply And Demand Monitoring

The District, in consultation with those agencies providing water to the District, monitors supply and demand conditions to determine when water management regulations are required to be put into practice. During water shortages the District implements water management strategies to preserve water for the highest priority uses: human consumption, public health, safety or welfare. If needed, further restrictions, including those on residential usage, may be imposed to further preserve water supplies.

After assessing the severity of the water supply situation, the General Manager or designee for the District may take all steps appropriate and necessary to inform the public of any restrictions on current water use and the prognosis of future availability of water. The General Manager or designee may declare a "Water Supply Management Condition" which imposes restrictions in varying degrees in the following areas:

- Issuance of new permanent meters
- Issuance of temporary meters (including construction meters)
- Out-of-District service
- Annexations to the District
- Interruption of service to certain classification of users, and
- The issuance of facility availability and commitment forms.

These restrictions have been incorporated in the District's Rules and Regulations.

### 6.2.2 Discontinuance/Interruption of Service

Under existing policies, during times of severe water shortages, the General Manager of the District has the authority to discontinue or interrupt service to meters that are not providing water for human consumption, public health, safety or welfare. This measure has been incorporated into the District's Rules and Regulations.

### 6.2.3 Authority to Take Necessary Steps to Conserve Water Supplies

District Rules and Regulations authorize the General Manager or designee to take any appropriate actions necessary to achieve the water conservation goals set for the District in cases of supply shortages or emergencies.

### 6.2.4 Implementation of District's Ordinance 91-5 "Water Conservation Plan"

California Water Code Sections 350 et seq. and Sections 71640 et seq. "… permit the governing body of a distributor of a public water supply to declare a Water Shortage Emergency Condition to prevail within the area served by such distributor, whenever it finds and determines there is an emergency caused by drought, a threatened or existing water shortage, or that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the

distributor to the extent that there would be insufficient water for human consumption, sanitation, and fire protection."

To this extent, the General Manager of the District has the option to declare a Water Shortage Emergency Condition and the elements contained in Part II of the "Water Conservation Plan" (District Ordinance 91-5, superseded by 98-03 and included in **Appendix E**) to be in effect. At the next regular meeting of the Board of Directors, it would ratify, modify or rescind the declaration of a Water Shortage Emergency Condition.

### 6.2.5 SDCWA Ordinance 91-6

In the event that SDCWA declares that supplies to the region are cut back to a 50 percent level, it may require that its member agencies enact water use restrictions to achieve this level of reduction. The District may be subject to penalties levied by SDCWA and/or MWD for not achieving these percentage reductions. (See Ordinance 91-6 in **Appendix E**). As noted previously, the SDCWA and its member agencies are developing a new Drought Management Plan that is scheduled for completion in 2006.

### 6.2.6 MWD "Incremental Interruption and Conservation Program"

The level of conservation required for the southern California region is set by the MWD. MWD has established an "Incremental Interruption and Conservation Program" (IICP), which was adopted on December 11, 1990 as a means of allocating water to its member agencies during drought conditions. The SDCWA is obliged to comply with reductions and restrictions enacted by the MWD and to pass them on to its member agencies.

On January 22, 1991, the District adopted Resolution 91-8 (included in **Appendix E**) authorizing implementation of the IICP to its retail districts and passing on any water use and supply restrictions and financial incentives and disincentives to those districts.

### 6.2.7 Authorization of Greywater Use by County Department of Health Services

The San Diego County Board of Supervisors has the authority to proclaim the existence of a local water emergency due to a drought and/or dramatic reductions in water supplies for the residents of the county. As such, the County Department of Health Services has a process for approving the appropriate use and/or distribution of household greywater for the duration of the emergency. Only approved uses and distribution systems that have been inspected by the Department of Health Services and approved by local health officers are allowed. Currently, the District is participating in a pilot program, and is tracking three greywater systems.

## 6.3 Provisions to Reduce Water Use

### 6.3.1 Use Restrictions

The District has adopted the "Water Conservation Plan" (Conservation Plan) under Resolution 91-5, which was superseded by Ordinance 98-03. The Conservation Plan contains water use restrictions for its customers and was developed collaboratively with five neighboring water districts. The Conservation Plan has been incorporated into the District's Rules and Regulations and is divided into two sections, Part I and Part II. Part I, entitled "Normal And Water Shortage Conditions," contains water use restrictions and enforcement measures to be in effect at all times, including times of water supply shortages.

Normal water use restrictions include:

- At no time shall water be wasted or used unreasonably.

- Water shall not be allowed to leave the customer's property by drainage onto adjacent properties or public or private roadways or streets, due to irrigation or neglect.
- Customers shall be required to repair all water leaks within forty-eight (48) hours of knowledge that a leak exists.
- Water shall not be used to wash down sidewalks, driveways, parking areas, tennis courts, patios, or other paved areas except to alleviate immediate safety, sanitation, or health hazards. Such hazards are those defined by the regulatory health and safety agency having jurisdiction in the area.
- The use of a hand-held hose, without an automatic shut-off nozzle, for spraying, lawn watering, vehicle washing, or structure washing is prohibited.
- Lawn watering or irrigation, other than by hand or by drip methods, is prohibited, EXCEPT between the hours of 4:00 p.m. and 9:00 a.m. the following morning.
- Restaurants shall not serve water to their customers except when specifically requested.

Part II, entitled "Water Shortage Emergency Conditions," contains additional measures and strengthens the restrictions in Part I. The restrictions in Part II are to be used in times of severe cutbacks from SDCWA or in times of a temporary disruption of supply, storage, distribution or other facilities. The language and extent of the restrictions were developed by SDCWA and adopted by the District and many other member agencies of SDCWA.

Emergency water use restrictions include guidelines for:

- Turf irrigation
- Ground cover irrigation
- Trees, shrubs, and agricultural areas irrigation
- Irrigation hours
- Hosing or spraying of outdoor paved or hard surfaces
- Water run-off due to outdoor water use or leaks
- Filling or draining of pools and spas
- Recreational or ornamental lakes and ponds,
- Golf course irrigation
- Restaurants serving water
- Ornamental fountains
- Washing vehicles
- New service connections

### 6.3.2 Conservation Rate Structure

On February 26, 1991, the District established an inclining block rate structure to encourage decreased water use during times of supply shortages. A "use allowance" is determined for each block in the rate structure and varies by customer type. Within this structure is the flexibility to alter use allowances within each block during times of supply shortages. The use allowances are decreased by the same percentage reduction that is being required of the District as a whole.

The District does not use historical comparisons for use reductions and does not use a per capita allocation for billing determinations. The block rate structure has been successful in reducing customer demands to the level required by the SDCWA. (Ordinances 99-04, 99-05, and 99-06 are included in **Appendix E**.)

### 6.3.3 Penalties for Excessive Use

The District's inclining block rate structure contains three prices for water used in different quantities. The two higher rates are called "Standard I" and "Standard II". These two rates are priced to discourage water used in quantities subject to these rates.

Contained within the District's Rules and Regulations are penalties or charges for violations of the water use restrictions during normal and water shortage conditions. An increasing level of fines is levied for up to four violations at the same address. Any subsequent violations at the same address will result in appropriate limitation of service by use of a flow restrictor or discontinuance of service.

## 6.4 Fiscal Impact Analysis

The following sections present an estimate of the financial impact that a reduction in water supply will have on the District.

### 6.4.1 Estimates of Decreased Revenues at 75 Percent Level of Service

An earthquake that severely damages the aqueducts bringing water from MWD is the most catastrophic event that could threaten the SDCWA's water supply. SCDWA has initiated the ESP to enhance supplies to its member agencies during that event. Once completed, the ESP will provide member agencies with 75 percent of normal demand for a two-month period if the aqueducts are severed completely. Alternatively, ESP would provide 75 percent of normal demand for a six-month period assuming that 211,550 AFY is available through the aqueducts from MWD. During both emergency events, member agencies are expected to enact the same percent water use restrictions on their customers and utilize emergency and local supplies, including local storage, groundwater, and water recycling. Hence, under the ESP scenarios, the greatest shortage in supply would be six months with 75 percent level of service.

In fiscal year 2004-2005, the District's revenue from retail commodity sales was $12.1 million. A 75 percent level of service results in a 25 percent reduction in revenue; therefore, the District's losses over a six-month emergency period would be approximately $1.5 million.

### 6.4.2 Expenditures/Measures to Overcome This Impact

In the event that there are revenues from retail water sales in excess of expenses, the revenues are contributed to the Rate Stabilization Fund and the Capital Replacement Fund. The District estimates the value in the Rate Stabilization Fund in 2005 to be approximately $6.5 million. Hence, a 25 percent reduction in revenue could be recovered through the Rate Stabilization Fund.

## 6.5 Monitoring of Actual Use Reductions

It will be of critical importance for the District to determine if water use reduction goals are being met during the water shortage events. Penalties may be incurred from the SDCWA or MWD if the District cannot meet water consumption reduction goals. Careful monitoring of water imported into the system and metered user records will enable the District to check water use.

### 6.5.1 Meter-Reading Schedule

During normal supply conditions, construction meters and agricultural accounts are read once every 30 days. All other retail meters are read every 60 days. The two meters supplying water to the District's wholesale system are read daily.

During times when supplies have been cut back, this schedule has remained unchanged. However, the largest accounts can be monitored on a weekly or bi-weekly basis. Using historical water use data for these largest accounts, it is possible to determine their impact during severe supply shortages and the need to discontinue service at any time, if needed. Service would not be discontinued on accounts supplying water for human consumption, health, safety or welfare purposes.

During water shortages, water use totals are monitored daily and provided in a written report to the appropriate members of the management team. These totals compare current water use with any target goals for the same period set by the SDCWA. If target reduction goals are not met, the General Manager can take corrective action as needed.

### 6.5.2 Reservoir Level Monitoring

The District has a 24-hour telemetry system, installed in 1988 and updated to utilize current technology, which monitors the water flows in the distribution system, pump stations, and reservoirs, as well as control valve settings on the turnouts. If any difficulties or questions of accuracy develop in the telemetry monitoring of the District's three largest wholesale reservoirs, due to power outages, etc., crews will be dispatched at least twice a day to take manual readings. During emergencies, or 50 percent supply cutbacks, the wholesale reservoir levels will be reported to the General Manager on a daily basis.

### 6.5.3 Metering Water Through SDCWA Connection No. 4

During normal supply times, District and SDCWA personnel read the meter located at the SDCWA No. 4 Connection on a daily basis in addition to the telemetry monitoring. This is the only direct source of water into the District from the SDCWA infrastructure. Meter readings are not performed if no water is available through the connection.

### 6.5.4 Metering Water Through SDCWA Connection No. 6

District personnel read the meter at the SDCWA Connection No. 6 on a daily basis, in addition to the telemetry monitoring. The amount of water supplied through this meter can be adjusted on a daily basis.

The meter readings from SDCWA Connections No. 4 and No. 6 are used to determine whether the District is meeting the supply reduction goals set by SDCWA.

## 6.6 Plan Implementation

The District adopted Ordinance 91-3 “Conservation Water Rates” on February 26, 1991 which established normal and conservation rates, an inclining block rate structure, and use allowances to appropriately allocate diminished water supplies. Yearly updates of the normal rates and conservation rates are adopted. Current normal and conservation water rates were adopted in Ordinances 99-04, 99-05, and 99-06.

The District adopted Ordinance 91-5 “Water Conservation Plan” on April 16, 1991, which was superseded by Ordinance 98-03 that allows for implementation of measures to appropriately allocate diminished water supplies.

# Appendix A

# Urban Water Management Planning Act

# Appendix B

# DWR Check List

# Appendix C

# Board Minutes and Approval

# Appendix D

# California Urban Water Conservation Council 2003-04 Annual Report and BMP Coverage Report

## Reports

Retail Annual Report 2003-2004

Retail BNP Coverage Report 2003-2004

Wholesale Annual Report 2003-2004

Wholesale BNP Coverage Report 2003-2004

# Appendix E

# Board Resolutions and Ordinances

## District Board Resolutions and Ordinances

| | |
|---|---|
| Ordinance 89-13 | Adoption of the Water Reclamation Ordinance |
| Ordinance 91-5 | Water Conservation Plan (superceded by 98-03, included) |
| Resolution 91-7 | Adoption of A Water Reclamation Plan |
| Resolution 91-8 | Implementation of MWD Incremental Interruption and Conservation Plan |
| Resolution 91-91 | Execution of the MOU |
| Resolution 92-4 | Adoption of A Water Shortage Contingency Plan |
| Ordinance 95-5 | Adoption of Reclaimed Water Rates |
| Ordinance 98-03 | Adoption of Rules and Regulations (including revised Water Conservation Plan) |
| Ordinance 99-04 | Adoption of Rules and Regulations Regarding Fees and Charges Imposed by SDCWA and MWD for Wholesale Water and Water-Related Services and Fees |
| Ordinance 99-05 | Rules and Regulations Regarding Rates and Charges for Wholesale Water Service |
| Ordinance 99-06 | Rules and Regulations Regarding Rates and Charges for Water Service |

SDCWA Ordinance

| | |
|---|---|
| Ordinance 91-6 | Restrictions on Available Water Supply |

# Appendix F

# Public Hearing Notice