

SANTA FE IRRIGATION DISTRICT

URBAN WATER MANAGEMENT PLAN

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Prepared For:



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Abbreviations, Acronyms, and Terms

Act	California Urban Water Management Planning Act
AFY	Acre-feet per year
BMP	Best Management Practice
CIP	Capital Improvement Program
CLIP	Commercial Landscape Incentive Program
CSD	Community Service District
CUWCC	California Urban Water Conservation Council
CVWD	Coachella Valley Water District
District	Santa Fe Irrigation District
DWR	Department of Water Resources
ESP	Emergency Storage Project
FY	Fiscal year
HCF	One hundred cubic feet
IID	Imperial Irrigation District
LAFCO	Local Agency Formation Commission
MGD	Million gallons per day
MOU	Memorandum of Understanding
MWD	Metropolitan Water District
OMWD	Olivenhain Municipal Water District
QSA	Quantification Settlement Agreement
REB Plant	R.E. Badger Filtration Plant
RO	Reverse Osmosis
SANDAG	San Diego Association of Governments
SDG&E	San Diego Gas and Electric
SDWD	San Dieguito Water District
SEJPA	San Elijo Joint Powers Authority
SONGS	San Onofre Generating Station
ULFT	Ultra low-flush toilet
UWMP	Urban Water Management Plan
Water Authority	San Diego County Water Authority
WBIC	Weather-based irrigation controllers

Chapter 1

Service Area

1.1 Introduction

This 2005 update of the Santa Fe Irrigation District's (District's) Urban Water Management Plan (UWMP) is prepared in accordance with the California Urban Water Management Planning Act (Act) of 1983 and its amendments. The text of the Act is contained in **Appendix A**. The 2005 demand and supply projections have not substantially changed since 2000, but the UWMP format and approach to various sections have been revised. **Appendix B** contains the District's completed Department of Water Resources (DWR) UWMP checklist, with references to the sections and page numbers included in the 2005 UWMP.

1.2 District History and Overview

Santa Fe Irrigation District (District) was formed January 26, 1923 under the California Irrigation District Act. A board of directors composed of 5 members governs the District. The District was organized to provide water service within its boundaries, and to provide irrigation and domestic water within this service area. The District provides retail water supply to the area now known as the City of Solana Beach, and the communities of Rancho Santa Fe and Fairbanks Ranch. The boundaries of the District's water service area are shown in **Figure 1-1**. The District service area contains approximately 10,200 acres of which 2,860 are in Solana Beach and 7,340 in the Rancho Santa Fe area. The present population of the District is approximately 20,900, of which two-thirds is in the Solana Beach area. In the twelve months of calendar year 2004, Santa Fe distributed approximately 12,100 acre-feet of potable water through 6,882 water meters and 500 acre-feet of recycled water through 43 meters. The District provides potable water service for agricultural irrigation, commercial and residential water customers and recycled water for irrigation of common areas, golf courses, schools, businesses and Caltrans, all located within Solana Beach.

The R.E. Badger Filtration Plant (REB Plant) was constructed in 1967 as a joint venture of the District and the San Dieguito Water District. The District joined the San Diego County Water Authority (Water Authority) in 1948 to acquire the right to purchase and distribute imported water throughout its service area. The District obtains its water from two sources: local water from Lake Hodges, and imported water purchased from the Water Authority. The District jointly retains water rights to the surface water in Lake Hodges through agreements with the City of San Diego. Both the local and imported water sources are delivered to the R.E. Badger Filtration Plant (REB Plant). The District has historically obtained approximately 30 percent of its water from Lake Hodges and 70 percent from the Water Authority. Currently, the two Districts are the only water agencies able to access water from Lake Hodges. In 2008, the Water Authority will commence use of Lake Hodges to store water in conjunction with its Emergency Storage Project and the lake will be connected to the Water Authority's aqueduct system.

Figure 1-1
Santa Fe Irrigation District Water Service Area

The District owns and maintains approximately 160 miles of pipeline and one above ground storage reservoir with a capacity of six million gallons. The District's water distribution system consists of fourteen pressure zones with 39 pressure-reducing stations and the Larrick Pump Station in Solana Beach. This pump station is used to keep pressures stable at peak demands and in portions of the Solana Beach service area.

Water facilities jointly owned with the San Dieguito Water District include: approximately 8 miles of transmission mains, two pumping stations, a 1.4 mw hydroelectric power plant, the 883-acre-foot raw water San Dieguito Reservoir, the 40-MGD REB Plant and a 13-million gallon filtered water reservoir. The District is the operator and administrator for the joint water facilities. The REB Plant treats raw local water from Lake Hodges and/or imported water purchased from the Water Authority. A treated water connection to the Water Authority's aqueduct provides additional supplies to meet peak demands or in the event the Plant is out of service for maintenance.

The Lake Hodges Dam Flume provided all the water to the District until 1964, when Colorado River water augmented the area's supply. The flume was the only outlet to Lake Hodges Dam. The Flume was taken out of service in August 2003 and replaced with a new 36-inch water line constructed to replace the flume. The Rancho Cielo Raw Water Pump Station was constructed on Del Dios Highway to pump raw water from Lake Hodges directly to the REB. Local water is still able to enter the San Dieguito Reservoir through a new 18-inch waterline that was installed in the old flume west of Del Dios Highway. The new 36-inch and 18-inch pipelines and pump station were dedicated in August 2004.

1.3 Water Master Plan

To ensure adequate system capacity and conditions to meet existing and future service area demands, the District prepares a water master plan on a 5-year planning cycle. The most recent plan, *Santa Fe Irrigation District Water Master Plan*, was prepared by Powell/BPS&J in 2001. A copy of the master plan is available at the District Administration office.

On an annual basis, the District Board of Directors approves a District budget that includes funding for projects, identified in the *Master Plan*. The FY 2006 capital improvement budget totaled \$1.9 million.

1.4 Agency Coordination

The District is one of twenty-three member agencies of the Water Authority. Member agency status entitles the District to directly purchase water for its needs from the Water Authority on a wholesale basis, and the District looks to the Water Authority to ensure that adequate amounts of water will be available to satisfy future water requirements. All imported water currently distributed by the Water Authority is purchased from the MWD and is delivered to the Water Authority from MWD facilities at Lake Skinner in southern Riverside County. The District has coordinated with the Water Authority to prepare this UWMP, as shown in **Table 1-1**.

**Table 1-1
Coordination with Appropriate Agencies**

Agency	Participated in UWMP Development	Commented on the Draft	Attended Public Meetings	Contacted for Assistance	Received Copy of Draft	Sent Notice of Intention to Adopt	Not Involved/ No Information
San Diego County Water Authority	x			x	x		
County of San Diego				x	x	x	
City of Solana Beach				x	x	x	
Rancho Santa Fe Community				x	x	x	

1.5 Service Area Population

Today, the District provides water to approximately 20,900 persons and 7,000 meters within its 16 square mile service area, which encompasses Solana Beach, Rancho Santa Fe, and Fairbanks Ranch.

Table 1-2 shows the District's population total for 2005, with projections to 2030, based on San Diego Association of Governments (SANDAG) 2030 Cities/Counties Forecast. Based on the SANDAG 2030 Cities/Counties Forecast, regional population is expected to increase by approximately 1.1 percent per year. However, the District's service area is mostly built out and is projected to experience a population increase of less than 0.5 percent per year.

**Table 1-2
Current and Projected Population**

	2005	2010	2015	2020	2025	2030
Service Area Population ¹	20,212	20,787	20,944	21,270	21,774	21,774

¹Current and projected populations are based on the SANDAG 2030 Cities/Counties Forecast, provided by the Water Authority.

The District's service area is characterized by low and very-low density urban development, including a large number of 3-acre and larger estate homes. Approximately 82 percent of the District's water demand is residential. Of the residential acres currently developed, approximately two-thirds are low-density single-family parcels. Many of these low-density residential properties have extensive irrigated landscapes, and the District estimates that 70 percent of its service area water use is attributed to landscaping.

The District's service area is also characterized by a significantly affluent population. The Rancho Santa Fe and Fairbanks Ranch communities include some of the largest and most luxurious residences in the County. According to the SANDAG 2030 Cities/Counties Forecast, the 2005 median household income is \$85,066, and by 2030 it is projected to be \$113,511. This

demographic factor is important to consider when the District contemplates the use of financial incentives or penalties to curtail water use.

1.6 Climate

The District serves an area that has a Mediterranean coastal climate. Summers are mild and dry, and winters are cooler. The region is subject to wide variations in annual precipitation, though the average rainfall in the District Area is approximately 9 inches. Summer fog helps reduce irrigation requirements.

1.7 Public Participation

In accordance with the Act, the Draft 2005 UWMP was made available for public review at the District's office as well as in the city of Solana Beach and community of Rancho Santa Fe. A copy of the plan was available on the District's website at www.sfidreb.org. In addition, community groups were notified about the preparation of the UWMP (**Appendix C**). The District Board of Directors held a public hearing on December 15, 2005 and adopted the "2005 Plan" on that same day. A copy of the resolution is included in **Appendix D**.

Chapter 2

Water Demand

Water consumption within the District's service area is determined by climactic, economic and demographic factors. The District currently supplies approximately 12,600 acre-feet per year (AFY) of potable water to its wholesale and retail customers. The relatively high landscape irrigation demands in the Rancho Santa Fe and Fairbanks Ranch areas accentuate the impact of weather patterns on overall water consumption. As temperatures increase, so do water demands at the District.

2.1 Historic Water Use

In dry years, the annual variations in water consumption can be extreme. As demonstrated during the drought of the late 1980s, water consumption can increase dramatically in dry years. During the late 1980s, there was a steady increase in average annual water consumption, followed by a dramatic decrease in demand due to a drought. The District believes many of the water conservation efforts adopted during the drought period had a long-term effect on lowering unit demands, since population has also grown somewhat since the early 1990s. Water use within this District has remained relatively stable over the last 5 years. **Figure 2-1** presents the historic water demand in the District since 1971.

2.2 Projected Water Use

Demographic and land use projections based on the SANDAG 2030 Cities/Counties Forecast were used to develop future water usage estimates within the District's service area. As discussed in Chapter 1, the District is mostly built out, with less than 10 percent of the District with potential for future development. The undeveloped acreage in the Rancho Santa Fe community primarily consists of relatively small parcels with no potential for large-scale developments. Some of the acreage that is classified as undeveloped is currently being used for agricultural production. In the City of Solana Beach, some of the existing residences will continue to be replaced with new construction, including some conversion to multi-family and other more water intensive developments. Although some population and demand increases are anticipated between 2005 and 2030, the District expects the increases to be relatively minor. **Figure 2-2** provides a graphical representation of both the historic and projected water demand in the District.

As discussed in Chapter 1, the District's service area includes a substantial number of estate residences with large lots and extensive irrigated landscaping. The District has estimated that approximately 70 percent of its water demand is being used for landscaping. As a result, the seasonal demand fluctuations are substantial, and they pose a continual challenge for the District in operating the Badger Filtration Plant. The District expects to evaluate methods of reducing irrigation demand in future years, recognizing that due to the affluent demographic of the service area, typical financial incentives to encourage conservation may not be effective.

Figure 2-1
Santa Fe Irrigation District Historic Water Use

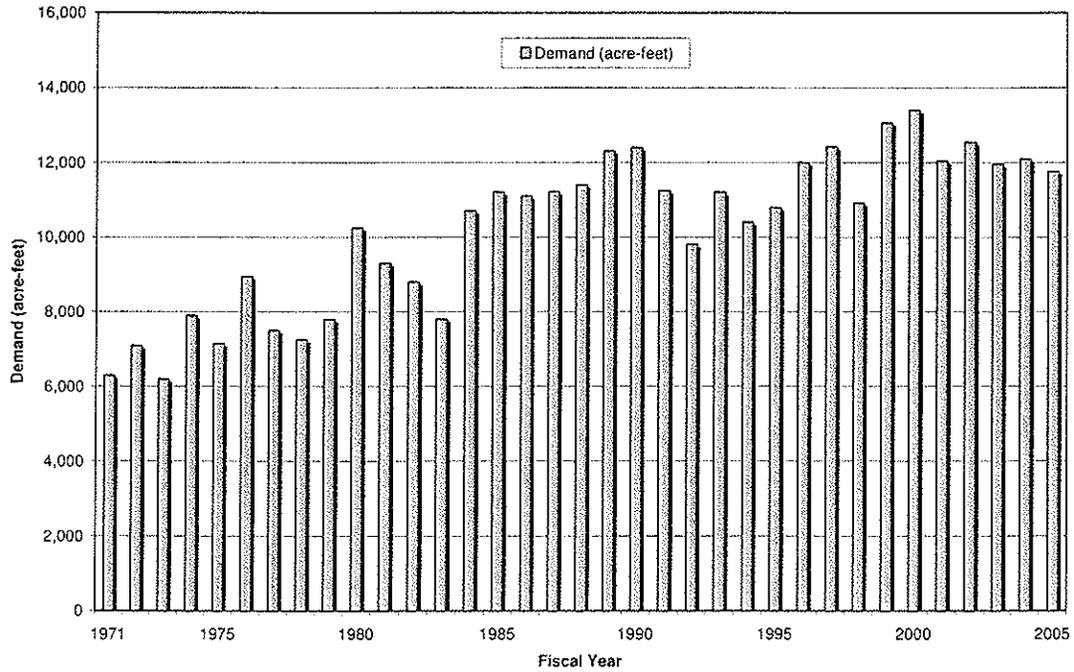


Figure 2-2
Historic and Projected Water Use

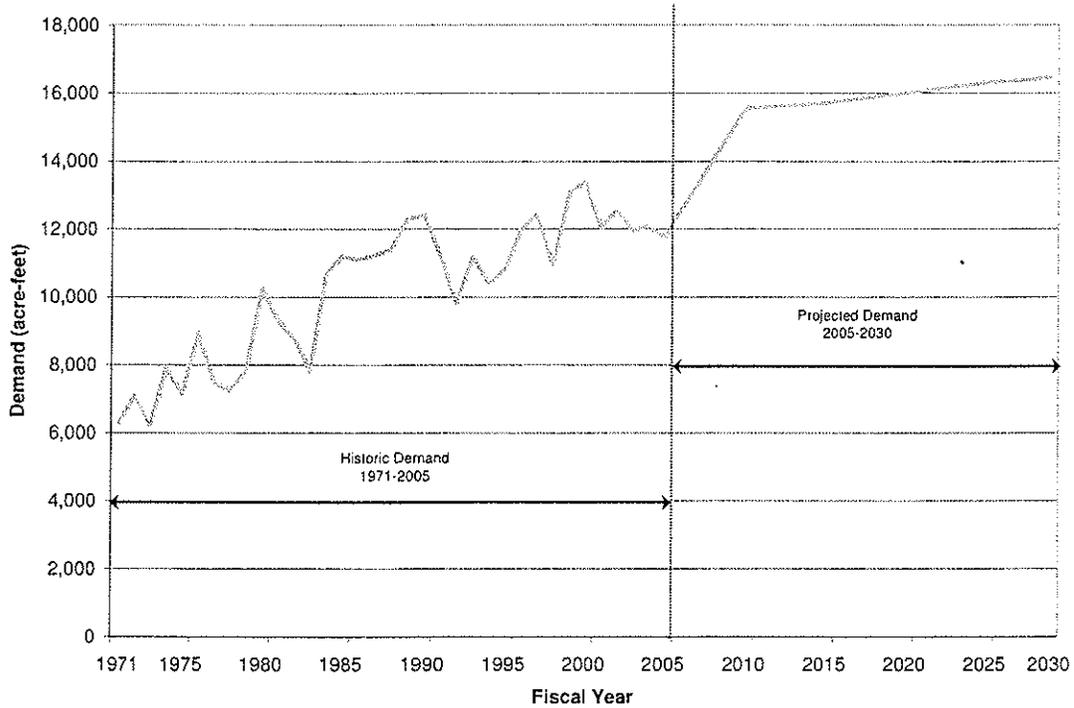


Table 2-1 provides past, current, and projected water deliveries in the District for various water use categories. A jump in water use projections occurs between 2005 and 2010 because 2005 was an unusually wet year with lower demands, and because the projections are coordinated with the Water Authority's projections. These projections represent a conservative approach, as the District estimates projected water use to be lower than the projections shown on **Table 2-1**. The District expects a slight increase in water use in future years as agricultural land is replaced with residences, and commercial properties are added to vacant lots within the District; the jump in water use from 2005 to 2010 is evident because the projections from the Water Authority are conservatively high.

Approximately 82 percent of the water use in the District's service area is for single-family and multi-family residential purposes. The commercial and industrial water use sector accounts for about five percent of total urban water demands. Landscape irrigation service connections amount to five percent, and agricultural water use comprises approximately 1.5 percent. Water use in the District is shown graphically in **Figure 2-3**.

2.2.1 Residential Water Use

Within the District's service area, residential water use accounts for approximately 82 percent of total water demand. Total housing units are comprised of a high percentage of single-family residences; 92 percent of all housing units are single-family structures, compared to the countywide average of 59 percent. Multi-family units within the District are much less prevalent at 8 percent, compared to the County average of 35 percent.

As previously mentioned, water use within the District's service area is influenced greatly by weather conditions. Throughout Southern California, approximately 70 percent of residential water demands are for indoor water use and 30 percent are for outside water use purposes. However, due to the large lot size and high irrigation demands in Rancho Santa Fe and Fairbanks Ranch, outdoor use accounts for about 70 percent of total residential water use within the District.

2.2.2 Industrial and Commercial Water Use

The District has virtually no industrial water use; however, a wide variety of commercial activities flourish. From restaurants to antique shops, and all types of businesses in between, the District enjoys diverse commercial developments. In Rancho Santa Fe, high-end boutiques, real estate sales and financial institutions prevail. In the coastal community of Solana Beach, restaurants and retail shopping are found.

Commercial water use is similar in many respects to residential demands. Some of the seasonal variations impacting interior and exterior water use in the residential sector are found in the commercial sector also.

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

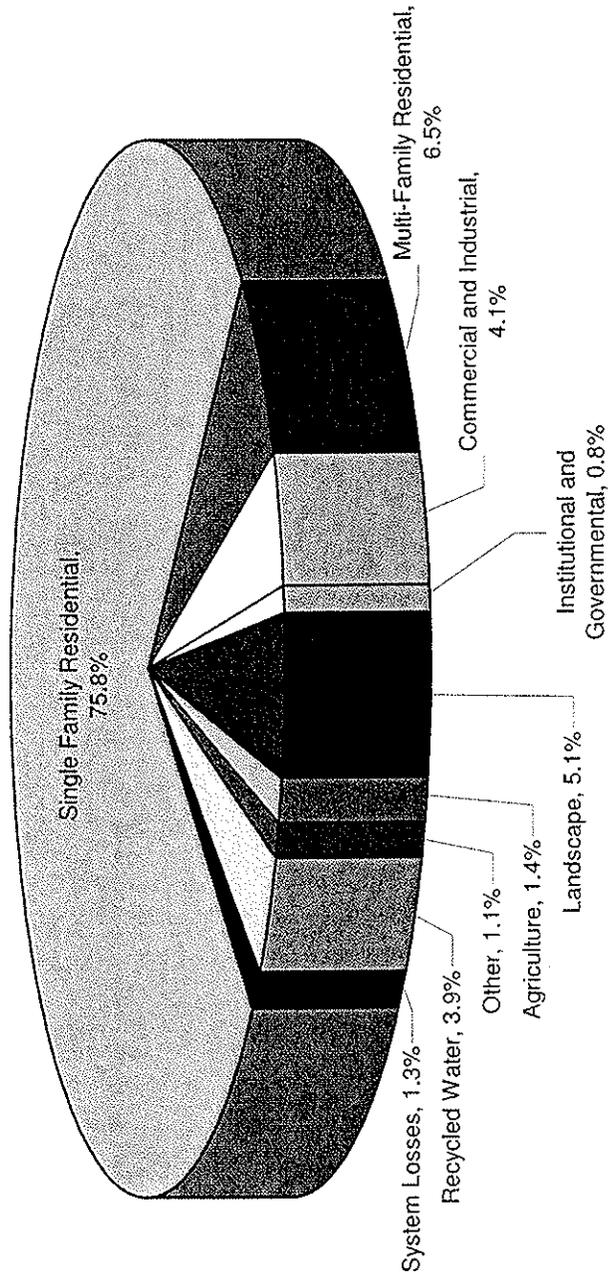
Year ¹	Water Use Sectors	Single Family	Multi-Family	Comm./Industrial	Inst./Governmental	Landscape ²	Agriculture	Other ³	Recycled Water	System Losses	TOTAL
2000	No. of Accounts	5,304	473	316	30	167	40	382	0		6,712
	Deliveries (AFY)	10,080	947	865	146	931	195	122	0	324	13,610
2005	No. of Accounts	5,406	470	323	30	143	37	634	43		7,086
	Deliveries (AFY)	9,554	817	518	105	637	182	137	494	162	12,606
2010	No. of Accounts	5,500	500	325	46	140	34	500	63		7,108
	Deliveries (AFY)	11,851	1,000	900	150	330	170	140	800	200	15,541
2015	No. of Accounts	5,500	510	325	46	135	34	500	75		7,125
	Deliveries (AFY)	12,025	1,020	900	150	100	170	140	1,000	200	15,705
2020	No. of Accounts	5,520	520	325	46	140	32	500	76		7,159
	Deliveries (AFY)	12,304	1,040	900	150	75	162	140	1,025	200	15,996
2025	No. of Accounts	5,540	530	325	46	136	32	500	77		7,186
	Deliveries (AFY)	12,581	1,060	900	150	75	162	140	1,040	200	16,308
2030	No. of Accounts	5,540	540	325	46	136	30	500	79		7,196
	Deliveries (AFY)	12,668	1,080	900	150	75	158	140	1,100	200	16,471

¹ 2000 and 2005 data are based on District records. 2010 through 2030 projections have been developed based on the expected growth within the service area as well as to coordinate Water Authority projections. A jump in water use, allocated to Single Family water use, is noted between years 2005 and 2010, primarily due to the difference between actual water use in 2005 and conservative projections from 2010 through 2030 incorporated in the Water Authority's UWMP.

² Landscape includes irrigation using potable water through irrigation meters only (excludes residential landscaping).

³ Other includes fire flow, temporary construction meters, interconnects to other water districts, and District water use.

Figure 2-3
Santa Fe Irrigation District Existing Water Consumption by Land Use



2.2.3 Agricultural Water Use

Within the District's service area, agricultural water use comprises approximately 1.5 percent of total demands. Agricultural water use has declined within the District's service area over the past few years. Over the last few years, owners of agricultural areas in the Rancho Santa Fe community have sold land to developers and new residential developments have been constructed, primarily single-family estate developments consistent with the existing residential land use.

2.2.4 Surplus Water and Interconnections

The District currently serves twenty-one users that are not within the District boundaries. The customers are located within the City of San Diego, City of Del Mar and the OMWD service areas and are considered surplus water users. Many of the agreements for these services date back over 20 years or are not in place. The District is investigating further to fully understand the agreements and how they were developed. The results of these investigations will be considered in a future municipal service review with LAFCO.

The District has interconnections with the City of San Diego, City of Del Mar, OMWD and the SDWD, which are used mainly for emergencies. OMWD has one connection that is set up as a continuous supply to serve the Fairbanks Ranch area of the distribution service area during peak demands.

The District will investigate and review agreements regarding both surplus water users and interconnections with other agencies. Once this investigation is complete and any necessary policy changes are approved by the Board of Directors, the section of the UWMP regarding the District's Water Shortage Emergency Response Plan may be amended.

Chapter 3

Water Demand Management

The California Urban Water Conservation Council (CUWCC) was formed to assist water retailers in implementing an effective conservation program through Best Management Practices (BMPs). The CUWCC was formed in 1991 through a Memorandum of Understanding (MOU) regarding urban water conservation in California. The District adopted the MOU on August 26, 2001 as Resolution 91-25. The urban water conservation practices (BMPs) were included in the MOU as means for reducing California's long-term urban water demands.

Listed in **Table 3-1** are the BMPs outlined by the CUWCC and identified in the Urban Water Management Planning Act.

Table 3-1
BMPs for Urban Water Management in California

BMP #	Description
1	Water survey programs for single-family residential and multifamily residential customers
2	Residential plumbing retrofit
3	System water audits, leak detection, and repair
4	Metering with commodity rates for all new connections and retrofit of existing connections
5	Large landscape conservation programs and incentives
6	High-efficiency washing machine rebate program
7	Public information programs
8	School education programs
9	Conservation programs for commercial, industrial, and institutional accounts
10	Wholesale agency programs
11	Conservation pricing
12	Water conservation coordinator
13	Water waste prohibition
14	Residential ultra-low-flush toilet replacement program

The District has satisfied the requirements of the Urban Water Management Planning Act by attaching a copy of the CUWCC 2003-2004 Annual Report and BMP Coverage Report (**Appendix E**). For informational purposes, this section provides an overview of the District's demand management program.

3.1 Water Demand Management Measures

The District is committed to water conservation as a method of reducing demands. The District's Administrative Code, Article 17 provides water conservation policies and procedures, and is included in **Appendix G**. The following sections describe the District's specific conservation programs in more detail.

BMP No. 1 (Water Survey Programs): In 1990, the District implemented a targeting /marketing strategy for single-family and multi-family residential water use surveys, and has continued to offer water management surveys.

BMP No. 2 (Residential Plumbing Retrofit): The District participates in the Water Authority's program to offer residential showerheads. Next year, this program will be adjusted to provide complete residential conservation packages.

BMP No. 3 (System Water Audits): Leak detection is monitored during home surveys, customer service appointments, and during bi-monthly meter reading.

BMP No. 4 (Metering with Commodity Rates): The District utilizes metered customer water bills to analyze water use consumption patterns.

BMP No. 5 (Large Landscape Conservation Programs): District customers who exhibit unusually high water usage relative to the size of the property are sent a letter and program brochure inviting them to participate in the District's water survey program. The District is also participating in an MWD program to replace individual irrigation controllers with a centralized irrigation control system.

BMP No. 6 (High-Efficiency Washing Machine Program): Vouchers are given for up to \$125 for purchase of a high-efficiency washing machine.

BMP No. 7 (Public Information Programs): The District has an ongoing program of public information through special mailings, newsletters, bill messages, and hold phone messages. All new customers are sent a packet of brochures containing information on the District, water quality, and water conservation. The District also provides speakers to community groups upon request, and provides an information booth at various events including the Del Mar Fair and Water Awareness Celebration.

BMP No. 8 (School Education Programs): The District participates in the Water Authority's education programs which include teacher education, school supplies, a traveling library, mobile lab, science fair awards and mini-grants for member agencies. The District also provides funding for a Splash Mobile and Poster Contest. The Splash Mobile is a water education program geared toward grades 4 to 6. The Poster Contest is sponsored by the District and 11 other North County water agencies in conjunction with Water Awareness Month.

BMP No. 9 (Conservation Programs for Institutional, Commercial, and Industrial Accounts): Water management surveys are offered to all District customers, including institutional, commercial, and industrial accounts.

BMP No. 10 (Wholesale Agency Programs): The Metropolitan Water District changed their rate structure in 2003 according to a two-tiered system. The Water Authority, as a member agency, can purchase imported water up to an amount equal to a base allocation, which is Tier I. Any additional purchases will fall into Tier II, which has a significantly higher cost. For the Water Authority, the difference between the cost of Tier II imported water and the cost of

implementing conservation measures is the value of conservation to the region. The Water Authority supports its member retail agencies in an effort to support local implementation.

BMP No. 11 (Conservation Pricing): The District has a conservation pricing structure, in accordance with this BMP. Water bills show gallons of water used per day for the last billing period compared to the same period the previous year. If desired, customers can also contact the District and be provided with historical water usage. Customers can compare their water usage with the same period of the prior year, and monitor their water usage over time.

BMP No. 12 (Water Conservation Coordinator): The District has a Conservation Coordinator position to address utility conservation efforts and to represent the District on issues regarding water conservation and recycled water use.

BMP No. 13 (Water Waste Prohibition): In 2004, the District's Administrative Code was revised to include a revised water conservation program; a copy is provided in **Appendix F**. Water waste restrictions are included within this section. The City of Solana Beach and the County of San Diego have the authority to enforce these water waste restrictions.

BMP No. 14 (Residential Ultra-Low-Flush Toilet Replacement Program): The District offers incentives that reduce customers' costs by up to \$95 when they replace old toilets with water-efficient models.

3.2 Effectiveness of Conservation Measures

The District is committed to promoting water conservation among its customers to reduce the consumption of potable water. Water use in the Santa Fe Irrigation District is currently approximately 82 percent residential, and about 70 percent of the District water use is estimated to result from irrigation. Thus, conservation efforts will continue to be focused on residential water use, and primarily residential irrigation.

The CUWCC has published a BMP Cost Savings Study, which assigns water savings to several of the BMPs that are considered quantifiable. However, due to the District's small size and resources, the District has relied on the Water Authority to perform the conservation savings estimates as part of their wholesale conservation program. Estimates of the District's conservation savings attributed to various best management practices are provided in **Table 3-2**.

The effectiveness of the conservation program is also evidenced by the relatively stable consumption of potable water over the last five years despite modest population increases.

**Table 3-2
Existing and Projected District Conservation Savings**

BMP #	BMP Description	Estimated Water Savings (AFY) ¹				
		2010	2015	2020	2025	2030
1	Residential Surveys	0.0	0.0	0.0	0.0	0.0
2	Residential Retrofits	39.8	39.8	39.8	39.8	39.8
	Landscape ²	259.6	316.5	373.3	430.0	487.1
6	Clothes Washer Incentives	15.9	20.9	20.9	20.9	20.9
9	Commercial/Industrial Inst.	14.2	21.8	29.5	37.0	44.6
14	ULFT Incentives	204.6	204.6	204.6	204.6	204.6
	SUBTOTAL	534.1	603.5	668.0	732.3	797.0
	Potential New BMPs					
	Efficiency Standards	170.0	175.2	182.5	195.5	195.8
	Greywater	0.4	0.5	0.7	0.8	0.8
	On Demand Water Heaters	0.1	0.2	0.3	0.4	0.5
	SUBTOTAL	170.5	175.9	183.5	196.7	197.1
	TOTAL	704.6	779.5	851.5	929.0	994.0

¹ Data provided by the San Diego County Water Authority, 2005

² Includes savings from Audits, Artificial Turf, WBIC, Water Budget and CLIP programs

Chapter 4

Water Supply

4.1 Water Sources

Existing water supply sources to the District include the surface water, imported water, and recycled water. However, the predominant source of supply is imported water purchased from the MWD, through the Water Authority. MWD uses the Colorado River and State Water Project to supply the Water Authority. This section will discuss the District's available water supplies and plans regarding the use of other potential resources.

4.1.1 Wholesale Water Projections

In accordance with the Act, the District provided water use projections to the Water Authority, and the Water Authority provided a draft UWMP for the District's use. Existing and future demands coordinated between the District and the Water Authority are shown in **Table 4-1**.

Table 4-1
Existing and Planned Water Authority Supply Provided to District (AFY)

Water Supply Sources	2005	2010	2015	2020	2025	2030
San Diego County Water Authority	8,844	11,473	11,437	11,703	12,000	12,103
Surface Water	3,268	3,268	3,268	3,268	3,268	3,268
Recycled Water	494	800	1,000	1,025	1,040	1,100
TOTAL	12,606	15,541	15,705	15,996	16,308	16,471

As this table indicates, the primary supply source for the District is the imported water from the Water Authority. Although surface water supplies may vary, they are estimated to be as noted above. The only remaining ways for the District to reduce its dependence on imported water is to increase use of recycled water and reduce demand by increasing conservation efforts. The District is continuing to make advances in these areas as documented in Chapter 3 and Section 4.4.

4.1.2 Imported Water

The District has been a member agency of the Water Authority since 1948. Membership in the Water Authority was essential due to the fact that local water supplies (Lake Hodges) could not provide sufficient, reliable quantities. The Water Authority provides essential additional supplies to supplement local sources. Due to the limited quantity available in the Lake Hodges system, future water demand increases must be served with a combination of conservation, increased imported supplies, and conversion of existing customers to the expanded recycled water system.

4.1.3 Surface Water

Dating back to the turn of the century, the District, and SDWD have maintained water rights in varying quantities from Lake Hodges. The variability of available water from Lake Hodges is directly attributable to weather patterns. Lake Hodges has the largest drainage basin of any surface water source in San Diego County. Therefore, in times of adequate rainfall, the District and SDWD can use as much as can be delivered through the transmission facilities (13 MGD). Conversely, in times of low rainfall, local water use is significantly reduced and higher volumes of imported water are required.

Lake Hodges provided the total water supply for the District and San Dieguito Water District (SDWD) customers until 1949 when the District and SDWD entered into an agreement with the City of San Diego and the City of San Diego formed an agreement with the Water Authority to provide imported water to the District. A copy of the 1998 agreement among the City of San Diego, Santa Fe Irrigation District, and San Dieguito Water District is included in **Appendix F**. According to this agreement, the City of San Diego will sell to SDWD and the District all of the local water collected in Lake Hodges, if requested by SDWD and the District and if the following conditions exist:

- The quantity of local water in Lake Hodges is greater than the quantity the City of San Diego is required to provide to SDWD and the District for the remainder of the water contract year;
- There will be at least 8,300 AF of storage in Lake Hodges available to SDWD and the District in the water contract year; and
- The water is put to beneficial use.

The District is entitled to receive 57.33 percent and SDWD is entitled to receive 42.67 percent of the first 7,500 AF of water supplied in any given water contract year. If an amount in excess of 7,500 AF of water is supplied to these districts within any given year, the District and SDWD shall each be entitled to receive 50 percent of such excess. The District and SDWD pay a local water rate to the City of San Diego, determined by the City of San Diego based on the total cost of operating and maintaining Lake Hodges, excluding recreation and including depreciation.

Beginning in 2008, the Lake Hodges Improvement Project, a pipeline and pump station constructed by the Water Authority, will create a connection between the Olivenhain Reservoir and Lake Hodges so imported water can be stored in Lake Hodges during times of drought. The pump station includes two 20-MW pump-turbines that are used to generate power when water is transferred from Olivenhain Reservoir to Lake Hodges. The Water Authority has an agreement with SDG&E to operate the pump-turbines such that power will be generated as needed by SDG&E when not precluded by an emergency need for water. The operation of the Lake Hodges Pump Station will result in a relatively stable water level in Lake Hodges, and frequent water transfers between Lake Hodges (local runoff water) and Olivenhain Reservoir (imported water) from the Water Authority's 2nd aqueduct depending on SDG&E's power needs and environmental conditions.

The agreement among the City of San Diego, Santa Fe Irrigation District, and San Dieguito Water District, provided in **Appendix F**, makes provisions for the Lake Hodges Improvement Project and resulting local water yield. Once the project is completed, in the first water contract year after operation, the City of San Diego will deliver and sell up to 5,700 AF to SDWD and the District; the District is entitled to receive 57.33 percent and SDWD is entitled to receive 42.67 of water supplied in any given water contract year. Beginning with the first water contract year after the Lake Hodges Improvement Project is operational, if the annual yield of local water is projected to be 11,400 AF or more, all local water will be divided 50 percent to San Diego 50 percent to the District and SDWD. The City of San Diego will deliver the excess local water requested by the districts. If it is not requested, it will become a local water credit. Districts may draw on that local water credit balance by purchasing water from the City of San Diego at local water prices. Local water prices are calculated based on the City of San Diego's operational cost as discussed above, but do not include the operation or construction cost of the Lake Hodges Improvement Project.

4.1.4 Recycled Water

The San Elijo Joint Powers Authority (SEJPA) owns and operates a Title 22 Recycled Water Facility located in Cardiff-by-the-Sea. Recycled water is delivered to the District under a 20-year "take or pay" agreement, in which the District is to purchase a minimum of 393 AFY. The Recycled Water Facility consists of a tertiary treatment system with a rated capacity of 2.48 MGD and a distribution pump station. The facility produces a high quality disinfected tertiary effluent suitable for unrestricted reuse. Additional detail about the District's use of recycled water is provided in Section 4.4.

4.1.5 Groundwater

Currently, there is no use of groundwater sources by the District. However, the District will evaluate potential uses within its boundaries in its proposed 2006 Integrated Water Resource Plan.

4.1.6 Transfer and Exchange Opportunities

The District's wholesale supplier, the Water Authority, has secured a water transfer as part of the *Quantification Settlement Agreement (QSA) for the Colorado River* in October 2003. The QSA was executed by the San Diego Water Authority, Coachella Valley Water District, Imperial Irrigation District, Metropolitan Water District, and the State of California. 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. The QSA commits the state to a restoration path for the environmentally sensitive Salton Sea and provides full mitigation for these water supply programs. The QSA assures California up to 75 years of stability in its Colorado River water supplies.

In addition to the Water Authority- Imperial Irrigation District (IID) water transfer, the Water Authority accepted assignment of the Metropolitan Water District's water rights to 77,700 acre-

feet per year for 110 years from projects that will line the All-American and Coachella canals. The project will stop the loss of water that currently occurs through seepage, and that conserved water will go to the Water Authority. This will provide the San Diego region with an additional 8.5 million acre-feet of water over the 110-year life of the agreement. The State Legislature authorized \$200 million from the state to help pay for construction of the canal-lining projects. The projects are also eligible for \$20 million in Proposition 50 funding. By taking on this responsibility, the Water Authority has secured for the San Diego region a major, new, 110-year water supply that is highly reliable, drought-proof and cost competitive.

The QSA includes a water transfer from IID to the Water Authority, ramping up to 200,000 AFY for up to 75 years. It also includes lining of the All-American and Coachella canals, with the 77,700 acre-feet of water conserved annually going to the Water Authority for 110 years. Key features of the agreement include the following:

- Quantification of IID's Colorado River entitlement at 3.1 million acre-feet
- Quantification of Coachella Valley Water District (CVWD)'s Colorado River entitlement at 330,000 acre-feet
- A peace treaty between the four water agencies and the promise for lasting peace among the seven states that share the Colorado River
- Water transfers:
 - IID-Water Authority transfer, ramping up to 200,000 acre-feet per year from IID to Water Authority for up to 75 years
 - IID-MWD transfer of up to 110,000 acre-feet per year from IID to MWD
 - IID-CVWD transfers ramping up to 103,000 acre-feet per year from IID to CVWD
 - Potential water transfers between 25,000 and 111,000 acre-feet annually from the Palo Verde Irrigation District to MWD
 - Lining of the All-American and Coachella canals, with the 77,700 acre-feet of water produced annually going to the Water Authority for 110 years
 - 16,000 acre-feet per year of additional canal-lining water provided to the San Luis Rey Settlement Parties to implement a 1988 federal law that resolved decades-old litigation

4.1.7 Development of Desalinated Water

The District's wholesale water supplier, the Water Authority, is working on developing a desalinated water supply as documented in the Water Authority's *2004 Annual Water Supply Report – Supply Reliability Through Diversification* and the Water Authority's *2005 Urban Water Management Plan*. The development of seawater desalination in San Diego County will assist the region in diversifying its water resources, and reduce dependence on imported supplies. The Water Authority has been evaluating seawater desalination as a potential reliable local water resource since the 1990s. The cost of seawater desalination has decreased over the last 15 years due to the technological advances in the development and manufacture of reverse osmosis (RO) membranes used in the desalination process. The Water Authority expects desalinated water to

provide 6 to 15 percent of the region's supply by the year 2020.

The Water Authority's current seawater desalination efforts are focused on three areas within San Diego County: Encina Power Station in the City of Carlsbad, San Onofre Generating Station (SONGS) in the northern portion of San Diego County on Marine Corps Base Camp Pendleton, and the South Bay/ South County area. Although all three sites are technically feasible, the Carlsbad location is the most developed alternative; The Environmental Impact Report and other permits have been initiated, a preliminary design report for distribution facilities has been completed, the current Capital Improvement Program (CIP) budget includes construction costs associated with the project, the Water Authority has executed an agreement with the City of Carlsbad, and negotiations are underway with a private leaseholder at the Encina Power Station. The Carlsbad seawater desalination plant would provide 56,000 AFY by 2015.

4.2 Reliability of Water Supply

Planners include the probability of catastrophic outages when using the reliability planning approach. The interruption considered most likely would be as a result of loss of power or a failure of a key facility. Other factors that can cause water supply shortages are severe drought, earthquakes, chemical spills, and sabotage.

Reliability planning requires information about: (1) the expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; (3) how available contingency measures can reduce the impact of shortages when they occur.

4.2.1 Reliability of Water Authority Supply

The MWD is currently the primary supplier of potable water to the Water Authority. The Water Authority is working to diversify its supply and decrease its dependence on MWD over the next 20 years, as documented in the Water Authority's *2004 Annual Water Supply Report – Supply Reliability Through Diversification*. The Water Authority 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 regional supplier, the Water Authority, has adopted a system-wide annualized demand reduction target of no more than 20 percent. It is believed that anything over a 20 percent reduction would cause an economic hardship within the area.

The Water Authority's 2005 *Urban Water Management Plan* describes the Water Authority'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 Water Authority plans to provide reliable supply in average, dry, and multiple dry year conditions.

4.2.2 Reliability of District Supply

Single dry years are not expected to result in a reduction in local supplies. During an extended event, an assumption was made that local supplies will be reduced by approximately 33 percent during the second and third years and to zero during the fourth year. Although the agreement between the District and SDWD and the City of San Diego allows for 3,268 AFY to be provided to the District from Lake Hodges after 2008, in dry years the entitlement to Lake Hodges water may not be available; in this case, the District will need to purchase a higher percentage of imported water through its separate imported water connection.

The Water Authority is planning on the use of dry year options and transfers to meet the shortage scenarios without impacting availability. **Table 4-2** provides the District's estimated water supply projections associated with several water supply reliability scenarios.

**Table 4-2
District Supply Reliability (AFY)**

Supply Source	Normal Year (2005)	Single Dry (2005)	Multiple Dry Water Years			
			Year 1 2006	Year 2 2007	Year 3 2008	Year 4 2009
San Diego County Water Authority	8,844	9,474	10,091	11,975	13,591	15,208
Surface Water	3,268	3,268	3,268	2,000	1,000	0
Recycled Water	494	494	494	494	494	494
TOTAL	12,606	13,236	13,853	14,469	15,085	15,702

¹ The single dry year assumes a 5% increase in demand.

² Multiple dry years are increased based on increased forecasted demand. Note that forecasted demand is conservatively high as noted in Chapter 2, so dry year demands are also conservatively high.

4.2.3 Water Quality Impacts on Reliability

Although the District has a treated water connection to the Water Authority's aqueduct, the District receives most of its supply as untreated water, which is treated at the R.E. Badger Filtration Plant. Water quality issues are different for each source of water delivered to the R.E. Badger Filtration Plant. A summary of the water quality issues associated with each supply source is provided below:

Surface Water: Water quality in Lake Hodges has generally been poor because it receives storm runoff from such a large drainage area. During periods of drought, Lake Hodges water has

high total dissolved solids and water may be unusable for irrigation. During winter months, water quality challenges include high turbidity and organics loading. In the spring and summer, algae blooms, iron, manganese, and sulfides create treatment challenges. The District relies on the City of San Diego's education and enforcement programs to increase compliance with urban runoff best management practices within the Lake Hodges watershed area. The Water Authority, City of San Diego, and County of San Diego have formed a regional water management group to coordinate development of an Integrated Regional Water Management Plan for the San Diego region. An important element of this plan is to identify projects to protect watersheds and enhance the region's local surface water quality.

Imported Water: The imported water supplied by the Water Authority is conveyed by the Metropolitan Water District from the Colorado River and from the northern Sierras (State Water Project). The Colorado River supplies typically contain high salinity levels; some perchlorate has also been detected and speculated to be linked to a chemical manufacturing site in Henderson, Nevada which has reduced perchlorate discharge to the river by over 80 percent since 2004. State Water Project water typically contains high levels of bromide and total organic carbon, most likely due to seawater intrusion and agricultural drainage from peat soil islands in the Bay-Delta, the confluence of the San Francisco Bay, Sacramento River, and San Joaquin River. Bromide and total organic carbon combine with chemicals used in the water treatment process to form disinfection by-products that are strictly regulated under the federal Safe Drinking Water Act.

Recycled Water: Recycled water meets all Title 22 standards for tertiary treated water, and is discussed in more detail in Section 4.4.

Water quality is continuously monitored by the District and improvements are made to the R.E. Badger Filtration plant as necessary to ensure that the water supply meets all drinking water standards. However, source water of poor quality causes increasingly high costs of treatment to meet state and federal drinking water standards.

Water quality in Lake Hodges is expected to improve after the Lake Hodges Improvement Project is constructed in 2008, because there will be more mixing between the water in Lake Hodges and the imported water stored in Olivenhain Reservoir. No change to drinking water quality that may affect water reliability is anticipated by the District over the next 20 years.

4.3 Potential Projects to Increase Water Supply

Only limited population growth and increases in water use is expected by the District over the next 20 years, so no major expansion projects are planned. However, the District is working to expand the use of recycled water as described in Section 4.4.

4.4 Recycled Water

A Santa Fe Irrigation District Recycled Water Master Plan was completed in September 2005. Currently, the District has an agreement with the San Elijo Joint Powers Authority to provide approximately 400 acre feet of recycled water for high-demand irrigation customers.

4.4.1 Recycled Water Facilities

The SEJPA owns and operates a Title 22 Recycled Water Facility located in Cardiff-by-the-Sea. Recycled water is delivered to the District under a 20-year “take or pay” agreement, in which the District (as purveyor) is to purchase a minimum of 393 AFY. The Recycled Water Facility consists of a tertiary treatment system with a rated capacity of 2.48 MGD and a distribution pump station. The facility produces a high quality disinfected tertiary effluent suitable for most irrigation uses.

Recycled water from the San Elijo Recycled Water Facility enters a 25,000-gallon clearwell, where it is then pumped into two separate distribution systems supplying three different communities. The North Distribution System is located within the City of Encinitas and the SDWD, and the South Distribution System serves customers within the District and Del Mar. The South Distribution System includes 4-inch to 24-inch pipelines, the Lomas Santa Fe Reservoir, and the Lomas Santa Fe Booster Pump Station.

Additional potential recycled water supply sources include the City of San Diego North City Water Reclamation Plant and local Community Service Districts (CSD). The City of San Diego’s recycled water distribution system extends to the northwest border of the City, to Fairbanks Ranch in San Dieguito Road, this location is the proposed supply point for the District. Negotiations are ongoing with the City of San Diego, so the supply quantities from the North City Water Reclamation Plant have not been finalized. The three community service districts, Rancho Santa Fe CSD, Fairbanks Ranch CSD, and Whispering Palms CSD, provide wastewater treatment service. The combined capacity of these plants is expected to be approximately 1,428 AFY at buildout. Although they do not currently produce Title 22 tertiary effluent, tertiary treatment facilities could be added, pending results of an ongoing feasibility analysis.

4.4.2 Existing and Potential Recycled Water Demand

Within the District’s service area, recycled water is currently supplied to 14 customers within the city of Solana Beach through 43 individual irrigation meters. Existing potable water customers who have been converted to the recycled water system include the Lomas Santa Fe Golf Club and Executive Course, San Dieguito and La Colonia Parks, slope and median irrigation along Interstate 5, and various homeowners associations.

The 2005 *Santa Fe Irrigation District Recycled Water Master Plan* identifies four alternative recycled water expansion options, each intended to add about 800 AFY of projected demand service capability. A financial evaluation will be conducted to determine feasibility of the proposed options. Although Proposition 50 grant funding was requested to design and construction pipelines and facilities that would provide over 400 AFY of recycled water to Rancho Santa Fe, this funding has not been secured. As the recycled water distribution system expands, additional customers include San Dieguito Park and incidental potential recycled water customers in Solana Beach such as commercial properties with landscape irrigation, and residential developments with common area landscaping. The District is currently investigating the supply of recycled water to private homeowners on estate lots in Rancho Santa Fe. This action will require approval from the Department of Health Services. Recycled water use other

than irrigation, such as for industrial or commercial use or groundwater recharge, has limited applicability for the District due to the nature of the District's commercial and industrial base and water supply sources. **Table 4-3** provides estimates of the District's current and projected recycled water use.

**Table 4-3
Current and Projected Recycled Water Use¹**

Type of Use	2000 Projection for 2005	2005 Actual Use	2010	2015	2020	2025	2030
Landscape	700	494	800	1,000	1,025	1,040	1,100

¹ Projections are based on the District's 2005 *Recycled Water Management Plan*, and adjusted to correspond with Water Authority projections.

4.4.3 Optimizing the Use of Recycled Water

To encourage customers to convert to recycled water, the District and SEJPA have implemented the following:

Loan Program: A loan program to finance customer retrofits on the existing recycled water system was initiated by the SEJPA. The 15 percent discount currently built into the recycled water price is deferred until the loan obligation is satisfied. Establish a grant program to pay for the retrofit, based on the size of the facility and the volume of recycled water to be used.

Technical Assistance: SEJPA staff also offers technical assistance. Recycled water customers can call upon trained experts to assist with any water quality, quantity or pressure concern. The technical assistance is provided around the clock.

Public Outreach: The District has made public outreach efforts such as printed brochures and an expanded website to inform residents and interested parties during the planning, design, and construction phases of water recycling facilities. This public outreach effort will become even more important as the recycled water system is expanded and smaller privately owned sites are connected.

Mandates and Resolutions: The District's Board of Directors has passed several resolutions mandating the use of recycled water, and the District is currently in the process of reviewing these resolutions. Resolution No. 90-13 amends the Emergency Water Management Program to require the use of recycled water, when available, for the irrigation of greenbelts, cemeteries, golf courses, parks and highway landscaped areas. Resolutions 95-15 and 97-25 further establish rules and regulations for reclaimed and non-potable water service. To date, almost all customers have connected to the recycled water system voluntarily, as most consider the availability of recycled water to be a benefit. Any new construction and commercial upgrade projects in the area of recycled water are required to use recycled water for irrigation.

The projected results of these actions are incorporated in the estimates for projected water use provided in Table 4-3. Additional detail about the District's plan to optimize the use of recycled water may be found in its 2005 *Santa Fe Irrigation District Recycled Water Master Plan*.

Chapter 5

Water Service Reliability

5.1 Projected Normal Year Supply and Demand

Table 5-1 compares current and projected water supply and demand. It indicates that in average precipitation years, the District has sufficient water to meet its customers' needs, through 2020. This is based on continued commitment to conservation programs, and additional recycled water becoming available.

Table 5-1
Projected Normal Year Supply and Demand (AFY)

	2005	2010	2015	2020	2025	2030
Demand	12,606	15,541	15,705	15,996	16,308	16,471
Supply						
San Diego County Water Authority	8,844	11,473	11,437	11,703	12,000	12,103
Lake Hodges	3,268	3,268	3,268	3,268	3,268	3,268
Recycled	494	800	1,000	1,025	1,040	1,100
SUBTOTAL	12,606	15,541	15,705	15,996	16,308	16,471
Difference (Supply-Demand)	0	0	0	0	0	0
% Supply Shortage	0%	0%	0%	0%	0%	0%

¹ Projections are based on District data, and adjusted to correspond with Water Authority 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. The District's ability to meet its customer demands in dry years is based on the Water Authority's ability to provide a reliable water supply. The Water Authority has documented its plans to provide a reliable water supply to the region, even in multiple dry years, in its 2003 *Regional Water Facilities Master Plan*, 2004 *Annual Water Supply Report - Water Supply Through Diversification*, and 2005 *Urban Water Management Plan*.

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

	Normal Year (2005)	Single Dry ¹ (2005)	Multiple Dry Water Years ²			
			Year 1 2006	Year 2 2007	Year 3 2008	Year 4 2009
Demand	12,606	13,236	13,853	14,469	15,085	15,702
Supply						
San Diego County Water Authority	8,844	9,474	10,091	11,975	13,591	15,208
Lake Hodges	3,268	3,268	3,268	2,000	1,000	0
Recycled	494	494	494	494	494	494
SUBTOTAL	12,606	13,236	13,853	14,469	15,085	15,702
Difference (Supply-Demand)	0	0	0	0	0	0
% Supply Shortage	0%	0%	0%	0%	0%	0%

¹ The single dry year assumes a 5% increase in demand.

² Multiple dry years are increased based on increased forecasted demand. Note that forecasted demand is conservatively high as noted in Chapter 2, so dry year demands are also conservatively high.

Chapter 6

Water Shortage Contingency Plan

The District has experienced only one occasion in the early 1990s where supply deficiencies have been so significant that mandatory water use restrictions have been needed. First, a statewide drought halted operations of the State Water Project, and simultaneously, a local drought significantly reduced flows into Lake Hodges. The Water Authority informed its member agencies that a mandatory 20 percent reduction in demand was needed.

The District's reaction to this condition was to adopt a drought management plan, implement mandatory and voluntary water use restrictions, and implement new water conservation programs. Based on experiences during the aforementioned drought, the community recognized that it is better to enter into a water shortage alert early, at a minimal level, to establish necessary rationing programs and policies, to gain public support and participation, and to reduce the likelihood of more severe shortage levels later. The District's drought management plan is incorporated in the District's *Administrative Code, Article 17, Water Conservation*; a copy of this article, including its most recent revisions in 2004, is included in **Appendix G**. The District's *Administrative Code, Article 17, Water Conservation* will be updated to coordinate with the Water Authority's Drought Management Plan. This will be done as part of the Integrated Water Resource Plan, which will be conducted in the spring of 2006.

6.1 Water Shortage Emergency Response

The District has taken significant steps in an effort to be prepared for catastrophic water supply interruption. Steps taken include development of planning documents outlining contingency actions and purchase of spare parts and key mechanical equipment to improve preparedness and enhance the District's ability to respond following a catastrophic event. The Emergency Response Plan was revised in 2005, but the revised plan was not yet approved by the District's Board of Directors at the time of the UWMP preparation.

Emergency Response Plan

Emergencies often strike without warning – interrupting normal operations, disrupting normal channels of communication and imposing great responsibilities that must be carried out with minimal time and resources. Disaster planning is an intelligent response to the anticipated conditions and expected circumstances of emergencies. In 1996, a comprehensive emergency response plan was adopted in conformance with Government Code Section 8550, which established the Standardized Emergency Management System.

The plan is integrated with the existing plans and systems within the Unified San Diego County Emergency Organization Operations Area, the Rancho Santa Fe Fire Protection District, the City of Solana Beach, and the San Diego County Water Authority. The District has established cooperative agreements with its adjacent water agencies for the emergency exchange and transportation of water. The District has agreements with its four bordering water districts: City of San Diego, San Dieguito WD, City of Del Mar, OMWD. All four agreements describe the number, location, type of connection, and agreed rate of flow. **Appendix H** provides a matrix of

the interconnections subject these emergency exchange agreements.

The following list summarizes District actions during a water supply catastrophe:

1. Determine the need for proclamation of a water shortage
2. Stretch existing water storage
3. Obtain additional water supplies
4. Contact and coordinate with other agencies
5. Activate an Emergency Response Team and Coordinator
6. Implement the catastrophe preparedness plan
7. Put employees and contractors on-call
8. Communicate as necessary with the public
9. Prepare for water quality interruptions

If an event were to occur, the District would respond immediately to assess water supply and transmission capabilities. Depending upon the results of the initial assessment, the Plan may be activated at one of four levels:

- Notification
- Pre-activation
- Emergency
- Deactivation

The **Notification** level of the Plan is used for the purpose of alerting staff and Directors that emergency conditions may exist and that the Emergency Operations Center may need to be activated. The General Manager/Director of District Emergency Services may activate specific functions, such as Public Information Officer. The Unified San Diego County Emergency Services Organization Operational Area may also notify the District of emergency activations within the Operational Area or the State may place the District on alert.

Pre-activation is a heightened stage of alert and notification. All staff with emergency assignments should maintain contact with the District and be prepared to report to the Emergency Operations Center. In this level, some emergency functions may be activated; however the District is operating under normal conditions.

The **Emergency** level is an official and partial or full activation of the District's Emergency Operations Center. During this phase, the District notifies the Water Authority and the County of San Diego of the activation and provides status reports.

The **Deactivation** stage returns the operation to normal as the need for emergency response functions slows and ceases. Some functional positions have transitional responsibilities for recovery projects and programs.

Emergency Storage Project and Supply Reliability

Similar to MWD, the Water Authority currently does not have sufficient emergency water storage to supply its member agencies during an extended period. The Water Authority has initiated an ESP, a system of reservoirs, pipelines, and other facilities designed to store and move water around the County of San Diego in the event of a natural disaster. The pipelines that carry imported water from MWD to San Diego cross several major fault lines on the way to San Diego County. An earthquake, drought, or other disaster could interrupt San Diego County's imported water supply for up to six months. Some communities would be without water within three to four days. The ESP is scheduled to be completed in 2011, and will provide an additional 90,100 AF of storage capacity to the region. Upon completion of the ESP, 75 percent of the member agencies' water needs are expected to be met during a six-month emergency, assuming full implementation of the water conservation BMPs.

To minimize the impact of future water supply shortages due to a disaster within the District, the District has purchased equipment to add supply and transmission redundancy. System improvements include emergency generators at San Dieguito Reservoir Pump Station. In the event of a loss of power, the generators will be used to continue deliveries of local water to the R.E. Badger Filtration Plant. Similarly, emergency generators are also installed at the treatment plant to ensure continued operation.

6.2 Water Shortage Contingency Plan

In 1991, The District adopted a Water Conservation Resolution (#92-06) for use in times of declared water shortage. The District's water conservation plan is incorporated in the District's *Administrative Code, Article 17, Water Conservation*; a copy of this article, including its most recent revisions in 2004, is included in **Appendix G**. The Water Conservation section of the Administrative Code is designed to establish priorities and restrictions during various types of water shortages, including a 50 percent reduction in water supply. The Code specifies watering restriction for outside irrigation (including golf course, park, school, agriculture and commercial uses), mobile equipment washing, pool refilling, over-irrigation, and hardscape maintenance.

The District expects to update its Water Conservation Resolution and Administrative Code in coordination with the Water Authority, which is currently modifying its Drought Management Plan. The Water Authority's 2005 *Urban Water Management Plan* presents the key components of the Water Authority's new Drought Management Plan. The plan will include three drought stages: Voluntary, Water Authority Supply Augmentation, and Mandatory Cutbacks. The Voluntary stage represents a reduction in the Water Authority's supplies by 10 percent or less. The Water Authority Supply Augmentation stage represents a reduction in the Water Authority's supplies of greater than 10 percent. At this stage, the Water Authority would take actions to augment supplies and try to remain at a ten percent voluntary level. In the event of a drought, the actual actions selected will depend on a number of conditions, including availability of supplies and cost. The Mandatory Cutback stage occurs when the Water Authority has exhausted water supply augmentation options and mandatory cutbacks are required. Implementation of the allocation plan and potential utilization of ESP supplies will occur during this stage. The Water

Authority expects to finalize its Drought Management Plan by 2006. The final plan will provide the region with the actions to be taken by the Water Authority and the member agencies in drought situations to reduce the impacts of shortages. Based on this plan, the District will update its own water shortage contingency plan in the spring of 2006 when it conducts an Integrated Water Resources Plan.

6.2.1 Interim Agricultural Water Program

The District offers the Interim Agricultural Water Program through MWD to customers who qualify as follows:

- Water is used for growing or raising of agricultural products with no less than one acre planted to agricultural crops;
- The growing of a variety of trees for family use does not constitute a commercial grove; a minimum of one acre of a single type of crop must be grown; and
- Golf courses, horse pastures, and the raising of feed for horses do not qualify for the agricultural rate;

These customers who elect to participate receive a discount of \$0.20 per one hundred cubic feet (HCF) of water. Currently the retail price is \$1.76 per HCF and the discount rate is \$1.56 per HCF. Discount pricing is based on the understanding that program participants would be the first water users to face cutbacks if a drought were declared. It would be mandatory for program participants to cut their water use by 30 percent before other users are asked to reduce. There are currently 37 program participants.

6.2.2 Water Rationing Stages

The District developed a seven stage water conservation/rationing plan to invoke during declared water shortages, referenced above and provided in **Appendix G**. The District has established an allocation method based on a combination of historic water consumption and a flat amount, as follows:

Stage I	Voluntary
Stage II	Reduce consumption by 10 percent
Stage III	Reduce consumption by 15 percent
Stage IV	Reduce consumption by 20 percent under rationing program; 20 HCF allowed per billing period plus 75.3 percent of usage in excess of 20 HCF in the base period, additional 15 HCF/unit for multi-family units, and additional 5 HCF for every resident in excess of four persons per single family dwelling unit and three per multi-family unit.
Stage V	Same as Stage IV except only 63.0 percent of usage in excess of 20 HCF allowed
Stage VI	Same as Stage IV except only 50.6 percent of usage in excess of 20 HCF allowed
Stage VII	Same as Stage IV except only 38.3 percent of usage in excess of 20 HCF allowed

Table 6-1 provides the customer reduction goals for these water rationing stages. As discussed previously, the water conservation stages and water rationing plan is expected to be modified based on the Water Authority's revised *Drought Management Plan* in the District's Integrated Water Resources Plan. For more detail about the restrictions associated with each stage, refer to **Appendix G**.

**Table 6-1
Water Rationing Stages and Reduction Goals**

Shortage Condition	Stage	Typical Customer Reduction	IAWP Customer Reduction	Type of Rationing Program
Possible Shortage	I	10%	30%	Voluntary Water Watch
Probable Shortage and 10% Reduction Required	II	10%	Up to 30%	Mandatory Water Alert
Shortage and 15% Reduction Required	III	15%	Up to 40%	Mandatory Water Warning
Shortage and 20% Reduction Required	IV	20%	Up to 50%	Mandatory Water Emergency
Shortage and 30% Reduction Required	V	30%	Up to 90%	Mandatory Water Emergency
Shortage and 40% Reduction Required	VI	40%	Up to 90%	Mandatory Water Emergency
Shortage and 50% Reduction Required	VII	50%	Up to 90%	Mandatory Water Emergency

6.2.3 Enforcement and Penalties

Penalties for violators of the water restriction stages include notification and warning, installation of a flow restriction device, and discontinuance of service depending on the water restriction stage and number of violations. For a willful and excessive violation, a misdemeanor punishable by \$1,000 and 30 days in jail could be issued, as authorized in California Water Code Section 377.

6.3 Revenue and Expenditure Impacts

A portion of the surplus revenues that the District collects is currently used to fund the Rate Stabilization Fund, conservation, and other capital improvements. The District has estimated projected ranges of water sales by shortage stage to best understand the impact each level of shortage will have on projected revenues and expenditures. The analysis assumes a 10 percent decrease in sales at Stage II; 25 percent at Stage IV, and a 50 percent at Stage VII. For each stage, water sales revenue and production expenses are reduced by the aforementioned amounts. Filtration plant expenses are reduced by one-half of the percent reduction in sales (for example Plant expenses were reduced by 25 percent during a Stage VII shortage of 50 percent). A summary of these estimates is presented in **Table 6-2**.

**Table 6-2
Water Shortage Revenue Impacts**

	FY 2006 Budget ²	Stage I (-10%)	Stage IV (-25%)	Stage VII (-50%)
Lost Revenue - Water Sales	\$9,966,528	(\$996,653)	(\$2,491,632)	(\$4,983,264)
Lost Revenue - Reduced Filtration Reimbursement (SDWD Treatment)	\$1,069,115	(\$106,912)	(\$267,279)	(\$534,558)
Reduced Expense - Filtration Plant ¹	\$3,534,778	\$176,739	\$441,847	\$883,695
Reduced Expense - Water Purchase	\$4,771,922	\$477,192	\$1,192,981	\$2,385,961
Total Annual Impact		(\$449,633)	(\$1,124,083)	(\$2,248,166)

¹ Filtration plant expenses were reduced by one-half of the percent reduction in sales (for example Plant expenses were reduced by 25% during a Stage VII shortage of 50%).

² Budget data was provided by the District's FY2006 Operating Budget.

The 2006 Rate Stabilization Fund is estimated to be about \$11.5 million and Total Reserves approximately \$24.7 million, which is sufficient to cover a 50 percent water shortage.

6.4 Mechanisms to Determine Water Use Reduction

Under normal water supply conditions, potable water production figures are recorded daily at the R.E. Badger Filtration Plant. Totals are reported monthly to the Board of Directors at the regular board meetings. During any stage shortage, daily production figures would be reported to the General Manager and Board of Directors. The General Manager will compare daily and weekly production to the target production to verify that the reduction goal is being met. If reduction goals are not met, the General Manager will notify the Board of Directors so that corrective action can be taken.

Appendix A

Urban Water Management Plan Act

Appendix B

**Department of Water Resources
UWMP Checklist**

Appendix C

Public Participation and Public Hearing Notice

Appendix D

2005 UWMP Resolution

Appendix E

CUWCC Annual Report and BMP Coverage Report

Appendix F

Lake Hodges Water Agreement

Appendix G

**Administrative Code, Article 17, Water Conservation
(Adopted 2004)**

Appendix H

Emergency Exchange Interconnections Matrix

**Emergency Exchange Connections Matrix
Metered and Unmetered**

SFID - OMWD Connections	
Metered	Unmetered
San Elijo Hills Whispering Palms Calle Mayor Circa Oriente Pojo Club Las Palmas, Rancho Santa Fe (2) Highland and San Mario, Solana Beach (2) Via de la Valle, Solana Beach	Santa Luisa-Santa Victoria Via de Santa Fe / Calzada del Bosque (3)
SFID - San Dieguito Water District (City of Encinitas) Connections	
Metered	Unmetered
	El Camino del Norte
SFID - City of San Diego Connections	
Metered	Unmetered
San Andreas, Solana Beach Caminito Daniella, Del Mar (2) El Camino Real - Casa Palmera (2)	
SFID - City of Del Mar	
Metered	Unmetered
Valley/Via de la Valle - Del Mar	