2010
Urban Water Management Plan

PADRE DAM
Municipal Water District

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The water supply and demand forecasts in a water supplier's Urban Water Management Plan are used by cities and counties in planning and land use decisions. The State of California uses the local forecasts to inventory and manage statewide water supplies.

Section 1 / Plan Preparation

1.1 The Urban Water Management Planning Act

California's legislature adopted the Urban Water Management Planning Act in 1983, declaring that the state's water supply is a limited resource subject to ever-increasing demands and that planning for, and implementing, water use efficiency is best accomplished at the local level.

The act requires every urban water supplier in California that provides over 3,000 acre feet of water annually, or serves 3,000 or more connections, to prepare an Urban Water Management Plan (UWMP) that assesses the reliability of its water resources over a 20-year planning horizon considering normal, dry, and multiple dry years.

Suppliers must update their UWMP every five years and submit it to California's Department of Water Resources, where it is reviewed to assure compliance with all requirements set forth in the 1983 legislation and all subsequent amendments (Water Code, Sections 10610 – 10656).

How Urban Water Management Plans Are Used

The intent of the Urban Water Management Planning Act is for the water supply and demand forecasts in UWMPs to facilitate other local, regional and statewide water management processes. Uses of UWMPs include the following:

City and County General Plans

Assuring that an adequate water supply is available for planned development and growth is an iterative and collaborative process between cities, counties and water suppliers.

Senate Bills 610 & 221

Senate Bills 610 and 221, adopted by the legislature in 2001, require city and county decision-makers to include water supply availability as a basis for approving residential developments of 500 or more housing units, or projects that would increase the water supplier's service connections by 10% or more.

Senate Bill x7-7

Governor Schwarzeneggar directed state water agencies in 2008 to develop a plan to reduce statewide per capita water use 20% by 2020. The plan divides the state into 10 hydrologic regions and sets the 2020 water use target in each region based on climate, land use patterns, water distribution infrastructure and socioeconomic characteristics, including the cost of water and the income level of residents. The plan was implemented with the adoption of Senate Bill x7-7 in 2009. Water suppliers must identify in their UWMPs their baseline daily per capita water use, 2020 water use target, 2015 interim water use target, compliance daily per capita water use, and progress towards their targets.

California Water Plan

The California Water Plan Update provides a framework for water managers, legislators, and the public to consider options and make decisions regarding California's water future. The Water Plan, which was updated in 2009 and will be updated again in 2013, includes water supply evaluations and assessments of agricultural, urban, and environmental water uses. The information submitted by water suppliers in their 2010 UWMPs will be used to create a statewide database for the 2013 update of the plan.

CUWCC Best Management Practices

To comply with the Urban Water Management Planning Act, water suppliers must implement the act's 14 demand management measures (DMMs) or the California Urban Water Conservation Council's best management practices (BMPs), and report water savings compliance in their UWMP. Assembly Bill 1420, adopted in 2007, conditions the awarding of state funded grants and loans to water suppliers on full compliance with the BMPs.

State Funded Grants and Loans

Water suppliers must comply with all provisions of the Urban Water Management Planning Act to be eligible to receive state-funded grants and loans (California Water Code, Section 10656).

Key Amendments to the Urban Water Management Planning Act Since 2005

Water Conservation

Water suppliers must identify their water conservation target as specified by Senate Bill SB x7-7 (California Water Code, Sections 10608.2(e) – 10608.42).

Water suppliers must be in full compliance with all provisions set forth in the CUWCC's *Memorandum of Understanding Regarding Urban Water Conservation in California*, dated December 10, 2008, to be considered in compliance with the CUWCC's BMPs, and eligible for state funded grants and loans. Water suppliers in compliance with the BMPs are considered to be in compliance with the Urban Water Management Planning Act's DMMs. (California Water Code, Sections 10631(j), 10631.5(a, c-f))

Water suppliers may be considered in compliance with the CUWCC's BMPs through their participation in a regional compliance plan (California Water Code, Section 10631.5(b)).

The California Department of Water Resources and the the CUWCC will convene a technical panel to provide information and recommendations to the Department of Water Resources and the legislature on new water conservation best practices. (California Water Code, Section 10631.7)

Lower Income Housing

Water use projections must include projected water use for single-family and multi-family residential housing needed for lower income households (Health and Safety Code Section 50079.5). The purpose of this amendment is to help suppliers grant a priority for the provision of service to housing units affordable to lower income households, in compliance with Government Code Section 65589.7 (California Water Code, Section 10631.1).

Recycled Water

Indirect potable reuse is to be considered as a potential use of recycled water (California Water Code, Section 10633(d).

2010 Urban Water Management Plans

Water suppliers are granted an extension to July 1, 2011 to adopt their 2010 UWMPs (California Water Code, Section 10644 and 10608.20(j)).

Water suppliers must provide to any city or county within their service area at least 60 days notice of the public hearing regarding the update of their UWMP (California Water Code, Section 1021(b)).

Water suppliers must submit a copy of their updated UWMP to the California State Library no later than 30 days after its adoption (California Water Code, Section 10644(a)).

1.2 Preparation of Padre Dam's 2010 UWMP

To prepare the 2010 UWMP, Padre Dam staff attended the California Department of Water Resources' statewide workshops and utilized the agency's *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 UWMP*. Staff collaborated with the San Diego County Water Authority, Padre Dam's wholesale water supplier, and the San Diego Association of Governments (SANDAG), which is comprised of the region's land use agencies. Padre Dam notified the land use agencies within its service area and key stakeholders of the preparation of a 2010 UWMP and posted a draft version for public review. A public hearing was conducted on June 17, 2011, and Padre Dam will submit a plan approved by its Board of Directors to the California Department of Water Resources, the California State Library, and any city or county which Padre Dam provides water service within thirty (30) days after adoption of the 2010 Plan (California Water Code, Section 10644(a)).

November 30, 2010
California Department of Water Resources webinar

December 18, 2010
California Department of Water Resources webinar

January 5, 2011
California Department of Water Resources webinar

January 12, 2011
California Department of Water Resources webinar

March 7, 2011
California Department of Water Resources workshop

March 22, 2011
San Diego County Water Authority workshop

April 15, 2011
60 day notice mailed to land use agencies and key stakeholders

June 1, 2011
Draft plan posted online for public review and comment

June 2, 2011
Advertised notice of public hearing to adopt plan

June 9, 2011
Advertised notice of public hearing to adopt plan

June 17, 2011
Public hearing (Option: June 28, 2011 Board Adoption)

June 28, 2011
Board adoption of plan

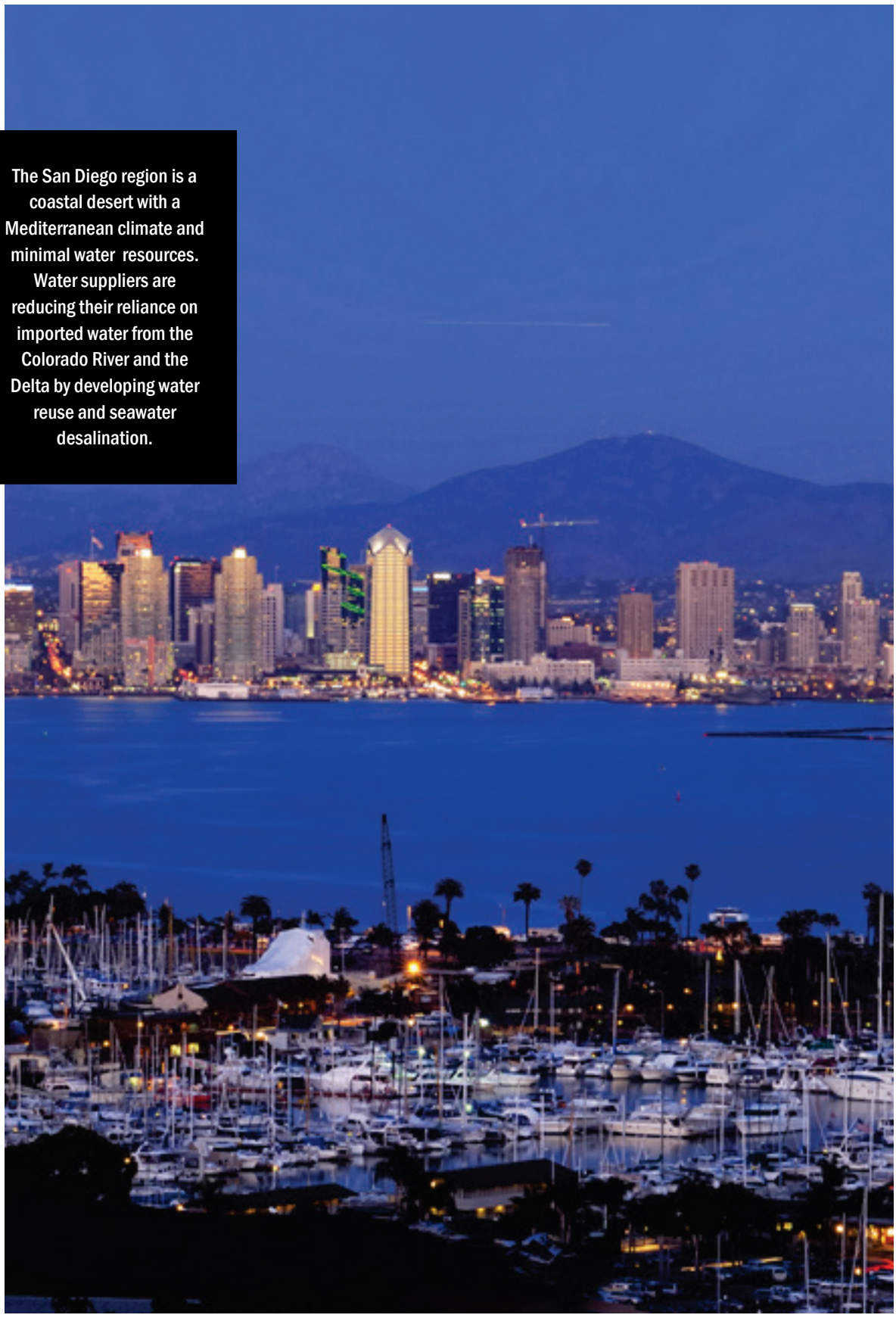
Within 30 Days After Adoption
Provide copies of the adopted plan to the California Department of Water Resources, the California State Library, and any city or county within which Padre Dam provides water service

Within 30 Days After Submitting to the Department of Water Resources
Provide plan for public review during normal business hours

Table 1 / Coordination with Appropriate Agencies

	Participated in developing plan	Commented on draft plan	Attended public meetings	Contacted for assistance	Sent copy of draft plan	Sent notice of intent to adopt	Not involved
Land Use Agencies							
San Diego Assn. of Governments	X			X			
San Diego County, Dept. of Planning					X	X	
San Diego County, County Supervisor					X	X	
City of Santee					X	X	
City of El Cajon					X	X	
Crest-Dehesa Comm. Planning Group					X	X	
Alpine Comm. Planning Group					X	X	
Lakeside Comm. Planning Group					X		
Water Suppliers							
San Diego County Water Authority	X			X	X	X	
Helix Water District					X	X	
Lakeside Water District					X	X	
Otay Water District					X		
Native American Tribes							
Sycuan Band of the Kumeyaay Nation					X	X	
Viejas Band of Kumeyaay Indians					X	X	
Barona Band of Mission Indians					X		
Ewiiaapaayp Band of Kumeyaay Indians					X		
Business Community							
Santee Chamber					X	X	
Alpine Mountain Empire Chamber					X	X	
San Diego East County Chamber					X	X	
School Districts							
Santee School District					X	X	
Cajon Valley School District					X	X	
Alpine Union School District					X	X	
Grossmont Union High School District					X	X	
Grossmont-Cuyamaca Comm. College District					X		

The San Diego region is a coastal desert with a Mediterranean climate and minimal water resources. Water suppliers are reducing their reliance on imported water from the Colorado River and the Delta by developing water reuse and seawater desalination.



Section 2 / System Description

2.1 Service Area Physical Description

Location

Padre Dam's 85 square mile service area is located approximately 20 miles east of downtown San Diego, California. The District's population of 91,670 (2010) resides in the City of Santee, the City of El Cajon, and the unincorporated communities of Blossom Valley, Crest, Harbison Canyon and Alpine.

The service area is split into the western service area and eastern service area. The western service area covers most of the Santee Valley and encompasses the City of Santee. Within the western service area, Padre Dam provides potable water service, wastewater collection and treatment, recycled water production and delivery, and park and recreation services.

The elevation gain from the Santee Valley to Padre Dam's highest eastern service area reservoir is 2,017 feet, and the area is characterized by hills, ridges, canyons and low population density. Padre Dam provides potable water service in the eastern service area. The eastern distribution system includes nine pumping stations, 16 pressure zones and 16 pressure reduction stations.

Figure 1 / Padre Dam Service Area

History

Padre Dam was formed in 1955 as Rio San Diego Municipal Water District to secure an entitlement to imported water from the Colorado River and wholesale the water to the existing groundwater suppliers. In 1956, a Santee committee asked for Rio to deliver water to the proposed Santee County Water District; in 1959, voters approved the annexation of Blossom Valley and Flinn Springs to Rio and, in 1960, the annexation of Alpine, Mountain Top and Harbison Canyon was approved. The district was renamed in 1976 for the Old Mission Dam located west of Santee in Mission Trails Regional Park.

Figure 2 / Service Area / Average Monthly Temperature (1981-2011)

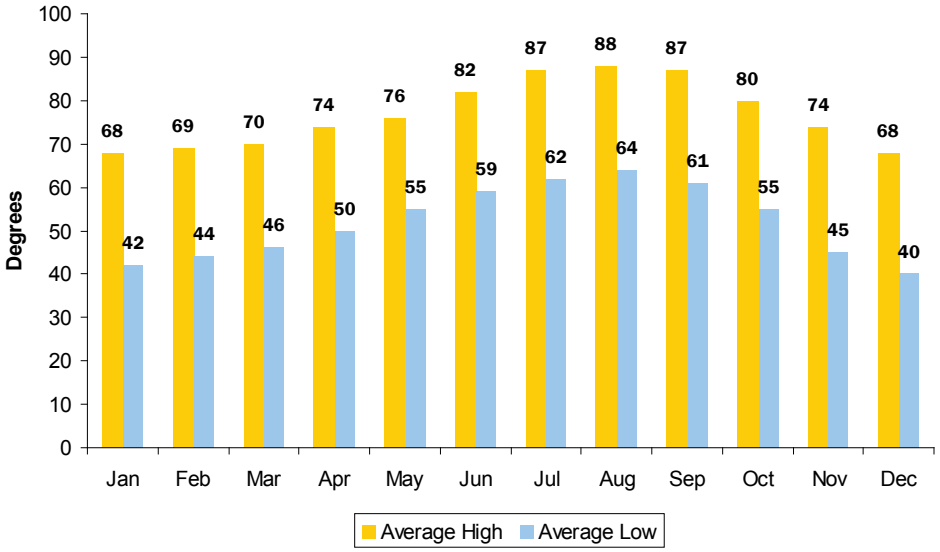
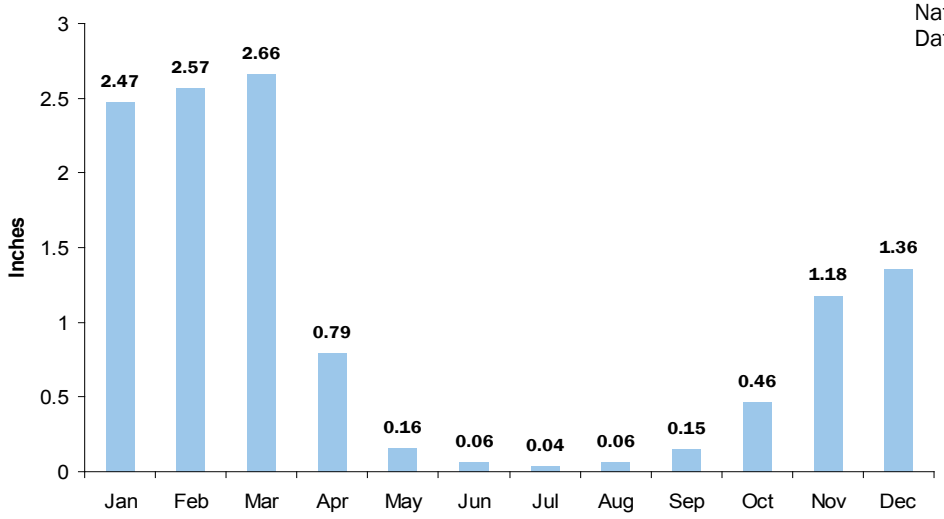


Figure 3 / Service Area / Average Monthly Precipitation (1981-2011)

Source: National Climatic Data Center



2.2 Service Area Population

Table 2a / Population & Household Data / Water Distribution System

	2010	2015	2020	2025	2030	2035
Total Population*	91,670	95,629	101,427	108,918	112,908	118,654
Total Housing Units	31,979	33,244	35,013	37,410	38,456	39,975
Occupied Households	30,566	32,188	33,997	36,351	37,436	39,066
Single Family Homes	20,041	22.135	23,676	25,403	26,256	26,945
Multi-Family Housing	6,261	6,535	6,783	7,555	7,770	8,730
Mobile Homes	3,740	3,518	3,538	3,393	3,410	3,391

* Includes the near-term annexation of the Castlerock development.

Table 2b / Demographic Data / Water Distribution System

	2008	2020	2030
Median Age			
Santee	37.6	39.6	39.9
El Cajon	33.6	34.7	35.6
Lakeside-Blossom Valley	37.0	39.3	39.8
Crest-Dehesa	40.3	43.1	43.5
Alpine	41.5	45.4	46.1
Median Household Income			
Santee	$56,080	$63,967	$71,793
El Cajon	$38,512	$43,898	$49,357
Lakeside-Blossom Valley	$49,678	$56,404	$63,478
Crest-Dehesa	$72,067	$82,926	$94,438
Alpine	$68,647	$78,363	$88,532

Source of Population Data

In compliance with Water Code, Section 10608.20 (f), the source of the population, housing and demographic data shown in Tables 2a and 2b is the San Diego Association of Governments' (SANDAG) Series 12: 2050 Regional Growth Forecast. SANDAG developed the forecast in 2009 with data provided by each land use agency in San Diego County, and provided Padre Dam with data that is specific to the population and housing served by the district's water distribution system and does not include the population for which the district provides sewer service only. SANDAG applied these parameters to the historic population data provided to Padre Dam, as well, to calculate the district's base daily per capita water use in compliance with Senate Bill x7-7 and the California Department of Water Resources' Technical Methodology 2 for calculating a supplier's service area population.

Figure 4 / Western Service Area Water Distribution System

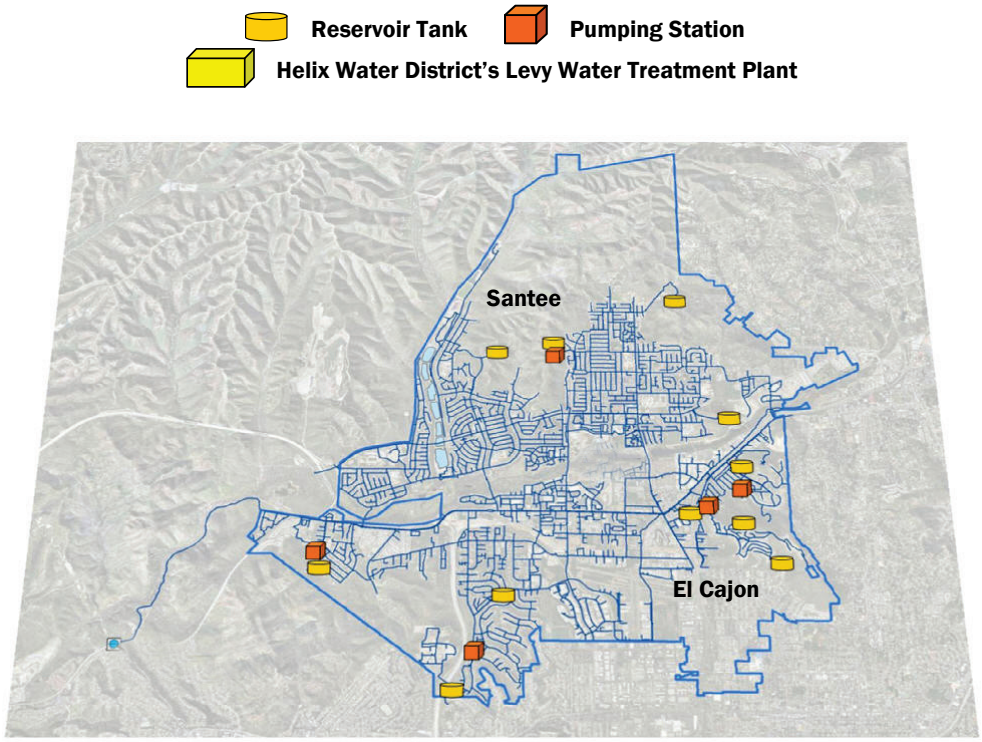
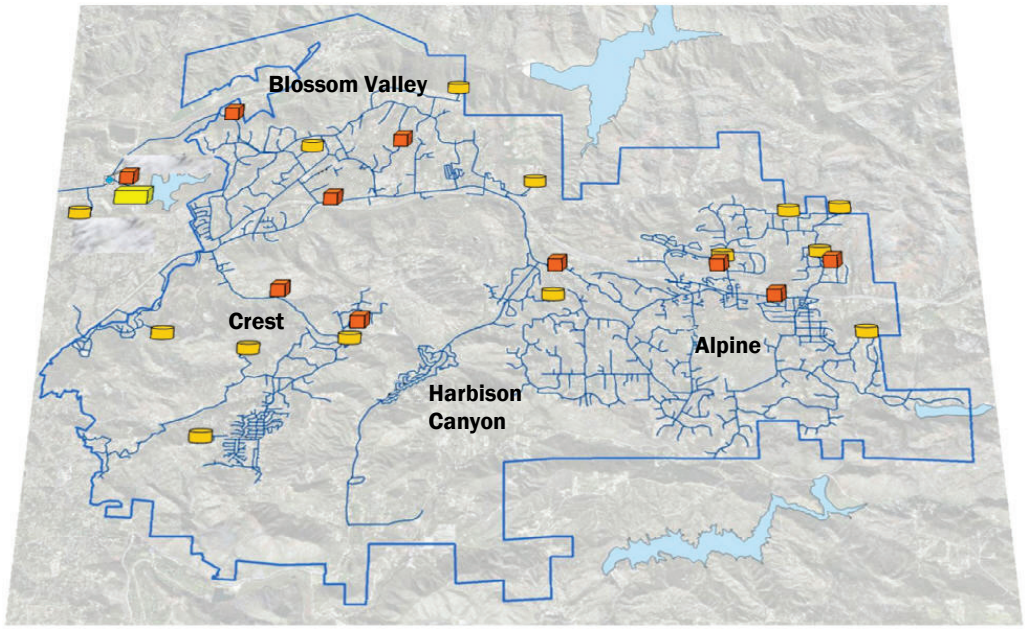


Figure 5 / Eastern Service Area Water Distribution System



2.3 Padre Dam's Water Systems

Water Distribution System

Approximately 24,000 active service connections
380 miles of pipeline
107 million gallon storage capacity
29 reservoir tanks
16 pump stations
16 pressure reducing stations
3 chloramination stations

Santee Lakes Recreation Preserve

Over 600,000 visitors annually
310 full hook-up campsites & 10 cabins
7 recycled water lakes on 190 acres
Fishing and boating
Day-use recreation facilities & special events
100% self-funded by user fees

Wastewater Collection and Treatment System

Approximately 15,200 active connections
167 miles of pipeline
4 lift stations
2 million gallons per day treatment plant
Advanced tertiary treatment level
Bardenpho treatment process

Recycled Water Distribution System

Approximately 217 active connections
33 miles of pipeline
1.5 million gallon storage capacity
1 reservoir tank
1 pump station

Systems Management

Padre Dam manages its $240 million infrastructure through long-term and short-term planning, standardization of materials, design and construction and consistent preventive and predictive maintenance.

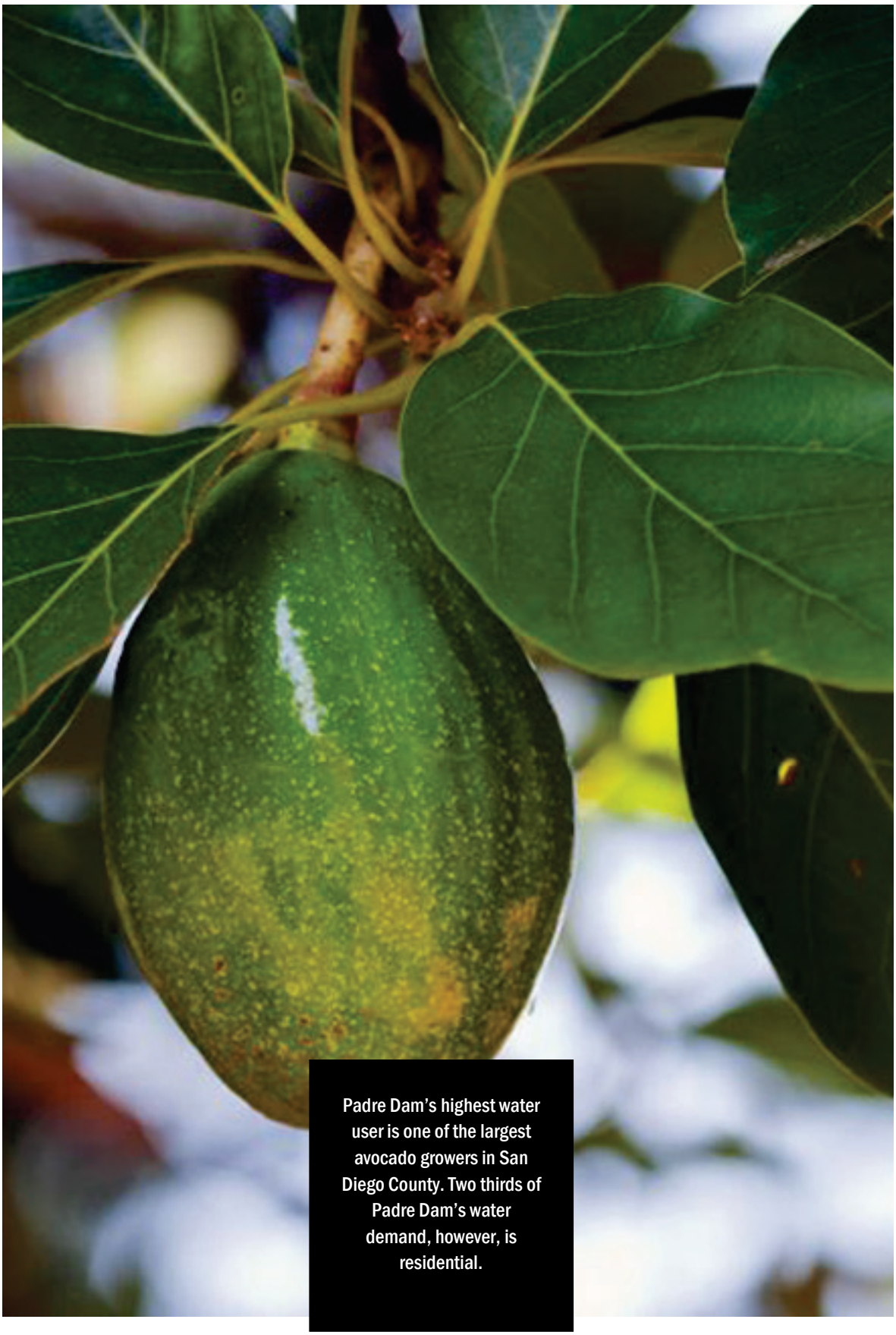
Key Planning Documents	Planning Horizon	Updated
Integrated Facilities Plan	30 years	Every 5 years
Urban Water Management Plan	20 years	Every 5 years
Strategic Plan	10 years	Every 5 years
Capital Improvement Plan	10 years	Every 2 years
Sewer System Management Plan	10 years	Every 5 years
Business Plan and Budget	2-5 years	Annually

Standardization

Padre Dam and four other agencies developed and published in 2002 a common set of standard specifications, standard drawings, and approved materials for construction of potable water, recycled water and sewer facilities. The program benefits the water suppliers and the contractors and suppliers they utilize.

Preventive and Predictive Maintenance

In 2007, Padre Dam's Operations and Water Quality Department implemented performance metrics and quarterly *actual vs. goal* reporting. This program minimizes system failures and service interruptions.



Padre Dam's highest water user is one of the largest avocado growers in San Diego County. Two thirds of Padre Dam's water demand, however, is residential.

Section 3 / System Demands

3.1 Baselines and Targets

In 2008, in response to worsening water supply conditions, Governor Schwarzeneggar ordered retail water suppliers statewide to reduce water use 20% by 2020. Senate Bill X7-7 (California Water Code, Section §10608 (e)), which was adopted by the legislature in November 2009, implemented the Governor's order and set up the regulatory framework suppliers will follow to achieve the targeted water savings by 2020.

In their 2010 UWMP,urban retail water suppliers must include their 2020 water use target, their 2015 interim water use target, and describe how the targets were calculated. This information is provided in Section 3.

Calculating Baselines and Targets

Senate Bill x7-7 mandates the following four step calculation to determine a water supplier's baseline water use and 2015 and 2020 target water use.

Step 1 / Determine Baseline Daily Per Capita Water Use

Padre Dam's 10-year baseline daily water use is 162.70 gallons per capita per day (GPCD). (See Table 4.)

A 10 year base period ending on June 30, 2008 was used for the following reasons:

The district's recycled water use in 2008 was less than 10% of total water use (eliminating the 15 year base period option);

The 10 year base period must end no earlier than December 31, 2004 and no later than December 31, 2010.

Gross annual water use was calculated as follows:

Annual water use was calculated based on a July 1 to June 30 fiscal year;

Padre Dam imports 100% of its potable water supply from the San Diego County Water Authority[a] and calculated gross water based on meter reads at our two wholesale connections;

Imported water passed through our system and wheeled to Lakeside Water District[b], and recycled water produced by Padre Dam, were both excluded from gross water use[c];

Agricultural water use was included in gross water use calculations because these customers may become municipal and industrial customers during the course of this plan;

Water in storage in the distribution system is included in gross water use calculations.

In compliance with Water Code, Section 10608.20 (f), the source of the population data used to calculate Padre Dam's baseline daily per capita water use is the San Diego Association of Governments' (SANDAG) Series 12: 2050 Regional Growth Forecast. SANDAG developed the forecast in 2009 with data provided by each land use agency in San Diego County, and provided Padre Dam with data that is specific to the population and housing served by the district's water distribution system, and does not include the population for which the district provides sewer service only. SANDAG applied these parameters to the historic population data provided to Padre Dam, as well, in order to calculate the district's service area population in compliance with the California Department of Water Resources' technical methodology 2.

[a] Padre Dam only imports treated potable water from the San Diego County Water Authority.
[b] Padre Dam was Lakeside Water District's wholesale water supplier through 2006, when the Lakeside Water District became a member agency of the San Diego County Water Authority.
[c] Padre Dam did not use Lakeside Water District water deliveries or population for any of our GPCD calculations.

Step 2 / Determine Urban Water Use Target

Padre Dam's 2020 water use target is 142 gallons per capita per day (GPCD).

Compliance Method 3 was used. The California Department of Water Resources' water use target for the South Coast hydrologic region is 149 gallons per capita per day (GPCD).

149 GPCD x 95% = 141.5 GPCD

Four Compliance Methods

METHOD 1 / reduce baseline daily per capita water use by 20% by 2020.

METHOD 2 / calculate a water use target based on 55 GPCD customer water use, measurement of all customer landscapes and implementation of irrigation water budgets, and a 10% reduction in commercial water use.

METHOD 3 / set water use target at 95% of the California Department of Water Resources water use target for the South Coast hydrologic region.

METHOD 4 / use method introduced by Department of Water Resources in late 2010.

Step 3 / Confirm Urban Water Use Target

Padre Dam's 2020 water use target meets the minimum water use reduction requirement.

The 142 GPCD water use target established in Step 1 is less than 152.86 GPCD, which is 95% of the baseline water use calculated using a 5 year baseline period.

- Senate Bill X7-7 mandates that a water supplier's 2020 water use target is less that 95% of the baseline water use calculated using a 5 year baseline period.
- Padre Dam selected a 5 year baseline period ending on June 30, 2008, which provided baseline water use of 160.91 GPCD; 95% of this baseline is 152.86 GPCD.

Step 4 / Determine Interim Water Use Target

Padre Dam's 2015 water use target is 152.35 GPCD.

The interim urban water use target is determined by adding the base daily per capita water use (162.70 GPCD) to the urban water use target (142 GPCD) and dividing by two.

Table 3 / Base Period Ranges

Base	Parameter	Value	Units
10-15 Year Base Period	2008 total water deliveries	5,262.82	Million Gallons
	2008 total volume of delivered recycled water	277.05	Million Gallons
	2008 recycled water as a percent of total deliveries	5.3	Percent
	Number of years in base period[1]	10	Years
	Year beginning base period range	1999	
	Year ending base period range[2]	2008	
5 Year Base Period	Number of years in base period	5	Years
	Year beginning base period range	2003	
	Year ending base period range[3]	2007	

Table 4 / Base Daily Per Capita Water Use / 10-15 Year Range

Sequence Year	Fiscal Year	Distribution System (MG)	Daily System Gross Water (MGD)	Annual Daily Per Capita (GPCD)
Year 1	1999	4901.52	13.43	158.15
Year 2	2000	5454.23	14.94	174.93
Year 3	2001	5019.16	13.75	159.97
Year 4	2002	5352.33	14.39	169.44
Year 5	2003	5083.27	13.93	159.95
Year 6	2004	5437.31	14.90	173.19
Year 7	2005	4953.25	13.57	156.93
Year 8	2006	5272.77	14.45	162.72
Year 9	2007	4826.24	13.31	150.78
Year 10	2008	5262.82	14.42	160.93
			Base Daily Per Capita Water Use	162.70

Table 5 / Base Daily Per Capita Water Use / 5 Year Range

Sequence Year	Calendar Year	Distribution System	Daily System Gross Water	Annual Daily Per Capita
Year 1	1999	4901.52	13.43	158.15
Year 2	2000	5454.23	14.94	174.93
Year 3	2001	5019.16	13.75	159.97
Year 4	2002	5352.33	14.39	169.44
Year 5	2003	5083.27	13.93	159.95
			Base Daily Per Capita Water Use	160.91

3.2 Water Demands

In 2007, District staff performed an internal update to the 2001 Integrated Facilities Plan. The 2007 IFP Update projected maximum demands at buildout - that is, all land in the District is completely developed in accordance with the general plan land use projections in force at the time. Demands were estimated using historical consumption patterns for each type of land use. Where available, correspondence with developers was used to adjust demands.

In the last three years District water sales have dropped 25 to 30 percent due to drought restrictions and the recession. For the purpose of the 2010 UWMP, it is assumed that typical consumption rates would be permanently reduced approximately 15 percent, even without mandatory 20 by 2020 limits. The SANDAG Series 12 population forecast indicates a roughly linear increase in population until 2035, with a much slower growth rate from 2035 to 2050. It is assumed that water demands will follow the same pattern.

Before 2015, the District will begin preparation of a new Integrated Facilities Plan which will incorporate recent changes in water use patterns. It is anticipated that the resulting demand projections will be available for the 2015 UWMP.

The following figures show historical potable water demand from 2001 through 2010 and four projection scenarios through 2035. Water use shown in Figures 6 and 7 includes system losses, but does not include water wheeled to Lakeside Water District or Riverview Water District, or demands met by existing recycled water supply.

Key for Figures 6 and 7

1. Historical demand from 2001 through 2010. Taken from customer billing records.
2. A) 2007 IFP Update. 2007 staff projections based on historical consumption patterns per acre by zoned land use type.
3. B) Fast economic recovery. Growth in demand begins immediately and increases approximately linearly to 2035.
4. C) Slow economic recovery. Projected demand in 2050 is the same as in the fast recovery scenario. From 2010 to 2015 population increases in accordance with the SANDAG Series 12 forecast, but the per capita consumption rate stays the same as the 2010 rate of 121 gpd (see Figure 6). From 2015, growth is approximately parallel to the fast economic recovery scenario.
5. D) 20 By 2020 Goals. SANDAG projected population times 20 By 2020 water use targets of 152 gpcd in 2015, and 142 gpcd in 2020 and thereafter.

The fast economic recovery scenario is the most conservative and is the basis for all demand projections in the 2010 UWMP.

Figure 6 / Demand Projections / Gallons Per Capita Per Day

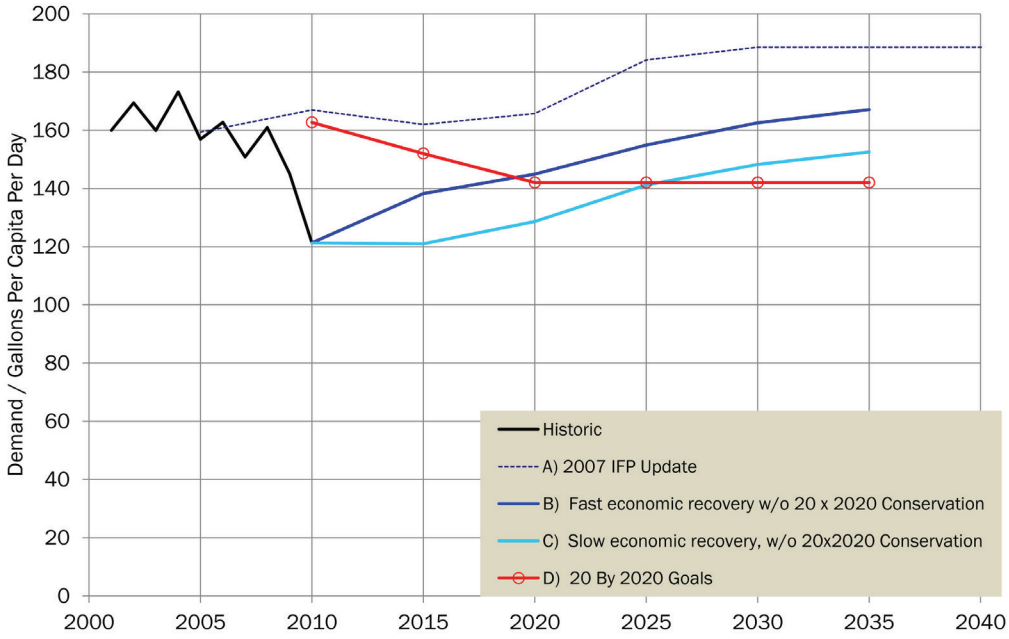


Figure 7 / Demand Projections / Acre Feet Per Year

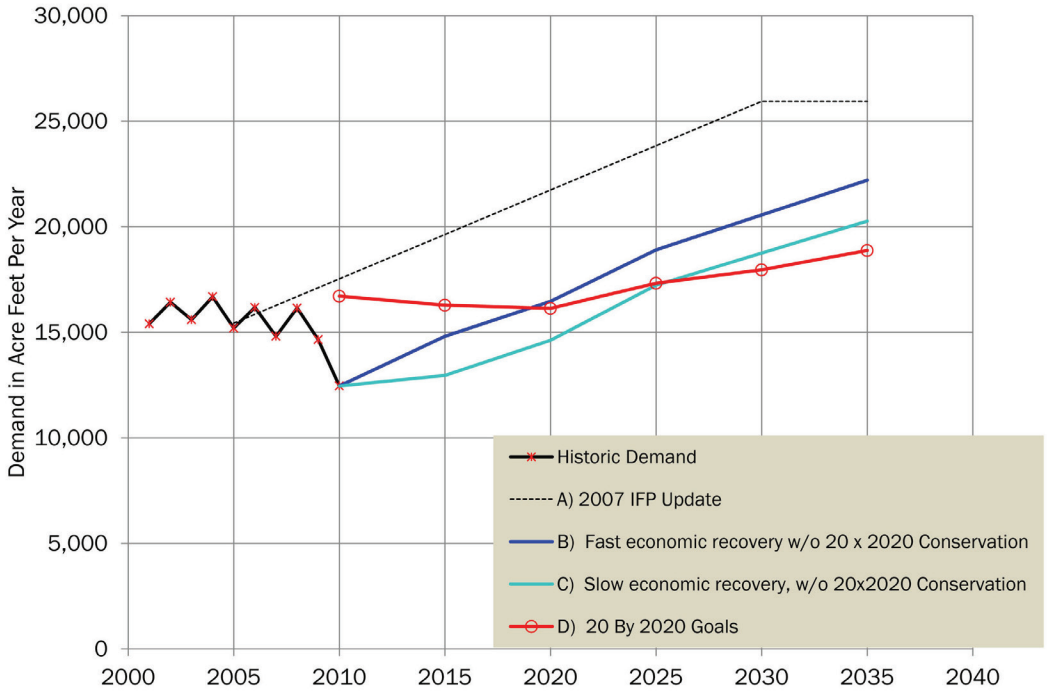


Table 6 / Water Demands

This table corresponds to Tables 3-7 in the California Department of Water Resources' *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan.* Tables 3-7 were consolidated because all Padre Dam water accounts are metered. The projected demand includes water use currently served by recycled water. The projected demand shown for 2015 through 2035 also includes the additional conservation required for Padre Dam to meet its 2020 water use target in compliance with Senate Bill X7-7 (See 3.1 Baselines and Targets).

Breakdown by water use sector was derived from the land use and consumption analysis performed during the 2007 IFP Update described in the previous sections. This estimate is independent of the SANDAG projections shown in Table 2a. This was done because the 2010 UWMP guidelines require more detailed information than what was provided by SANDAG.

1. Numbers shown for 2005 and 2010 are actual amounts taken from District customer service billing records.
2. In accordance with the *Guidebook,* projected volumes assume compliance with 20 By 2020 targets: 152 gpcd for 2015, 142 gpcd for 2020 and thereafter.
3. Volume includes demands currently served or projected to be served by the existing recycled water supply system.
4. Volume excludes system losses which have historically been approximately four percent of the supply.
5. The number of single family accounts was estimated from the number of parcels zoned for single family use times the average allowable housing density per acre. Information from correspondence with developers was also used where available.
6. The number of accounts for all other sectors was estimated from the number of parcels in that land use category. For the Multi-Family sector, note that one account typically serves multiple households.

(In Acre Feet)	Single family (a)	Multi family	Commercial	Industrial	Government	Landscape (Irrigation-Only)	Agriculture	Santee Lakes	Other (b)	Total
2005 Actual										
Accounts	19,043	1,610	917	(c)	119	432	12	1	17	22,151
Volume	9,680	1,454	979	(c)	451	1,327	954	1,120	24	15,989
2010 Actual										
Accounts	19,153	1,647	887	(a)	121	458	4	1	95	22,366
Volume	7,792	1,357	861	(a)	369	1,384	741	1,120	152	13,776
2015 Projected										
Accounts	25,893	1,905	708	490	139	513	0 (d)	1	121	29,770
Volume	8,926	1,199	799	799	533	2,644	0	1,120	133	16,153

(In Acre Feet)	Single family (a)	Multi family	Commercial	Industrial	Government	Landscape (Irrigation-Only)	Agriculture	Santee Lakes	Other (b)	Total
2020 Projected										
Accounts	26,693	1,970	733	506	144	520	0	1	125	30,692
Volume	9,555	1,283	856	856	570	2,826	0	1,120	143	17,209
2025 Projected										
Accounts	29,075	2,035	757	523	148	528	0	1	129	33,196
Volume	9,870	1,326	884	884	589	3,642	0	1,120	147	18,462
2030 Projected										
Accounts	30,145	2,100	781	540	153	535	0	1	133	34,338
Volume	10,353	1,391	927	927	618	3,693	0	1,120	155	19,184
2035 Projected										
Accounts	30,815	2,165	805	557	158	542	0	1	138	35,181
Volume	10,941	1,470	980	980	653	3,754	0	1,120	163	20,061

(a) Single family homes includes mobile home parks.
(b) Other water use includes fire service, construction and hotels.
(c) 2005 and 2010 data combines commercial and industrial water use.
(d) The San Diego County Water Authority, Padre Dam's wholesale water supplier, is expected to eliminate its agricultural water rate. When this occurs, agricultural water use will be included in municipal and industrial water use.

Table 6a / How 2015-2035 Water Demands Were Calculated

The demand projections for 2015 through 2035 shown in Table 6 include the additional water conservation required for Padre Dam to meet the 2020 water use target required by Senate Bill X7-7. Table 6a summarizes projected demands and the additional conservation required to meet 20 By 2020 goals. It is assumed that the 2020 water use target will continue into the years after 2020. The following table shows how demand was calculated.

	2015	2020	2025	2030	2035
Target Demand					
2020 Water Use Target in GPCD	152	142	142	142	142
Projected Population	95,629	101,427	108,918	112,908	118,654
Target Demand in Acre Feet	16,282	15,910	17,217	17,966	18,880
Projected Normal Year Demand (In Acre Feet)					
Projected Demand (without additional conservation)	16,827	18,481	20,918	22,572	24,225
Verifiable Recycled Water Supply	(2,016)	(2,016)	(2,016)	(2,016)	(2,016)
Adjusted Potable Demand	14,811	16,465	18,902	20,556	22,209
Required Conservation	None*	(555)	(1,685)	(2,590)	(3,329)

* Conservation not required because the projected demand is less than the 2015 Water Use Target.

Projected Water Demands / Lower Income Households

Cities Within Padre Dam's Service Area

In February 2010, the San Diego Association of Governments (SANDAG) approved a 2050 Regional Growth Forecast for use in transportation and sustainability planning and the development of the region's next Regional Housing Needs Assessment (RHNA). The RHNA, which has not yet been finalized or approved, will allocate the total number of housing units by income category – very low, low, moderate, and above moderate – that the 18 cities in the county, and the county itself, will need to plan for over an eight year cycle starting January 1, 2013 and ending December 31, 2020.

Santee

The various proposals under consideration allocate 18% to 40% of the city's total housing, or 659 to 1,450 units, to low income and very low income households.

Unincorporated Areas Within Padre Dam's Service Area

San Diego County's five year RHNA cycle ended in 2010 with 642 of the 4,357 low income and very low income housing units approved, under construction or completed. The county is currently developing a General Plan Update that will include a new RHNA. The county is currently assessing the following two communities for lower income housing:

Lakeside / Blossom Valley

County planners identify 99 high density housing units (24 or more dwelling units per acre) as potential housing units for very low income households.

Alpine

County planners identify 289 high density housing units (20 or more dwelling units per acre) as potential housing units for very low income households.

Water Demands of Lower Income Housing

The historic, average daily water use of apartments within Padre Dam's service area is 398 gallons per day, and the average daily water use of condominiums is 442 gallons per day. Based on these averages, up to 910 acre feet per year of water is needed for the up to 1,838 lower income housing units identified by SANDAG and San Diego County within Padre Dam's service area. This demand is included in the future water demand projections shown in Table 6 for 2015 through 2035.

Table 7 / Low Income Projected Water Demands

(In Acre Feet)	2015	2020	2025	2030	2035
City of Santee	Data not available from agency				
City of El Cajon	Data not available from agency				
San Diego County	Data not available from agency				

Other Water Demands

Table 8 / Sales to Other Water Agencies

(In Acre Feet)	2005	2010	2015	2020	2025	2030	2035
Lakeside Water District	3,062	2,173	0 (a)	0	0	0	0
Riverview Water District	945	1,159	0 (a)	0	0	0	0
Total	4,007	3,332	0	0	0	0	0

(a) Lakeside Water District and Riverview Water District completed construction of a direct connection to the San Diego County Water Authority's wholesale water distribution system in 2010, eliminating the need to wheel water from the Water Authority through Padre Dam's system.

Table 9 / Additional Water Uses and Losses

Table 9 shows all other water uses and losses not included in the previous tables. System losses have historically averaged about four percent.

(In Acre Feet)	2005	2010	2015	2020	2025	2030	2035
Saltwater Barrier	0	0	0	0	0	0	0
Groundwater Recharge	0	0	0	0	0	0	0
Conjunctive Use	0	0	0	0	0	0	0
Raw Water	0	0	0	0	0	0	0
Recycled Water*	0	0	0	0	0	0	0
System Loss	742	364	673	717	769	799	836
Total	742	364	673	717	769	799	836

* Recycled water included in Table 6.

Table 10 / Total Water Use

Table 10 shows the total quantity of water required to meet District demands assuming compliance with 20 By 2020 limits. These demands will have to be supplied by a combination of recycled water and imported potable water.

(In Acre Feet)	2005	2010	2015	2020	2025	2030	2035
Total Deliveries (ref. Table 6)	15,989	13,776	16,153	17,209	18,462	19,184	20,061
Sales to Other Agencies	4,007	3,332	0	0	0	0	0
Additional Uses & Losses (ref. Table 9)	742	364	673	717	769	799	836
Total	20,738	17,472	16,826	17,926	19,231	19,983	20,897

3.3 Water Demand Projections for Wholesale Supplier

Padre Dam imports 100 percent of its potable water supply from the San Diego County Water Authority, the wholesale supplier of imported water from the State Water Project and Colorado River for retail suppliers.

The San Diego County Water Authority states in its 2010 Urban Water Management Plan (Section 9-2) if Metropolitan Water District, San Diego County Water Authority and member agency supplies are developed as planned, along with achievement of the SBx7-7 retail conservation target, no shortages are anticipated within the Water Authority;s service area in a normal year through 2035.

Table 11 / Demand Projections Provided to Wholesale Supplier

(In Acre Feet)	2010	2015	2020	2025	2030	2035
San Diego County Water Authority	15,772	14,810	15,910	17,215	17,967	18,881

3.4 Water Use Reduction Plan

This section describes the policies, technologies, facilities, incentives, learning activities and public outreach that Padre Dam has implemented, or will implement within the five year horizon of this UWMP, to maximize its water resources and minimize the need to import water from other regions (Water Code, Section 10620 (f)). The demand management measures described in this section are incorporated into the BMPs outlined in Section 6 of this UWMP, as well.

Policies

Water Budget Based Rate Structure

In 2009, Padre Dam implemented water budgets, a water rate structure that encourages efficient water use. Each customer receives a daily water allocation, or water budget. Residential allocations are based on lot size, an indicator of landscape irrigation needs, purchased capacity, and the average historical water use of all customers with a similar lot size. Commercial, government and potable water irrigation allocations are based on purchased capacity only.

Customers are encouraged not to exceed their allocation by an inclining block rate structure. A customer's allocation is placed in tiers one and two of five rate tiers. Additional water is available for customer use at higher rates in tiers three, four and five.

Allocations change throughout the year based on the local evapotranspiration rate and historical water use, to provide customers with more water at lower rates during the warmer months of the year when landscape irrigation needs are higher. The District may reduce a customer's allocation when the District is in a drought level or when the District, San Diego County Water Authority or Metropolitan Water District of Southern California order water use reductions. Padre Dam also implemented a variance program that allows customers additional water for medical needs, to prevent loss of production or jobs, to comply with defensible space and erosion control ordinances, or other special circumstances.

Best Management Practices (BMPs)

Padre Dam has been a signatory to the California Urban Water Conservation Council (CUWCC) memorandum of understanding since 1997 and has implemented the BMPs and submitted progress reports to the CUWCC every two years since. Assembly Bill 1420, adopted in 2009, makes access to state funded grants and loans contingent on full compliance with the BMPs. In coordination with Assembly Bill 1420, the CUWCC has developed three compliance options: continued compliance with the 14 BMPs, the Flex-Track option and the gallons per capita per day option. Padre Dam selected the gallons per capita per day option. Padre Dam's reports for 2009 and 2010 can be found in Appendix 4.

Permanent Water Waste Prohibitions

In 2009, Padre Dam revised its drought response ordinance to place water waste prohibitions in effect at all times, independent of water supply conditions. Overwatering, water running off the property, use of a hose without a self-closing nozzle and other wasteful water uses are identified and enforceable.

Water Efficient Landscape Ordinances

Cities and counties throughout California were required by Assembly Bill 1881 to adopt the State Model Water Efficient Landscape Ordinance or a local or regional ordinance by January 1, 2010. Padre Dam participated in a working group with Helix Water District, San Diego County, the City of Santee, the City of La Mesa and the City of El Cajon to develop a draft ordinance for adoption at each of the land use agencies. Each of the involved land use agencies adopted an ordinance in compliance with Assembly Bill 1881.

Technologies

Automated Meter Reading Technology

Padre Dam launched an automated meter reading (AMR) system in 2010. The AMR system provides the District with customer water use data on a daily and hourly basis, with a 24 hour delay. Padre Dam makes the water use data available to customers online through a password protected site, allowing customers to monitor and manage their water use from the computer in their own home. A key feature of this technology is that it identifies continuous water flow, allowing customers to discover water leaks within a short timeframe, prevent water loss and avoid a high water bill.

Automated Leak Alerts

In 2011, Padre Dam will begin notifying customers of continuous water flow, and possible water leaks, by telephone, text message or email. Customers will subscribe to the service and automated notices will be delivered daily. Automated customer notices are expected to substantially reduce undiscovered leaks and large water losses.

Facilities

Water Efficient Demonstration Landscape

In 2010, Padre Dam completed the construction of a 15,000 square foot water efficient demonstration landscape at its customer service center building in Santee. The landscape features approximately 200 species of Mediterranean and California native grasses, plants and trees, and interpretive signage. Visitors are provided with a printed plant guide that identifies each plant in the landscape and provides its sun, space and irrigation needs. The guide is also provided on the district's website as a searchable, photographic database. Other garden programs include a garden club, plant trading and special events.

Residential Incentives

Residential High-Efficiency Clothes Washer Rebates

This program provides a financial incentive to encourage customers to choose a high-efficiency clothes washer (HEW) instead of a standard top-loading model. HEWs use 55% less water, 30% less energy, require 50% less drying time, clean better, and are gentler on clothes than standard clothes washers. Drying time can be cut in half. This program generates both water and energy savings. HEWs must be from the list of approved models and have a water efficiency factor of 4.0 or less. The Metropolitan Water District operates the program on behalf of the Water Authority and its member agencies and rebates start at $85. Metropolitan has not announced whether funding for this program will continue beyond fiscal year 2011-2012.

Rotating Nozzle Rebates

The SoCal WaterSmart Program offers a rebate starting at $3 per nozzle for residential properties. Metropolitan has not announced whether funding for this program will continue beyond fiscal year 2011-2012.

Residential Weather-Based Irrigation Controller

A weather-based irrigation controller can be an effective technology for reducing water usage outdoors. Unlike a standard automatic timer that turns on the sprinklers at set intervals, a "smart" controller uses weather data and site information such as plant type and sprinkler system output to adjust watering times and frequency. Incentives start at $80 per controller for sites less than an acre. For residential sites one acre or larger, incentives start at $25 per station. Rebate amount cannot exceed the purchase price of the controller. Metropolitan has not announced whether funding for this program will continue beyond fiscal year 2011-2012.

Commercial, Industrial and Institutional Incentives

Save-A-Buck

This program provides a rebate for the replacement of older, inefficient devices used by businesses. The installation of many of the products saves not only water, but also wastewater and energy. Qualifying devices include: high-efficiency toilets, ultra low and zero water urinals, irrigation controllers, rotating nozzles, food steamers, air-cooled ice machines, pressurized waterbrooms and HVAC equipment. Metropolitan has not announced whether funding for this program will continue beyond fiscal year 2011-2012.

Commercial WaterSmart Irrigation Checkups

The WaterSmart Irrigation Checkup is a free program that provides site-specific recommendations to help maximize irrigation efficiency. Metropolitan and the San Diego County Water Authority have not announced whether funding for this program will continue beyond fiscal year 2011-2012.

Residential Water Surveys

Residential Surveys are a free service designed to assist customers of participating agencies with the identification of indoor and outdoor water savings opportunities. Participants can expect to have technicians review indoor fixtures and evaluate the performance of the site's irrigation system. At the end, the participant will receive a list of recommendations and a proposed watering schedule.

Customer Classes

Water Efficient Landscaping Classes

Padre Dam offers a series of two classes for customers to learn about replacing their current landscape with more water efficient landscaping. In the first class customers learn the basics of landscape design, plant selection, and irrigation system design, fertilizing and watering. The second class offers the chance to see real landscape layouts and design concepts while getting questions answered on a customer's specific landscape.

Graywater and Rainwater Harvesting Classes

This class covers the basic information needed for customers interested in collecting rainwater and/or installing a graywater system in their home. New regulations have made this easier and with water rates continuing to rise these options provide customers one more way to help keep their water bill down.

Elementary School Classroom Program

Grease Can Program

We visit the classroom and teach students about what a watershed is, how saving water protects the watershed and how pouring grease down the drain can cause sewage spills and water pollution. Students make their own grease can to use at home.

Water is Life Poster Contest

Students are invited to put their creative caps on and participate in the Water is Life Poster Contest. To enter, students create a hand drawn poster depicting a water conservation message. We offer teachers a short lesson on water conservation and water supply prior to students entering the contest.

Water Recycling Facility Tours

Students take a tour of the Water Recycling Facility to learn about the process of turning sewage into clean, safe recycled water for recreation and irrigation. Water recycling is part of California's fifth grade science curriculum. Groups of all ages are welcome.

Splash Lab Mobile

Padre Dam sponsors visits from the Splash Lab to local schools. A completely self-contained mobile lab visits schools. Students conduct a scientific investigation about how water pollution affects the environment and wildlife. The Splash Science Mobile Lab is designed for students in grades 4th, 5th, and 6th and aligned with the California State Science Content standards and Environmental Education Principles and Concepts.

Public Outreach

Customer Communications

Padre Dam communicates with customers on a regular basis through a newsletter mailed with water bills, additional direct mail pieces, the district's website, events and the district's Customer Service staff.

Customer Workshops

Padre Dam utilizes workshops to introduce customers to water use policy or pricing changes. Workshops will be used to introduce customers to Senate Bill X7-7.

Media Communications

Padre Dam solicits media coverage of water use efficiency topics and activities by issuing press releases and working directly with media contacts.

In 2009, Padre Dam issued over $50 million in Certificates of Participation to fund construction of a second water distribution line to the eastern service area, the retrofit of five reservoirs tanks, and other infrastructure upgrades to improve water reliability.

Section 4 / System Supplies

4.1 Water Sources

Padre Dam imports 100% of its potable water supply through the San Diego County Water Authority and Metropolitan Water District of Southern California. The following graphic shows the vast system of water resources and infrastructure needed to meet the demand for water in Southern California, San Diego County and Padre Dam's service area.

Water Sources

1. Colorado River

The Colorado River flows from the Rocky Mountains in Colorado to the Gulf of California and is a major water resource for Wyoming, Colorado, Utah, Nevada, California, Arizona and New Mexico. The river's annual flow was allocated among the seven states in the 1922 Colorado River Compact. Ten consecutive years of drought in the Colorado River Basin, from 1999 to 2009, have reduced Lake Mead to 43% of its water storage capacity. In 2010, the Colorado River provided 61% of San Diego County's water supply. Additional discussion of Colorado River supplies is provided below.

2. State Water Project

The California State Water Project is a water storage and delivery system of reservoirs, aqueducts, power plants and pumping plants constructed in the 1960s. Its main purpose is to store water and distribute it to 29 urban and agricultural water suppliers in Northern California, the San Francisco Bay Area, the San Joaquin Valley, the Central Coast, and Southern California. Of the contracted water supply, 70 percent goes to urban users and 30 percent goes to agricultural users. Additional discussion of State Water Project supplies is provided below.

3. The Delta

The Delta, at the center of the State Water Project, is where the rivers that carry the spring snowmelt down the western slopes of the Sierra converge. Since 2008, water deliveries from the Delta to Southern California have been limited by federal pumping restrictions enacted to protect the endangered Chinook Salmon, Delta Smelt and Longfin Smelt. In 2010, the Delta only supplied 18% of San Diego County's water supply. Stakeholders are currently developing plans for new water conveyance systems that will protect and restore the Delta's ecosystem. Additional discussion of the Delta below.

4. Regional Water Resources

In 1995, the San Diego County Water Authority launched the 2020 Supply Diversification Plan, a long term strategy to reduce dependence on imported water supplies from Metropolitan Water District of Southern California by developing water transfer agreements with other suppliers, desalination, recycled water, groundwater, surface water storage and conservation. In 2010, regional water resources provided 21% of the county's water supply. Additional discussion of regional resources below.

Conveyance Facilities

5. Colorado River Aqueduct

California's legislature formed Metropolitan Water District of Southern California in 1928, primarily to construct and operate the Colorado River Aqueduct. The 242 mile long aqueduct, which was completed in 1935, conveys water from Lake Havasu on the Colorado River to Lake Matthews, near Temecula.

6. California Aqueduct

The 444 mile long California Aqueduct delivers water from the Delta to Southern California. The aqueduct is a State Water Project facility and was constructed in the 1960s.

The San Diego County Water Authority

The San Diego County Water Authority was formed by legislative action in 1944 to import Colorado River water into San Diego County, and today is the wholesale water supplier for the 26 retail water suppliers that serve the San Diego region, including Padre Dam.

Following the 1987-1992 drought and severe water shortages in Southern California, the San Diego County Water Authority developed a water resources plan focused on minimizing the use of imported water from Metropolitan Water District of Southern California, maximizing the development of regional and local water resources, and developing a diversified water supply to increase the reliability of the region's water supply (see Figure 8).

Figure 8 San Diego County Water Authority Regional Water Sources

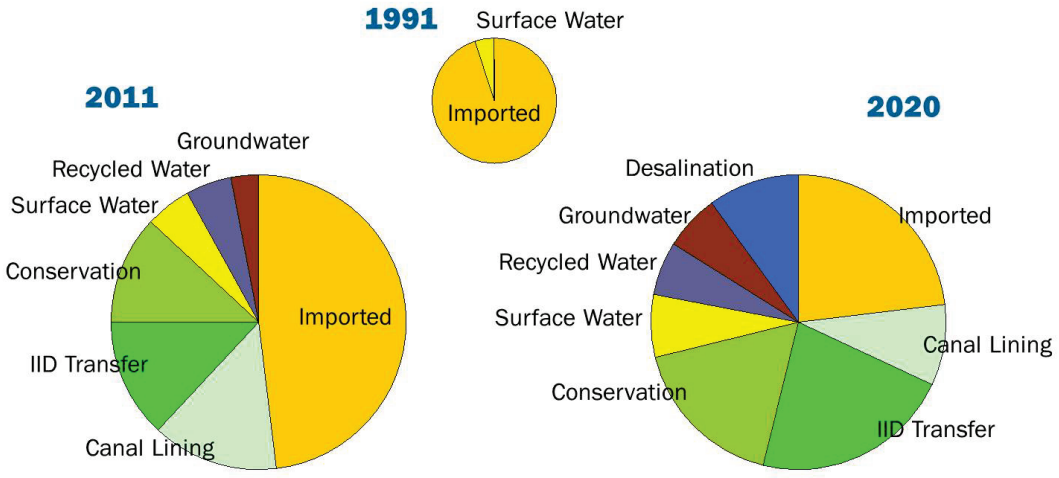


Table 12 / Padre Dam's Total Water Supplies

Padre Dam imports 100 percent of its potable water supply from the San Diego County Water Authority. Table 12 shows the volumes Padre Dam received in 2010 and has determined will be required to meet future normal water year demands, assuming Padre Dam's compliance with 2015 and 2020 water use targets mandated by Senate Bill x7-7.

(In Acre Feet)	2010	2015	2020	2025	2030	2035
San Diego County Water Authority (wholesaler)	15,772	14,810	15,910	17,215	17,967	18,881
Supplier Produced Groundwater		0	0	0	0	0
Supplier Produced Surface Water		0	0	0	0	0
Transfers In		0	0	0	0	0
Exchanges In		0	0	0	0	0
Water Recycling Facility	1,874	2,016	2,016	2,016	2,016	2,016
Desalinated Water	0	0	0	0	0	0
Total	17,646	16,826	17,926	19,231	19,983	20,897

Table 13 / Padre Dam's Wholesale Supplies

The Water Authority's UWMP states that if Metropolitan, the Water Authority and member agency supplies are developed as planned, along with achievement of the SBX7-7 retail conservation target, no shortages are anticipated within the Water Authority's service area in a normal year through 2035. Therefore, Table 13 shows the amount of water available from the Water Authority equals the amount required shown in Table 12.

(In Acre Feet)	2015	2020	2025	2030	2035
San Diego County Water Authority	14,810	15,910	17,215	17,967	18,881
Total	14,810	15,910	17,215	17,967	18,881

4.2 Groundwater

Groundwater supplies are not available or utilized by Padre Dam or the San Diego County Water Authority. Padre Dam is planning two groundwater recharge projects, using recycled water, in partnership with Helix Water District and the United States Bureau of Reclamation (See Section 4.5 Recycled Water Opportunities).

Table 14 / Groundwater / Volume Pumped by Padre Dam

(In Acre Feet)	2006	2007	2008	2009	2010
Total Groundwater Pumped	0	0	0	0	0
Groundwater as % of Total Supply	0	0	0	0	0

Table 15 / Groundwater / Projected Volume Pumped by Padre Dam

(In Acre Feet)	2015	2020	2025	2030	2035
Total Groundwater Pumped	0	0	0	0	0
Groundwater as % of Total Supply	0	0	0	0	0

4.3 Transfer Opportunities

Padre Dam relies on the San Diego County Water Authority to acquire water transfer agreements as needed for water supply reliability during normal and dry year conditions. A key component of the Water Authority's water supply diversification plan (see Figure 8) is a 1998 agreement between the Water Authority and Imperial Irrigation District for the long term transfer of Colorado River water voluntarily conserved by Imperial Valley farmers to the San Diego region. In 2010, the Water Authority received 70,000 acre feet of water through the agreement, and the annual transfer will increase to 200,000 acre feet by 2021 (see Section 4.2 of the Water Authority's 2010 UWMP). The Water Authority also utilized short term transfer agreements in 2009 to offset water shortages caused by drought conditions, and considers short term transfers an important strategy to manage future dry-year scenarios (see Section 11.2.3.2 of the Water Authority's 2010 UWMP).

Table 16 / Transfer and Exchange Opportunities for Padre Dam

Transfer Agency	Transferor Exchange	Short Term or Long Term	Proposed Volume
None	0	n/a	n/a

4.4 Desalinated Water Opportunities

While two retail water suppliers – Sweetwater Authority and the City of Oceanside—are developing groundwater and brackish groundwater desalination projects, the San Diego County Water Authority's water supply diversification plan focuses on ocean water desalination to provide 10% of the region's water supply by 2030 (see Figure 8). Three projects are in development, each of which will reduce the region's dependence on imported water, insulate the region from the effects of dry year conditions, and contribute to Padre Dam's water supply:

Carlsbad Seawater Desalination Project

This fully-permitted project is expected to go online in 2016 and produce 56,000 acre feet of water per year, which is six to eight percent of projected regional demand. The Water Authority expects to complete a purchase agreement for the water and the treatment plant with the project developer, Poseidon Resources, in 2011. Water from the plant will be conveyed to the Water Authority's Twin Oaks Valley Water Treatment Plant facility, blended with treated imported water and distributed through the Water Authority's aqueducts to member retail suppliers, including Padre Dam. The Water Authority will finance the purchase agreement through its wholesale rates and charges. The Water Authority currently categorizes the Carlsbad project as verifiable water supply and includes this water in projected water supplies for normal, single dry and multiple-dry year scenarios beginning in 2020 (see Section 4.5 of the Water Authority's 2010 UWMP).

Camp Pendleton Seawater Desalination Project

The Water Authority and Marine Corps Base Camp Pendleton completed a feasibility study in 2009 for a 50 to 150 million gallons per day desalination plant located on the base. The Water Authority categorizes the project as an additional planned project expected to go online after 2020. (See Section 4.6 of the Water Authority's 2010 UWMP).

Rosarito Beach Seawater Desalination Project

The Water Authority is participating with Mexico, the Central Arizona Water Conservation District, the Southern Nevada Water Authority and Metropolitan Water District of Southern California in studies to reduce demand for Colorado River water, and the studies include development of a 25 to 50 million gallons per day seawater desalination plant located at Rosarito Beach, Mexico. This is considered a conceptual-level project. If built, the plant would provide water for both U.S. and Mexican water users. (See Section 4.6 of the Water Authority's 2010 UWMP).

4.5 Recycled Water Opportunities

In 1959, Padre Dam opted to develop a local wastewater treatment and water recycling facility in lieu of joining the regional METRO wastewater collection and treatment system being developed at the time by the City of San Diego. The district developed Santee Lakes Recreation Preserve, seven recycled water lakes and a 190 acre regional park and campground in the 1960s, and expanded its water recycling facility to 2 million gallons per day in 1997. The facility treats wastewater to the tertiary level for use at Santee Lakes and throughout the community.

Table 17 / Recycled Water / Wastewater Collection and Treatment

(In Acre Feet)	2005	2010	2015	2020
Wastewater Collected and Treated in Service Area	6,107	5,264	6,076	6,571
Wastewater Collected & Treated by Outside Service				2,141
Volume Meeting Recycled Water Standard				
Existing / Verifiable	1,874	1,874	2,016	2,016
Planned			2,801	2,801
Conceptual				3,024
Total	1,874	1,874	4,817	7,841

(In Acre Feet)	2025	2030	2035
Wastewater Collected and Treated in Service Area	6,801	7,032	7,083
Wastewater Collected & Treated by Outside Service	4,978	4,747	4,696
Volume Meeting Recycled Water Standard			
Existing / Verifiable	2,016	2,016	2,016
Planned	2,801	2,801	2,801
Conceptual	5,784	5,784	5,784
Total	10,601	10,601	10,601

Table 18 / Recycled Water / Non-Recycled Wastewater Disposal

(In Acre Feet)	2010	2015	2020	2025	2030	2035
Disposed of in Sycamore Creek and San Diego River. Included in the 1,120 acre feet used to flush Santee Lakes.	672	672	672	672	672	672
Total	672	672	672	672	672	672

Potential Future Use of Recycled Water

Padre Dam is currently studying the feasibility of expanding its water recycling facility, and introducing advanced treatment systems, in order to provide a recycled water supply for additional local users, local and regional groundwater recharge projects, and an indirect potable reuse project. Outreach to potential future customers is planned but not yet implemented and demand estimates are based on landscaped acreage and typical water consumption rates. Padre Dam categorizes potential future customers by the feasibility, likelihood and cost of constructing recycled water distribution facilties to reach them.

Projects in the Capital Improvement Projects (CIP) Budget

Projects to serve the following categories of customers are planned in the next five years and are budgeted in the District's Capital Improvement Program:

Future Customers Near Existing Water Lines

These developments are currently planned or recently connected to the system and are located adjacent to existing recycled waterlines. Use of recycled water can be accomplished at little or no cost to Padre Dam.

Existing Customers with Potable Irrigation, Located Near Existing Recycled Water Lines

These users have separate meters for their domestic (in-house) use and their outside irrigation use. They are currently using potable water for both their domestic and outdoor irrigation uses. The demand for this category of user is well documented and is based on existing meter records. There will be some cost of retrofitting the existing irrigation system from using potable water to recycled water.

Future Customers Serviced with $1.3 Million of New Recycled Waterlines

Customers in this category are not adjacent to existing recycled lines but can be reached for fewer construction dollars per unit of demand than other customers and therefore represent a quicker return on the investment.

Carlton Oaks Country Club

The golf course currently irrigates with groundwater using on-site wells. During peak summer demands, low groundwater levels are causing production rate problems for the golf course. The golf course is interested in using recycled water during the winter months to keep their groundwater in reserve for use during the peak summer months. However, the golf course is only interested in using recycled water if the District adopts a seasonal discount for recycled water. For planning purposes, it is assumed that the golf course would use one half of their typical water use during the winter months.

Projects in the CIP Budget Not Planned in the Next Five Years

Feasibility studies and planning for these projects is in the CIP Budget, but construction is not expected within the next five years:

El Monte Valley Project

Padre Dam's WRF will supply the Helix Water District with highly purified, near-distilled quality recycled water. The water will be pumped into recharge basins in the El Monte Valley where it will filter naturally through sand and gravel into the groundwater basin. After at least six months in the groundwater basin, the water will be pumped from wells and sent to the RM Levy Water Treatment Plant in Lakeside, where it will be treated again with ozone, and will then become drinking water.

Santee Aquifer Project

Padre Dam's WRF will supply highly purified, near-distilled quality recycled water that will be injected into the Santee Aquifer, a groundwater basin within the City of Santee and Padre Dam's service area. After at least six months in the groundwater basin, the water will be pumped from wells, treated and blended with potable water in the water distribution system. The Bureau of Reclamation is assisting Padre Dam in the development of this project.

Projects Not Included in the CIP Budget

The following potential customers have been identified, but projects to serve the them are not included in the CIP Budget.

Customers with Extensive Facilities Needs or Timing Issues

The two largest users in this category are the Castlerock and Fanita Ranch developments and have had a history of delays and setbacks.

Willowbrook Golf Course

Willowbrook Golf Course is an existing nine hole course located in the easterly portion of Padre Dam's Western Service area. The current source of water used for golf course irrigation is either well water similar to Carlton Oaks Golf Course or potable water from Lakeside Water District The golf course does lie within Padre Dam's Western Service area for sewer service and therefore could potentially be served using recycled water produced by Padre Dam.

Constraints and Limitations

Funding

Funding for the expansion of Padre Dam's water recycling facility may be delayed because of the steep decline in revenues and capital fund balances in the past two years.

Financial and cost-benefit analyses are in progress. The financial benefits of water recycling could be very high (avoidance of treatment costs at the City of San Diego's Point Loma Wastewater Treatment Plant, reduction in imported water costs, and revenue from recycled water sales).

The WRF Expansion and construction of new pipelines depend on construction financing from the State Revolving Fund (SRF). However, Padre Dam would pay a large share of study and design costs and would be responsible for repayment of SRF loan. The ability to borrow from the SRF will depend on compliance with SRF requirements, as well as requirements of 2009 bond issuance which prescribes minimum fund balances, and minimum revenue and debt ratios.

Feasibility studies and design would be paid for primarily by District funds, though Title 16 and ARRA grants may be available for partial funding of projects. Typically the District must first spend at least a matching amount to be eligible for grants. In addition, there may be a delay of several years before grant monies are received.

Storage

Storage facilities would be required to serve all identified demands.

Capacity

Potential average annual demands are greater than projected WRF production.

Seasonal Demand

Recycled water demands vary considerably during the year. Should peak summer demands exceed the water recycling facility's production capacity, the shortage of water must come from any combination of seasonal storage, groundwater supplementation and potable water.

Planning Level Project Cost and Funding Sources

Project	Cost Estimate	Anticipated Funding Source
WRF Phase 1 Expansion to 4.4 MGD	$48M	Potential Title 16 and ARRA grants. State Revolving Fund Loan for construction.
RF Phase 2 Expansion 4.4 MGD to 10 MGD	$130M	Potential Title 16 and ARRA grants. State Revolving Fund Loan for construction
Distribution System	$2.1M	Potential Title 16 and ARRA grants. State Revolving Fund Loan for construction.
Santee Basin Aquifer	Not available	Conceptual study in progress
El Monte / Pipeline (to Helix)	$75M	Helix Water District

Project costs and potential funding sources are described in *Engineering Report, Padre Dam Water Recycling Facility Expansion to 4.4 mgd, May 17, 201,* which is provided in the Appendix 6 to this document.

Estimated Timeline / Padre Dam's Recycled Water Projects

Initial Studies and Aquifer Testing	
Santee Basin Aquifer	2011 to 2014
Environmental Review and Permits	
WRF Expansion / AWT	2010 to 2011 (MND)
El Monte/ Pipeline (to Helix)	2010 to 2012 (EIR)
Santee Basin Aquifer	2015 to 2016 (MND or EIR)
Design	
WRF Expansion / AWT	2013
El Monte /Pipeline	2012 to 2013
Santee Basin Aquifer	2016 to 2017
Construction	
WRF Expansion / AWT	2014 to 2015
El Monte / Pipeline	2013 to 2014
Santee Basin Aquifer	2018 to 2020

Table 19 / Recycled Water / Potential Future Use

Table 19 shows preliminary estimates of potential future recycled use. Quantities and timing will be adjusted after outreach to potential customers is completed.

	Feasibility	2015	2020	2025	2030	2035
Landscape Irrigation						
Parks, Medians and HOA Landscapes	Existing Use	896	896	896	896	896
Parks, Medians And HOA Landscapes	Planned and budgeted in CIP	401	401	401	401	401
Parks, Medians And HOA Landscapes	Extensive facilities and timing issues	799	799	1,582	1,582	1,582
Parks, Medians And HOA Landscapes	Extensive facilities, annexation required	83	83	83	83	83
Golf Course Irrigation						
Carlton Oaks Golf Course	Planned and budgeted in CIP	414	414	414	414	414
Willowbrook Golf Course	Extensive facilities and timing issues			560	560	560
Recreation						
Santee Lakes	Existing Use	1,120	1,120	1,120	1,120	1,120
Indirect Potable Reuse						
El Monte Valley Recharge (Helix Water District)	Preparing CEQA	1,120	2,240	5,000	5,000	5,000
Santee Aquifer Recharge	Feasibility studies underway	0	900	1,792	1,792	1,792
Total		4,833	6,853	11,848	11,848	11,848
Total Within Service Area		3,713	4,613	6,848	6,848	6,848

Table 20 / Recycled Water / 2005 Projected Use vs. 2010 Actual Use

	2010 Actual Use	2005 Projected Use
Agricultural Irrigation		
Landscape Irrigation	739	1,000
Commercial Irrigation		
Golf Course Irrigation		
Wildlife Habitat		
Wetlands		
Industrial Reuse		
Groundwater Recharge		
Seawater Barrier		
Getothermal/Energy		
Indirect Potable Reuse		
Construction	15	
Santee Lakes	1,120	600
Total	1,874	1,600

Table 21 / Recycled Water / Methods to Encourage Use

Assuming construction of the WRF distribution system expansion, the following measures would be used to encourage recycled water use.

		Projected Results				
	2010	2015	2020	2025	2030	2035
Implemented (a)						
Set rate at 90% of potable water rate						
Eliminated capacity fee	754	1,283	2,183	4,418	4,418	4,418
Mandated for irrigation when available						
Planned						
Seasonal rates (b)		414	414	414	414	414
Total		414	414	414	414	414

(a) Projected results in the implemented section include combined projections for all implemented methods.
(a) Seasonal rates are lower rates to encourage winter off-peak use of recycled water.

4.6 Future Water Projects

Table 22 / Future Water Supply Projects

(In Acre Feet)	Projected start	Projected completion	Potential project constraints	Normal-year supply	Single-dry year supply	Multiple-dry year first year supply	Multiple-dry year second year supply	Multiple-dry year third year supply
East County Regional Treated Water Improvement Program*	2010	2016	Construction halted by litigation	6,723	6,723	6,723	6,723	6,723
Water Recycling Facility Expansion Project	2016	2018	Interagency coordination; funding	2,016	2,016	2,016	2,016	2,016
Santee Aquifer Groundwater Recharge Project	n/a	n/a	Feasibility study in progress	1,681	1,681	1,681	1,681	1,681
Total		n/a		10,420	10,420	10,420	10,420	10,420

* Supply shown is maximum capacity. Actual supply depends on availability from the County Water Authority.

Lake Oroville, a part of the State Water Project, stores water from the Sierra snowpack for Southern California water users. This photo, taken in 2009, shows the impact of California's most recent drought, which began in 2007 and ended in 2011.

Section 5 / Water Supply Reliability and Water Shortage Contingency Planning

5.1 Water Supply Reliability

The Urban Water Management Planning Act requires suppliers to assess the reliability of their water resources over the 20 year planning horizon of the document, compare supply and demand projections during normal water years, single dry years and multiple dry years, and describe their drought contingency plan (see Water Code, Sections 10631 (c) and 10635). Because Padre Dam imports 100% of its drinking water supply from the San Diego Water Authority, this section will refer extensively to the reliability of their water resources and those of their suppliers, Metropolitan Water District of Southern California and the California Department of Water Resources.

Water Supply Reliability

Padre Dam's drinking water (see Section 4.1, Table 12), which is imported from the San Diego County Water Authority, is vulnerable to issues that can affect the availability and reliability of service to the district's customers. These issues, described below, are fully documented by the San Diego County Water Authority (SDCWA), Metropolitan Water District of Southern California (MWD) and the California Department of Water Resources (DWR), and in studies of California's water resources conducted by government agencies, universities and non-profit organizations. The documents referenced in the following tables are available in the appendix to Padre Dam's 2010 UWMP.

San Diego County Water Authority / State Water Project / Delta

Issue	Supplier Response	Documentation
Limited water conveyance in compliance with biological opinions issued by U.S. Fish and Wildlife Service in 2008 and the National Marine Fisheries Service in 2009 and the California Department of Fish and Game to protect the endangered Delta Smelt, Longfin Smelt and Chinook Salmon.	MWD developing voluntary storage and transfer programs with other State Water Project contractors in the Central Valley to develop additional dry year water supply.	MWD, *2010 UWMP*, page 2-16
	MWD's Two Gate System demonstration to protect Delta fish species.	MWD, *2010 UWMP*, page 2-15
	Legislature and governor approved 2009 Comprehensive Water Package, which mandated 20% statewide conservation by 2020, formed the Bay Delta Conservation Plan to restore the Delta, and provided additional fixes to California's water issues.	DWR, *State Water Project Delivery Reliability Report 2009*, page 25
	Bay Delta Conservation Plan includes construction of a conveyance tunnel under the Delta or a conveyance canal around the Delta.	*Bay Delta Conservation Plan Steering Committee Working Draft*, 2010, page 4-15
Failure of Delta levees caused by earthquake(s) or flood(s).	DWR developing two-phase *Delta Risk Management Strategy*.	DWR, *State Water Project Delivery Reliability Report 2009*, page 32
A reduction in the Sierra snowpack of up to 70% by 2070 caused by climate change.	SDCWA and its member retail suppliers implementing Water Supply Diversification Plan since 1994.	California Climate Change Center, *Our Changing Climate*, July 2006, page 9 SDCWA, *2010 UWMP*, page 9-7
Rising sea levels and saltwater intrusion in the Delta caused by climate change.	SDCWA member retail suppliers developing recycled water, groundwater and desalination projects.	DWR, *State Water Project Delivery Reliability Report 2009*, page 19 SDCWA, *2010 UWMP*, page 9-7

San Diego County Water Authority / Colorado River

Issue	Supplier Response	Documentation
U.S. Department of Interior mandate in 2001 that California reduce its use of Colorado River water.	SDCWA secured rights to 77,000 AFY of Colorado River water through the 2003 Quantification Settlement Agreement for lining the All American and Coachella Canals to prevent water loss.	SDCWA, *2010 UWMP*, page 4-1
Climate change -- tree ring studies show evidence of droughts lasting up to 100 years in Colorado River Basin in the 1500s.	SDCWA and its member retail suppliers implementing Water Supply Diversification Plan since 1994.	SDCWA, *2010 UWMP*, page 9-7
Projected decline in annual flow levels and increased frequency and duration of drought conditions.	SDCWA and its member retail suppliers implementing Water Supply Diversification Plan since 1994.	U.S. Bureau of Reclamation, *Colorado River Basin Water Supply and Demand Study*, 2011, page ES-5
Superior Court judge invalidated 13 agreements related to the Quantification Settlement Agreement (QSA). SDCWA has with CVWD, IID and Metropolitan WD. SDCWA and other parties involved in the QSA have appealed the judge's decision. Appellate decision is expected in 2011 or 2012.	Defend the QSA against existing and potential litigation to ensure continued delivery of conserved supplies from canal lining projects and Imperial Irrigation District water transfer.	SDCWA, *2010 UWMP*, page 10-10 and 10-13

Transfers

Issue	Supplier Response	Documentation
Multiple year drought conditions in the Colorado River Basin or State Water Project.	SDCWA Board approved a Dry Year Transfer Program in 2007, acquired 20,000 AF of water in 2009 through a one year transfer agreement with Placer County Water Agency, and additional water in 2010 through transfer agreement with the South Feather Water and Power Agency.	SDCWA, *2010 UWMP*, page 11-9
	SDCWA acquired out-of-region groundwater storage agreements in 2008 for 70,000 AF in Kern County and for 23,077 AF with the Butte Water District and Sutter Extension Water District.	SDCWA, *2010 UWMP*, page 11-8
The ability to secure agriculture to urban water transfer agreements is more difficult when global commodity and food prices are high.	As shown in the two preceding examples, SDCWA develops relationships and secures agreements before water supply conditions are severe.	SDCWA, *2010 UWMP*, pages 11-9 – 11-10

Recycled Water

Issue	Supplier Response	Documentation
Limited customer base.	Padre Dam eliminated the recycled water capacity fee charged to customers upon connection to the district's recycled water distribution system in 2009, and maintains the recycled water commodity rate at 90% of the potable water rate.	Padre Dam, *2010 UWMP*, page 42, Table 21
High cost of expanding distribution system.	City of San Diego and member agencies of the city's METRO wastewater collection and treatment system, including Padre Dam, are studying indirect potable reuse as a means to reduce the cost of mandated upgrades to the City of San Diego's Pt. Loma Treatment Plant, and to provide a new, drought-proof water supply.	Padre Dam, *2010 UWMP*, page 44
High cost of developing the advanced water treatment facility needed for indirect potable reuse.	Padre Dam is studying project-related partnerships as a means to expand the funding available for plant construction.	Padre Dam, *2010 UWMP*, page 44
Traditional, single-agency approach among water suppliers to capital projects.		

Ocean Water Desalination

Issue	Supplier Response	Documentation
Environmental lawsuits.	SDCWA supports and lobbies for legislation supporting the development of seawater desalination as a critical new water supply.	SDCWA, *2011 Legislative Policy Guidelines*, page 6
Limited number of existing power plants with seawater intake facilities.	SDCWA supports and lobbies for legislation that protects existing coastal facilities with intake and discharge infrastructure that could be used for desalination.	SDCWA, *2011 Legislative Policy Guidelines*, page 6
High cost of developing an advanced water treatment facility.	SDCWA pursuing purchase agreement with Poseidon Resources for water produced at Carlsbad Desalination Project, and considering multi-agency and multi-national partnerships to develop the MCB Camp Pendleton Seawater Desalination Project and Rosarito Beach Binational Desalination Plant.	SDCWA, *2010 UWMP*, pages 4-5 – 4-9
Traditional, single-agency approach among water suppliers to capital projects.		

5.2 Water Quality

Padre Dam imports 100 percent of its potable water supply from the San Diego County Water Authority. Water imported from the Delta and the Colorado River by Metropolitan Water District of Southern California is treated at Metropolitan's Skinner Treatment Plant, near Temecula, California, and released into the Water Authority's system. Colorado River water independently imported by the San Diego County Water Authority, and water from regional resources, is treated at Water Authority facilities or treated locally at Helix Water District's Levy Treatment Plant. Metropolitan, the Water Authority, Helix and Padre Dam coordinate annually to assess water quality levels and produce the Consumer Confidence Report that is mandated by the state and distributed to Padre Dam customers.

Table 23/ Water Quality / Current and Projected Impacts

Water quality issues affecting Padre Dam's imported water supply are described in detail in Metropolitan Water District of Southern California's 2010 UWMP Section 4 and the San Diego County Water Authority's 2010 UWMP Section 7. Table 23 provides a summary of the information in these documents. Both documents are included in the appendix to Padre Dam's 2010 UWMP.

Water Source / Condition	Impact
Colorado River	
Salinity (TDS). High levels occur naturally. Agricultural development elevates levels further.	Damages distribution system and home appliances. Excessive levels in recycled water damage many crops and plants. Controlled by blending with lower-salinity Delta water.
Perchlorate. Found in solid rocket propellant, some types of munitions, and fireworks.	Has been detected at low levels. Affects human thyroid. Levels reduced by aggressive cleanup efforts. Monitored and reported through Metropolitan's Perchlorate Action Plan.
Uranium. A 16-million ton pile of uranium mill tailings lies 750 ft from the river in Moab, Utah and thousands of additional mining claims have been filed since 2008.	Contaminated groundwater is slowly seeping into the river. Risk of catastrophic contamination due to flood or other natural disaster. Current levels are below MCL and can be treated by regional water treatment plants. US DOE cleanup program at mining sites to be complete between 2019 and 2025. Proposed legislation to protect sections from additional mining.
Nutrients.	Historically low levels, but with population growth still a concern. Control through wastewater management.
Arsenic. Occurs naturally. Historically levels have been below the MCL.	Monitored by drinking water agencies. Can be reduced through water treatment processes.
Delta	
Total Organic Carbon and Bromide. Naturally occurring, but elevated due to agricultural drainage and seawater intrusion.	Form disinfection byproducts (DBPs) associated with adverse health effects. CALFED Bay-Delta Program calls for wide range of actions to improve Bay-Delta water quality. Water agencies instituting new Disinfection Byproducts Rule Stage 1 and 2.
Nutrients. Higher levels than the Colorado River.	Causes nuisance algal growth which affect taste and odor, and increase treatment costs.
Salinity (TDS). Significantly lower average levels than the Colorado River, but can vary widely within short periods of time.	Short-term increases in TDS reduces ability to blend with Colorado River water, making it difficult to simultaneously meet salinity objective and water supply reliability objective.
Arsenic. Occurs naturally. Historically levels have been below the MCL. Groundwater storage programs may increase risk of arsenic contamination.	Pilot arsenic treatment facility is being tested by one of the groundwater partners.

* California Maximum Contaminant Level

5.3 Drought Planning

This section describes the reliability of the San Diego County Water Authority's water supply, and Padre Dam's water supply, during an average water year, a single dry year and multiple dry water years (Water Code, Section 10631 (c)(1)).

Determining Water Usage Reductions

Padre Dam installed a district-wide automated meter reading system during FY 2009-2010. This system provides Padre Dam the ability to monitor customer use on an hourly basis if needed. Padre Dam can also run an exceptions report on high water use to use as a tool to detect customer water leaks. During a water supply shortage, such as a drought or emergency shortage, Padre Dam would monitor usage and increase public outreach as needed. Short-term changes in pumping, flow rates, or reservoir levels are shown through Padre Dam's SCADA system and the system is monitored 24-hours a day.

San Diego County Water Authority / Supply and Demand Comparisons

Tables 24a through 24g, and the statement preceding each table, are from Section 9 of the San Diego County Water Authority's 2010 UWMP.

Table 24a/ San Diego County Water Authority / Normal Year Supply and Demand Assessment*

If MWD, SDCWA and member agency supplies are developed as planned, along with achievement of the SBX7-7 retail conservation target, no shortages are anticipated within the Water Authority's service area in a normal year through 2035. (Text and following table from SDCWA, *2010 UWMP*, Section 9.2.)

Acre Feet Per Year

	2015	2020	2025	2030	2035
Water Authority Supplies					
IID Water Transfer	100,000	190,000	200,000	200,000	200,000
ACC and CC Lining Projects	80,200	80,200	80,200	80,200	80,200
Proposed Regional Seawater Desalination	0	56,000	56,000	56,000	56,000
Sub-Total	180,200	326,200	336,200	336,200	336,200
Member Agency Supplies					
Surface Water	48,206	47,940	47,878	47,542	47,289
Water Recycling	38,660	43,728	46,603	48,278	49,998
Groundwater	11,710	11,100	12,100	12,840	12,840
Groundwater Recovery	10,320	15,520	15,520	15,520	15,520
Sub-Total	108,896	118,288	122,101	124,180	125,647
Metropolitan Water District Supplies	358,189	230,601	259,694	293,239	323,838
Total Projected Supplies	647,285	675,089	717,995	753,619	785,685
Total Demands w/ SBX7-7 Conservation	647,285	675,089	717,995	753,619	785,685

*Normal water year demands based on 1960–2008 hydrologies.

Table 24b/ San Diego County Water Authority / Single Dry Year Supply and Demand Assessment

If MWD, SDCWA and member agency supplies are developed as planned, along with achievement of the SBX7-7 retail conservation target, no shortages are anticipated within the Water Authority's service area in a single dry year through 2035. (Text and following table from SDCWA, *2010 UWMP*, Section 9.3.)

Acre Feet Per Year

	2015	2020	2025	2030	2035
Water Authority Supplies					
IID Water Transfer	100,000	190,000	200,000	200,000	200,000
ACC and CC Lining Projects	80,200	80,200	80,200	80,200	80,200
Proposed Regional Seawater Desalination	0	56,000	56,000	56,000	56,000
Sub-Total	180,200	326,200	336,200	336,200	336,200
Member Agency Supplies					
Surface Water	17,932	17,932	17,932	17,932	17,932
Water Recycling	38,660	43,728	46,603	48,278	49,998
Groundwater	9,977	9,977	9,977	9,977	9,977
Groundwater Recovery	10,320	15,520	15,520	15,520	15,520
Sub-Total	76,889	87,157	90,032	91,707	93,427
Metropolitan Supplies	430,431	305,101	338,501	376,023	409,389
Total Projected Supplies	687,520	718,458	764,733	803,930	839,016
Total Demands w/ SBX7-7 Conservation	687,520	718,458	764,733	803,930	839,016

Tables 24c-g show multiple dry water year assessments in five year increments, and that regional shortfalls are projected to occur within the Water Authority's service area, which in turn will be administered by the Authority to ensure an adequate and reliable supply to its member agencies in accordance with planned management actions that are fully set forth and described in the Authority's 2010 UWMP. Shortages occur in the early years primarily because the Carlsbad Seawater Desalination project is not yet on-line and IID transfer supplies have not fully ramped up to 200,000 AFY. Shortages occurring in later years are due primarily to increasing water demands due to regional growth.

As discussed in further detail below and in the Water Authority's 2010 UWMP, these potential shortfalls do not mean that supplies will not be sufficient to meet demand, but rather show that multiple dry-year scenarios may occur as a forecasted component of California's variable hydrology and that supplies and demands must be managed during those times through extraordinary measures to ensure sufficient supplies on a regional basis. The detailed information, analyses and conclusions set forth in this 2010 UWMP and the various supporting documentation (such as MWD's 2010 UWMP, the Water Authority's 2010 UWMP, and DWR's 2009 SWP Delivery Reliability Report) demonstrate the availability and reliability

of imported supplies available to Padre Dam through the Authority during normal, single-dry, and multiple-dry years over the next 20-year planning horizon and beyond. As analyzed and fully set forth by MWD, the Authority, and DWR, Padre Dam also recognizes that various factors exist that can possibly affect the amounts and timing of imported water supplies from the Colorado River and the SWP. Those factors include, without limitation, legal, regulatory, environmental, and water quality issues affecting threatened and endangered fish species, drought conditions, seismic or other emergencies, climate change, or other extraordinary and unforeseen circumstances. Despite these possibilities, Padre Dam understands, as noted by the courts, that "some level of uncertainty is a permanent, inherent feature of modern water management which arises from a wide range of scientific and legal regulatory factors that cannot be avoided" and that "water management is subject to the vagaries of climate, competing demands ... environmental constraints, and overlapping regulatory regimes of both the federal and state levels." Accordingly, while Padre Dam recognizes the various factors that can give rise to the possibility of affecting imported supplies available to the Water Authority, those possibilities have been expressly accounted for by the MWD, the Authority, and DWR and are included within their long-term average delivery projections for imported water supplies from the Colorado River and the SWP. In turn, those projections have been utilized by the Authority in its 2010 UWMP and are utilized and incorporated into this Plan for purposes of evaluating imported supplies available to Padre Dam. To this end, Section 10631(k) of the UWMP Act provides that Padre Dam may rely upon the water supply information provided by the Water Authority for purposes of quantifying the existing and planned amounts of imported water available to Padre Dam throughout the UWMP planning horizon, and for describing the reliability of that supply and vulnerability to seasonal or climatic shortages during average, single-dry and multiple-dry year periods.

The Water Authority has invested in carryover storage supply capacity, which can be utilized in dry-years to improve reliability. The carryover storage investment includes both surface water storage in San Vicente Reservoir and out-of-region groundwater storage in California's central valley, for a total of approximately 170,000 AF of storage capacity available by 2012, when the San Vicente Dam raise is scheduled for completion. Once completed, it will take three to five years to fill the reservoir.

In years where shortages may still occur, after utilization of carryover storage, additional regional shortage management measures, consistent with the Water Authority's Water Shortage and Drought Response Plan, will be taken to fill the supply shortfall. These measures could include securing dry-year transfers, which the Water Authority successfully acquired and utilized during the recent shortage period. In addition to dry-year supplies, extraordinary conservation, achieved through voluntary or mandatory water-use restrictions, could also assist in managing shortages. A description of the savings achieved during the 2007-2011 shortage period is described in Section 11.2.2 of the Water Authority's UWMP. The amount of savings achieved through extraordinary conservation measures could be limited due to demand hardening, especially following compliance with SBX7-7 conservation savings. (Text and following tables from SDCWA, 2010 UWMP, Section 9.3.)

Table 24c/ San Diego County Water Authority / Multiple Dry Water Year Supply and Demand Assessment 2012-2014

Acre Feet Per Year

	2012	2013	2014
Member Agency Supplies	69,597	84,440	103,907
Water Authority Supplies	170,200	180,200	180,200
Metropolitan Allocation (Preferential Right)	317,760	319,177	320,456
Total Estimated Core Supplies w/o Storage Takes	557,557	583,817	604,563
Total Demands w/ SBX7-7 Conservation	658,381	679,509	711,241
Potential Supply (Shortage) or Surplus *(Difference between Supplies and Demands)*	(100,824)	(95,692)	(106,678)
Utilization Carryover Supplies	40,000	40,000	30,000
Total Projected Core Supplies w/ Utilization of Carryover Storage Supplies	597,557	623,817	634,563
Remaining Potential Surplus Supply, or (Shortage) that will be handled through Management Actions	(60,824)	(55,692)	(76,678)

Table 24d/ San Diego County Water Authority / Multiple Dry Water Year Supply and Demand Assessment 2016-2018

Acre Feet Per Year

	2016	2017	2018
Member Agency Supplies	78,943	93,408	112,499
Water Authority Supplies	236,200	236,200	266,200
Metropolitan Allocation (Preferential Right)	322,661	323,350	324,100
Total Estimated Core Supplies w/o Storage Takes	637,804	652,958	702,799
Total Demands w/ SBX7-7 Conservation	682,338	705,461	740,326
Potential Supply (Shortage) or Surplus *(Difference between Supplies and Demands)*	(44,534)	(52,503)	(37,527)
Utilization Carryover Supplies	44,534	40,000	30,000
Total Projected Core Supplies w/ Utilization of Carryover Storage Supplies	682,338	692,958	732,799
Remaining Potential Surplus Supply, or (Shortage) that will be handled through Management Actions	0	(12,503)	(7,527)

Table 24e/ San Diego County Water Authority / Multiple Dry Water Year Supply and Demand Assessment 2021-2023

Acre Feet Per Year

	2021	2022	2023
Member Agency Supplies	87,732	100,719	118,331
Water Authority Supplies	336,200	336,200	336,200
Metropolitan Allocation (Preferential Right)	326,697	327,671	328,695
Total Estimated Core Supplies w/o Storage Takes	750,629	764,590	783,226
Total Demands w/ SBX7-7 Conservation	724,294	751,800	790,177
Potential Supply (Shortage) or Surplus *(Difference between Supplies and Demands)*	26,335	12,790	(6,951)
Utilization Carryover Supplies	0	0	6,951
Total Projected Core Supplies w/ Utilization of Carryover Storage Supplies	750,629	764,590	790,177
Remaining Potential Surplus Supply, or (Shortage) that will be handled through Management Actions	26,335	12,790	0

Table 24f/ San Diego County Water Authority / Multiple Dry Water Year Supply and Demand Assessment 2026-2028

Acre Feet Per Year

	2026	2027	2028
Member Agency Supplies	90,367	103,114	120,486
Water Authority Supplies	336,200	336,200	336,200
Metropolitan Allocation (Preferential Right)	332,058	333,272	334,532
Total Estimated Core Supplies w/o Storage Takes	758,625	772,586	791,218
Total Demands w/ SBX7-7 Conservation	772,892	801,649	844,137
Potential Supply (Shortage) or Surplus *(Difference between Supplies and Demands)*	(14,267)	(29,063)	(52,919)
Utilization Carryover Supplies	14,267	29,063	40,000
Total Projected Core Supplies w/ Utilization of Carryover Storage Supplies	772,892	801,649	831,218
Remaining Potential Surplus Supply, or (Shortage) that will be handled through Management Actions	0	0	(12,919)

**Table 24g/ San Diego County Water Authority /
Multiple Dry Water Year Supply and Demand Assessment 2031-2033**

Acre Feet Per Year

	2031	2032	2033
Member Agency Supplies	92,051	104,807	122,188
Water Authority Supplies	336,200	336,200	336,200
Metropolitan Allocation (Preferential Right)	338,575	340,009	341,486
Total Estimated Core Supplies w/o Storage Takes	766,826	781,016	799,874
Total Demands w/ SBX7-7 Conservation	811,421	842,947	882,795
Potential Supply (Shortage) or Surplus *(Difference between Supplies and Demands)*	(44,595)	(61,931)	(82,921)
Utilization Carryover Supplies	44,595	40,000	30,000
Total Projected Core Supplies w/ Utilization of Carryover Storage Supplies	811,421	821,016	829,874
Remaining Potential Surplus Supply, or (Shortage) that will be Offset through Management Actions	0	(21,931)	(52,921)

How Padre Dam Assessed Water Supply Reliability

The 2010 UWMP Guidebook, Section 5 recommends a methodology to model single and multiple dry year conditions using historical runoff records. This method was modified because the worst case for Padre Dam occurs during extended periods of high demand resulting from high temperatures and low precipitation within the service area. Fifteen years of demand and precipitation data were reviewed in order to select the driest single year and driest three-year sequence. However, precipitation data was inconsistent, with many years missing data from typical wet months. Instead, the highest demand years were selected to represent dry-year projections.

Projected dry year demands were then compared to the Water Authority's dry year supply projections to quantify potential shortages. Calculations are shown below in Table 25a and summarized in Table 25b.

Table 25a / Calculations Used for Table 25b

The 2010 UWMP Guidebook tables are based on volume (acre feet). Since District population increased during this period, the same calculation was performed on a volume per capita basis. The difference in demand ratios was minimal.

	Potable Deliveries Acre Feet	Ratio to Normal Year (2005)
1995	12,867	0.846
1996	15,599	1.026
1997	15,601	1.026
1998	13,342	0.878
1999	15,042	0.990
2000	16,738	1.101
2001	15,403	1.013
2002	16,426	1.081
2003	15,600	1.026
2004	16,686	1.098
2005	15,201	1.000
2006	16,182	1.065
2007	14,811	0.974
2008	16,151	1.062
2009*	14,653	0.964
2010*	12,459	0.820
Average	15,173	

* Volume delivered in 2009 and 2010 shows the effect of a mandatory 8% reduction in water use ordered from 2009-2011.

Table 25b / Basis of Water Year Data

This table assumes that Padre Dam's wholesale water suppliers are not asking the public for increased voluntary water conservation or implementing mandatory water conservation, as these measures would decrease water demand.

Water Year Type	Base Years	Potable Deliveries Acre Feet	Percent of Average Water Year
Average Water Year	2005	15,201	110%
Single Dry Water Year	2000	16,738	110%
Multiple Dry Water Years			
Year 1	2000	16,738	110%
Year 2	2001	15,403	101%
Year 3	2002	16,426	108%
Year 4 *	2003	15,600	103%

*Year 4 is not used in reliability of supply calculations, but is required in UWMP Guidebook Table 28.

Table 26/ Factors Resulting in Inconsistency of Supply

	Specific source	Limitation quantified	Legal and Environmental	Water quality	Climatic
San Diego County Water Authority	Delta and Colorado River	n/a	Legal and environmental decisions about the Delta cause current supply inconsistency. Future supply may not be consistent due to legal rulings, environmental decisions and delays in construction. Legal decisions regarding the QSA could reduce supplies from the Colorado River.	Water quality concerns and challenges could affect supplies in the future.	Extended drought on Colorado River may reduce supply. Drought and climate change could result in reduction of imported supplies.
Water Recycling Facility		n/a	X		
Desalination		n/a	X		

Padre Dam / Supply and Demand Comparisons

Comparing Supply and Demand

Tables 27a through 27c compare supply and demand based on demand projections provided in Table 6 (Section 3.2). The percentages shown in Table 25b were applied to normal year demands to estimate dry year demands. The Water Authority projects shortages in certain dry year scenarios. Padre Dam assumes that any shortage will be applied to the Water Authority's member retail suppliers in proportion to their demand. Projected supply shortages provided in the San Diego County Water Authority's 2010 UWMP (Section 9).

Table 27a/ Supply and Demand Comparison / Normal Year

(In Acre Feet)	2015	2020	2025	2030	2035
County Water Authority Supply Shortage, % of member agency demand	None	None	None	None	None
Supply totals (from Table 12)	16,826	17,926	19,231	19,983	20,897
Demand totals (From Table 10)	16,826	17,926	19,231	19,983	20,897
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

Table 27b/ Supply and Demand Comparison / Single Dry Year

Multiple Dry Year / First Year Supply (110% of normal year demand)

(In Acre Feet)	2015	2020	2025	2030	2035
County Water Authority Supply Shortage, % of member agency demand	None	None	None	None	None
Supply totals	18,509	19,719	21,154	21,982	22,987
Demand totals	18,509	19,719	21,154	21,982	22,987
Difference	0	0	0	0	0
Difference as % of Supply	0.0%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	0.0%	0.0%	0.0%	0.0%	0.0%

Table 27c/ Supply and Demand Comparison / Multiple Dry Year Events

Multiple Dry Year / First Year Supply (110% of normal year demand)

(In Acre Feet)	2012	2015	2020	2025	2030
County Water Authority Supply Shortage, % of member agency demand	9.2%	None	None	None	None
Supply totals	14,307	18,510	19,719	21,155	21,980
Demand totals	15,757	18,510	19,719	21,155	21,980
Difference	(1,450)	0	0	0	0
Difference as % of Supply	-10.1%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	-9.2%	0.0%	0.0%	0.0%	0.0%

Multiple Dry Year / Second Year Supply (101% of normal year demand)

(In Acre Feet)	2013	2016	2021	2026	2031
County Water Authority Supply Shortage, % of member agency demand	8.2%	None	None	None	None
Supply totals	14,055	17,217	18,369	19,576	20,366
Demand totals	15,310	17,217	18,369	19,576	20,366
Difference	(1,255)	0	0	0	0
Difference as % of Supply	-8.9%	0.0%	0.0%	0.0%	0.0%
Difference as % of Demand	-8.2%	0.0%	0.0%	0.0%	0.0%

Multiple Dry Year / Third Year Supply (108% of normal year demand)

(In Acre Feet)	2014	2017	2022	2027	2032
County Water Authority Supply Shortage, % of member agency demand	10.8%	1.8%	0%	0%	2.6%
Supply totals	15,407	18,312	19,924	21,095	21,404
Demand totals	17,272	18,648	19,924	21,095	21,975
Difference	(1,865)	(336)	0	0	(571)
Difference as % of Supply	-12.1%	-1.8%	0.0%	0.0%	-2.7%
Difference as % of Demand	-10.8%	-1.8%	0.0%	0.0%	-2.6%

Note: The Urban Water Management Plan Act only requires supply projections over a 20-year period or as far as data is available. The San Diego County Water Authority, Padre Dam's wholesale supplier, has not made multiple-dry year supply projections available for 2035 or beyond. The Act entitles Padre Dam to rely upon the water supply information made available by the Authority.

5.4 Water Shortage Contingency Planning

Padre Dam is prepared to deal with periods of water supply shortage and adopted our most recent Water Supply Management Plan in 2008. The Water Supply Management Plan is part of the District's Rules and Regulations.

Padre Dam's Water Supply Management Plan establishes water management requirements necessary to conserve water, enable effective water supply planning, assure reasonable and beneficial use of water, prevent waste of water, prevent unreasonable use of water, prevent unreasonable method of use of water within Padre Dam in order to assure adequate supplies of water to meet the needs of the public, and further the public health, safety, and welfare, recognizing that water is a scarce natural resource that requires careful management not only in times of drought, but at all times. A copy of Padre Dam's Rules and Regulations, Section 5.1, Water Supply Management Plan can be found in the Appendix 5 to this document. Tables 30a-33 outline measures in place to manage supply shortage and supply management efforts for normal conditions.

Padre Dam's adopted Water Shortage Management Plan is part of Padre Dam's Rules and Regulations, Section 5 and can be found in Appendix 5 of this document.

Table 28a / Water Shortage Contingency / Water Supply Conditions

SDCWA Drought Management Plan	MWD Trigger	SDCWA Response
Stage 1	Withdraws water from storage to meet current-year demand	Encourages voluntary conservation and maximizes storage
Stage 2	Reduces water deliveries to member water suppliers	Buys water transfers, May increase conservation
Stage 3	Severely reduces water deliveries To member water suppliers	Reduces water deliveries to member water suppliers

Table 28b / Water Shortage Contingency / Rationing Stages

SDCWA Drought Management Plan	Padre Dam Drought Ordinance	Water Use Restrictions	Water Shortage
Stage 1 or 2	Level 1	Voluntary	Up to 10%
Stage 2 or 3	Level 2	Mandatory	Up to 20%
Stage 3	Level 3	Mandatory	Up to 40%
Stage 3	Level 4	Mandatory	Up to 50%

Table 29/ Water Shortage Contingency / Mandatory Prohibitions

Examples of Prohibitions	Level When Prohibition is in Effect
Stop washing paved surfaces	All Levels
Stop water waste from inefficient landscape irrigation	All Levels
Use recirculated water only in ornamental water features	All Levels
Serve water in restaurants upon request only	All Levels
Offer lodging guests the option of not laundering linens daily	All Levels
Provide proof of leak repair within the specified number of days	All Levels
Use recycled water for construction purposes when available	All Levels
Wash vehicles with high pressure/low volume or recirculated water only	All Levels
Specified time limits and methods for landscape irrigation	Levels 2, 3, 4
No new meters or annexations	Levels 3, 4
Use recycled water only in ornamental water features	Levels 3, 4

Table 30/ Water Shortage Contingency / Consumption Reduction Methods

Consumption Reduction Methods	Level When Method Is in Effect	Projected Reduction
Water allocation decrease in tiers 2, 3, 4 and 5 of allocation-based, tiered rate structure	Level 3	Up to 40%
Water rate increase in tiers 2, 3, 4 and 5 of allocation-based, tiered rate structure	Level 3	Up to 40%
Moratorium on new meters and annexations	Level 3	Up to 40%
Severe water allocation decrease in tiers 2, 3, 4 and 5 of allocation-based, tiered rate structure	Level 4	Up to 50%
Severe rate increase in tiers 2, 3, 4 and 5 of allocation-based, tiered rate structure	Level 4	Up to 50%
Moratorium on residential and commercial landscape irrigation	Level 4	Up to 50%

Table 31/ Water Shortage Contingency / Penalties and Charges

Penalties	Level When Penalty Is in Effect
$150 for second violation; $300 third violation; $600 fourth violation	Level 1
$150 for second violation; $300 third violation; $600 fourth violation	Level 2
$300 for second violation; $600 third violation; $1200 fourth violation	Level 3
$300 for second violation; $600 third violation; $1200 fourth violation	Level 4

5.5 Catastrophic Water Shortage

If a catastrophic water shortage occurs, such as an earthquake, Padre Dam relies on the San Diego County Water Authority's Integrated Contingency Plan (ICP) and Emergency Storage Plan (ESP), which were developed to protect public health and safety and to prevent or limit economic damage that could occur from the severe shortage of water supplies. The Water Authority analysis shows that with the ICP and ESP they are taking actions to prepare for and appropriately handle a catatrophic interruption of water supplies for all of its member agencies. The Water Authority's ICP and ESP are discussed below and also in the 2010 Water Authority Urban Water Management Plan (See Section 11.1.1 and 11.1.2).

Integrated Contingency Plan (ICP)

(Excerpt from San Diego County Water Authority Urban Water Management Plan Section 11.1.1)

The Water Authority's ICP provides staff with the information necessary to respond to an emergency that causes severe damage to the Water Authority's water distribution system, or impedes the Water Authority's ability to provide reliable water service to its member agencies. The ICP describes the situations and incidents that will trigger the activation of the Water Authority's ICP and Emergency Operations Center. It also provides direction and strategies for responding to a crisis. The Water Authority's ICP includes:

- Authorities, policies, and procedures associated with emergency response activities
- Emergency Operations Center activities, including activation and deactivation guidelines
- Multi-agency and multi-jurisdictional coordination, particularly between the Water Authority, its member agencies, and Metropolitan in accordance with Standardized Emergency Management System (SEMS) and National Incident Management System (NIMS) guidelines
- Incident Command System management and organization and emergency staffing required to assist in mitigating any significant emergency or disaster
- Mutual Aid Agreements and covenants that outline the terms and conditions under which mutual aid assistance will be provided
- Hazard specific action plans and Incident Command System position checklists

In addition, the Water Authority's ICP uses a step-by-step approach to emergency response planning by providing tools such as resource and information lists, personnel rosters, pertinent policies and procedures, and reference materials. The Water Authority provides input to the Unified San Diego County Emergency Services Organization's "Operational Area Emergency Plan," which in turn, supports the Water Authority's plan.

Water Authority Emergency Shortage Project (ESP)

(Excerpt from San Diego County Water Authority Urban Water Management Plan Section 11.2)

In June 1998, the Water Authority's Board authorized implementation of the ESP to reduce the risk of potential catastrophic damage that could result from a prolonged interruption of imported water due to earthquake, drought, or other disasters. The ESP is a system of reservoirs, pipelines, and other facilities

that will work together to store and move water around the county in the event of a natural disaster. The ESP will provide, when complete, up to six months of emergency water storage in the San Diego region.

The ESP facilities are located throughout San Diego County and are being constructed in phases. Construction of the first facilities began in 2000. The initial ESP phase included construction of the 318-foot-high Olivenhain Dam and accompanying Olivenhain Reservoir, which together added 24,300 AF of emergency storage for the region. Raising the height of the San Vicente Dam is the last major component of the ESP, and should be completed by 2012. The raised dam will add an additional 117 feet, making this the tallest dam raise in the United States, and will allow for an additional 52,000 AF of emergency storage, as well as 100,000 AF of carryover storage (see SDCWA UWMP, Section 11.2.3.1 for discussion on carryover storage).

When completed, the ESP will provide 90,100 AF of stored water for emergency purposes to meet the county's needs through at least 2030. The Water Authority Board of Directors may also authorize that supplies from the ESP be used in a prolonged drought or other water shortage situation where imported and local supplies do not meet 75 percent of the Water Authority's member agencies Municipal and Industrial (M&I) demands.

In sizing the ESP, the Water Authority assumed a 75 percent level of service to all Water Authority member agencies during an outage and full implementation of the water conservation best management practices. The following steps from the August 2002 Emergency Water Delivery Plans show the methodology for calculating the allocation of ESP supplies to member agencies in a prolonged outage situation without imported supplies:

1. Estimate the duration of the emergency (i.e. time needed to repair damaged pipelines).
2. Determine each member agency's net demand during the emergency period by adding M&I water demands and agricultural water demands and then subtracting recycled water supplies.
3. Determine each member agency's useable local supplies during the emergency period (local supplies include surface water and groundwater).
4. Determine each member agency's level of service based on usable local supplies and net demand.
5. Adjust the allocation of ESP supplies based on a member agency's participation in an interruptible agricultural program (e.g. Metropolitan Interim Agricultural Water Program or Water Authority Special Agricultural Water Rate). Interruptible agricultural program customers will be required to take a reduction in deliveries during a water shortage due to an emergency at double the system-wide reduction up to a maximum of 90 percent. Water not delivered to interruptible agricultural program customers will be redistributed to member agencies based on the "system-wide" level of service targets.
6. Determine the amount of local supplies that can be transferred between member agencies, with transfers occurring only after a member agency has a level of service greater than 75 percent based on their usable local supplies.
7. Allocate delivery of useable ESP storage supplies along with available Water Authority and Metropolitan supplies

5.6 Water Shortage Financial Considerations

This section discusses Padre Dam's ability to manage its finances during periods when water sales to customers are reduced by a water supply shortage and extraordinary conservation. Padre Dam's water rate structure is designed to soften any financial impacts of a declining sales situation.

Padre Dam's financial goal is to be revenue neutral and maintain revenues equal to costs and budgeted expenses while maintaining adequate reserves for economic uncertainties in water sales. Padre Dam's normal water supply and supply shortage rates are developed based on the historical financial trend and water demand average. Fluctuations in demand will dramatically impact Padre Dam's financial stability.

Water Rates

Padre Dam adopted a water conservation rate structure in 2009 that addresses normal water use and can be adjusted during times of drought or supply shortage to recover revenue loss while encouraging conservation. Padre Dam has a 5-tiered rate structure. Tier 1 is designed to provide for indoor water use. Tier 1 and 2 combined is the customer's baseline water use. More water is available in Tiers 3, 4 and 5 but at a progressively higher rate. Tier allocations and rates are adjusted depending on the water supply conditions. Water rates generate well over 70% of Padre Dam's water revenue requirements to sustain operations.

A system charge is a cost recovery charge that is generally included in the rate structure to pay for wholesaler fixed charges, customer service billing, meter costs and other operational and maintenance costs such as debt service. Systems charges help with revenue stability due to fluctuations in water sales which are driven predominately by variation in weather conditions and uncontrollable state and federal mandates. It is Padre Dam's goal to keep revenue from fixed charges below 30%.

Padre Dam's annual revenue requirement from rates and charges is based on historical average of water sales and projected growth. If a water supply shortage occurs, Padre Dam's ability to recover its cost of services, including fixed wholesaler costs, could be impacted depending on the severity of water supply reductions. Padre Dam has a rate stabilization fund to mitigate the risk of large unexpected rate increases that are more difficult for customers to budget and plan for but that fund has been depleted during the recent drought.

When water sales are lower than expected, due to prolonged dry weather conditions or unusually wet weather, and revenues are not sufficient to pay expenditures, funds from the water reserve fund balance are used to offset the need for higher rates due to a drop in sales. However, if reserve funds fall below Board approved levels a rate increase may be necessary.

Section 6 / Demand Management Measures

6.1 Demand Management Measures

Demand management measures (DMMs) are mechanisms a water supplier implements to increase water conservation. Water suppliers that are members of the California Urban Water Conservation Council have the option of submitting their annual Best Management Practices (BMPs) compliance reports in lieu of describing the DMMs. In fact, the state's DMMs and the CUWCC's BMPs are identical mechanisms and programs.

The goal of the DMM section in a UWMP is to provide a comprehensive description of the water conservation programs that are currently implemented and those planned to be implemented. Padre Dam will include its approved 2009 and 2010 BMP compliance reports with the final and adopted draft of this UWMP. Until then, Padre Dam's draft BMP reports and draft UWMP will be posted on Padre Dam's website at www.padredam.org.

Padre Dam participated in the development and implementation of water use efficiency programs and water conservation measures, including programs run through Metropolitan Water District and the San Diego County Water Authority.

Best Management Practices

Padre Dam has implemented the Best Management Practices as stated in the California Urban Water Conservation Council MOU for the Gallons Per Capita Per Day Compliance Track. The GPCD Compliance Track required that Padre Dam implement the Foundational BMPs listed below and that Padre Dam meet it's 2018 GPCD goal of 18% reduction from baseline. Padre Dam is currently in compliance with the foundational BMPs and our GPCD goals. Foundational BMPs include: Operations Practices (Conservation Coordinator), Water Loss, Commodity Metering, Retail Conservation Pricing, Public Outreach and School Education.

Implemented Foundational BMPs

Conservation Coordinator

- Staff and maintain the position of trained conservation coordinator, or equivalent consulting support, and provide that function with the necessary resources to implement BMPs.

Water waste prevention

- Water agency shall enact and enforce an ordinance or establish terms of service that prohibit water waste and support local ordinances that prohibit water waste

Water Loss

- Standard Water Audit and Water Balance - All agencies shall quantify their current volume of apparent and real water loss. Agencies shall complete the standard water audit and balance using the AWWA Water Loss software to determine their current

volume of apparent and real water loss and the cost impact of these losses on utility operations at no less than annual intervals.
- Validation - Agencies may use up to four years to develop a validated data set for all entries of their water audit and balance. Data validation shall follow the methods suggested by the AWWA Software to improve the accuracy of the quantities for real and apparent losses.

Metering with Commodity Rates
- 100% of existing unmetered accounts to be metered and billed by volume of use within above specified time periods. Service lines dedicated to fire suppression systems are exempt from this requirement.

Conservation Pricing
- Conservation pricing requires volumetric rates. While this BMP defines a minimum percentage of water sales revenue from volumetric rates, the goal of this BMP is to recover the maximum amount of water sales revenue from volumetric rates that is consistent with utility costs, financial stability, revenue sufficiency, and customer equity. In addition to volumetric rates, conservation pricing may also include one or more of the following other charges:
    - Service connection charges designed to recover the separable costs of adding new customers to the water distribution system.
    - Monthly or bimonthly meter/service charges to recover costs unrelated to the volume of water delivered or new service connections and to ensure system revenue sufficiency.

Public Information and Education Programs
Agencies shall maintain an active public information program to promote and educate customers about water use efficiency. At minimum a public information program shall consist of the following components:
- Contacts with the public (minimum = 4 times per year).
- Water supplier contacts with media (minimum = 4 times per year).
- An actively maintained website that is updated regularly (minimum = 4 times per year).
- Annual budget for public outreach program.

Agencies shall maintain an active school education program to educate students in the agency's service area about water conservation and efficient water use. An agency may participate in a mutual arrangement as described in Section A. At minimum a school information program shall consist of the following:
- Curriculum materials developed and/or provided by agency (including confirmation that materials meet state framework requirements and are grade appropriate).
- Materials distributed to K-6 students. When possible, school education programs will reach grades 7-12 as well.
- Annual budget for school education program.
- Description of all water supplier education programs.

Padre Dam is in compliance with the GPCD (including foundational BMP's) track of the BMP options. Padre Dam's completed BMP reports and CUWCC self-certification forms are included in Appendix 4 of this document.

Section 7 / Integrated Regional Water Management Planning

7.1 San Diego Integrated Regional Water Management Planning Group

The San Diego Integrated Regional Water Management Planning Group (SDIRWMPG) is an interdisciplinary effort by water retailers, wastewater agencies, stormwater and flood managers, watershed groups, the business community, tribes, agriculture, and regulatory agencies to coordinate water resource management efforts and to enable the San Diego region to apply for grants offered in connection with the California Department of Water Resources' Integrated Regional Water Management (IRWM) program.

IRWM recognizes that the development of sustainable water resources in California depends on projects that enhance water supply, water quality, the environment and public awareness. Voters made up to $1.5 billion available for IRWM projects through the approval of Proposition 50 in 2002 and Proposition 84 in 2006, and the State of California made IRMW the focus of the 2005 and 2009 updates to the California Water Plan.

The San Diego County Water Authority, City of San Diego and San Diego County formed the SDIRWMPG in 2005 and formed a regional advisory committee to write the San Diego IRWM Plan. In 2008, the California Department of Water Resources awarded a $25 million IRWM grant to the San Diego planning region through Proposition 50. In 2009, the California Department of Water Resources allocated approximately $71 million to the San Diego region through Proposition 84.

Padre Dam is a member of the SDIRWMPG regional advisory committee and a recipient of Proposition 50 funds through the SDIRWMPG for the expansion of the district's water recycling facility. Padre Dam is also a member of the statewide public advisory committee assisting with the development of the 2013 update to the California Water Plan.