

City of Santa Barbara
Urban Water Management Plan
2010 Update – Adopted June 2011



Prepared by the City of Santa Barbara, Water Resources Division,
pursuant to California Water Code, Section 10631

Adopted by the Santa Barbara City Council on June 14, 2011
as Agenda Item No. 15

City Council:

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Section 3: System Demands

Historical Demand

The City's water demand history is shown in Figure 4. Produced water is used as the traditional indicator of demand since water is produced to meet the demand. With construction of the 1989 Water Reclamation Project, the City began tracking total water demand based on production to the potable water and recycled water distribution systems. The combined total is referred to as "system" demand. Figure 5 shows metered sales by sector for 1987 to present. Both figures illustrate the demand response to severe drought in the late 1980's and early 1990's, and partial recoveries of demand once drastic measures were no longer needed. Variations from 1998 onward are primarily the result of year-to-year variations in weather as illustrated in Figure 6.

Figure 4

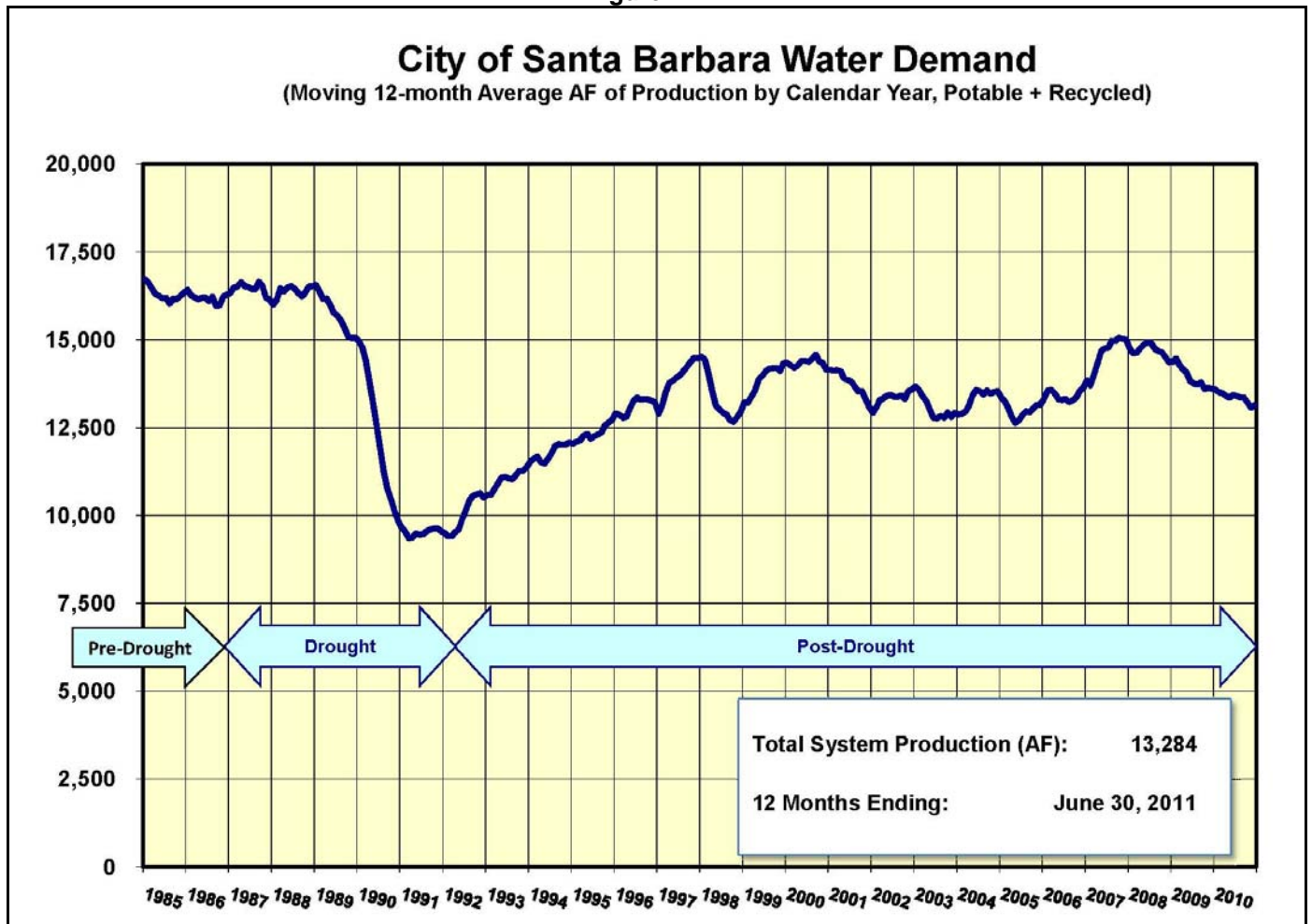


Figure 5

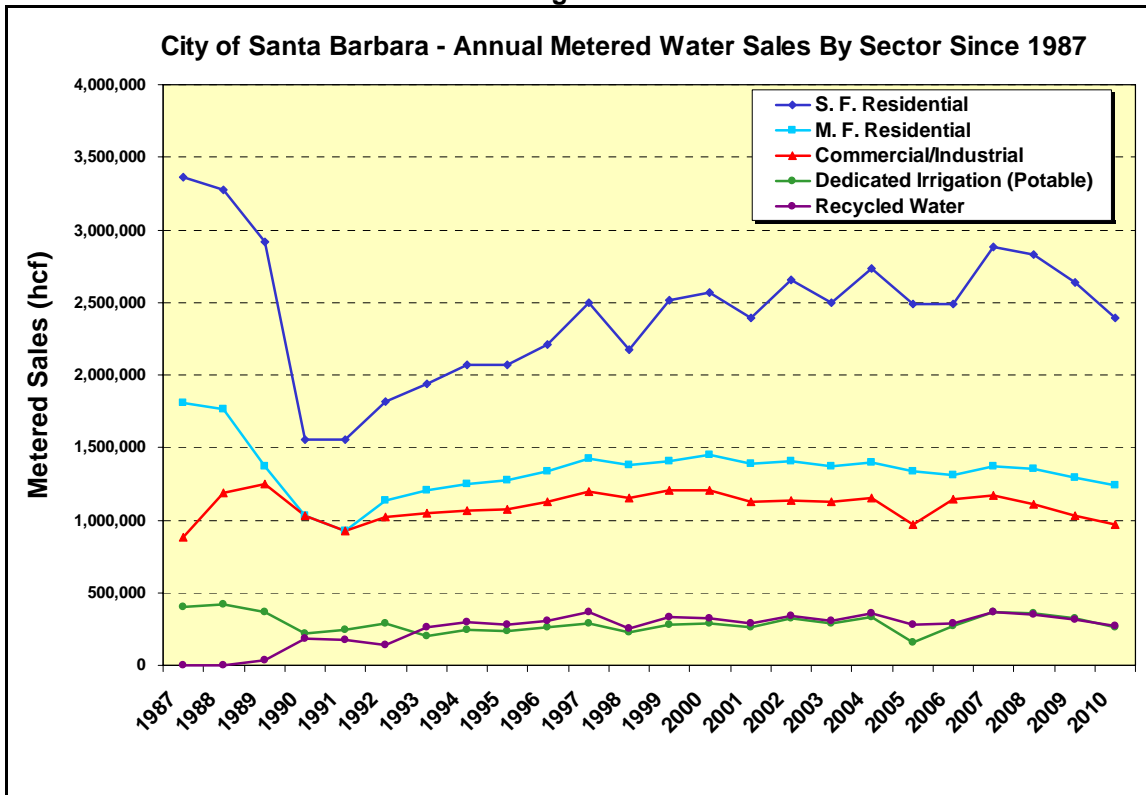
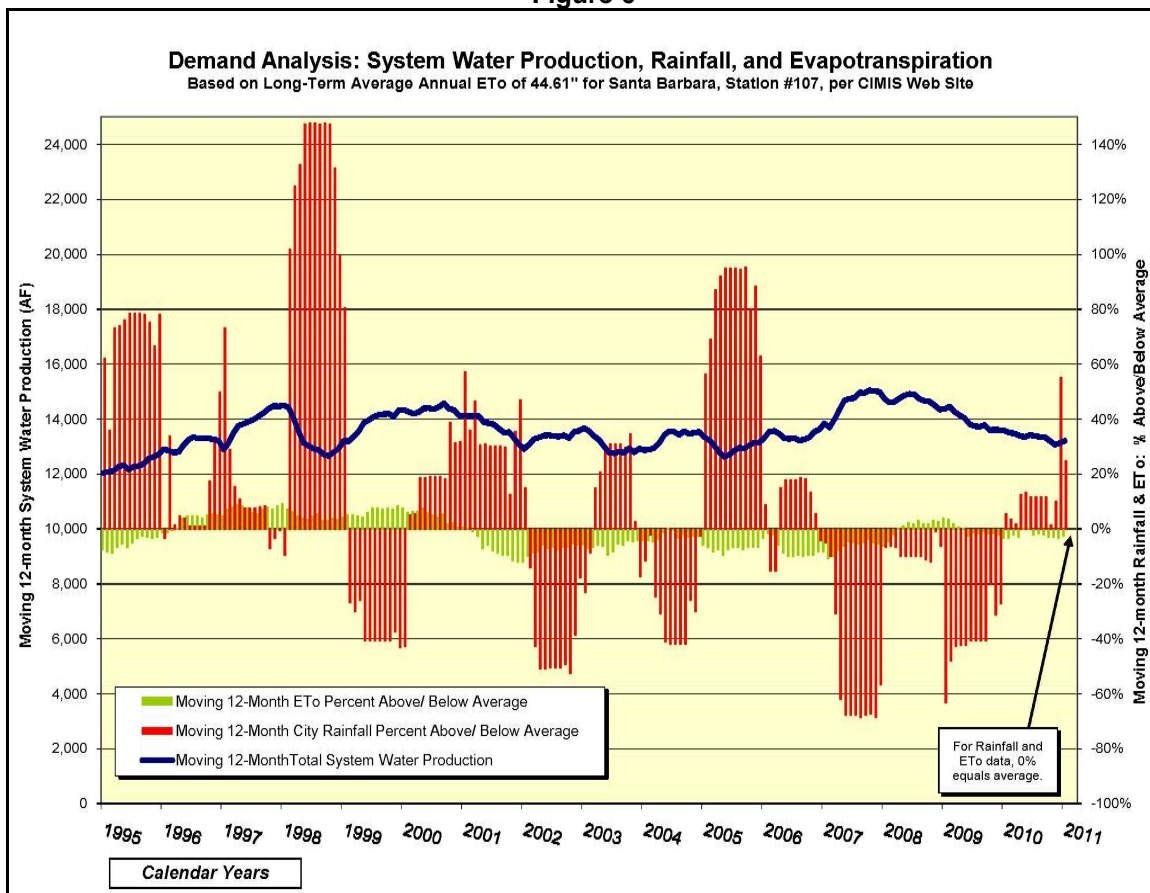


Figure 6



Baselines and Targets

Pursuant to the Water Conservation Act of 2009 (SB7x-7) and related official methodologies, baseline per capita water use is required for two base periods, a 10 to 15 year period and a 5-year period. Recycled water deliveries for 2008 equal 5.9% of total deliveries. This is below 10%, thereby requiring use of a 10-year base period. Required data for the 10-year and 5-year base periods are shown in Table 2 and Table 3 respectively, calculated individually for the City of Santa Barbara water service area. A map of the City's service area is included as Appendix B. The service area includes in-City census tracts and out-of-City census tracts served by the distribution system, and excludes in-City census tracts not served.

Table 2
Base Daily Per Capita Water Use: 10-Year Range

Base Period Year		Distribution System Population	Daily System Gross Water Use (per UWMP Guidebook Definition)		Annual daily per capita water use (gpcd)
Sequence Year	Fiscal Year		(AFY)	(mgd)	
Year 1	2000	92,229	13,792	12.3	134
Year 2	2001	92,807	13,344	11.9	128
Year 3	2002	93,390	12,879	11.5	123
Year 4	2003	93,267	12,223	10.9	117
Year 5	2004	93,315	13,073	11.7	125
Year 6	2005	92,882	12,528	11.2	120
Year 7	2006	91,946	12,860	11.5	125
Year 8	2007	91,934	14,106	12.6	137
Year 9	2008	92,776	14,432	12.9	139
Year 10	2009	93,017	13,576	12.1	130
Base Daily Per Capita Water Use:					128

Table 3
Base Daily Per Capita Water Use: 5-year Range

Base Period Year		Distribution System Population	System Gross Water Use		Annual daily per capita water use (GPCD)
Sequence Year	Fiscal Year		(AFY)	(mgd)	
Year 1	2006	91,946	12,860	11.5	125
Year 2	2007	91,934	14,106	12.6	137
Year 3	2008	92,776	14,432	12.9	139
Year 4	2009	93,017	13,576	12.1	130
Year 5	2010	91,416	13,276	11.9	130
5-Year Base Daily Per Capita Water Use:					132

Population values in the base period tables are based on California Department of Finance (DOF) data for the City of Santa Barbara. City population for 2000 was compared with U.S. Census Bureau data to confirm approximate equality. Adjustments to add out-of-City population served by the City distribution system and deduct in-City population not served by the City system were made using 2000 census block data. The percentage increment of total population served in excess of the official City population value was calculated for 2000 and applied to DOF data for subsequent years. Year-to-year variations are partly explained by adjustments made by DOF from time to time.

Gross Water Use values are calculated as Total Water Received, including local surface water and groundwater, imported State Water for City use via the Central Coast Water Authority (CCWA), receipt of State Water for conveyance to La Cumbre Mutual Water Company (LCMWC). Deducted from this are agricultural deliveries, net exports to Goleta Water District (GWD), State Water conveyance to LCMWC, and export to long-term storage (groundwater injection and recharge). Consistent with State methodologies, calculation of Gross Water Use includes potable water used for blending (as discussed below), and excludes the recycled water component of deliveries to recycled water customers. A sample calculation for FY 2010 is shown in Table 4. Historical calculations for 1996 to present are shown in Table 5.

Table 4
Sample Calculation of Gross Water Use for FY 2010 (AFY)

City Supplies:		
Cachuma Project	7,637	
Gibraltar Reservoir	2,933	
Mission Tunnel	1,220	
Devils Canyon Creek	0	
Groundwater	1,164	
Desalination	0	
Subtotal City Supplies:		12,954
Imported Supplies (SWP via CCWA):		541
State Water Received for LCMWC:		947
Total Water Received:		14,442
Less Agricultural Deliveries		106
Less Net Exports to GWD		38
Less State Water Conveyance to LCMWC		947
Less Export to Long Term Groundwater Storage		75
Gross Water Use:		13,276

Based on use of DWR's Urban Water Use Target Method #3 and location in the Central Coast Hydrologic Region, the urban water use target is 95% of the region target, or 117 GPCD. Table 3 shows calculation of the 5-year base period, resulting in a Base Daily Per Capita Water Use of 132 GPCD, 95% of which is equal to 125 GPCD. Since the urban water use target of 117 GPCD is not greater than 125 GPCD (i.e. it results in a targeted reduction of at least 5% compared to the 5-year base period) the target of 117 GPCD is confirmed. The interim target for 2015 is calculated as:

$$(128 \text{ GPCD Base Daily Water Use} + 117 \text{ Urban Water Use Target}) / 2 = 123 \text{ GPCD.}$$

Table 5

Tabulation of Historical Gross Water Use

Water into distribution system; less net exports, diversions to long-term storage (groundwater injection), and agricultural deliveries

Year	Cachuma	Gibraltar	Mission Tunnel	Devils Canyon	Ground Water	Desal	Total From Own Sources	From Imported Sources (CCWA/ SWP)	SWP Received for La Cumbre Mutual Conveyance	Total Water Received	Agricultural Deliveries	Net Exports to Goleta Water Dist.	Conveyance to La Cumbre Mutual	Export to Long Term Storage (GW Injection)	Gross Water Use
1996	5,561	5,452	1,692	71	-	-	12,776	-	-	12,776	103	44	-	75	12,554
1997	7,301	4,217	1,427	280	-	-	13,225	-	-	13,225	114	33	-	-	13,078
1998	7,269	3,962	1,803	79	73	-	13,186	-	1,012	14,198	81	648	1,012	-	12,457
1999	5,879	5,273	1,872	38	134	-	13,196	-	1,042	14,238	107	(294)	1,042	-	13,383
2000	11,300	1,394	1,149	-	357	-	14,200	-	646	14,846	120	179	646	109	13,792
2001	5,523	5,573	1,886	-	280	-	13,262	-	830	14,092	113	(276)	830	81	13,344
2002	7,373	3,827	1,267	3	8	-	12,478	539	945	13,962	114	(48)	945	72	12,879
2003	6,484	3,127	942	31	-	-	10,584	1,924	742	13,250	113	172	742	-	12,223
2004	7,777	3,414	1,256	20	-	-	12,467	890	776	14,133	134	62	776	88	13,073
2005	7,523	1,879	1,585	70	-	-	11,057	1,903	550	13,510	105	312	550	15	12,528
2006	5,305	4,546	1,786	-	906	-	12,543	659	511	13,713	134	208	511	-	12,860
2007	7,804	3,783	1,409	-	434	-	13,430	667	804	14,901	157	(227)	804	61	14,106
2008	10,734	1,576	1,093	160	751	-	14,314	609	879	15,802	155	212	879	124	14,432
2009	8,236	2,569	1,142	76	1,112	-	13,135	496	902	14,533	139	(225)	902	141	13,576
2010	7,637	2,933	1,220	-	1,164	-	12,954	541	947	14,442	106	38	947	75	13,276

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**Table 6
Water Demands and Total Water Use (AF)**

	<i>Actual</i>				<i>Projected</i>							
	2005		2010		2015		2020		2025		2030	
Water use sectors	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)
Single family	16,850	5,758	16,920	5,824	17,007	5,684	17,094	5,588	17,181	5,527	17,268	5,487
Multi-family	5,786	3,094	6,126	2,931	6,417	2,860	6,417	2,812	6,417	2,781	6,417	2,761
Commercial	2,364	2,230	2,530	2,066	2,565	2,016	2,600	1,982	2,635	1,960	2,670	1,946
Industrial	53	360	56	255	56	249	56	245	56	242	56	240
Institutional/ Government (included w/ Comm.)	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Landscape	624	556	729	541	749	528	769	519	789	513	809	510
Agriculture	56	105	59	106	59	103	59	102	59	101	59	100
Total Potable Accts. & Deliveries (Metered Sales)	25,733	12,104	26,420	11,722	26,854	11,441	26,996	11,248	27,138	11,125	27,280	11,045
Sales to Other Agencies		0		0		0		0		0		0
Net Exports to Other Districts		312		38		0		0		0		0
Groundwater Recharge		15		75		75		75		75		75
Blending to Recycled Water		645		651		300		275		275		275
System Losses		NA		1,009		995		978		967		960
Total Water Use		13,076		13,495		12,811		12,576		12,443		12,355

Note: "Total Water Use" above and as illustrated in Table 11 is not intended to equal "Gross Water Use" that is the basis of the Urban Water Use Target calculation.

Tabulation of Target & Projected Urban Water Use:

	2015	2020	2025	2030
Potable Metered Sales:	11,441	11,248	11,125	11,045
Potable System Losses:	995	978	967	960
Blending to Recycled Water System:	300	275	275	275
Less Agriculture Deliveries:	-103	-102	-101	-100
Gross Water Use:	12,632	12,399	12,267	12,180
Projected Service Area Population:	93,091	94,766	96,441	98,116
Target Urban Water Use (GPCD):	123	117	117	117
Projected Urban Water Use (GPCD):	121	117	114	111

Recycled Water Sales	2005		2010		2015		2020		2025		2030	
	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)	# of accts.	Volume (AF)
	76	718	84	697	99	875	114	950	129	1,025	144	1,100

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Water Demands

Table 6 shows the various demands on the City water system at 5-year intervals. These include metered sales by customer class, net exports, groundwater recharge, blend water into the recycled water system for managing mineral content, and system losses. Also included is a tabulation of target and projected values for urban water use, consistent with methodologies for implementing SBx7-7 water use reduction requirements.

Table 7 summarizes water use projected to be needed to serve single-family residential and multi-family residential housing needed for lower income households. The information is derived from Appendix C, which was prepared by staff of the City's Community Development Department using information from the Plan Santa Barbara General Plan Certified Final EIR dated September 2010 and the City of Santa Barbara General Plan Housing Element, September 2010 Proposed Final. These demands have been included in the overall water use projections in Table 6.

**Table 7
Low-Income Projected Water Demand (AFY)**

	2010	2015	2020	2025	2030
Single Family Residential	552	560	568	576	584
Multi-Family Residential	192	213	235	256	278
Total	744	774	803	832	862

The City of Santa Barbara receives wholesale deliveries of State Water from the Central Coast Water Authority. Table 8 shows the projections of water use from CCWA, as they were provided to CCWA.

**Table 8
Retail Agency Demand Projections Provided to Wholesale Supplier (AFY)**

	2010	2015	2020	2025	2030
Central Coast Water Authority	2,084	2,064	2,043	2,023	2,002

Water Use Reduction Plan

The City's long term commitment to water conservation is evident in reductions in water demand achieved over the past twenty years. Total system demand has dropped from approximately 16,300 AFY in the late 1980's to approximately 14,000 AFY currently. To achieve the next level of demand management reductions it was important to evaluate the effects of updated plumbing codes and appliance standards, ongoing implementation of the CUWCC BMP's, and added measures that can be cost effectively implemented to further offset water demand.

The City hired Maddaus Water Management (MWM), an engineering firm widely recognized for expertise in demand management, to analyze the existing conservation program and use its proprietary Demand Management Decision Support System (DSS) to model current and potential water conservation measures. The DSS also quantified the demand reduction effects of these measures along with the effects of plumbing codes and appliance standards. Key findings, including the effect of assumed development consistent with the City's General Plan update process, are as follows:

- The 2030 system demand would be expected to increase by 1,202 AFY (compared to the 2006 model reference point of 13,623 AFY) to 14,825 AFY, if the effects of already adopted plumbing codes and appliance standards were not considered. (Note that this will not actually occur, but it is a useful reference point to illustrate the ongoing effect of stricter codes and standards on both new and existing development.)
- The effects of the plumbing code and appliance standards are estimated to reduce 2030 demand by 919 AFY, to 13,906 AFY, not including the effects of conservation program activities and measures.
- Conservation Program B, which includes current conservation program measures along with those that together meet a utility benefit-cost ratio of 1.0, is estimated to reduce demand by an additional 498 AFY, to 13,408 AFY.

The results described above are illustrated in Figure ES-1 of the Executive Summary of the Technical Memorandum prepared by MWM, which is included in this plan as Appendix D. The benefit-cost ratios shown in Table ES-3 of Appendix D were calculated on the basis of an avoided cost of \$600 per AF, which is an average of the variable costs associated with State Water Project Table A deliveries, groundwater produced from the Ortega Groundwater Treatment Plant, and deliveries of purchased water through the State Water Project during non-critical drought periods. Program B was selected on the basis of its cost effectiveness. The model results have been incorporated into the demand and Urban Water Use projections itemized in Table 9 and graphed in Figure 7. The results of these projections indicate that the City will meet its 2020 Urban Water Use Target by implementing the water conservation measures in Program B, adding 150 AFY of new recycled water user demand to offset potable usage, and reducing the amount of potable blend water from a 2010 amount of 651 AFY to 250 AFY. The required new recycled demand is about half of what has already been identified in planning studies and much of the blend water reduction will come from planned corrections to the secondary treatment process. The conservation measures of Program B are identified in Table ES-1 of Appendix D.

Figure 7

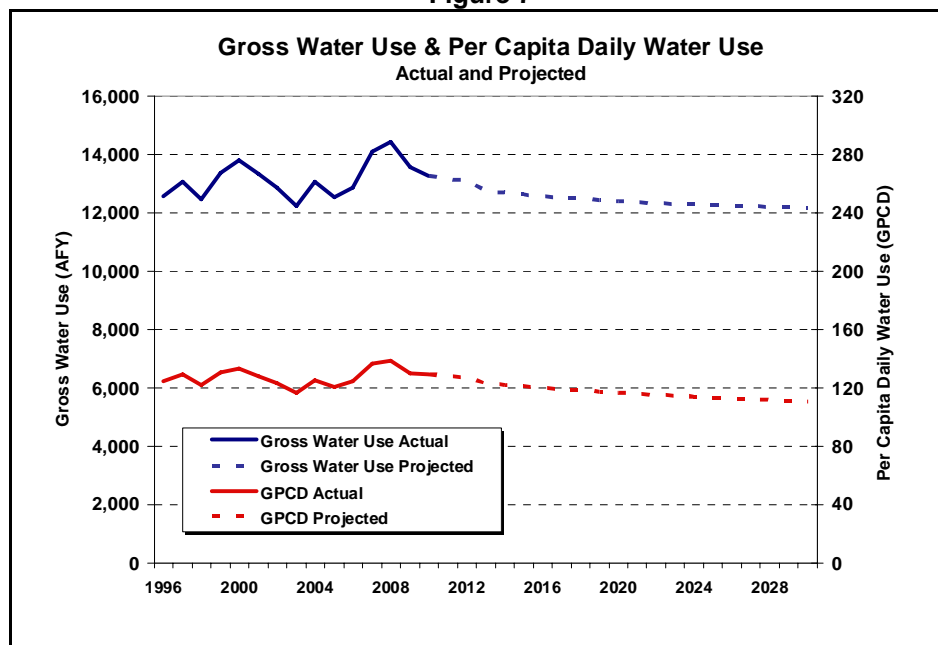


Table 9

Demand & Urban Water Use Projections

Volumes in AF, except as noted

Input assumptions:

- 300 = Planned Potable Demand Reduction from New Recycled Water Connections
- Row 27 = Projected "Program B" demand reductions, including plumbing codes & conservation program
- 0 = Additional 20-year demand reductions from conservation above "Program B"
- 275 = Target Blending Amount After Secondary Improvement (starting 2015)

Summary Information:

- 300 = Total Demand Reductions from New Recycled Water
- 1320 = Total Demand Reductions from New Water Conservation
- 150 = Demand reductions from incr. recycled water by 2020
- 802 = Conservation reductions projected by 2020

Service Area Growth Projection - Per Plan SB Final EIR:

	20-year Total	Annual Amount
20-Year Breakout by Sector:		
Single Family Residential	166	8.31
Multi-Family Residential	445	22.26
Non-Residential	283	14.16
Total:	895	44.73

0 = Calculated average annual required conservation demand reductions in excess of "Program B"

- 6,700 = 20-year Population Growth Projection (from Plan SB Final EIR)
- 335 = Annual average population increase

	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030
Starting Potable Production		12,731	12,669	12,614	12,557	12,497	12,436	12,397	12,352	12,314	12,270	12,226	12,195	12,166	12,140	12,115	12,093	12,072	12,053	12,036	12,020
Demand from New Devel.																					
SFR		8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31	8.31
MFR		22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26	22.26
Non-Resid.		14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16	14.16
Demand Reductions																					
New Recycled Water Use		-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15	-15
New Conserv. - Prog B		-92	-84	-87	-90	-91	-69	-74	-68	-73	-74	-61	-59	-56	-54	-52	-50	-49	-47	-46	-44
New Conserv. > Prog B		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Ending Potable Production	12,731	12,669	12,614	12,557	12,497	12,436	12,397	12,352	12,314	12,270	12,226	12,195	12,166	12,140	12,115	12,093	12,072	12,053	12,036	12,020	12,005
Plus Blend Water to Recycled	651	600	600	300	300	300	275	275	275	275	275	275	275	275	275	275	275	275	275	275	275
Less Agriculture Deliveries	-106	-105	-105	-104	-104	-103	-103	-103	-102	-102	-102	-101	-101	-101	-101	-101	-100	-100	-100	-100	-100
Gross Water Use:	13,276	13,164	13,109	12,752	12,693	12,632	12,568	12,524	12,486	12,443	12,399	12,369	12,340	12,314	12,289	12,267	12,246	12,228	12,210	12,195	12,180
Service Area Population:																					
Starting Amount		91,416	91,751	92,086	92,421	92,756	93,091	93,426	93,761	94,096	94,431	94,766	95,101	95,436	95,771	96,106	96,441	96,776	97,111	97,446	97,781
Added Population		335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335	335
Ending Amount	91,416	91,751	92,086	92,421	92,756	93,091	93,426	93,761	94,096	94,431	94,766	95,101	95,436	95,771	96,106	96,441	96,776	97,111	97,446	97,781	98,116
Per Capita Use (GPCD):	130	128	127	123	122	121	120	119	118	118	117	116	115	115	114	114	113	112	112	111	111
Recycled Production:	696	815	830	845	860	875	890	905	920	935	950	965	980	995	1,010	1,025	1,040	1,055	1,070	1,085	1,100
System Production:	13,427	13,484	13,444	13,402	13,357	13,311	13,287	13,257	13,234	13,205	13,176	13,160	13,146	13,135	13,125	13,118	13,112	13,108	13,106	13,105	13,105