

LOS ANGELES COUNTY DEPARTMENT OF PUBLIC WORKS

Los Angeles County Waterworks Districts

District 40, Antelope Valley



URBAN WATER
MANAGEMENT
PLAN

December 1995

**URBAN WATER MANAGEMENT PLAN
FOR
DISTRICT No. 40, ANTELOPE VALLEY
REGIONS 4, 24, 27, 33, 34, 35, 38, & 39**

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EXECUTIVE SUMMARY

This report represents the Urban Water Management Plan for Los Angeles County Waterworks District No. 40, Antelope Valley. This plan has been prepared in compliance with the Urban Water Management Planning Act which became effective on January 1, 1984. This act requires that urban water suppliers with more than 3,000 customers (service connections), or supplying more than 3,000 acre-feet of water annually (AFY) prepare an urban water management plan.

Available Water Supplies

There are two sources of water available to the District. They are the groundwater supply and imported water via the State Water Project. Based on studies conducted by the United States Geological Survey (USGS), the Antelope Valley Groundwater Basin has a storage capacity of 68 million AF. Due to the overdrafting of the basin since the early 1920s, approximately 13 million AF have been extracted, leaving 55 million AF of water in the basin. The natural recharge of the basin is about 59,100 AFY, which is currently being exceeded by present groundwater extractions.

The District acquires imported State water from the Antelope Valley-East Kern Water Agency (AVEK), whose entitlement of State water is 138,000 AF. Because of hydrologic and environmental conditions, and the fact that the State Water Project conveyance facilities have not been completed, the delivery of this entitlement varies. The source reliability, according to the recently completed Antelope Valley Water Resource Study, is as follows:

- 50 percent probability of getting at least 76 percent of potential supply (116,800 AFY).

- 80 percent probability of getting at least 50 percent of potential supply (77,000 AFY).
- 90 percent probability of getting at least 36 percent of potential supply (46,200 AF).

Hence, this vital source of imported water will provide only 36 percent of the full entitlement 90 percent of the time.

Future Water Demands

The 1995 population of the District was 128,700. The Los Angeles County Department of Regional planning (DRP) projects that by 2010, the population of the District will be 253,200. Following is the amount and source of the District's projected water demands through 2010:

Year	District Population	Source of District Water (AF)		
		Groundwater	AVEK	Total
1995	128,700	17,298 (40%)	25,946 (60%)	43,244
2000	160,700	21,738 (40%)	32,608 (60%)	54,346
2005	201,400	13,695 (20%)	54,782 (80%)	68,477
2010	253,200	17,294 (20%)	69,175 (80%)	86,469

The District's goal is to reduce its reliance on groundwater from the existing 40 percent to 20 percent, and to increase its reliance on imported State Water Project water from 60 percent to 80 percent. As a result, although the District's total water demands will almost double over the next 15 years. On the basis that the AVEK entitlement is available, groundwater extractions will remain about the same.

Future Water Supply Plan

To maximize the availability of imported State water and mitigate its lack of reliability, the Antelope Valley Water Resource Study recommends the construction of additional long-term storage facilities so that excess water may be collected and stored during wet years or winter months. Environmental and economic considerations preclude the construction of the required surface storage facilities. The Study recommends aquifer storage and the development of an Artificial Storage and Recovery (ASR) Program in the Antelope Valley.

Studies conducted by the Los Angeles County Department of Public Works, USGS, and AVEK have shown that an ASR program is feasible within the boundaries of Los Angeles County Waterworks District No. 40. In October 1995, District 40, USGS, and AVEK agreed to conduct a demonstration project to provide the information necessary to prepare the appropriate environmental documents, and to design and implement a full-scale ASR program. Additional water transmission facilities will also be required to deliver the water throughout the District's service areas. The District is preparing a Master Plan of water facilities to identify where to locate new storage tanks, pumping stations, and transmission mains. The plan is scheduled for completion in July 1996. Implementation of an ASR program wherein imported State water (treated to potable water standards) is injected into the groundwater basin, is an efficient and cost-effective way to maximize the District's available water supply and firm up its water supply for existing and future customers. A full-scale program will more efficiently use the existing water resources and relieve some stress on the groundwater basin.

Water Shortages

With the development of the ASR program, the construction of planned improvements, and the more efficient management of existing water resources, most water shortages are expected to be mitigated. However, if they do occur, the County Board of Supervisors has adopted a phased water conservation plan. The plan was adopted in May 1991 during the recent 1987-92 drought. It consists of a nine stage (phase) approach that addresses incremental increases in a water shortage up to a maximum of a 50 percent. Surcharges are assessed for water usage in excess of a designated percentage of a customer's historic use. Other restrictions are imposed on landscape watering, issuance of construction meters, and on the issuance of permanent metered water service, depending on the seriousness of the water shortage.

During the 1987-92 drought, the Board of Supervisors required a 20 percent reduction in water usage within the District. The program was in effect from August 1991 through April 1992. During this nine-month period, actual water usage was reduced by 17 percent for a savings of 3,358 AF. Taking into consideration the growth of the District from the April 1989 to March 1990 base year to the period in which the program was in effect, the adjusted water usage amounted to a 40 percent reduction or a savings of 7,823 AF.

The District's rate structure is designed to minimize the effect of revenue reductions that result from conservation programs. Extra revenues collected from the conservation surcharge offset a portion of the water sales revenue loss. If water sales revenues are reduced to the point that they are not adequate to finance the District's operation and maintenance expenditures, the Board of Supervisors may then transfer funds from the District's Accumulative Capital Outlay Fund to its General Fund. This could delay capital improvement projects. As a final option, the Board could increase water rates to meet the operating needs of the District. During the 1987-92 drought, there were sufficient General Fund reserves to absorb the impact of the reduced water sales revenues.

When the California Aqueduct is down for repairs, the District's existing water system is inadequate to meet peak demands throughout the District without requesting a special conservation effort from its customers. To address this deficiency, the Master Plan of water facilities will identify facilities needed to provide adequate domestic and fire protection throughout the District in the event of a disaster or drought when imported water supplies are reduced.

Conservation and Reclaimed Water

The District has implemented many water conservation activities. These include the distribution of water conservation literature and billing inserts, school education, and planning retrofit programs. The County Board of Supervisors and the Cities of Palmdale and Lancaster have also approved building and plumbing code revisions and the adoption of water conservation landscaping and graywater ordinances. In addition, reclaimed water is currently being used on limited scale. However, the use of reclaimed water for future agricultural and landscaping uses is being considered. The County Sanitation Districts of Los Angeles County is a member of the Antelope Valley Water Group which was formed to provide means of communication among the Valley's water agencies regarding water related issues.

Valley-wide Water Demands

The District is a member of the Antelope Valley Water Group (AVWG), which was formed in 1991 to provide a means of communication for Valley agencies with an interest in water. Other AVWG members include the Cities of Palmdale and Lancaster, Edwards Air Force Base, the County Sanitation Districts and the various water agencies in the Valley. This group initiated the

aforementioned Antelope Valley Water Resources Study which points out that the probability of meeting the Valley's 1993 water demands without exceeding the natural groundwater recharge amount of 59,100 AFY, is approximately 73 percent. As the population of the Valley increases, the probability of meeting the water demands will decrease each year until it reaches zero, unless water management programs are implemented. Currently, most water purveyors use groundwater to meet their water demands and the imported water supply is under utilized.

The study made several recommendations, including the following:

- Create a framework to manage the development and use of water supplies.
- Develop a program to optimize the use of available water supplies.
- Develop water conservation reclaimed water and aquifer storage and recovery programs.
- Actively encourage the State Department of Water Resources to complete the State Water Project and/or improve its reliability.
- Obtain additional imported water supplies.

If each water agency is going to meet its overall water needs for the foreseeable future, it is going to take a cooperative effort on behalf of all the effected agencies. The AVWG has agreed to continue meeting to maintain a dialogue and work toward resolving the Valley's water resource management issues.

CHAPTER 1

INTRODUCTION

This document represents the Urban Water Management Plan for the Los Angeles County Waterworks District No. 40 (District), Antelope Valley Water System. The system is operated and maintained by the Los Angeles County Department of Public Works (LACDPW). The plan has been prepared in compliance with the Urban Water Management Planning Act, California Water Code Section 10610 through 10656, which were added by Statute 1983, Chapter 1009, and became effective on January 1, 1984. Appendix A presents a copy of the Act's provisions. This Act, known as Assembly Bill (AB) 797, requires that "every urban water supplier providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet (AF) of water annually to prepare and adopt... an urban water management plan." This is the first plan for the District and will provide consolidated information regarding water management activities.

1.1 Waterworks District 40

The LACDPW Waterworks and Sewer Maintenance Division oversees the operations of the Los Angeles County Waterworks Districts which provides water service to several districts of incorporated and unincorporated Los Angeles County. The District is one of LACDPW's waterworks districts and is located in the Antelope Valley area that is part of northern Los Angeles County (see Figure 1-1). It consists of eight Regions (Regions 4, 24, 27, 33, 34, 35, 38, and 39). These Regions are not all hydraulically interconnected. However, Regions 4 and 34 are hydraulically interconnected, as are Regions 24, 27, and 33. There are emergency interconnections between Region 38 and 35 and between Regions 39 and 24. The eight Regions cover the City of Lancaster and the west side of the City of Palmdale. These Regions also

KERN

COUNTY

EDWARDS AIR FORCE BASE

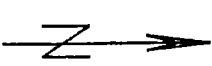
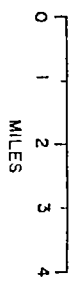
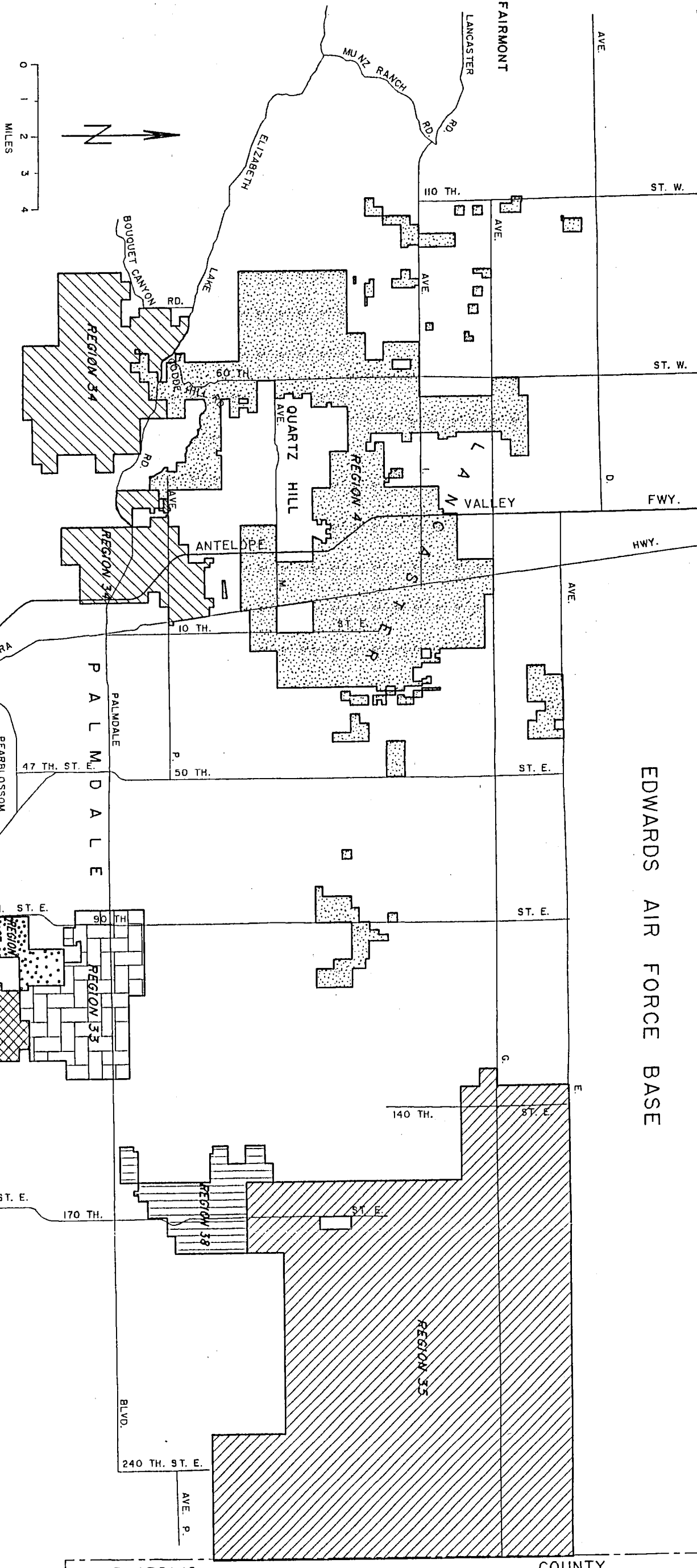








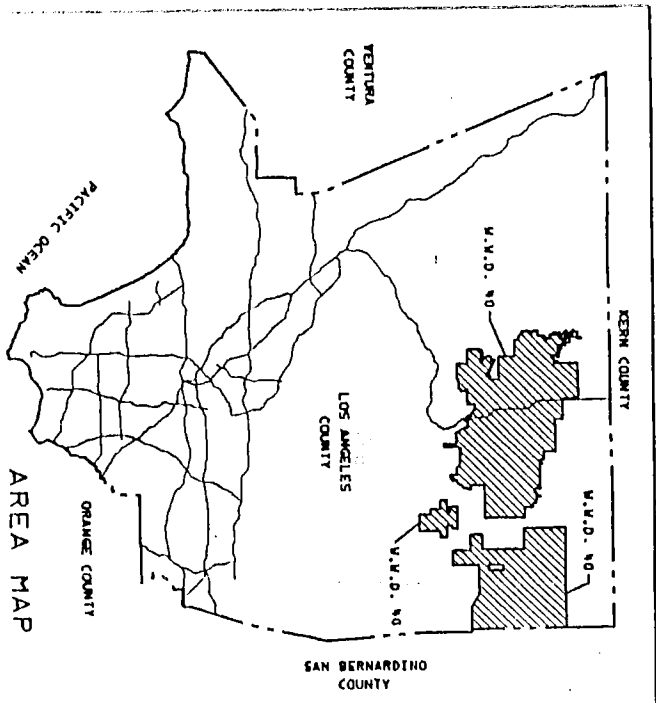


FIGURE 1-1
WATERWORKS DISTRICT 40
ANTELOPE VALLEY

LEGEND:

-  REGION 4, LANCASTER BOUNDARY
-  REGION 24, PEARLBLOSSOM BOUNDARY
-  REGION 27, LITTLE ROCK BOUNDARY
-  REGION 33, SUN VILLAGE BOUNDARY
-  REGION 34, DESERT VIEW HIGHLANDS BOUNDARY
-  REGION 35, N E LOS ANGELES COUNTY BOUNDARY
-  REGION 38, LAKE LOS ANGELES BOUNDARY
-  REGION 39, ROCK CREEK BOUNDARY



include unincorporated areas in northern Los Angeles County. The District covers over 125,552 acres with 40,654 water meter connections. The District was consolidated on November 2, 1993 to reduce administrative costs and increase the efficiency of the system. The consolidated District has more than 765 miles of water mains and serves a population of 128,700. The majority of these service connections serve residential units with some services to commercial and industrial customers (see Appendix D). Major system facilities include 42 wells, 27 pump stations, and 52 storage tanks with approximately 57 million gallons of storage capacity. The District obtains its water supply from groundwater wells and from the State Water Project through the Antelope Valley-East Kern Water Agency (AVEK).

1.2 Rationale for Preparation of One Plan for All Regions in District 40

Although the Act only requires plans for Regions 4 & 34 and 38, this plan includes all Regions in the District. The rationale to include all Regions in the District is their similar geographic and climatic characteristics. Regions are also contiguous and/or are in close proximity to each other and share the same water sources (i.e., groundwater and/or purchased water). Furthermore, Regions could be interconnected in the future and are served by the same staff. By preparing one plan for all Regions, it gives the District a clear picture of how groundwater can be best managed and the kinds of water conservation practices that can be used to conserve water.

1.3 Development Process for the 1995 Plan

The Waterworks and Sewer Maintenance Division of LACDPW prepared this Urban Water Management Plan. It will be adopted by the County Board of Supervisors as the governing body of the County Waterworks Districts in January 1996 (see Appendix F). The plan will be submitted to the California Department of Water Resources within 30 days of Board approval.

1.4 Coordination with Local Agencies

The District is a member of the Antelope Valley Water Group (AVWG), which was formed in 1991 to provide a means of communication for Valley agencies with an interest in water. Other water group members include the Cities of Palmdale and Lancaster, Edwards Air Force Base, the County Sanitation Districts of Los Angeles County, and the various water agencies in the Valley. In an attempt to prepare a water resource study of regional focus, the AVWG initiated the Antelope Valley Water Resources Study. Prior to adopting to final draft of the report, public meetings were held throughout the Antelope Valley. They were well publicized in the Antelope Valley newspapers and well attended. The Group has agreed to continue to maintain a dialogue to resolve differences over water issues. Further, this plan is based on the current general plans of the County and the Cities of Lancaster and Palmdale.

1.5 Format of Report

The chapters in this plan correspond to the outline presented in the California Water Code, specifically Section 10631, 10632, and 10633.

The elements in Section 10631 are required plan components for all water utilities. The elements in Section 10632 are required in plans prepared by agencies that will have a "need for expanded or additional water supplies." The elements in Section 10633 are required to discuss the impacts of implementing the alternative management practices discussed in Section 10631 and 10632. Because the District anticipates an increasing demand for water within its service area, this plan incorporates the requirements of Section 10632 and 10633.

Following this introduction, Chapter 2 describes water demand. Chapter 3 describes current

conservation measures. Chapter 4 and 5 identify the water supplies available and water pricing structure. Finally, Chapter 6 and 7 discuss drought management programs and alternative water conservation practices. Table 1-1 describes the individual chapters and the way in which they correspond to the specific provisions of the Act.

**Table 1-1
Summary of Suggested Plan Chapters and Corresponding Provisions of the Act**

Chapter/Heading	Corresponding Provisions of the Act
1. Introduction	10632 (b): Plan preparation, coordination with local water, wastewater, and planning agencies
2. Water Demands	10631 (a) & (e): Past, current, projected potable and recycled water use; breakdown of water uses 10632 (a)(1): Recycled water
3. Implemented Water and Reclaimed Water Conservation Programs	10631 (b)(1): Reclamation measures currently adopted and being practiced. 10631 (m): Community involvement for water management planning
4. Water Supplies	10632 (a)(2): Exchanges or transfer of water on a short term or long term basis 10632 (a) (3): Management of water system pressures & peak demand
5. Water Pricing and Rate Structures	10632 (a)(7): Change in pricing, rate structure & regulations
6. Management Response During Drought and Other Emergencies	10631 (e)(2~9): Provide an urban water shortage contingency Plan 10631 (f): Frequency & magnitude of supply deficiencies 10631 (k): Actions and plans to enforce conservation
7. Preliminary Evaluation and Implementation of Alternative water Conservation Practices	10631 (c): Alternative conservation measures 10631 (d): Schedule of implementation (of proposed actions) 10631 (g): Methods of evaluate effectiveness of the conservation measures 10631 (h): Steps necessary to implement proposed action 10631 (i): Findings actions and planning relating to water conservation management activities 10631 (j): Encourage recirculation of water 10631 (l): Water savings from conservation measures by user group 10632 (a)(4): Meter retrofitting for all water uses 10632 (a)(5): Incentives to alter water use practices 10632 (a)(6): Public information and educations programs 10633: Alternative water management practices

CHAPTER 2

WATER DEMANDS

This chapter summarizes the past, current, projected, and reclaimed water demands in the District to provide a frame of reference about the size of the water utility and its potential for water conservation through reclaimed water use.

2.1 Potable Water Demand

The 1995 population in the District was 128,700, which corresponds to an annual total system demand for potable water of 43,244 acre-feet (AF). The volumes and percentages of water used by customer types are presented in Appendix D which illustrates percent-disaggregated water use by system or region throughout the District. The majority of water users in the service area are residential with some commercial and industrial. Table 2-2 and Figure 2-2 show the past and projected groundwater and purchased water use in the District. The projected population increase and water demand for each Region are tabulated by the type of water use in Appendix E (i.e., single family residential, multi-family residential, commercial/institutional, industrial, landscape irrigation, and others).

It should be noted that the Antelope Valley Water Resources Study (see Section 4.6) estimates a higher population than used in this report. For example, it estimates the District's water demand in 2010 to be 135,000 AFY, as compared to the estimated demand of 86,469 AFY shown in Table 2-2. The water resources study does not take into consideration the flattening of the population curve that has occurred during the 1990s as development has slowed down. The District agrees with the 135,000 AFY demand, but feels that it will take place at a later date. Note that the sum of the purchased water and groundwater in 1991 and 1992 is less than it was in

Table 2-2

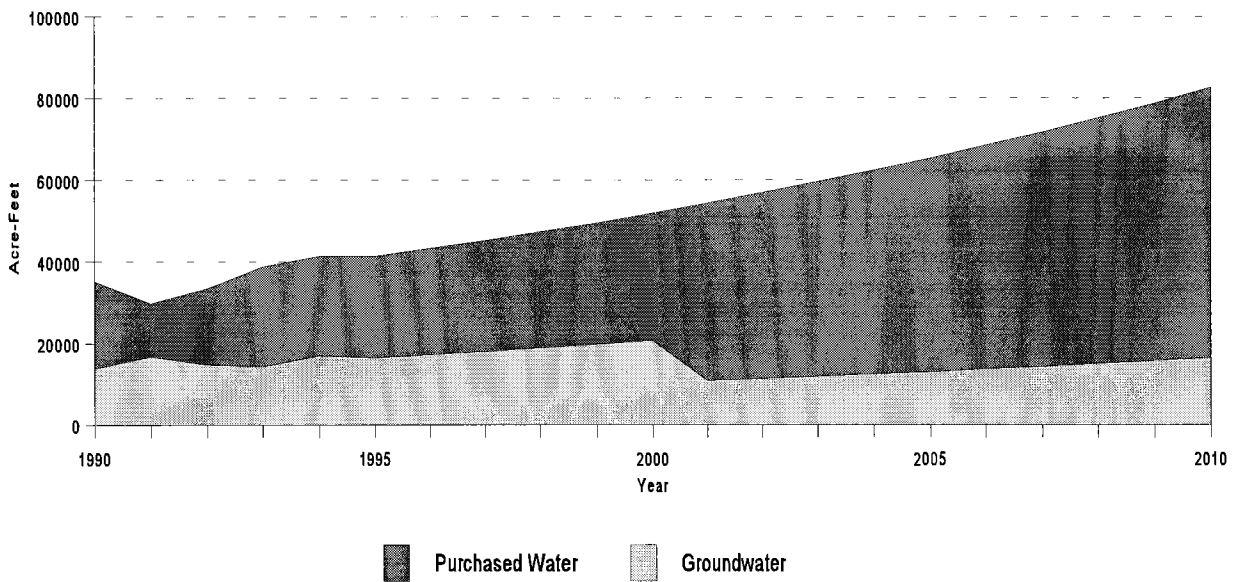
**Los Angeles County Waterworks District No. 40, Antelope Valley
Summary of Historic and Projected Groundwater and Purchased Water Use**

Year	Ground-water	Purchased Water	Ground-water	Purchased Water	Total Water Use	
	Ac-Ft/Year		Percent Use		Ac-Ft/Year	
1990	13,897	21,232	39.6%	60.4%	35,129	Historic Use
1991	16,793	12,943	56.5%	43.5%	29,736	
1992	14,755	18,704	44.1%	55.9%	33,459	
1993	14,357	24,409	37.0%	63.0%	38,766	
1994	17,011	24,329	41.1%	58.9%	41,340	
1995	17,298	25,946	40.0%	60.0%	43,244	
1996	18,102	27,153	40.0%	60.0%	45,255	
1997	18,947	28,420	40.0%	60.0%	47,367	
1998	19,833	29,749	40.0%	60.0%	49,582	
1999	20,763	31,144	40.0%	60.0%	51,907	
2000	10,869	43,477	20.0%	80.0%	54,346	
2001	11,381	45,525	20.0%	80.0%	56,906	
2002	11,919	47,675	20.0%	80.0%	59,594	
2003	12,483	49,930	20.0%	80.0%	62,413	
2004	13,074	52,297	20.0%	80.0%	65,371	
2005	13,695	54,782	20.0%	80.0%	68,477	
2006	14,347	57,389	20.0%	80.0%	71,736	
2007	15,031	60,126	20.0%	80.0%	75,157	
2008	15,749	62,998	20.0%	80.0%	78,747	
2009	16,503	66,012	20.0%	80.0%	82,515	
2010	17,294	69,175	20.0%	80.0%	86,469	

Source: Water projection based on population projection from the Los Angeles County Dept. of Regional Planning

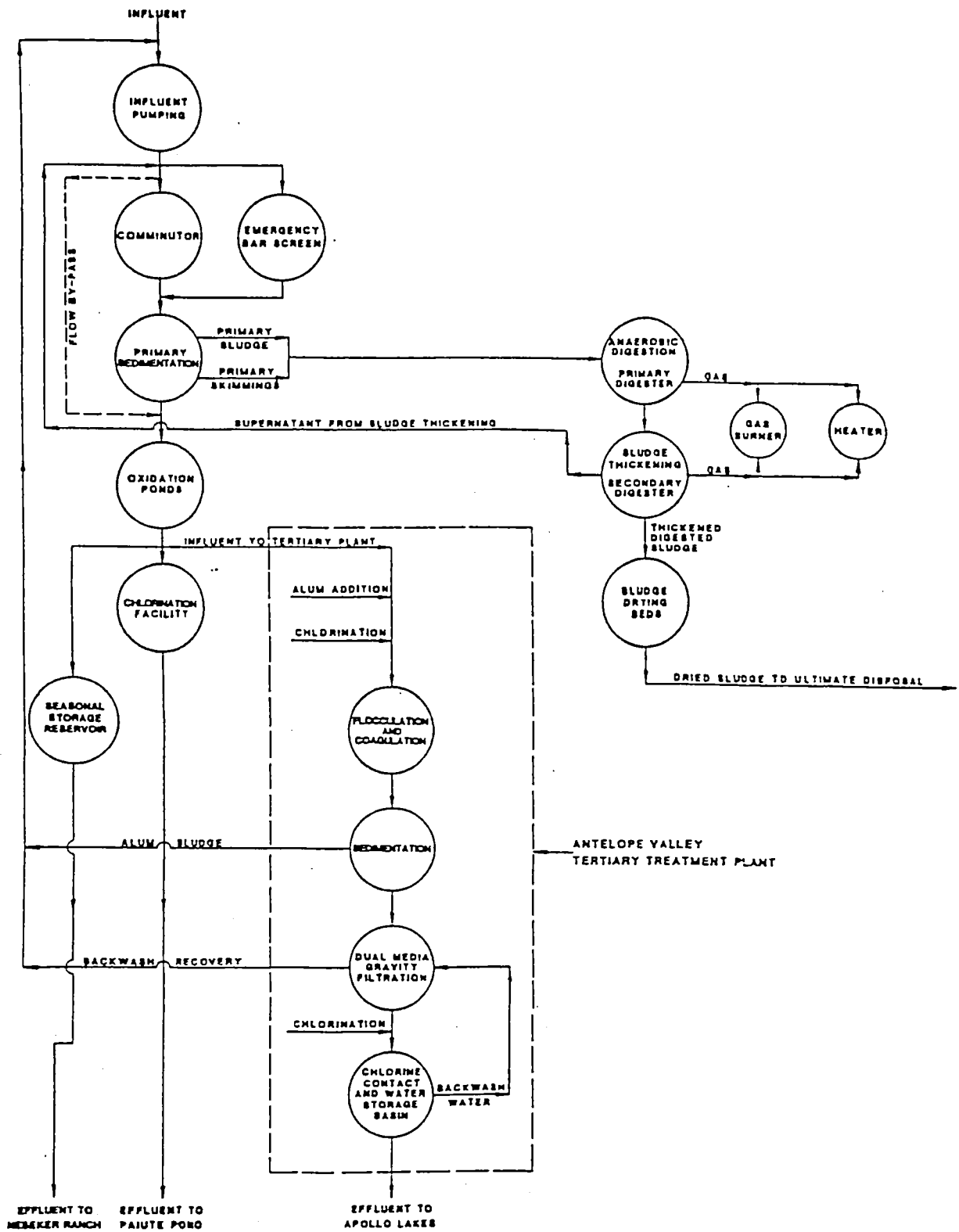
1990. This is a result of conservation efforts which were triggered by the 1987-1992 drought. For more details on projected water uses by service area, see Appendix E. The District currently uses about 60 percent imported water and 40 percent groundwater. The overall goal of the District is to utilize 80 percent imported water from AVEK and 20 percent groundwater. As a result, although the District’s water demands will almost double over the next 15 years, groundwater extractions will remain about the same.

FIGURE 2-2
HISTORICAL AND PROJECTED WATER SUPPLY - DISTRICT 40



2.2 Reclaimed Water Demand

Currently, reclaimed water is mainly used by some agricultural and landscape irrigation and wetlands in the District. However, small parks, schools, golf courses, and farms are also being considered as potential reclaimed water users. There are eleven wastewater treatment facilities in the Antelope Valley and eight of them produce reclaimed water. Among these facilities, only the



Source: County Sanitation Districts of Los Angeles County

FIGURE 2-3
Lancaster WRP Schematic

County Sanitation Districts of Los Angeles County (CSDLAC), District 14-Lancaster Water Reclamation Plant (WRP) provides reclaimed water within the District. Also it is the only facility in Antelope Valley supplying tertiary treated water. The total capacity of the plant is 10.0 million gallon per day (mgd). It is designed to produce only 0.6 mgd of tertiary treated water, with the remainder of the plant's influent being treated only to a secondary treatment level. A schematic of the plant's process is presented on Figure 2-3. Undisinfected secondary effluent from the WRP is used for irrigating farmland. Tertiary quality effluent is used at Apollo Lakes County Park for lake and irrigation use and at the Fox Air Field facility for irrigation and fire suppression. The remaining effluent is disinfected and then discharged into Paiute Ponds. To accommodate anticipated growth in the Antelope Valley, CSDLAC is planning to expand the plant to a total capacity of 16.0 mgd in 1996.

Wastewater Flow

Average daily flow rate for the WRP during the period from 1970 through 1992 steadily increased. The historical flow rates are summarized in Table 2-3 and depicted on Figure 2-4. The projected flows to the year 2020 are also depicted on Figure 2-4. This is provided by CSDLAC and based on the adopted 1989 Growth Management Plan in the Air Quality Management Plan (AQMP/GMP) by the Southern California Association of Governments (SCAG). The other projections on Figure 2-4 were developed based on the medium population projections for the Cities of Palmdale and Lancaster and the wastewater flow per capita in the AQMP/GMP. The SCAG projections are shown for comparison purposes only. Based on the medium projections developed for this study, the average daily wastewater flow in the year 2020 is estimated to be 29.8 mgd for the Lancaster WRP.

It is important to consider seasonal wastewater flows rather than average daily flows when developing a reclaimed water system, because reclaimed water demands typically peak in the summer months and are minimal in the winter months. Figure 2-5 presents the projected 2020 seasonal flow patterns for the Lancaster WRP. The 2020 patterns were developed based on the current seasonal flow patterns.

TABLE 2-3**Historical Average Daily Wastewater Flows**

Year	Palmdale WRP (mgd)	Lancaster WRP (mgd)	Rosamond WRP (mgd)	Edwards AFB WRP (mgd)
1970	1.1	3.2	NA	NA
1971	1.3	3.6	NA	NA
1972	1.3	3.7	NA	NA
1973	1.6	4.0	NA	NA
1974	1.6	3.9	NA	NA
1975	1.6	4.0	NA	NA
1976	1.6	4.0	NA	NA
1977	1.6	3.8	NA	NA
1978	1.7	3.8	NA	NA
1979	1.8	4.3	NA	NA
1980	1.9	4.7	NA	NA
1981	2.1	4.8	NA	NA
1982	2.2	4.9	NA	NA
1983	2.4	5.3	NA	NA
1984	2.8	5.7	NA	NA
1985	3.3	5.5	0.3	1.3
1986	3.8	5.8	0.3	1.3
1987	4.6	6.2	0.4	1.3
1988	4.8	6.5	0.4	1.7
1989	6.4	7.7	0.6	1.7
1990	7.2	8.3	0.7	1.7
1991	7.9	8.1	0.7	1.7
1992	7.4	8.4	0.7	1.7

NA: Not Available

Source: Antelope Valley Water Resource Study, 1995

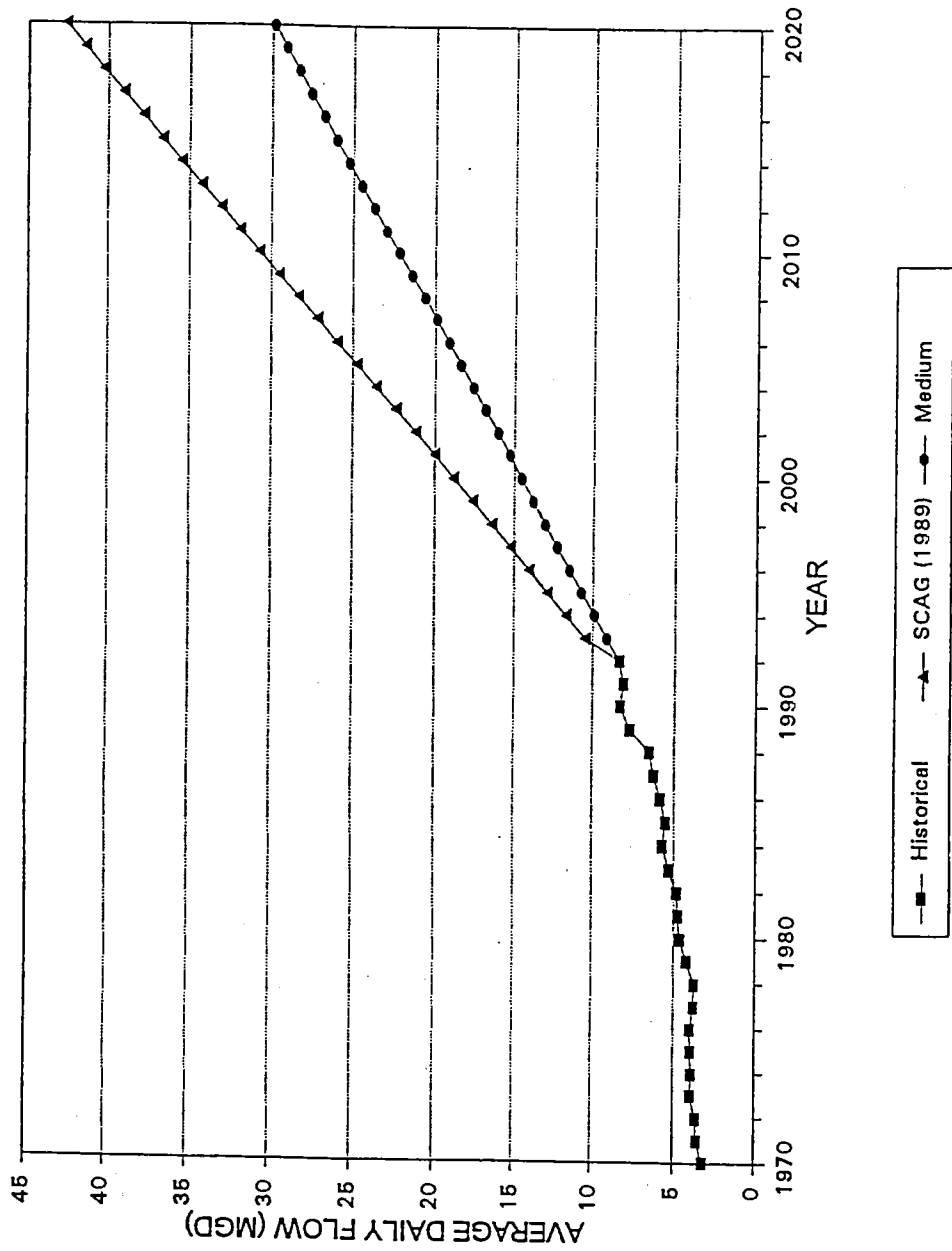


FIGURE 2-4
 Historical and Projected Flows
 Lancaster WRP

Source: Antelope Valley Water Group, 1995

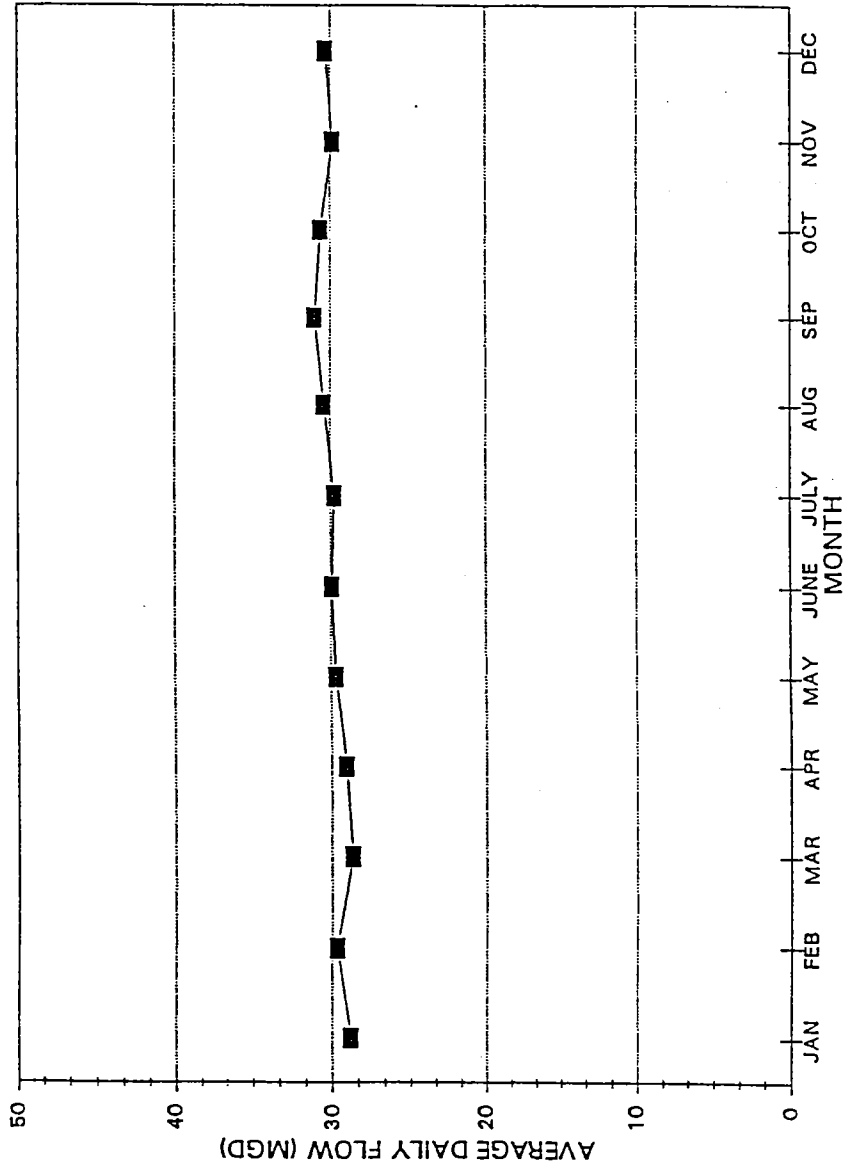


FIGURE 2-5
 Projected 2020 Seasonal Flows
 Lancaster WRP

Source: Antelope Valley Water Group, 1995

CHAPTER 3

IMPLEMENTED WATER AND RECLAIMED WATER CONSERVATION PRACTICES

This chapter summarizes the District's ongoing water conservation programs. The Los Angeles County Waterworks Districts are engaged in two conservation programs, as discussed below in Section 3.1 and 3.2. As described in Chapter 7, the California Urban Water Conservation Council (CUWCC) has been promoting specific water conservation practices (i.e., Alternative Water Conservation Practices-AWCPs) throughout California. These practices have received acceptance locally and statewide by being included in California Water Code.

Of the applicable 15 AWCPs, the District is currently implementing five. The remaining practices are scheduled to be evaluated and potentially implemented (see Chapter 7, Section 7.3 Proposed Implementation Schedule of AWCPs).

3.1 Water Conservation Practices

The District has implemented a broad array of water conservation activities which include public education, appliance retrofits, and institutional revisions. Following is a discussion of these activities.

3.1.1 Public Information & Education

Public information and education outreach continues to be a popular and effective means of encouraging consumers to use water efficiently. There are four separate public education AWCPs in the District. The primary goals of these programs are to educate consumers in the benefits and methods of water conservation and to provide them with information on how to

conserve water.

Distribution of Water Conservation Literature

The District has distributed many brochures, book covers, pamphlets, decals, and bumper stickers that deal with a variety of water issues. These are provided at no charge to the public. Table 3-1 lists the brochures that are directly related to water conservation. Furthermore, the annual water quality reports for each system in the District provide information on the need for conservation, landscaping, and water conservation approaches.

Billing Inserts

The District has modified its billing format to compare current water usage with the historical usage of the same billing period of the previous year on each customer's bill to increase the customer's awareness of water use patterns.

School Education

The District has been providing at no charge water conservation materials such as poster board signs, brochures, decals, car bumper stickers, and book covers to the Lancaster School District and other organizations such as the Boy Scouts of America.

3.1.2 Retrofit Programs

The District sponsored two retrofit programs. These are a low-flow showerhead distribution program and a toilet-tank volume reduction program. However, these programs are not currently in effect.

Table 3-1	
Water Conservation Literatures	
Title	Contents
“Be Water Tight, 25 Ways to Save Water”	A brochure that presents 25 ways to save water in a residence, both indoors and outdoors.
“Take a Day Off”	A brochure that provides a quick reference for homeowners on efficient irrigation practices based on climate zone and evapotranspiration rates.
“Colorful Landscapes for Water Conservation”	A full-color booklet which displays water efficient plants. The brochure shows that low-water-using plants can be colorful and pleasing while being water efficient. The brochure also provides a sample layout of residential landscapes.
“How to Read Your Water Meter”	A brochure that teaches how to read a water meter so the customers can monitor their water consumption.
“The Top Ten Tips for Saving Water”	A brochure that presents 10 ways to save a significant amount of water and 26 more ways to save additional water in a residence, both indoors and outdoors.

3.1.3 Institutional Revisions for Water Conservation

The District has facilitated and supported the enactment of local ordinances and the revisions of policies to encourage water conservation. Three specific policies that affect the District are summarized below.

Building and Plumbing Code Revisions

On January 1, 1978, California passed a law requiring the installation of low-flush toilets in new hotels, motels, apartment buildings, and dwellings. The State of California Energy Commission established regulations on January 1, 1980 that require the installation of low flow showerheads and faucets in new construction. This legislation, establishing flush volume limits, was enacted

in 1982. All of these laws have been incorporated in the State Building Code and are being enforced. The California legislature adopted AB 2355 (Filante), which requires all new construction after January 1, 1992 to install low-flow toilets (1.6 gallon-per-flush). These regulations are expected to reduce the use of water in the interior of buildings.

For new development, at least one house in each model home display must be landscaped with water-efficient plants and irrigated with appropriate water-conserving irrigation systems.

The landscaping for these models must have the following:

- Drought-tolerant plant material
- Turf areas must comprise no more than 30 percent of the area landscaped
- The model home display must draw attention to the specific landscape material and irrigation techniques used

City of Lancaster Water Conservation Landscaping and Graywater Ordinances

The City of Lancaster adopted Ordinance No. 629 in December 1992. This ordinance was adopted to minimize water use on landscaping by specifying acceptable water saving irrigation systems and low water-use plant materials. The specifications apply to all new and rehabilitating (including developer installed) landscape development projects, both public and private.

Cemeteries, registered historical sites, and projects with a landscaped area of less than 1,000 square feet are exempt from the ordinance.

The City of Lancaster also has provisions for graywater use in its municipal plumbing code, Ordinance No. 604. The provisions apply to the construction, alteration and repair of existing graywater systems and to the installation of new systems (allowed in residential occupancies only).

City of Palmdale Water Conservation Landscaping Ordinance

The City of Palmdale adopted Ordinance No. U-992 in February 11, 1993. This ordinance was adopted to minimize water use on landscaping by specifying acceptable water saving irrigation systems and low water-use plant materials. The specifications apply to all new and rehabilitating (including developer installed) landscape development projects, both public and private. Cemeteries, registered historical sites, homeowner-provided landscaping at single-family and multi-family projects, ecological restoration and mined-land reclamation projects that do not require permanent irrigation systems, and any projects with a landscaped area of less than 1,500 square feet are exempt from the ordinance.

County Water Conservation Landscaping and Graywater Ordinances

On December 17, 1992, the County of Los Angeles adopted Ordinance No. 92-0135, landscaping in compliance with the Water Conservation in Landscaping Act (AB325). The ordinance establishes a procedure for designing, installing, and maintaining water efficient landscapes in new and rehabilitated projects. On September 26, 1991, the County Board of Supervisors adopted an ordinance for Graywater Systems for Residential Occupancies. This applies to construction, alteration, and repair of graywater systems for on-site underground irrigation of trees and other deep-rooted plants. Both ordinances apply only to the unincorporated areas of the county.

3.2 Reclaimed Water Program

As described in Chapter 2, Apollo Lakes County Park and Fox Air Field are the only facilities that use reclaimed water in the District. The water comes from the County Sanitation District of Los Angeles County (CSDLAC), Lancaster Water Reclamation Plant. The Tertiary treatment is used to ensure quality reclaimed water to its customers. For more details see Chapter 2.

CHAPTER 4

POTABLE WATER SUPPLIES

Water supplies for the District are obtained from both local and imported sources. Local groundwater comprises approximately 40 percent of the District's current water demand. Imported water is purchased from AVEK, which provides the remaining 60 percent of the District's water demand. Except for emergency interconnections with some retail agencies, there are no water exchange or transfer programs on a short-term or long-term basis because the Antelope Valley Groundwater Basin is not adjudicated.

4.1 County Waterworks District Act

The Los Angeles County Waterworks District No.40 was formed in accordance with Division 16 Sections 55000 - 55991 of the State Water Code. The District is governed by the Los Angeles County Board of Supervisors with the Waterworks and Sewer Maintenance Division of the County Department of Public Works providing administration, operation, and maintenance of the District's facilities. The principal Act, among other things, authorizes the District to supply its inhabitants with water for irrigation, domestic, industrial, and fire protection purposes, and to acquire and conserve water from any source.

4.2 Groundwater Supply

Based on the various studies conducted by the U.S. Geological Survey (USGS) and the State of California Department of Water Resources, the Antelope Valley Groundwater Basin consists of the principal or upper aquifer from which most of the water is currently being extracted from the

deep aquifer. The groundwater basin has a storage capacity of approximately 68,000,000 AF ⁽¹⁾⁽²⁾ of which approximately 13,000,000 acre-feet has been extracted leaving approximately 55,000,000 AF of water available in storage. However, not all of this water can be economically extracted. The basin has an annual natural recharge from the watershed area varying from a minimum of 40,700 acre-feet per year (AFY) to a maximum of 76,000 AFY, or an average of about 58,000 AFY ⁽¹⁾⁽²⁾⁽³⁾⁽⁴⁾. The Antelope Valley Water Resources Study (see Section 4.6) generally considered the recharge amount to be 59,100 AFY.

Due to past water extractions primarily for agricultural purposes, pumping has exceeded the natural recharge. The groundwater extractions between 1926 and 1972 resulted in the overdrafting of the aquifer that caused the groundwater levels to drop 200 to 300 feet or an average of 4 to 6 feet per year. This overdrafting produced substantial ground surface settlement and sink holes in the Lancaster area. It also caused groundwater pumping depressions in several areas of the Antelope Valley. Loss of water production in many wells has occurred in some areas of the groundwater basin. With the completion of the State Water Project in the 1970s and the reduction of agricultural activity, groundwater extractions have been reduced. This has stabilized groundwater levels in some areas of the Valley. Some District wells have actually shown a rise in groundwater levels. Due to agriculture water demands, groundwater extractions (for the Los Angeles County portion of the Valley) increased from 29,000 AF in 1919 to approximately 400,000 AF in 1950. This was followed by a decline to 53,000 AF in 1983. However, due to increasing urban development, extractions have increased to a high of 92,000 AF in 1992. In any event, groundwater extractions exceed the natural recharge of the basin.

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- (1) Department of Water Resources, "Preliminary Evaluation of State Water Project Groundwater Storage Program Antelope Valley," dated February 1979.
 - (2) Department of Water Resources, "Planned Utilization of Water Resources in the Antelope Valley," dated October 1980.
 - (3) U.S. Department of Interior, Geological Survey, Water Resource Division, "Water Resources of the Antelope Valley," dated 1967.
 - (4) U.S. Department of Interior, Geological Survey, Water Resource Division, "Calibration of a Mathematical Model of the Antelope Valley Groundwater Basin, California," dated 1976.
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In addition, the Antelope Valley Groundwater Basin is not adjudicated and existing pumpers and overlying landowners have correlative water rights in the basin and may pump without limit, so long as the water is being put to a beneficial use. To safeguard the basin and provide a reliable water supply for the present and future inhabitants of the area, there is a need to develop a program to manage the groundwater basin to bring extractions more in line with the perennial yield of the basin.

4.3 Imported Water Supply

Water is imported into the Antelope Valley via the State Water Project (California Aqueduct). In the Valley it is contracted by AVEK, Palmdale Water District and Littlerock Creek Irrigation District. The latter two districts are retail purveyors and have contracts with the State Department of Water Resources for imported water for their own use. District 40 purchases its water supply from AVEK. The present entitlement of the State Water Project (SWP) are as follows:

Table 4-1 Antelope Valley State Water Project Entitlement	
Agency	Entitlement (AFY)*
AVEK	138,000
Palmdale Water District	17,300
Littlerock Creek Irrigation District	2,300
Total	157,600

* Acre-Feet Per Year

The delivery of these water entitlement varies according to hydrologic and environmental

conditions in the state. It is also affected by the fact that the State Water Project conveyance facilities have not been completed. The source reliability according to the Antelope Valley Water Resources Study is as follows:

- 50 percent probability of getting at least 76 percent of potential supply (116,800 AF).
- 80 percent probability of getting at least 50 percent of potential supply (77,000 AF).
- 90 percent probability of getting at least 36 percent of potential supply (46,200 AF).

Hence, this vital source of imported water will provide only 36 percent of the full entitlement 90 percent of the time. To firm up this water supply, it is necessary to provide seasonal storage or long-term storage facilities. Environmental and economical constraints prohibit the construction of surface storage facilities, and studies have shown that surface percolation through spreading grounds is not feasible. However, various case studies and preliminary studies conducted by District 40 indicate that it would be feasible and economical to implement a direct injection or Artificial Storage and Recovery (ASR) Program (See section 4.6). In addition, the State Department of Water Resources should be actively encouraged to complete the State Water Project to increase the reliability of the water conveyance system.

To keep AVEK apprised of its needs, the District annually submits a seven-year estimate of purchased imported water needs. As shown in Table 2-2, these demands are expected to increase from 24,796 AFY in 1995 to 66,012 AFY in the year 2010. This takes into consideration the District goal of increasing its use of imported water from the current 60 percent to 80 percent, to reduce demands on the groundwater supply.

4.4 Reclaimed Water Supply

As described in Chapter 2, CSDLAC supplies reclaimed water to Apollo Lake County Park and Fox Air Field. Due to the anticipated population increase and increasing awareness of water conservation, the future use of reclaimed water is expected to increase. According to the Antelope Valley Water Resource Study (see Section 4-6), the reclaimed water supply is projected to increase from 20,900 to 83,700 AFY between 1993 and 2020. Five-year projections are shown in Table 4-2. Although the supply may change seasonally, due to the amount of wastewater generated, it is a predictable and reliable source.

Year	Volume (acre-feet)
1993	20,900
1995	23,162*
2000	29,948*
2005	38,721*
2010	50,065*
2015	64,732*
2020	83,700

Source: Antelope Valley Water Resource Study

*based on uniform annual growth percentage.

4.5 Quality of Water Supply

According to the Antelope Valley Water Resources Study, the water quality of the Antelope Valley Groundwater Basin is generally good. The District administers a groundwater quality monitoring program to ensure compliance with Federal and State drinking water standards. The purchased water provided to the District by AVEK also complies with both Federal and State drinking water regulations.

Because of the more stringent water quality standards in recent years, the District has a multi-phase program to install chlorination stations at various well sites in the Valley. The first phase of this program was completed in 1995. This will assure the presence of a disinfectant residual (chlorine) throughout the District's distribution system.

In October 1995, the state enacted legislation requiring the fluoridation of water in systems with more than 10,000 service connections. This affects the Lancaster-West Palmdale portions of the District (Regions 4 and 34). Although the law is effective on January 1, 1996, it is conditioned on the availability of funding from sources other than the retail water purveyor for both capital, and operation and maintenance costs. The first step is to submit a cost estimate to the State Department of Health Services (DHS) which is due in July 1996. DHS is also developing the regulations that will apply for implementing a fluoridation program. To date, a source of funds has not been made available.

Other Federal regulations are currently being considered that could have an impact on the District. These include the potential reduction of maximum allowable levels of arsenic and radon. Both are present in the basin's groundwater; however, both are well within existing State and Federal standards.

4.6 Water Supply Management Programs

Management of Water System Pressures and Peak Demands

The District is committed to operate its system to meet customer needs at all times. This includes providing customers with a minimum pressure of 40 psi at all times. Because of the availability of two sources of water supply (groundwater and imported AVEK water), the District has the capability of providing a supply of groundwater with minimal interruption in service or loss of pressure during times when the aqueduct is out of service due to an emergency or for repairs. However, due to the extremely high demands during summer months, it is necessary to request customers to conserve in order to avoid loss of pressure in some areas.

The District is currently developing a Master Plan of facilities, which should be completed by June 1996. This plan will help the District identify where to construct additional storage facilities, water mains and other facilities to assure that the system operates in an optimum manner under all reasonable conditions. The District generates approximately \$4 million per year in revenues dedicated for capital improvements to upgrade the system for existing customers. Additional facilities will be required to meet the District's anticipated growth demands. The Master Plan of facilities will identify where to place these facilities. Additional facilities that are required to support new customers, will be financed entirely by developers and not existing customers.

Antelope Valley Water Resources Study

The District is a member of the Antelope Valley Water Group (AVWG), which was formed in 1991 to provide a means of communication for Valley agencies with an interest in water. Other AVWG members include the Cities of Palmdale and Lancaster, Edwards Air Force Base, AVEK, Antelope Valley United Water Purveyors Association, Palmdale Water District, Rosamond Community Services District and the County Sanitation Districts of Los Angeles County. In an

attempt to prepare a water resource study of regional focus, the AVWG initiated the Antelope Valley Water Resources Study. The study was conducted by USGS and Kennedy/Jenks Consultants. Members of the group contributed toward the cost. The final draft of the study has been completed and four public meetings were held throughout the Valley to receive public input on the document. The Group has approved the final draft. The final report is forthcoming.

The study concluded that imported State Water Project water and reclaimed water are not being utilized at their full capacity. Based on water supplies in the Antelope Valley, the probability of meeting the Valley's 1993 demands without exceeding the natural annual groundwater recharge amount of 59,100 AFY, is approximately 73 percent. As the population of the Valley increases, the probability of meeting the basin's demands will decrease each year until it reaches zero, unless additional water management programs are implemented. Currently, water purveyors compensate for the lack of supply reliability by increasing their groundwater extractions.

The study made several recommendations, including the following:

- Create a framework to manage the development and use of water supplies - There is no formal management of the basin's water supplies, except as is being done by local agencies on their own. The study recommends the creation of an agency through the Groundwater Management Act (AB 3030), or through special act legislation to create a groundwater management agency. The AVWG has agreed to continue meeting to maintain a dialogue and to work toward resolving the Valley's water resource management issues.
- Develop a program to optimize the use of available water supplies - To optimize the use of State water, groundwater extractions should be reduced to natural recharge. In lieu of groundwater, other supplies should be utilized as much as possible. Priority should be given to the utilization of supplies that may be lost due to non-use, such as imported State

water during wet years or winter months, and reclaimed water. The source which could be better utilized is the imported State water. When State water is available, it should be fully utilized, thereby reserving groundwater for periods of reduced State water deliveries. If the direct use of these resources cannot be accomplished, facilities should be constructed to recover and store them in the underground aquifer.

- Develop water conservation, reclaimed water and aquifer storage and recovery programs - Water conservation and reclaimed water programs are covered elsewhere in the plan. District 40 proposes to implement an aquifer storage and recovery program. This is discussed in the next section.
- Actively encourage the California Department of Water Resources to complete the State Water Project and/or improve its reliability - The State Water Project has never been completed and proposed projects have met with strong resistance from environmentalists and interests opposed to exported water from Northern California to Southern California. In addition, the reliability of the imported water has undergone significant changes primarily as a result of environmental concerns in the Bay-Delta. It is recommended that Valley water agencies continue to monitor the development of Bay-Delta protection plans and encourage the development of consistent operating procedures for Delta water exports. The recently approved Monterey agreement will assist in this objective.
- Obtain additional imported water supplies - Notwithstanding the aforementioned ways to enhance and manage the Valley's available water supplies, AVEK should make every effort to obtain additional imported water supplies. The probable source of these supplies will be other state water contractors.

Artificial Storage and Recovery Study (ASR)

In 1988, LACDPW completed a study on the feasibility of recharging the Antelope Valley

groundwater basin with untreated imported State water using surface spreading grounds, similar to those utilized along the San Gabriel River in the Metropolitan County area. The study determined that the only viable locations were located along the fringes of the basin away from the existing well fields and at higher elevations. These recharge areas would also be some distance from the imported water supply. Due to high costs, surface recharge is not viable at this time. However, the study concluded that an ASR program through well injection might be a more effective way of recharging the basin. In 1994, USGS, AVEK and the District conducted aquifer interference tests within a pumping depression located beneath the District's well field in Lancaster. A total of 118 AF of treated State water donated by AVEK was injected into the aquifer. These tests indicated that an ASR program is feasible. However, it was also determined that injection tests caused measurable changes in land surface elevations. A demonstration project is the next step in the development of a full-scale ASR program.

USGS, AVEK and the District have agreed to implement a demonstration project to provide the information necessary to prepare environmental documents and to design and implement a full scale ASR program. The proposed demonstration project will inject a maximum of 3,000 AF of imported State water (treated to drinking water standards) into the aquifer in two or three injection and recovery cycles. The project will consist of the following elements:

- Analysis of land surface elevation changes observed during the 1994 injection tests.
- Setting up a monitoring network to measure land surface elevation changes, storage capacity and the degree of recovery expected from and ASR program.
- Development of an aquifer model as an ASR management tool.

A complex system of monuments has been set up to measure changes in ground surface elevations during the injection cycles. The monuments will also serve as microgravity stations to

measure water level changes.

Water quality samples will be taken and analyzed before, during and after injection/recovery cycles to evaluate the effect, if any, of the injected water on the quality of the groundwater. The injected water will be contained within the pumping depression.

Implementation of an ASR program is a cost-effective and efficient way of maximizing an area's available water supply. It will firm up the District's water supply for existing and future customers. A full-scale ASR program utilizing the pumping depression under Lancaster will directly benefit District customers and will indirectly benefit the entire Valley by reducing the District's dependence on the groundwater basin.

CHAPTER 5

WATER PRICING AND RATE STRUCTURES

District 40 charges for water service to customers of the District. These charges are based on the financial requirements to effectively deliver a continuous supply of safe and potable water at reasonable prices. However, the charges and water rates vary between regions.

Retail Water Rates

The District obtains its revenue from four separate charges: Service Charge, Water Quantity Charge, Facility Surcharge, and the Water Availability Standby Charge.

The Service Charge is a bi-monthly charge on all open accounts and is based on the size of the meter. Larger meters are assessed a larger Service Charge. The charge includes a minimum allotment of 500 cubic-feet of water (approximately 125 gallons per day) at no extra cost. Larger meters are provided higher Service Charge allowances, and water usage in excess of the service charge allowance is assessed a Quantity Charge. Revenues generated by the Service and Quantity Charges are deposited in the District's General Fund and are used to operate and maintain the District's water delivery system. The Service and Quantity Charges for the District are shown in Table 5-1. The differences in Service and Quantity Charges is due to the cost to maintain each Region's system and the cost of pumping the water into the higher elevations (zones).

There is a Facility Surcharge assessment of \$0.05 per 100 cubic-feet of water sold in Region 4 only. These revenues are used to upgrade the District's facilities. The Water Availability Standby Charge is levied on all property within the District excepting Region 35. The charge varies from \$6.00 to \$30.00 per parcel or acre per year, depending on the property's proximity to a District water main. There is no Standby Charge in Region 35. This charge appears on the

**Table 5-1
Summary of Water Prices**

Region	Zone	Monthly Service Charge	Quantity Charge (per ccf*)
4	2555' Zone	\$7.85	\$0.45
4	2615' Zone & 2696' Zone	\$7.85	\$0.48
4	2837' Zone	\$7.85	\$0.50
4	2892' Zone & 2910' Zone	\$7.85	\$0.51
4	2980' Zone & 3005' Zone	\$7.85	\$0.62
24	All	\$8.81	\$0.53
27	All	\$9.77	\$0.53
33	All	\$9.78	\$0.53
34	All	\$10.79	\$0.84
35	All	\$9.52	\$0.69
38	All	\$9.52	\$0.53
39	All	\$14.90	\$1.06
*ccf = 100 cubic feet (approximately 748 gallons)			

property tax bill. Revenues from the Facility Surcharge and the Water Availability Standby Charge are deposited in the District's Accumulative Capital Outlay Fund and are used to upgrade or construct new tanks, pumping stations, water mains and pressure regulating stations to improve water service to existing customers.

Water rates are set by the County Board of Supervisors as the governing board of the District. The Service and Quantity Charges are based on fiscal requirements for operation and maintenance costs, and rate increases are proposed when these expenditures exceed revenues. Rate increases are approved by the Board only after providing customer notification, holding public meetings within the affected communities, and holding a public hearing.

The District has retained the same charges and rates that were in existence prior to the consolidation of the District in November 1993. LACDPW is currently evaluating all of the charges and rates throughout the new consolidated District to assure consistency and fairness in the amount charged for District water service.

Purchased Water Rates

The District buys surface water conveyed from the Sacramento Delta via the California Aqueduct from AVEK. The wholesale water rates are set by the AVEK Board of Directors. The historic rates for purchased water are shown in Table 5-2.

Groundwater Rates

The District pumps water from Antelope Valley Groundwater Basin. The groundwater is free for the taking except for the cost to extract the water from the Basin. The Basin is not adjudicated, and there is no groundwater management agency to oversee the pumping from the Basin.

Anyone who has a permit to pump water can pump without limitations or extraction assessments except that the water must be put to a beneficial use.

Table 5-2
Historic Purchased Water Rates

Fiscal Year	Treated Water (Per Acre-Foot)
1987	\$135.00
1988	\$145.00
1989	\$155.00
1990	\$165.00
1991	\$190.00
1992	\$190.00
1993	\$190.00
1994	\$170.00
1995	\$170.00

CHAPTER 6

MANAGEMENT RESPONSE DURING DROUGHT AND OTHER EMERGENCIES

The Urban Water Management Act requires that an urban water shortage contingency plan be developed to allow agencies to respond effectively to drought and other water shortage emergencies. The District has developed and adopted a contingency plan called the “Phased Water Conservation Plan” to address a shortage in water supplies. This chapter identifies the potential for shortage in water supply, summarizes the actions outlined in the “Phased Water Conservation Plan,” and evaluates the effectiveness and financial impacts of the plan.

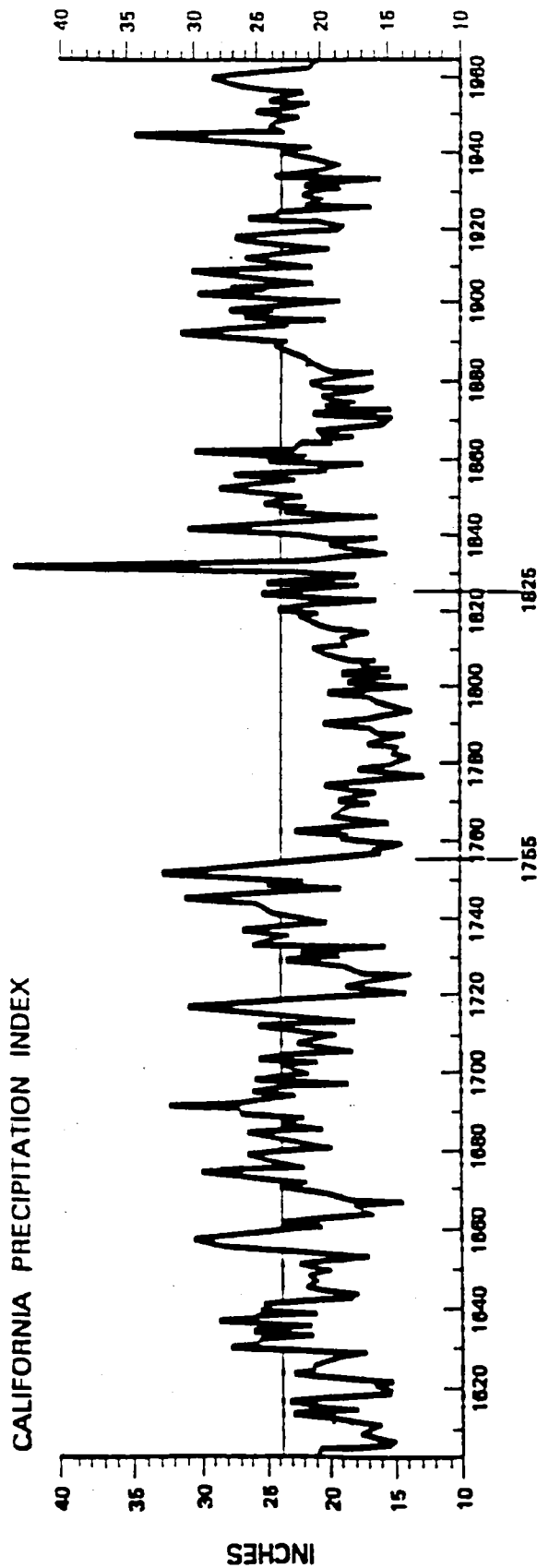
6.1 Drought History & Deficiencies

According to studies conducted at the University of Arizona’s Laboratory of Tree-Ring Research, which was funded by California Department of Water Resources (DWR), California has been more dry than wet. This is depicted on Figure 6-1, which is a reconstruction of California’s annual precipitation from the year 1600 to 1960.

Because of the enormous capacity of the groundwater basin, water purveyors have historically pumped more groundwater to meet their needs during periods of drought. However, because of the historical overdrafting of the basin and the resultant subsidence of the basin, it is imperative that purveyors take a more responsible approach to managing available water supplies to minimize the impact on the basin.

The most recent drought was experienced between 1987 and 1992. Because the drought was

FIGURE 6-1
Reconstructed Statewide Precipitation Index in Inches for California.
Mean Line Drawn for 1901 to 1963 Water Year Total, 23.82 Inches



Source: California Department of Water Resources

preceded by the wettest period in state history, State reservoirs were full and the impact of the drought was not really felt until 1990. The District's approach was to implement a "Phased Water Conservation Plan" to reduce the District's water demands and make up the difference by pumping more groundwater. To further mitigate this problem of overdraft, the District is currently conducting a joint Artificial Storage and Recovery (ASR) Demonstration Project with AVEK and the United States Geological Survey (see Section 4.6). If this proves to be feasible, the District will then be able to store sufficient treated imported water from AVEK in the groundwater basin during wet years or winter months, and withdraw it during a drought.

6.2 Potential for Water Shortage

The only firm water supply in the Antelope Valley is the groundwater supply. Imported water from the State Water Project may be reduced because of drought or it may be interrupted to make repairs or because of disaster. In 1991, for example, the State Department of Water Resources (DWR) reduced deliveries to only 20 percent of normal. Valley water agencies, including District 40, made up the difference by increasing their use of groundwater. It should be noted, however, that District 40 also imposed a conservation program which required customers to reduce water usage by 20 percent. Customers who exceeded specified goals based on historical usage were required to pay surcharges (see Section 6.4). District 40 was the only water agency in the Valley to take this step. The other agencies remained on voluntary conservation programs.

From time to time, the State aqueduct system requires repairs. To minimize the impact of these repairs on the delivery of water to contractors, DWR generally schedules the repairs during winter months when water demands are lowest. The State Water Project delivery system is also subject to disaster, such as earthquake. To date, no major interruption of imported water deliveries has occurred because of a disaster.

The Antelope Valley is very fortunate to have a vast groundwater supply to utilize as a primary source of water supply. However, steps must be taken to manage the groundwater basin to protect this valuable and essential resource from water quality problems and the problems associated with overdrafting, such as declining groundwater levels and settlement.

6.3 Phased Water Conservation Plan

The District's Phased Water Conservation Plan is contained in the "Rules and Regulations of the Los Angeles County Waterworks Districts and the Marina del Rey Water System." (see Appendix B.) The objective of the plan is to minimize the effect of a water shortage on District water users by encouraging customers to efficiently use the water resources. The plan accomplishes this by financially discouraging wasteful water use and encouraging water conservation.

The phased water conservation plan is comprised of a nine-stage (phased) approach that addresses an incremental increase in a water shortage. The plan is implemented when the Los Angeles County Board of Supervisors determines that the District will be faced with a specified water shortage and establishes a corresponding conservation target for the water users (Table 6-1). The conservation target is a percentage of a customer's historical usage or the District wide average (whichever is larger) during a "base" billing period set by the Board of Supervisors.

Table 6-1
Summary of Phased Water Conservation Plan
Targeted Conservation Goals for Water Users (%)

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9
Anticipated Shortage in Water Supply	10	15	20	25	30	35	40	45	50
Conservation Target as a Percent of Baseline Use	90	85	80	75	70	65	60	55	50

To discourage wasteful or unreasonable water use, a conservation surcharge is imposed for water use beyond targeted goals. A conservation surcharge of \$3.00 per 100 cubic-feet is imposed on water usage in excess of the target amount but less than the base amount. This increases the price of water used from between three and eight times the normal rate, depending on the Region (see Table 5-1). The baseline quantity amounts to the customer's actual water usage during the "base" billing period or the District average, whichever is higher. For water use in excess of the baseline quantity, the conservation surcharge of \$6.00 per 100 cubic-feet, which increases the price of water 6 to 16 times the normal rate. For example, if the Board of Supervisors declares a "Phase III" water shortage of 20 percent, a customer is charged the normal water rate for water usage up to 80 percent of the customer's baseline quantity. There is a \$3.00 per 100 cubic-feet surcharge for water usage between 80 percent and 100 percent of the baseline quantity. There is a \$6.00 per 100 cubic-feet surcharge for water used in excess of 100 percent of the baseline quantity. This surcharge is in addition to the normal Quantity Charges for water use.

In addition the Board of Supervisors reserves the right to install flow-restricting devices on individual violators if persistent violations occur. However, customers may appeal charges or their baseline quantities if they feel they are unjustified.

To encourage water conservation, the following additional measures may be incrementally imposed as stages of water shortage increase:

- New construction meters may not be issued.
- Water service (“Will Serve”) letters may be issued stating that no new permanent metering services will be issued until the water shortage has ended.
- Lawn, landscape, and turf watering may be restricted to every other day and not allowed between 10 a.m. and 5 p.m.
- Existing construction meters may be removed.
- During more critical droughts, lawn, landscape, and turf watering may be prohibited with tree and shrub watering allowed only by buckets.
- During more critical droughts, new permanent meters will not be installed.
- All landscape, turf, and lawn watering, including trees and shrubs, may be prohibited.

6.4 Effectiveness of Conservation Efforts

Quantifying the effectiveness of specific conservation practices is difficult when several practices are simultaneously implemented. The District conservation program includes public information, school education, and a landscaping ordinance to cite a few. Quantifying the effectiveness is further complicated by the variation of water use from year to year, due to

change in climatological factors such as precipitation, temperature, and relative humidity.

An understanding of the effectiveness of the overall program was, however, demonstrated in the 1987-1992 drought. In April 1990, the District implemented a voluntary water conservation action calling on all customers to voluntarily reduce their water usage by 10 percent. It was effective in reducing water consumption from between 5 to 15 percent district-wide. A water-wasting ordinance also was adopted March 21, 1991 to further encourage the public to use water wisely. The ordinance applied to County unincorporated areas only and included prohibitions on washing paved surfaces, restrictions on landscape watering times and overwatering. However, the State's action in March 1991 to limit imported water to 20 percent of normal deliveries caused the District to take more strict conservation measures to avoid further overdrafting of the basin.

As a result of the fifth consecutive year of drought and the serious water supply situation, the Board of Supervisors approved the nine phase water conservation plan on May 23, 1991, and declared a Phase III water shortage. The action imposed mandatory water reductions of 20 percent and restrictions on serving new developments. Customers were surcharged for water overuse. Small meter accounts (primarily single-family residences) were required to meet target goals of 80 percent of the District's average consumptions. Larger accounts were based on target goals of 80 percent of their actual historical consumption.

On July 25, 1991, the Board of Supervisors approved an amendment to the plan to reduce hardship on customers with smaller meters. The amendment essentially imposed target goals based on the District's average consumption or the customer's historical usage during the base period between April 1989 through March 1990, whichever was larger. The rainstorms of January and February 1992 resulted in an above normal storm season, thus relaxing the cutbacks in imported water deliveries from the Department of Water Resources. On April 14, 1992, the Board of Supervisors approved discontinuing the Phase III conservation plan and returned to the

10 percent voluntary goal along with continued efforts to prohibit water-wasting.

Although it is difficult to determine the actual reductions in water usage due to the Phase III Conservation Program, an estimate of its effect can be taken from the annual water consumption data, as shown in Table 6-2. Based on the actual water usage during the period from August 1991 through April 1992, water usage was reduced by 3,358 AF or 17 percent. However, this does not take into consideration the development boom that the Antelope Valley was experiencing. Taking the 21 percent increase in numbers of service connections between the April 1989 through May 1990 base period, and the nine-month period of mandatory water reductions, the adjusted reduction on a per customer basis decreased by 40 percent for a savings of 7,823 AF of water during this nine month period. Since the discontinuance of the Phase III Conservation Program, water consumption has increased and continues to return to pre-drought levels.

6.5 Summary and Mitigation of the Phased Conservation Plan's Potential Financial Impact

To evaluate the potential financial impact of implementing the Phased Water Conservation Plan, an estimate of the reduction in operating revenue was developed by the District. The estimate is based on incremental reduction in water sales. This is based on the existing water usage of 60 percent AVEK water and 40 percent well water. Water sale history (1993-1994 fiscal year) was used as a baseline. Table 6-3 summarizes the results.

The water service financing program for the District is designed to minimize the effect of reduced revenue attributable to implementing the conservation plan. As explained in Chapter 5, the District's source of waterworks funding is structured into four categories: Service Charge, Facility Surcharge, Water Quantity Charge, and Water Availability Standby Charge. The

Table 6-2
Water Savings During Phase III Conservation Program
from August 1, 1991 to May 1, 1992

Month	Base Year		Drought Year		Actual Reduction (AF)	Adjusted for Population (AF)
	Usage (AF)	Customers	Usage (AF)	Customers		
August	3,806	22,695	3,117	29,436	689	1,819
September	3,404	23,481	2,997	29,585	407	1,292
October	2,233	23,660	2,287	29,714	-54	517
November	1,631	24,243	1,897	29,725	-266	103
December	1,548	24,528	1,232	29,689	316	642
January	1,276	24,834	1,079	29,697	197	447
February	1,043	25,375	891	29,650	152	328
March	2,139	25,566	1,039	29,745	1,100	1,450
April	2,557	25,723	1,740	29,836	817	1,226
Total	19,637	220,105	16,279	267,077	3,358	7,823
% Change					17%	40%

Note: Base year was April 1989 through March 1990.

Table 6-3
Estimate of Annual Potential Reduction in Revenue
Due to Water Delivery by Conservation Phases
(Reduction presented in \$1,000)

Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8	Phase 9
10%	15%	20%	25%	30%	35%	40%	45%	50%
\$496	\$745	\$993	\$1,241	\$1,489	\$1,737	\$1,986	\$2,234	\$2,482

Note: Reduction in revenue based on 1993-1994 fiscal year demand

Service Charge is a fixed connection charge based on the size of the meter and is collected bi-monthly. Water Quantity and Facility Surcharges are based on the actual quantity of water used each month. The Standby Charge is assessed on all property and shows up on a property owner's tax bill. A reduction in water sales will affect only the Water Quantity Charge and the Facility Surcharge. This would affect system maintenance and operation revenues, and to a lesser degree, it would reduce revenue available for capital improvements.

If reduced water sales affect operating and maintenance revenues to the point that they are not adequate, the District has identified three ways to reduce such an impact. These are:

- Extra revenue contributed by the conservation surcharge. As demonstrated in the recent drought, the conservation surcharge program generated additional funds which were used to offset a portion of the cost of implementing a conservation program including the reduction of water sales revenue.
- Delay of capital improvement projects. If necessary, the Los Angeles County Board of Supervisors can authorize the transfer of funds from the District's Accumulative Capital Outlay (ACO) Fund allocated for capital improvement projects to the District's General Fund to finance District operation and maintenance expenses.
- If sufficient surcharge revenues and ACO funds are not available, the Board of Supervisors could increase water rates to meet operating needs.

During the 1987-92 drought, there were sufficient reserves to absorb the impact of the water sale revenue losses.

CHAPTER 7

PRELIMINARY EVALUATION AND IMPLEMENTATION OF ALTERNATIVE WATER CONSERVATION PRACTICES

Chapter 7 identifies and describes the various water conservation practices that could be implemented in the District and proposes an implementation schedule for the practices to ensure compliance with the California Urban Water Management Planning Act. To facilitate this objective, this chapter:

- Identifies and describes Alternative Water Conservation Practices (AWCPs) (Section 7.1)
- Summarizes the District ongoing AWCPs (Section 7.2)
- Conducts and documents a preliminary evaluation of the AWCPs (Section 7.2)
- Proposes a Schedule of Implementation of AWCPs (Section 7.3)

This plan presents a preliminary evaluation of AWCPs; a comprehensive evaluation would be premature because of the unavailability of local (or regional) data on the cost, effectiveness, reliability, and technical or economic reasonableness of each water conservation practice. The California Urban Water Conservation Council (CUWCC) is addressing data limitations by coordinating a statewide evaluation of AWCPs. Future evaluation will consider reliable water saving estimates and the social, environmental, and economic impacts of implementing various AWCPs. The CUWCC is comprised of signatories to the “Memorandum of Understanding Regarding Urban Water Conservation in California,” September 1991 (MOU). A primary objective of the CUWCC is to expedite implementation of water conservation measures in urban

areas by facilitating the development and evaluation of effective water conservation programs. A copy of the MOU, which describes the CUWCC and its objectives in further detail, is presented in Appendix C.

The District will be submitting a recommendations to the Board of Supervisors for their approval to become a signatory to the “Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California” at the end of November, 1995. Therefore, the District will incorporate MOU in this plan.

7.1 Summary of Alternative Water Conservation Practices (AWCPs)

The CUWCC developed a list of AWCPs (also called best management practices or BMPs). The list, presented in the next pages, is divided into two categories, AWCPs and potential AWCPs (PAWCPs). AWCPs are water conservation practices that are believed to achieve significant conservation benefits, be technically and economically reasonable, and be environmentally and socially acceptable. PAWCPs are possible conservation practices that have not been elevated to the AWCP list.

The list of AWCPs is expected to be dynamic. As urban water users implement local use of AWCPs, the CUWCC will periodically evaluate the effectiveness of these various measures. An AWCP will be removed from the list if review of new data indicate that the practice cannot be made economically reasonable or fails the AWCP definition stated above. Similarly, a PAWCP will be changed to an AWCP if it is economically reasonable and meets the AWCP definition.

The District has already implemented five of the 15 AWCPs. The AWCPs being implemented are listed in Section 7.2 and are described in detail in Chapter 3.

7.1.1 Alternative Water Conservation Practices

The 15 AWCPs relevant to the District are described below.

Public Information

This conservation practice calls for ongoing programs that promote water conservation and conservation-related benefits, including providing speakers to community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills that shows an average use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote other water conservation practices; and coordination with other governmental agencies, industry groups, and public interest groups.

Conservation Pricing

Conservation pricing focuses on eliminating nonconserving pricing and adopting conserving pricing.

Nonconserving pricing provides no incentive to customers to reduce use. Such pricing is characterized by one or more of the following components:

- Rates in which the unit price decreases as the quantity used increases (declining block rates)
- Rates that involve charging customers a fixed amount per billing cycle, regardless of the quantity used
- Pricing in which the typical bill is determined by high fixed charges and low

commodity charges

Conservation pricing provides incentives to customers to reduce average or peak use, or both.

Such pricing includes:

- Rates designed to recover the cost of providing service
- Billing for water service based on metered water use

Conservation pricing is also characterized by one or more of the following components:

- Rates in which the unit rate is constant regardless of the quantity used (uniform rate) or increases as the quantity used increases (increasing block rate)
- Seasonal rates or excess-rate surcharges to reduce peak demand during summer months
- Rates based on the long-run marginal cost or the cost of adding the next unit of capacity to the system
- Lifeline rates

Landscape Water Conservation for New and Existing Single-Family Homes

This practice calls for providing guidelines, information, and incentives for installing more water-efficient landscapes and for instituting water-saving practices (e.g., encouraging local nurseries to promote sale and use of low-water-using plants, providing landscape water conservation materials in new-homeowner packets and water bills, sponsoring demonstration gardens, and enacting and implementing landscape water conservation ordinances). Ordinances

could be based on the “Water Conservation in Landscaping Act” (California Government Code §§ 65590 *et seq.*).

School Education

School education consists of ongoing programs that promote water conservation and conservation-related benefits, including working with school districts in the water supplier’s service area to provide educational materials and instructional assistance in a classroom setting.

Ultra-Low-Flush Toilet Replacement

This practice replaces high-water-using toilets with ultra-low-flush (ULF) toilets (1.6 gallons or less) in residential, commercial, and industrial buildings. Such programs may offer rebates of up to \$100 for each replacement that (1) would not have occurred without the rebate, (2) requiring replacement at the time of resale, or (3) requiring replacement at the time of change of service.

Water Conservation Coordinator

This conservation practice designates a water conservation coordinator who is responsible for preparing the conservation plan, managing its implementation, and evaluating the results. This work should be coordinated with the supplier’s operations and planning staff.

Metering with Commodity Rates for All New Connections and Connection

Retrofits

This conservation method requires meters for all new connections and billing by volume of use or establishing a program for retrofit of unmetered connections and billing by volume of use. For example, there would be a requirement that all connections be retrofit at or within 6 months of resale of the property or that they be retrofit by neighborhood.

Landscape Water Conservation Requirements for Developments

This practice affects the development industry by requiring conservation measures for new and existing commercial, industrial, institutional, governmental, and multi-family developments. The emphasis is to enact and implement landscape water conservation ordinances or, if the supplier lacks the authority to enact ordinances, cooperating with cities, counties, and the green industry in the service area to develop and implement landscape water conservation ordinances that comply with “Water Conservation in Landscaping Act” (California Government Code §§ 65590 *et seq.*). The ordinance is required to be at least as effective as the Model Water Efficient Landscape Ordinance being developed by the California Department of Water Resources.

Review of New Commercial and Industrial Water Use

This conservation practice requires the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process.

Commercial and Industrial Water Conservation

Water conservation for commercial and industrial users includes identifying and contacting the top 10 percent of industrial and commercial customers and offering audits and incentives sufficient to achieve customer implementation. This practice also requires the water utility to provide follow-up audits at least once every 5 years, if necessary.

Interior and Exterior Water Audits and Incentive Programs

The audit and incentive programs are targeted for single-family residential, multi-family residential, governmental, and institutional customers. The intent is to identify the top 20 percent of water users in each sector, contact them directly, and offer the audit service on a repeating cycle and provide incentives sufficient to achieve customer implementation (e.g., free showerheads, hose-end sprinkler timers, adjustment of high-water-use bills if customers

implement water conservation measures, etc.). Audit and incentive programs could be established as a cooperative program among organizations that could benefit from their implementation.

Plumbing-New and Retrofit

This conservation practice comprises the following three related measures.

- Enforcement of water-conserving plumbing fixture standards, including requirements for ULF toilets in all new construction beginning January 1, 1992. Enforcement could be achieved by contacting the local building departments and providing information to the inspectors, and by contacting major developers and plumbing supply outlets to inform them of the requirements.
- Support of state and federal legislation that prohibits the sale of toilets that use more than 1.6 gallons per flush [State legislation prohibiting sale of toilets using more than 1.6 gallons per flush was enacted in October, 1992.]
- Plumbing retrofit

Plumbing retrofit kits, including high-quality, low-flow showerheads, could be delivered to homes constructed before 1980 that do not have the water-saving features. The retrofit kit also could include toilet volume displacement devices or other devices to reduce flush volume for each home that does not already have ULF toilets, with the offer for the water utility to install the devices and to inspect the operation of the devices at least three times.

Distribution System Water Audits, Leak Detection, and Repair

This conservation method consists of completing a water audit of the water supplier's distribution system at least once every 3 years, using methods described in industry manuals

(e.g., American Water Works Association’s “Manual of Water Supply Practices, Water Audits and Leak Detection”). The intent is to also advise customers when it appears possible that leaks originate on the customers’ side of the meter and to perform distribution system leak detection and repair when an audit reveals such measures to be cost-effective.

Large Landscape Water Audits and Incentives

This practice identifies all irrigators of large (at least 3 acres) landscapes (e.g., golf courses, green belts, common areas, multi-family housing landscapes, schools, business parks, cemeteries, parks, and publicly owned landscapes on or adjacent to road right-of-way); contacting them by mail and/or telephone; offering landscape audits, using methods such as those described in the Landscape Water Management Handbook, prepared by the California Department of Water Resources; applying cost-effective incentives sufficient to achieve customer implementation; providing follow-up audits at least once every 5 years; and providing multilingual training and information needed for implementation.

Water Waste Prohibition

This conservation practice enacts and enforces measures that prohibit gutter flooding, sale of automatic (i.e., self-regenerating) water softeners, single-pass cooling systems in new connections, and nonrecirculating systems in all new conveyor car washes, commercial laundry systems, and decorative water fountains.

7.1.2 Potential Alternative Water Conservation Practices (PAWCPS)

Potential alternative Water Conservation Practices (PAWCPS) are practices that potentially meet the AWCP definition. However, further investigation, coordinated through CUWCC, will be undertaken before changing PAWCPS to AWCPs. Where appropriate, demonstration projects will be carried out to determine whether the practices meet the definition of AWCPs.

The following are PAWCPS:

- Rate structures and other economic incentives and disincentives to encourage water conservation
- Efficiency standards for water-using appliances and irrigation devices
- Replacement of water-using appliances (except toilets and showerheads, the replacement of which is incorporated as best management practice) and irrigation devices
- Retrofit of car washes
- Graywater use
- Distribution system pressure regulation
- Water supplier billing records itemized by customer class (e.g., residential, commercial, industrial)
- Swimming pool and spa conservation, including covers to reduce evaporation
- Restriction or prohibition of devices that use evaporation to cool exterior spaces
- Point-of use water heaters, recirculation hot water systems, and hot water pipe insulation
- Efficiency standards for new industrial and commercial processes

7.1.3 Other Water Conservation Practices Required by the Water Code

Section 10632 of the Act lists seven water conservation practices that should be considered. Of these, five are included in the discussion of AWCPs or PAWCPs above. The two remaining practices are summarized below.

Water Reclamation

Water reclamation has been proven to be an effective conservation practice in specific situations and reclaimed water can safely replace potable water in irrigation applications, essentially increasing the potable supply. Reclaimed water is relatively drought resistant, although its use could be slightly reduced during drought. However, the District does not have its own reclaimed water system. Apollo Lakes County Park and Fox Air Field are being served by CSDL, Lancaster Water Reclamation Plant in District 40. This is described more fully in Chapter 2.

Exchange and Transfer of Water on a Short-Term or Long-Term Basis

The District currently does not have exchange and transfer programs.

7.2 Preliminary Evaluation of AWCPs

This evaluation identifies, in a preliminary way, water conservation practices that have the potential to provide significant water saving at a reasonable cost and that could be implemented in the District. The preliminary evaluation of AWCPs includes an initial estimate of reliable water savings for selected AWCPs, initial objectives for AWCPs with non quantified water savings, a discussion of ability to implement, and future courses of action that could be taken.

The CUWCC has developed an initial estimate for reliable water savings for AWCPs that involves plumbing retrofit of appliances (see Table 7-1). For other AWCPs, the CUWCC

developed goals or percentages that reflect water conservation targets that it believes to be reasonable and achievable. Due to a lack of information about the remaining AWCPs, neither quantified results nor percentages are presented. This future group represents AWCPs that provide potential water savings through indirect means. Public education and water wasting prohibition are examples. The CUWCC expects that, as more and better data are gathered and reviewed, the benefit of these “less tangible” programs will be better understood and water savings or goals will present themselves at that time (see Table 7-2). Note that these are initial estimates based on limited data. As the CUWCC continues to collect and review AWCPs data, refinements of these estimates are expected.

Desirable water conservation practices are those that are effective and implementable. “Effective” means that the practice achieves significant conservation benefit while it is technically and economically reasonable. “Implementable” means that the practice is environmentally and socially acceptable and that it is otherwise reasonable for the District to implement. The AWCPs identified and described in Section 7.1 meet this definition.

These AWCPs have been accepted as “reasonable” conservation practices on local, regional, and statewide bases. Statewide, the State of California, in recent amendments to the Act, stated that an urban water supplier may recover in its rates the cost incurred in preparing its Urban Water Management Plan and implementing reasonable water conservation measures included in the plan. It further stated that any best management practice (referred to as AWCPs in this document) that is identified in the MOU is deemed a reasonable practice (Section 10654, Miscellaneous Provisions of the California Urban Water Management Planning Act).

Therefore, it is recommended that the District considers only the implementation of identified AWCPs.

Table 7-1		
Estimate for Reliable Savings from Alternative Water Conservation Practices		
Alternative Water Conservation Practice	Pre-1980 Construction	Post-1980 Construction
Interior and Exterior Water Audits and Incentive Programs for Single-Family Residential, Multi-family Residential, and Governmental/Institutional Customers		
Single-Family and Multi-family		
Low-flow showerhead	7.2 gcd	2.9 gcd
Toilet retrofit ^a	1.3 gcd	0
Leak repair	0.5 gcd	0.5 gcd
Landscape audit, percent outdoor use	10%	10%
Governmental/Institutional		
Interior retrofit, percent indoor use	5%	0
Landscape audit, percent outdoor use (Outdoor use = summer - winter use, on an average annual basis)	10%	20%
Plumbing - New and Retrofit		
• Enforcement of water conserving plumbing fixture standards including requirements for ultra-low-flush toilets in all new construction beginning January 1, 1992	See Exhibit 6 in Appendix C	See Exhibit 6 in Appendix C
• Support of state and federal legislation prohibiting sale of toilets using more than 1.6 gallons per flush	See Exhibit 6 in Appendix C	See Exhibit 6 in Appendix C
• Plumbing retrofit		
Single-family Canvass		
Toilet retrofit ^a	1.3 gcd	N/A
Low-flow showerhead	7.2 gcd	N/A
Multi-family Owner Contact		
Toilet retrofit	1.3 gcd	N/A
Low-flow showerhead	7.2 gcd	N/A
^a Five-year life (toilet retrofit) gcd = gallons per capita per day Low-flow showerhead = 2.5 gallons per minute maximum flow Ultra-low-flush toilet = 1.6 gallons per flush maximum N/A = not applicable NQ = no quantified at this time		

Alternative Water Conservation Practice	Target
<i>Distribution System Water Audits Leak Detection and Repair</i> Decrease Unaccounted for water to no more than a target percent of total use (All other utilities remain at current levels)	10%
<i>Metering with Commodity Rates for All New Connections and retrofit of existing Connections</i> Unmetered portion of utility, percent of applied water	20%
<i>Large Landscape Water Audits and Incentives</i> Landscape audit for multi-family, commercial, industrial, institutional, and public users, with 3 acres of landscaping or more, percent of irrigation water use	15%
<i>Landscape Water Conservation Requirements for New and Existing Commercial, Industrial, Institutional, Governmental, and Multi-family Developments</i> Reduced landscape water use, percent of new irrigation use	20%
<i>Public Information</i>	NQ
<i>School Education</i>	NQ
<i>Commercial and Industrial Water Conservation</i> Commercial water reduction results from AWCPs, such as interior and landscape water audits, plumbing codes, and other factors, but excluding ultra-low-flush toilet replacement (estimated reduction in gallons per employee per day by the year 2000, over the period 1980-2000).	12% ^b
Industrial water reduction results from best management practices, waste discharge fees, new Technology, water audits, plumbing codes, and other factors, but excluding ultra-low-flush toilet Replacement (estimated reduction in gallons per employee per day by the year 2000, over the Period 1980-2000).	15% ^b
<i>New Commercial and Industrial Water Use Review</i>	NQ
<i>Conservation Pricing</i>	NQ
<i>Landscape Water Conservation for New and Existing Single-Family Homes</i>	NQ
<i>Water Waste Prohibition</i>	NQ
<i>Water Conservation Coordinator</i>	NQ
<i>Ultra-Low-Flush Toilet Replacement Programs</i>	See Exhibit 6 in Appendix C
^b Includes savings accounted for in other AWCPs N/A = not applicable NQ = not quantified at this time	

The District has already implemented 5 of the 15 AWCPs suggested by CUWCC. Details of these programs listed below are in Chapter 3.

- Public information
- School education
- Landscape ordinance
- Metering of all connections
- Reclaimed water use

7.3 Proposed Implementation Schedule of AWCPs

The CUWCC proposed the following initial schedule for implementing AWCPs. Its member agencies, including the District, have agreed to it, in principle. However, considering the ongoing evaluation process and potential for change in AWCPs, it is important to keep in mind this is an initial schedule. As more and better data are collected on AWCPs and PAWCPs, both the AWCPs lists and the implementation schedules could change.

The proposed schedule recommends that seven AWCPs be implemented in the first year. The District's conservation efforts has already implemented four of the seven proposed AWCP's.

The CUWCC's proposed initial implementation schedule is as follows:

Year 1

- Enforcement of water-conserving plumbing fixture standards, including the requirement of ULF toilets in all new construction beginning January 1, 1992
- Support of state and federal legislation prohibiting sales of toilets that use more than 1.6 gallons per flush

- Distribution system water audits
- Public information
- School education
- Water waste prohibition
- Water conservation coordinator

Year 2

- Plumbing retrofit
- Leak detection and repair
- Metering with commodity rates for all new connections and retrofit of existing connections
- Landscape water conservation requirements for new and existing commercial, industrial, institutional, governmental, and multi-family developments
- Conservation pricing (all components, except billing for sewer service based on metered water use)
- Landscape water conservation for new and existing single-family homes
- ULF toilet replacement

Year 3

- Interior and exterior water audits and incentive programs for single-family residential, multi-family residential, and governmental/institutional customers
- Large landscape water audits and incentives
- Commercial and industrial water conservation
- New commercial and industrial water use review
- Conservation pricing (billing for sewer service based on metered water use)
- Financial incentives.

In order for these schedules to be implemented various steps may be required. It may start from submitting recommendations or draft ordinances to the Board of Supervisors for their approval. Once they are approved, the District will allocate approved funds for their purposes and assign a team or a person to start implementing the programs. Although, these steps may be employed as a general guideline they may vary from programs to programs.

7.4 Summary of Reclaimed Water Potential

Expansion of reclaimed water system in the District seems inevitable. This is based on the projected population growth, proposed expansion of the WRPs, and increasing awareness of water conservation. Therefore, reclaimed water can become a reliable and dependable water supply to the District in the future.

Appendix A

Urban Water Management Planning Act

CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT

Established: AB 797, Klehs, 1983

Amended: AB 2661, Klehs, 1990

AB 11X, Filante, 1991

AB 1869, Speier, 1991

AB 892, Frazee, 1993

SB 1017, McCorquodale, 1994

AB 2853, Cortese, 1994

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

CHAPTER 1. GENERAL DECLARATION AND POLICY

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

10610.2. The Legislature finds and declares as follows:

(a) The waters of the state are a limited and renewable resource subject to ever increasing demands.

(b) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

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

(a) The conservation and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.

(b) The conservation and efficient use of urban water supplies shall be a guiding criterion in public decisions.

(c) Urban water suppliers shall be required to develop water management plans to achieve conservation and efficient use.

CHAPTER 3. URBAN WATER MANAGEMENT PLANS

Article 1. General Provisions

10620. (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640) .

(b) Every person that becomes an urban water supplier after December 31, 1984, shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

(2) Each urban water supplier shall coordinate the preparation of its urban water shortage contingency plan with other urban water suppliers and public agencies in the area, to the extent practicable.

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

10621. (a) Each urban water supplier shall periodically update its plan at least once every five years. After the review, it shall make any amendments or changes to its plan which are indicated by the review.

(b) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

Article 2. Contents of Plans

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

(5) Consumption limits in the most restrictive stages. Each urban water supplier may use any type of consumption limit in its water shortage contingency plan that would reduce water use and is appropriate for its area. Examples of consumption limits that may be used include, but are not limited to, percentage reductions in water allotments, per capita allocations, an increasing block rate schedule for high usage of water with incentives for conservation, or restrictions on specific uses.

(6) Penalties or charges for excessive use.

(7) An analysis of the impacts of the plan on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance to carry out the urban water shortage contingency plan.

(9) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency plan.

(f) Describe the frequency and magnitude of supply deficiencies, based on available historic data and future projected conditions comparing water supply and demand, including a description of deficiencies in time of drought and emergency and the ability to meet deficiencies.

(g) To the extent feasible, describe the method which will be used to evaluate the effectiveness of each conservation measure implemented under the plan.

(h) Describe the steps which would be necessary to implement any proposed actions in the plan.

(i) Describe findings, actions, and planning relating to all of the following:

(1) The use of internal and external water audits for single-family residential, multifamily residential, institutional, commercial, industrial, and governmental customers, and the use of incentive programs to encourage customer audits and program participation.

(2) The use of distribution system water audits.

(3) Leak detection and repair.

(4) The use of large landscape water audits.

(F) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.

(2) Exchanges or transfer of water on a short-term or long-term basis.

(3) Management of water system pressures and peak demands.

(4) Issues relevant to meter retrofitting for all uses.

(5) Incentives to alter water use practices, including fixture and appliance retrofit programs.

(6) Public information and educational programs to promote wise use and eliminate waste.

(7) Changes in pricing, rate structures, and regulations.

(b) The preparation of the plan shall be coordinated with local water, waste water, and planning agencies.

10633. The plan shall contain an evaluation of the alternative water management practices identified in Sections 10631 and 10632, taking into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.

Evaluation of the elements in Section 10632 shall include a comparison of the estimated cost of alternative water management practices with the incremental costs of expanded or additional water supplies, and in the course of the evaluation first consideration shall be given to water management practices, or combination of practices, which offer lower incremental costs than expanded or additional water supplies, considering all the preceding evaluation factors.

Article 3. Adoption and Implementation of Plans

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

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

CHAPTER 4. MISCELLANEOUS PROVISIONS

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

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part, or within 18 months after commencement of urban water service by a supplier commencing that service after January 1, 1984.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

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

10652. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of subdivision (e) of Section 10631. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing subdivision (e) of Section 10631, or any project for expanded or additional water supplies.

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

Appendix B

Phase Water Conservation Plan

PART 5 - PHASED WATER CONSERVATION PLAN
SECTION A - STATEMENT OF POLICY AND DECLARATION OF PURPOSE

RULE

5-A-1

STATEMENT OF POLICY AND DECLARATION OF PURPOSE: Because of the water supply conditions prevailing in any or all of the County Waterworks Districts and/or in the area from which any or all of the Districts obtain all or a portion of their supply, the general welfare requires that the water resources available to any or all of the Districts be put to the maximum beneficial use to the extent to which they are capable, and that the unreasonable use, or unreasonable method of use of water be discouraged and that the conservation of such water be practiced with a view to the reasonable and beneficial use thereof in the interest of the people of any or all of the Districts and for the public welfare. The purpose of this Phased Water Conservation Plan is to minimize the effect of a shortage of water supplies on the customers of any or all of the Districts during a water shortage emergency.

SECTION B - AUTHORIZATION TO IMPLEMENT WATER CONSERVATION

5-B-1

AUTHORIZATION TO IMPLEMENT WATER CONSERVATION:

5-B-1a

The Board of Directors of the Waterworks Districts may implement the applicable provisions of this conservation plan, following the public hearing required by Rule 5-B-1b, upon its determination that such implementation is necessary to protect the public welfare and safety.

5-B-1b

The Board of Directors of the Waterworks Districts shall hold a public hearing for the purpose of determining whether a shortage exists in any or all of the Districts and which measures provided by this ordinance should be implemented. Notice of the time and place of the public hearing shall be published not less than ten (10) days before the hearing in a newspaper of general circulation within the affected District or Districts.

5-B-1c

The Board of Directors shall issue its determination of shortage and corrective measures by resolution published in a daily newspaper of general circulation within the affected District or Districts. Conservation surcharges assessed per Rule 5-0-1 shall become effective no sooner than the first full billing period commencing on or after the date of such publication.

SECTION C - GENERAL PROHIBITION

5-C-1

GENERAL PROHIBITION:

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION E - PHASE II SHORTAGE

RULE

5-E-1 PHASE II SHORTAGE:

5-E-1a A Phase II Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between ten percent (10%) and fifteen percent (15%) in its water supplies.

5-E-1b A customer with a meter size of one and one-half (1 1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of eighty-five percent (85%) of the base quantity. All water used in

5-E-1c excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-E-1d For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period to be defined by the Board of Directors, or
2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of eighty-five percent (85%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

SECTION F - PHASE III SHORTAGE

5-F-1 PHASE III SHORTAGE:

5-F-1a A Phase III Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between fifteen percent (15%) and twenty percent (20%) in its water supplies.

5-D-1c Rev. 7/91

5-E-1c Rev. 7/91

5-F-1c Rev. 7/91

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION G - PHASE IV SHORTAGE (Continued)

RULE

5-G-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of seventy-five percent (75%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-G-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or
2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of seventy-five (75%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-G-1d The watering of lawn, landscape or other turf area with water supplied by the District shall be limited to not more than every other day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

5-G-1e New meters to provide construction water service shall not be issued.

5-G-1f Water Service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

SECTION H - PHASE V SHORTAGE

5-H-1 PHASE V SHORTAGE:

5-G-1c Rev. 7/91

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION I - PHASE VI SHORTAGE

RULE

5-I-1 PHASE VI SHORTAGE:

5-I-1a A Phase VI Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between thirty (30%) and thirty-five percent (35%) in its water supplies.

5-I-1b A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of sixty-five percent (65%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

5-I-1c For meter sizes of one (1) inch or less, a base quantity shall be computed and will be the larger of the following amounts:

1. The average of the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors, or
2. The amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.

A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to a target quantity of sixty-five percent (65%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.

5-I-1d The watering of lawn, landscape or other turf area with water supplied by the District shall be limited to not more than every third day and shall be prohibited between the hours of 10:00 a.m. and 5:00 p.m.

5-I-1e New meters to provide construction water service shall not be issued.

5-I-1f Water service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.

5-I-1c Rev. 7/91

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION K - PHASE VIII SHORTAGE (Continued)

RULE

- 5-K-1a** A Phase VIII Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between forty (40%) and forty-five percent (45%) in its water supplies.
- 5-K-1b** A customer with a meter size of one and one-half (1-1/2) inches or larger shall be billed at his or her normal established water rate for all water used up to a target quantity of fifty-five percent (55%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1. The base quantity shall be determined by the amount of water used on the customer's premises during the corresponding billing period of a base period to be defined by the Board of Directors.
- 5-K-1c** For meter sizes of one (1) inch or less, a base quantity shall be computed by averaging the water usage for all similar sized meters during the corresponding billing period of a base period to be defined by the Board of Directors. A customer with a meter size of one (1) inch or less shall be billed at his or her normal established water rate for all water used up to fifty-five percent (55%) of the base quantity. All water used in excess of the target quantity shall be subject to a conservation surcharge per Rule 5-0-1.
- 5-K-1d** The watering of lawn, landscape or other turf area with water supplied by the District shall be prohibited except that trees and shrubs may be watered at any time by bucket.
- 5-K-1e** All meters to provide construction water shall be removed.
- 5-K-1f** Water service ("Will Serve") letters will be issued but such letters will be issued with the condition that permanent metered service to any newly created lot will be prohibited until the Board of Directors determines that the provisions of the Phased Water Conservation Plan are no longer in effect or that the severity of the water supply condition may be reduced to a Phase I or Phase II shortage.
- 5-K-g** No new permanent meters shall be installed.

SECTION L - PHASE IX SHORTAGE

5-L-1 PHASE IX SHORTAGE:

- 5-L-1a** A Phase IX Shortage shall be declared whenever the Board of Directors determines that it is likely that the District will suffer a shortage of between forty-five (45%) and fifty percent (50%) in its water supplies.

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION M - RELIEF FROM COMPLIANCE (Continued)

RULE

5-M-1b

The application for relief may include a request that the customer be relieved, in whole or in part, from the conservation surcharge provisions of Rules 5-D-1b, 5-D-1c, 5-E-1b, 5-F-1c, 5-G-1b and 5-G-1c, 5-H-1b, 5-H-1c, 5-I-1b, 5-I-1c, 5-J-1b, 5-J-1c, 5-K-1b, 5-K-1c, 5-L-1b and 5-L-1c.

5-M-1c

In determining whether to grant relief, and the nature of any relief, the Director of Public Works shall take into consideration all relevant factors including, but not limited to:

1. Whether any additional reduction in water consumption will result in unemployment;
2. Whether additional members have been added to the household;
3. Whether any additional landscaped property has been added to the property since the corresponding billing period of the base year;
4. Changes in vacancy factors in multi-family housing;
5. Increased number of employees in commercial, industrial, and governmental offices;
6. Increased production requiring increased process water;
7. Water uses during new construction;
8. Adjustments to water use caused by emergency health or safety hazards;
9. First filling of a permit-constructed swimming pool; and
10. Water use necessary for reasons related to family illness or health.
11. Whether the basic period for billing should be adjusted due to the unique circumstances of the type of facility, such as a boat, which results in irregular, intermittent periods of consumption.

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION O - CONSERVATION SURCHARGES (Continued)

RULE
5-O-1b (Continued)

1. **First violation.** The Director of Public Works or designee shall issue a written notice of the fact of a first violation to the customer.
2. **Second violation.** For a second violation during any one water shortage emergency, the Director of Public Works or designee shall issue a written notice of the fact of a second violation to the customer.
3. **Third and subsequent violations.** For a third and each subsequent violation during any one water shortage emergency, the Director of Public Works or designee may install a flow-restricting device or the service of the customer at the premises at which the violation occurred for installing and for removing the flow-restricting devices and for restoration of normal service. The charge shall be paid before normal service can be restored.

5-O-1c All monies collected by a District pursuant to this ordinance shall be deposited in that District's General Fund as reimbursement for the District's costs and expenses of administering this conservation plan.

5-O-1d The District shall give notice to customer of water conservation surcharges or of water usage violations as follows:

1. Notice of water conservation surcharges or of first and second violations of the water use prohibitions of Rules 5-G-1d, 5-H-1d, 5-I-1d, 5-J-1d, 5-K-1d and 5-L-1d shall be given to the customer in person or by regular mail.
 - B. If the customer is absent from or unavailable at the premises at which the violation occurred, by leaving a copy with some person of suitable age and discretion at the premises and sending a copy through the regular mail to the address at which the customer is normally billed; or
 - C. If a person of suitable age or discretion cannot be found, then by affixing a copy in a conspicuous place at the premises at which the violation occurred and also sending a copy through the regular mail to the address at which the customer is normally billed.

PART 5 - PHASED WATER CONSERVATION PLAN (Continued)
SECTION R - PUBLIC HEALTH AND SAFETY NOT TO BE AFFECTED

RULE

5-R-1 PUBLIC HEALTH AND SAFETY NOT TO BE AFFECTED:

Nothing in this ordinance shall be construed to require the District to curtail the supply of water to any customer when such water is required by that customer to maintain an adequate level of public health and safety.

SECTION S - SEVERABILITY

5-S-1 SEVERABILITY:

If any part of this ordinance or the application thereof to any person or circumstances is for any reason held invalid or unconstitutional by a decision of any court of competent jurisdiction, the validity of the remainder of the ordinance or the application of such provision to other persons or circumstances shall not be affected. The Board of Directors of the District or Districts declares that it would have adopted this ordinance and all provisions hereof irrespective of the fact that any one or more of the provisions be declared invalid or unconstitutional.

Appendix C

Memorandum of Understanding Regarding Urban Water Conservation in California

MEMORANDUM OF UNDERSTANDING
REGARDING
URBAN WATER CONSERVATION
IN
CALIFORNIA



**MEMORANDUM OF UNDERSTANDING REGARDING
URBAN WATER CONSERVATION IN CALIFORNIA
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**MEMORANDUM OF UNDERSTANDING
REGARDING
URBAN WATER CONSERVATION IN CALIFORNIA**

This Memorandum of Understanding Regarding Urban Water Conservation in California ("MOU") is made and entered into on the dates set forth below among the undersigned parties ("signatories"). The signatories represent urban water suppliers, public advocacy organizations and other interested groups as defined in Section 1 of this MOU.

**AMENDED
September, 1991
February 10, 1993
March 9, 1994**

TERMS

SECTION 1. DEFINITIONS

For purposes of this MOU, the following definitions apply:

- 1.1 **Best Management Practices.** A Best Management Practice ("BMP") means a policy, program, practice, rule, regulation or ordinance or the use of devices, equipment or facilities which meets either of the following criteria:
- (a) An established and generally accepted practice among water suppliers that results in more efficient use or conservation of water;
 - (b) A practice for which sufficient data are available from existing water conservation projects to indicate that significant conservation or conservation related benefits can be achieved; that the practice is technically and economically reasonable and not environmentally or socially unacceptable; and that the practice is not otherwise unreasonable for most water suppliers to carry out.
- Although the term "Best Management Practices" has been used in various statutes and regulations, the definitions and interpretations of that term in those statutes and regulations do not apply to this MOU. The term "Best Management Practices" or "BMPs" has an independent and special meaning in this MOU and is to be applied for purposes of this MOU only as defined above.
- 1.2 **Implementation.** "Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in the descriptions of the various BMPs and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in Section 4.4 of this MOU. Section B of Exhibit 1 to this MOU establishes the schedule for initial implementation of BMPs.
- 1.3 **Signatory Groups.** For purposes of this MOU, signatories will be divided into three groups as follows:
- (a) Group 1 will consist of water suppliers. A "water supplier" is defined as any entity, including a city, which delivers or supplies water for urban use at the wholesale or retail level.
 - (b) Group 2 will consist of public advocacy organizations. A "public advocacy organization" is defined as a non profit organization:
 - (i) whose primary function is not the representation of trade, industrial, or utility entities, and
 - (ii) whose prime mission is the protection of the environment or who has a clear interest in advancing the BMP process.
 - (c) Group 3 will consist of other interested groups. "Other interested groups" is defined as any other group which does not fall into one of the two groups above.
- 1.4 **California Urban Water Conservation Council.** The California Urban Water Conservation Council or "Council" will have responsibility for monitoring the implementation of this MOU and will be comprised of signatories to this MOU grouped according to the definitions in Section 1.3 above. The duties of the Council are set forth in Section 6 and in Exhibit 2 to this MOU.

TERMS

SECTION 4. IMPLEMENTATION OF BEST MANAGEMENT PRACTICES

- 4.1 **The Best Management Practices List, Schedule of Implementation and Assumptions.** Exhibit 1 to this MOU contains:
- (a) In Section A: A list identifying those practices which the signatories believe presently meet the definition of a BMP as set forth in Section 1.1 of this MOU.
 - (b) In Section B: A schedule for implementing the BMPs to be followed by signatory water suppliers unless exempted under Section 4.5 of this MOU or an alternative schedule is prepared pursuant to Section 4.6 of this MOU.
 - (c) In Section C: Assumptions for use in developing estimates of reliable savings from the implementation of BMPs. Estimates of reliable savings are the water conservation savings which can be achieved with a high degree of confidence in a given service area. The estimate of reliable savings for each BMP depends upon the nature of the BMP and upon the amount of data available to evaluate potential savings. For some BMPs (e.g., public information) estimates of reliable savings may never be generated. For others, additional data may lead to significant changes in the estimate of reliable savings. It is probable that average savings achieved by water suppliers will exceed the estimates of reliable savings.
 - (d) In Section D: A list of "Potential Best Management Practices" ("PBMPs"). PBMPs are possible conservation practices which have not been promoted to the BMP list.
- 4.2 **Initial BMPs, PBMPs, Schedules, and Estimates of Reliable Savings.** The initial position of conservation practices on the BMP and PBMP lists, the initial schedule of implementation and study for the BMP list, the initial schedule of study for the PBMP list, and the initial estimates of reliable savings represent compromises by the signatories to move the process forward both for purposes of the present Bay/Delta proceedings as defined in Section 5 and to promote water conservation generally. The signatories agree that as more and better data are collected in the future, the lists, the schedules, and the estimates of reliable savings will be refined and revised based upon the most objective criteria available. However, the signatories agree that the measures included as initial BMPs in Section A of Exhibit 1 are economically justified on a statewide basis.
- 4.3 **Future Revision of BMPs, PBMPs, Schedules, and Estimates of Reliable Savings.** After the beginning of the initial term of the MOU as provided in Section 7.1, the California Urban Water Conservation Council ("Council") will, pursuant to Section 6 of this MOU and Exhibit 2, alter the composition of the BMP and PBMP lists, redefine individual BMPs, alter the schedules of implementation, and update the assumptions of reliable savings as more data becomes available. This dynamic BMP assessment process includes the following specific commitments:

TERMS

- (a) A full cost-benefit analysis, performed in accordance with the principles set forth in Exhibit 3, demonstrates that either the program (I) is not cost-effective overall when total program benefits and costs are considered; OR (ii) is not cost-effective to the individual water supplier even after the water supplier has made a good faith effort to share costs with other program beneficiaries.
- (b) Adequate funds are not and cannot reasonably be made available from sources accessible to the water supplier including funds from other entities. However, this exemption cannot be used if a new, less cost-effective water management option would be implemented instead of the BMP for which the water supplier is seeking this exemption.
- (c) Implementation of the BMP is (I) not within the legal authority of the water supplier; and (ii) the water supplier has made a good faith effort to work with other entities that have the legal authority to carry out the BMP; and (iii) the water supplier has made a good faith effort to work with other relevant entities to encourage the removal of institutional barriers to the implementation of BMPs within its service area.

4.6 **Schedule of Implementation.** The schedule of implementation for BMPs is set forth in Section B of Exhibit 1 to this MOU. However, it is recognized by the signatories that deviations from this schedule by water suppliers may be necessary. Therefore, a water supplier may modify, to the minimum extent necessary, the schedule for implementation of BMPs if the water supplier substantiates one or more of the following findings:

- (a) That after a good faith effort to implement the BMP within the time prescribed, implementation is not feasible pursuant to the schedule. However, implementation of this BMP is still required as soon as feasible within the initial term of this MOU as defined in Section 7.1.
- (b) That implementation of one or more BMPs prior to other BMPs will have a more positive effect on conservation or water supplies than will adherence to the schedule.
- (c) That implementation of one or more Potential BMPs or other conservation measures prior to one or more BMPs will have a more positive effect on conservation or water supplies than will adherence to the schedule.

TERMS

- (d) That the State Board should include a policy statement in the water rights phase of the Bay/Delta proceedings supporting the BMP process described in this MOU and that the BMP process should be considered in any documents prepared by the State Board pursuant to the California Environmental Quality Act as part of the present Bay/Delta proceedings.
- 5.3 **Letter to State Board.** Within 30 days of signing this MOU, each signatory will jointly or individually convey the principles set forth in Sections 5.1 and 5.2 above by sending a letter to the State Board, copied to the EPA, in the form attached to this MOU as Exhibit 4.
- 5.4 **Withdrawal from MOU.** If during the present Bay/Delta proceedings, the State Board or EPA uses future urban water conservation savings that are inconsistent with the use of BMPs as provided in this MOU, any signatory shall have the right to withdraw from the MOU by providing written notice to the Council as described in Section 7.4(a)(I) below.
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SECTION 6. CALIFORNIA URBAN WATER CONSERVATION COUNCIL

- 6.1 **Organization.** The California Urban Water Conservation Council ("Council") will be comprised of all signatories to this MOU grouped according to the definition in Section 1. The signatories agree to the necessary organization and duties of the Council as specified in Exhibit 2 to this MOU. Within 30 days of the effective date of this MOU, the Council will hold its first meeting.
- 6.2 **Annual Reports.** The signatory water suppliers will submit standardized reports annually to the Council providing sufficient information to inform the Council on the progress being made towards implementing the BMP process. The Council will also make annual reports to the State Board. An outline for the Council's annual report to the State Board is attached as Exhibit 5 to this MOU.

TERMS

- (D) Discussions between the signatory wishing to withdraw and the specific signatories named have failed to satisfy the objections of the signatory wishing to withdraw.

After a signatory declares an intent to withdraw under Section 7.4(a), the MOU shall remain in effect as to that signatory for 180 days.

- (b) **Withdrawal after expiration of initial term.** After the initial term of 10 years, any signatory may declare its intent to withdraw from the MOU unconditionally by providing written notice to the Council. After a signatory has declared its intent to withdraw as provided in this section, the MOU will remain in effect as to that signatory for 180 days.
- (c) **Immediate withdrawal.** Any signatory who does not sign a modification to the MOU requiring a 2/3 vote as described in Exhibit 2 of this MOU may withdraw from the MOU by providing written notice to the Council. The withdrawing signatory's duties under this MOU will be terminated effective immediately upon providing such written notice.

If a signatory withdraws from the MOU under any of the above methods, the MOU shall remain in effect as to all other signatories.

- 7.5 **Additional Parties.** Additional parties may sign the MOU after September 1, 1991 by providing written notice to and upon approval by the Council. Additional parties will be assigned by the Council to one of the three signatory groups defined in Section 1.3 before entry into the Council. All additional signatory water suppliers shall be subject to the schedule of implementation provided in Exhibit 1.
- 7.6 **Legal Authority.** Nothing in this MOU is intended to give any signatory, agency, entity or organization expansion of any existing authority. No organization formed pursuant to this MOU has authority beyond that specified in this MOU.
- 7.7 **Non-Contractual Agreement.** This MOU is intended to embody general principles agreed upon between and among the signatories and is not intended to create contractual relationships, rights, obligations, duties or remedies in a court of law between or among the signatories.
- 7.8 **Modifications.** The signatories agree that this writing constitutes the entire understanding between and among the signatories. The general manager, chief executive officer or executive director of each signatory or their designee shall have the authority to vote on any modifications to this MOU and its exhibits. Any modifications to the MOU itself and to its exhibits shall be made by the Council as described in Exhibit 2.

EXHIBIT 1

BEST MANAGEMENT PRACTICES, IMPLEMENTATION SCHEDULES, ASSUMPTIONS, AND POTENTIAL BEST MANAGEMENT PRACTICES FOR URBAN WATER CONSERVATION IN CALIFORNIA

SECTION A. Best Management Practices

This section contains those Best Management Practices ("BMPs") that signatory water suppliers commit to implementing. Suppliers' water needs estimates will be adjusted to reflect estimates of reliable savings from this category of BMPs. For some BMPs, no estimate of savings is made.

It is recognized by all parties that a single implementation method for a BMP would not be appropriate for all water suppliers. In fact, it is likely that as the process moves forward, water suppliers will find new implementation methods even more effective than those described. Any implementation method used should be at least as effective as the methods described below.

1. **INTERIOR AND EXTERIOR WATER AUDITS AND INCENTIVE PROGRAMS FOR SINGLE FAMILY RESIDENTIAL, MULTI-FAMILY RESIDENTIAL, AND GOVERNMENTAL/INSTITUTIONAL CUSTOMERS.**

Implementation methods shall be at least as effective as identifying the top 20% of water users in each sector, directly contacting them (e.g., by mail and/or telephone) and offering the service on a repeating cycle; providing incentives sufficient to achieve customer implementation (e.g., free showerheads, hose end sprinkler timers, adjustment to high water use bills if customers implement water conservation measures, etc.). This could be a cooperative program among organizations that would benefit from its implementation.

2. **PLUMBING, NEW AND RETROFIT.**

a. **ENFORCEMENT OF WATER CONSERVING PLUMBING FIXTURE STANDARDS INCLUDING REQUIREMENT FOR ULTRA LOW FLUSH ("ULF") TOILETS IN ALL NEW CONSTRUCTION BEGINNING JANUARY 1, 1992.**

Implementation methods shall be at least as effective as contacting the local building departments and providing information to the inspectors, and contacting major developers and plumbing supply outlets to inform them of the requirement.

b. **SUPPORT OF STATE AND FEDERAL LEGISLATION PROHIBITING SALE OF TOILETS USING MORE THAN 1.6 GALLONS PER FLUSH.**

[STATUS OF BMP 2b: INACTIVE. State legislation prohibiting sale of toilets using more than 1.6 gallons per flush was enacted in October, 1992.]

c. **PLUMBING RETROFIT.**

Implementation methods shall be at least as effective as delivering retrofit kits including high quality low-flow showerheads to pre-1980 homes that do not have them and toilet displacement devices or other devices to reduce flush volume for each home that does not already have ULF toilets; offering to install the devices; and following up at least three times.

EXHIBIT 1

7. **PUBLIC INFORMATION.** --- ---

Implementation methods shall be at least as effective as ongoing programs promoting water conservation and conservation related benefits including providing speakers to community groups and the media; using paid and public service advertising; using bill inserts; providing information on customers' bills showing use in gallons per day for the last billing period compared to the same period the year before; providing public information to promote other water conservation practices; and coordinating with other governmental agencies, industry groups and public interest groups.

8. **SCHOOL EDUCATION.** --- ---

Implementation methods shall be at least as effective as ongoing programs promoting water conservation and conservation related benefits including working with the school districts in the water supplier's service area to provide educational materials and instructional assistance.

9. **COMMERCIAL AND INDUSTRIAL WATER CONSERVATION.** --- ---

Implementation methods shall be at least as effective as identifying and contacting the top 10% of the industrial and commercial customers directly (by mail and/or telephone); offering audits and incentives sufficient to achieve customer implementation; and providing follow-up audits at least once every five years if necessary.

10. **NEW COMMERCIAL AND INDUSTRIAL WATER USE REVIEW.** --- ---

Implementation methods shall be at least as effective as assuring the review of proposed water uses for new commercial and industrial water service and making recommendations for improved water use efficiency before completion of the building permit process.

11. **CONSERVATION PRICING.** --- ---

Implementation methods shall be at least as effective as eliminating nonconserving pricing and adopting conserving pricing. For signatories supplying both water and sewer service, this BMP applies to pricing of both water and sewer service. Signatories that supply water but not sewer service shall make good faith efforts to work with sewer agencies so that those sewer agencies adopt conservation pricing for sewer service.

Nonconserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components:

- a. Rates in which the unit price decreases as the quantity used increases (declining block rates);
- b. Rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used;
- c. Pricing in which the typical bill is determined by high fixed charges and low commodity charges.

EXHIBIT 1

14. WATER CONSERVATION COORDINATOR.

Implementation methods shall be at least as effective as designating a water conservation coordinator responsible for preparing the conservation plan, managing its implementation, and evaluating the results. For very small water suppliers, this might be a part-time responsibility. For larger suppliers this would be a full-time responsibility with additional staff as appropriate. This work should be coordinated with the supplier's operations and planning staff.

15. FINANCIAL INCENTIVES.

Implementation methods shall be at least as effective as:

- a. Offering financial incentives to facilitate implementation of conservation programs. Initial recommendations for such incentives will be developed by the Council within two years of the initial signing of the MOU, including incentives to improve the efficiency of landscape water use; and
- b. Financial incentives offered by wholesale water suppliers to their customers to achieve conservation.

16. ULTRA LOW FLUSH TOILET REPLACEMENT.

Water suppliers agree to implement programs for replacement of existing high-water-using toilets with ultra-low-flush toilets (1.6 gallons or less) in residential, commercial, and industrial buildings. Such programs will be at least as effective as offering rebates of up to \$100 for each replacement that would not have occurred without the rebate, or requiring replacement at the time of resale, or requiring replacement at the time of change of service. This level of implementation will be reviewed by the Council after development of the assumptions included in the following two paragraphs using the economic principles included in paragraphs 3 and 4 of Exhibit 3.

- a. Assumptions for determining estimates of reliable savings from installation of ultra-low-flush toilets in both existing and new residential, commercial, and industrial structures will be recommended by the Council to the State Water Resources Control Board ("State Board") by December 31, 1991 for use in the present Bay/Delta proceedings.
- b. Should the Council not agree on the above assumptions, a panel will be formed by December 31, 1991 to develop such assumptions. The panel shall consist of one member appointed from the signatory public advocacy group; one member appointed from the signatory water supplier group; and one member mutually agreed to by the two appointed members. The assumptions to be used for this BMP will be determined by a majority vote of the panel by February 15, 1992 using the criteria for determining estimates of reliable savings included in this MOU. The decision of the panel will be adopted by the Council and forwarded to the State Board by March 1, 1992.

EXHIBIT 1

SECTION B. Implementation Schedules

Best Management Practices will be implemented by signatory water suppliers according to the schedule set forth below. "Implementation" means achieving and maintaining the staffing, funding, and in general, the priority levels necessary to achieve the level of activity called for in the descriptions of the various BMPs and to satisfy the commitment by the signatories to use good faith efforts to optimize savings from implementing BMPs as described in section 4.4 of the MOU. BMPs will be implemented at a level of effort projected to achieve at least the coverages specified in Section C of this Exhibit within the initial ten year term of the MOU.

This schedule sets forth the latest dates by which implementation of BMPs will be underway. It is recognized that some signatories are already implementing some BMPs, and that this schedule does not prohibit signatories from implementing BMPs sooner than required.

The following BMPs will be implemented by the end of the first year of the initial term (numbers correspond to those in the list set forth in Section A above):

- 2a. ENFORCEMENT OF WATER CONSERVING PLUMBING FIXTURE STANDARDS INCLUDING REQUIREMENT FOR ULTRA LOW FLUSH TOILETS IN ALL NEW CONSTRUCTION BEGINNING JANUARY 1, 1992.

- 2b. SUPPORT OF STATE AND FEDERAL LEGISLATION PROHIBITING SALE OF TOILETS USING MORE THAN 1.6 GALLONS PER FLUSH.
[STATUS OF BMP 2b: ACCOMPLISHED. State and federal legislation prohibiting sale of toilets using more than 1.6 gallons per flush was enacted in October 1992.]

3. DISTRIBUTION SYSTEM WATER AUDITS. (LEAK DETECTION AND REPAIR to be implemented by end of second year.)

7. PUBLIC INFORMATION.

8. SCHOOL EDUCATION.

13. WATER WASTE PROHIBITION.

14. WATER CONSERVATION COORDINATOR.

EXHIBIT 1

**SECTION C:
Assumptions for Estimating Reliable Savings from Best Management Practices**

Best Management Practice	Estimated Water Savings	
	Pre-1980 Construction	Post 1980 Construction
1. Interior and Exterior Water Audits and Incentive Programs for Single Family Residential, Multi-family Residential and Governmental/Institutional Customers		
<u>SINGLE FAMILY AND MULTI-FAMILY</u>		
<i>Reduction Factors (Unit water savings) _____</i>		
Low-flow showerhead (2.5 gallons per minute maximum flow)	7.2 gcd*	2.9 gcd
Toilet retrofit (Five year life)	1.3 gcd	0
Leak Repair	0.5 gcd	0.5 gcd
Landscape audit, percent outdoor use	10%	10%
<i>Coverage Factor (Installation and/or compliance rate) _____</i>		
Target (Number of customers offered an incentive or audit.) top percent of users	20%	20%
Accept audit	70%	70%
<u>GOVERNMENTAL/INSTITUTIONAL</u>		
<i>Reduction Factor (Unit water savings) _____</i>		
Interior retrofit, percent indoor use	5%	
Landscape audit, percent outdoor use (Oudoor use = summer - winter use, on an average annual basis)	10%	0 20%
<i>Coverage Factor (Installation and/or compliance rate) _____</i>		
Target (Number of customers offered an incentive or audit.)top percent of users	20%	70%
Accept audit	70%	

*gcd = gallons per capita per day

EXHIBIT 1

Best Management Practice	Factor
3. Distribution System Water Audits, Leak Detection and Repair	
<i>Reduction Factor (Unit water savings)</i> _____ Lower unaccounted for water (authorized unmetered usage, leakage and meter error) to no more than percent total use (All other utilities remain at current levels)	10%
<i>Coverage Factor (Installation and/or compliance rate)</i> _____ Total number of utilities participating in audits Utilities participating in leak detection and repair	100% Varies based on Cost-Effectiveness Analysis
4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections	
<i>Reduction Factor (Unit water savings)</i> _____ Unmetered portion of utility, percent of applied water	20%
<i>Coverage Factor (Installation and/or compliance rate)</i> _____ Unmetered Customers	100%
5. Large Landscape Water Audits and Incentives	
<i>Reduction Factor (Unit water savings)</i> _____ Landscape audit for multi-family, commercial, industrial, institutional, and public users, with 3 acres of landscaping or more, percent of irrigation water use.	15%
<i>Coverage Factor (Installation and/or compliance rate)</i> _____ Applies to all sites three acres or more	100% of sites 3 acres or more
6. Landscape Water Conservation Requirements for New and Existing Commercial, Industrial, Institutional, Governmental, and Multi-family Developments	
<i>Reduction Factor (Unit water savings)</i> _____ Reduced landscape water use, percent of new irrigation use	20%
<i>Coverage Factor (Installation and/or compliance rate)</i> _____ All new landscape areas	100% of new landscape areas

EXHIBIT 1

Best Management Practices	Factor
<p>12. Landscape Water Conservation for New and Existing Single Family Homes</p> <p><i>Reduction Factor (Unit Water Savings)</i> _____</p> <p><i>Coverage Factor (Installation and/or compliance rate)</i> _____</p>	<p>NOT QUANTIFIED AT THIS TIME</p>
<p>13. Water Prohibition</p> <p><i>Reduction Factor (Unit Water Savings)</i> _____</p> <p><i>Coverage Factor</i> _____</p>	<p>NOT QUANTIFIED AT THIS TIME</p>
<p>14. Water Conservation Coordinator</p> <p><i>Reduction Factor</i> _____</p> <p><i>Coverage Factor</i> _____</p>	<p>NOT QUANTIFIED AT THIS TIME</p>
<p>15. Financial Incentives</p> <p><i>Reduction Factor</i> _____</p> <p><i>Coverage Factor</i> _____</p>	<p>NOT QUANTIFIED AT THIS TIME</p>
<p>16. Ultra Low Flush Toilet Replacement Programs (1.6 gallons per flush maximum)</p> <p><i>Reduction Factor</i> _____</p> <p><i>Coverage Factor</i> _____</p>	<p>SEE EXHIBIT 6</p>

EXHIBIT 1

SECTION D.

Potential Best Management Practices

This Section contains Potential Best Management Practices ("PBMPs") that will be studied. Where appropriate, demonstration projects will be carried out to determine if the practices meet the criteria to be designated as BMPs. Within one year of the initial signing of this MOU, the Council will develop and adopt a schedule for studies of these PBMPs.

1. RATE STRUCTURES AND OTHER ECONOMIC INCENTIVES AND DISINCENTIVES TO ENCOURAGE WATER CONSERVATION.

This is the top priority PBMP to be studied. Such studies should include seasonal rates; increasing block rates; connection fee discounts; grant or loan programs to help finance conservation projects; financial incentives to change landscapes; variable hookup fees tied to landscaping; and interruptible water service to large industrial, commercial or public customers. Studies on this PBMP will be initiated within 12 months from the initial signing of the MOU. At least one of these studies will include a pilot project on incentives to encourage landscape water conservation.

2. EFFICIENCY STANDARDS FOR WATER USING APPLIANCES AND IRRIGATION DEVICES.

3. REPLACEMENT OF EXISTING WATER USING APPLIANCES (EXCEPT TOILETS AND SHOWERHEADS WHOSE REPLACEMENTS ARE INCORPORATED AS BEST MANAGEMENT PRACTICES) AND IRRIGATION DEVICES.

4. RETROFIT OF EXISTING CAR WASHES.

5. GRAYWATER USE.

6. DISTRIBUTION SYSTEM PRESSURE REGULATION.

7. WATER SUPPLIER BILLING RECORDS BROKEN DOWN BY CUSTOMER CLASS (E.G., RESIDENTIAL, COMMERCIAL, INDUSTRIAL).

8. SWIMMING POOL AND SPA CONSERVATION INCLUDING COVERS TO REDUCE EVAPORATION.

9. RESTRICTIONS OR PROHIBITIONS ON DEVICES THAT USE EVAPORATION TO COOL EXTERIOR SPACES.

10. POINT-OF-USE WATER HEATERS, RECIRCULATING HOT WATER SYSTEMS AND HOT WATER PIPE INSULATION.

11. EFFICIENCY STANDARDS FOR NEW INDUSTRIAL AND COMMERCIAL PROCESSES.

EXHIBIT 2

- l. Making annual reports to the State Water Resources Control Board and the Council Members on the above items based on the format described in Exhibit 5.
 - m. Within two years of the initial signing of this MOU, developing and implementing procedures and a funding mechanism for independent evaluation of the MOU process at the Council and signatory levels.
 - n. Undertaking such additional responsibilities as the Members may agree upon.
4. The Council will make formal reports to the State Water Resources Control Board and to the governing bodies of all Council Members. Such reports shall include a formal annual written report. Other reports such as status reports and periodic updates may be prepared as deemed appropriate by the Council. Any Member of the Council will be entitled to review draft reports and comment on all reports. Such comments shall be included in any final report at the Member's request.
 5. It is anticipated that the Council will develop a committee structure, which will include a Membership Committee as described in Section 7.2 of the MOU. A Steering Committee and one or more technical committees may also be needed.
 6. For purposes of the Council, signatories will be divided into three groups: water suppliers ("Group 1"), public advocacy organizations ("Group 2") and other interested groups ("Group 3") as those terms are defined in Section 1 of the MOU. Members of Groups 1 and 2 shall be members of the Council and shall possess all voting rights. Members of Group 3 shall not have voting rights, but shall act in an advisory capacity to the Council.
 7. Decisions by the Council to undertake additional responsibilities; to modify the MOU itself; or to modify Exhibits 2 or 3 require the following:
 - a. The Council will provide notice to all signatories giving the text of the proposed action or modification at least 60 days in advance of the vote by the Council.
 - b. To pass the action or modification, there must be a vote in favor of the action or modification by at least 2/3 of the members of Group 1 voting, including votes made in person or in writing, and a vote in favor of the action or modification by at least 2/3 of the members of Group 2 voting, including votes made in person or in writing.
 8. All other modifications and Council actions shall be undertaken as follows: There must be a vote in favor of the modification or action by a simple majority of the members of Group 1 voting, including votes made in person or in writing, and a vote in favor of the modification or action by a simple majority of the members of Group 2 voting, including votes made in person or in writing.

EXHIBIT 3

PRINCIPLES TO GUIDE THE PERFORMANCE OF BMP ECONOMIC (COST-EFFECTIVENESS) ANALYSES

1. The total cost-effectiveness of a conservation measure will be measured by comparing the present value of the benefits of the measure listed in paragraph 3 below to the present value of the costs listed in paragraph 4. The measure will be cost-effective if the present value of the benefits exceeds the present value of the costs.
2. The cost-effectiveness of a conservation measure to the water supplier will be measured by comparing the present value of the benefits described in paragraph 5 to the present value of the costs described in paragraph 6. The measure will be cost-effective if the present value of the benefits exceeds the present value of the costs.
3. Total benefits exclude financial incentives received by water suppliers or by retail customers. These benefits include:
 - a. avoided capital costs of production, transport, storage, treatment, wastewater treatment and distribution capacity.
 - b. avoided operating costs, including but not limited to, energy and labor
 - c. environmental benefits and avoided environmental costs
 - d. avoided costs to other water suppliers, including those associated with making surplus water available to other suppliers
 - e. benefits to retail customers, including benefits to customers of other suppliers associated with making surplus water available to these suppliers
4. Total program costs are those costs associated with the planning, design, and implementation of the particular BMP, excluding financial incentives paid either to other water suppliers or to retail customers. These costs include:
 - a. capital expenditures for equipment or conservation devices
 - b. operating expenses for staff or contractors to plan, design, or implement the program
 - c. costs to other water suppliers
 - d. costs to the environment
 - e. costs to retail customers
5. Program benefits to the water supplier include:
 - a. costs avoided by the water supplier of constructing production, transport, storage, treatment, distribution capacity, and wastewater treatment facilities, if any.
 - b. operating costs avoided by the water supplier, including but not limited to, energy and labor associated with the water deliveries that no longer must be made

EXHIBIT 4

FORM OF LETTER TO STATE WATER RESOURCES CONTROL BOARD

W. Don Maughan, Chairman, and Members
State Water Resources Control Board
901 "P" Street
Sacramento, California 95801

Subject: Bay/Delta Proceedings:
Urban Water Conservation

Dear Chairman Maughan and Members:

We are pleased to forward to you a copy of a "Memorandum of Understanding Regarding Urban Water Conservation in California" recently entered into by many urban water suppliers, public advocacy organizations, and other interested groups.

This Memorandum of Understanding was developed over a period of many months of fact-gathering and intensive negotiations. It commits the signatory water suppliers to good faith implementation of a program of water conservation which embodies a series of "Best Management Practices" for California's urban areas. It also commits all of the signatories to an ongoing, structured process of data collection through which other conservation measures, not yet in general use, can be evaluated as to whether they should be added to the list of Best Management Practices. Finally, it commits all signatories to recommending to this Board that the Best Management Practices identified in this Memorandum of Understanding be taken as the benchmark for estimating reliable savings for urban areas which utilize waters affected by the Bay/Delta proceedings. An important part of this program is the signatories' recognition of the need to provide long-term reliability for urban water suppliers and long-term protection of the environment.

To carry out these commitments, please be advised that each of the signatories has endorsed making the following recommendations to this Board:

1. That for purposes of the present Bay/Delta proceedings, implementation of the Best Management Practices process set forth in the Memorandum of Understanding represents a sufficient long-term water conservation program by the signatory water suppliers, recognizing that additional programs may be required during occasional water supply shortages.
2. That for purposes of the present Bay/Delta proceedings only, the Board should base its estimates of future urban water conservation savings on implementation of all of the Best Management Practices included in Section A of Exhibit 1 to the Memorandum of Understanding for the entire service area of the signatory water suppliers and only on those Best Management Practices, except for (a) the conservation potential for water supplied by urban agencies for agricultural purposes, or (b) in cases where higher levels of conservation have been mandated.

EXHIBIT 4

Very Truly Yours,

Name of Signatory

By: _____

cc: Administrator
U.S. Environmental Protection Agency
401 "M" Street, SW
Washington, D.C. 20460

Regional Administrator, Region IX
U.S. Environmental Protection Agency
215 Fremont Street
San Francisco, California 94105

EXHIBIT 5

URBAN WATER CONSERVATION ANNUAL REPORT OUTLINE

I. Executive Summary

II. Implementation Assessment

Water Suppliers' Report
Findings
Comments
Progress

Public Advocacy Organizations' Report
Findings
Comments
Progress

III. Survey Results for 199X

Summary of Survey Responses
Table ___. Per Capita Usage [by region]
Table ___. Status of BMP Implementation [by supplier]
Table ___. Proposed Implementation Schedules

Interpretation of Survey Responses
Lack of Data
Climatic Influences
Implementation Difficulties

Evaluation of Results

IV. Trend Analysis

Comparison with Prior Years
Table ___. Per Capita Usage [by region]

Projected Conservation
Table ___. Schedule of Implementation

Updated Estimates of Future Savings [by region]

Evaluation of Progress

V. Studies of Best Management Practices

Assessment of Current BMPs
Table ___. Evaluation of Effectiveness [by measure and region]

EXHIBIT 6

ASSUMPTIONS AND METHODOLOGY FOR DETERMINING ESTIMATES OF RELIABLE WATER SAVINGS FROM THE INSTALLATION OF ULF TOILETS

July 1992

Approved June 30, 1992
California Urban Water Conservation Council

SUMMARY

On June 30, 1992, the California Urban Water Conservation Council (CUWCC) adopted the assumptions and methodology described in this report for determining estimates of reliable water savings from the installation of ULF toilets. The Council voted to provide only a method for estimating ULF toilet conservation potential, not specific estimates for different regions or agencies.

The methodology presented here was explicitly developed to balance simplicity and accuracy. The method allows a water agency to customize the estimate of conservation potential by using service-area-specific information on household demographics, composition of housing stock, and turnover rates of real estate. Agencies lacking service area specific information can use regional averages. Given the large supply of conserved water that ULF toilets represent, the Council feels that the method's adjustments of estimated conservation potential for different local conditions is well worth the extra effort.

The first step required to estimate a given area's conservation potential is to assess water savings likely to result per ULF toilet retrofit. We provide a scheme for adjusting estimates of water savings that were realized by first-year participants in the Los Angeles and Santa Monica toilet rebate programs to make these estimates suitable for other service areas. Water savings estimates for participating households in Los Angeles and Santa Monica were derived through sophisticated statistical models based on data provided by over 23,000 households covering a seven year period². These reliable estimates of conservation form the best basis for extrapolating to other service areas. These estimates should not be used directly, but must be adjusted for three service-area-specific factors: 1) people per household; 2) toilet retrofits per household; and 3) the mix of pre-1980 and post-1980 toilets.

The method and assumptions presented here apply to three separate ULF-toilet-related Best Management Practices (BMPs) in the Memorandum of Understanding (MOU).

BMP 2A requires enforcement of water conserving plumbing fixture standards including requirement for Ultra-Low-Flush (ULF) toilets in all new construction beginning January 1, 1992. Note that BMP 2A is now a state law.

BMP 2B requires support of State and Federal legislation prohibiting sale of toilets using more than 1.6 gallons per flush. Such a regulation is presently being considered in the California State Legislature. Water savings estimates pertaining to BMP 2B should be considered applicable if and when the legislation passes.

²See The Conserving Effect of Ultra Low Flush Toilet Rebate Programs, Chesnutt, T., A. Bamezai, C. McSpadden, A & N Technical Services, June 1992, and related reports listed in Appendix A.

EXHIBIT 6

I. INTRODUCTION

There are several ways that currently proposed BMP's can produce savings from ULF toilets. The 1991 plumbing code requires installation of ULF toilets (BMP 2A) in new construction. Additionally, if the State of California enacts legislation banning the sale and installation of non-ULF toilets (BMP 2B), the result will be the natural replacement of existing toilets with ULF toilets as and when existing toilets begin to malfunction, are damaged, or households decide to remodel their bathrooms. Programs that affect the replacement of non-ULF toilets with ULF toilets (BMP 16), would additionally affect the existing housing stock.

This report describes a methodology for quantifying the conservation targets under BMP 16. In particular, the ULF Toilet Subcommittee has selected ULF replacement-upon-resale-or-exchange legislation as a quantifiable way for determining ULF conservation targets (under BMP 16) over a period of 10 years. The calculations required to quantify this legislation, and hence BMP 16, also yield information on the water saving potential of the other ULF-related BMP's. To keep estimates of ULF conservation potential accurate, it is important not to double count conservation from the different types of ULF programs.

Our basic method can be described as multiplying how much water ULF toilets save in a household by the number of households affected. Both of these quantities will vary in different service areas and are discussed in turn.

First, the quantity of water likely to be saved by a ULF toilet retrofit will vary in different service areas because of differences in household characteristics and age of the housing stock. Section II describes how we estimate water savings from ULF retrofits for different service areas.

Second, the number of affected homes will vary in different service areas due to differences in housing turnover rates and differences in the rate at which toilets are naturally replaced because of either damage, malfunction, or bathroom remodeling. Since, at the time of malfunction or breakdown some toilets are likely to be retrofitted with ULF toilets, the net water saving effect of BMP-16 will be overstated if this is not taken into account. Section III deals with this second set of issues. Section IV contains illustrative calculations for a hypothetical service area.

EXHIBIT 6

Based on the data available from the first year of ULF rebate programs, we estimate that retrofitting a post-1980 (3.5 gl/flush toilet) saves 20 percent less than retrofitting a pre-1980 toilet⁶. If one does know the proportion of post-1980 toilets in a service area, then this information can be used to adjust any of the estimates of conservation. Since the overall mean net conservation provided in Tables 1 and 2 is a weighted average of pre- and post 1980 toilets, we can back out separate savings estimates for pre-1980 and post-1980 toilets. These estimates can then be applied to the proportion of the housing stock that has each type of toilet.

The adjustment factors come from combining our knowledge of the proportion of post- 1980 toilets (7.5 percent in single family homes) with how much less water retrofits of post-80 toilets save relative to pre-1980 toilets (about 20 percent). We state the following two equations:

$$\begin{aligned} \overline{N}_{SF} &= N_{post-80} * .075 + N_{pre-80} * .925 \\ N_{post-80} &= .8 * N_{pre-80} \end{aligned}$$

and solve for N_{pre-80} and $N_{post-80}$ in terms of the overall single family mean \overline{N}_{SF} :

$$\begin{aligned} N_{pre80} &= \overline{N}_{SF} \div (.8 * .075 + .925) \approx \overline{N}_{SF} * 1.015 \\ N_{post80} &\approx \overline{N}_{SF} * 1.015 * .8 \approx \overline{N}_{SF} * .812 \end{aligned} \tag{1}$$

Changing for the proportion of post-80 toilets in the multiple family sample (about 12.5 percent), we can find the comparable relationships between the multiple family overall savings and pre-/post-80 toilet savings:

$$\begin{aligned} N_{pre80} &= \overline{N}_{MF} \div (.8 * .125 + .875) \approx \overline{N}_{MF} * 1.0255 \\ N_{post80} &\approx \overline{N}_{MF} * 1.026 * .8 \approx \overline{N}_{MF} * .8205 \end{aligned} \tag{2}$$

Thus, if there is information on the mix of pre-/post-1980 toilets in a service area, the overall mean water savings given in Tables 1 and 2 should be separated into its two components: the mean for pre-1980 toilets and the mean for post-1980 toilets. For single family households, the mean for pre-1980 toilets can be derived by multiplying the overall mean from Table 1 by 1.015 and the mean for post-1980 toilets can be derived by multiplying the overall mean from Table 1 by 0.812. For multiple family households, the mean for pre-1980 toilets can be derived by multiplying the overall mean from Table 2 by 1.0255 and the mean for post-1980 toilets can be derived by multiplying the overall mean from Table 2 by 0.8205.

⁶ Our estimate is an empirical one based on observed retrofits in Los Angeles and Santa Monica. It can differ from theoretical calculations based upon design specifications of toilets meeting the 1980 plumbing code versus those that do not for several reasons. Toilets may use less on average if they were designed conservatively or they may use more if the earlier 1980-compliant designs resulted in more double flushes. Many supposedly 5-7 gl./flush toilets actually use 4-5 gl/flush in laboratory tests. Furthermore, the average rate at which toilets develop leaks and the preexisting installation of toilet dams or bags can alter theoretical calculations. Since no one knows, or can know, the true average amount of water used per flush across the mix of installed toilets in a service area, we believe this issue is moot.

EXHIBIT 6

Table 2 Planning Table For Estimating Water Savings in Service Areas with Different Household Characteristics—Multiple Family (Gallons per Unit per Day)

Persons per Unit	Toilets per Unit					
	1.0	1.1	1.2	1.3	1.4	1.5
1.5	30.7	33.0	35.0	36.7	38.1	39.2
1.6	31.8	34.2	36.3	38.0	39.5	40.6
1.7	32.9	35.4	37.5	39.4	40.9	42.1
1.8	34.0	36.6	38.8	40.7	42.3	43.5
1.9	35.1	37.8	40.1	42.0	43.6	44.9
2.0	36.2	38.9	41.3	43.3	45.0	46.3
2.1	37.4	40.1	42.5	44.6	46.3	47.6
2.2	38.5	41.3	43.8	45.9	47.6	49.0
2.3	39.6	42.5	45.0	47.2	49.0	50.3
2.4	40.7	43.6	46.2	48.5	50.3	51.7
2.5	41.8	44.8	47.4	49.7	51.6	53.0
2.6	42.8	45.9	48.7	51.0	52.8	54.3
2.7	43.9	47.1	49.9	52.2	54.1	55.6
2.8	45.0	48.2	51.0	53.4	55.4	56.8
2.9	46.1	49.4	52.2	54.6	56.6	58.1
3.0	47.2	50.5	53.4	55.9	57.8	59.3

Note: Above figures are accurate within ± 5 percent of model estimated water savings.

EXHIBIT 6

III. ESTIMATING TOILETS REPLACED BECAUSE OF HOUSING TURNOVER

Existing non-ULF toilets can be replaced with ULF toilets for reasons other than a legislation that requires retrofit upon resale or exchange. For example, toilets break down, malfunction, and are usually replaced when households remodel their bathrooms. Given that the State of California is considering another separate piece of legislation that would ban the sale and installation of non-ULF toilets in the state, it is very likely that a large number of old toilets will be replaced with ULF toilets purely as a result of the normal toilet replacement cycle. If this is not taken into account, one will overstate the water-saving effectiveness of a legislation that requires retrofit upon resale or exchange. To account for these complexities, we estimate the water-saving effectiveness of retrofit upon sale or exchange legislation by calculating the water that will be saved if it were in place and the amount of water that would be saved anyway in the absence of such legislation. There are at least seven factors that can affect estimates of net water savings attributable to a legislation that requires ULF toilet retrofits upon resale or exchange.

- Housing demolition rate
- Housing turnover rate
- Natural toilet replacement rate
- Existing mix of toilets
- Type of new toilet used for replacement
- Average number of people and toilets per household
- Changes in household size over time

Of these seven factors, changes in average household size over time can be safely ignored because it is unlikely to change appreciably over a period of ten years which is the focus of this analysis. Information about the average number of people and toilets per household, and the existing mix of pre-1980 and post-1980 toilets are required to forecast per-retrofit water savings--this was discussed in detail in Section II.

For the remaining factors--that is, the housing demolition rate, the housing turnover rate, the natural toilet replacement rate, and type of new toilet used for replacement--water planners should use data that is relevant to their own service area. Although some amount of uncertainty naturally surrounds estimates of the above factors, it is largest in the case of the natural toilet replacement rate and the type of new toilet that is likely to be used for replacement. To assess the extent to which this uncertainty affects estimates of the water-saving potential of BMP 16, we performed detailed sensitivity analyses. A total of six scenarios were considered for the sensitivity analysis.

It is generally agreed that, on average, a toilet lasts anywhere from 20 to 30 years, although some claim to have seen toilets as old as 50-60 years. Assuming that toilets are replaced at an annual rate of 3 percent implies that after 30 years approximately 40 percent $[(1-0.03)^{30}]$ of toilets of this vintage would still be around; with a replacement rate of 7 percent this number declines to 11 percent $[(1-0.07)^{30}]$ which can be considered the other end of the range. We performed sensitivity analyses assuming the natural toilet replacement rate is 3 percent, 5 percent and 7 percent. The sensitivity analyses also considered

EXHIBIT 6

IV. SAMPLE CALCULATION FOR A HYPOTHETICAL SERVICE AREA

In this section, we present detailed calculations for a hypothetical service area to demonstrate the method of calculating conservation targets. Single family and multiple family homes are analyzed separately. This scenario is based on a natural rate of toilet changeout of 4 percent per year, and that all new retrofits are of the 1.6 gallon-per-flush variety (i.e., BMP-2B that bans sale of non-ULF toilets in the State of California is in effect.)

Table 3 shows the data used for this sample calculation. For example, in this service area, publicly available data on real-estate sales suggest that 30 percent of all single family homes and 42 percent of all multiple family complexes were sold at least once in the last five years. This is typically the format in which real-estate transactions data are available. This five-year estimate can be transformed into an annual turnover rate using the following formula:

$$(1 - P)^5 = (1 - S)$$

where S is the proportion of the stock that was sold at least once during the five year period and P is the annual turnover rate. We apply a different turnover rates for the single family and the multiple family housing stock.

Table 3 Data Used in Sample Calculation

Parameter	Single Family	Multiple Family
Annual housing demolition rate	0.5%	0.5%
Annual housing turnover rate	6.9%	10.3%
Annual toilet replacement rate	4.0%	4.0%
No. of homes with old pre-1980 toilets	700,000	420,000
No. of homes with 3.5 gal. (post-1980) toilets	250,000	210,000
No. of homes with 1.6 gal. toilets	50,000	70,000
Average persons per household	3.25	2.47
Average toilets per household	2.16	1.20

NOTE: Homes already with 1.6 gallon/flush toilets are excluded from the analysis.

After establishing the home turnover rate, the next step is to estimate average water savings per household per day using information contained in Section II. For single family households (Table 1), average household water savings corresponding to 3.25 people per household (refer footnote 1) and

EXHIBIT 6

Table 4 Single Family Natural Replacement Only BMP 2b

Year	Housing Stock	Homes Naturally Retrofitted	Toilets Naturally Retrofitted	Annual Water Savings (AF/yr)	Annual Cumulative Savings (AF/yr)
1992	950,000	0	0	0	0
1993	912,190	37,810	81,670	1,709	1,709
1994	875,885	36,305	78,419	1,641	3,350
1995	841,025	34,860	75,298	1,576	4,926
1996	807,552	33,473	72,301	1,513	6,439
1997	775,411	32,141	69,424	1,453	7,891
1998	744,550	30,861	66,661	1,395	9,286
1999	714,917	29,633	64,007	1,339	10,626
2000	666,483	28,454	61,460	1,286	11,912
2001	659,142	27,321	59,014	1,235	13,147
2002	632,908	26,234	56,665	1,186	14,333

Note: Water savings are from a weighted mix of pre-1980 and post-1980 toilets.

Table 5 Single Family: Natural Replacement and Housing Turnover (BMP2b and BMP 16)

Year	Housing Stock	Homes Naturally Retrofitted	Home Turnover	Total Homes Retrofitted	Total Toilets Retrofitted	Annual Water Savings (AF/yr)	Annual Cumulative Savings (AF/yr)
1992	950,000	0	0	0	0	0	0
1993	849,758	37,810	62,432	100,242	216,522	4,531	4,531
1994	760,094	33,820	55,844	89,665	193,675	4,053	8,584
1995	679,890	30,252	49,952	80,203	173,239	3,625	12,209
1996	608,150	27,060	44,681	71,740	154,959	3,243	15,452
1997	543,979	24,204	39,966	64,171	138,608	2,901	18,352
1998	486,580	21,650	35,749	57,399	123,983	2,594	20,947
1999	435,237	19,366	31,977	51,343	110,900	2,321	23,267
2000	389,312	17,322	28,603	45,925	99,198	2,076	25,343
2001	348,232	15,495	25,585	41,079	88,731	1,857	27,200
2002	311,488	13,860	22,885	36,745	79,369	1,661	28,861

EXHIBIT 6

Table 8 Conservation Targets (AF/yr) : Net Conservation for Single and Multiple Family

Year	Single Family Savings			Multiple Family Savings			Total Annual Savings (SF + MF) AF/yr			Annual Cumulative Savings AF/yr		
	Natural	Natural + Turnover	Net Savings	Natural	Natural + Turnover	Net Savings	Natural	Natural + Turnover	Net Savings	Natural	Natural + Turnover	Net Savings
	BMP 2B	BMP 2B + 16	BMP 16	BMP 2B	BMP 2B + 16	BMP 16	BMP 2B	BMP 2B + 16	BMP 16	BMP 2B	BMP 2B + 16	BMP 16
1992	0	0	0	0	0	0	0	0	0	0	0	0
1993	1709	4531	2822	1224	4250	3026	2833	8781	5848	2933	8781	5646
1994	1641	4053	2412	1175	4663	2487	2816	7715	4899	5749	16496	10747
1995	1578	3625	2050	1129	3156	2028	2704	6782	4077	8453	23276	14824
1996	1513	3243	1730	1064	2720	1637	2597	5963	3366	11050	29241	18190
1997	1453	2901	1448	1040	2344	1304	2493	5245	2752	13543	34485	20942
1998	1395	2594	1200	999	2020	1021	2394	4615	2221	15837	39100	23163
1999	1339	2321	981	959	1741	782	2299	4082	1763	18236	43162	24826
2000	1286	2076	790	921	1501	579	2207	3578	1389	20443	46736	26295
2001	1235	1857	622	884	1283	409	2119	3150	1031	22583	49888	27326
2002	1186	1661	475	849	1115	265	2035	2775	740	24598	52664	28068

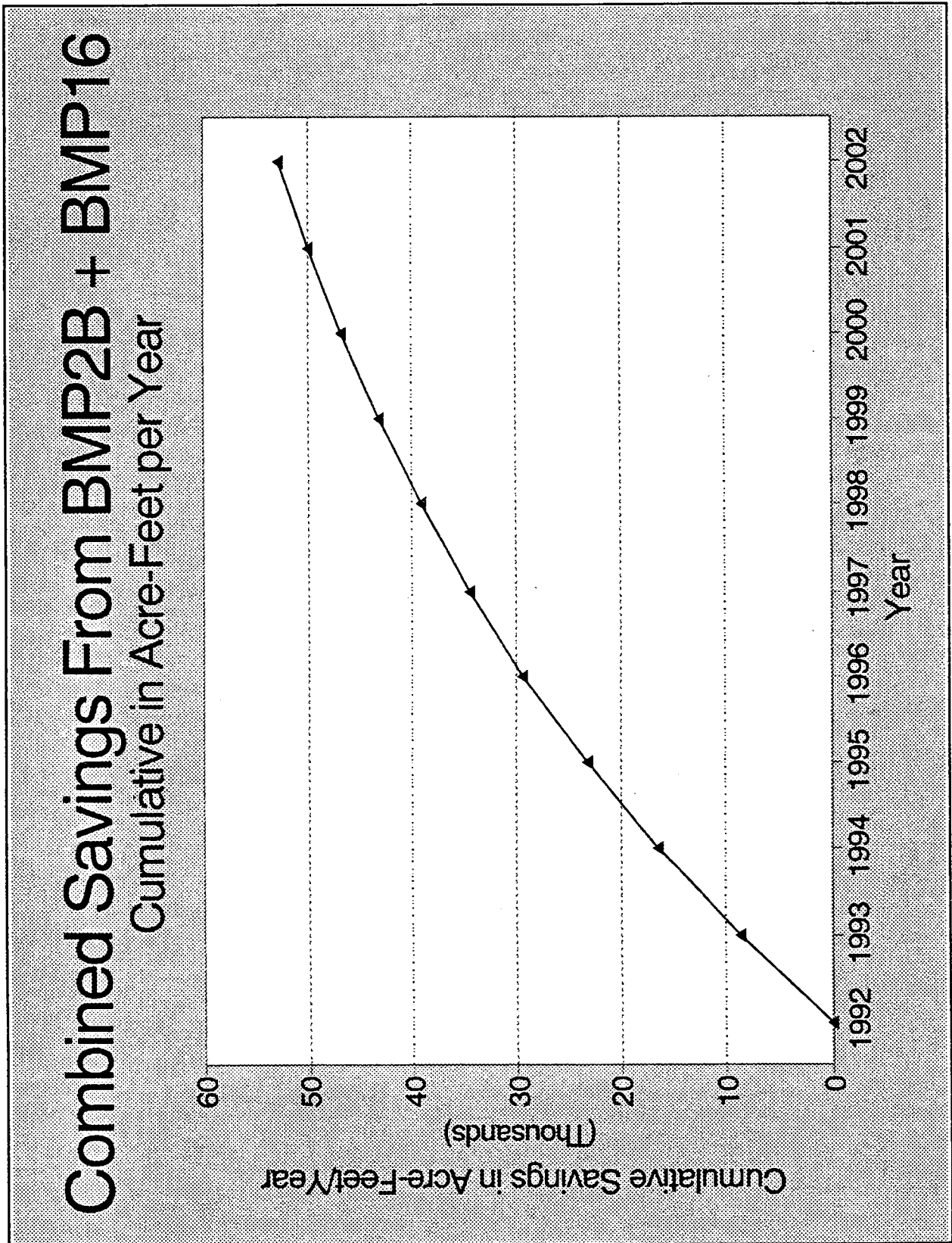


Figure 2 Combined Savings From Natural Replacement and Housing Turnover (BMP2B+BMP16)

EXHIBIT 6

V. ESTIMATING WATER SAVINGS FROM NEW CONSTRUCTION (BMP 2A)

The analysis described above can be extended to evaluate water savings that will be achieved from new construction. For this analysis each service area will be required to forecast the rate of growth of new construction by type (single family, multiple family, and so on). The water savings calculations would be based on installation of 1.6 ULF toilets, assuming the implementation of the 1991 plumbing code, as opposed to installation of 3.5 gallon/flush toilets.

EXHIBIT 7

**BYLAWS
OF
CALIFORNIA URBAN WATER CONSERVATION COUNCIL**

Adopted December 7, 1994

EXHIBIT 7

BYLAWS OF CALIFORNIA URBAN WATER CONSERVATION COUNCIL

ARTICLE I

Name, Principal Office, Purpose and Restrictions

- 1.01** Name. The name of the corporation is California Urban Water Conservation Council, a California nonprofit public benefit corporation (Council).
- 1.02** Principal Office. The Board of Directors (Board) shall determine the location of the principal office of the corporation.
- 1.03** Purpose. The purpose of the Council is to implement the Memorandum of Understanding Regarding Urban Water Conservation in California dated September 1991, as amended from time to time, among signatories comprised of water suppliers, public advocacy organizations and other interested groups (the MOU).
- 1.04** Restrictions. All policies and activities of the Council shall be consistent with and limited by the MOU and shall also be consistent with:
- a. Applicable federal, state and local antitrust and trade regulation laws;
 - b. Applicable tax-exemption requirements including that no part of the Council's net earnings inure to the benefit of any private individual; and
 - c. All other legal requirements including the California Nonprofit Corporation Law under which the Council is incorporated and to which its operations are subject, as amended from time to time.

EXHIBIT 7

ARTICLE IV Board of Directors

- 4.01** **Board of Directors.** The Board of Directors is the governing body of the Council and has authority and responsibility for the supervision, control, and direction of the Council. The Board may employ an Executive Director and other staff to perform such duties as described and agreed upon by the Board. A meeting of the full Board may be referred to as a "Plenary session" or "Plenary meeting".
- 4.02** **Composition.** The Board shall consist of the representatives of Group 1 and Group 2 signatories. Representatives of Group 3 signatories shall be advisory directors. Advisory directors may attend and participate in meetings, but do not have a vote.
- 4.03** **Term of Office.** All representatives will serve until replaced by the signatory they represent.
- 4.04** **Meetings.** The President, the Vice-president, the Secretary or 10 percent or more of the directors of each of Group 1 and Group 2 may call meetings of the Board. The Board shall hold its annual meeting at the time and place it selects and may hold other regular meetings each year at the time and place it selects.
- 4.05** **Notice.** The Board may hold regular meetings without additional notice if the time and place of such meetings has been fixed by the Board and communicated to all Board members. The Board may hold special meetings upon seven days notice by first class mail or 48 hours notice delivered personally or by telephone or electronic media.
- 4.06** **Quorum.** A quorum of the Board shall be at least 30 representatives with voting rights , provided that at least 10 percent of the directors from each of Group 1 and Group 2 are present.
- 4.07** **Board Action.** Any decision by the Board to undertake responsibilities in addition to those listed in Exhibit 2, Section 3 of the MOU; to modify the MOU itself; or to modify Exhibits 2 or 3 of the MOU must be carried out according to the procedures in Exhibit 3, Section 7 of the MOU.

All other Board actions, including modification of MOU Exhibits other than Exhibits 2 or 3 and modification of the Bylaws, require that a quorum be present at a properly noticed meeting of the Board, that a majority of the directors voting from Group 1 vote in favor of the action, and that a majority of the directors voting from Group 2 vote in favor of the action.

The Board may modify the Bylaws and take other actions only to the extent that such actions are consistent with the then current version of the MOU.

EXHIBIT 7

- 5.07 **Committee Action.** All Executive committee actions require that a quorum be present, that a majority of the Executive Committee members voting from Group 1 vote in favor of the action, and that a majority of the Executive Committee Members voting from Group 2 vote in favor of the action.

The Executive Committee may also act without meeting, provided that (1) the taking of the vote has previously been authorized by the Executive Committee; (2) the vote has received seven days notice by first class mail or 48 hours notice delivered personally or by telephone or electronic media; and (3) the proposed action is approved by 50% or more of the Group 1 and 50% or more of the Group 2 members of the Executive Committee voting.

The Executive Committee may take action without seeking Board approval only where the Board has delegated such authority to the Executive Committee and only to the extent that the action is consistent with the then current version of the MOU.

ARTICLE VI Officers

- 6.01 **Officers.** The officers of the Council are President, Vice-President, Secretary and Treasurer. The President and Vice-President may be referred to as Convener and Vice-Convener, respectively.
- 6.02 **Qualifications.** Only designated representatives of signatories may serve as officers. In addition, the offices of President and Vice President may only be held by directors representing Group 1 or Group 2 signatories. No person may hold more than one office at the same time, except that one person may hold the offices of Secretary and Treasurer concurrently.
- 6.03 **Selection and Term of Office.** The officers shall be selected by the Board and immediately assume office at the first Plenary meeting of the calendar year for a term of one year. The offices of President and Vice-President shall not be held by designees from the same Group. The office of President shall alternate between Group 1 and Group 2. The Board may specify that the Secretary and/or Treasurer will be members of Group 3. If so, then Group 3 will select these officers, subject to approval by the Board.
- 6.04 **Duties.** The officers perform those duties that are usual to their positions and that are assigned to them by the Board, including those duties that are set forth in the position descriptions for each officer as adopted by the Board from time to time. In addition, the President of the Council acts as Chair of the Board and the Executive Committee; the Vice-President acts in place of the President when the President is not available; and the Treasurer is the chief financial officer of the Council.
- 6.05 **Vacancies.** If a vacancy occurs among the officers, for any reason, the Executive Committee shall elect another designee from the same Group for the unexpired portion of the term. Signatories whose designee serves as an officer may not substitute another individual into that office.

Appendix D

Tables & Graphs for Disaggregated Water Use

Table 2-1A Waterworks District No. 4 - Regions 4 & 34 Water Use Data						
Class	Number of meters	Percent Used	Volume Used (MG) 1994	Volume Use (MG) 2000	Volume Use (MG) 2005	Volume Use (MG) 2010
Single Family Residential	23,637	69.24%	8,113.11	10871.97	13875.30	17708.28
Multi-family Residential	3,675	10.77%	1,261.39	1690.33	2157.27	2753.20
Commercial/Institutional	3,079	9.02%	1,056.83	1416.20	1807.42	2306.72
Industrial	174	0.51%	59.73	80.04	102.15	130.37
Landscape Irrigation	1,033	3.03%	354.57	475.14	606.40	773.91
Others*	2,539	7.43%	871.50	1167.85	1490.47	1902.20
Total	34,137	100.00%	11,717.13	15701.54	20039.01	25574.69

Source: Department of Water Resources, Public Water System Statistics-1994

*Others ~ e.g., fire protection, temporary construction meter, public agency, resale.

Figure 2-1A

Disaggregation of Water Use - Regions 4 & 34

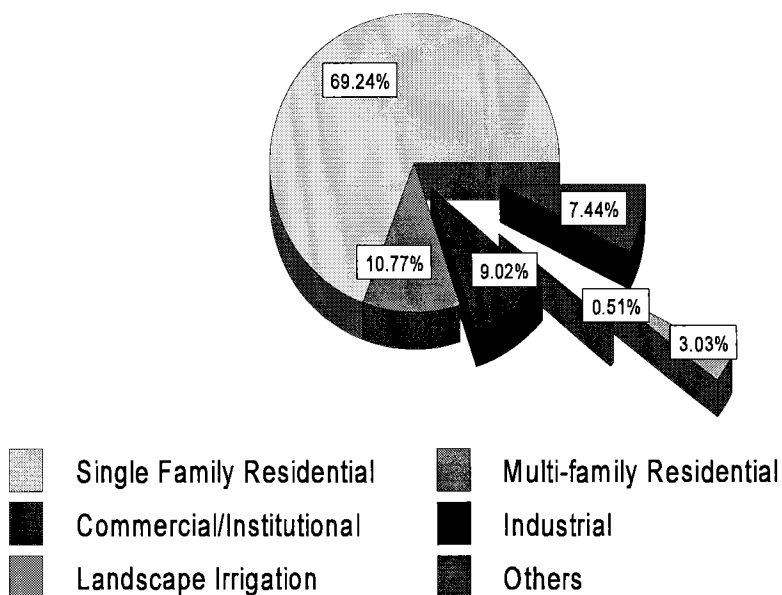


Table 2-1B Waterworks District No. 40 - Regions 24, 27, & 33 Water Use Data						
Class	Number of meters	Percent Used	Volume Used (MG) 1994	Volume Use (MG) 2000	Volume Use (MG) 2005	Volume Use (MG) 2010
Single Family Residential	2,258	89.81%	633.74	792.90	955.68	1151.87
Multi-family Residential	20	0.80%	5.61	7.02	8.46	10.20
Commercial/Institutional	51	2.03%	14.29	17.88	21.55	25.97
Industrial	0	0.00%	0	0	0	0
Landscape Irrigation	7	0.28%	1.98	2.48	2.99	3.60
Others	178	7.08%	49.95	62.49	75.32	90.79
Total	2,514	100.00%	705.57	882.77	1064.00	1282.43

Source: Department of Water Resources, Public Water System Statistics-1994

*Others ~ e.g., fire protection, temporary construction meter, public agency, resale.

Figure 2-1B
Disaggregation of Water Use - Regions 24, 27, & 34

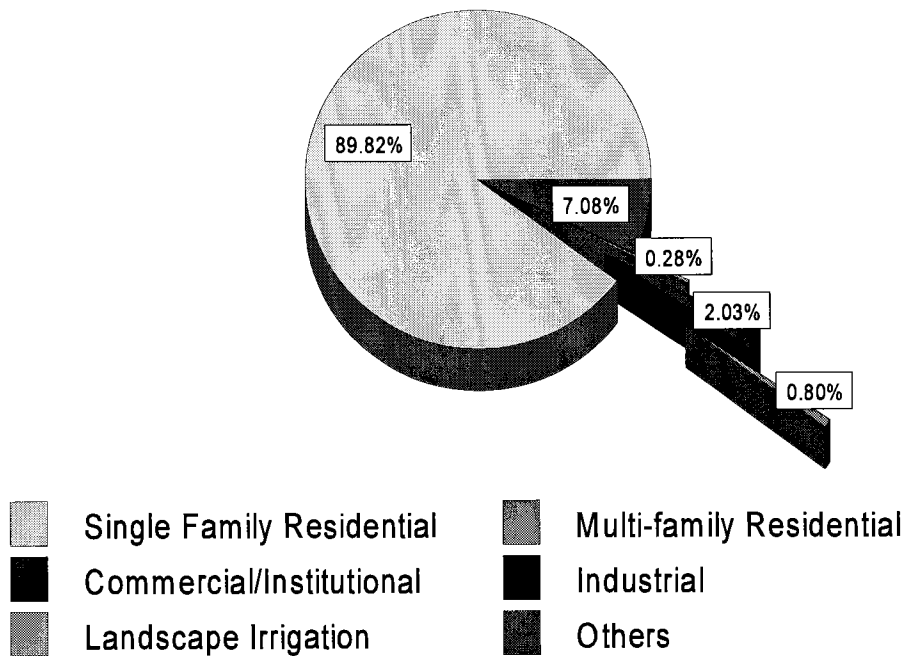


Table 2-1C Waterworks District No. 40 - Regions 35 Water Use Data						
Class	Number of meters	Percent Used	Volume Used (MG) 1994	Volume Use (MG) 2000	Volume Use (MG) 2005	Volume Use (MG) 2010
Single Family Residential	157	73.36%	53.79	76.92	103.64	136.63
Multi-family Residential	0	0.00%	0	0	0	0
Commercial/Institutional	0	0.00%	0	0	0	0
Industrial	0	0.00%	0	0	0	0
Landscape Irrigation	5	2.35%	1.72	2.46	3.31	4.46
Others	52	24.29%	17.81	25.47	34.31	46.23
Total	214	100.00%	73.32	104.85	141.26	190.32

Source: Department of Water Resources, Public Water System Statistics-1994

*Others ~ e.g., fire protection, temporary construction meter, public agency, resale.

Figure 2-1C
Disaggregation of Water Use - Region 35

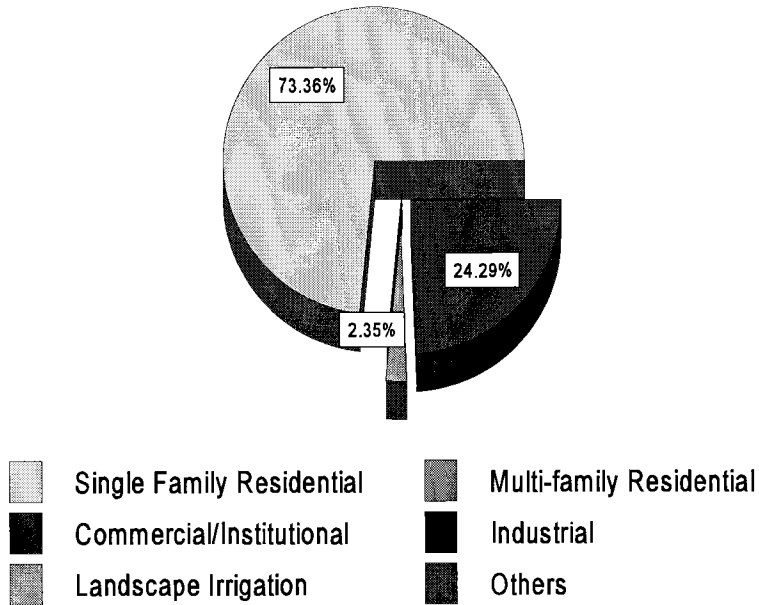


Table 2-1D Waterworks District No. 40 - Regions 38 Water Use Data						
Class	Number of meters	Percent Used	Volume Used (MG) 1994	Volume Use (MG) 2000	Volume Use (MG) 2005	Volume Use (MG) 2010
Single Family Residential	3,308	95.58%	856.36	876.49	893.63	911.10
Multi-family Residential	1	0.03%	0.24	0.25	0.25	0.26
Commercial/Institutional	35	1.01%	9.05	9.26	9.44	9.63
Industrial	0	0.00%	0	0	0	0
Landscape Irrigation	1	0.03%	0.24	0.25	0.25	0.26
Others	116	3.35%	30.03	30.74	31.34	31.95
Total	3,460	100.00%	895.92	916.98	934.91	953.19

Source: Department of Water Resources, Public Water System Statistics-1994

*Others ~ e.g., fire protection, temporary construction meter, public agency, resale.

Figure 2-1D

Disaggregation of Water Use - Region 38

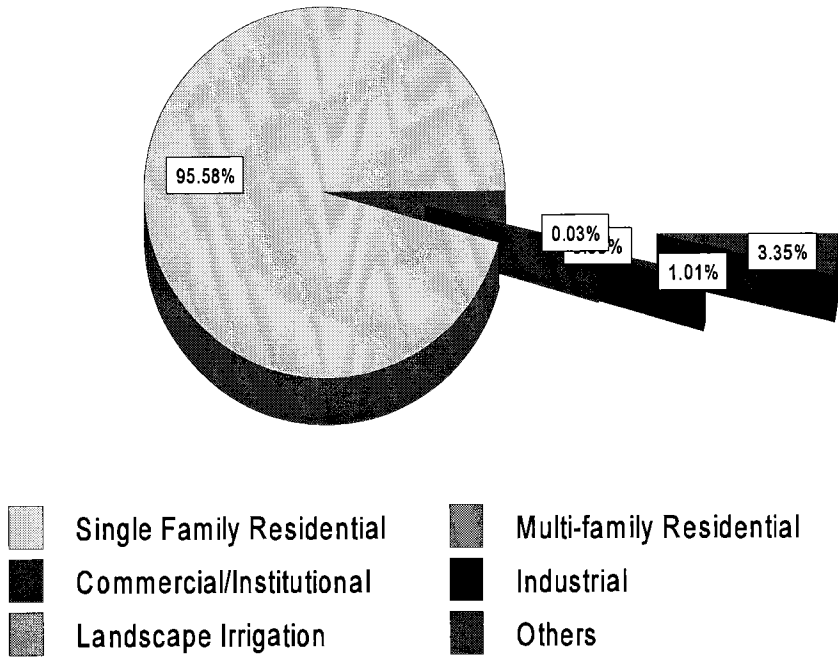
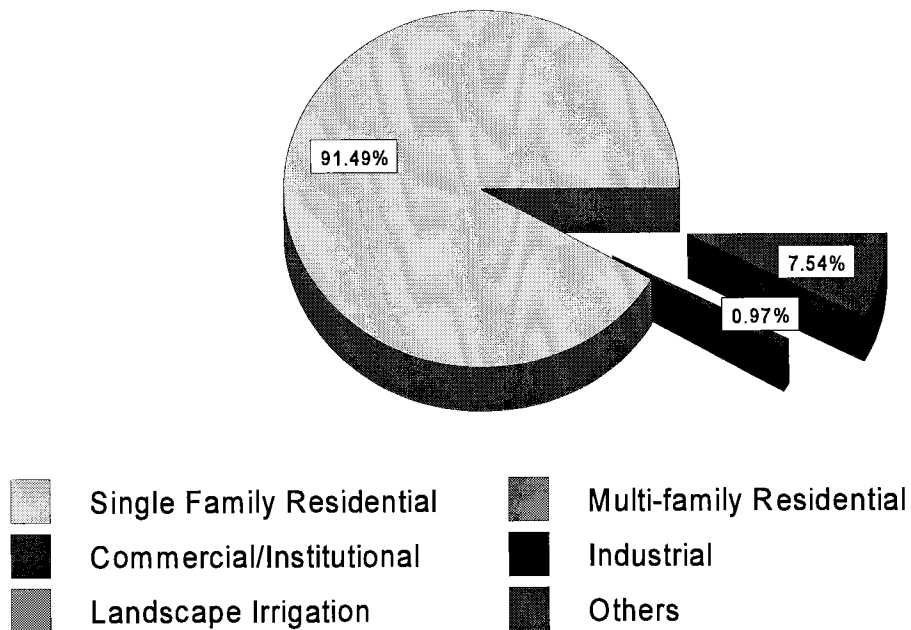


Table 2-1E Waterworks District No. 40 - Regions 39 Water Use Data						
Class	Number of meters	Percent Used	Volume Used (MG)1994	Volume Use (MG) 2000	Volume Use (MG) 2005	Volume Use (MG) 2010
Single Family Residential	280	91.49%	68.07	93.91	122.80	160.57
Multi-family Residential	0	0.00%	0	0	0	0
Commercial/Institutional	3	0.97%	0.72	0.99	1.30	1.70
Industrial	0	0.00%	0	0	0	0
Landscape Irrigation	0	0.00%	0	0	0	0
Others	23	7.54%	5.61	7.74	10.12	13.23
Total	306	100.00%	74.40	102.64	134.22	175.50

Source: Department of Water Resources, Public Water System Statistics-1994

*Others ~ e.g., fire protection, temporary construction meter, public agency, resale.

Figure 2-1E
Disaggregation of Water Use - Region 39



Appendix E

Projection of Population & Water Demand (Source: Los Angeles County Department of Regional Planning)

PROJECTION SUMMARIES FOR DISTRICT 40

POPULATION PROJECTION - DISTRICT 40

Water Regions	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010							
Growth*	0.0500	0.0381	0.0614	0.0039	0.0551	123193	128722	134523	140609	146994	153693	160722	168096	175834	183953	192472	201411	210791	220634	230962	241801	253175		
4&34	101728	106814	112154	117761	123648	129830	136321	143136	150292	157805	165695	173978	182676	191809	201398	211467	222039	233000	243461	253922	264383	274844	285305	
24, 27, & 33	7869	8168	8479	880	9137	9484	9845	10220	10609	11012	11431	11866	12318	12787	13273	13778	14302	14836	15380	15934	16498	17072	17656	18240
35	736	781	829	880	934	992	1053	1117	1186	1259	1336	1418	1505	1598	1696	1800	1910	2024	2142	2264	2392	2526	2666	2810
38	11902	11948	11995	12041	12088	12135	12182	12229	12276	12324	12372	12420	12468	12517	12566	12614	12663	12712	12761	12810	12859	12908	12957	13006
39	958	1011	1066	1125	1187	1253	1322	1395	1471	1552	1638	1728	1823	1924	2030	2142	2260	2384	2514	2650	2792	2940	3094	3254
Total	123193	128722	134523	140609	146994	153693	160722	168096	175834	183953	192472	201411	210791	220634	230962	241801	253175							

* Growth - growth per year

WATER DEMAND PROJECTION - DISTRICT 40 (Unit = Million Gallons)

Water Regions	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4&34	11717.13	12302.92	12917.99	13563.81	14241.92	14953.93	15701.54	16486.52	17310.75	18176.18	19084.88	20039.01	21040.84	22092.75	23197.26	24356.98	25574.69
24, 27, & 33	705.57	732.42	760.29	789.21	819.24	850.42	882.77	916.36	951.23	987.43	1025.00	1064.00	1104.48	1146.51	1190.13	1235.42	1282.43
35	73.32	77.82	82.60	87.68	93.07	98.78	104.85	111.29	118.13	125.38	133.09	141.26	149.94	159.15	168.93	179.31	190.32
38	895.92	899.40	902.89	906.39	909.91	913.44	916.98	920.54	924.11	927.70	931.29	934.91	938.54	942.18	945.83	949.50	953.19
39	74.40	78.50	82.82	87.39	92.20	97.28	102.64	108.30	114.27	120.56	127.21	134.22	141.61	149.41	157.65	166.33	175.50
Total Vol. Used	13466.34	14091.05	14746.59	15434.48	16156.34	16913.85	17708.79	18543.01	19418.48	20337.25	21301.47	22313.39	23375.41	24490.01	25659.80	26887.54	28176.12

WATER DEMAND PROJECTION - DISTRICT 40 (Unit = Acre-Feet)

Water Regions	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
4&34	35958.55	37756.26	39643.85	41625.80	43706.85	45891.93	48186.25	50595.27	53124.73	55780.65	58569.34	61497.46	64571.96	67800.18	71189.78	74748.84	78485.83
24, 27, & 33	2165.31	2247.71	2333.23	2422.01	2514.17	2609.83	2709.14	2812.22	2919.22	3030.30	3145.60	3265.29	3389.54	3518.51	3652.39	3791.36	3935.62
35	225.01	238.83	253.50	269.08	285.61	303.15	321.77	341.54	362.52	384.79	408.43	433.52	460.15	488.42	518.42	550.27	584.07
38	2749.48	2760.15	2770.85	2781.61	2792.40	2803.23	2814.11	2825.03	2835.99	2846.99	2858.04	2869.13	2880.26	2891.44	2902.65	2913.92	2925.22
39	228.33	240.91	254.18	268.19	282.96	298.55	315.00	332.36	350.67	370.00	390.38	411.89	434.59	458.53	483.80	510.46	538.58
Total Vol. Used	41326.68	43243.85	45255.62	47366.68	49581.98	51906.69	54346.27	56906.42	59593.14	62412.73	65371.80	68477.29	71736.50	75157.07	78747.04	82514.84	86469.33
Ground Water	17011.09	17297.54	18102.25	18946.67	19832.79	20762.68	21738.51	11381.28	11918.63	12482.55	13074.36	13695.46	14347.30	15031.41	15749.41	16502.97	17293.87
Purchased Water	24328.71	25946.31	27153.37	28420.01	29749.19	31144.02	32607.76	45525.13	47674.51	49930.18	52297.44	54781.83	57389.20	60125.66	62997.63	66011.87	69175.46

PROJECTIONS FOR REGIONS 4 & 34

POPULATION PROJECTION

Regions 4 & 34	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Class	101728	106814	112154	117761	123648	129830	136321	143136	150292	157805	165695	173978	182676	191809	201398	211467	222039
Total	70436	73958	77655	81538	85614	89894	94388	99107	104062	109264	114727	120463	126485	132809	139448	146420	153740
Single Family	10956	11504	12079	12683	13317	13983	14682	15416	16186	16996	17845	18737	19674	20658	21691	22775	23914
Multi-family	9176	9635	10116	10622	11153	11711	12296	12911	13556	14234	14946	15693	16477	17301	18166	19074	20028
Commercial/Institutional	519	545	572	601	631	662	695	730	766	805	845	887	932	978	1027	1078	1132
Industrial	3082	3236	3398	3568	3747	3934	4131	4337	4554	4782	5021	5272	5535	5812	6102	6407	6728
Landscape Irrigation	7558	7936	8333	8750	9187	9646	10129	10635	11167	11725	12311	12927	13573	14251	14964	15712	16498
Other	101728	106814	112154	117761	123648	129830	136321	143136	150292	157805	165695	173978	182676	191809	201398	211467	222039

* Growth - growth per year

WATER DEMAND PROJECTION

Regions 4 & 34	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Single Family	8113.11	8518.72	8944.60	9391.78	9861.31	10354.32	10871.97	11415.50	11986.21	12585.45	13214.65	13875.30	14568.98	15297.34	16062.12	16865.13	17706.28
Multi-family	1261.39	1324.45	1390.67	1460.19	1533.19	1609.84	1690.33	1774.83	1863.56	1956.73	2054.55	2157.27	2265.12	2378.36	2497.27	2622.11	2753.20
Commercial/Institutional	1056.83	1109.67	1165.14	1223.39	1284.55	1348.77	1416.20	1487.01	1561.35	1639.41	1721.37	1807.42	1897.78	1992.66	2092.28	2196.89	2306.72
Industrial	59.73	62.72	65.85	69.14	72.60	76.23	80.04	84.04	88.24	92.66	97.29	102.15	107.26	112.62	118.25	124.16	130.37
Landscape Irrigation	354.57	372.30	390.91	410.45	430.97	452.52	475.14	498.90	523.84	550.03	577.52	606.40	636.71	668.54	701.97	737.06	773.91
Other	871.50	915.07	960.82	1008.85	1059.29	1112.25	1167.85	1226.24	1287.54	1351.91	1419.50	1490.47	1564.98	1643.22	1725.37	1811.63	1902.20
Total (MG)	11717.13	12302.92	12917.99	13563.81	14241.92	14953.93	15701.54	16486.52	17310.75	18176.18	19084.88	20039.01	21040.84	22092.75	23197.26	24356.98	25574.69
Total (Ac-Ft)	35958.55	37756.26	39643.85	41625.80	43706.85	45891.93	48186.25	50595.27	53124.73	55780.65	58569.34	61497.46	64571.96	67800.18	71189.78	74748.84	78485.83

Volume of Water in million gallons unless stated otherwise

PROJECTIONS FOR REGIONS 24, 27, & 33

POPULATION PROJECTION

Regions 24, 27, & 33	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Class																	
Total	7869	8168	8479	8802	9137	9484	9845	10220	10609	11012	11431	11866	12318	12787	13273	13778	14302
Single Family	7067	7336	7615	7905	8206	8518	8842	9179	9528	9890	10267	10657	11063	11484	11921	12374	12845
Multi-family	63	65	68	70	73	76	79	82	85	88	91	95	99	102	106	110	114
Commercial/Institutional	160	166	172	179	185	193	200	207	215	224	232	241	250	260	269	280	290
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landscaping/Irrigation	22	23	24	25	26	27	28	29	30	31	32	33	34	36	37	39	40
Other	557	578	600	623	647	671	697	724	751	780	809	840	872	905	940	975	1013
Total	7869	8168	8479	8802	9137	9484	9845	10220	10609	11012	11431	11866	12318	12787	13273	13778	14302

* Growth - growth per year

WATER DEMAND PROJECTION

Regions 24, 27, & 33	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Single Family	633.74	657.85	682.89	708.87	735.84	763.84	792.90	823.07	854.39	886.90	920.65	955.68	992.04	1029.79	1068.97	1109.65	1151.87
Multi-family	5.61	5.82	6.05	6.28	6.51	6.76	7.02	7.29	7.56	7.85	8.15	8.46	8.78	9.12	9.46	9.82	10.20
Commercial/Institutional	14.29	14.83	15.40	15.98	16.59	17.22	17.88	18.56	19.27	20.00	20.76	21.55	22.37	23.22	24.10	25.02	25.97
Industrial	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscaping/Irrigation	1.98	2.06	2.13	2.21	2.30	2.39	2.48	2.57	2.67	2.77	2.88	2.99	3.10	3.22	3.34	3.47	3.60
Other	49.95	51.85	53.82	55.87	58.00	60.20	62.49	64.87	67.34	69.90	72.56	75.32	78.19	81.17	84.25	87.46	90.79
Total	705.57	732.42	760.29	789.21	819.24	850.42	882.77	916.36	951.23	987.43	1025.00	1064.00	1104.48	1146.51	1190.13	1235.42	1282.43

Volume of Water in million gallons unless stated otherwise

PROJECTIONS FOR REGION 35

POPULATION PROJECTION

Region 35	Growth*	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	
Class																			
Total	0.0614	736	781	829	880	934	992	1053	1117	1186	1259	1336	1418	1505	1598	1696	1800	1910	
Single Family		540	573	608	646	685	727	772	820	870	923	980	1040	1104	1172	1244	1320	1402	
Multi-family		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Commercial/Institutional		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Industrial		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Landscape Irrigation		17	18	19	21	22	23	25	26	28	30	31	33	35	38	40	42	45	
Other		179	190	201	214	227	241	256	271	288	306	325	344	366	388	412	437	464	
Total		736	781	829	880	934	992	1053	1117	1186	1259	1336	1418	1505	1598	1696	1800	1910	

* Growth - growth per year

WATER DEMAND PROJECTION

Region 35	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Single Family	53.79	57.09	60.60	64.32	68.28	72.47	76.92	81.65	86.66	91.99	97.64	103.64	110.00	116.76	123.93	131.54	139.63
Multi-family	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial/Institutional	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Industrial	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape Irrigation	1.72	1.83	1.94	2.06	2.18	2.32	2.46	2.61	2.77	2.94	3.12	3.31	3.52	3.73	3.96	4.21	4.46
Other	17.81	18.90	20.07	21.30	22.61	23.99	25.47	27.03	28.69	30.46	32.33	34.31	36.42	38.66	41.03	43.55	46.23
Total	73.32	77.82	82.60	87.68	93.07	98.78	104.85	111.29	118.13	125.38	133.09	141.26	149.94	159.15	168.93	179.31	190.32

Volume of Water in million gallons unless stated otherwise

PROJECTIONS FOR REGION 38

POPULATION PROJECTION

Region 38	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Class																	
Total	11902	11948	11995	12041	12088	12135	12182	12229	12276	12324	12372	12420	12468	12517	12565	12614	12663
Single Family	11376	11420	11464	11509	11554	11598	11643	11689	11734	11779	11825	11871	11917	11963	12010	12056	12103
Multi-family	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Commercial/Institutional	120	121	121	122	122	123	123	124	124	124	125	125	126	126	127	127	128
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landscape Irrigation	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
Other	399	400	402	403	405	407	408	410	411	413	414	416	418	419	421	423	424
Total	11902	11948	11995	12041	12088	12135	12182	12229	12276	12324	12372	12420	12468	12517	12565	12614	12663

* Growth - growth per year

WATER DEMAND PROJECTION

Region 38	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Single Family	856.36	859.68	863.02	866.37	869.73	873.10	876.49	879.89	883.31	886.73	890.17	893.63	897.09	900.57	904.07	907.58	911.10
Multi-family	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.26
Commercial/Institutional	9.05	9.09	9.12	9.16	9.19	9.23	9.26	9.30	9.33	9.37	9.41	9.44	9.48	9.52	9.55	9.59	9.63
Industrial	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape Irrigation	0.24	0.24	0.24	0.24	0.24	0.24	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.25	0.26
Other	30.03	30.15	30.26	30.38	30.50	30.62	30.74	30.86	30.97	31.10	31.22	31.34	31.46	31.58	31.70	31.83	31.95
Total	895.92	899.40	902.89	906.39	909.91	913.44	916.98	920.54	924.11	927.70	931.29	934.91	938.54	942.18	945.83	949.50	953.19

Volume of Water in million gallons unless stated otherwise

PROJECTIONS FOR REGION 39

POPULATION PROJECTION

Region 39 Class	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Total	958	1011	1066	1125	1187	1253	1322	1395	1471	1552	1638	1728	1823	1924	2030	2142	2260
Single Family	876	925	976	1029	1086	1146	1209	1276	1346	1420	1499	1581	1668	1760	1857	1959	2067
Multi-family	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Commercial/Institutional	9	10	10	11	12	12	13	14	14	15	16	17	18	19	20	21	22
Industrial	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Landscape Irrigation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other	72	76	80	85	90	94	100	105	111	117	124	130	137	145	153	161	170
Total	958	1011	1066	1125	1187	1253	1322	1395	1471	1552	1638	1728	1823	1924	2030	2142	2260

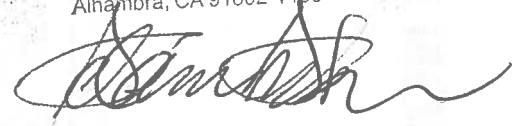
* Growth - growth per year

WATER DEMAND PROJECTION

Region 39 Class	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010
Single Family	68.07	71.82	75.78	79.95	84.36	89.01	93.91	99.09	104.55	110.31	116.38	122.80	129.56	136.70	144.23	152.18	160.57
Multi-family	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Commercial/Institutional	0.72	0.76	0.80	0.85	0.89	0.94	0.99	1.05	1.11	1.17	1.23	1.30	1.37	1.45	1.53	1.61	1.70
Industrial	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Landscape Irrigation	0	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Other	5.61	5.92	6.25	6.59	6.95	7.34	7.74	8.17	8.62	9.09	9.59	10.12	10.68	11.27	11.89	12.54	13.23
Total (MG)	74.4	78.50	82.82	87.39	92.20	97.28	102.64	108.30	114.27	120.56	127.21	134.22	141.61	149.41	157.65	166.33	175.50

Volume of Water in million gallons unless stated otherwise

LOS ANGELES COUNTY WATERWORKS DISTRICTS
Department of Public Works
P.O. Box 1460
Alhambra, CA 91802-1460

A handwritten signature in black ink, appearing to be "D. J. ...", written over the printed address.