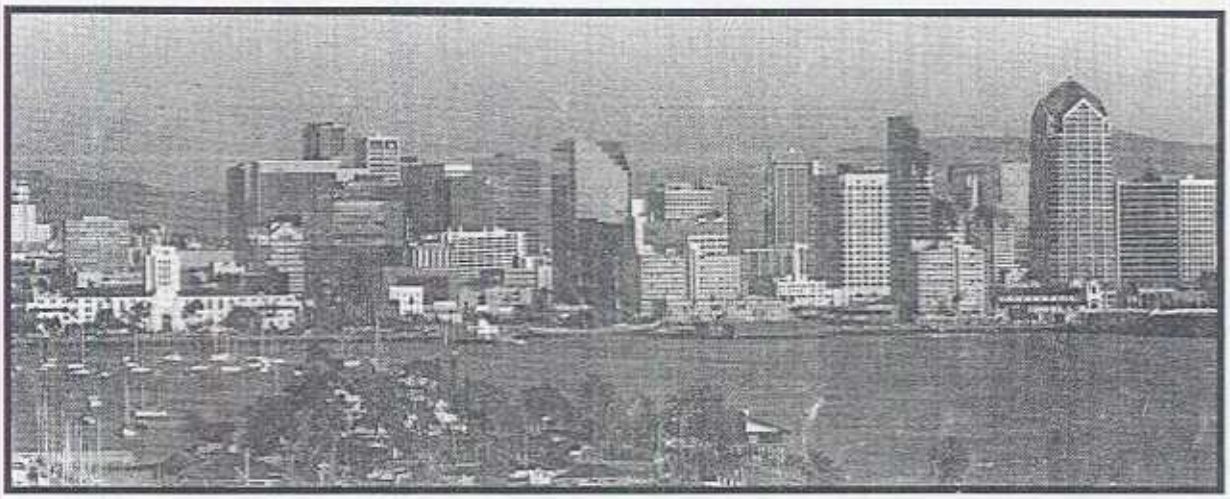
Urban Water Management Plan



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SECTION 1

INTRODUCTION

The California Water Code requires all urban water suppliers within the state to prepare Urban Water Management Plans and update them every five years. These plans satisfy the requirements of the Urban Water Management Planning Act of 1983, and the six amendments made to the Act since 1990. Sections 10610 through 10656 of the Water Code detail the information that must be provided in a plan, as well as who must file them. Appendix C contains the text of the Act.

Urban water management plans require water suppliers to review historic and projected demand and supply balances, and consider alternative supply sources, such as reclaimed or recycled water. Recent amendments to the Water Code also require the plans to provide detailed information about demand management, or water conservation, and to outline drought contingency plans for times of water shortage. According to the Act, the purpose of the plan is to help local agencies "achieve conservation and efficient use" of the state's water resources.

Urban water management plans are also now required for land use planning purposes. Senate Bill 901, adopted in October 1995, requires land use planning agencies to use assessments of water supply availability, prepared by water agencies, before adopting or amending specific or general plans. Water agencies are required to use urban water management plans to make the assessments of supply availability.

Water suppliers are considered urban and must file plans to the state's Department of Water Resources if they are "providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually." By this definition, the Authority and all its member agencies are urban water suppliers. Updated plans are due to DWR by December 31, 1995.

This report constitutes the 1995 update to the San Diego County Water Authority's 1990 Urban Water Management Plan. Because the Authority is a water wholesaler, this Plan addresses regional issues of San Diego County water demands, supplies, and management. Plans submitted by Authority member agencies, which are retail water agencies, are expected to provide information about these issues at the consumer level. Authority member agencies are not required to conform to the regional planning elements contained in this plan. However, member agencies may utilize this Plan to complete their own urban water management plans and to reduce preparation costs.

San Diego County Water Authority.

The San Diego County Water Authority is a wholesaler of imported water to 22 retail service member agencies and the Pendleton military reservation. Water is purchased by the Authority from the Metropolitan Water District of Southern California, and transported through five Authority pipelines to member agency service connections for retail use. The water originates from the Colorado River (MWD's Colorado River Aqueduct) and California's Sacramento-San Joaquin Delta (State Water Project).

Created by an act of the California Legislature in 1943, the Authority's first role was to serve a supplemental supply of water to the region as its civilian and military population expanded to meet wartime activities. The rapid population increase continued during the postwar period of the 1950s, leveled off, and then began again during the late 1970s and 1980s. Population growth caused the region to rely more and more on the Authority for an imported supply of water. By 1990, the Authority had become the region's predominant source of water, supplying 95 percent of the water needed by more than 2.5 million people in that year. On average, the Authority now supplies 90 percent of the region's water needs.

The Authority is governed by a 33-member board of directors. The number of directors permitted on the board is determined by the assessed property valuation done each year by the San Diego County Assessor's office. Individual board directors are elected or appointed by each member agency's governing body. Each member agency is currently represented by a single board member, except for the city of San Diego, which has 10 members, and the Helix Water District, which has two members.

The Authority is authorized under its enabling legislation to levy property taxes within its service area, establish water rates, impose a water standby or service availability charge, incur bonded indebtedness, issue notes and short-term revenue certificates, and exercise the power of eminent domain to acquire property. The Authority's Board may also set the terms and conditions under which additional areas may be annexed to the Authority.

Authority Mission

In 1993, the Authority developed a mission statement that accompanied its first Strategic Plan. The current mission statement is as follows: *"The mission of the San Diego County Water Authority is to provide a safe and reliable supply of water to its member agencies serving the San Diego region."*

To accomplish this mission, the Authority established three strategic goals: a water supply goal, a facilities goal, and a facilities maintenance goal. The water supply goal sets the Authority's standard on water supply reliability, which is to *"meet 100 percent of the annual water supply requests of the Authority's member agencies 90 percent of the time, 90 percent of the requests 98 percent of the time, and never less than 80 percent of the requests."* The facilities goal is to

"provide the necessary facilities for a safe, reliable, and operationally flexible water storage, treatment and delivery system." The facilities maintenance goal is to maintain the necessary Authority facilities to support the water supply goal and to minimize short-term system outages.

Member Agencies

The Authority's 23 member agencies include six cities, four water districts, nine municipal water districts, two irrigation districts, a public utility, and a federal agency. These agencies, listed in **Table 1-1**, have diverse and varying water needs. Some agencies are almost exclusively urban, and serve treated water for domestic and industrial purposes. Others are almost entirely agricultural, with limited need for treated water. Agencies also vary in their dependence upon the Authority for supplies. Eleven agencies were 100 percent dependent upon imported water during 1993-94, while the others produced varying amounts of local water to supplement imported supplies. Overall, the Authority supplied 77 percent of the total water used by its member agencies in 1993-94.

Member Agency	Area (acres)	1994 Population
Carlsbad M.W.D.	20,640	57,706
Del Mar, City Of	1,159	4,860
Escondido, City Of	21,569	117,338
Fallbrook P.U.D.	27,988	26,498
Helix W.D.	31,292	231,363
National City, City Of	5,577	52,932
Oceanside, City Of	26,575	145,404
Olivenhain M.W.D.	30,530	46,445
Otay W.D.	63,062	99,929
Padre Dam M.W.D.	54,539	121,900
Pendleton Military Res.	134,625	50,000
Poway, City Of	23,214	46,689
Rainbow M.W.D.	47,260	14,693
Ramona M.W.D.	46,524	33,500
Rincon Del Diablo M.W.D.	10,596	26,300
San Diego, City Of	210,626	1,194,950
San Dieguito W.D.	5,647	35,821
Santa Fe I.D.	10,179	19,800
South Bay I.D.	15,566	110,500
Vallecitos W.D.	28,571	55,983
Valley Center M.W.D.	61,022	20,014
Vista I.D.	19,407	90,000
Yuima M.W.D.	12,792	1,858
Total	908,959	2,604,483

Table 1-1 Authority Member Agencies

By most measures, the city of San Diego is the Authority's dominant member agency. An urban agency, the city of San Diego has far more population, geographical area, and assessed valuation than any other member agency, and typically receives more than a third of the Authority's water deliveries. The city of San Diego also owns and operates 68 percent of the county's total water storage capacity.

Five of the Authority's member agencies serve water primarily for agricultural purposes. These agencies - Fallbrook PUD, Rainbow MWD, Ramona MWD, Valley Center MWD, and Yuima MWD - are all located in the northeastern portion of the Authority's service area. Historically, agricultural water deliveries represent about 18 percent of the Authority's total deliveries. This percentage remained fairly constant before, during, and after the drought years between 1987 and 1993.

Geography of Service Area

The Authority's boundaries extend from the border with Mexico on the south to Orange and Riverside counties in the north, and from the Pacific Ocean to the foothills that terminate the coastal plain on the east. With a total of 908,959 acres (1,420.3 square miles), the Authority service area encompasses the western third of the land area of San Diego County. **Figure 1-1** shows the Authority's service area, its member agencies, and aqueducts.

In terms of land area, the largest member agency is the city of San Diego, with 210,626 acres. The smallest agency is the city of Del Mar, with 1,159 acres.

Population of Service Area

Total population in the Authority's service area reached 2,604,483 people in 1994. Projections from the San Diego Association of Governments (SANDAG) indicate that the county population will reach about 3.8 million in the year 2015. This would result in growth of 51 percent from the years 1990 through 2015. The Authority serves 98 percent of the people who live in the county.

The city of San Diego has the largest population of any member agency, with 1,194,950 people. The agency with the least population is the Yuima MWD, at 1,850 people. Population density is about 2.83 people per acre, or 1,811 people per square mile. National City has the highest density (9.33/acre), while Yuima MWD has the lowest (0.14/acre).

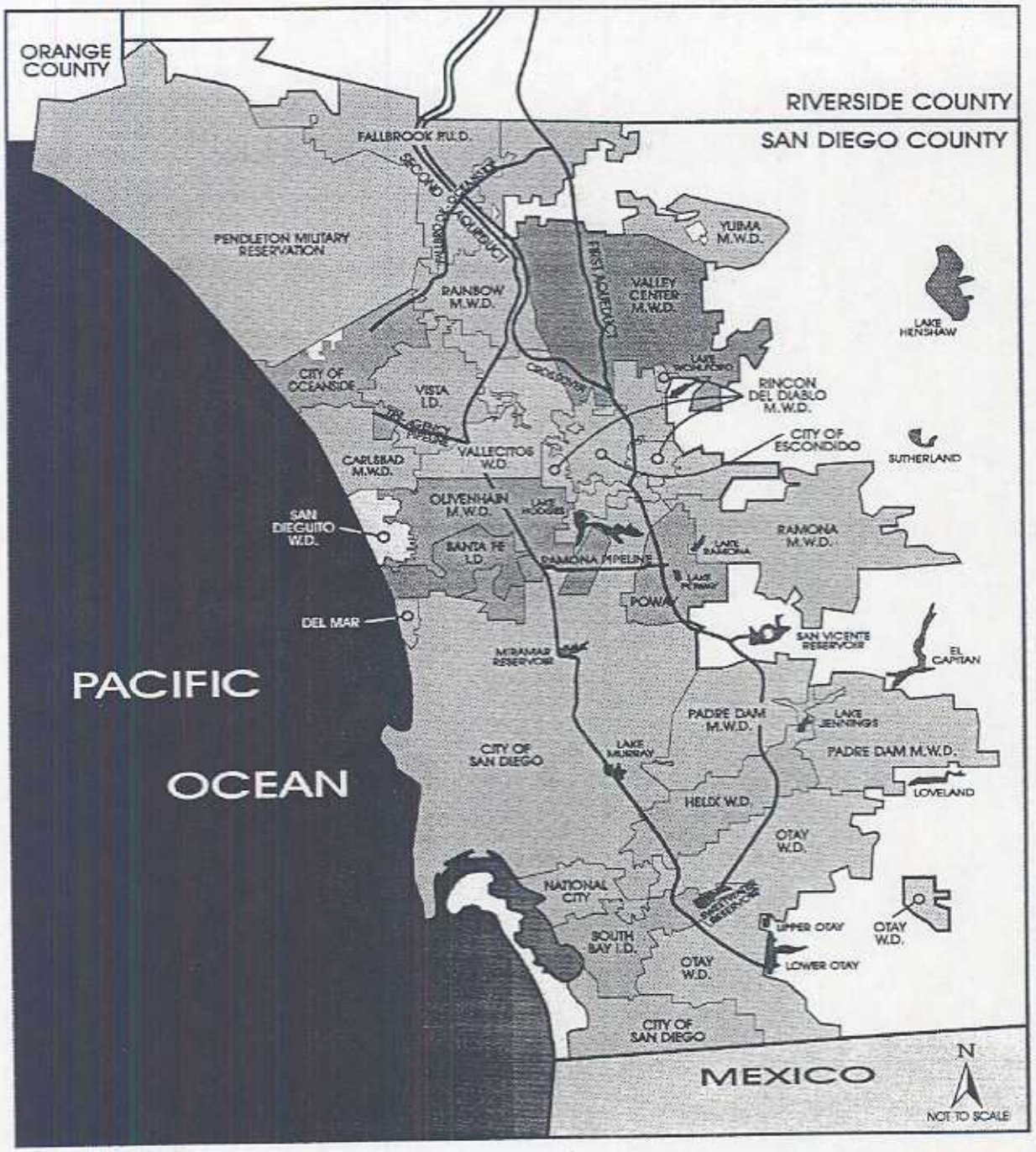

Figure 1-1
San Diego County Water Authority Service Area

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SECTION 2

WATER DEMANDS

Water use in the San Diego region is closely linked to the local economy, population growth, and weather. Since the formation of the Authority in 1943, rapid expansion of the local economy created jobs and stimulated regional population growth, largely through in-migration to the region. This in turn produced a relatively steady increase in the long-term demand for water. In recent years that pattern has shifted: an economic downturn that began in 1990 is continuing, but has not entirely dampened population growth, which is now being generated more by natural increase than by job creation. Despite the population growth, water demands from 1991 through 1995 fell well below projections made in the 1990 Urban Water Management Plan.

Authority water demand set a record in 1990, when 646,488 acre-feet of water was used. Since then, water useage has fallen off considerably, reaching a low of 503,210 acre-feet in 1992, before climbing back to 536,907 acre-feet in 1994. This drop in water use is the result of several factors, but primarily caused by a poor economy and a six-year drought that occurred between 1986-92. The Authority enacted a series of mandatory and voluntary conservation measures to reduce water useage in 1991-92. This experience caused many consumers to change water useage habits beyond the short-term requests for conservation, a phenomenon known as "residual" conservation. The winter of 1993-94, by contrast, was abnormally wet, which also worked to reduce demand.

Water demand in 1993-94 was comparable to that of a decade ago; the 1983-84 total use was 540,260 acre-feet. However, between 1984 and 1994 the service area population increased from 2.040 million to 2.695 million people, a gain of 24 percent. Per capita demand in 1984 was 0.208 acre-foot/capita/year; by 1994 per capita demand had fallen to 0.176.

This trend is expected to reverse itself over the next five years as the economy recovers, development moves into hotter inland areas, and the population continues to grow. After the year 2000, per capita demand is expected to level off, barring unexpected drought shortages. **Figure 2-1** shows historic and projected per capita demands.

Variations in weather affect short-term water requirements, causing demand spikes during hot, dry months or years, and reductions in useage during wet weather. Studies have shown that hot, dry weather may generate urban water demands that are about 7 percent greater than normal, and agricultural demands that are about 9 percent greater than normal. The Authority also uses these percentages to estimate below-normal demands.

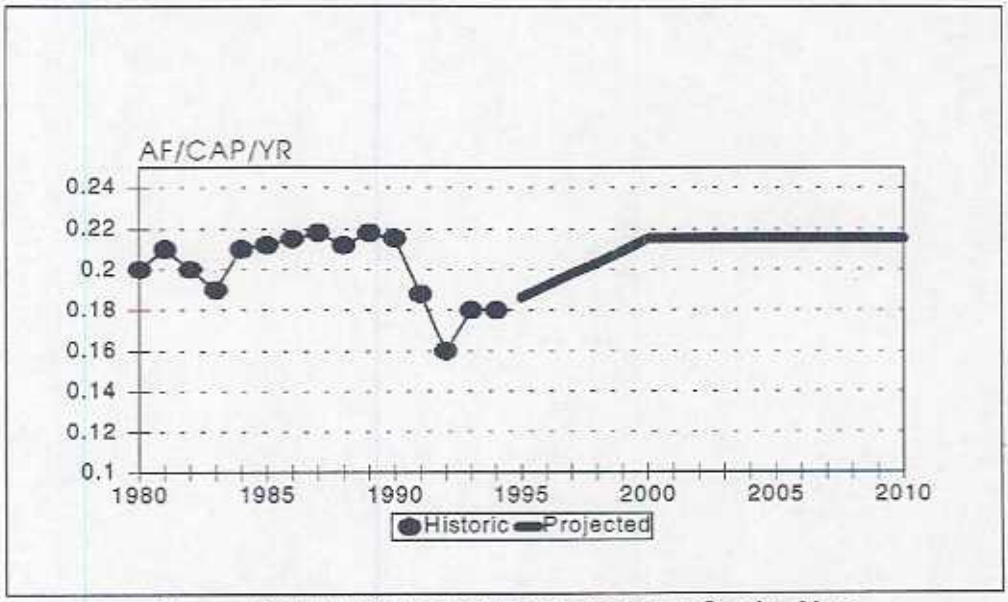


Figure 2-1 Historic and Projected Per Capita Use
Source: Authority June 1994 Water Demand Forecast Update

Drought-induced reductions in deliveries, along with other factors, have complicated the task of forecasting near-term regional water demand. "Normal" demand for water may have been permanently reduced by recent conservation measures such as low-flow showers and toilets and the public's awareness of water as a limited resource. During the relatively warm summer of 1992, when the Authority had a voluntary 10 percent conservation goal, actual usage was down by about 15-20 percent. A combination of factors may have been responsible for this, but conservation and water awareness played a large role.

The Authority's service area can roughly be divided into two climate zones, a coastal strip that has mild summer temperatures rarely exceeding 80 degrees, and an inland valley zone that has hotter summer weather that exceeds 90 degrees. Most of the population growth since 1980 has occurred in the inland valley areas, which tends to generate higher per capita water demand. Future population growth is expected to occur largely in this region. Average annual rainfall for the entire region is about 10 inches per year.

2.1 DEMOGRAPHIC TRENDS

San Diego County's population has grown every year since the Authority was formed in 1943. The growth can be characterized overall as steady, but punctuated with booms associated with economic activity. The fastest rate of growth occurred between 1950 and 1960, when the county's population increased at an average rate of 8.7 percent annually, reaching 1 million people by the end of the decade.

The 1980s produced another surge in population, driven by in-migration to the county by people in search of jobs. Between 1986 and 1990, the growth rate was about 3.5 percent

annually, which added an average of 80,000 people per year. Since 1990, growth has slowed because of an economic recession that is still lingering. Between 1990 and 1994, the region grew about 2.0 percent per year, for an average annual increase of about 42,000 people. The 1994 estimated population of the Authority's service area was 2,604,483 people. This represents 98 percent of the county population. The region's future growth rate is expected to increase from its current pace, but remain slower than the historic past.

The San Diego Association of Governments (SANDAG) projects that San Diego County will add 1.3 million residents between 1990 and 2015, until the county reaches a total population of about 3.8 million. This represents an average annual increase of about 52,000 people. This projected rate of growth is twice the projected national growth rate. **Figure 2-2** shows historic and projected population.

In the future, it is projected that more population growth will occur through natural increase, or the difference between births and deaths, than from in-migration. This trend is caused largely by a reduction of future employment opportunities, which is expected to limit in-migration, and also to projected higher birthrates for residents. **Figure 2-3** shows how the projected pattern of growth differs from the past, when in-migration constituted the largest growth sector.

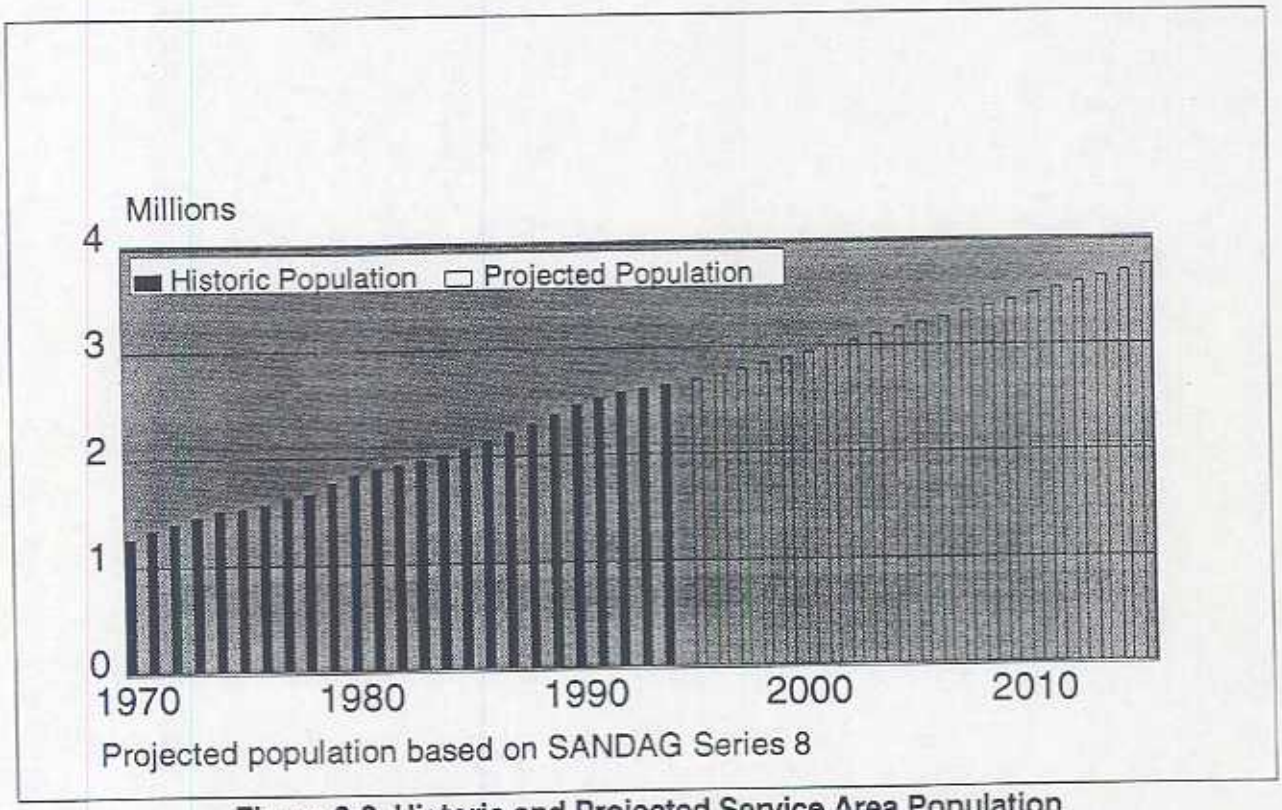


Figure 2-2 Historic and Projected Service Area Population

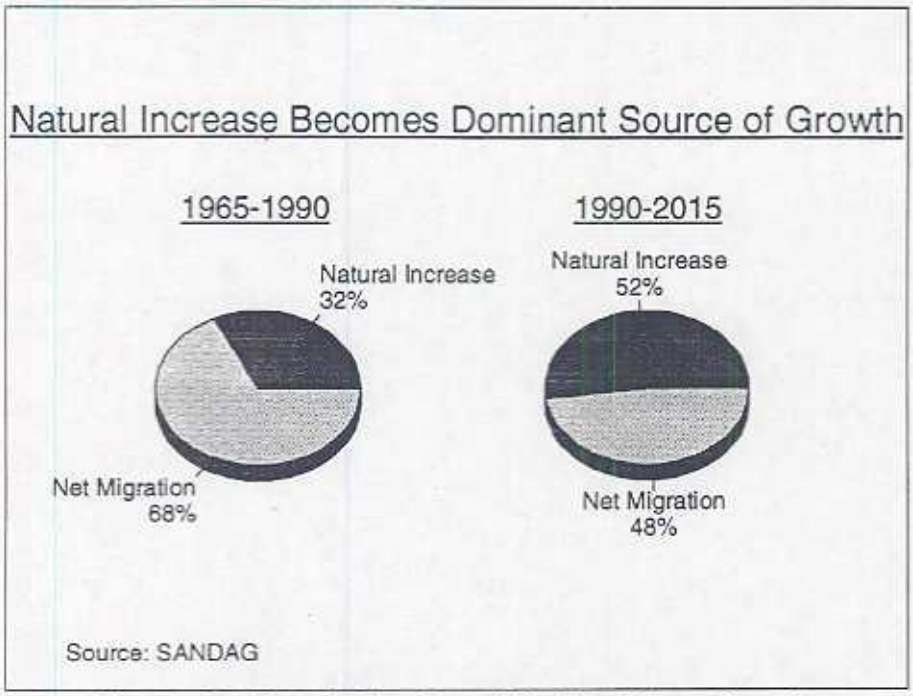


Figure 2-3 Population Growth In San Diego County

Table 2-1 provides information on various factors that affect water useage, such as housing, household size, employment, and personal income. These data are from SANDAG and represent the entire county, not just the Authority service area. However, because the service area currently includes 98 percent of the county's population, the data are expected to closely resemble that of the service area. Factors that tend to increase per capita water useage include a larger proportion of single-family homes in the housing mix, decreasing household size, and increasing personal income.

2.2 WATER USE CHARACTERISTICS

Demand for water in the Authority's service area is divided into two basic categories: municipal and industrial (M&I), and agricultural. Municipal and industrial use constitutes about 80-85 percent of regional water consumption. This category includes water used for residential landscaping, human consumption, and other domestic purposes, as well as water supplied for commercial and industrial use. Agricultural water is used mostly for irrigating crops, and accounts for the remaining 15-20 percent of demand.

Urban water use is sub-classified into four user groups: residential, commercial, industrial, and public/other. In 1994, the residential sector used 54 percent, commercial 13 percent, industrial 2 percent and public/other 12 percent, as shown on **Figure 2-4.** An estimated 19 percent of water use was for agricultural purposes.

	1965	1970	1980	1990	2000	2010	2015
Total Population	1,147,500	1,367,200	1,873,400	2,520,500	3,004,400	3,517,800	3,763,300
Total Housing Units	396,800	459,300	724,000	950,200	1,054,700	1,269,800	1,372,000
Single-Family	287,300	308,800	440,800	556,300	609,600	721,000	770,400
Multi-Family	92,200	128,300	245,300	347,900	398,100	495,400	542,400
Mobile Home	17,300	22,200	37,900	46,000	47,000	53,400	59,200
Household Size	3.04	2.94	2.62	2.70	2.86	2.79	2.75
Per Cap. Personal Income ($92)	15,000	19,500	19,700	20,800	19,100	20,200	21,000

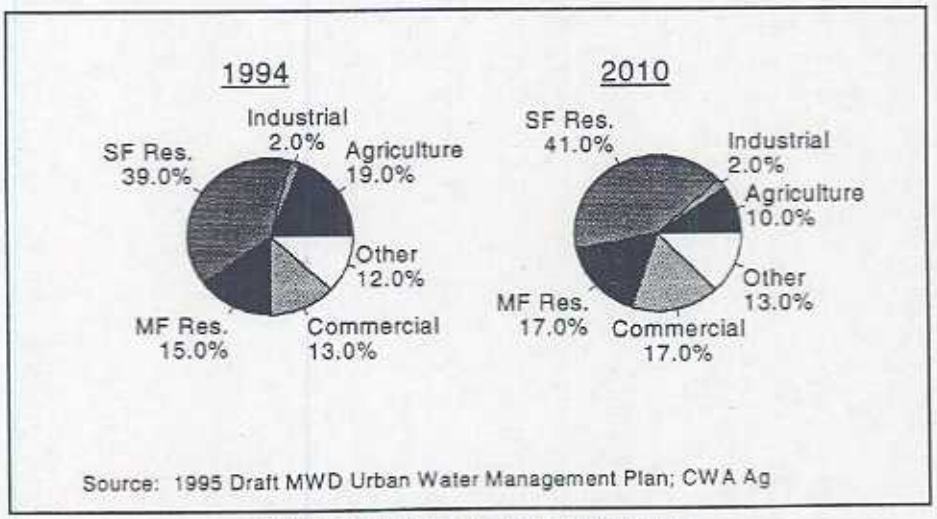
*Source: SANDAG Series 8 regionwide forecast

Table 2-1 Demographic Characteristics of San Diego County

Residential Demand

Residential water consumption is composed of both indoor and outdoor uses. Indoor water use includes sanitation, bathing, laundry, cooking, and drinking. Most outdoor water use is for turf and other landscaping irrigation requirements. Other minor outdoor uses include car washing, surface cleaning and similar activities. For single family homes and rural areas, outdoor demands may be as high as 60 percent of total residential use.

Indoor uses remain generally constant throughout the year while



Source: 1995 Draft MWD Urban Water Management Plan; CWA Ag

Figure 2-4 Regional Water Use

outdoor uses fluctuate considerably from winter to summer, depending on the irrigation requirements and landscape types. Annual and seasonal climatic conditions significantly change evapotranspiration rates and irrigation requirements. A homeowner's perception of irrigation requirements is also influenced by weather changes, and in most cases results in over-irrigation during hot periods and under-irrigation during the cooler seasons.

Based on SANDAG data, the San Diego region housing stock composition in 1995 is 58 percent single-family homes, 37 percent multi-family homes and 5 percent mobile homes. Single-family residences generally contain larger landscaped areas, predominantly planted in turf, and require more water for outdoor application in comparison to other types of housing. Larger lot sizes will further increase the amount of landscaped area of single-family homes. The general characteristics of multi-family and mobile homes limit outdoor landscaping and water use, although some condominium and apartment developments do contain green belt areas which are generally landscaped with water-consuming plant stock.

Changes in the service area housing stock, as well as development occurring further from the coast, impact water use, particularly in the area of outdoor water use. Indoor water use will also change as the number of bathrooms and water-consuming appliances increase in single-family homes.

Current SANDAG forecasts show a slight decline in the number of single-family compared to multi-family homes by the year 2015, indicating the possibility of a slight reduction in residential per capita demand based on housing stock. Household size is forecast to increase from 2.70 persons per dwelling to 2.75 in 2015, which would also tend to reduce per capita water consumption.

Commercial and Industrial Demand

Between 1950 and 1992, San Diego's economy relied on defense spending and was driven largely by the manufacturing sector. Defense spending has since declined, and many of the manufacturing jobs have disappeared. The region lost a total of 75,000 jobs between 1990 and 1993. Future economic growth is projected by SANDAG to look different than historic growth, with the services sector assuming a larger share of the total, and significant gains expected by the wholesale/retail trade and government sectors of the economy. Only modest gains will be made in manufacturing, and a decline is projected for the agriculture and mining sector.

Industrial water consumption consists of a wide range of uses, including product processing and small-scale equipment cooling, sanitation, and air conditioning. Water-intensive industrial uses in the city of San Diego, such as kelp processing, electronics manufacturing, and aerospace manufacturing typically require smaller amounts of water when compared to other water-intensive industries found elsewhere in Southern California, such as petroleum refineries, smelters, chemical processors, and canneries.

Industrial water use is estimated to be only 2 percent of the total use

within the Authority. SANDAG growth forecasts indicate that the manufacturing and construction sectors of the economy, which largely make up industrial water use, will grow 12 percent by 2010, but will drop in relation to total employment from 18 to 15 percent of the regional economy. With conservation efforts, industrial water demand is expected to remain relatively constant in the future.

Commercial water demands consist of uses which are generally incidental but necessary for the operation of a business or institution, such as drinking, sanitation and landscape irrigation. Commercial users include service industries such as restaurants, car washes, laundries, hotels, and golf courses. The commercial sector used an estimated 13 percent of the total water consumed in 1994. Employment data from SANDAG indicate that almost half of San Diego's residents are employed in commercial (trade and service) industries. The commercial sector is forecasted to have the highest growth, increasing 25 percent and employing 58 percent of the work force by 2010 as a result. Water use in the commercial sector is expected to increase to 17 percent of the total by the year 2010.

The tourist industry in San Diego County affects the per capita rate of consumption within the Authority by not only the number of visitors, but also through expansion of service industries and attractions, which tend to be large outdoor water users. Tourism is concentrated in the summer months and affects seasonal demands and peaking. SANDAG regional population forecasts do not specifically account for tourism, but as an economic sector it is reflected in the economic forecasts and causes per capita use to increase.

2.3 PROJECTING URBAN DEMAND

Municipal and industrial water demand forecasting in the San Diego region has historically been done using a per capita methodology. Water use is measured at individual consumer levels, then multiplied by the projected population to obtain a demand forecast. While these forecasts have proven quite accurate, they are unable to take into account economic, demographic and land use changes which affect water use.

The Authority is working with a consultant to calibrate its own version of the U.S. Army Corps of Engineers IWR-MAIN (Institute for Water Resources - Municipal And Industrial Needs) computer model, which projects urban water use. Versions of this econometric model have evolved over a 20-year period and are being used by many cities and water agencies, including MWD, which uses a model called MWD-MAIN. The Authority's version is expected to be available in December 1995.

The Authority version of this model will account for a wide variety of economic, demographic and climatic factors, such as population, type of housing, household occupancy, conservation practices, water prices, and weather conditions. Results from the model include forecasts comprised of individual demand sectors, such as commercial, industrial, and residential. The model treats commercial and industrial water demands as functions

of employment, and also accounts for water and wastewater prices and conservation practices.

Population and demographic forecasts from SANDAG are a prime input into the model. These forecasts are intended for local government and special agency use, and are provided both on a regional and sub-regional basis. The latest forecast, adopted for planning purposes by SANDAG's board of directors, is called the Series 8 forecast. This forecast will be used by the Authority's model.

Current water demand projections for the Authority service area are shown in the **Table 2-2**. The municipal and industrial water projections were made by MWD-MAIN, using SANDAG Series 8 data. Data for 1994 reflect actual total demands.

2.4 AGRICULTURAL DEMAND

The coastal and inland valley areas of the county possess a moderate and virtually frost-free climate able to support a variety of sub-tropical crops, making the San Diego area a unique agricultural region. The primary crops being grown for the national and international markets are avocados, citrus, cut flowers, and nursery products. To a lesser extent, local fresh market crops and livestock are produced in the Authority service area. In recent years agriculture has accounted for between 15 and 20 percent of the Authority's total water supply, and generates about 1.5 percent of San Diego County's gross regional product.

The Authority is the largest agricultural water consuming agency within MWD, requiring approximately 50 percent of MWD's total agricultural water supply each year. Agricultural water use within the Authority is concentrated mainly in north county member agencies such as Rainbow MWD, Valley Center MWD, Fallbrook PUD and Yuima MWD.

The peak year for agricultural water use was 1990, when more than

DEMAND SECTORS	1994	2000	2010
Municipal and Industrial			
Residential, Single-Family	218,007	291,000	341,000
Residential, Multi-Family	86,148	115,000	144,000
Commercial	74,720	122,000	140,000
Industrial	10,549	17,000	18,000
Other	68,567	88,000	104,000
Total M&I	457,991	633,000	747,000
Agriculture	78,916	85,000	85,000
Total Use	536,907	718,000	832,000

Table 2-2 Water Demand Projections (AF/YR)
Source: Authority June 1994 Water Demand Forecast Update.
Note: 1994 based on actual use; future years assume BMP conservation.

122,297 acre-feet was applied to various agricultural crops and products. Since then, agricultural use has fallen significantly, reaching just 78,916 acre-feet in 1994. A 1993 study on agricultural water use projects that agricultural demand will remain at about its current level, never rising above 85,000 acre-feet per year through the year 2010. The reasons for this reduction in use include economic forces affecting crop prices, and the increasing costs of production, including the cost of water.

Agricultural water demand forecasts are based on the economic outlook for crop production, and corresponding estimates of producing acreage and water use. Weather variations also significantly affect annual irrigation demand, although it is difficult to establish a true correlation with the data available.

The agricultural industry served by the Authority pays some of the highest water rates in the state. The rates are more than 30 times that of the Central Valley Project or Imperial Irrigation District rate structures. Because of these high rates and crops adaptable to efficient irrigation technology, irrigation efficiency in the region is very high in comparison to other agricultural regions of the state. Additionally, due to the high water cost, crops grown in the Authority service area are generally not able to be in direct market competition with other areas operating with lower water costs.

2.5 TOTAL DEMAND

Figure 2-5 shows projected normal, below-normal, and above-normal total water demands for the Authority to the year 2010. Normal demand is expected to reach 832,000 acre-feet by 2010, assuming average weather conditions, continuation of existing conservation programs, and the future implementation of conservation Best Management Practices (BMPs). Projected above-normal demands for 2010 is 889,000 acre-feet; below-normal demand is 773,000 acre-feet.

These demand projections were made using Series 8 regional population forecasts approved by SANDAG's Board of Directors in September 1994. Revisons to the population forecast or annexations to the Authority service area could affect the demand forecast.

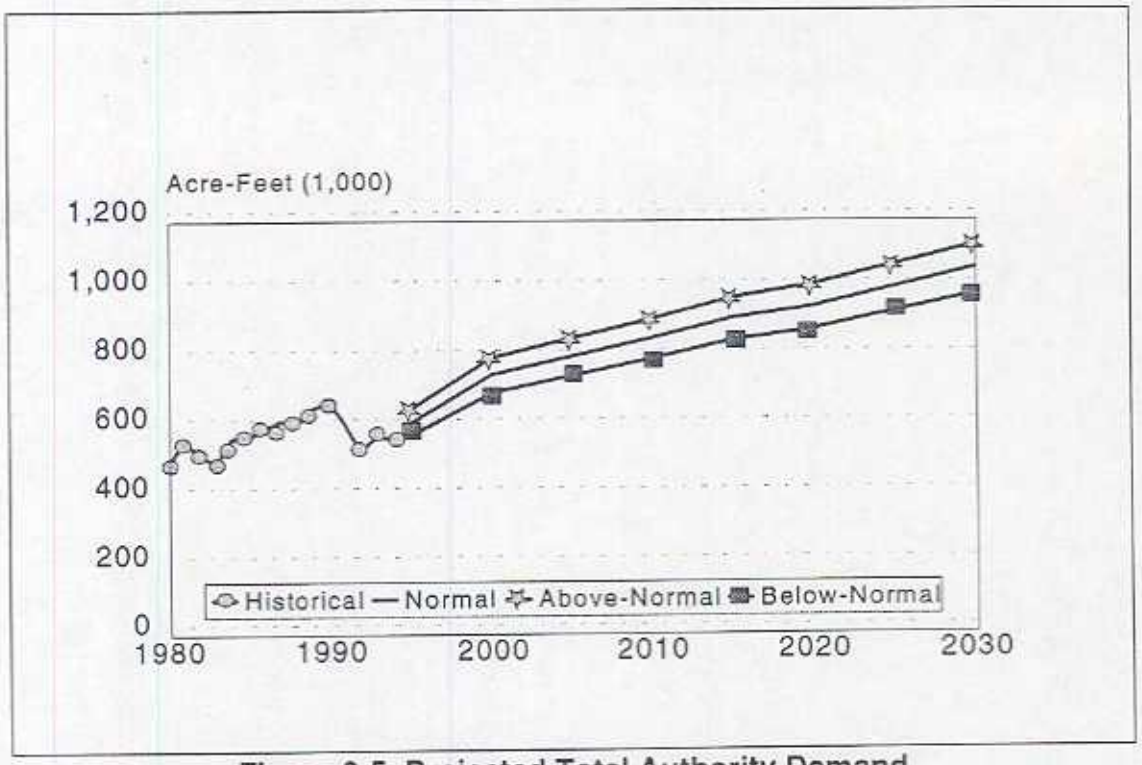


Figure 2-5 Projected Total Authority Demand
Source: Authority June 1994 Water Demand Forecast Update

SECTION 3

DEMAND MANAGEMENT

The Authority recognizes water conservation, or demand management, as a priority in any water resource strategy developed for the San Diego region. Through its innovative demand management programs, the Authority has developed a variety of effective approaches to water conservation.

The Authority has demonstrated its commitment to conservation by signing the "Memorandum of Understanding (MOU) Regarding Urban Water Conservation in California." Urban water agencies participating in the MOU are committed to using good faith efforts to implement the best management practices (BMPs), to develop new cost-effective practices, and to initiate these practices as they become feasible.

Long-Term Program Goal. The long-term goal of the Authority's water conservation program is to achieve and maintain a high level of water use efficiency in the Authority's service area. The specific objectives include:

- Elimination of wasteful practices in water use.
- Development of information on both current and potential conservation practices.
- Timely implementation of conservation practices.

Conservation Program. The Authority's conservation program has five major components:

1. Active participation in evolving statewide implementation of BMPs.

2. Participation in water conservation research and development programs to define the reliable yield from existing conservation programs, to improve the design and targeting of future programs, and to hasten the development of new conservation technologies and measures.

3. Provision of financial incentives, including cost sharing, to member agencies to encourage implementation of conservation measures and programs.

4. Management of region-wide programs on behalf of the member agencies to assure area-wide implementation and achieve economies of scale.

5. Public information and education activities to spread knowledge of water and techniques for its efficient use.

Each of these components plays an important role in the mplementation of the Authority's demand management measures.

3.1 BEST MANAGEMENT PRACTICES

In 1991 the Authority and other California water agencies, together with the environmental community and other public interest groups, signed a landmark document, the "Memorandum of Understanding Regarding Urban Water Conservation in California". **Table 3-1**, taken from the first page of the MOU, lists the policy issues that motivated this consensus process. BMPs can be generally thought of as conservation practices that are established and considered to be cost effective. The specific set of BMPs agreed to in this consensus process is listed in **Table 3-2**.

The MOU describes an evolving process that is important for improving the management of water resources in California. Furthermore, it allows for improvements in the definitions of the BMPs as the state of knowledge improves. The Authority is committed to complete implementation of the current BMPs, the development of better information about how water may be conserved in a resource-preserving cost-effective manner, and development of better water management practices.

As part of the MOU, the California Urban Water Conservation Council (CUWCC) was created to monitor, guide, and assist MOU signatories in implementing the BMPs. The Authority has been an active participant in the CUWCC and its subcommittees.

3.2 RESEARCH PROGRAMS

The importance given to demand management alternatives in overall water supply planning requires that conservation programs establish the quantity of water savings that can be expected. The Authority, in cooperation with its member agencies and MWD, has subjected its programs to rigorous scrutiny to help assess reliable yield and cost-effectiveness to produce a recommendation for improved program design.

The Authority's role in this process has primarily been providing partial funding for the pilot programs under study. Typically, the Authority, its participating member agencies, and MWD fund these pilots. Later, the agencies involved cooperate in the data-gathering phase of research. Finally, MWD does the data analysis to generate the research outcome.

Pilot programs for which such research is underway, or has been completed include:

1. Public Facilities Retrofit Program
2. Large Turf Audit Program
3. Clothes Washer Rebate Program

TABLE 3-1

MEMORANDUM OF UNDERSTANDING (MOU) REGARDING URBAN WATER CONSERVATION IN CALIFORNIA

1. The signatories to this MOU recognize that California's economy, quality of life, and environment depend in large part upon the water resources of the State. The signatories also recognize the need to provide reliable urban water supplies and to protect the environment. Increasing demands for urban, agricultural, and environmental water uses call for conservation resources. Many organizations and groups in California have an interest in urban water conservation, and this MOU is intended to gain much needed consensus on a complex issue.

2. The urban water conservation practices included in this MOU (referred to as "Best Management Practices" or "BMPs") are intended to reduce long-term demands from what they would have been without implementation of these practices and are in addition to programs which may be instituted during occasional water supply shortages.

3. The combination of BMPs and urban growth, unless properly accounted for in water management planning, could make reductions in urban demands during short-term emergencies such as droughts or earthquakes more difficult to achieve. However, notwithstanding such difficulties, the signatory water suppliers will carry out the urban water conservation BMP process as described in this MOU.

4. The signatories recognize that means other than urban water conservation may be needed to provide long-term reliability for urban water suppliers and long-term protection of the environment. However, the signatories may have differing views on what additional measures might be appropriate to provide for these needs. Accordingly, the MOU is not intended to address these issues.

5. A major benefit of the MOU is to conserve water which could be used for the protection of streams, wetlands and estuaries, and/or urban water supply reliability. This MOU leaves to other forums the issue of how conserved water will be used.

6. It is the intent of this MOU that individual signatory water suppliers (1) develop comprehensive conservation BMP programs using sound economic criteria and (2) consider water conservation on an equal basis with other water management options.

7. It is recognized that present urban water use throughout the State varies according to many factors including, but not limited to, climate, types of housing and landscaping, amounts and kinds of commercial, industrial and recreational development, and the extent to which conservation measures have already been implemented. It is further recognized that many of the BMPs identified in Exhibit 1 to this MOU have already been implemented in some areas and that even with broader employment of BMPs, future urban water use will continue to vary from area to area. Therefore, this MOU is not intended to establish uniform per capita water use allotments throughout the urban areas of the State. This MOU is also not intended to limit the amount or types of conservation a water supplier can pursue or to limit a water supplier's more rapid implementation of BMPs.

8. It is recognized that projections of future water demand should include estimates of anticipated demand reductions due to changes in the real price of water.

TABLE 3-2

BEST MANAGEMENT PRACTICES

1. Interior and exterior water audits and incentive programs for single-family residential, multifamily residential, and governmental/institutional customers.

2. Plumbing - new and retrofit:

   a. Enforcement of requirements of ultra-low-flush toilets in all new construction beginning January 1, 1992;
   b. Support of State and Federal legislation prohibiting sale of toilets using more than 1.6 gallons per flush;
   c. Plumbing retrofit.

3. Distribution system water audits, leak detection and repair.

4. Metering with commodity rates for all new connections and retrofit of existing connections.

5. Large landscape water audits and incentives.

6. Landscape water conservation requirements for new and existing commercial, industrial, institutional, governmental, and multifamily developments.

7. Public information.

8. School education.

9. Commercial and industrial water conservation.

10. New commercial and industrial water use review.

11. Conservation pricing.

12. Landscape water conservation for new and existing single-family homes.

13. Water waste prohibition.

14. Water conservation coordinator.

15. Financial incentives.

16. Ultra-low-flush toilet replacement.

3.3 COST SHARING PROGRAM

Since 1988 MWD has operated a Conservation Credits Program to provide financial support to its member agencies and subagencies in implementing conservation measures. Under this program, MWD provides $154 per acre-foot for demonstrable water savings, up to half of the cost of each qualifying conservation project.

The Authority and its member agencies have taken advantage of MWD's program in their aggressive efforts to implement BMPs. One of the Authority's important roles in this process is that of a cost sharing partner with its member agencies and MWD in the conservation credits process.

In many cases, the cost sharing is divided among MWD, the Authority, and its member agencies. In most of those cases the cost of the program is split as follows:

MWD:	50%
Authority:	25%
Member Agency	25%

In other cases, the Authority and MWD evenly divide the program cost, and for some programs, funding from other agencies has been secured. An example of the latter is the co-funding that San Diego Gas and Electric provided for the installation of water-efficient showerheads and residential clothes washers.

In all three funding scenarios described above, the Authority acts as the focal point in managing the cost sharing arrangements.

3.4 IMPLEMENTATION OF BMPs

The Authority assists member agencies in implementing the BMPs in two ways. As indicated above, the Authority provides direct funding assistance for the implementation of BMPs. Additionally, the Authority operates programs to implement BMPs for its participating member agencies.

The method of implementation for each of the 16 BMPs is discussed below. Specific levels of implementation for each BMP can be found in the Authority's annual reports to the California Urban Water Conservation Council, given in Appendix A.

Water Audits. The Authority, in conjunction with participating member agencies, operates a program to provide water audit services for single-family residential, multi-family residential and small commercial customers. Audits are made available to the top 30 percent of users in each category. The survey concentrates on exterior water use, especially irrigation practices. Additionally, information and equipment is provided to assist in enhancing in-door water use efficiency.

Plumbing. In conjunction with its member agencies, the Authority works to assure only Ultra-Low-Flush Toilets (ULFTs) are installed in new construction, and sold or installed in its service area. This effort has included notices and educational information to local building departments, workshops for plumbers, and outreach to plumbing retailers and wholesalers.

The Authority, in conjunction with its member agencies and San Diego Gas and Electric (SDG&E), distributed or installed over 500,000 conservation retrofit kits for pre-1980 homes. The kits included: high-quality showerheads, toilet displacement devices, toilet leak detection tablets and conservation information.

Distribution System Audits, Leak Detection, and Repair. Four member agencies participated in an Authority-operated Distribution System Water Audit. Information derived from the audit was used by those agencies in determining the need for leak detection and repair programs in their respective service areas. Additionally, Authority staff performs annual audits, along with daily leak detection and repair of its water delivery system.

Metering with Commodity Rates. All Authority water sales are metered. Commodity rates are included in the Authority's charges to member agencies purchasing water. Additionally, retail customers in the Authority's service area are all charged commodity rates for metered water purchased.

Landscape Audits and Incentives. The Authority offers audits of large landscapes at no cost to the irrigator. The audits are performed by qualified consultants trained in the Cal Poly method. Follow-ups are performed to provide additional assistance to irrigators.

Direct financial assistance has been provided to public agencies who have completed the audit. The assistance has been used to assure the irrigation system repairs identified in the audit are implemented. Often, this includes the purchase of matching irrigation heads or other needed irrigation equipment.

The Authority has sponsored multi-lingual irrigation training classes. The Spanish language version of the classes, known as Protector del Agua, was the first in a series of such classes offered in the Authority's service area. Classes are now offered in English, as well as Spanish, and at a variety of different levels of irrigation maintenance skills.

Public Information and Education. These programs educate and inform the public about water either directly or indirectly through a number of activities. These include: working with community, political and business leaders to increase their awareness of Authority programs and the need for water efficiency, reuse and repurification; good media relations practices (distribution of press releases, arranging electronic and print interviews and talk show appearances, responding promptly to media requests for information), resulting in water-related news stories and editorials; writing guest editorials and letters to the editor; public service announcements for electronic media; print, electronic, outdoor and multilingual advertising as appropriate; development and distribution of appropriate literature (bill inserts, brochures, fact sheets, charts, etc.); speakers' presentations to community groups; development of

audiovisual presentation materials for speakers; sponsorship of conservation-related competitions/awards; presence (through booths, displays) at community events; and coordinating all such informational/educational efforts with appropriate governmental agencies, businesses and community groups.

School Education. The School Education Program focuses on educating young people about where the region's water comes from and instilling in them the importance of conservation. An ongoing program for kindergarten through 12th-grade students consists of development curriculum, classroom presentations for fourth-graders, secondary students, and in-service teacher training. Other student-focused activities include an interactive play about the history of water in the San Diego area and importance of wise water use, a garden designed to educate teachers and students about water-efficient landscaping, a conservation patch program for youth groups, and a water quality testing program emphasizing hands-on testing of local waters.

Commercial, Industrial and Institutional. The Authority manages a program that offers audits to the top 10 percent of the commercial, industrial or institutional customers of its participating member agencies. Through the audits, participants are encouraged to make cost-effective improvements to their water use practices.

New Commercial, Industrial and Institutional. Information to encourage water use efficiency in design of new commercial, industrial and institutional facilities is made available through the Authority.

Conservation Pricing. The Authority bills its member agencies on a commodity basis for metered water use. Additionally, retail customers in the Authority's service area are also billed on a commodity basis for metered water use.

Residential Landscape Conservation. The Authority, in conjunction with its member agencies, has offered workshops to alert local land use regulatory agencies of their responsibilities relative to establishment and enforcement of landscape water conservation ordinances. Those responsibilities are detailed in the state Water Conservation in Landscaping Act. The Authority and its member agencies have served in an advisory role to assist these regulatory authorities in designing the ordinances. Finally, the Authority and its member agencies have assisted in relaying information concerning the new regulations to the local landscape industry.

Workshops to guide homeowners in design and maintenance of water efficient residential landscapes have also been sponsored by the Authority. The workshops were held at the San Diego Zoo and San Diego Wild Animal Park, and provided specific direction to homeowners about water efficiency

opportunities in their residential landscape.

Water Waste Prohibition. While the Authority does not have jurisdiction over water waste prohibition regulations, it has assisted its member agencies in drafting such prohibitions in the past.

Water Conservation Coordinator. The Authority currently has four staff positions dedicated to implementing its water conservation programs.

Financial Incentives. The Authority, in conjunction with its member agencies and MWD, have offered direct financial incentives to participants in the Showerhead Distribution, Public Facilities Irrigation Assistance, Public Facilities Plumbing Assistance and ULFT Voucher/Rebate programs.

Ultra-Low-Flush Toilet Replacement. The Authority, in conjunction with its member agencies and MWD, has assisted in funding and operating three types of ULFT replacement programs resulting in the installation of approximately 200,000 ULFTs:

1. ULFT Voucher/Rebate - Through this program participating customers have been offered up to a $75 rebate or voucher toward the purchase of an approved ULFT. The Authority has operated the program on behalf of its participating member agencies, except in the city of San Diego. The city of San Diego operates its own program with financial assistance from the Authority and MWD.

2. Community Based ULFT Distribution - This program offers ULFTs at no cost to low-income customers for installation in their homes. The Authority operates the program, and community- based organizations distribute the ULFTs. The program not only reaches customers who have traditionally not participated in other conservation programs, it also but provides employment opportunities for community residents.

3. Public Institutions Plumbing Retrofit - This program targets public facilities (i.e. parks, libraries, schools and offices) for installation of ULFTs and other efficient plumbing devices. The Authority and MWD fund the purchase cost of the ULFTs, while the public facility participants are responsible for assuring installation.

Clothes Washer Rebates. SDG&E operates a clothes washing machine rebate program that is partially funded by the Authority and MWD. The program offers a $100 rebate on approved water and energy conserving horizontal-axis clothes washing machines.

SECTION 4

WATER SUPPLIES

On average, 90 percent of the water used in the Authority's service area is imported from the Metropolitan Water District (MWD). The source of this imported water is MWD's Colorado River Aqueduct and the State Water Project. Historically, about 30 percent of the imported water came from the SWP and 70 percent from the CRA. However, because of reduced delivery levels, water imported into the Authority service area was nearly 100 percent of Colorado River origin between 1991-94. This resulted in salinity levels that were too high for many reclamation projects. To lower salinity levels, MWD began blending supplies again in 1995, using a blend of 25 percent SWP and 75 percent CRA.

Local impounding reservoirs and groundwater basins supply 10 percent of Authority demand, on average. This 10/90 percentage split between local and imported supplies can vary widely each year, depending upon runoff into local reservoirs. **Figure 4-1** shows historic local and imported member agency water use.

Projected water demands and supplies are shown in **Table 4-1.** These supplies

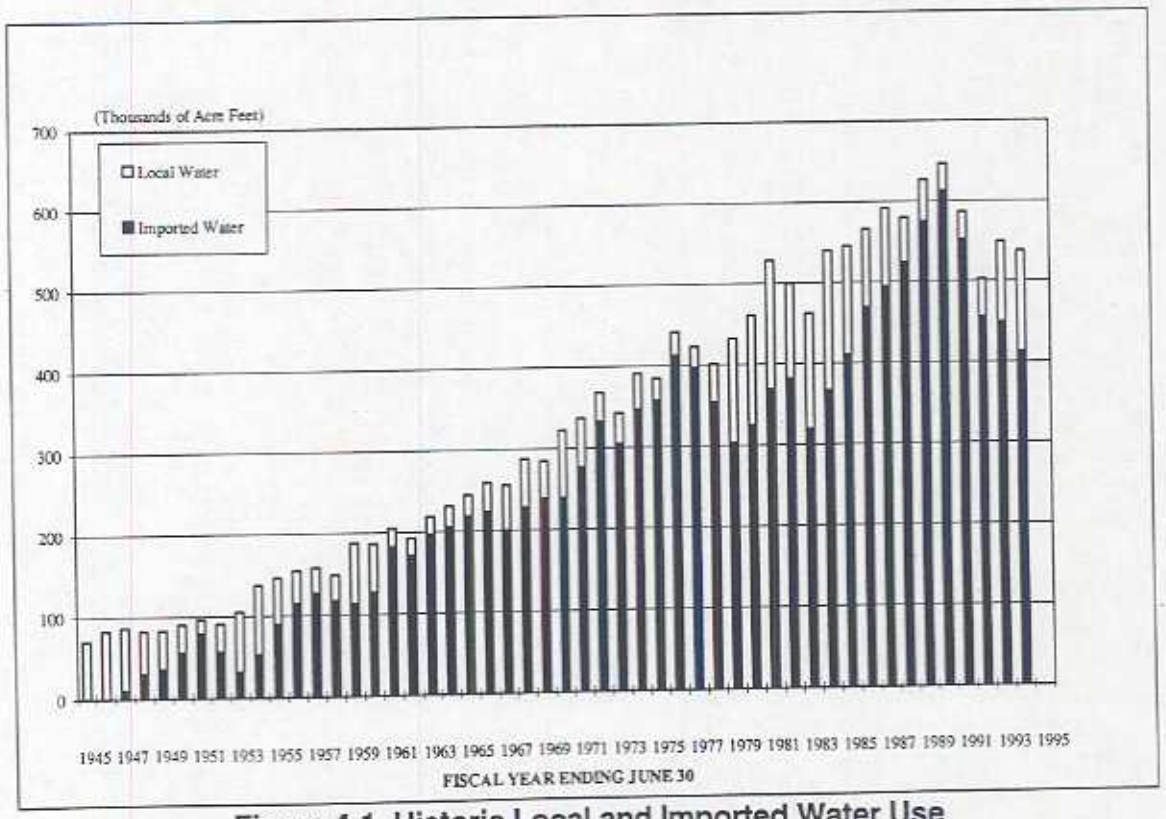


Figure 4-1 Historic Local and Imported Water Use

Table 4-1
Projected Authority Normal Year Demands and Supplies
Source: Authority June 1994 Water Demand Forecast Update

Demand/Supply	1995 (AF)	2000 (AF)	2005 (AF)	2010 (AF)
Total Demand Forecast	611,000	755,000	833,000	902,000
BMP Savings	(21,000)	(37,000)	(52,000)	(70,000)
Demand Forecast With BMPs	590,000	718,000	781,000	832,000
Existing Local Supplies	(115,000)	(60,000)	(60,000)	(60,000)
New Water Reclamation	(11,000)	(18,000)	(36,000)	(50,000)
New Groundwater	(2,000)	(5,000)	(10,000)	(15,000)
New Seawater Desalination	0	0	0	(20,000)
Imported Water Requirement	462,000	635,000	675,000	687,000

include newly developed reclaimed water, groundwater, and seawater desalination resources. If these supplies were developed, the Authority would reduce its average normal year imported water requirement from 90 percent to 82 percent by the year 2010. This program of resources development would also comply with the current Authority water supply reliability goal, which is to meet 100 percent of the annual water suppy requests of the Authority's member agencies 90 percent of the time, 90 percent of the requests 98 percent of the time, and never less than 80 percent of the requests.

Table 4-2 shows the supplies that are projected to be available during a dry year, assuming that imported supplies from MWD were reduced by 31 percent, a level of shortage that occurred in 1991-92. The dry-year scenario also assumes that a certain amount of carryover storage will be available from both the Authority and MWD, and that water transfers would be available in amounts larger than

Table 4-2
Projected Authority Dry-Year Supplies
Source: Authority June 1994 Water Demand Forecast Update

Dry-Year Supply	1995 (AF)	2000 (AF)	2005 (AF)	2010 (AF)
Imported Water	324,000	465,000	506,000	524,000
Authority Carryover	15,000	20,000	30,000	34,000
Dependable Local Water	25,000	25,000	25,000	25,000
New Local Water	13,000	23,000	46,000	85,000
Transfers	28,000	57,000	57,000	75,000
Loss of Reclaimed Water	(1,000)	(2,000)	(4,000)	(5,000)
Dry-Year Supply Forecast	404,000	588,000	660,000	738,000
Conservation Required	32%	18%	15%	12%

previously used by the Authority. Reclaimed supplies were reduced to account for lower wastewater flows during a water shortage. The resulting 2010 water shortage, or conservation requirement, is 12 percent.

4.1 LOCAL SUPPLIES

Local water supplies consist of developed surface water impoundments, groundwater, and reclaimed water within the San Diego region. The average annual local water use since 1948 is about 84,000 acre-feet. This use, however, is highly variable, with annual yields varying from a low of just over 17,000 acre-feet to just over 173,000 acre-feet. Prolonged dry periods (1961-1966) with average annual local supply yields of around 25,000 acre-feet are contrasted by wet cycles where average annual local production rose to as much as 141,000 acre-feet (1979-1985). In 1993-94, 123,759 acre-feet of water was obtained from local sources (23 percent of the total supply). For planning purposes, local supplies are assumed to have a dependable yield of 25,000 acre-feet and a normal yield of 60,000 acre-feet.

4.1.1 Surface Water Supplies.

A total of 24 surface reservoirs are located within the Authority's service area, with a combined total capacity of 571,600 acre-feet. The city of San Diego owns and operates seven reservoirs with a combined capacity of 387,600 acre-feet, or 68 percent of the total.

The Authority neither owns nor operates any reservoir, although it has an agreement with the city of San Diego for storage of up to 40,000 acre-feet in San Vicente and Lower Otay reservoirs. **Table 4-3** lists the 12 major reservoirs of the county, which have a combined storage capacity of 487,881 acre-feet, or 85 percent of the total. **Figure 4-2** shows the locations of local reservoirs.

Member Agency	Reservoir	Capacity (AF)
Escondido, city of	Wohlford	5,503
Helix WD	Cuyamaca	887
San Diego, city of	Barret	39,076
San Diego, city of	El Capitan	108,741
San Diego, city of	Hodges	32,769
San Diego, city of	Morena	49,318
San Diego, city of	Lower Otay	46,108
San Diego, city of	San Vicente	83,660
San Diego, city of	Sutherland	27,944
Sweetwater Authority	Loveland	25,400
Sweetwater Authority	Sweetwater	25,360
Vista ID	Henshaw	43,115

Table 4-3 Major Reservoirs of San Diego Region

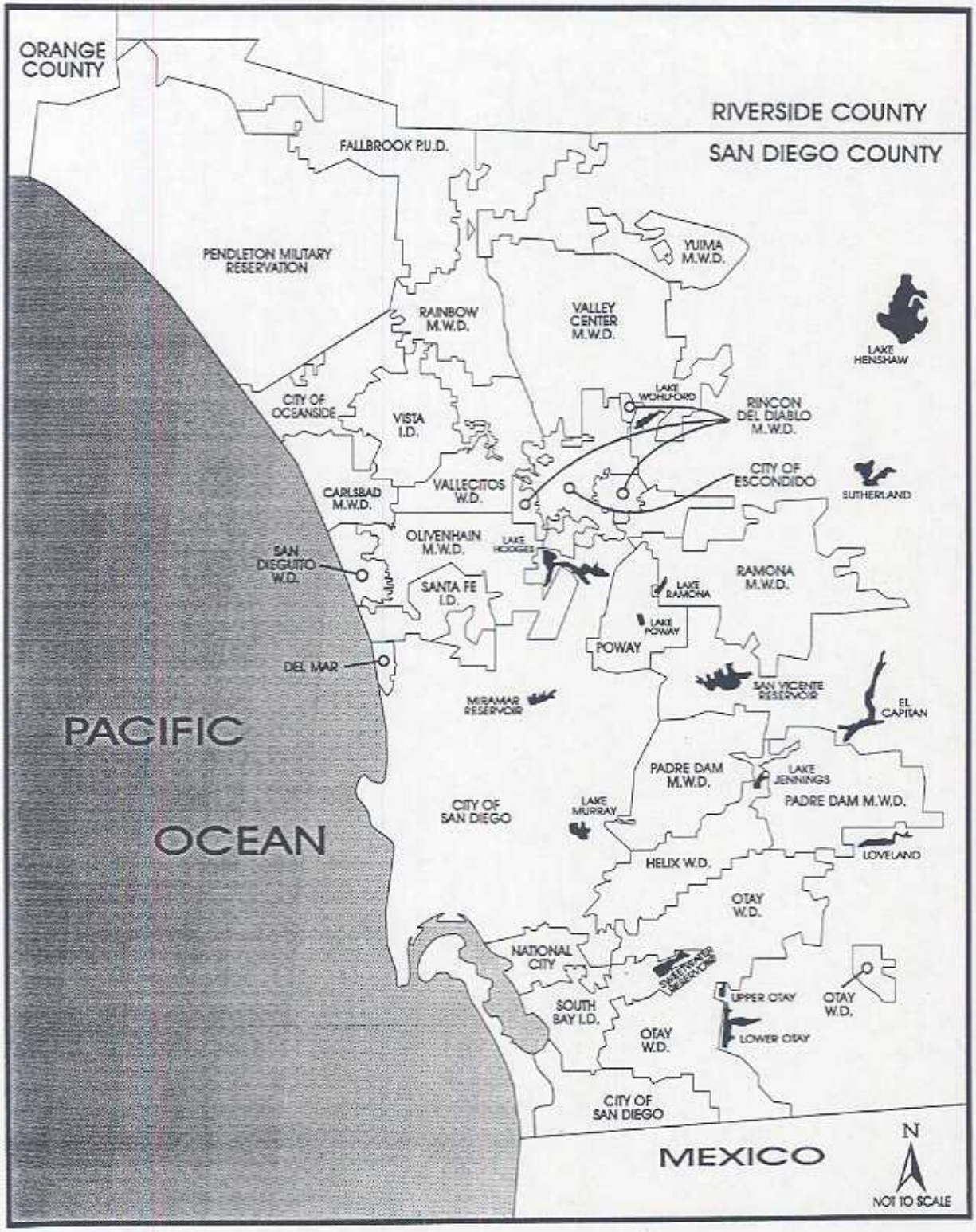


Figure 4-2 Reservoir Locations

Future Surface Supplies. The most significant current effort to increase local surface water supply in San Diego County is the Authority's Emergency Storage Project. While this effort is expected to increase the county's total water storage by about 90,000 acre-feet, use of the ESP will be limited to emergency purposes, such as the catastrophic failure of one or more Authority pipelines during an earthquake or other natural disaster, or a prolonged drought. The MWD is constructing Domenigoni Reservoir in Riverside County, which will provide the Authority with both operational and emergency storage benefits.

The ESP is being designed to meet emergency demands through the year 2030, and to handle two planning scenarios. In the first scenario, water delivery to MWD would be interrupted for up to six months due to an earthquake along the San Andreas or San Jacinto faults. Under this scenario, the Authority could still draw upon MWD emergency storage water, including that stored at Domenigoni Reservoir. The second scenario involves a two-month interruption of deliveries from MWD to the Authority because of an earthquake on the Elsinore Fault. For this scenario, only water stored within the county would be available for use.

4.1.2 Groundwater Supplies

Groundwater supplies in the western portion of San Diego County are limited due to the semi-arid hydrologic conditions and the geology of the region. Short and narrow river valleys with shallow alluvial deposits are characteristic of many of the more productive groundwater basins. Outside of these alluvial basins, much of the geology consists of fractured crystalline bedrock and fine-grained sedimentary deposits that generally yield relatively limited amounts of groundwater to domestic wells. One noticeable exception in the Authority's service area is the San Diego Formation, located in the southwestern portion of the county. At the present time, the geometry and geographic extent, hydrogeologic characteristics, and groundwater production potential of the majority of this fine- to coarse-grained sedimentary formation are not well understood. Studies are being conducted to better understand the water supply potential of this aquifer.

The more well known and better understood alluvial aquifers, which have well yields appropriate for large municipal water supplies, have been developed to a large degree. Many of these basins have been overdrafted in the past and are suffering from water quality problems due to seawater intrusion and urban and agricultural runoff contamination. However, potential exists for additional development of groundwater.

Groundwater Basin Development. Although the potential is relatively limited, groundwater resources can be developed to provide an additional increment of supply and reliability for the region. The Authority is evaluating the larger groundwater basins identified on **Figure 4-3** in terms of local supply potential and seasonal and carryover

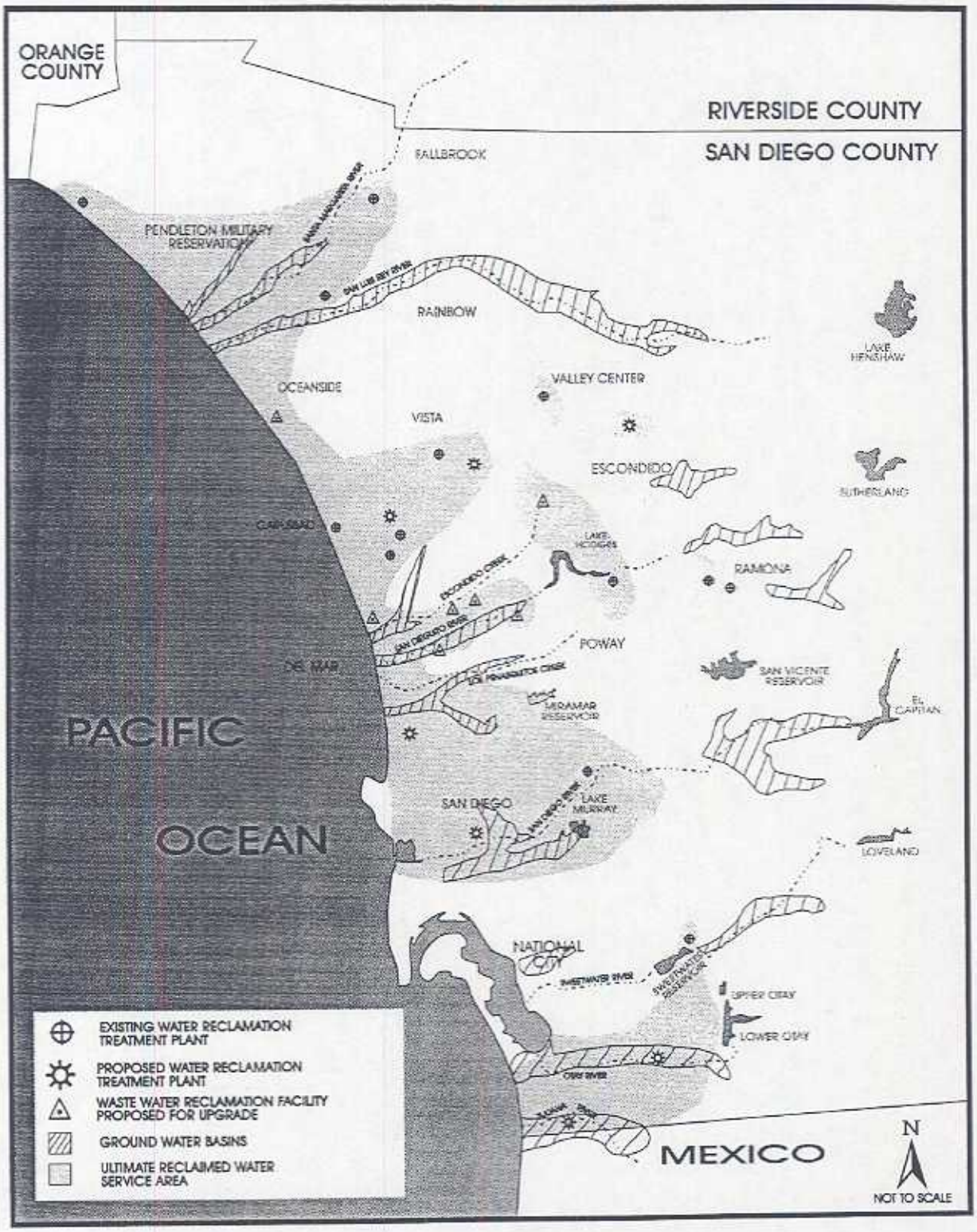


Figure 4-3 Groundwater Basins and Reclamation Facilities

storage capabilities. Potential uses are divided into the following categories:

1) Conjunctive use and artificial recharge of higher-quality groundwater basins with imported water and surface runoff for potable uses; and

2) Conjunctive use and artificial recharge of poorer quality groundwater basins with imported and reclaimed water, surface runoff, and wellhead treatment for potable and/or non-potable uses.

A number of issues need to be resolved in each potential use scenario. In the first category, institutional, legal and operational issues are apparent. High-quality groundwater basins which have the potential for conjunctive use must be collectively managed to effectively utilize available storage capacity.

Currently, most of the higher quality basins are utilized by a number of individual private interests. In most cases, private wells are not regulated. Specific basin management agreements would have to be developed to establish rights and responsibilities under a conjunctive use program.

In some cases the basin may have to be adjudicated, a time-consuming process. Operational problems would also have to be resolved before the reliability of a conjunctive use program can be established.

Conjunctive use of degraded groundwater basins may not have as many institutional and operational problems as those associated with higher quality basins. In most cases, degraded groundwater basins have been abandoned by well owners in favor of imported water. Nonetheless, groundwater rights in degraded basins would need to be established.

Developing degraded groundwater would involve extraction followed by demineralization to obtain water suitable for domestic purposes. The normal safe yield of the groundwater basins in certain locations could be supplemented with reclaimed and/or imported supplies. Limitations related to brine disposal requirements associated with the need to demineralize brackish groundwater supplies may be a significant constraint related to siting such a project.

Degraded groundwater basins offer an opportunity to extend the yield of a water reclamation project. Excess reclaimed water available when demand is low could be stored in these basins and subsequently extracted during periods of high demand.

One consideration which transcends the operation of all potential groundwater recovery projects is that of water quality control. Water contamination issues potentially affecting the viability of the use of the groundwater must be evaluated. Past, present and future land use within the watershed is a critical consideration.

Projected Groundwater Supplies. **Table 4-4** shows planned and existing groundwater projects within the Authority's service area. All projects, with the exception of the Oceanside desalter, are either in a planning or design stage. The projected yields of these projects are therefore tentative at this time. Other groundwater projects, not identified here, are also being considered by other agencies in the Authority's service area, but are conceptual only, and these projects have not yet been documented.

For water supply planning purposes, the the Authority is projecting a total of 15,000 acre-feet of new groundwater production by the year 2010. This number will be re-evaluated as more information is gained about planned groundwater projects.

4.1.3 Seawater Desalination

Over the past five years, the Authority has studied two major seawater desalination proposals. Both studies concluded that the construction of seawater desalination plants is not economical at this time. However, for planning purposes, the Authority is anticipating a total production of 20,000 acre-feet of desalinated seawater by the year 2010.

The first study, completed in 1991, was for a large powerplant and desalination plant in Northern Baja, Mexico. Mexico was chosen as the possible location because less time would have been required for permitting than if the plant were to be constructed in southern California. Moreover, siting such a new plant in southern California would be difficult due to a lack of suitable coastal locations. The plant would have met all U.S. environmental standards. The results of this study showed this project to be uneconomical, largely because of the cost of pumping the product water 25 miles into the Authority's distribution system.

The second study was for a plant to be located in the South Bay, near Chula Vista. This project would have combined the construction of a desalination plant with the repowering of an existing San Diego Gas and Electric power plant. This project would have constructed a 30 mgd plant by the

Table 4-4 Groundwater Projects

PROJECT	TOTAL YIELD (AFY)	OPERATION DATE
Oceanside No. 1	2,200	1994
Sweetwater Desalter No. 1	5,000	1997
Oceanside No. 2	2,500	1997
San Pasqual	5,000-9,000	1997
Otay/Sweetwater	1,500	2000
San Dieguito Desalter	2,500-5,000	2004
Lower Santa Margarita	2,000-3,000	1999

year 2002. Although the study found the plant technically feasible, many of the anticipated economies of scale of collocating it with SDG&E's power plant failed to materialize. As a result, the plant was determined to be uneconomical at this time. The Authority Board subsequently instructed staff to look at alternatives to the project and provide near-term financial participation for seawater desalination only through the ongoing projects of the Metropolitan Water District.

Limitations of Seawater Desalination. Seawater desalination is often identified as the ultimate solution to California's and especially Southern California's water problems. While desalination may well have an important part to play in the overall reliability of Southern California's water supply, there are many problems confronting this technology which are likely to prevent its large-scale use. Primary among these problems is facility siting. Desalination on a large-scale requires relatively large parcels of land, preferably near the coast. Pumping seawater and brine over long distances to avoid the need for a coastal location would add to desalination's already considerable expense.

Desalination is included as a local supply development strategy in the Authority's Strategic Plan. By recommending desalination as a local supply development objective, the Authority can pursue opportunities to evaluate potentially cost effective projects and support MWD in the development of new methods which may result in future costs savings. Therefore, it is reasonable to maintain desalination as a component of the total local supply development forecast.

4.1.4 Water Reclamation

Reclaimed water plays a substantial role in supplementing Authority supplies, with an estimated 10,000 acre-feet of beneficial reuse occurring in 1995. The Authority supports the reclamation projects of its member agencies with technical and financial assistance. Existing and projected reclaimed supplies are listed in **Table 4-5.**

The San Diego area water reclamation program is an ambitious, long-term program designed to decrease regional reliance on imported water supplies. The program is a cooperative effort by the Authority, its member agencies, and local providers of wastewater treatment. Together, these agencies have developed a system of interconnected water reclamation projects that will make the best use of existing and planned water reclamation facilities and result in a cost effective and efficient use of local water resources.

When completed, the water reclamation program will serve an area of more than 700 square miles, from the agricultural valleys near Fallbrook in the north to the expanding business centers along the international border with Mexico in the south. Ultimately, up to 50,000 acre-feet of reclaimed water will be added annually to the region's scarce local water supply, almost doubling the existing average local supply. Facilities to be constructed

Table 4-5
Projected Water Reclamation Development

AGENCY	1995 (AF)	2000 (AF)	2005 (AF)	2010 (AF)
Carlsbad MWD	1,000	1,500	2,100	4,000
City of Escondido	-	1,000	2,800	2,800
Fairbanks Ranch CSD	150	150	150	150
Fallbrook PUD	600	600	1,000	1,000
City of Oceanside	300	300	1,000	2,000
Olivenhain MWD	-	750	2,000	3,000
Otay WD	800	1,000	1,400	4,000
Padre Dam MWD	600	800	1,000	2,000
Pendleton	3,900	3,900	3,900	3,900
City of Poway	-	500	1,500	1,500
Ramona MWD	1,200	1,200	1,500	1,500
Rancho Santa Fe CSD	200	200	200	200
Rincon MWD	-	200	400	400
City of San Diego	500	4,000	14,500	19,000
San Elijo JPA	-	1,150	1,400	1,750
Vallecitos WD	-	-	-	1,000
Valley Center MWD	300	300	300	450
Vista ID	300	300	700	1,000
Whispering Palms	150	150	150	150
TOTAL	10,000	18,000	36,000	49,800

include up to 11 new or expanded water reclamation plants, a state-of-the-art water repurification facility, and hundreds of miles of reclaimed water delivery pipeline.

Construction is already under way for a number of these reclamation facilities. The city of San Diego has begun construction of what will be the region's largest reclamation facility, the 30-million-gallon-per-day North City Reclamation Plant. The Padre Dam MWD has begun construction of the expansion of its successful reclamation program. The city of Escondido will begin construction of reclamation facilities in 1996.

While still in the planning stages, the proposed Water Repurification Program could have far-reaching consequences for both the region and the state. This innovative water supply project will treat reclaimed water to a quality standard equal to that of untreated potable water supplies. The repurified water would be stored in a local reservoir for subsequent potable uses. If implemented on a wide scale, water repurification technology could help to solve California's long-term supply problem.

The total cost of the San Diego area water reclamation program is about $646 million. With an annual cost in the range of $900-$1,200 per acre-foot, the program is competitive with the development of new imported or other local water supplies. However, the level of capital investment makes it a heavy financial burden for the local agencies.

Although some portions of the project are receiving federal grants and low-interest state loans, most capital costs must be funded by local ratepayers. The financial feasibility of this ambitious water supply development project, if funded solely with local resources, is questionable. Thus, the Authority and MWD are providing additional financial incentives to ensure the projects are constructed and the benefits realized.

Reclamation Financial/Technical Assistance The Authority established a water reclamation department in 1988 to address regional implementation issues identified by local agencies. The Authority also established the Water Authority Reclamation Advisory Committee (WARAC). WARAC is comprised of representatives from wastewater and water agencies, the Farm Bureau, Department of Health Services, Regional Water Quality Control Board, and regional planning groups all interested or involved in the production and utilization of reclaimed water. The primary purpose of WARAC is to organize, plan and develop regional water reclamation projects. WARAC also provides recommendations to the Authority on issues related to reclaimed water development.

Local agencies often identify reclamation project funding as their number one constraint. In response to this need, the Authority developed the Financial Assistance Program (FAP) in 1988. FAP provides funding assistance to agencies for the development of water reclamation facilities plans, feasibility investigations, state loan applications, and preliminary engineering studies. The funding is provided on a cost sharing basis, with a maximum contribution of $50,000. As of June 30, 1995, the Authority has funded about $2 million in water reclamation planning studies.

MWD currently provides an incentive of $154 per acre-foot for water reclamation through its Local Projects Program (LPP). This amount is expected to increase to $250 per acre-foot when MWD merges the LPP into a new program called the Local Resources Program (LRP). In addition, the Authority has a Reclaimed Water Development Fund (RWDF). The purpose of RWDF is to provide Authority member agencies financial assistance to develop cost-effective water reclamation projects capable of relieving a demand upon the Authority. The maximum financial contribution currently available through RWDF is $100 per acre-foot of reclaimed water used, for a total commitment of about $100 million through 2020.

The Authority has adopted a number of policies, model ordinances and guidance documents to assist the local agencies with water reclamation project implementation. For example, it is the policy of many Authority member agencies that where reclaimed water

use is allowed by law and is available in sufficient quantities, at a reasonable cost and quality, reclaimed water shall be the sole water supply delivered for non-potable uses.

Local agencies have adopted Authority-sponsored ordinances related to reclaimed water master planning and have conditioned new development projects to require reclaimed water irrigation systems. Water reclamation guidance documents available from the Authority include: Model Rules and Regulations for Reclaimed Water Service, Construction Specifications for Reclaimed Water Systems, Retrofit Guidelines, and a user's manual.

Reclaimed Water Losses in Dry Years. In dry years, when both indoor and outdoor conservation efforts are being practiced, less wastewater flow is available for reclamation. In 1991, wastewater flow reductions of about 10 percent were observed. These reduced flows are accounted for in Authority dry-year planning.

Water Repurification. All current Authority-supported reclamation projects use reclaimed water for non-potable purposes. Water "repurification" would treat wastewater to a quality such that it could be used for potable purposes. The Authority, in conjunction with the city of San Diego, is studying a proposal that would treat up to 22,000 acre-feet of wastewater annually for a potable supply.

Under this proposal, 20 million gallons per day of wastewater from a city of San Diego reclamation plant would be treated using state-of-the-art technology, including microfiltration and reverse osmosis desalination. This water would then be delivered to a local surface reservoir, where it would reside for a period of time and be blended with local runoff and imported water. The blended water would then be withdrawn by the city on demand, filtered, disinfected, and supplied to customers through the city's potable distribution system.

4.2 IMPORTED SUPPLIES

The Authority has traditionally relied upon the Metropolitan Water District (MWD) to meet most of its water demands. MWD was formed in 1928 "for the purpose of developing, storing and distributing water for domestic and municipal purposes." In 1952 MWD adopted a statement of policy, reaffirmed in 1989, which has become known as the "Laguna Declaration". This statement was a simple and clear commitment "to provide its service area with adequate supplies of water to meet expanding and increasing needs in the years ahead." In 1992 the MWD Board adopted the following Mission Statement:

> *"The Mission of the Metropolitan Water District of Southern California is to provide its service area with adequate and reliable supplies of high quality water to meet present and future needs in an environmentally and economically responsible way."*

MWD now supplies water to about 16 million people in Southern California, and obtains imported supplies from the Colorado River and the State Water Project (SWP). Over

the past 25 years MWD has supplied an average of 1.5 million acre-feet of water to its member agencies: 1.05 million acre-feet from the CRA and 0.45 million acre-feet from the SWP.

While MWD has aggressive plans underway to continue to meet the needs of its member agencies, there is no assurance that the potential supplies MWD has identified are developable in the time frame needed. All of the potential supplies are subject to many uncertainties, a great deal of which are beyond the sole control of MWD. Many involve innovative water management programs that are not universally accepted by those outside of MWD who may be involved. Of particular note is the status of the State Water Project and efforts to improve its supply capability and reliability.

Integrated Resources Plan. In June 1993 MWD initiated a process known as the Integrated Resources Plan (IRP) that expands MWD's role from supplemental water supplier to a centralized regional water resources planning agency. The IRP's goal is to determine and implement the most reliable and cost-effective means of water supply for MWD's entire service area. A "Preferred Resource Mix" of imported and local water resources was established, along with demand management programs, that would achieve this result. The Preferred Resource Mix was selected from three options: maximize local resources, maximize imported resources, and an intermediate mix that maximizes neither local nor imported water resources. The intermediate mix was selected for development.

The IRP established the desired level of regional water supply reliability: MWD's reliability goal is to provide 100 percent of full service wholesale water demands 90 percent of the time, and never provide less than 80 percent of full service wholesale demands. Least cost planning principles were used to determine the components of the Preferred Resource Mix, balancing the regional benefits of local supply development with the costs of producing local supplies.

In June 1994 MWD held a Strategic IRP Assembly that produced the following strategy conclusions:

- the region should utilize all cost-effective local resource options;
- the region should implement Best Management Practices;
- Colorado River supplies should be maximized;
- State Water Project supplies should be enhanced;
- Water markets and transfers should be supported;
- a blend to SWP and CRA supplies should be maintained to manage water quality; and
- MWD's existing Capital Improvement Program should be supported.

Domenigoni Reservoir.
MWD's Domenigoni Reservoir will provide major supply benefits to San Diego County. The reservoir, which is under construction, has a planned capacity of nearly 800,000 acre-feet. With this amount of additional storage, MWD will be able

to store significantly more imported water during wet years, for use during dry years. This will be beneficial for regional operational and emergency storage.

4.2.1 Colorado River Aqueduct

The Colorado River Aqueduct, owned and operated by MWD, transports water from Lake Havasu on the Colorado River, to its terminus at Lake Matthews in Riverside County. The aqueduct has an annual maximum capacity of 1.3 million acre-feet. MWD's total annual use of Colorado River water is about 1.3 million acre-feet. MWD is entitled to only 550,000 acre-feet of this water; the remainder must be declared surplus by the federal government before it becomes available to MWD. Several California irrigation districts hold rights to 3.85 million acre-feet. Certain Indian reservations, towns and individuals also hold rights that predate MWD's rights.

In 1964, the United States Supreme Court limited California's annual diversions on a dependable basis to 4.4 million acre-feet in the case *Arizona v. California*. As such, MWD's annual diversions from the Colorado River on a dependable basis were limited to approximately 550,000 acre-feet. During declarations of surplus, MWD has the highest priority of any California contractor to divert these surplus waters.

The Secretary of the Interior has the discretion to allow California to use any water that Arizona and Nevada have available from the Colorado River, but do not use. It is difficult to predict the criteria the Secretary will use in determining whether to release unused water to California. If the agricultural agencies in California do not use the entire supply available to them, MWD also has the right to divert the unused portion.

To offset the decrease in Colorado River entitlement, MWD has begun a number of exchange/transfer programs that will result in additional Colorado River supplies. These include a water conservation program with the Imperial Irrigation District (IID), a demonstration program to store unused Colorado River water underground in Arizona, lining the All American and Coachella canals, and the Palo Verde and IID fallowing programs. In addition to these programs, MWD and others are seeking to bank water and improve the management of the Colorado River system.

4.2.2 State Water Project

Metropolitan's other primary source of water is the State Water Project (SWP). The SWP is owned by the State of California and operated by the California Department of Water Resources (DWR). This project transports water from the Sacramento-San Joaquin Delta via the 444-mile-long California Aqueduct to 29 contract agencies in the state.

The MWD has an annual entitlement to SWP water of 2,011,500 acre-feet out of a total maximum contractual entitlement of 4.2 million acre-feet for the 29 contractors. The current firm yield of the SWP, 2.4 million acre-feet, falls below the project-

wide SWP contractor requests of 3.6 million acre-feet in 1992. The current yield is based on the average annual supplies available if the hydrologic conditions which occurred during the seven-year period from 1928-1934 reoccurred. In certain future years, the supply of water available to MWD is likely to be less.

Demands for SWP water are expected to increase to 4.2 million acre-feet by the year 2010. Thus, MWD's water supply from the SWP faces potential limitations. The current firm yield of the SWP is only about one-half of the contract entitlements due to the lack of sufficient water conveyance facilities.

A three-year operating agreement for the Bay/Delta, source of SWP supplies, was reached in December 1994. The agreement provides for salinity standards, water quality monitoring, and measures for ecosystem restoration, including guaranteed minimum flows and fish screens. The agreement was widely hailed as a temporary solution to the historic conflicts of urban, agricultural, and environmental water use and is being viewed as a model for more permanent measures. Long-term Delta solutions being sought by the Authority and MWD include cross-Delta conveyance facilities.

4.2.3 Los Angeles Aqueduct

Another imported water supply into the MWD region is the Los Angeles Aqueduct (LAA). This supply, which serves only the city of Los Angeles, consists of surface and groundwater supplies obtained from the Owens Valley and Mono Basin. The availability of water from this source bears directly upon the amount of water that MWD must supply.

Litigation over water exports from the Mono Basin resulted in restrictions to the water rights licenses of Los Angeles. These restrictions will significantly curtail the amount of water that Los Angeles can export from the Basin in the future.

4.2.4 Water Transfers

Water transfers have been planned as a partial solution to water shortages for the Authority and other urban areas in the state. In simple terms, water transfers encompass a variety of transactions reallocating water supplies, which to a large extent, have already been developed and are being used. These transactions generally involve a shift water from relatively low-value use, usually agricultural, to a higher value use, usually municipal and industrial.

The State Water Bank is an example of a water transfer. Inititated in 1991 by the Department of Water Resources during a drought emergency, the State Water Bank allowed water districts located in water-short areas to purchase supplies to reduce the level of drought-induced shortage. The DWR "purchased" water supplies, primarily from northern California agricultural entities, and sold these water supplies to water districts experiencing severe shortages. The Metropolitan Water District purchased 215,000 acre-feet of bank water in 1991. Of this 215,000

acre-feet, 188,000 acre-feet was melded into MWD's overall supply. About 27,000 acre-feet was purchased through MWD by MWD member agencies, including 21,600 acre-feet purchased directly by the Authority.

The Authority anticipates using some form of water transfer to meet its supply reliability goal during a dry year. The transfer could be purchased from the State Water Bank, or it could result from other transfer arrangements. The following amounts of transfer have been planned for dry-year scenarios (in acre-feet per year):

Year	Transfer
1995	28,000
2000	57,000
2005	57,000
2010	75,000

Water Transfer Conditions. To change a point of water use in California, at a mimimum the following three conditions need to exist:

1) There must be a willing buyer and seller and a means of conveyance;

2) The exchange must not create significant environmental or unreasonable economic effects, i.e., it must be in the public interest; and,

3) The seller of the water must be able to provide documented rights to the water used and intended for transfer.

The opportunity for water transfers depends upon the above factors as well as the specific geographic and institutional circumstances. While using water transfers to solve urban water needs is conceptually simple, on a project-specific level it has historically been complex given the physical and institutional arrangements.

Most irrigators receiving surface waters have only a contract specifying an amount to be delivered to them for beneficial use on their property. The actual water right is most often held by the water district or yet another agency which delivers water to the district.

Generally, it has been the policy of most water districts to discourage transfers of water to areas outside their boundaries. Given that most of California's water has been developed by large governmental projects which then wholesale to smaller agencies, few situations existed where willing water users could easily sell water to interested buyers.

Even where such situations do exist, issues surrounding the use of non-owned facilities for transporting the water, or "wheeling," often complicate the transaction. This facet of the California water situation stands in sharp contrast to states such as Arizona and Colorado where appropriative water rights are often held directly by the user and are severable from the land.

Imperial Valley Pipeline. A potential exists for relatively large amounts of transfer water to be developed from agricultural lands in the

Imperial Valley for delivery to urban areas, including the Authority. However, because the capacity of the Colorado River Aqueduct is limited to 1.3 million acre-feet per year, additional conveyance capacity may be needed to realize such a transfer.

In June of 1991, the Authority completed a study of a proposed pump/generation pipeline from the Imperial Valley. The proposed pipeline would have delivered 100,000 acre-feet annually. This concept was not pursued further than the study.

More recently, the Authority and the Imperial Irrigation District have begun talks concerning the transfer of up to 500,000 acre-feet per year of Colorado River water to the Authority. The two agencies signed a memorandum of understanding in September 1995 to explore the idea of a transfer, including the cost of developing and transporting the water.

4.2.5 Authority Facilities

Water imported by the Authority is delivered through two aqueducts, consisting of five large-diameter pipes. Delivery points are located about six miles south of the Riverside/San Diego county line. The First Aqueduct is comprised of Pipelines 1 and 2, which are located in the same right of way and operated as a unit. Pipelines 3, 4, and 5 form the Second Aqueduct. These pipelines are operated independently and are located in separate rights of way for much of their length. **Figure 4-4** shows the locations of the Authority's aqueducts within San Diego County.

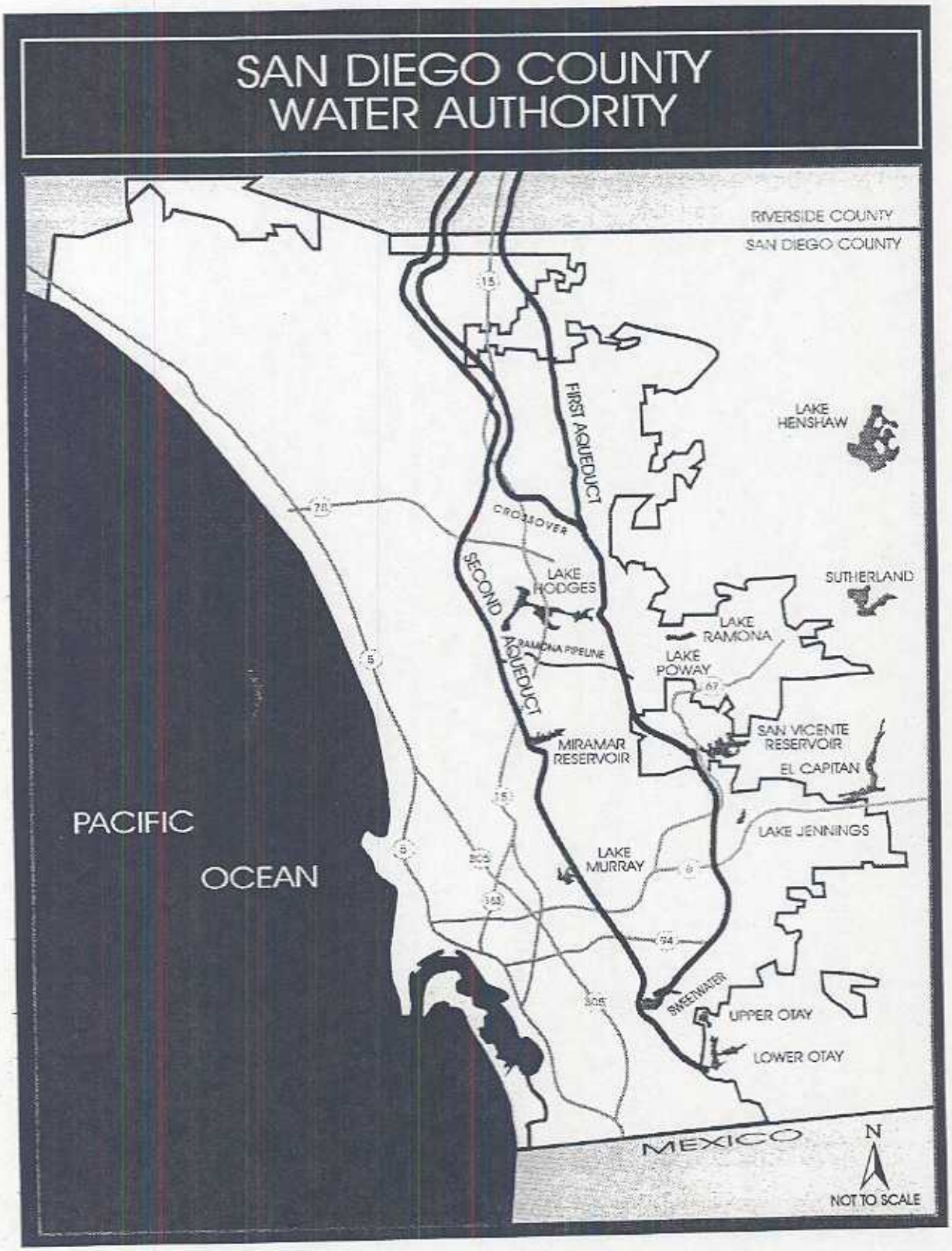


Figure 4-4 Authority Aqueducts

SECTION 5

PRICING AND RATE STRUCTURES

The Authority's rate structure is designed to provide sufficient revenue diversity to reduce rate shocks associated with varying levels of water sales. Pricing structures used to encourage efficient management of water resources are directly passed through to the Authority's member agencies from the Metropolitan Water District (MWD). This section provides an overview of the Authority and MWD rate structures, and concludes with an analysis of wholesale rates within the Authority's service area.

Ever since the Authority was formed, the predominant revenue stream has been a commodity rate levied as a surcharge to the MWD rate. In 1989 the Authority initiated what was then a $540 million Capital Improvement Program (CIP) that would place a significant demand on future water rates. Additional sources of revenue were reviewed to diversify the revenue structure, focusing on fixed revenue sources, which slow rate increases and lower the reliance on variable revenue sources. The Authority's CIP has since grown to more than $720 million, and has the potential to reach well over $1.0 billion.

5.1 MWD'S PRICING POLICY

The following section is reprinted from MWD's Regional Urban Water Management Plan draft dated April 25, 1995:

Since the 1987-1992 drought, MWD has made significant progress in modifying its wholesale rate structure and incentive programs to achieve water conservation and improved water management. The major objectives of the current pricing policy include:

1) Revenue sufficiency and stability. The structure of water rates is designed to secure a firm revenue base and provide for relatively stable water commodity rates over time. These rates should be sufficient to generate total revenue requirements less receipts from interest, power recovery, taxes, and other revenue sources. The rate structure is expected to provide a substantial base amount of assured revenue each year to ensure the stability of net revenues. The stability of the revenues is enhanced by the use of a Rate Stabilization Fund.

2) Efficient Water Management. Together with incentive programs, water rates are structured to promote efficient water use and achieve the water supply goals of Metropolitan's Integrated Resources Plan. The pricing policy is expected to encourage efficient use of the distribution system so that peaking demands are discouraged and the capture of available water is maximized. The policy is also designed to provide water resource management incentives and stimulate member and local agencies to increase the use of local water

resources, particularly during droughts.

3) Equity and fairness. A central concern setting water rates is that they follow the principle of equity under which member agencies and their customers are apportioned costs of service in a manner that is fair and avoids the subsidy of one group of users at the expense of another. The rate structure provides equal rates for the same class of service to all member public agencies. The new growth in the service area is expected to pay its fair share of the additional costs of growth on Metropolitan's system.

4) Effective management of shortages and surpluses. The pricing policy also considers the need for a proactive plan to ensure equity and efficient use of regional resources during shortage periods, as well as effective use of storage during periods of water surplus. The water rate structure is easily convertible to an emergency conservation pricing plan if necessary.

5) Minimum rate shock and administrative effort. The water rate structure and reserves are set up so that the amount of change in water rates each year is relatively small yet it allows Metropolitan to reach the necessary revenue levels. Also, the current rates are simple to administer and easy to implement.

6) Financial viability. The pricing policy allows Metropolitan to maintain high bond ratings to access capital markets at the lowest possible interest rate. The water rate structure is designed to avoid negative impacts on the borrowing capability of Metropolitan and its member agencies.

The various components of the wholesale rate structure and the financial incentive programs are designed to achieve one or more of the objectives listed above. Additional objectives are also considered. They include: (1) full allocation of the actual and social costs of providing service; (2) efficient use of water in terms of quality used and timing of uses; (3) efficient pattern of system development over time and efficient growth in water use; and (4) transparency of water rates to provide a clear and predictable price signal to member agencies and their customers.

5.2 AUTHORITY'S FINANCIAL STRUCTURE

The Authority's financial structure is determined by state legislation (The County Water Authority Act) which enables the Board of Directors to levy water rates and other charges. The County Water Authority Act enables the Authority to establish water rates, impose water standby charges, incur bonded indebtedness, issue commercial paper, and levy taxes on property within its service area.

The Authority's primary source of income is from a surcharge placed on water purchased from MWD. This source of revenue is expected to produce 53 percent of the Authority's total income in fiscal year 1996. The remaining 47 percent is collected from a water availability standby charge, connections fees, interest,

miscellaneous income and property taxes.

5.3 WHOLESALE WATER RATES

Table 5-1 presents the Authority's wholesale cost of water from fiscal year 1986 to 1996. The Authority's wholesale rate is composed of the wholesale rate charged by MWD with a uniform Authority surcharge above and beyond the MWD rate. The Authority surcharge remains the same ("postage stamp pricing") regardless of the delivery point for each member agency.

Between fiscal years 1986-87 through 1990-91, MWD's water rates remained unchanged. Since then, the prices of noninterruptible and emergency service have increased each year. The interruptible service was discontinued in 1991. A new class of service, seasonal storage water, was introduced in fiscal year 1989-1990.

Changes in the structure and levels of water rates have affected the *average cost* of water provided to the Authority by MWD. The average cost of water is derived from total cost of water (accrual) divided by total volume of water sold in each fiscal year. The average cost of water to the Authority has increased from $184.18

Table 5-1
Wholesale Water Rates 1985-1996 (Dollars/AF)

MWD Wholesale Rates:

		Fiscal Year								
Type of Service		**85-86**	**86-89**	**89-90**	**90-91**	**91-92**	**92-93**	**93-94**	**94-95**	**95-96**
Non-Interruptible	***Untreated***	192	197	197	197	222	269	318	335	344
	Treated	224	230	230	230	261	322	385	412	426
Interruptible	***Untreated***	148	153	153	153/ 197	N/A	N/A	N/A	N/A	N/A
	Treated	180	186	186	186/ 230	N/A	N/A	N/A	N/A	N/A
Interim Ag Program	***Untreated***	N/A	N/A	N/A	N/A	N/A	N/A	205	222	231
	Treated	N/A	N/A	N/A	N/A	N/A	N/A	248	275	289
Seasonal Storage	***Untreated***	N/A	N/A	115	115	130	168	208	222	229
	Treated	N/A	N/A	135	135	154	203	253	275	286
Emergency	***Untreated***	586	591	591	591	666	807	954	1005	1032
	Treated	618	624	624	624	705	860	1021	1082	1278
Reclaimed		84	84	84	84	84	84	113	113	113

(4/1/91) Interruptible discount eliminated.
(5/1/94) Interim Agricultural Water Program implemented.

Authority Wholesale Water Rates 1985-1996

CWA Surcharge	Untreated	10	15	40	40	55	55	70	70	80
	Treated	17	22	47	47	62	62	70	70	80

in 1987 to $332.49 in 1994. The Authority's average cost of surcharge water has increased from $12.28 (1987) to $66.77 per acre-foot (1994).

The Authority's current rate structure is composed of two types of charge (due to a direct pass through of the MWD structure): commodity charges and fixed charges. The commodity charge is based upon the quantity and type of water sold to each member agency. Fixed charges are based on historical rolling averages of demands. The specific types of charges are detailed below.

5.3.1 Water Commodity Charges

As shown in **Table 5-1**, both MWD and the Authority adopted new commodity rates for fiscal year 1995-96. Each type of service is described below.

Noninterruptible Water Service. Noninterruptible service refers to water deliveries for domestic and municipal purposes which require continuity of service. It is not subject to interruption or reduction, except as a last resort during a shortage. Approximately 84 percent if the Authority's water is sold under the noninterruptible class of service. Approximately 52 percent of this water is treated.

The Authority's price for noninterruptible untreated water in fiscal year 1995-96 is $424 per acre-foot, or $1.30 per 1,000 gallons. The price of noninterruptible treated water is $506 per acre- foot, or $1.55 per 1,000 gallons.

Emergency Water Service. Emergency service is available only when a member agency cannot sustain a reduction or interruption in the delivery of water required under the obligation of interruptible water service. The delivery of water under this type of service must be authorized by MWD's general manager after determining that serious hardship would result to an MWD member agency or any of its subagencies. This class of water is priced at three times the noninterruptible rate. However, since interruptible water service and its obligations have expired, emergency water service has not been necessary.

Seasonal Storage Service. When surplus water is available, generally between October and April and as designated by MWD's general manager, water may be purchased at a discounted rate if an MWD member agency participates in the Seasonal Storage Program. About 14 percent of the Authority's water qualifies for the seasonal program.

Agricultural Water Service. Approximately 16 percent of the Authority's water is sold under the Interim Agricultural Water Program as established by MWD in 1994. The discount for agricultural water is currently $137 per acre-foot for treated water and $113 per acre-foot for untreated water. About 90 percent of this class of water sold by the Authority is treated water. In return for the discount, agricultural users are subject to delivery interruptions of up to 30 percent prior to any mandatory

delivery reductions to municipal and industrial users.

5.3.2 Other Revenues

In addition to commodity charges, the Authority's rate structure includes revenue from sources that are described below.

Property Tax Assessment. Property tax revenue is used to pay the Authority's general obligation bond debt service. The obligation associated with the general obligation debt will be fully satisfied in fiscal year 2003. The current tax rate is 0.00120 per 100 dollars of secured assessed valuation and 0.00135 per 100 dollars of unsecured valuation.

Readiness-to-Serve Charge. The readiness-to-serve (RTS) charge is designed to recover the principal and interest payments on non-tax supported debt incurred by MWD to fund capital improvements associated with meeting the reliability and water quality needs of existing water users. In 1995-96 each Authority member agency's share of the RTS charge will be based on an average of sales for 1992-93 and 1993-94, less sales of water placed into long-term storage. Standby charges collected in the Authority's service area ($11.51/parcel) on behalf of MWD are used as a credit against the total Authority obligation to MWD.

New Demand Charge. The new demand charge (NDC) is designed to recover the capital costs associated with meeting new demands on MWD's system. This one-time charge covers the costs of improving water quality and meeting the Authority's demands above 550,220 acre feet per year (base amount). The full cost of untreated incremental demands is estimated to be $1,621 per acre-foot. Payment for this charge can be amortized for up to 15 years with interest. The incremental cost of treatment may be added to this charge in the future. For 1995-1996, the new demand charge has been set at $1,000 per acre-foot of water above average historical demands. The intention is to increase this charge toward the full cost over the next five years.

Treated Water Peaking Charge. The treated water peaking charge is set to encourage agencies that contribute to the peak rates of flow through MWD's water treatment facilities during the summer season to change their operations or more equitably share in the cost of facilities to meet their needs. If the peak week flow to a member agency during the five-month period from May through September exceeds 130 percent of average weekly flows during the five-month period, the agency pays a charge for each cubic foot per second (cfs) above the average. This charge will first be assessed during the calendar year 1996 and collected in 1997-98.

5.4 PRICING INCENTIVE PROGRAMS

MWD maintains four programs that provide economic incentives to encourage member agencies to maximize the use of local resources, increase local storage of imported water supplies, and implement long

term water conservation programs. These programs are the Local Projects Program, the Groundwater Recovery Program, the Conservation Credits Program, and Seasonal Storage Service.

5.5 AVERAGE WHOLESALE PRICING

The rate structure that MWD adopted in fiscal year 1995 had a dramatic effect on the cost of water for Authority member agencies. In the past, all MWD member agencies were charged the same rate regardless of what type of water was purchased. This basic tenet has remained intact for the MWD commodity rate structure, but not for the other types of "water rate charges." Because of historical and future consumption patterns of Authority member agencies, the cost of water for the retail consumer will vary significantly across the Authority service area.

Those agencies that anticipate growth will sustain a larger amount of MWD costs than those agencies that anticipate little or no growth. The effect of the new demand charge will have a significant impact on the growing agencies. The readiness-to-serve charge requires that all member agencies pay something toward the MWD system regardless of use. Agencies that have the ability to pump groundwater or capture local runoff will be required to pay a minimum readiness-to-serve charge even if they use little or no imported water during a given year.

SECTION 6

WATER MANAGEMENT ISSUES

The Authority's primary water management goal is to provide the most reliable water supply at the least cost, using the tenets of what is popularly known as "least-cost planning." Strategies for meeting this goal must balance the benefits of reliable supplies and the infrastructure and water supply costs necessary to achieve them. At some point, the costs incurred for a certain level of reliability become greater than potential economic damages from a slight shortfall, and that level of reliability is not economically justified. The Authority will always seek to find a balance, and optimize resource benefits and costs.

Variability of Water Requirements. As a wholesaler, the Authority must contend with the variable nature of the county's water requirements. Weather-generated fluctuations exist in both the demand for water at the consumer level and in the amount of imported water required by Authority member agencies.

Hot, dry summer weather creates spikes of demand at the consumer level, while winter rainfall fills local reservoirs that can be used by member agencies to offset the need for Authority imported water.

The primary significance of variable demand is that the Authority must plan, design, and construct storage and conveyance facilities that have sufficient capacity to meet peak and emergency water requirements. Variable supply also plays a role in facilities planning. During dry years, the Authority may be required to supply up to 95 percent of the total demand; during wet years that requirement may drop to as low as 68 percent, as member agencies turn to cheaper local supplies. The Authority must operate within this range of water requirement, providing sufficient capacity to meet dry year peak demands, while generating enough revenue, even during wet years, to pay for necessary facilities.

Supply Shortages and Reliability. The San Diego region is dependent upon imported water supplies purchased from the Metropolitan Water District (MWD). Thus, the frequency and magnitude of Authority shortages are directly linked to MWD's water management policies and actions.

For most of its 50-year history, the Authority has been able to receive water from MWD and provide water to its member agencies with 100 percent

reliability. This absolute level of reliability ended during the drought of 1986-92, when MWD enacted water rationing and mandatory conservation measures. The most severe shortfall occurred between March 1991 and March 1992, when MWD reduced supplies to the Authority by 31 percent, based on deliveries made in 1989-90. The Authority was able to use local water and purchases from a state water bank to limit its member agency shortfall to 20 percent.

Future supply reliability has suffered from the uncertain firm yields of MWD's primary sources of water, the State Water Project (SWP) and the Colorado River Aqueduct (CRA). Although the CRA has been kept full in recent years, MWD does not hold firm entitlement to the amount of water it currently takes, about 1.3 million acre-feet per year. Because of a court decision, MWD's entitlement is only 550,000 acre-feet, and it relies upon surplus Colorado River flows for the remainder. As Arizona and other Colorado River Basin states develop and take more water from the river, MWD could see its share reduced. Preservation of habitat for endangered species could also affect future yields from the Colorado River.

While MWD has entitlement to about 2 million acre-feet per year from the State Water Project, this source also faces future uncertainty. Drought, lack of conveyance facilities, and requirements for environmental restoration reduced the SWP's firm yield from 4.2 million acre-feet, to which the project's 29 contractors are entitled, to 2.4 million acre-feet in 1993. An operating agreement for exporting water from the Sacramento/San Joaquin Delta was reached in 1994 that could resolve some of the uncertainties over environmental protection and water quality issues. However, a long-term solution, including new facilities to move water across the delta, is still being sought by SWP users.

In response to these issues, MWD has initated an Integrated Resource Plan that is developing a number of programs to improve reliability, including imported and local supply development, enhanced storage, water exchanges, and demand management. This effort is expected to improve the level of reliability by the year 2010 so that significant shortages would occur only once every 50 years.

Reliability Goals. The Authority's primary goal in reviewing future water resources is to increase supply reliability. Both MWD and the Authority have recently instituted reliability goals.

MWD's goal states that "Metropolitan will provide 100 percent of full service wholesale demands to its member agencies 90 percent of the time. During adverse hydrologic conditions, such as a repeat of the 1991 drought,

Metropolitan will never provide less than 80 percent of full service demands to its member agencies."

The Authority's reliability goal is similar: to meet 100 percent of its member agencies' demand 90 percent of the time, 90 percent of the demand 98 percent of the time, and never deliver less than 80 percent of demand. The Authority is examining ways to increase reliability even more with methods such as transfer or storage agreements, which would provide additional water during drought years.

Emphasis On Imported Supplies. San Diego County will likely obtain most of its water supplies from MWD well into the future, although it is possible to reduce the percentage of imported water required. On a per capita basis, local supplies during a normal year are sufficient for only about 300,000 people, or less than 12 percent of the Authority's service area population. The need for imported water is driven by the county's inability, at least in the near term, to develop sufficient cost-effective quantities of local water. Local supply development is, however, a large part of the Authority's strategy for improving reliability.

Lessening imported water requirements, even by a small percentage, can pay big dividends during times of water shortage. This was illustrated in 1991, when drought forced MWD to allocate water and reduce deliveries to its member agencies by 31 percent. By using local resources and carryover storage, the Authority was able to lessen the impact to 20 percent for its member agencies. The difference between these two levels of service is significant, and San Diego County was able to avoid any long-term economic harm from the shortage. During future water shortages, local resources are expected to be available again to offset reductions in imported supplies, improve overall Authority reliability, and provide a measure of drought-proofing.

A revenue restructuring program recently adopted by MWD may increase the economic competitiveness of local resources, compared with imported supplies. In terms of local supply development, the most significant part of this program is the new demand charge described in Section 5 of this Plan, which is levied on every unit of water sold by MWD to the Authority above a certain annual base level. Water developed locally will avoid this charge, and increase its economic attractiveness.

Emergency Water Storage. One of the reliability issues facing the Authority is to assure that enough water is stored locally to prevent economically crippling shortages during an emergency. The primary emergency being considered is a great earthquake, but the stored water would be

available to alleviate shortages from a severe drought as well.

Currently, only five pipelines are used to transport all Authority supplies (a sixth is under design). If these pipelines were severed during an earthquake, portions of the region could be without imported water supplies for up to six months.

Under present conditions, this shutoff could result in multi-billion dollar economic losses, and the loss of tens of thousands of jobs. To insure against such disaster, the Authority is pursuing an Emergency Storage Project (ESP).

The ESP will make about 90,000 acre-feet of water available for emergency use. This is approximately equivalent to the existing capacity of San Vicente Reservoir. At this time four potential projects exist, consisting of combinations of a new reservoir, the expansion or re-operation of existing reservoirs, or a combination of these methods. The projected completion date for the project is near the year 2000.

Water Management Strategies. Long-term Authority strategies range from the development of local water supplies to participation in state and federal efforts at managing the Authority's imported source waters, including the State Water Project and the Colorado River Aqueduct.

Authority strategic goals can be divided into two basic categories: those that manage water resources to achieve the Authority's mission, and those that provide facilities to deliver the water.

The water supply goal includes objectives for local supply development and imported water management. Least cost planning principles suggest that there is an optimum "mix" of local and imported resources to meet reliability goals. Efforts will be made to find this mix, and develop the additional local resources that are required. While planning future supplies, the Authority must also focus on its demand management effort, which promotes wise and efficient water use through water conservation programs. During dry years, the Authority will seek to find alternative sources of imported water, or "transfers," that may be used to supplement water imported from MWD.

Tradeoffs exist for all water management options. The Authority could, for example, increase reliability by maximizing the level of local water supply, using groundwater, reclamation, and seawater desalination. Such a strategy would realize other benefits, such as local control over the resource and a reduction of the required capacity (and costs) of future Authority imported water facilities. However, this course of action could cost considerably more than the alternative: purchasing

imported water from MWD. Moreover, problems could arise with locating some of the facilities that would be required for a maximum local supply effort, such as a large-scale seawater desalination plant.

The need to participate in state and federal actions that affect Authority imported water supplies has grown in importance. State and federal legislative and regulatory activities have increased both in frequency and scope in recent years. Examples of this activity include setting water quality standards for the Sacramento/San Joaquin Delta, which is the source of State Water Project supplies, and proposals to create habitat for endangered species along the Colorado River, which could affect the yield of the Colorado River Aqueduct. Close attention must also be paid to the fiscal, water management, and facility policies of MWD.

As future demand increases, the Authority will need to provide sufficient facilities to convey, store, and treat water. The facilities goal is incorporated in the Authority's Capital Improvement Program, which addresses these needs through specific projects. As a member agency of MWD, the Authority will also work to ensure that the San Diego region's facilities needs are adequately addressed by MWD's current and future policies and programs.

Water Supply Management Programs. The Authority participates in three MWD supply management programs that assist local supply development and reduce seasonal peaking of imported water. The Local Projects Program (LPP) provides financial support to develop reclaimed water projects that reduce the demand for imported water. **Table 6-1** shows existing and planned Authority projects for this program. The current level of LPP support is $154/acre-foot of reclaimed water produced.

The Groundwater Recovery Program (GRP) is a financial assistance program that was designed to encourage the cleanup and use of contaminated and brackish groundwater basins. MWD currently pays up to $250/acre-foot for these groundwater projects. Only one project in the Authority's service area is participating in this program, although other projects are planned. The participating project is a brackish water desalter in Oceanside, which began operating in 1994 and will produce 2,000 acre-feet per year.

MWD is restructuring its financial incentive programs by combining the LPP and the GRP into a single program called the Local Resources Program (LRP). The LRP would increase funding for reclamation projects from the current $154 per acre-foot to as much as $250 per acre-foot.

PROJECT	Ultimate Yield	1993-94 Deliveries	Total Through 1993-94
Encina Basin, Phase 1	2,050	848	1,760
Encina	165	123	262
Escondido	2,800	-	-
Fallbrook Sanitary District	1,200	143	927
North City	17,500	-	-
Oceanside	300	26	58
Otay Phase 1	1,500	749	2,100
Rancho Santa Fe	220	-	-
San Pasqual	1,100	-	47
Santa Maria	1,600	-	-
Shadowridge	375	294	804
TOTAL YIELD	28,810	2,183	5,958

Table 6-1 Local Projects Program

Groundwater projects would continue to receive up to $250 per acre-foot.

The Authority also participates in MWD's Seasonal Storage Service Program, which provides a discounted rate for water purchased in the winter and used during the summer, to alleviate summer peaking. Typically, Authority member agencies purchase a total of 40,000 to 60,000 acre-feet of water each year during the Seasonal Storage Service period of October through April. In 1993-94 Authority member agencies purchased 61,552 acre-feet of Seasonal Storage Service water.

Demand Management. As discussed in Section 3 of this Plan, the Authority has taken an aggressive lead in promoting water conservation, using programs that provide permanent water savings without affecting lifestyles or the economy. Future policies will look toward implementing additional water-saving measures.

Conservation is viewed in a similar light as local water development, because each unit of water conserved frees up a unit for other uses. Conservation has also proven to be very cost-effective, and like local water projects, reduces the costs of purchasing, transporting, and storing imported water supplies.

One of the consequences of implementing new conservation programs is a concept known as "demand hardening," which is the diminished ability or willingness of customers to reduce demand during a shortage. This occurs because every incremental addition to conservation causes total water use to approach a minimum limit,

the demand which is truly essential and cannot be further reduced without causing economic harm. The significance of this is that during future water shortages, the room for conserving non-essential water supplies will have shrunk, and customers cannot reduce demand further without suffering hardship.

For this reason, the 20-percent conservation effort required and met in 1992 will be much tougher to achieve 15 years from now. In fact, the Authority considers a 12 percent conservation requirement in 2010 to be the equivalent of a 20-percent effort today, when considering the effect of conservation measures being implemented.

Projected Resource Development. The Authority's resource development options include deciding the desirable level of local supply development, within the limitations of project feasibility, and determining the amounts of transfer water that may be available from other areas for dry-year supplies. Local supplies available to the Authority include reclamation, groundwater recovery, and seawater desalination. In addition, the Authority will continue to make demand management a high-level priority. **Table 6-2** shows the water resources that the Authority projects will be developed in the future. Transfers are projected for dry years only.

Resource	1995	2000	2005	2010
Conservation	21,000	37,000	52,000	70,000
Reclamation	11,000	18,000	36,000	50,000
Groundwater	2,000	5,000	10,000	15,000
Desalination	0	0	0	20,000
Transfers	28,000	57,000	57,000	75,000

Table 6-2 Projected Water Resources Development (AFY)

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SECTION 7

DROUGHT MANAGEMENT

In the recent past, the Authority has largely shared the water shortages of its sole supplier, the Metropolitan Water District (MWD). Because an average of 90 percent of the water used in the San Diego region is imported from MWD, shortages that are imposed by MWD tend to be translated to equivalent shortages by the Authority.

Drought shortages during 1991-92 were ameliorated, however, by the Authority's ability to purchase transfer supplies from a newly established state water bank, and by using water stored in local surface reservoirs. Each of these measures lessened the conservation requirement of Authority member agencies by about five percent. Whereas MWD required a reduction of 31 percent of base-year (1989-90) deliveries, the Authority requested its member agencies to reduce deliveries by 20 percent during that year. Transfers are expected to play an even larger role in lessening future water shortages.

Recent Drought Management Programs. The six-year drought that ended in 1992 resulted in a number of regional programs designed to fairly and efficiently deliver water during times of shortage. Major drought management plans began in 1988, when MWD prepared a Drought Action Plan to reduce regional water demands. The Plan included the optimization of supplies from the State Water Project and the Colorado River Aqueduct, and a number of demand management techniques, including voluntary 10-percent conservation. In 1989, an Authority committee developed a model water supply emergency ordinance that specified appropriate responses to various levels of supply. The ordinanace was also used for drafting individual member agency ordinances.

MWD adopted a revised Drought Action Plan in 1990 that intensified both supply and demand management. While maintaining its 10 percent voluntary conservation goal, MWD instituted a conservation incentive program that paid $100 per acre-foot to any member agency that reduced demand to less than 95 percent of what was used during the same period in 1989. Also beginning in 1990, Authority water deliveries from MWD began to be reduced under an MWD program called the Incremental Interruption and Conservation Plan (IICP).

The IICP had several stages of delivery reductions, which were determined largely by the availability of imported supplies from the State Water Project and local supplies from MWD's member agencies. The program had six stages of delivery reduction targets, ranging from Stage 1, voluntary conservation of 10 percent, to Stage 6, which reduced non-firm deliveries by 60 percent, and firm deliveries by 30 percent. The percentage reductions used in each stage were based on deliveries made in 1989-90, adjusted for growth, loss of local supplies, conservation, and reclamation. The

IICP featured financial penalties, or disincentives, for agencies that failed to reduce deliveries to the appropriate level. For a brief time, MWD also offered financial incentives to those agencies that conserved in excess of the stage target. A chronology of the IICP and delivery reduction targets is given in **Table 7-1**.

MWD and 11 other urban and agricultural water districts participated in a State Drought Emergency Water Bank, beginning in 1991. The water for the bank was obtained by fallowing or idling farmland in northern California, using groundwater instead of surface water, and transferring surplus surface waters from local reservoirs to the bank. During the 1991-92 fiscal year, the Authority purchased more than 21,000 acre-feet from this bank. This water was critical to alleviating the severity of the local drought shortage

Authority requests for conservation from its member agencies essentially mirrored each IICP stage. In December 1990 MWD initiated IICP Stage 1 and the Authority requested its member agencies to reduce overall water consumption by 10 percent; in February 1991 MWD went to Stage 3, and the Authority requested 15 percent conservation; in March 1991 MWD went to Stage 5 and the Authority requested 31 percent conservation. Later, the Authority purchased state water bank supplies and used local water to reduce its conservation target to 20 percent. This lasted until heavy rainfall restored supplies for the entire state in March 1992.

To achieve the conservation targets through this period of drought, the Authority and its member agencies launched aggressive short- and long-term water conservation campaigns.

In March 1991, the Authority enacted Ordinance 91-1, "Declaring the Existence of a Water Shortage Emergency Condition and Establishing Procedures to Preserve and Allocate Available Water Supplies." This ordinance provided direction for securing and managing water supplies during times of drought, making delivery allocations to member agenices, conservation programs to achieve water savings, and financial surcharges for exceeding allocations.

Current MWD Drought Management. In response to the dry winter of 1994-95, MWD established the 1995 Drought Management Plan. This plan, which was designed as a set of operating procedures for calendar year 1995, sought to minimize impacts to the retail

Table 7-1 IICP Implementation, 1990-1992

Date of Implementation	Stage	Percent of Firm/Nonfirm Reduction
December 1, 1990	1	10 (Voluntary)
February 1, 1991	3	10/30
March 1, 1991	5	20/50
March 1, 1992	3	10/30
April 1, 1992	1	10 (Voluntary)
November 8, 1994	None	N/A

customer. The principles of this plan, which are also supported by the Authority, are given by MWD as follows:

- Avoid mandatory stages of the IICP to the extent practicable.
- Use water management programs in a coordinated and efficient manner.
- Operate MWD's system to capture and store excess water in groundwater and surface storage.
- Encourage regional storage during periods of excess supply and encourage use of this storage during periods of drought.
- Use equitable means to conserve and use alternative supplies.
- Adopt measures that will balance costs and inconvenience to customers.
- Avoid financial hardship to MWD and its member agencies.
- Use cost-effective transfer programs.
- Use public information to encourage efficient water use, and to educate the public on water supply and reliability issues.
- Recognize the need to minimize the impacts of water shortage on the region's economy.
- Reward conservation efforts through water allocation methodology and penalize inefficient water practices.

MWD modified its IICP program for 1995, and planned to use implementation of this program only as a final resort during a water shortage. Notable changes to the program included the use of a three-year average base period (currently 1989-92), revised conservation stages, and a target marketing system for marketing unused allocations between MWD member agencies. Current IICP stages, percentage reductions, and disincentives for use over target levels are given in **Table 7-2**. The overall reduction is for all MWD member agencies as a whole, not for the Authority.

Current Authority Drought Management. Since 1991, the Authority's Ordinance 91-1 has been through a number of revisions and amendments. The latest version is Ordinance 94-3, "Ordinance of the San Diego County Water Authority Establishing Contingency Plans, Rules, Regulations, and Restrictions, so That Available Water Supplies are Allocated Among Member Agencies for the Greatest Public Interest and Benefit." A copy of this ordinance, which was adopted by the Authority board in December 1994, is included in this Plan

Table 7-2 Features of 1995 IICP

Stage	Reduction in Agricultural Deliveries (%)	Reduction of Firm Deliveries (%)	Overall Reduction (%)	Disincentive ($/AF)
1	30	5	6	$134
2	30	10	11	$168
3	40	15	16	$302
4	50	20	22	$419
5	75	25	28	$553
6	90	30	33	$670

as Appendix B. A table of water conservation measures that are recommended by this ordinance to achieve water savings is also included in Appendix B. This table provides a number of conservation scenarios, including short-term water system failures, in which no water would be delivered by the Authority. This situation could exist if the region were subjected to an earthquake that severed Authority or MWD pipelines.

Ordinance 94-3 uses the following principles to secure and manage water supplies during a drought:

- Minimize shortages by using Authority-owned storage and securing additional supplies.
- Increase deliveries from MWD through target marketing provisions of the IICP.
- Negotiate with member agencies for the use of locally stored water.
- Allocate available MWD supplies using IICP methodology and reduction percentages for firm and agricultural supplies.
- Recommend conservation programs and techniques to member agencies.
- Monitor member agencies deliveries and use.
- Share MWD disincentive surcharges for using excess water.

The Authority is somewhat limited in the range of supply options that are available to cope with drought shortages. Currently, the Authority neither owns nor operates any surface reservoir or groundwater facilities, reclamation plants, or desalination plants. To supplement normal deliveries from MWD, the Authority may use water it stores locally (up to 40,000 acre-feet), purchase supplies from the state water bank, increase its MWD allocation through MWD's target marketing system, or purchase water transfers independently of MWD. The Authority is also reviewing opportunities to store water in the groundwater basins of other MWD member agencies, a supply that would be used only in times of drought.

Revenue Impacts of Drought. The Authority receives 53 percent of its revenue from water sales. If these revenues are less than required to meet the Authority's financial obligations, a rate stabilization fund is utilized. If these monies are not sufficient, revenue enhancement options would be reviewed and appropriate responses implemented.

In the event of a water emergency, an ordinance similar to Ordinance 94-3 would be activated to respond to the level of shortage. At that time drought response stage actions would go into effect, and the Authority would be operating with reduced water sales. The amount of decreased revenue would depend upon the response stage under which the Authority would operate.

SAN DIEGO COUNTY WATER AUTHORITY
1995 URBAN WATER MANAGEMENT PLAN

APPENDIX A

ANNUAL REPORTS TO THE URBAN WATER CONSERVATION COUNCIL

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WATER POLICY COMMITTEE
AGENDA ITEM NO. I-1

San Diego County Water Authority
A Public Agency
3211 Fifth Avenue • San Diego, California 92103-5718
(619) 682-4100 FAX (619) 297-0511

October 6, 1994

TO: Board of Directors

VIA: Water Policy Committee

FROM: Lester A. Snow, General Manager

RE: Annual Report on Progress in Implementing the Best Management Practices (BMPs) for Submission to the California Urban Water Conservation Council (Action)

SUMMARY

At its September 1993 meeting, the Board approved the Authority's Annual Report on the Implementation of the Best Management Practices (BMP) for submittal to the California Urban Water Conservation Council (CUWCC) for fiscal year (FY) 1992-93. The attached FY 1993-94 BMP Annual Report confirms the Authority's continued commitment to support first and second year BMP activities, as well as its active participation in the implementation of third year BMP measures.

FISCAL IMPACT/STRATEGIC PLAN

There is no fiscal impact with this action. This item is consistent with the Authority's Strategic Plan; Section VIII, Water Policy 2, Long Term Conservation and Section IX, Part C, Paragraph 2, Conservation.

RECOMMENDATION

It is recommended that the Board approve the attached Annual Report on Implementation of the BMPs for submittal to the CUWCC.

DETAILED REPORT

On December 11, 1991, the Authority, along with over 120 other water agencies, public interest groups and other interested organizations, participated in the signing of the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). The MOU not only described the urban water conservation activities, or BMPs, expected to be implemented by the signatories, it also included dates of completion for the listed BMPs. In an effort to determine the level of progress each signatory has made

MEMBER AGENCIES

CITIES
• Del Mar • Escondido • National City
• Oceanside • Poway • San Diego

COUNTY
• San Diego
• [illegible]

IRRIGATION DISTRICTS
• Santa Fe • South Bay
• Vista

PUBLIC UTILITY DISTRICT
• Fallbrook

WATER DISTRICTS
• Otay
• San Dieguito
• [illegible]

FEDERAL AGENCY
• Pendleton Military Reservation

MUNICIPAL WATER DISTRICTS
• Carlsbad
• Olivenhain
• Rancho

PRINTED ON RECYCLED PAPER

toward implementing the BMP, standardized progress reports are submitted annually to the CUWCC, which is comprised of MOU signatories. The reports cover time periods consistent with the Authority's fiscal year. This third year report, to be submitted by the Authority to the CUWCC, will cover the reporting period from July 1, 1993 to June 30, 1994. The deadline for submitting third year reporting activities is October 31, 1994.

As a result of the Authority's aggressive implementations of first, second, and third year water conservation BMPs, the cumulative water savings for FY 93-94 was nearly 11,500 acre feet. This amount of water savings is comparable to the annual us of the City of Poway.

In addition to realizing substantial water savings via BMP implementation, the consensus achieved by the CUWCC (whose membership is composed of representatives is the public, private, and environmental fields) to support and implement the BMPs, has proved to be a positive and unifying force.

Additionally, as evidenced at the State Water Resources Control Board Workshop held on July 7, 1994, the implementation of the BMPs continues to be strongly supported by the Board's members.

Prepared by: _____
Maria G. Mariscal, Water Resource Associate

Reviewed by: _____
Charles N. Rhodes, Ass't General Manager, Resources

Approved by: _____
Lester A. Snow, General Manager

Attachment

I:\BMP.rep

CALIFORNIA URBAN WATER CONSERVATION COUNCIL
BEST MANAGEMENT PRACTICES
WHOLESALE WATER AGENCY ANNUAL REPORT

REPORT PERIOD JULY 1, 1993 TO JUNE 30, 1994
SUBMITTAL DATE: OCTOBER 31, 1994

RETURN COMPLETED REPORT TO:

JE NAE BARTELS
CUWCC
455 CAPITOL MALL SUITE 705
SACRAMENTO, CA 95814-4408

AGENCY AND SERVICE AREA INFORMATION

AGENCY NAME San Diego County Water Authority

ADDRESS 3211 Fifth Avenue

CITY, STATE ZIP San Diego, CA 92103

NAME OF CONSERVATION COORDINATOR Bill Jacoby

PHONE (619) 682-4156 FAX (619) 574-1286

NAME OF PERSON PREPARING THIS REPORT Maria Mariscal

PHONE (619) 682-4157 FAX (619) 574-1286

YEAR AGENCY SIGNED THE MOU 1991 DATE OF THIS REPORT 9/29/94

DOES THIS WHOLESALE AGENCY ALSO SELL DIRECTLY TO END USER? YES ____ NO X

IF "YES", HAS THIS AGENCY COMPLETED RETAIL AGENCY ANNUAL REPORT? YES ____ NO ____

THIS AGENCY IS A: MUNICIPALITY ____ SPECIAL DISTRICT: X INVESTOR OWNED ____

UTILITY SERVICES PROVIDED BY THIS AGENCY INCLUDE:

SEWER ____ ELECTRICITY ____ GAS ____ OTHER ____

TOTAL EXPENDITURES AND PROPOSED BUDGET			
WATER UTILITY	PRIOR YEAR	REPORT YEAR	FOLLOWING YEAR
OPERATIONS & MAINTENANCE	$ 10,699,000	$ 11,477,000	$ 13,319,000
CAPITAL	$ 148,831,000	$ 36,767,000	$ 72,570,000
CONSERVATION	$ 1,211,000	$ 1,676,000	$ 1,800,000
TOTAL	$ 160,741,000	$ 49,920,000	$ 87,689,000

CUWCC WHOLESALE W ' TER AGENCY ANNUAL REP^'.T

Please list retail agencies that purchase water from this agency:

WATER PURCHASERS				
SIGNED MOU	NAME OF AGENCY	RETAILER or WHOLESALER	ACRE FEET SUPPLIED DURING REPORT YEAR	
	Carlsbad M.W.D.	Retailer	14,963	AF
	Del Mar, City Of	Retailer	1,352	AF
X	Escondido, City Of	Retailer	15,400	AF
	Fallbrook P.U.D.	Retailer	11,719	AF
X	Helix W.D.	Retailer	23,067	AF
X	National City	Retailer	770	AF
X	Oceanside, City Of	Retailer	25,791	AF
X	Olivenhain M.W.D.	Retailer	12,436	AF
X	Otay W.D.	Retailer	21,177	AF
X	Padre Dam M.W.D.	Retailer	18,641	AF
N/A	Pendleton Military Reservation	Military	66	AF
	Poway, City Of	Retailer	11,546	AF
	Rainbow M.W.D.	Retailer	22,289	AF
X	Ramona M.W.D.	Retailer	6,977	AF
X	Rincon Del Diablo M.W.D.	Retailer	6,166	AF
X	San Diego, City Of	Retailer	139,008	AF
X	San Dieguito W.D.	Retailer	3,521	AF
X	Santa Fe I.D.	Retailer	5,306	AF
X	South Bay I.D.	Retailer	608	AF
X	Vallecitos W.D.	Retailer	12,096	AF
X	Valley Center M.W.D.	Retailer	33,799	AF
X	Vista	Retailer	5,426	AF
	Yuima M.W.D.	Retailer	612	AF
		TOTAL	392,733	AF

Continue on separate sheet if needed

WATER REUSE SURVEY

HAS THIS WHOLESALE AGENCY PREPARED A FEASIBILITY STUDY ON WATER RECLAMATION?

YES X NO ____

YEAR STUDY COMPLETED 1987

ANNUAL RECLAMATION SUMMARY		
CURRENT AMOUNT OF WATER REUSE	10,000	AF
TOTAL POTENTIAL USES IDENTIFIED	over 100,000	AF
PROJECTED REUSE OF RECYCLED WATER, 2000	18,000	AF
PROJECTED REUSE OF RECYCLED WATER 2010	50,000	AF

If no reuse is planned, please explain why on a separate sheet.

AGENCYWATER FACILITIES CONSERVATION MEASURES

WATER CONSERVATION ACTIONS PERFORMED BY THIS AGENCY WITHINTHE WATER UTILITY FACILITIES AND OPERATIONS	
ACTION	✓
LOW FLOW SHOWERHEADS INSTALLED	X
AERATORS INSTALLED ON SINKS	X
ULTRA LOW FLOW TOILETS INSTALLED (1)	X
WATER EFFICIENT LANDSCAPING AT FACILITIES	X
AUTOMATIC SHUT OFF NOZZLES ON HOSES	X
IRRIGATION CONTROLLED FOR EFFICIENT USE	X
LEAKS DETECTED AND REPAIRED	X
CLEANING OF APPRATUS AND VEHICLES WITH MINIMUM WATER USE	X
EMPLOYEE INFORMATION PROGRAM	X
WATER EFFICIENT HEATING AND COOLING SYSTEM	X
FOUNTAINS CONVERTED TO RECIRCULATING	N/A
OTHER (Specify)	

(1) No wall-hung, gravity-type, 1.6 ULFT models available at this time. Once these toilet models become available in this market, retrofits will take place for the remaining 3.5 gpf toilets.

CUWCC WHOLESALE 'ATER AGENCY ANNUAL REP(T

PLEASE CHECK THIS AGENCY'S EFFORTS ON BEHALF OF THE BMP'S DURING THIS REPORT YEAR.

IMPLEMENTATION OR SUPPORT OF BMP'S 1993/94								
	PROVIDE							
BEST MANAGEMENT PRACTICE	PROGRAMS	MATERIALS	MONETARY SUPPORT	OTHER	EXEMPT*	EXCEPTION*	EXPENDITURES	NUMBER COMPLETED
1. Interior and Exterior Audits	X	X	X				$ 30,000	611
2. Plumbing Retrofit	X	X	X				(1)	(1)
3. System Water Audits (Authority)	X		X				Ongoing maintenance and personnel costs	Ongoing Program
4. Metering and Commodity Rates	X	X					Ongoing maintanence and personnel costs	
5. Landscape Water Audits	X	X	X				$ 168,250	178
6. Non-Residential Landscape	X	X	X				(2)	(2)
7. Public Information	X	X	X				$ 1,766,662	Ongoing Program
8. School Education	X	X	X				$ 282,045	(3)
9. Commercial and Industrial Audits	PROGRAM SCHEDULED TO BEGIN FISCAL YEAR 94-95							
10. New Commercial/Industrial Audits	X		X				$ 10,000	Program currently in development
11. Conservation Pricing - Water	X	X					N/A	
12. Residential Landscape	X	X	X				$ 24,000	(4)
13. Water Waste Prohibition		X					Ongoing Administrative Support	
14. Conservation Coordinator (s)			X				$ 336,000	
15. Financial Incentives	X	X	X				N/A	N/A
16. Toilet Replacement	X	X	X				$ 942,651	43,292 (5)

* A check in this box requires an Exemption\Exception Form to be filed.

(1) Complete - over 500,000 kits distributed in previous years
(2) Cooperated with county and local cities in implementation
(3) 83,499 students contacted directly, 28,841 contacted indirectly
(4) Provided residential landscape classes
(5) $ 592,635 Rebate program, $ 350,016 Community Based Organizations

EXEMPTION: DURING REPORT YEAR 1993-94 THIS AGENCY DID NOT FULFILL THE REQUIREMENTS OF

BMP_____

AGENCY NAME_____

DIRECTIONS:

PLEASE USE THIS AS A COVER SHEET FOR EACH BMP THAT REQUIRES AN EXEMPTION

ATTACH EXPLANATION OF WHY AGENCY HAS EXEMPTED ITSELF FROM THIS BMP.

ALL EXEMPTIONS MUST PROVIDE A COST BENEFIT ANALYSIS AS AGREED UPON IN THE MOU. (EXHIBIT 3 ATTACHED)

EXCEPTION: FOR REPORT YEAR _____, THIS AGENCY IMPLEMENTED **BMP**_____ IN A MANNER DIFFERENT THAN THE DEFINITION IN THE MOU.

AGENCY NAME_____

PLEASE USE THIS AS A COVER SHEET FOR EACH BMP THAT REQUIRES AN EXCEPTION.

ATTACH EXPLANATION OF HOW AGENCY IMPLEMENTS THIS BMP DIFFERENTLY, AND INCLUDE JUSTIFICATION FOR THIS DIFFERENCE TO DEMONSTRATE THAT THIS METHOD IS "AS LEAST AS GOOD AS" THE REQUIREMENT IN THE BMP.

San Diego County Water Authority
A Public Agency
3211 Fifth Avenue • San Diego, California 92103-5718
(619) 297-3218 FAX (619) 297-0511

September 2, 1993

TO: Board of Directors

VIA: Water Policy Committee

FROM: Lester A. Snow, General Manager

RE: Approve Annual Report on Progress in Implementing BMPs for Submission to the California Urban Water Conservation Council (Action)

SUMMARY

At its August 1991 meeting, the Board approved the signing of the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). During the September 1992 meeting, the Board approved the Authority's Fiscal Year 1992 Annual Report on the implementation of first year Best Management Practices (BMP) for submittal to the California Urban Water Conservation Council (CUWCC). The attached BMP Annual Report demonstrates that the Authority has now also completed all required second year BMP activities, and is well under way in implementing several third year BMP measures.

FISCAL IMPACT/STRATEGIC PLAN

There is no fiscal impact with this action. This item is consistent with the Authority's Strategic Plan; Section VIII, Water Policy 2, Long Term Conservation and Section IX, Part C, Paragraph 2, Conservation.

RECOMMENDATION

It is recommended that the Board approve the attached Annual Report on Implementation of the BMPs for submittal to the CUWCC.

DETAILED REPORT

On December 11, 1991, the Authority, along with over 120 other water agencies, public interest groups and other interested organizations, participated in an MOU signing ceremony held on the steps of the state capitol. The MOU not only described the urban

MEMBER AGENCIES

CITIES
• Del Mar • Escondido • National City
• Oceanside • Poway • San Diego

COUNTY
• San Diego
(ex-officio)

IRRIGATION DISTRICTS
• Santa Fe • South Bay

WATER DISTRICTS
• Helix • Otay
• San Dieguito

COUNTY WATER DISTRICT
• Olivenhain

PUBLIC UTILITY DISTRICT
• Fallbrook

FEDERAL AGENCY
• Pendleton Military Reservation

MUNICIPAL WATER DISTRICTS
• Sweetwater • Rainbow
• Carlsbad • Ramona
• Olivenhain • Rincon del Diablo
• Padre Dam • Vista
• Yuima

PRINTED ON RECYCLED PAPER

water conservation activities, or BMPs, expected to be implemented by the signatories, it also included dates of completion for the listed BMPs. In an effort to determine the level of progress each signatory has made toward implementing the BMPs, standardized progress reports are submitted annually to the CUWCC, which is comprised of MOU signatories. The reports cover time periods consistent with the Authority's fiscal year. This second report, to be submitted by the Authority to the CUWCC, will cover the reporting period from July 1, 1992 to June 30, 1993. The deadline for submitting second year reporting activities is October 1, 1993.

As previously stated and reflected on the attached Best Management Practices Annual Report, the Authority has implemented all first and second year BMPs. The Authority is also aggressively implementing third year BMPs.

It is the intention of the CUWCC to promote continuing consensus concerning urban water conservation, among the various interest groups competing for the state's limited water resources. In fulfilling BMP program obligations this year, as in the year before, the Authority, along with many of its member agencies, will play an important role in assuring the success of this consensus process.

Prepared by: _____
Maria G. Mariscal, Water Resource Assistant

Reviewed by: _____
Charles N. Rhodes, Ass't General Manager, Resources

Approved by: _____
Lester A. Snow, General Manager

MGM/s
Attachment

I:bmp.rep.

BEST MANAGEMENT PRACTICES WHOLESALER ANNUAL REPORT

Report Period: July 1, 1992 to June 30, 1993
(Annual data in this report should be for the year specified.)

This report compiles the information of BMP implementation for wholesale agencies only. If your agency serves both wholesale and retail, both reports need to be completed.

Wholesale Agency and Service Area Information

Agency Name SAN DIEGO COUNTY WATER AUTHORITY

Address 3211 FIFTH AVENUE

SAN DIEGO CA 92103

Name of Conservation Coordinator BILL JACOBY

Phone (619) 297-3399 EXT. 234

Date of this Report August 26, 1993

Does this agency supply retail? No
Has this agency completed the retail annual report? No
Do any agencies this agency supplies also wholesale? Yes

SUPPLY

Specify sources of supply into your system and quantities delivered during the year covered by this report.

Sources	Acre-feet supplied
Treated	163,171.54
Untreated	292,782.36
TOTAL	455,953.90
Reclaimed	N/A
M&I	368,814.20
Agriculture	87,139.70
TOTAL	455,953.90

Estimated residential population of service area 2,520,763

AGENCY EXPENDITURES AND RATE STRUCTURE FOR REPORTING YEAR

	Prior Year	Report Year	Next Year
Capital Expenditures	124,769,174	141,389,422	180,967,484
O & M Expenditures	3,039,084	3,077,924	3,291,306
TOTAL	127,808,258	144,467,346	184,258,790
Conservation Expenditures	1,602,096	1,210,703	1,419,050
Public Information	Unavailable	219,840	275,528

RATE STRUCTURE

Please attach a description of your rate structure for all types of delivered water.

SEE ATTACHMENT A

OPTIONAL: Describe and attach any rationing program implemented in reporting year and results.

SEE ATTACHMENT B

BMP IMPLEMENTATION

In many circumstances, a wholesale agency has limited abilities to influence BMP implementation in its service area. If applicable, please describe these limitations if your agency has been unable to implement a particular BMP.

For each BMP (attached), describe what your agency has done to implement the measures and/or any programs that you have in place that supports your retail agencies.

Please attach a description of any local support programs and/or incentive programs with proposed/approved budget.

OPTIONAL: Describe programs that are being analyzed for implementation methodology/effectiveness and savings and any results.

Has your agency prepared a feasibility study on water reclamation? Yes (SEE BELOW)

Has your agency informed all relevant land planning agencies of the impacts that planning decisions involving projected growth have upon the reliability of the water supplies for your service area? Yes

The Authority also has an ongoing program to provide its member agencies with financial and technical assistance for water reclamation projects.

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. YEAR 1.

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. YEAR 1.

c. PLUMBING RETROFIT. YEAR 2.

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.

ENFORCEMENT: Agency took actions to enforce or publicize fixture standards. Yes

On a separate sheet, please list city councils, boards of supervisors, planning departments, building departments, developers, plumbing suppliers, and any other groups contacted to publicize water conserving fixture standards, with a notation on the method of contact (letter, phone call, speech, etc.)

SUPPORT: Agency contacted legislators in support of toilet legislation. Yes

On a separate sheet, list legislators contacted in support of legislation prohibiting sale of toilets using more than 1.6 gallons per flush, specify method of contact, and if you wish, attach copies of any letters. The Authority sponsored SB 1224 and was the lead agency in insuring the passage of this bill through the legislature. The Authority also played a key role in securing the Governor's approval on the legislation.

PLUMBING RETROFIT:

Please indicate if your agency implements this BMP differently from example in MOU No. If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No. If applicable, enclose substantiated findings to support exemption.

Summary of retrofit program:

housing units	SF	MF
1. Total ~~households~~ in service area:	570,696	363,272
2. Pre-1980 households in service area:	390,744	257,202
3. Pre-1980 households retrofitted before BMP implementation:	352,144	186,176
4. Target households for retrofit, total (Line 2 - Line 3):	38,600	71,026
5. Annual target of households to be retrofitted (Line 4 ÷ 9 years):	4,289	7,892
6. Households retrofitted this year:	2,058	686

(Note: the "annual target of households to be retrofitted" shows the number of retrofits your agency should accomplish each year in order to meet your commitment by the end of the MOU term.)

Check devices used and installation methods:

Devices Installation Methods	A*	B*	C*	D*
Low Flow Showerheads		3,842		
Faucet Aerators				
Toilet Dams				
Toilet Bags				
Dye Tablets				
Other (specify) _____				
Other (specify) _____				

*A = Installed by agency staff.
*B = Installed by contractor.
*C = Resident asked to install, agency followup installation offer.
*D = Other installation method (please describe on separate sheet).

You may attach any program description, brochures, etc.

3. DISTRIBUTION SYSTEM WATER AUDITS, LEAK DETECTION AND REPAIR. AUDIT, YEAR 1; DETECTION AND REPAIR YEAR 2.

Implementation methods shall be at least as effective as at least once every three years completing a water audit of the water supplier's distribution system using methodology such as that described in the American Water Works Association's "Manual of Water Supply Practices, Water Audits and Leak Detection;" advising customers whenever it appears possible that leaks exist on the customers' side of the meter; and performing distribution system leak detection and repair whenever the audit reveals that it would be cost effective.

Please indicate if your agency implements this BMP differently from example in MOU Yes. If applicable, enclose written description of substitute program.

SEE ATTACHMENT C

Please indicate if your agency exempts itself from this BMP No. If applicable, enclose substantiated findings to support exemption.

(SEE BELOW)

Date of last complete water audit: N/A

Proposed date of next complete water audit: N/A

% and quantity unaccounted for water:

0.34 % of water into system

1,465.3 acre-feet

Estimate of unmetered uses: N/A acre feet.

Agency has mapped and recorded known leaks and repairs Yes

Check status of agency leak detection program:

have one X

propose one _____

no program _____

Date of last leak survey: N/A

miles of main in system: 230

miles of main surveyed per year: 230

For this reporting year, the Authority also provided program administration and funding assistance to four member agencies participating in the Authority's Distribution System Water Audit Program.

7. PUBLIC INFORMATION. YEAR 1

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.

Please indicate if your agency implements this BMP differently from example in MOU No . If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

Public information expenditures relating to conservation for report year: $ 219,840

Please check the items that your agency has:

Public Information Medium	✓
Paid Advertising	X
Public Service Advertising	X
Bill Inserts or messages	
Previous use shown on bill	
Brochures	X
Lawn watering guides	X
Demonstration gardens	X
Special events	X
Speakers bureau	X
Other (specify) Fair Displays	X
Other (specify)	

You may attach samples of public information materials.

8. SCHOOL EDUCATION. YEAR 1.

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.

Please indicate if your agency implements this BMP differently from example in MOU No . If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

Agency has its own school education program X*

Agency participates in another agency's program N/A

# of students in service area: 500,000

# of teachers in service area: 10,000

Agency program is characterized by:

direct contact with students (assemblies, etc.) X

students reached last year: 129,000

teacher training X

teachers trained last year: 1,077

Grades targeted:

K	1	2	3	4	5	6	7	8	9	10	11	12
X	X	X	X	X	X	X	X	X	X	X	X	X

Check materials used:

own materials X

other materials X

* For this reporting period, the total school education budget was $116,500.

13. WATER WASTE PROHIBITION. YEAR 1.

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, sales of automatic (self-regenerating) water softeners, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and nonrecycling decorative water fountains.

Please indicate if your agency exempts itself from this BMP __Yes__. If applicable, enclose substantiated findings to support exemption.

(SEE BELOW)

Date of passage of water waste ordinance: __N/A__

Check water uses controlled by ordinance: The matrix provided to the member agencies included:

Water Use	✓
Gutter flooding	X
Automatic water softeners	X
Single pass cooling systems	
Nonrecirculating car washes	X
Nonrecirculating laundries	
Nonrecirculating fountains	X
Customer plumbing leaks	X
Midday irrigation	X
Hosing of hard surfaces	X
Water served in restaurants	X
Other (specify) Temporary ban on all outside irrigation	
Other (specify) No refilling of pools, spas, & fountains	

Prohibitions apply during:

shortage__X__

seasonal_____

always__X__

Attach a copy of your ordinance(s). ATTACHMENT D

Wholesale status. The Authority developed a set of water waste guidelines, in the form of a matrix, that member agencies could fully adopt or modify for their particular service area.

14. WATER CONSERVATION COORDINATOR. YEAR 1.

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.

Please indicate if your agency implements this BMP differently from example in MOU No . If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

Date position established: November of 1988

Annual salary range: $ 50,010 -- $ 67,238

Staff person-years dedicated to water conservation this year:

4

4. METERING WITH COMMODITY RATES FOR ALL NEW CONNECTIONS AND RETROFIT OF EXISTING CONNECTIONS. YEAR 2.

Implementation methods shall be requiring meters for all new connections and billing by volume of use; and establishing a program for retrofitting any existing unmetered connections and billing by volume of use; for example, through a requirement that all connections be retrofitted at or within six months of resale of the property or retrofitted by neighborhood.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

This agency has unmetered connections? No

If yes, attach a description of your program for metering new and existing connections.

6. LANDSCAPE WATER CONSERVATION REQUIREMENTS FOR NEW AND EXISTING COMMERCIAL, INDUSTRIAL, INSTITUTIONAL, GOVERNMENTAL, AND MULTI-FAMILY DEVELOPMENTS. YEAR 2.

Implementation methods shall be enacting and implementing landscape water conservation ordinances, or if the supplier does not have 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 pursuant to the "Water Conservation in Landscaping Act" ("Act") (California Government Code §§ 65590 et seq.). The ordinance shall be at least as effective as the Model Water Efficient Landscape Ordinance being developed by the Department of Water Resources. A study of the effectiveness of this BMP will be initiated within two years of the date local agencies must adopt ordinances under the Act.

Please indicate if your agency implements this BMP differently from example in MOU No . If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

Agency that adopts and administers ordinance if other than water supplier: San Diego County & Various cities

Date ordinance adopted: Varies by jurisdiction

Ordinance is identical to one endorsed by California Urban Water Conservation Council Varies by jurisdiction
If not, please attach copy.

If not, is ordinance
water budget approach? Some are

prescriptive approach? Some are

The Authority sponsored a series of workshops for the county, cities, the green industry and local water agencies. The workshops were designed to facilitate the implementation of the Water Conservation Landscaping Act in the Authority's service area. Additionally, Authority staff has served on advisory committees to jurisdictions drafting landscape ordinances.

11. CONSERVATION PRICING. WATER SERVICE, YEAR 2; SEWER SERVICE YEAR 3.

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.

Please indicate if your agency implements this BMP differently from example in MOU __N/A__. If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP __Yes__. If applicable, enclose substantiated findings to support exemption. The Water Authority is a wholesale agency that charges its member agencies based on metered water use.

Check all rate structures that are used in your service area:

Sector	Life line	Flat	Uni-form	Inc. block	Dec. block
Sgl fam res.					
Mult fam res.					
Commercial					
Industrial					
Public agency					
Irrigation					
Reclaimed					
Agricultural					
Other					

Please attach a description of your rate structures.

12. LANDSCAPE WATER CONSERVATION FOR NEW AND EXISTING SINGLE FAMILY HOMES. YEAR 2.

Implementation methods shall be at least as effective as providing guidelines, information and incentives for installation of more efficient landscapes and water saving practices (e.g., encouraging local nurseries to promote sales and use of low water using plants, providing landscape water conservation materials in new home owner packets and water bills, sponsoring demonstration gardens); and enacting and implementing landscape water conservation ordinances or, if the supplier does not have 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 pursuant to the "Water Conservation in Landscaping Act ("Act") (California Government Code §§ 65590 et seq.). The ordinance shall be at least as effective as the Model Water Efficient Landscape Ordinance being developed by the Department of Water Resources.

Please indicate if your agency implements this BMP differently from example in MOU __No__. If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP __No__. If applicable, enclose substantiated findings to support exemption.

Check the programs your agency uses to reach customers who will design or maintain single family home landscapes:

Program	✓
Brochures	X
Mandatory requirements	X[1]
Incentives (specify on separate sheet)	
Nursery plant tagging	
New home information packet	
Demonstration garden	X
Awards	X
Garden or home shows	X
Garden contest	X
Guidelines	
Other (specify)	X[2]
Other (specify)	

1 No jurisdiction - support & cooperation only

2 Sponsored residential xeriscape education classes for customers at the San Diego Zoo & Wildlife Animal Park

16. ULTRA LOW FLUSH TOILET REPLACEMENT. YEAR 2.

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.

Please indicate if your agency implements this BMP differently from example in MOU __No__. If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP __No__. If applicable, enclose substantiated findings to support exemption.

Target water savings from toilet replacement program:

__14,683__ af during term of MOU

Please specify TOTAL toilets replaced by program type. If you have detail on water use sector (single family, multifamily, etc.) please include sector also:

Water Use Sector	Rebates	Replace on Resale	Change of Service	Direct Install	Other Pub. Fac. Incentives
Single Family	11,691				
Multi Family	6,444				
Comm/Indust.	417				
Pub. Agency	0				1,872
TOTAL	18,552				1,872

Rebate amount(s) $__75.00__

Attach a copy of any toilet replacement ordinance. N/A

1. INTERIOR AND EXTERIOR WATER AUDITS AND INCENTIVE PROGRAMS FOR SINGLE FAMILY RESIDENTIAL, MULTI-FAMILY RESIDENTIAL, AND GOVERNMENTAL/INSTITUTIONAL CUSTOMERS. YEAR 3.

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.

Please indicate if your agency implements this BMP differently from example in MOU No . If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption. For single-family customers, the program will be implemented in fiscal year '93-'94. The audit program will progressively target the top 10,20 and 30% highest water users among single family residences.

Program results for report year:

	SF Units	MF Units	Gov/Inst
1. # of connections			
2. Target connections (Line 1 x 20%)			
3. Audits done, last 5 yrs			
4. Annual target ([line 2 - line 3]÷8 yrs)			
5. Audits offered			
6. Audits performed			
7. Cost per audit	$	$	$

(Note: the "annual target" shows the number of audits your agency should accomplish each year in order to meet your commitment by the end of the MOU term.)

Please describe measures included in audits and the method of program delivery. SEE ATTACHMENT F

In 1991, the Authority provided 8 public agencies with funding in the amount $20,000 for the purchase of irrigation hardware. Additionally, 8,500 low-flow showerheads were provided to a variety of public agencies.

5. LARGE LANDSCAPE WATER AUDITS AND INCENTIVES. YEAR 3.

Implementation methods shall be at least as effective as identifying 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 rights-of-way); contacting them directly (by mail and/or telephone); offering landscape audits using methodology such as that described in the Landscape Water Management Handbook prepared for the California Department of Water Resources; and cost-effective incentives sufficient to achieve customer implementation; providing follow-up audits at least once every five years; and providing multi-lingual training and information necessary for implementation.

Please indicate if your agency implements this BMP differently from example in MOU Yes . If applicable, enclose written description of substitute program. We exceed the requirements by auditing sites 2 acres or more.
Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

Program summary: FY '92 132 audit equaling 2882.8 acres

1. Number of 3-acre+ landscapes in service area:	Unknown*
2. Audits completed in last five years:	287
3. Target audits to be completed, total (line 1 - line 2):	Unknown
4. Target audits to complete this year (line 3 ÷ 8 years):	Unknown
5. Audits offered this year:	Unknown
6. Audits conducted this year:	155
7. Acres audited this year:	2116.6

(Note: the "target audits to complete this year" shows the number of audits your agency should accomplish each year in order to meet your commitment by the end of the MOU term.)

Method of contact is letter X ; phone call X ; visit ___; other X . Advertised in local landscape publications.

Agency offers incentives to participants No ; if applicable please enclose description.

Auditors on staff _____ or contract? X

Irrigator training offered in these foreign languages:
Spanish X , Other (specify) _____

You may attach program descriptions and samples of public information materials.

* Because the Authority's service area is so large, and we are a wholesale agency, it has not been possible to make this calculation.

9. COMMERCIAL AND INDUSTRIAL WATER CONSERVATION. YEAR 3.

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.

Please indicate if your agency implements this BMP differently from example in MOU No . If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP No . If applicable, enclose substantiated findings to support exemption.

Summary of Program: The Authority is preparing to implement this program in fiscal year 93-94.

	Commercial	Industrial
1. Number of customers:		
2. Total targeted customers (line 1 x 10%):		
3. Audits done, last 5 yrs:		
4. Target audits, this year ([line 2 - line 3] ÷ 8 years):		
5. Audits offered this year:		
6. Audits conducted this year:		

(Note: the "target audits, this year" shows the number of audits your agency should accomplish each year in order to meet your commitment by the end of the MOU term.)

What services besides water delivery do you provide to commercial and industrial customers?

sewer N/A electricity N/A

If neither, check if audit programs are coordinated with wastewater and energy utilities No

Please attach your agency's definitions of commercial and industrial customers. For example, do you count multifamily residential connections as commercial?

The Authority combines commercial & industrial with residential customers. Agriculture is in a separate category.

10. NEW COMMERCIAL AND INDUSTRIAL WATER USE REVIEW. YEAR 3

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.

Please indicate if your agency implements this BMP differently from example in MOU __No__. If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP __No__. If applicable, enclose substantiated findings to support exemption.

Agency has a program to review new commercial and industrial water uses __No__. Not at this time. The Authority is preparing to implement this program in fiscal year 93-94.
Date review procedure established: __N/A__

Reviews completed in last year: __N/A__

Attach a list of actions recommended and rate of implementation.

15. FINANCIAL INCENTIVES. YEAR 3.

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.

Please indicate if your agency implements this BMP differently from example in MOU __No__. If applicable, enclose written description of substitute program.

Please indicate if your agency exempts itself from this BMP __No__. If applicable, enclose substantiated findings to support exemption.

Agency offers financial incentives other than those described in other BMPs __Yes__.

Attach a description of financial incentives offered by your agency.

SEE ATTACHMENT F

sannrep9.who

Att chment A

WATER RATES

THE METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA

Dollars per Acre Foot

FISCAL YEAR	NONINTERRUPTIBLE		INTERRUPTIBLE		SEASONAL STORAGE		RECLAIMED WATER	EMERGENCY	
	Untreated	Treated	Untreated	Treated	Untreated	Treated		Untreated	Treated
85-86	192	224	148	180	N/A	N/A	84	586	618
86-89	197	230	153	186	N/A	N/A	84	591	624
89-90	197	230	153	186	115	135	84	591	624
90-91	197	230	153	186	115	135	84	591	624
4-1-91*			197	230					
91-92	222	261	222	261	130	154	84	666	705
92-93	269	322	**N/A	**N/A	168	203	84/113 ***	807	860
93-94	318	385	**N/A	**N/A	208	253	113	954	1,121

San Diego County Water Authority

Dollars per Acre Foot

92-93	324	384	**N/A	**N/A	223	265	84/113 ***	862	922
93-94	388	455	**N/A	**N/A	278	323	113	1,024	1,191

* 4-1-91 Interruptible differential eliminated by Board action.

** 7-1-92 Interruptible water service eliminated by Board action.

*** Effective 4-01-93.

Rev. 6-15-93

Attachment B

INCREMENTAL INTERRUPTION AND CONSERVATION PLAN

Administrative Procedures Using Base Year 1989-1990

Introduction

The Incremental Interruption and Conservation Plan (IICP) is designed to encourage member public agencies to utilize water held in local groundwater and surface storage reserves and promote consumer water conservation to reduce demands on imported sources during droughts. Under the program, Metropolitan assigns each member public agency a monthly scheduled target quantity of water and an annual discretionary pool based on the total amount of water purchased from Metropolitan in fiscal year 1989-1990. This is referred to as the base year. If the scheduled target quantity is exceeded, agencies must pay a disincentive charge for the amount of water utilized over target quantity plus the applicable service rate. The annual discretionary pool will be managed at the discretion of the General Manager. The program is implemented in stages, each stage progressively reducing the target quantities and discretionary pools for each member public agency. Metropolitan's Board of Directors determines the appropriate stage.

GUIDELINES

SCHEDULED TARGET QUANTITIES

Scheduled target quantities are established for member agencies based upon the amount of water purchased from Metropolitan in the corresponding month of the base year. To determine member agency scheduled targets, member agency deliveries in the base year are categorized into firm service and non-firm service depending upon the service classes taken in the base year (Noninterruptible Service, Interruptible Service and Seasonal Storage Service).

Non-firm Service

- Agricultural
- Seawater Barrier

Firm Service

- All Noninterruptible Service
- Seasonal Storage Service delivered in the winter period of the base year and produced from storage in the summer of the base year.

Once the deliveries have been categorized as firm service or non-firm service, proportional reductions are then applied to each category; non-firm service is reduced by a greater proportion than firm service. The percentage by which each category of service is to be reduced is determined by which stage of the IICP is in effect. The following table specifies the percentages by which firm and non-firm service are reduced in determining monthly target quantities for the member agencies.

Reductions from Base Year

Stage	Reduction in Non-Firm Deliveries	Plus Conservation of Firm Deliveries
I	Voluntary	Goal 10%
II	20%	5%
III	30%	10%
IV	40%	15%
V	50%	20%
VI	90%	30%

The monthly target quantity for the member agency is the arithmetic sum of the proportionally reduced firm and non-firm usage.

DISCRETIONARY POOL

The discretionary pools are established for member agencies based upon deliveries normally made to storage in the base year for:

- Direct Groundwater Replenishment
- In-lieu Groundwater Replenishment
- Long-Term Seasonal Storage
- Reservoir Storage

Water is available from the discretionary pool exclusively for storage in member agency facilities for use by the agency from storage during periods when discretionary pool water is not available. This pool is managed at the discretion of the General Manager and the delivery goal is derived by the stage of the IICP in effect such that discretionary pool deliveries are reduced in the same manner as the non-firm service. A reasonable variance in the annual objective is allowed, and in fact, is likely since deliveries from this pool are used to balance supply versus demand during periods of fluctuations in supply. Discretionary pool water may not be available to all agencies at all times.

ADJUSTMENTS

Adjustments would be made to the scheduled target quantities and the discretionary pool to reflect population growth, changes in local water supplies, conservation and reclamation. The following scenarios qualify for adjustments.

(A) Loss of Local Water Supply - adjustments to the target quantities and the discretionary pool will be recommended if:

1. A well, reclamation plant, aqueduct, reservoir, pipeline fails

2. There is less surface water because of drought.

3. Court order, regulatory order, or negotiated agreement limits the use of local supplies.

4. A decreasing groundwater table where the basin does not readily lend itself to replenishment of imported water and has historically relied solely on the infiltration of natural runoff.

5. No adjustment would be made to account for routine or elective maintenance.

(B) Conservation - adjustments will be recommended if an agency uses less water because of a significant conservation effort that occurred in the base year consisting of:

1. A mandatory water conservation program.

2. A major water management program with demonstrated results.

3. Participation in the Drought Action Plan '90 during the month of June of 1990 where a 5 percent voluntary reduction in demands was rewarded.

4. Municipal and Industrial plumbing retrofits that resulted in verifiable monthly conservation.

(C) Growth and Development - agencies' target quantities and discretionary pool will be adjusted for growth based on:

1. The number of new service connections.

2. A demonstrated change in the mix of service connections toward larger sized connections.

3. The establishment or expansion of a major industrial water user after the base year.

4. State Department of Finance population estimates provided that the member agency service area corresponds to the census tracts used by the state.

(D) Reclamation Water Projects - an agency which operates a reclamation plant with a project cost that is greater then Metropolitan's treated noninterruptible water rate in the base year ($230.00) and clearly replaces a potential use of Metropolitan water and not merely a method of disposal is eligible for an increase in firm service. The increase would be equal to the overall reduction percentage in the applicable stage of IICP, not to exceed 31 percent. However, the adjusted IICP target quantity shall not exceed 90 percent of the base month.

(E) Reallocation - a rescheduling of base-year deliveries of Metropolitan water is acceptable to meet the agency's operational needs. The adjustments would reflect changes in monthly target quantities, but make no change in the annual sum of the targets.

(F) Transfer from Discretionary Pool to Scheduled Quantities - If rescheduling will not meet the needs of the agency, it may request a transfer of base year deliveries from the discretionary pool to the nonfirm scheduled base-year quantities. This transfer will only be approved for in-lieu groundwater replenishment and reservoir storage taken in the base year. Water taken as seasonal storage service or groundwater spreading in the base year cannot be included in the quantity shifted. This shifted water will be reapportioned monthly and is subject to the IICP stage in effect.

To apply for an adjustment, a request with proper documentation should be submitted for approval to Metropolitan. Standardized forms have been developed to assist agencies requesting adjustments. Whenever possible, these forms should be utilized by agencies requesting adjustments.

WATER RATES

The water rate for the scheduled target quantities is the noninterruptible rate at the time of delivery except for short-term seasonal storage. When the General Manager declares seasonal storage service available, any water delivered under this program will be assessed at the seasonal storage rates.

The rate for the discretionary pool is the seasonal storage rate. If the discretionary pool water is transferred to the scheduled target quantity water, the rate will change to the noninterruptible.

DISINCENTIVE CHARGE

A disincentive charge of twice the noninterruptible water rate (currently $444 per acre-foot) is applied to a member agency that does not meet its obligation to maintain a demand below the scheduled target quantity. The under-delivery of discretionary pool water cannot be used to offset an overuse of scheduled targets. The disincentive applies only for Stages II through VI of the IICP and to deliveries from Metropolitan, not total water usage. The overuse penalties do not apply to the discretionary pool.

ACCOUNTING AND RECONCILIATION

Although disincentive charges are levied against an agency in any month in which the agency's water usage exceeds its IICP target, agencies are allowed to offset overuse by extra conservation in other months through an annual reconciliation process. The reconciliation process occurs at the end of each water year (October 1 through September 30) or immediately following the Board's determination that Stage II through Stage VI are no longer in effect, whichever is earlier.

In the reconciliation process, under usage in one month is allowed to offset over usage in another month. Thus, an agency which had utilized more than its target in one month and had paid a disincentive charge for that over usage would be eligible for a refund of the disincentive charge to the extent that water usage in other months was less than the target allocation to that agency. Through the annual reconciliations, disincentive charges remain applicable only to the extent that an agency's usage in the entire year exceeded the sum of the agency's monthly targets for that year. Water used from the discretionary pool is excluded from the reconciliation.

The distinction between deliveries made as part of the discretionary pool and the deliveries chargeable against an agency's monthly allocation is that water from the discretionary pool must be stored for later use. Thus, agencies must certify as to the quantities of water stored for later use during periods when discretionary pool water is available in order to process monthly accountings and potential disincentive charges.

Generally, the seasonal storage certification form will be used to certify water taken under the discretionary pool. An agency that has a contractual agreement with Metropolitan and is required to certify by a different format to avoid any overqualification of seasonal storage or discretionary pool will be governed by the terms of the agreement. Certification procedures are contained in Section 4507 of Metropolitan's Administrative Code.

An agency may choose to designate on the seasonal storage certification form the amount of water stored as shift seasonal storage under the scheduled target quantities and the amount of water stored under the discretionary pool. If an agency does not designate the type of water served, Metropolitan by default will designate the stored water as part of the discretionary pool first and second as part of the

shift water. All water delivered that has not been certified otherwise will be charged at the noninterruptible rate. Certifications are due three business days after the end of the working month in order to be processed in that month's invoices.

In-lieu deliveries to storage under the IICP discretionary pool for example require agencies to account and certify that they have made operational changes necessary for such storage. These accounting and certification processes must take place after the deliveries have been made. The lag time between deliveries and certifications typically is several weeks. Because of this lag it is not possible to immediately determine each agency's performance under the IICP. Thus, a delay in disincentive charges may be required for all agencies. However the annual reconciliation will account for any irregularities.

Example

As an example of how scheduled targets and the discretionary pool are determined, consider a hypothetical agency which utilized 200 acre-feet (AF) in January of the base year and 50 AF of long-term seasonal storage cumulative over the base year. The 200 AF is further broken down to

100 AF of noninterruptible water, 50 acre-feet of agricultural service, and 50 AF of seawater barrier.

In Stage V the agency's scheduled target quantity for January is determined as follows:

100 AF noninterruptible - 20 percent	=	80 AF
+50 AF agricultural - 50 percent	=	25 AF
+50 AF seawater barrier - 50 percent	=	25 AF
equals scheduled January target quantity	=	130 AF

The agency's discretionary pool for the year if at Stage V for the entire period is determined as follows:

50 AF long-term seasonal storage - 50 percent = 25 AF

Therefore, this agency would be allowed to purchase a maximum of 130 AF in January during Stage V under the scheduled target quantities without incurring a disincentive charge. This amount can be increased at the discretion of the General Manager through deliveries made to storage of water in the discretionary pool.

Attachment C

San Diego County Water Authority
Distribution System Water Audit Program

The Authority has an ongoing, distribution system water audit program which includes:

- 24 hour computer monitoring of all pipe systems;
- Weekly scheduled, physical system inspections and patrols for possible leakage and encroachments;
- Monthly paper audits to verify and compare water purchases to actual wholesale and member agency water deliveries.

RESPONSE STAGE ACTIONS

User Type	Stage I	Stage I	Stage II	Stage III	Stage IV	Stage V	Stage VI	Water Emergency
Household and household members	INDOOR Check toilets for leaks and repair. Don't use toilets as ashtrays or waste baskets. If you have an older toilet, install a weighted plastic bottle in toilet tank which does not interfere with flush mechanism. Limit shower time. Install watersaving showerheads. Replace old toilets with ultra-low-flow 1.6 gal./flush toilets. Run only fully loaded dishwashers and washing machines. Keep bottle of water in refrigerator for drinking.	OUTDOOR Water lawns only during morning, evening and nighttime hours. Avoid overwatering. If your lawn springs back when stepped on, it doesn't need water. When lawn watering, deep soak infrequently. Rather than using sprinklers frequently, aerate and dethatch lawns. Aim sprinklers so they water lawn and garden not pavement. Use mulch around trees and plants. Use a broom to clean paved areas, never a hose. Check irrigation/sprinkler system for leaks and repairs. Reset irrigation clocks by season, water once a week in winter, no more than 3 times a week in summer. Turn system off during rainy periods. Install pool/spa covers.	Same as Stage I actions. Defer renovation of existing landscape unless xeriscape principles applied	Same as Stage II plus respond to penalty pricing of retail agency.	Same as Stage III plus water no more than twice per week. Capture shower, sink warm-up water with bucket and use outdoors or to flush toilets.	Same as Stage IV except outside watering with a hand-held hose with positive shutoff or drip irrigation systems only. Eliminate sprinkler use.	Same as V and no outside irrigation except with water reclaimed from indoor use with hand held bucket to effect a 40% cutback.	Short-term system failure. Same as V and no outside irrigation except with water reclaimed from indoor use with hand-held bucket to effect a 40% cutback.

Revised
ORD. 91-6

Attachment D

Authority Droughi asponse Program

R E S P O N S E S T A G E A C T I O N S

User Type	Stage I	Stage I	Stage II	Stage III	Stage IV	Stage V	Stage VI	Water Emergency
Household and household members	INDOOR Shut off faucet while brushing teeth and shaving. If handwashing dishes, use one full basin to rinse rather than running water. Have pre-1991 reverse osmosis water treatment units retro-fitted with an automatic shutoff valve. Call 1-800-992-8375 for referral. If water softeners are self-regenerating, should be a demand initiated regeneration type, or controlled manually. Call 1-800-9WATER5 for more information.	OUTDOOR Wash vehicles with hand-held hose with positive shut off nozzle and bucket only. Avoid mid-day hours. Replace inactively used turf areas with drought-tolerant landscaping.						

Authority Drought Response Program

RESPONSE STAGE ACTIONS

Retail Water Delivery Agencies	Stage I	Stage II	Stage III	Stage IV	Stage V	Stage VI	Water Emergency
	Divide customer classes into minimum categories of .Residential -single family -multi-family .Commercial .Industrial .Agricultural .Institutional Institute inclining block pricing for M & I uses.	Same as I plus employ public information campaign to cut waste using adopted ordinance or suggested user response stage actions.	Same as II plus penalty pricing. With surcharges for exceeding targets of 15% cutback. Actively enforce use ordinances with personnel and flow restrictors for repeat violators.	Same as III but require 20% cutback with surcharge for use beyond allotment.	Same as Stage IV but 30% cutback.	Same as Stage IV but 40% cutback.	Short term system failure. Ban outdoor watering for emergency duration. Recommend minimal indoor uses.
	Adopt mandatory water management or anti-waste ordinances. Establishment of construction use Best Management Practices for construction water.	Same as Stage I with 10% cutback.	Same as Stage II plus cap on construction meters and permits for unmetered service, institute penalty pricing structure for construction water use and require 15% cutback.	Same as Stage III but with 20% cutback.	If available all construction water must be reclaimed or non-potable.	Same as Stage V.	Same as Stage V.
		Reduce the number of new connections allowed by 10% or provide a conservation offset option.	Reduce the number of new connections allowed by 15% or provide a conservation offset option.	Reduce the number of new connections allowed by 20% or provide a conservation offset option.	Reduce the number of new connections allowed by 30% or provide a conservation offset option.	Reduce the number of new connections allowed by 40% or provide a conservation offset option.	No new connections allowed.

RESPONSE S1 GE ACTIONS

User Type	Stage I	Stage II	Stage III	Stage IV	Stage V	Stage VI	Water Emergency
Restaurant and food service	Serve water only upon request. Use brooms to clean outdoor paved areas. Spot clean with water only. Have pre-1991 reverse osmosis water treatment units retro-fitted with automatic shut off valve. Call 1-800-992-8375 for referral. If water softners are self-regenerating, should be a demand initiated regeneration type, or controlled manually. Call 1-800-9WATER5 for more information.	Wash vegetables and prepare foods in tubs of water where possible - no running water. Effect a 10% cutback.	Stage II plus reduce landscape irrigation. Effect a 15% cutback.	Same as Stage III. Limit landscape irrigation to twice a week. Effect a 20% cutback.	Same as Stage I. Effect a 30% cutback.	Same as Stage III. Effect a 40% cutback.	Short-term system failure. Eliminate outdoor irrigation. Use disposable table service.
Car washes	Use water recirculation pumps. Check for leaks in system.	Same as Stage I. Effect a 10% cutback.	Same as Stage I. Effect a 15% cutback.	Same as Stage I. Effect a 20% cutback.	Same as Stage III. Effect a 30% cutback.	Same as Stage III. Effect a 40% cutback.	Terminate operations if so directed.
Hotels and other lodging facilities	Check for plumbing leaks. Start replacement of non-conserving toilets and showerheads. Reduce outside irrigation.	Same as Stage I plus reduce air conditioning system water use. Effect a 10% cutback.	Same as Stage I but reduce consumption by 15% through flow restriction or operational hours limitation.	Same as Stage III plus reduce overall consumption by 20%	Same as Stage III plus reduce overall consumption by 30%	Same as Stage III. Effect a 40% cutback. Post emergency notices in rooms asking limited water use.	Eliminate outdoor irrigation. Post emergency notices in rooms asking limited water use.

Authority Drought Response Program

R E S P O N S E S T A G E A C T I O N S

User Type	Stage I	Stage II	Stage III	Stage IV	Stage V	Stage VI	Water Emergency
Landscape (except residential)	Irrigate only during evening, night and morning hours. Check irrigation systems for leaks, broken parts and sprinkler aim. Repair as necessary. Set irrigation schedules appropriate to season. Call for a landscape audit (728-1332 North County and 442-0559 South County). Conversion of non-functional turf areas to drought-tolerant plants (i.e., those areas not used for activities). Convert shrubs and planter areas to drip irrigation.	Stage I actions plus reduce watering of low use areas. Effect a 10% cutback.	Stage II plus eliminate watering of non-functional turf areas (i.e., areas not used for activities). Effect a 15% cutback.	Stage III plus irrigate no more than twice per week. Effect a 20% cutback.	Eliminate watering of ornamental turf areas. Water only actively used turf area no more than twice per week. Effect a 30% cutback.	Stage V plus irrigate playing fileds only. Effect a 40% cutback.	Short term-system failure. No outdoor watering.

Authority Drought Response Program

RESPONSE STAGE ACTIONS

er Type	Stage I	Stage II	Stage III	Stage IV	Stage V	Stage VI	Water Emergency
Agriculture	Use drip irrigation and micro sprinklers for perennial crops and all nurseries. Check system for malfunctions. Utilize CIMIS Irrigation demand climate information: Call 1-800-339-9954 for daily information or 1-800-336-3023 for weekly data. Request an audit of your irrigation system. North County: (619) 728-1332.	Same as I. Increase surveillance of irrigation system. Effect a 10% cutback.	Same as II, but effect a 15% cutback on normal demands through sustenance watering of less productive perennial plants, pruning and stumping.	Same as III. but effect a 20% cutback.	Same as III, but effect a 30% cutback.	Same as III, but effect a 40% cutback.	Short-term system failure. Temporarily discontinue all irrigation depending upon circumstances of emergency.

San Diego County Water Authority
Single Family Survey Program

Member agencies will be responsible for identifying and notifying the target customers.

An audit will consist of a survey of interior and exterior water uses at a residence. The customer will also be given a packet of educational materials and incentives such as hose-end timers, buckets, coupons and catch cans.

The exterior audit shall consist of:

- meter leak detection test
- soil analysis to determine soil type, water infiltration rate and water retention capacity, root zone depth and thatch build-up
- identify type of grass and suggest aeration, dethatching and mowing height as appropriate
- check irrigation system for coverage, leaks, mismatched, misdirected or broken sprinkler heads
- determine irrigation system uniformity and precipitation rate
- calculate appropriate irrigation schedule and instruct homeowner in use
- check for exterior faucet leaks and advise homeowner
- recommend low-volume irrigation, xeriscape and mulch where appropriate
- recommend pool, spa and hot tub covers where appropriate

The interior audit will be a review of indoor water savings opportunities. This will allow the auditor to concentrate efforts on the exterior of the home where most potential water savings opportunities exist. The meter leak test will indicate if there is a leak in the home. Each in-home water use will be reviewed and the homeowner will be offered low-flow shower heads, dye tablets, toilet dams or bags and faucet aerators where appropriate with instructions on their proper use.

San Diego County Water Authority
Public Institutions Plumbing Retrofit Program

In an effort to reduce local water demands and offer financial assistance to local public agencies interested in replacing their high volume flush toilets for 1.6 gallon per flush ultra-low flush toilets (ULFTs), the San Diego County Water Authority (Authority), in cooperation with local water agencies, developed a Public Institutions Plumbing Retrofit Program.

This program was designed to offer select, public agencies direct funding assistance to purchase Authority-approved, ULFTs for installation in public facility sites. The Authority also provided low-flow showerheads on a per request basis. It was the responsibility of the participating public agency to procure the ULFTs and submit the invoice to the Authority for payment.

As a result of the funding assistance provided by the Authority, a total of 1,872 ULFTs were purchased and installed in public facility sites for the BMP reporting period of July 1, 1992 to June 30, 1993.

WATER POLICY COMMITTEE
AGENDA ITEM NO. I-2

San Diego County Water Authority
A Public Agency
3211 Fifth Avenue • San Diego, California 92103-5718
(619) 297-3218 FAX (619) 297-0511

September 3, 1992

TO: Board of Directors

VIA: Water Policy Committee

FROM: Lester A. Snow, General Manager

RE: Approve the Annual Report on Implementation of the Best Management Practices for Submittal to the California Urban Water Conservation Council (Action)

SUMMARY

At its August 1991 meeting, the Board approved the signing of the Memorandum of Understanding Regarding Urban Water Conservation in California (MOU). To date, the Authority has completed all required first year Best Management Practice (BMP) activities (as evidenced by the attached BMP Annual Report) and is well under way in implementing several second and third year BMP measures.

FISCAL IMPACT/STRATEGIC PLAN

There is no fiscal impact with this action. This item is consistent with the Authority's adopted strategic plan; Strategic Policy 9, Long Term Conservation; and Section IX, Part C, Paragraph 2.

RECOMMENDATION

That the Board approve the attached Annual Report on the Implementation of the BMPs for submittal to the California Urban Water Conservation Council (CUWCC).

DETAILED REPORT

On December 11, 1991, the Authority, along with over 120 other water agencies, public interest groups and other interested organizations, participated in a signing ceremony held on the steps of the state capitol. The MOU not only described the urban water conservation activities, or BMPs, expected to be implemented by the signatories, it also included dates of completion for the listed BMPs. In an effort to determine the level of progress each

MEMBER AGENCIES
CITIES
COUNTY
IRRIGATION DISTRICTS
WATER DISTRICTS
COUNTY WATER DISTRICT
PUBLIC UTILITY DISTRICT
FEDERAL AGENCY
MUNICIPAL WATER DISTRICTS
PRINTED ON RECYCLED PAPER

signatory has made toward implementing the BMPs, standardized progress reports will be submitted annually to the CUWCC, which is comprised of MOU signatories. The deadline for submitting first year reporting activities is October 1, 1992.

As previously stated and reflected on the attached Best Management Practices Annual Report, the Authority has implemented all first year BMPs. The Authority is also aggressively implementing second and third year BMPs.

Implementation of the Urban Water Conservation Best Management Practices is expected to play a vital role in resolving the conservation issue during the Bay/Delta hearings.

Prepared by: _____
Maria G. Mariscal, Water Resource Assistant

Reviewed by: _____
Charles N. Rhodes, Ass't General Manager, Resources

Approved by: _____
Lester A. Snow, General Manager

Attachment

BEST MANAGEMENT PRACTICES ANNUAL REPORT

Report Period: to June 30, 1992

Agency and Service Area Information

Agency Name: SAN DIEGO COUNTY WATER AUTHORITY

Address: 3211 FIFTH AVENUE, SAN DIEGO CA. Zip Code: 92103

Contact Person: BILL JACOBY Phone #: (619) 297-3399 EXT. 234

Date of Submittal: September 10, 1992

Your Agency is a water: __Retailer or X Wholesaler, or __Both? If wholesaler, please attach list of retailers. If Retailer please attach list of wholesalers.

First Year BMPs (These BMPs should be implemented by 8/31/92)

BMP 2a. Enforcement of water conserving plumbing fixture standards including requirement for ultra low flush toilets in all new construction beginning 1/1/92.

List steps your agency has taken (e.g. informing building inspection departments, developers and plumbing supply outlets of the requirements): Sponsored a "Water-Wise Plumbing Seminar" for local plumbers informing them of the new plumbing legislation. Made presentations to plumbing groups, wholesalers and trade unions informing them of the change in the plumbing codes.

BMP 2b. Support for State and Federal legislation prohibiting sale of toilets using more than 1.6 gallons per flush.

List steps your agency has taken (e.g. Board/Council action, letters to legislators): Sponsored legislation (SB 1224) to prohibit the sale of non-1.6 gallon per flush toilets in California.

BMP 3. Distribution system water audits.

Has a water audit been completed? Yes
Date completed: The Authority has an ongoing, distribution system water audit program, which includes 24 hour computer monitoring of all pipe systems; weekly scheduled, physical system inspections and patrols for possible leakage and encroachments; and monthly paper audits to verify and compare water purchases to actual wholesale and member agency water deliveries.

BMP 7. Public Information.

List types of water conservation related public information activities: Public education through the use of print, electronic and outdoor multilingual advertising; good media relations resulting in conservation-related news stories and editorials; development and distribution of conservation-related literature (bill inserts, brochures, fact sheets, charts, etc.) and other materials (table tents, hotel room cards, magnets, stickers, etc.); speakers' presentation to community groups on conservation; sponsorship of conservation-related competitions/awards; presence (through booths, displays) at community events, encouraging conservation; coordinating with governmental agencies (including member agencies), business and community groups.

BMP 8. School Education.

List education related activities: Classroom presentations for grades K-12th; Development of educational materials; and Theater presentations for K-9th.

BMP 13. Water Waste Prohibition (Note: Implementation of the portion of this BMP addressing sales of self generating water softeners has been delayed for one year).

Date of passage of water waste ordinance: N/A
Types of waste prohibited: The Authority developed a set of water waste guidelines that member agencies could fully adopt or modify for their particular service area.

BMP 14. Water Conservation Coordinator.

Date position established: November of 1988.
Percent of time employee spends on this task: 100%, additionally, there are 3 other permanent employees who work in the water conservation division.

COMPLETION OF THIS FORM IS OPTIONAL

Second and Third Year BMPs

Second Year BMPs (These BMPs should be implemented by 8/31/93)

BMP 2c. Plumbing Retrofit.

Kits installed for residential customers in report year: 106,129

Kits distributed through other methods in report year: 130,000

BMP 3. Leak Detection and Repair.

Miles of main surveyed this year: N/A

BMP 4. Metering with Commodity Rates for all New Connections and Retrofit of Existing Connections.

Has a program been established for retrofitting any existing unmetered connections? N/A, wholesaler status

BMP 6. Landscape Water Conservation Requirements for New and Existing Commercial, Industrial, Institutional, Governmental, and Multi-family Developments.

Agencies administering the ordinance(s) and date(s) ordinance(s) adopted in service area: 12 of the Authority's member agencies have developed their own landscape ordinances (dates of adoption vary) or are planning to adopt the state-wide ordinance that will go into effect Jan. 1, 1993.

BMP 11. Conservation Pricing.

Types of conservation pricing in use (e.g. lifeline rates): N/A, wholesale status. The Authority, however, did sponsor a water rate workshop for its member agencies.

BMP 12. Landscape Water Conservation for New and Existing Single Family Homes.

How is landscape water conservation for single family homes promoted? New homes: For both new and existing homes, a series of Xeriscape workshops are being conducted to inform and educate the public on water-wise gardening techniques; Ongoing activities include the development and distribution of informational brochures and the promotion and development of demonstration gardens in cooperation with local realtors,

development companies, and other interested parties.
Existing homes: See above.

BMP 16. Ultra Low Flush Toilet Replacement.

Type of replacement program (check one or more):
Replace on resale N/A (Date took effect): N/A
Rebate X Number of rebates issued: 27,230
Replace on change of service: N/A

Third Year BMPs (These BMPs are to be Implemented by 8/31/94).

BMP 1. Interior and Exterior Water Audits and Incentive Programs for Single Family Residential, Multi-family, Residential, and Governmental/Institutional Customers.

Number of audits completed:
Single family N/A Incentives offered:
Multi-family N/A Incentives offered:
Governmental/Institutional 2 Incentives offered: The audit was free of charge and low-flow showerheads were distributed.

BMP 5. Large Landscape Water Audits and Incentives.

Number of audits (over three acres) performed: 107 Note: In addition, 25 audits of two to three acres were also conducted
Total acres audited: 1849.3
Incentives offered: The audit itself was conducted free of charge. Financial assistance was offered only to audit participants.
Was multi-lingual training and information provided? Yes

BMP 9. Commercial and Industrial Water Conservation.

Number of commercial audits performed in report year: None to date.
Number of industrial audits performed: None to date.

BMP 10. New Commercial and Industrial Water Use Review.

Date review procedure established: N/A
Reviews completed: N/A

BMP 11. Conservation Pricing. (Billing for sewer service based on metered water use.)

List water conservation pricing structures that are used in

your service area: In the past, the Authority passed through the MWD's Incremental Interruption and Conservation Program (IICP) incentives, which established monthly targets for MWD's member agencies based on 89-90 water use levels (taking growth rates, conservation program efforts, and changes in local supply into consideration). The Authority established monthly allocations for each of the member agencies based on MWD's given IICP targets.

BMP 15. Financial-Incentives.

Describe any financial incentives offered by your agency. Toilet rebate incentives offered through the Authority's Ultra-Low Flush Toilet Rebate Program as noted earlier. Additionally, the Authority is exploring the possibility of developing a cost-share program for commercial and industrial customers in cooperation with the member agencies.

Attachment I

SAN DIEGO COUNTY WATER AUTHORITY
RETAIL AGENCIES

BUENO COLORADO MUNICIPAL
WATER DISTRICT —
202 W. Connecticut Avenue
Vista, CA 92083
724-8811
Tom Wilson, General Manager

CARLSBAD MUNICIPAL WATER
DISTRICT
5950 El Camino Real
Carlsbad, CA 92008
Robert Greaney
General Manager
438-2722

CITY OF DEL MAR
Water Utilities Department
1050 Camino del Mar
Del Mar, CA 92014
Gloria Curry, City Manager
755-9313

CITY OF OCEANSIDE
300 N. Hill Street
Oceanside, CA 92054
Barry Martin
Water Utilities Director
966-4850

CITY OF ESCONDIDO
Civic Center Plaza
Water Utilities Department
201 N. Broadway
Escondido, CA 92025
George Lohnes
Utilities Engineer
741-4651

OTAY WATER DISTRICT
10595 Jamacha Blvd.
Spring Valley, CA 91978
Keith Lewinger
General Manager
670-2222

FALLBROOK PUBLIC UTILITY
DISTRICT
P. O. Box 2290
Fallbrook, CA 92088-2290
Gordon W. Tinker - General
Manager and Chief Engineer
728-1125

HELIX WATER DISTRICT
P. O. Box 518
La Mesa, CA 91944-0518
Robert D. Friedgen - General
Manager & District Engineer
466-0585

CITY OF NATIONAL CITY
1243 National City Blvd.
National City, CA 91950
Tom McCabe - City Manager
336-4200

OLIVENHAIN MUNICIPAL WATER
DISTRICT
1966 Olivenhain Road
Encinitas, CA 92024
David McCollom
General Manager
753-6466

SAN DIEGUITO WATER DISTRICT
59 E. "D" Street
Encinitas, CA 92024
Joe Palmer, Operations Manager
753-1145

PADRE DAM MUNICIPAL WATER
DISTRICT
P. O. Box 719003
Santee, CA 92072-9003
Russell Dowers
General Manager
448-3111

PENDLETON MILITARY RESERVATION
United Sates Marine Corps
Marine Corp Base
Camp Pendleton, CA 92055
Lawrence Carlson
Natural Resources Office
725-4523

CITY OF POWAY
P. O. Box 789
Poway, CA 92064-0120
Alan D. Archibald
Dir. of Public Works
748-6600

RAINBOW MUN.WATER DISTRICT
P.O. Box 2500
Fallbrook, CA 92088
Arthur R. Bullock
General Manager
728-1178

RAMONA MUN. WATER DISTRICT
105 Earlham Street
Ramona, CA 92065-1599
Harry Ehrlich, Acting G. M.
789-1330

RINCON DEL DIABLO MUNICIPAL
WATER DISTRICT
1920 N. Iris Lane
Escondido, CA 92027
Fred Adjarian, Manager
745-5522

CITY OF SAN DIEGO
Water Utilities Department
202 "C" Street
San Diego, CA 92101
Milon Mills Jr.
Water Utilities Director
236-6164

VALLECITOS WATER DISTRICT
788 W. San Marcos Blvd.
San Marcos, CA 92069
William Rucker
General Manager
744-0460

SANTA FE IRRIGATION DISTRICT
P. O. Box 409
Rancho Santa Fe, CA 92067
Geoff Poole
District Manager
756-2424

SOUTH BAY IRRIGATION DISTRICT
505 Garrett Avenue
Chula Vista, CA 91910
427-0868

VALLEY CENTER MUN. WATER
DISTRICT
P. O. Box 67
Valley Center, CA 92082
Gary Arant, General Manager
749-1600

YUIMA MUNICIPAL WATER DISTRICT
P. O. Box 177
Pauma Valley, CA 92061
Susan Collins, General Manager
742-3704

OTHER OPERATING HEADS

SWEETWATER AUTHORITY
P. O. Box 2328
Chula Vista, CA 92012
Garry Butterfield
General Manager
420-1413

Attachment II

SAN DIEGO COUNTY WATER AUTHORITY
WHOLESALER

METROPOLITAN WATER DISTRICT OF SOUTHERN CALIFORNIA
Office: 1111 Sunset Boulevard, Los Angeles, CA 90012
Mailing Address: — P.O. Box 54153, Los Angeles, CA 90054-0153
Carl Boronkay
General Manager

SAN DIEGO COUNTY WATER AUTHORITY
1995 URBAN WATER MANAGEMENT PLAN

APPENDIX B

AUTHORITY ORDINANCE 94-3

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ORDINANCE NO. 94-3

ORDINANCE OF THE SAN DIEGO COUNTY WATER AUTHORITY ("AUTHORITY") ESTABLISHING CONTINGENCY PLANS, RULES, REGULATIONS, AND RESTRICTIONS SO THAT AVAILABLE WATER SUPPLIES ARE ALLOCATED AMONG MEMBER AGENCIES FOR THE GREATEST PUBLIC INTEREST AND BENEFIT

WHEREAS, the water year ending September 30, 1994 produced the fourth driest year on record for runoff into the Sacramento-San Joaquin Delta and produced less runoff than any single year of the most recent California drought ending in 1992; and

WHEREAS the Metropolitan Water District of Southern California (MWD) depends upon water supplies from the State Water Project, which receives its supplies from the Delta, to meet water demands of its member agencies; and

WHEREAS, the San Diego County Water Authority (Authority) is a member agency of MWD, from which the Authority receives all of its water supplies; and

WHEREAS, MWD expects to have sufficient supplies to meet forecasted demands in 1995, but has adopted a 1995 Drought Management Plan (DMP) to manage any supply shortages which may be more extreme than currently forecast; and

WHEREAS, the final phase of the DMP would be the allocation of available supplies to its member agencies, including the Authority, through implementation of a 1995 Incremental Interruption and Conservation Plan (IICP); and

WHEREAS, in the event that MWD implements its 1995 IICP, it is considered necessary that future available supplies to the

Authority be allocated among the Authority's member agencies for the greatest public interest and benefit as provided by Section 45-5(11) of the County Water Authority Act (Chapter 45, Water Code Appendix); and

WHEREAS, the Authority has determined that it is necessary to establish methods and procedures for managing and securing available water supplies and for the allocation of these supplies to its member agencies;

NOW, THEREFORE, the Board of Directors of the San Diego County Water Authority hereby Determines, Declares, Resolves, and Orders, as follows:

SECTION I. MANAGING AND SECURING AVAILABLE WATER SUPPLIES

If MWD implements its IICP, the Authority shall act to minimize shortages to the San Diego region by managing available Authority owned storage and securing additional available water supplies. As a first priority, the Authority, in coordination with the City of San Diego, shall make available up to 25 percent of Authority owned storage for allocation to its member agencies. Second, the Authority may seek to increase deliveries from MWD through the target marketing provisions of the IICP. Third, the Authority shall consider negotiating with member agencies with local storage to use that storage to reduce demand on the Authority.

SECTION II. DELIVERIES TO MEMBER AGENCIES.

The General Manager shall provide for all reasonable deliveries to member agencies, unless the Board of Directors

determines that it is necessary to encourage further conservation and/or establish monthly allocations to member agencies under Section III A. Any allocation of supplies to member agencies shall be administered by the General Manager according to the provisions set forth in Sections III to V.

SECTION III. MONTHLY ALLOCATIONS TO MEMBER AGENCIES.

A. Amounts.

The IICP was adopted by MWD on November 8, 1994 as part of the DMP. Implementation of the IICP is the final phase of the DMP, and is a means of allocating water to MWD member agencies during drought conditions. The IICP establishes monthly targets for firm and agricultural deliveries for each of MWD's member agencies. The monthly target for firm deliveries is to be based on an average of total water delivered by MWD, less long term seasonal storage and agricultural deliveries, in the same month of fiscal years 1989-90, 1990-91, and 1991-92. Adjustments may be made to reflect growth, changes in local supplies, reclamation, and significant conservation programs. The monthly target for Authority agricultural deliveries from MWD (deliveries certified under MWD's Interim Agricultural Water Program or IAWP) shall be in accordance with the IICP option which allows agricultural deliveries to be based upon IAWP deliveries certified during the previous 12 months prior to a implementation of delivery reductions.

If the Board of Directors determines that it is necessary to establish monthly allocations to member agencies, then the

General Manager shall allocate available MWD supplies, except those supplies received through target marketing efforts, to member agencies by applying the same IICP methodology and reduction percentages. Separate allocations for firm supplies and agricultural water supplies, based upon the definitions used by MWD for firm and interim agricultural water supplies, shall be made for each member agency. The total allocation to each member agency shall be the sum of all firm and agricultural supply allocations.

The General Manager shall notify each member agency of its monthly allocation and the basis for its calculation, notify each member agency when changes in MWD's IICP stage are proposed and acted upon, and provide monthly status reports and a formal accounting to each member agency as part of the regular billing process.

B. Adjustments and Modifications to Monthly Allocations.

Member agencies may apply to the Authority for adjustments to allocations, using the criteria provided in the IICP. The General Manager shall review each application for adjustment, and forward them to Metropolitan for consideration and make such adjustments and modifications in member agency allocations as may be necessary and appropriate to pass through any adjustments received by the Authority from Metropolitan on behalf of a member agency.

C. Additional Available Water Supplies.

Authority owned storage, supplies received from the MWD

target marketing program, and other supply sources described in Section I shall be made available to member agencies. Member agencies must submit a request in writing to the General Manager for such supplies. Allocation of such supplies shall be made by the Board upon review of all member agency requests and recommendation from the General Manager. All cost associated with securing such supplies shall be passed through to the member agencies requesting such supplies.

D. Conservation Programs.

In order to achieve the reductions necessary for continued conservation under pre-IICP conditions, or to comply with monthly allocations imposed under Section III A and III B, the Authority may recommend that each member agency implement programs substantially equivalent to those set forth in the Response Stage Actions of the Drought Response Plan, which is attached as Exhibit A hereto.

SECTION IV. SURCHARGES FOR EXCESS MONTHLY WATER ALLOCATIONS.

A. Sharing MWD Disincentive Surcharges.

If MWD levies any disincentive surcharges against the Authority, the amount of such surcharges shall be shared prorata among member agencies that received more deliveries than their allocations under Section III A and III B hereof. The respective shares shall be a fraction of the total surcharge. The numerator shall be the amount each such member agency received more than its delivery allocation. The denominator shall be the sum of the numerators as determined for all such member agencies. No

surcharges shall be assessed unless the Authority receives a surcharge from Metropolitan and member agencies exceed their allocation. In no case shall the surcharge assessed by the Authority exceed the maximum unit surcharge rate assessed by Metropolitan.

B. Cumulating - Reconciliation.

Any sums due to Authority from member agencies hereunder shall be invoiced on the monthly billing statement by Authority to the affected member agencies, after Authority is billed by MWD. A reconciliation for each class of delivery shall occur concurrent with any reconciliation date established by Metropolitan as part of its implementation of the IICP, unless a different reconciliation date becomes effective by subsequent Board action.

SECTION V. DELIVERY RESTRICTIONS.

A. Notices.

The General Manager shall, at his discretion in a timely and appropriate manner, notify each member agency about the differences between monthly allocations and actual deliveries. If the differences indicate that a member agency is unlikely to be able to meet its monthly allocations, a warning notice may be given.

B. Reductions.

Following implementation of the IICP, the establishment of monthly allocations by the General Manager, notice, and an opportunity to be heard, member agencies which have not reduced

deliveries to within 5% of monthly allocations may have their daily deliveries reduced by the General Manager in a manner estimated to result in attainment of monthly allocations.

C. Adjustments.

The General Manager may make adjustments in deliveries to a member agency because of special circumstances or to protect domestic use, sanitation, and fire protection. Also, consideration will be given to pertinent matters designed to avoid discrimination between consumers using water for the same purpose and to promote uniformity in the beneficial uses made of water within the boundaries of the San Diego County Water Authority.

SECTION VI. CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA).

The San Diego County Water Authority finds that this ordinance and actions taken hereafter pursuant to this ordinance are exempt for the California Environmental Quality Act as specific actions necessary to prevent or mitigate an emergency pursuant to Public Resources Code Section 21080(b)(4) and the California Environmental Quality Act Guidelines Section 15269(c). The General Manager is hereby authorized and directed to file a Notice of Exemption as soon as possible following adoption of this ordinance.

SECTION VII. APPEALS.

A. Appeals Board.

There is hereby created an Appeals Board consisting of five directors, to be appointed by the Chairman. The Chairman shall

also appoint five directors to serve as alternate members. There is delegated to the Appeals Board the full authority of the Board of Directors to consider and resolve all appeals lodged by member agencies with the Executive Secretary.

B. Appeals by Member Agencies.

Each member agency may file with the Executive Secretary a request to have the Appeals Board review any action taken by the General Manager hereunder. Representatives of the member agency may appear before the Appeals Board and present such testimony and documentation considered appropriate for a proper understanding and evaluation for the claims and basis for the appeal.

The General Manager shall arrange for such counter presentation considered appropriate for the Appeals Board to fully comprehend all aspects relative to the decision which is the subject of the appeal.

C. Procedure - Decisions.

The Appeals Board shall meet as soon as practical but not later than ten business days after a request is made by a member agency. The Chairman of the Board shall designate a person to be the presiding member of the Appeals Board. No member of the Appeals Board shall participate in or act upon any appeal by the member agency he or she represents. The Appeals Board, with the advice of General Counsel, shall establish fair and reasonable procedures for hearing the appeal and reviewing determinations by the General Manager.

The Chairman shall appoint alternates to serve in the case of any appeal which a member is disqualified or unable to attend. Consistent with circumstances relative to the nature of the appeal, the Appeals Board shall conduct the appeal and render its decisions as expeditiously as practical. The decision shall be in writing briefly describing the pertinent circumstances for the appeal, and the basis for the decision. General Counsel may prepare a draft, pursuant to oral instructions from the Appeals Board, but each member of the Appeals Board must either approve or dissent in writing. The decision of a majority of the Appeals Board shall be the final decision on the subject of the appeal.

SECTION VIII. RESERVED DISCRETION.

The Board of Directors hereby reserves its legislative discretion to modify any of the provisions hereof as changed circumstances may warrant. Modifications to increase or decrease restrictions or water allocations will be made as deemed necessary and appropriate. The General Manager shall keep the Board advised about matters pertinent to drought conditions, MWD deliveries, Authority deliveries to member agencies, appeals, and the nature and extent of other emergency conditions.

SECTION IX. SUPERSEDURE.

If any provisions of this Ordinance are inconsistent with previous actions of the Board pertaining to plans to respond to drought conditions, the provisions hereof shall supersede such inconsistent provisions.

SECTION X. EFFECTIVE DATE.

This ordinance shall become effective on January 1, 1995.

SECTION XI. SUNSET PROVISION.

This ordinance shall remain in effect until December 31, 1995.

SECTION XII. LEGAL BASIS FOR ACTIONS.

The foregoing rules, regulations are taken pursuant to Article X, Section 2 of the California Constitution and the legislative powers delegated to the Authority by Section 45-5(11) of the County Water Authority Act (West's Water Code, Appendix, Section 45).

PASSED, APPROVED, and ADOPTED this 8th day of December, 1994.

AYES: Unless noted below, all Directors voted aye.

NOES:

ABSTAIN:

ABSENT: Broomell, Buckner, Griffen and Turner

John M. Leach, Chair
Board of Directors

Joseph Parker, Secretary
Board of Directors

I, Janet R. Maltman, Executive Secretary of the Board of Directors of San Diego County Water Authority, do hereby certify that the above and foregoing is a full, true and correct copy of said Ordinance 94-3 of said Board and that the same has not been amended or repealed.

Janet R. Maltman
Executive Secretary

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SAN DIEGO COUNTY WATER AUTHORITY
1995 URBAN WATER MANAGEMENT PLAN

APPENDIX C

CALIFORNIA URBAN WATER MANAGEMENT PLANNING ACT

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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 2. DEFINITIONS

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

10611.5. "Conservation" means those measures that limit the amount of water used only to that which is reasonably necessary for the beneficial use to be served.

10612. "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

10613. "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

10614. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

10615. "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate reasonable and practical efficient uses and reclamation and conservation activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

10616. "Public agency" means any board, commission, county, city and county, city, regional agency, district, or other public entity.

10617. "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 7 (commencing with Section 4010) of Part 1 of Division 5 of the Health and Safety Code.

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.

10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:

(a) Include an estimate of past, current, and projected potable and recycled water use and, to the extent records are available, segregate those uses between residential, industrial, commercial, and governmental uses.

(b) (1) Identify conservation and reclamation measures currently adopted and being practiced.

(2) Urban water suppliers that are members of the California Urban Water Conservation Council and submit annual reports to that council in accordance with the "Memorandum of Understanding Regarding Urban Water Conservation in California," dated September 1991, may submit the annual reports for the purposes of identifying conservation measures as required by paragraph (1).

(c) Describe alternative conservation measures, including, but not limited to, consumer education, metering, water saving fixtures and appliances, pool covers, lawn and garden irrigation techniques, and low water use landscaping, that would improve the efficiency of water use with an evaluation of their costs and their environmental and other significant impacts.

(d) Provide a schedule of implementation for proposed actions as indicated by the plan.

(e) Provide an urban water shortage contingency plan that includes all of the following elements that are within the authority of the urban water supplier:

(1) Past, current, and projected water use and, to the extent records are available, a breakdown of those uses on the basis of single-family residential, multifamily residential, commercial, industrial, governmental, and agricultural use.

(2) An estimate of the minimum water supply available at the end of 12, 24, and 36 months, assuming the worst case water supply shortages.

(3) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions that are applicable to each stage.

(4) Mandatory provisions to reduce water use that include prohibitions against specific wasteful practices, such as gutter flooding.

(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.

(j) Describe actions and planning to eliminate the use of once-through cooling systems, nonrecirculating water systems, and nonrecycling decorative water fountains, and to encourage the recirculation of water if proper public health and safety standards are maintained.

(k) Describe actions and plans to enforce conservation measures.

(l) To the extent feasible, describe the amount of water saved through water conservation measures employed by user groups.

(m) Describe actions and planning to ensure the involvement of community members within the service area with regard to water management planning.

10632. (a) In addition to the elements required pursuant to Section 10631, a plan projecting a future use which indicates a need for expanded or additional water supplies shall be adopted in accordance with this chapter and shall include an evaluation of the following alternatives:

(1) Recycled water. The plan's evaluation of this alternative shall provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier and shall include all of the following information:

(A) A description of the waste water collection and treatment systems in the supplier's service area, including a quantification of the amount of waste water collected and treated and the methods of waste water disposal.

(B) A description of the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.

(C) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

(D) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

(E) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water where fresh water is not necessary, and the projected results of these actions in terms of acre-feet of recycled water used per year.

(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.

10641. (a) An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water conservation and management methods and techniques.

(b) In order to assist urban water suppliers in obtaining needed expertise as provided for in subdivision (a), the department, upon request of an urban water supplier, shall provide the supplier with a list of persons or agencies having expertise or experience in the development of water management plans.

10642. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

10643. An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

10644. An urban water supplier shall file with the department a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be filed with the department within 30 days after adoption.

Plans filed under this section shall describe the basis for the decision of the urban water supplier to add, change, or retain conservation measures.

The department shall annually prepare and submit to the Legislature a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall highlight the outstanding elements of individual plans. The department shall provide a copy of the report to each urban water supplier which has filed its plan with the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

10645. Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

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.

10654. An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the "Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

10655. If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

10656. An urban water supplier that does not submit an amendment to its urban water management plan pursuant to subdivision (a) of Section 10621 to the department by January 31, 1992, is ineligible to receive.drought assistance from the state until the urban water management plan is submitted pursuant to Article 3 (commencing with Section 10640) of Chapter 3.

SEC. 2. No appropriation is made and no reimbursement is required by this act pursuant to Section 6 of Article XIII B of the California Constitution or Section 2231 or 2234 of the Revenue and Taxation Code because the local agency or school district has the authority to levy service charges, fees, or assessments sufficient to pay for the program or level of service mandated by this act.

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