

# **2005 URBAN WATER MANAGEMENT PLAN**

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CASITAS MUNICIPAL WATER DISTRICT



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## EXECUTIVE SUMMARY

The 2005 Urban Water Management Plan (UWMP) has been prepared by Casitas Municipal Water District (CMWD) and submitted to the California Department of Water Resources (DWR) to meet the requirements of the 1984 Urban Water Management Planning Act and all subsequent amendments adopted through December 2004. The act requires urban water suppliers providing water for municipal purposes to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually to prepare an adopt an UWMP every five years. The plan includes all information necessary to meet the requirements of the California Water Code Division 6, Part 2.6. The District has provided a public review of the draft plan (Section 8, p. 191) before adoption by the Board of Directors (Section 8, p. 192) and submittal to the California Department of Water Resources.

This plan provides information on present and future water sources and demands and provides an assessment of CMWD's water resource needs. Specifically, the UWMP provides water supply planning for a 20-year planning period in 5-year increments. It identifies and quantifies that there will be adequate water supplies for existing and future demands during normal, dry and drought years. It also describes Casitas' efforts to implement water conservation and water efficient uses for Casitas' urban water supplies.

CMWD has coordinated its UWMP planning efforts with a number of agencies to ensure the accuracy of the data and issues presented in this plan. Table 2 lists the agencies that have provided coordination with the development of this UWMP.

This document has been laid out according to DWR's guidance manual to ensure and easily verify that the information presented here meets all of the DWR requirements.





## SECTION 1 – AGENCY COORDINATION

### City and County Notification and Participation (§ 10621(b))

The Casitas Municipal Water District during the preparation of the 2005 Urban Water Management Plan (UWMP) notified all the agencies listed in the table below including the County of Ventura, City of Ojai, and City of Ventura of planned public meeting dates and times that were scheduled as part of the process for updating the plan. Casitas invited comments from all agencies as well. An initial letter was mailed on March 9, 2005 to all of the agencies listed in Table 1 below. A second letter was mailed to all agencies listed below on September 30, 2005, which indicated that a copy of a draft plan was available on Casitas’ website and a CD copy could be made available. The letter also indicated that written comments regarding the draft plan could be submitted up until October 31, 2005 and that a public hearing was scheduled for October 26, 2005. In addition, a hardcopy was made available for review at the District’s main office for anyone who wanted to review it.

Casitas’ June 2005 newsletter that was sent to all 29,000 households within the District also provided all of the planning meeting times and locations for the Urban Water Management Plan. The District noticed and advertised the public hearing on October 26, 2005 in accordance with all of the requirements of the Urban Water Management Planning Act.

### AGENCIES NOTIFIED (TABLE 1)

<i>Agencies Notified by Letter</i>
City of Ojai – City Manager Dan Singer and Mayor Sue Horgan
Ventura County Resource Conservation District
Ventura County Watershed Protection District
Faria Beach Homeowner’s Association
Ventura County Supervisors John Flynn, Steve Bennett, Linda Parks, Judy Mikels, Kathy Long
Sulphur Mountain Road Water Association
Rincon Water & Road Works
Hermitage Mutual Water Company
Carpinteria Valley Water District
Ojai Valley Land Conservancy – Mr. Richard Handley
Siete Robles Mutual Water Company
Ventura River County Water District
Sisar Mutual Water Company
Ranchitos Decielo Mutual Water Company
Southern California Water Company
City of Ventura – Don Davis, Utilities Manager
Ojai Basin Groundwater Agency
Tico Mutual Water Company
Senior Canyon Mutual Water Company
Meiners Oaks County Water District
City of Ventura - City Council, Mayor

**COORDINATION WITH APPROPRIATE AGENCIES (TABLE 2)**

<i>Check at least one box per row</i>	<i>Participated in UWMP development</i>	<i>Commented on draft</i>	<i>Attended public meetings</i>	<i>Contacted For assistance</i>	<i>Received copy of draft</i>	<i>Sent notice of intention to adopt</i>	<i>Not Involved / No Information</i>
City of Ventura		X		X	X	X	
County of Ventura		X		X	X	X	
City of Ojai				X	X	X	
Ojai Land Conservancy				X	X	X	
Carpinteria Valley Water District				X	X	X	
Southern California Water Company		X		X	X	X	
Hermitage Mutual Water Company				X	X	X	
Meiners Oaks County Water District				X	X	X	
Ranchitos Decielo Mutual Water Company				X	X	X	
Rincon Water & Road Works				X	X	X	
Senior Canyon Mutual Water Company				X	X	X	
Sisar Mutual Water Company				X	X	X	
Sulphur Mountain Road Water Assoc.				X	X	X	
Tico Mutual Water Company				X	X	X	
Ventura River County Water District	X		X	X	X	X	
Ojai Basin Groundwater Agency				X	X	X	
Siete Robles Mutual Water Company				X	X	X	

### **Coordinating Conservation Efforts**

Casitas actively engages community participation in its ongoing water management activities to encourage greater water use efficiency within the District. Casitas has adopted a number of strategies to get the public to adopt water conservation practices so that the District may delay as long as possible the need to import water. Some of these activities include:

- Sending out quarterly newsletters that include information on water conservation to all residents within the District.
- Developing a water conservation package that included a folder and inserts highlighting water conservation activities and mailed it to all customers in 2004, additional copies remain available at the District Office for the public.
- Providing water conservation information to all new customers to the District.
- Participating in local community events to provide information on water conservation.
- Speaking to local community groups about water conservation.
- Providing information on website on how to use water more efficiently.
- Supplying curriculum to elementary schools in the District on water conservation.

In 2004, Casitas began participating in the Ventura County Integrated Regional Water Management Plan group. This effort included developing a list of all potential projects among regional water agencies and organizations that could benefit from seeking regional cooperation. The group will submit both a planning and implementation grant applications for Proposition 50 regional grants. Casitas developed six proposals that were submitted for review by the group. One proposal was in conjunction with the Senior Canyon Water Company. Casitas would like to further secure the reliability of Senior Canyon's own water supply so that it will rely less on Casitas' water. Casitas also submitted a grant proposal to the Bureau of Reclamation's Water 2025 program on behalf of Senior Canyon.



## SECTION 2 – CONTENTS OF UWMP - STEP ONE: APPROPRIATE LEVEL OF PLANNING FOR SIZE OF AGENCY

Voters approved the formation of the Ventura River Municipal Water District, later named the Casitas Municipal Water District, in October of 1952. The District immediately entered into agreements with the United States Department of the Interior, Bureau of Reclamation (USBR), which led to the construction of Casitas Dam and the mainline distribution facilities. Upon completion of construction in 1959 Casitas assumed full responsibility for the operation and maintenance of all facilities. The District was designed and constructed to provide a system of water conservation and distribution works to meet the supplemental water requirements within the District. The project water is derived solely from local sources.

Beginning sometime around 1976 local groundwater users decreased pumping of groundwater and increased use of Casitas’ water. This was probably due to two factors:

- Users with shallow, less dependable wells abandoned their wells and switched to Casitas as their sole source.
- Users faced with major expense for rehabilitation or replacing wells and equipment found it economically feasible to switch to Casitas.

Since the adoption of Casitas’ Water Efficiency and Allocation Program in March of 1992, customers have decreased water demand from a 1989 high of 26,253 acre-feet to approximately 12,000 acre-feet in 1993. The largest portion of this reduction is due to a switchback to groundwater as a primary source and Casitas as a supplemental supply. Water demand since 2000 has averaged 19,832 acre-feet annually as shown by the following statistics.

**TOTAL WATER DEMAND (TABLE 3)**

<i>Fiscal Year</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>	<i>Annual Avg.</i>
<b>Total Acre Feet</b>	23,229	18,873	21,066	16,476	19,514	19,832

The District is focused on limiting current deliveries to maintain the safe annual yield average of 20,840 acre-feet during a historical drought period or 19,780 acre-feet during a drought recovery period. No shortages requiring the mandatory rationing of water have been experienced. Although, Casitas has not had to enact the rationing stages of the Water Efficiency and Allocations Program, controls on the expansion of use remain in effect and the Board of Directors has requested voluntary conservation. The District continues implement water conservation programs to assist customers as well.

Within Casitas’ district boundaries there are fourteen other public and private water agencies, which receive supplemental water from Casitas. The public water agencies served by Casitas include the City of Ventura, Ventura River County Water District and Meiners Oaks County Water District. Southern California Water Company that serves the City of Ojai, an investor owned public utility. In addition, there are ten other water companies serving various areas of the District. The majority of these agencies are dependant on groundwater as their major source of supply. Casitas’ customers are classified as residential, agricultural, resale, business, industrial, interdepartmental, and fire. Casitas’ largest customer classes by usage are resale and agricultural.

The District is not anticipating any significant changes in population growth within its service area boundaries within the next five years, for additional details see Section Two: Service Area Information with 20-year projections. The low population growth trend is likely to limit water use expansion by customers.

### **Distribution Facilities and Water Treatment**

Casitas' distribution system includes approximately ninety-seven miles of main and distribution pipelines, nine pumping plants, four chlorination stations, and thirty million gallons of treated water stored in fourteen steel balancing reservoirs located throughout the District. Casitas has meters on all of its direct service customers, including meters on all connections to other water agencies. Other water agencies meter their own customers. The facilities were built in the late 1950s by the Bureau of Reclamation, but have been operated and maintained by Casitas since 1959. The District completed construction of a sixty-five million gallon per day pressure filtration treatment plant in December of 1996 that enables Casitas to meet the regulations set forth in the State of California surface Water Treatment Rules. Balancing reservoirs placed throughout the system at various elevations presently regulates water system pressures within Casitas' distribution system. These elevations are determined from the requirements of various zones of service ranging from sea level to 1,500 feet above sea level. Because of the terrain, the requirements of customers within the various zones vary widely. Some areas of the District that have excessive pressures require pressure-reducing stations. The vast majority of customers are furnished between 50 and 80 pounds per square inch pressure at their meters.



## SECTION 2 – CONTENTS OF UWMP - STEP TWO: SERVICE AREA INFORMATION WITH 20 YEAR PROJECTIONS

Population growth with the project area paralleled the population growth in Southern California up until 1960. The District’s population in 1960 was 45,000. Growth from that period to 2000 has not been excessive. The population forecast for the District’s service area reflects a very low growth period until the year 2025. Casitas serves directly and indirectly a population of 66,246. There is a large population within the District’s boundaries that is served by other water agencies. Casitas’ largest customer, the city of Ventura, is projecting less than a 1% population increase during each of the next five years. The regional population increases are predicated to be minimal for the area as shown in the following data tables, which were provided by the Local Agency Formation Commission (LAFCO).

### VENTURA COUNTY POPULATION PROJECTIONS BY SUB AREA\* (TABLE 4)

<i>Sub Area</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>
Ojai Area	32,106	32,901	33,866	34,190	34,925
Ventura Area	114,193	119,652	125,454	130,696	136,969

\*Retrieved August 31, 2005, from <http://www.ventura.lafco.ca.gov/pdf/MSR/CSA3414MSRFinal.pdf>.

### WATER DEMAND PROJECTIONS WITHIN CASITAS MWD (AF/Y)\* (TABLE 5)

<i>Year</i>	<i>Population<sup>1</sup></i>	<i>M &amp; I Demand<sup>2</sup></i>	<i>Agricultural Acres<sup>3</sup></i>	<i>Agricultural Demand<sup>4</sup></i>	<i>Oil Company Demand<sup>5</sup></i>	<i>Unaccounted Water<sup>6</sup></i>	<i>Total Demand</i>
2000	63,934	14,065	717	1,434	561	3,840	20,617
2010	68,557	15,083	717	1,434	1,563	2,462	21,259
2020	73,137	16,090	717	1,434	2,689	3,194	24,124
2030	78,312	17,229	717	1,434	3,714	3,925	27,019

\*Acre-feet per year.

<sup>1</sup>Based on Countywide population forecast adopted by Ventura Council of Governments on May 24, 2001.

<sup>2</sup>Municipal and Industrial demand, based on population forecast times per capita M & I use factor (0.22 acre-feet per person per year) taken from Ventura County Water Conservation Management Plan.

<sup>3</sup>Source: General Plan Land Use Appendix.

<sup>4</sup>Based on water use factor of 2.0 acre-feet per acre per year.

<sup>5</sup>Source: Projected from past years of City of Ventura and CMWD usage. According to the City of Ventura this projected usage reflects a much larger increase than historical usage trends by Aera Energy would otherwise suggest.

<sup>6</sup>Source: Projected from data included in CMWD Water Supply and Use Status Report – Appendix D (2004).

The increase from the LAFCO information provided in the above tables indicates that the Ojai Area is growing at a rate of 0.43% per year while the Ventura Area is growing at a rate of 0.96% per year. The County of Ventura has information that indicates an overall population increase of 0.8549%. Using all of the above data to estimate population increases for the entire District service area would show;

### 20 YEAR SERVICE AREA POPULATION PROJECTIONS (TABLE 6)

<i>Sub Area</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>
Casitas	66,246	68,557	70,847	73,137	75,580

This average indicates a population growth of about 0.70%. This would appear to be as good a number as possible because it is based on the population projections for each area of the District.

**Climate:**

The Climate within the Casitas Municipal Water District boundaries varies significantly based on the distance from the Pacific Ocean, elevation, area drainage and slope aspect. Generally, the climate is classified as Mediterranean and is characterized by cool, wet winters and warm, dry summers. Precipitation, as reported by the National Oceanic and Atmospheric Administration (NOAA), a federal agency, weather station located at Ojai, averages 21.7” annually while average precipitation at the NOAA Ventura station is 14.5.” Annual rainfall is 23.74” as reported by the Lake Casitas Recreation Area Weather Station. Standard Monthly Average ETo is not available. Nearly eighty percent (80%) of the annual rainfall occurs from December to March. In the inland areas winter low temperatures often fall below freezing while summer highs hit above 100 degrees Fahrenheit. Temperatures along the coast are moderated by the ocean and seldom reach the extremes seen inland. Coastal marine fog is usually present from May until July, but may occur any time of the year. This overcast generally burns off in the inland areas, but may persist on the coast all day. Strong, hot, dry easterly winds (Santa Anas) typically occur in the fall. These winds increase the evapotranspiration (ET) and result in increased agricultural and landscape water use.

**AVERAGE TEMPERATURE AND AVERAGE RAINFALL (TABLE 7)**

	<i>Jan</i>	<i>Feb</i>	<i>Mar</i>	<i>Apr</i>	<i>May</i>	<i>June</i>	<i>July</i>	<i>Aug</i>	<i>Sept</i>	<i>Oct</i>	<i>Nov</i>	<i>Dec</i>
<b>Avg. Temp* (Fahrenheit)</b>	51	52	54	57	60	65	69	70	68	62	56	52
<b>Avg. Rainfall (inches)</b>	5.18	5.70	4.11	1.28	.31	.06	.01	.04	.4	.56	2.74	3.27

- From the Casitas Weather Station at the Recreation Area.

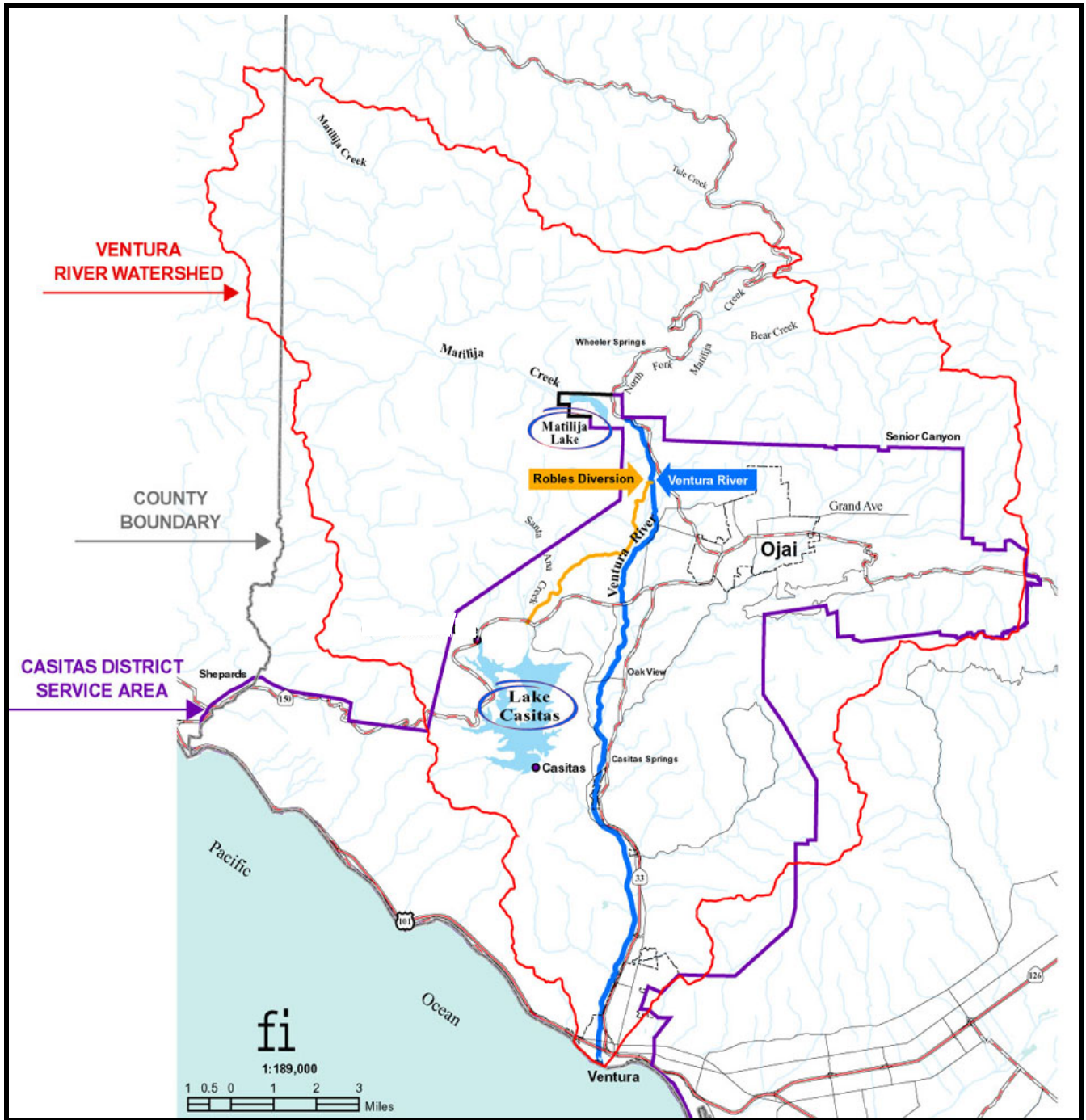


Figure 1 – Casitas Municipal Water District Service Area





## SECTION 2 – CONTENTS OF UWMP - STEP THREE: WATER SOURCES

Presently, the CMWD relies on Lake Casitas surface water supply as its primary water source. This fact is unlikely to change in the foreseeable future. The Mira Monte well provides roughly 300 acre-feet per year compared to the roughly 20,000 acre-feet that is realized from the lake. The projected 20,540 acre-feet of surface water per year is the safe yield during a twenty-one year drought period according to the peer reviewed Casitas Municipal Water District Water Supply and Use Status Report, December 7, 2004. The total safe yield is 20,840 when the Mira Monte well is added to the Lake Casitas yield.

The CMWD is considering several potential new sources of water in the future that may include water banking, desalination, water transfers or increase lake storage capacity through excavation or canal diversion capacity by building higher canal walls. The attainment of additional water sources by any of these means will require extensive future planning and decision-making. At the present time, it cannot be determined when such water sources could be realized due to the extensive infrastructure requirements needed to accomplish these goals.

CMWD has considered purchasing water from the Carpinteria Valley Water District because it would require much less investment and could be accomplished easily after an agreement was reached between the two agencies.

Other potential sources of water could be realized through increased efficiencies and decreasing water demands such as:

- Assist water customers like the Senior Canyon Mutual Water Company with upgrading their system so they rely less on Casitas’ water.
- Renegotiate agreement with the City of Ventura.
- Collect water from flushing the system and return it via tanker truck to treatment plant for re-use.
- Increase efforts to diminish leaks within in the system and increase the speed of repairs.

**CURRENT AND PLANNED WATER SUPPLIES – AF/Y (TABLE 8)**

<i>Water Supply Sources</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
Wholesale water providers	0	0	0	0	0	0
Supplier produced groundwater	300	300	300	300	300	300
Supplier surface diversions	20,540	20,540	20,540	20,540	20,540	20,540
Transfers in or out	0	0	0	0	0	0
Carpinteria Valley Water District	0	0	0	0	0	0
Exchanges in or out	0	0	0	0	0	0
Recycled Water (current and projected use)	0	0	0	0	0	0
Desalination	0	0	0	0	0	0
Other	0	0	0	0	0	0



## **SECTION 2 – CONTENTS OF UWMP - STEP THREE: WATER SOURCES – GROUNDWATER**

The Casitas Municipal Water District acquired the Mira Monte Mutual Water Company in November 1982 along with its well. The water company had gone out of business and deeded the well to Casitas because of the high nitrate content found within the well. The State Department of Health Services issued an amended domestic water permit to bring the Mira Monte Well, Recordation No. 560048, back on line for Casitas to use. Casitas blends the water pumped from the Mira Monte well with Lake Casitas surface water to reduce nitrate levels. Casitas has tested and operated the well on a monthly basis since 1982 to the present. In 1990, Casitas built blending facilities to stay in compliance with maximum nitrate concentration levels for domestic water.

There are two major ground water basins that impact Casitas water supplies. The first is the Ventura River ground water basin, which has been described as a water slide with a couple of bumps. If you do not use it, all the water will drain to the ocean within 3 years. The second is the Ojai Basin, which has been described as a tipped bowl. It will only take so much water before it spills water and therefore, it has a fixed capacity much like Lake Casitas. The usual rule to maximize efficiency is to use surface water before ground water because groundwater does not evaporate and is reasonably protected from pollution. In addition, surface storage fills so quickly as it is usually on a river. For the Casitas area, this rule is reversed. Use of the groundwater basins should be first because they fill so quickly when there is rain, and then use the surface storage because it has such a large capacity and ability to be maintained as long-term water supply evening in a drought.

Casitas' Mira Monte Well No. 5600848 is associated with the Ventura River ground water basin. However, water quality is markedly different than that in the remainder of the Ventura River Basin, and the pattern of basin refill and draw down does not directly correlate with the Ventura River Basin. There are no records that indicate pumping from the Mira Monte area of the basin impacts well levels in the Ventura River Basin.

The only water purveyor that pumps water from the same area is the Tico Mutual Water Company, which serves approximately 120 persons through 39 connections. Estimates are that approximately 400 to 500 acre-feet per year have been pumped from this area during critically dry periods such as 1951 and 1961 without causing a shortage of supply. Casitas believes that the historically based pumping average of 300 acre-feet of water per year from the Mira Monte Well will not jeopardize the water supply both in the immediate basin or in the larger Ventura River groundwater basin.

### **The Upper Ventura River Basin;**

The average usage above the Robles Dam over the years is about 2,800 acre-feet (*Ojai Groundwater Basin Study for Casitas MWD*, Murray, Burns, & Kienlen, MBK, August 1988). This is mostly based upon the water usage from a single private agricultural user. The heavy usage of this property ceased in 1988 and the average from 1988 to 2000 is only about 405 acre-feet per year. This would indicate that this basin is now greatly underutilized and has available capacity.

In the past, Casitas has investigated drilling wells in this groundwater aquifer near the Robles Diversion facility. There have been a lot of complaints from Ventura River County Water District and the Meiners Oaks County Water District about such water production. There is a concern that Casitas would simply be causing those agencies to take Casitas' water because they would be losing their water from the aquifer as result of Casitas emptying their groundwater sources.

**The lower Ventura River Basin;**

The lower Ventura River Basin had an average extraction during the period of 1944-1983 of 7,493 acre-feet (*Water Supply and Demand Study: Status Report*, by R. Barnett June 6, 1989). The City of Ventura extracted an average of 5,506 acre-feet and the users between Robles Dam and Foster Park extracted 1,987 acre-feet.

During dry cycle periods when the full yield is not available water supply must be obtained from alternate sources.

**Ojai Ground Water Basin;**

Created in 1992, the Ojai Basin Ground Water Management Agency was developed to protect the Ojai Ground Water basin. The basin is used 54.4 percent for Agriculture, 40.8% by the Southern California Water Company, and 2% for domestic, and 2.7 % for landscaping. Storage in the Ojai Groundwater basin has been estimated to have a capacity as high as 68,722 acre-feet, with a low of 40,700 acre-feet, which occurred in 1951 (Murray, Burns, & Kienlen, MBK). Storage in October 2002 was 62,567 acre-feet, which was down from about 66,000 acre-feet in 2001.

Precipitation in the Ojai Ground Water basin was 12.9 inches in 1999, 24.4 in 2000, 30.2 in 2001, and 9.4 inches in 2002. Estimated irrigation demand in 2002 was 7,021 acre-feet. Casitas provided 4,249 acre-feet of water to meet this irrigation demand. Private groundwater wells provided the remaining 2,772 acre-feet. The Southern California Water Company extracted an additional 2,213 acre-feet of groundwater. Extractions decreased from 4,985 acre-feet in 2002 from 6,143 acre-feet in 2001.

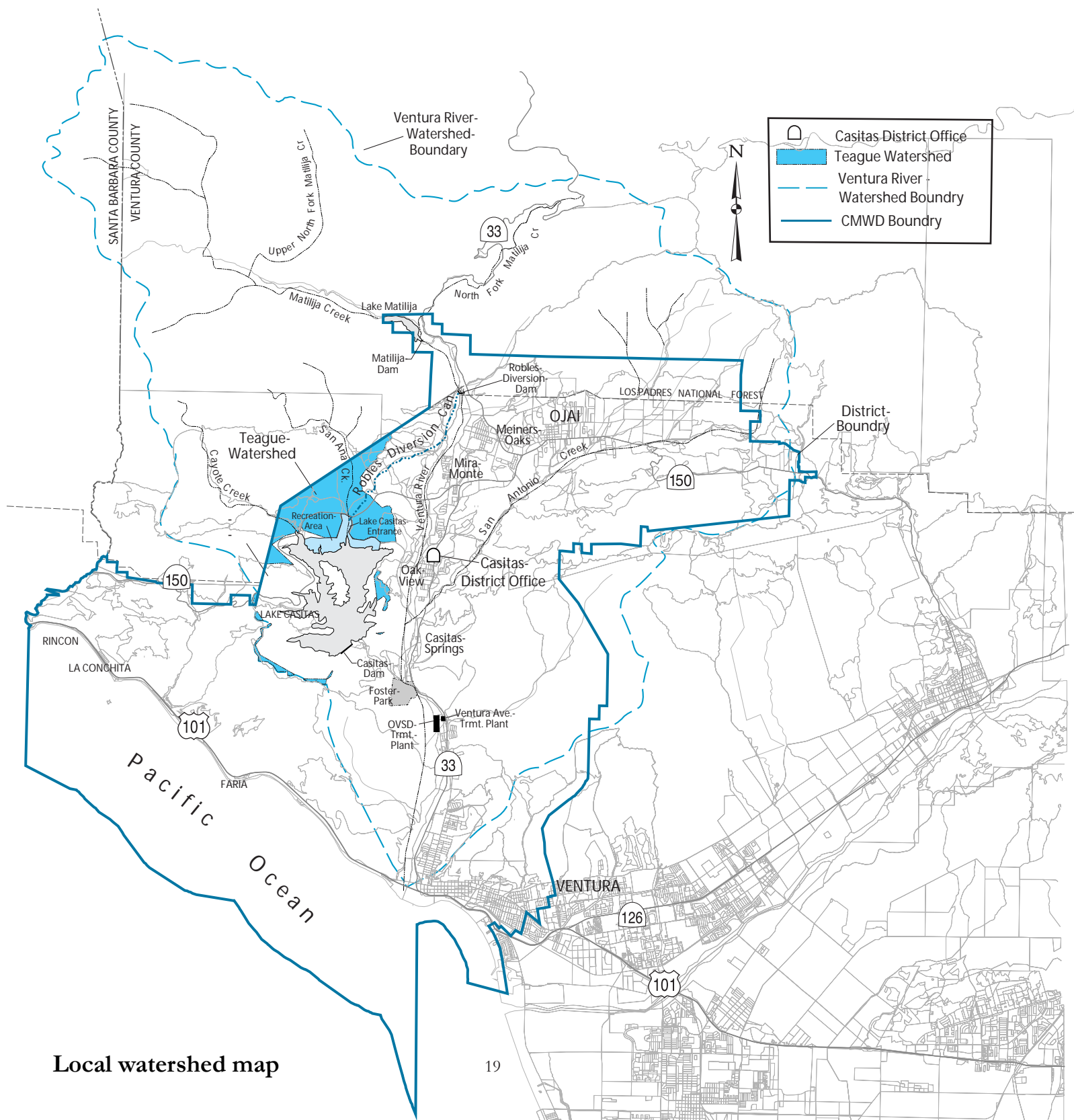
The Ojai Basin appears to be 20,000 acre-feet away from the minimum level seen in 1951. It would take about 4 years of no rain at current demands to get to that level again.

**AMOUNT OF GROUNDWATER PUMPED – AF/Y (TABLE 9)**

<i>Basin Name (s)</i>	<i>2000</i>	<i>2001</i>	<i>2002</i>	<i>2003</i>	<i>2004</i>
<b>Mira Monte Well (Ventura River Groundwater Basin)</b>	300	300	300	300	300
<b>% of Total Water Supply</b>	.01	.01	.01	.01	.01

**AMOUNT OF GROUNDWATER PROJECTED TO BE PUMPED – AF/Y (TABLE 10)**

<i>Basin Name(s)</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
<b>Mira Monte Well (Ventura River Groundwater Basin)</b>	300	300	300	300	300
<b>% of Total Water Supply</b>	.01	.01	.01	.01	.01



Local watershed map

The report has also evaluated the impact to water supplies that could result from regulatory requirements to release additional water for fisheries and the removal of a dam structure from the water system. In the evaluation of water supply, the Ventura River Basin hydrology and water storage at Lake Casitas were modeled with water demands that would:

- (1) Result in depletion of water storage to minimum lake levels in the drought of record (1945-65); and
- (2) Result in a recovery of water storage to maximum lake levels in the wet period of record (1966-80).

The historical record has also provided information regarding a ‘multiple dry years’ occurrence in the drought period and the resulting escalation of water demands. It should be noted that during multiple dry years, surface flow in the Ventura River Basin becomes non-existent. The water demands from Lake Casitas’ supply can escalate due to multiple years of insufficient rainfall that will result in increased agricultural water demands and in the reduction of groundwater availability to other water purveyors and agriculture. The representative multiple dry years for which water use data is available for comparative analysis is the period of 1987 through 1990 (Table 11). The water use model that was developed in the Supply and Use Study provides a prediction of water use escalation as a factor of yearly rainfall, as follows:

**WATER USE MULTIPLE DRY YEAR (TABLE 11)\***

	<i>Year 0</i>	<i>Year 1</i>	<i>Year 2</i>	<i>Year 3</i>
	(1987)	(1988)	(1989)	(1990)
<b>Local Yearly Rainfall (in.)</b>	9.83	18.40	11.85	8.86
<b>Predicted Water Use (AF/Y)</b>	21,824	21,318	24,111	26,184
<b>Actual Water Use (AF/Y)</b>	22,339	21,032	24,416	22,454

\*CMWD Water Supply and Use Status Report, December 7, 2004

It is recognized that the actual water use in 1990 was skewed due to water use decisions made by the City of Ventura to move to an alternate water source during this year and the following five years, primarily due to the lack of filtration treatment of Lake Casitas water in these years, thus reducing their demands on Lake Casitas’ supply.

The District’s Ordinance No. 92-7 implements a water efficiency and allocation program for all Casitas’ customers. It provides a water management strategy that will curtail the water use of its customers in the event of an extended drought. The customer water use curtailment is set into a block structure, increasing the water use restrictions as the Lake Casitas storage level declines over time. Having a customer’s water cost increase as their water usage escalates enforces the structure. The Board of Directors of the Casitas Municipal Water District has the authority to implement this water use management strategy as described in this ordinance to the degree and duration it believes is necessary to maintain a safe water supply for the community.

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The District has participated as member of the Ventura County entitlement to State water. The District's share of State Water is 5,000 acre-feet if all committed State Water should be made available for a given year. Casitas share would diminish according the percentage of State Water that is made available for any given year. At this time, the infrastructure to bring the State Water into western Ventura County has not been constructed. In 1988, the District, City of Ventura, and United Water Conservation District considered the feasibility of importing State water into Ventura County. The preferred pipeline project was estimated in 1987 to cost \$109 million dollars (ENR Index 6000). Casitas' cost would likely be a proportion of this overall cost. For example, if three other major water purveyors were involved with this project Casitas' cost would be 25% of the \$109 million total. Alternative methods of bringing State Water into the western Ventura County area were also considered in 1990 (Optimization Study of State Water Importation, Kennedy/Jenks/Chilton, May 1990). The alternative methods involved groundwater banking, interagency coordination, water transfers and exchanges. Water transfers and/or exchanges with other agencies in Ventura County that are associated with State Water Project may provide opportunities to shift away the reliance on Lake Casitas water during times of depleted water storage in Lake Casitas, provided other water resources (i.e. State water and local groundwater banks) are available during the extended drought period.



## **SECTION 2 – CONTENTS OF UWMP - STEP FIVE: TRANSFER AND EXCHANGE OPPORTUNITIES**

### **Semitropic Water Storage District:**

Semitropic Water Storage District has a program, which allows for the storage of water through groundwater banking. This program was put together a number of years ago for the purpose of developing the assets to assist both the Storage District's needs and those of outside interests. To date, six organizations have acquired banking rights in the water-banking project. These organizations have acquired a little more than one million acre-feet in storage rights. There are still approximately 450,000 acre-feet of storage rights available.

The way that the operation works is that the water is either recharged into the area or not used by overlying groundwater rights holders. They use surface water instead of groundwater. This resulted in a net increase in storage in the area. The facilities not only bring the water in but take it out as well. The recovery program requires a number of wells capable of pumping the water back into the delivery system to others such as the State Water canal. This usually means a number of water offsets with other organizations so that the water can be used by the water agency banking their water. The water placed in the ground is in trust for those agencies that have placed it with the Semitropic Water Storage District. The District makes a report on the amount of water in the Bank every two years and on the impacts of moving the water in and out.

The costs of being a part of the Semitropic Water Bank includes fees for transferring water into storage at about \$63 dollars per acre-foot and for the cost of taking the water out of storage at \$63 dollars per acre-foot plus energy costs. There are also operation and maintenance fees and probably the cost of buying the water. The facilities have the capability of providing up to 356,000 acre-feet of dry year supply and can take in 315,000 acre-feet of surplus water per year. Additionally, a banking district could only recover about 95 percent of the water put into the Storage Bank. New shares in the Bank are available in the near future. The shares will allow certain types of recovery based upon priority and capacity.

Casitas may be interested in use of the Storage Bank. The water could come from the State Water Project (SWP) in that Casitas has an allocation of 5,000 acre-feet per year. The long-term cost of placing this water in the storage would be offset if the district needed the water in the future. In the past, between 0 and 100 percent of the water from the SWP has been available. If the district banks approximately 2,250 acre-feet per year, Casitas would have approximately 22,000 acre-feet in storage in 10 years. This water would be available in emergencies during water shortage situations. Some type of a contract with Metropolitan, Calleguas and Oxnard, or Santa Barbara would be necessary to deliver it.

The key issue here would be exactly how much water should be placed into such an account. This amount would be based upon the other solutions of an integrated water management plan. Other solutions could include such things as water conservation, the operation of other systems to reduce usage, conservation projects by other entities and agricultural evaluation programs to reduce water demand.



### **The State of Water Banking and Water Transfers:**

Water supply situations are not likely to improve. Water agencies are going to be looking for additional ways to store water when it is plentiful so that it will be available when it is not. It is unlikely that additional large water projects will be developed. The solution therefore lies in using the water that is available through existing projects more effectively than it is currently being used. Among the items that are likely to limit water availability from existing projects are changes in the requirements for endangered species, limits on one's ability to move water, water quality, and difficulty in getting permits within a reasonable amount of time.

### **Water Transfers and Banking in Reclamation Projects:**

A discussion was held with Ms. Cheryl Carter, from the United States Bureau of Reclamation on water transfers. It was her position that agencies that transferred water through federal projects need federal approval. There is usually a requirement in the contracts for the facilities that requires this approval. If it is within the contract, you need to follow that contract. If there are water transfers with Reclamation water, then one must follow policies of Reclamation. This tends to indicate that Casitas may have water transfer and banking issues with Reclamation. Before entering an agreement on water transfer, Casitas should discuss the issue with Reclamation.

### **Water Banking within the Casitas Boundaries:**

Another potential for water banking is to investigate the ability to do so with existing groundwater aquifers in the Upper Ojai or Ojai. There have already been requests by customers who feel that water spreading should be reestablished.

### **Use of State Water to re-charge Groundwater and then Recovery:**

The first option explored by the City of Ventura was the suggestion that Casitas run its share of SWP water down the Santa Clara River to be captured by the United Water Conservation District's spreading grounds for the replenishment of the Fox Canyon groundwater aquifer. The water would then be withdrawn by the City of Ventura and offset against the purchases from Casitas. It was expected that in a dry year that little water would get through and all would be lost in transit. During a wet year, recovery could be between 80 to 85 percent. There was a discussion about whether this method was permitted. United Water Conservation District indicated that they felt the Fox Canyon GMA would permit it in the end. In addition to the cost of buying the state water, there would also be a cost of approximately \$250 per acre-foot to produce and treat the water from groundwater by the city. It was felt that it would be better to have some water than no water at all. It appeared that there was some discussion about doing this method with the City of Oxnard and that it would cost about \$500 per acre-foot. That would be including the cost of the water, the loss during transit, and pumping by the city. This project may require environmental review because it will pump water out of the Fox Canyon Groundwater Management agency area, which might not be feasible.

### **Transfer Water through multiple Agencies:**

This option is similar to the agreements that Santa Barbara set up in the early 1990's to transfer its state water up to their service area through the City of Ventura. This option requires a number of political agreements and probably requires California Environmental Quality Act (CEQA) review for these agreements. This option can produce better quality water at a higher cost. This option also uses more energy than other options. The cost of water to Santa Barbara agencies was about \$1000 per acre-foot in 1991 dollars plus there would be the cost of an interconnecting pipeline.

### **Install the State Water Project:**

This option was looked at in the early 1990s and would cost approximately \$90 million. The EIR was completed but it is probably in need of an update. This option would probably cost \$1000 per acre-foot of water.

### **The use of City Credits in Groundwater:**

The City of Ventura indicated they probably have 30,000 acre-feet of credits in the Fox Canyon Groundwater aquifer. There was some feeling that these credits may never be used. It was felt that they might be used conjunctively to provide flexibility in purchase agreements. This water could be used if it was offset against the nonuse of Casitas' water. It was noted that current in district use for the city is about 8,000 acre-feet per year. The city only buys approximately 6,000 acre-feet per year. This option may also require a CEQA review for an agreement. It was felt that this option might be better to do now when there is plenty of water than when there is a drought. It was felt that the city would like to have a right to the extra 2,000 acre-feet of water that is used in the city without having to purchase it from Casitas. They felt that this would require a change in the bottom end of the agreement. A small step in this direction may be the first reasonable action. The city would want to be paid for water quality and maintenance cost.

### **Use of Sanitary District Water:**

The City of Ventura has asserted their ownership over any water that would be discharged by the sanitary plant as a part of their agreement for the land. It was felt that they could apply for a grant to study this alternative. The current available grant would pay fifty percent of the cost of the plan. The Ojai Valley Sanitary District had some limits to the amount of water that they could provide. A grant application was submitted in June 2005 to the State Water Resources Control Board. It was anticipated that the cost of that study would be \$150,000. Instead of having treated water supplying a local oil company, as much as 1,000 acre-feet of water per year could be offset by using Sanitary District water to supply the oil company. One oil company is willing to use that water, offsetting about 600 acre-feet of water per year from Lake Casitas in the process. The cost associated with studying this option is cheap since the pipeline is in place and there is a willing customer. There may be some charge for additional treatment and maintenance. The City of Ventura would be willing to share some of the cost of the analysis. There was some concern that this option could be controversial, but they were willing to go to the State Water Resources Control Board and negotiate for grant funding.

### **Water Transfer from Carpinteria Valley Water District**

During the June 23, 2004 meeting, the Board of Directors approved a contract with Carpinteria Valley Water District for the purchase of 500 acre-feet of water between July 2, 2004 and June 30, 2005. The cost of this water was \$640 per acre-foot, which was anticipated to go up by at least five percent on July 1, 2004. Therefore, the total cost of the water was up to \$336,000. Furthermore, Casitas would have to install a pump station with probable treatment with chloramines costing between \$20,000 and \$60,000. The total cost for the water is therefore close to \$400,000.

The safe yield is a 21-year period. Carpinteria water purchased and then stored in Lake Casitas would be subject to depreciation due to evaporation. This would not be the case if water was added directly into Casitas' distribution system. The draft water supply and demand study shows that over the safe yield period, there is a mean average loss of 2,634 acre-feet per year and a mean average storage of 96,971 acre-feet. Thus, the mean average lake loss of water is 2.7 (2,634 a.f./96,971 a.f.) percent per year. Assuming average usage, there would be 250 acre-feet in the lake over the long-term drought. Thus about 108 (250x2.7%<sup>0</sup>x16) acre-feet would evaporate over the long-term drought.

During the July 14, 2004 Casitas Board of Directors meeting, the Board requested staff to:

- Develop some history regarding capital facility charges and how they were set;
- Report back on the action of Carpinteria Valley Water District on their actions;
- Develop a water rate, which would pay for the water excluding agriculture.
- The history of the Mira Monte well capital facilities charge that is the costs of putting the well into operation and a blending pipeline were combined and divided by the amount of water available from the well. This resulted in a cost of about \$1,000 per acre-foot and was charged directly to new customers coming on line.

Staff discovered that Carpinteria was going to sell the water to Montecito rather than to Casitas. Carpinteria indicated to the General Manager that their Board wanted to give Montecito first refusal under all conditions. Casitas moved ahead as quickly as possible, but could not clear CEQA in time. **THIS SHOULD NOT PREVENT CASITAS FROM PROCEEDING ON THE INTERTIE AND RELEASING WATER TO OUR CUSTOMERS.** There are several reasons for Casitas to continue to pursue this effort. First, Casitas has raised the expectation to those waiting on our allocation priority list, those people waiting to receive new water allocations, that there is no fault with the methodology that Casitas is using to provide them with water, only with the timing. That is Casitas has decided to provide new allocations with the expectation that Casitas will purchase additional water supply in the future. Second, Casitas has 16 more years of water in the lake under the safe yield methodology. History shows that there are large rainfalls even during a drought, which would likely not fill Casitas since it is not on the river, but could fill Lake Cachuma because it is on a river. This would likely set the stage for a sale to Casitas when neither Carpinteria nor Montecito need the water. If Casitas were prepared to take the water, operational issues aside, Casitas would get the water. Finally, other solutions may present themselves during the time Casitas is waiting to purchase water. This may result in different economics, but at least Casitas can begin to serve water to those waiting on the priority list for new allocations.



## SECTION 2 – CONTENTS OF UWMP - STEP SIX: WATER USE BY CUSTOMER-TYPE – PAST, CURRENT AND FUTURE

Water demand from Lake Casitas includes water delivered to Casitas' customers, minor losses in the distribution system due to leaks, and flushing of the system for water quality maintenance. Casitas water demand can vary dramatically from year to year. Historical releases range from a minimum of 656 acre-feet during the first year of operation in 1959 to a maximum of 26,253 acre-feet in 1989. Demand is closely tied to rain conditions. During wet years there is a major reduction in water demand compared to dry years. During dry years, demand can increase dramatically when local groundwater sources utilized by agriculture and other customers are no longer available. These customers then must rely more on Casitas' surface water. Table 12 illustrates past, current, and projected water demand from 2000 to 2030 in acre-feet per year. Water demands for 2000 are actual water sales. Future demand projections are calculated using linear regression analysis that relies on actual usage from past years starting in 1976 except for industrial customers it was calculated since 1999. Industrial usage has been significantly increasing in the last few years and a longer-term data would have shown a decreasing trend instead of an increasing trend which is a more likely scenario.

In 1989, Casitas' supply and demand studies indicated that demand was approaching the safe annual yield and any significant increase above existing levels could ultimately lead to demand out-stripping supplies. A continued water supply deficit could lead to future supply shortages during long-term drought conditions. In 1992, Casitas' Water Efficiency and Allocation Program was adopted by the District's Board of Directors to encourage efficient use of water and to reduce demand to ensure the safe annual yield of supply would not exceed the critical 21,920 acre-feet per year average (as it was determined at that time). Average demand is not anticipated to increase above the current safe yield of 20,840 that is derived from the Water Supply and Use Status Report completed in December of 2004. Steps are being taken by the District to limit future demand including changes in the District's allocation program. Furthermore, the Ojai City Council adopted a new growth management plan that restricts housing and population growth to less than 1 percent annually through 2010.

### **Regression Analysis:**

Regression analysis is a statistical term where one or more variables are measured to predict a pattern for how those variables will likely react or occur in the future. In other words, past data can allow us to predict future data. The word 'regression' literally means 'a move backwards,' but in statistics it can be viewed to mean 'a move forward.' Casitas has gathered data on past water usage by all customer groups. Linear regression allows us to use this data to create a graph line that can show a trend toward future water usage for all of our customers. A line formula is developed using regression analysis to plot a trend line for future water usage ( $y = x + 1$ , where  $y$ =water usage,  $x$ =year,  $1$ = where the line intercepts graph lines, and the number before the  $x$  = the slope of the line.) This line is created using past annual water usage for each customer group. The line can help us predict future water usage trends for our customers with all things being equal. Some of Casitas' customer groups have particular circumstances that have influenced past usage that may make this analysis less reliable as a predictor for future water usage. For example, an inaccurate prediction for how fast business' water usage would grow in the future would result if there had been a surge in water usage in the past due to a large number of new businesses created from a large business development project, that could not be repeated in the future because of limited places for building such development. There could

also be things that could happen in the future that may change how water usage was used in the past. The following explanations on the predicted future water usages for each customer group explains the results of the regression analysis performed. It then explains what other possible variables could influence these results. This analysis provides us with some reliable guidance methodology that we can use to help us determine the most likely changes to expect in future water usage among all of our customers.

### **Customer Classification:**

**Residential Classification** – Residential customers are typically single-family residences. The residential classification also includes a limited amount of multi-residential accounts. Residential customers average three persons per connection. Total per capita water use for Casitas’ direct residential accounts averages 157 gallons per capita per day. Casitas is providing additional residential allocations if additional water supply is identified. Casitas is also implementing water conservation best management practices that are likely to reduce water usage as well. Linear regression analysis ( $y=39.7x + 685.8$  where  $1976 = 1$ ,  $x$ =year,  $y$ =usage) indicates a trend of increasing usage but these projections might be an exaggeration because there is a limited amount of growth in new housing that is expected.

**Agricultural Classification** – The Bureau of Reclamation has classified approximately 12,500 acres of land as agricultural within Casitas’ district boundaries. Casitas provides about 5,700 acres irrigated lands with water. Some agricultural lands are served by well water or receive water from other water agencies. Some rely on those other sources of water for only part of the time and then receive supplemental water from Casitas. Agricultural acreage within the District is primarily made up of avocado and citrus orchards. There is a limited amount of flowers, strawberries, apples and walnuts. Agricultural demand fluctuates depending on weather conditions, but generally averages two and a half acre-feet per acre for inland areas and two acre-feet per acre on the coast per year. The portion of Lake Casitas’ safe annual yield allocated to agricultural has been 8,880 acre-feet or 44 percent of the safe annual yield. Agricultural is not expected to increase over the next twenty years and may even slightly decrease. The cost of purchasing new water allocations is cost prohibitive for most agricultural interests. Casitas is implementing the Significant Watering Efficiency Assistance Program (SWEAP) to assist agricultural customers in improving irrigation efficiencies. SWEAP will also implement a tiered pricing rate for agricultural customers that will encourage greater efficiency as well. Linear regression analysis ( $y=76.9x + 6,063.1$  where  $1976 = 1$ ,  $x$ =year,  $y$ =usage) indicates a slight growth in water demand but this may not be the case because Casitas is taking steps as described above to increase incentives for greater agriculture water use efficiencies.

**Business Classification** – Businesses directly served by the District range from small restaurants, gas stations, beauty shops and small strip malls to two local golf courses. Casitas is implementing water conservation best management practices that are likely to reduce some water usage. Casitas does not anticipate any growth in this area even though linear regression analysis ( $y=9.89x + 428.4$  where  $1976 = 1$ ,  $x$ =year,  $y$ =usage) shows a slight trend toward increasing usage.

**Industrial Classification** – A limited number of industrial customers are served directly by the District. Industrial services are primarily oil field and gas production facilities. High-pressure water injection for oil recovery is the primary use of the industrial demand. The changes in the economics of the oil industry may result in greater oil pumping by Casitas’ customers, which will likely mean that there will be greater water usage in this sector, which is the trend since 1999. The linear regression trend line ( $y = 11.396x + 60$ , where  $1999=1$ ,  $x$ =year,  $y$ =usage) indicates that usage will increase significantly over the next thirty years.

**Interdepartmental Classification** – This classification is for the District’s own services, which includes the Lake Casitas Recreation Area, Dam tender’s house, and Casitas’ office and maintenance building.

Institutional/government – This classification includes government and non-profit organizations. The linear regression trend line ( $y = -7.1x + 612.2$  where  $1976 = 1$ ,  $x = \text{year}$ ,  $y = \text{usage}$ ) indicates a slight decrease in usage in the future. It is likely to remain stabilized because there is not likely to be a decrease in the number of institutions.

Multi-family and landscape – Casitas does not currently separate customer accounts with these categories.

The projections for the number of future customer accounts in Table 12 were done utilizing regression analysis. Again, this may over estimate the number of potential future accounts because of the limited build out available in the service area. It is very unlikely there will be any significant increase in the number of new agriculture accounts given the cost to purchase new water allocations so the projections included in Table 12 do not show any increase in the number of agriculture accounts.

**PAST, CURRENT AND PROJECTED WATER DELIVERIES (TABLE 12)**

<i>Year</i>		<i>Water Use Sectors</i>	<i>Single family</i>	<i>Multi-family</i>	<i>Com-mercial</i>	<i>Indust-rial</i>	<i>Instit/-gov</i>	<i>Land-scape</i>	<i>Ag</i>	<i>Total</i>
<b>2000</b>	Metered	# of accounts	2,594	0	97	10	91	0	260	2,961
		Deliveries AF/Y	1,826	0	638	91	533	0	9,115	12,243
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0
<b>2005</b>	Metered	# of accounts	2,682	0	107	12	97	0	260	3,056
		Deliveries AF/Y	1,877	0	725	170	399	0	8,370	11,541
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0
<b>2010</b>	Metered	# of accounts	2,811	0	116	12	105	0	260	3,156
		Deliveries AF/Y	2,076	0	775	197	364	0	8,755	12,167
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0
<b>2015</b>	Metered	# of accounts	2,925	0	125	12	113	0	260	3,156
		Deliveries AF/Y	2,275	0	824	254	328	0	9,139	12,820
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0
<b>2020</b>	Metered	# of accounts	3,038	0	135	13	121	0	260	3,156
		Deliveries AF/Y	2,473	0	874	311	293	0	9,524	13,475
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0
<b>2025</b>	Metered	# of accounts	3,152	0	144	13	129	0	260	3,156
		Deliveries AF/Y	2,672	0	923	368	257	0	9,908	14,128
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0
<b>2030 /opt</b>	Metered	# of accounts	3,266	0	153	13	137	0	260	3,156
		Deliveries AF/Y	2,870	0	972	425	222	0	10,293	14,782
	unmetered	# of accounts	0	0	0	0	0	0	0	0
		Deliveries AF/Y	0	0	0	0	0	0	0	0



## **SECTION 2 – CONTENTS OF UWMP - STEP SIX: WATER USE BY CUSTOMER – TYPE – PAST, CURRENT AND FUTURE (CONTINUED)**

Resale Classification – Casitas sells water to other agencies and cities within Casitas’ boundaries that purchase Casitas water to supplement their own supplies. Casitas has worked with resale agencies to maintain limits on demand. However, demand is closely tied to rain conditions. During wet years there is a major reduction in water demand compared to dry years. During dry years, demand can increase dramatically when local groundwater sources utilized by resale customers are no longer available. These customers then must rely more on Casitas’ surface water and in some cases exclusively.

Projections for future water usage were made utilizing regression analysis, a math term that predicts future usage by using past usage data. In this case, water usage data starting from the 1995-96 Fiscal Year was used to determine trends. There are many variables that can change demand for water dramatically among resale agencies. For example, the Casitas Mutual Water Company like many of the other resale agencies relies on groundwater as their primary source of water. They usually take between zero and three acre-feet of water per year from Casitas but in 1995-96 they took 55.9 acre-feet of water because their well had become contaminated. Casitas is considered the backup source of water for the resale customers so during a drought when wells run dry demand for Casitas’ water can increase dramatically from most resale agencies. This can make it difficult to predict future usage because it relies so much on weather patterns and individual circumstances. However, regression analysis is a good method to predict future water usage in conjunction with an analysis of other known variables. It can help predict possible trends that might not otherwise be noticed.

1. Casitas Mutual Water Company – The linear regression line derived from past usage data ( $y=3x + 23.3$ , where  $x$ =years, 1995-96 FY =1,  $y$ =water usage in acre-feet) indicates that future water usage will slowly drop off to zero. Usage is predicted to diminish but at any given moment this usage could go up to nearly 60 acre-feet per year if something should happen to their ability to use their primary well water as happened in 1995-96. Again, this could be due to drought, a problem with the well, or contaminates found in the groundwater.
2. Ventura River Water County Water – The linear regression line derived from past usage data ( $y=17.1x + 66$ , where  $x$  = years, 1995-96 FY = 1,  $y$  = water usage in acre-feet) indicates a gradual increase in usage but this is probably not likely to happen. Past demand for water from Casitas has fluctuated from 74.4 to 335.4 acre-feet of water per year. This fluctuation appeared to be based on rainfall more than any other variable. There is no other variable that is likely to create an increasing linear demand.
3. City of Ventura – The linear regression line ( $y=17.1x + 6,202$ , where  $x$ =years, 1997-98 FY =1,  $y$ = water usage in acre-feet) indicates a gradual increase in water demand from Casitas but this is also likely a faulty prediction. There is a contract for the city to purchase 6,000 acre-feet per year and normally the amount purchased does not significantly vary from this figure. The much smaller water purchases during the years 1995-96 and 1996-97 were taken out of the linear equation to prevent a distortion of future projections. The water purchases during those two years were prior to the existing 6,000 acre-feet per year agreement between Casitas and the city.



4. Tico Mutual Water Company – The linear regression line ( $y = -1.1x + 15.8$ , where  $x = \text{years}$ , 1996-97 FY = 1,  $y = \text{water usage in acre-feet}$ ) indicates a decreasing usage that goes to zero by 2015 but this is not likely correct. Past usage appears somewhat random or rain dependent rather than indicating a decreasing pattern. The 1995-96 FY was taken out of the linear equation because there was no service connection at that time.
5. Southern California Water Company – The linear regression line ( $y = 1.8x + 451.6$ , where  $x = \text{years}$ , 1995-96 FY = 1,  $y = \text{water usage in acre-feet}$ ) indicates a gradual increase in usage. Demand appears somewhat random or rainfall dependent so this increasing trend may be somewhat inaccurate.
6. Meiners Oaks County Water – The linear regression line ( $y = .65x - 2.1$  where  $x = \text{years}$ , 1995-96 FY = 1,  $y = \text{water usage in acre-feet}$ ) shows a gradual increase in usage. This is most certainly incorrect. Water usage from Meiners Oaks is usually zero and has historically occurred only during drought periods when their groundwater sources have diminished.
7. Hermitage Mutual Water Company – The linear regression line ( $y = 7.5x + 653.9$  where  $x = \text{years}$ , 1995-96 FY = 1,  $y = \text{water usage in acre-feet}$ ) points to an ever-increasing water usage demand. There appears to be a slight trend toward greater demand but their usage is also linked to rainfall. When it is dry they tend to rely more on Casitas water.
8. Sisar Mutual Water Company – The linear regression line ( $y = .025x + 4.8$  where  $x = \text{years}$ , 1996-97 FY = 1,  $y = \text{water usage in acre-feet}$ ) shows a slight increase in usage. Their water usage fluctuates considerably from year to year so this may skew any ability to predict that there is a general increase in usage occurring.
9. Siete Robles Mutual Water Company – The linear regression line ( $y = -1.6x + 42.5$ , where  $x = \text{years}$ , 1995-96 FY = 1,  $y = \text{water usage in acre-feet}$ ) indicates a gradual decrease in demand for Casitas water but they recently repaired a well and their usage has dropped almost to zero during the 2004-05 period. Their demand is expected to stay low unless there should be a water quality issue with their groundwater or drought diminishes their capacity to pump their well water.

**SALES TO OTHER AGENCIES – AF/YEAR (TABLE 13)**

<i>Water Distributed</i>	<i>2000</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
<b>Casitas Mutual Water Company</b>	0	3.6	0	0	0	0	0
<b>Ventura River County Water</b>	108.2	333.7	323.2	408.9	494.6	563.2	648.9
<b>City of Ventura</b>	5,928.4	6,970	6,460.9	6,547.0	6,633.1	6,701.9	6,788.0
<b>Tico Mutual Water Company</b>	12.47	8.0	0	0	0	0	0
<b>Southern California Water Company</b>	496.5	584.5	478.7	487.8	496.8	504.1	513.1
<b>Meiners Oaks Water District</b>	0	8.3	7.6	10.8	14.1	16.6	19.9
<b>Hermitage Mutual Water Company</b>	642.7	575.3	766.5	804.0	841.6	871.6	909.1
<b>Sisar Mutual Water Company</b>	1.4	6	5.2	5.3	5.5	5.6	5.7
<b>Siete Robles Mutual Water Company</b>	68.3	0	18.5	10.5	2.5	0	0
<b>Total</b>	7,257.97	8,489.4	8,060.6	8,274.3	8,488.2	8,663	8,925.7

Casitas lost 6.2 acre-feet of water from calculated leaks in 2004-05 FY. This has been an average year for leaks so it is projected that future losses will remain approximately 6 acre-feet per year. Flushing averaged in 2005 at about a 15 acre-feet loss, which is a typical systematic procedure so it should not vary from one year to the next by any significant amount.

**ADDITIONAL WATER USES AND LOSSES – AF/YEAR (TABLE 14)**

<i>Water Use</i>	<i>2000</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
<b>Saline barriers</b>	0	0	0	0	0	0	0
<b>Groundwater recharge</b>	0	0	0	0	0	0	0
<b>Conjunctive use</b>	0	0	0	0	0	0	0
<b>Raw water</b>	0	0	0	0	0	0	0
<b>Recycled</b>	0	0	0	0	0	0	0
<b>Other (define) Flushing</b>	15	15	15	15	15	15	15
<b>Unaccounted-for system losses</b>	UNK	6.2	6	6	6	6	6
<b>Total</b>	15	21.2	21	21	21	21	21.

**TOTAL WATER USE – AF/YEAR (TABLE 15)**

<i>Water Use</i>	<i>2000</i>	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
<b>Sum of Tables 11, 12, and 13</b>	19,501	19,936	20,074	20,861	21,673	22,444	23,304

Total water use is the sum of water use by customer categories, sales to other agencies and additional water uses.



## SECTION 2 – CONTENTS OF UWMP - STEP SEVEN: DEMAND MANAGEMENT MEASURES: CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC) 2003-04 COVERAGE REPORT

Reported as of 9/19/05

### BMP 01 Coverage: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: **Casitas Municipal Water District**      Reporting Period: **03-04**

MOU Exhibit 1 Coverage Requirement	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

A Reporting Unit (RU) must meet three conditions to satisfy strict compliance for BMP 1.

Condition 1: Adopt survey targeting and marketing strategy on time

Condition 2: Offer surveys to 20% of SF accounts and 20% of MF units during report period

Condition 3: Be on track to survey 15% of SF accounts and 15% of MF units within 10 years of implementation start date.

---

#### Test for Condition 1

Casitas Municipal Water District to Implement Targeting/Marketing Program by:	1999		
	<u>Single-Family</u>	<u>Multi-Family</u>	
Year Casitas Municipal Water District Reported Implementing Targeting/Marketing Program:			
Casitas Municipal Water District Met Targeting/Marketing Coverage Requirement:	NO	NO	

---

#### Test for Condition 2

---

		<u>Single-Family</u>	<u>Multi-Family</u>
Survey Program to Start by:	1998	Residential Survey Offers (%)	
Reporting Period:	03-04	Survey Offers $\geq$ 20%	NO

**Test for Condition 3**

	Completed Residential Surveys	
	<u>Single Family</u>	<u>Multi-Family</u>
Total Completed Surveys 1999 - 2004: Past Credit for Surveys Completed Prior to 1999 (Implementation of Reporting Database):		
Total + Credit		
Residential Accounts in Base Year	2,484	
Casitas Municipal Water District Survey Coverage as % of Base Year Residential Accounts		
Coverage Requirement by Year 7 of Implementation per Exhibit 1	7.90%	7.90%
Casitas Municipal Water District on Schedule to Meet 10-Year Coverage Requirement	NO	NO

**BMP 1 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 02 Coverage: Residential Plumbing Retrofit**

Reporting Unit: **Casitas Municipal Water District**      Reporting Period: **03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one of three conditions to satisfy strict

compliance for BMP 2.

Condition 1: The agency has demonstrated that 75% of SF accounts and 75% of MF units constructed prior to 1992 are fitted with low-flow showerheads.

Condition 2: An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area.

Condition 3: The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family accounts and 10% of multi-family units constructed prior to 1992 during the reporting period.

---

**Test for Condition 1**

---

<u>Report Year</u>	<u>Report Period</u>	<u>Single-Family</u>		<u>Multi-Family</u>	
		<u>Reported Saturation</u>	<u>Saturation ≥ 75%?</u>	<u>Reported Saturation</u>	<u>Saturation ≥ 75%?</u>
1999	99-00	4.00%	NO		NO
2000	99-00	8.00%	NO		NO
2001	01-02		NO		NO
2002	01-02		NO		NO
2003	03-04		NO		NO
2004	03-04		NO		NO

---

**Test for Condition 2**

---

<u>Report Year</u>	<u>Report Period</u>	<u>Casitas Municipal Water District has ordinance requiring showerhead retrofit?</u>
1999	99-00	NO
2000	99-00	NO
2001	01-02	YES
2002	01-02	YES
2003	03-04	YES
2004	03-04	YES

---

**Test for Condition 3**

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Reporting Period: 03-04

<u>1992 SF Accounts</u>	<u>Num. Showerheads Distributed to SF Accounts</u>	<u>Single-Family Coverage Ratio</u>	<u>SF Coverage Ratio &gt; 10%</u>
2,496			NO
<u>1992 MF Accounts</u>	<u>Num. Showerheads Distributed to MF Accounts</u>	<u>Multi-Family Coverage Ratio</u>	<u>MF Coverage Ratio &gt; 10%</u>

---

**BMP 2 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

**BMP 03 Coverage: System Water Audits, Leak Detection and Repair**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **03-04**

<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one of two conditions to be in compliance with BMP 3:

Condition 1: Perform a prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done.

Condition 2: Perform a prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.

**Test for Conditions 1 and 2**

<u>Report Year</u>	<u>Report Period</u>	<u>Pre-Screen Completed</u>	<u>Pre-Screen Result</u>	<u>Full Audit Indicated</u>	<u>Full Audit Completed</u>
1999	99-00	NO			NO
2000	99-00	NO			NO
2001	01-02	NO			NO
2002	01-02	NO			NO
2003	03-04	NO			NO
2004	03-04	YES	93.1%	No	NO

**BMP 3 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

**BMP 04 Coverage: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **03-04**

<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	Yes

---

An agency must be on track to retrofit 100% of its unmetered accounts within 10 years to be in compliance with BMP 4.

---

**Test for Compliance**

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Total Meter Retrofits Reported through 2004  
No. of Unmetered Accounts in Base Year  
Meter Retrofit Coverage as % of Base Year Unmetered Accounts  
Coverage Requirement by Year 6 of Implementation per Exhibit 1 42.0%  
RU on Schedule to meet 10 Year Coverage Requirement YES

---

**BMP 4 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

<b>BMP 05 Coverage: Large Landscape Conservation Programs and Incentives</b>	
Reporting Unit: <b>Casitas Municipal Water District</b>	Reporting Period: <b>03-04</b>
<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

An agency must meet three conditions to comply with BMP 5.

Condition 1: Develop water budgets for 90% of its dedicated landscape meter accounts within four years of the date implementation is to start.

Condition 2: (a) Offer landscape surveys to at least 20% of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15% of its CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters.

Condition 3: Implement and maintain customer incentive program(s) for irrigation equipment retrofits.

---

**Test for Condition 1**

---

<u>Year</u>	<u>Report Period</u>	<u>BMP 5 Implementation Year</u>	<u>No. of Irrigation Meter Accounts</u>	<u>No. of Irrigation Accounts with Budgets</u>	<u>Budget Coverage Ratio</u>	<u>90% Coverage Met by Year</u> <u>4</u>
1999	99-00	1				NA
2000	99-00	2				NA
2001	01-02	3				NA
2002	01-02	4				No
2003	03-04	5				No
2004	03-04	6				No

---

**Test for Condition 2a (survey offers)**

---

Select Reporting Period:	03-04
Large Landscape Survey Offers as % of Mixed Use Meter CII Accounts	
Survey Offers Equal or Exceed 20% Coverage Requirement	NO

---

**Test for Condition 2a (surveys completed)**

---

Total Completed Landscape Surveys Reported through	
Credit for Surveys Completed Prior to Implementation of Reporting Database	
Total + Credit	
CII Accounts in Base Year	131
RU Survey Coverage as a % of Base Year CII Accounts	
Coverage Requirement by Year of Implementation per Exhibit 1	6.3%
RU on Schedule to Meet 10 Year Coverage Requirement	NO

---

**Test for Condition 2b (mixed use budget or meter retrofit program)**

---

<u>Report Year</u>	<u>Report Period</u>	<u>BMP 5 Implementation Year</u>	<u>Agency has mixed-use budget program</u>	<u>No. of mixed-use budgets</u>
1999	99-00	1	NO	



2000	99-00	2	NO
2001	01-02	3	NO
2002	01-02	4	NO
2003	03-04	5	NO
2004	03-04	6	NO

<u>Report Year</u>	<u>Report Period</u>	<u>BMP 4 Implementation Year</u>	<u>No. of mixed use CII accounts</u>	<u>No. of mixed use CII accounts fitted with irrig. Meters</u>
1999	99-00	1		
2000	99-00	2		
2001	01-02	3		
2002	01-02	4		
2003	03-04	5		
2004	03-04	6		

**Test for Condition 3**

<u>Report Year</u>	<u>Report Period</u>	<u>BMP 5 Implementation Year</u>	<u>RU offers financial incentives?</u>	<u>No. of Loans</u>	<u>Total Amt. Loans</u>
1999	99-00	1	NO		
2000	99-00	2	NO		
2001	01-02	3	NO		
2002	01-02	4	NO		
2003	03-04	5	NO		
2004	03-04	6	NO		

<u>Report Year</u>	<u>Report Period</u>	<u>No. of Grants</u>	<u>Total Amt. Grants</u>	<u>No. of rebates</u>	<u>Total Amt. Rebates</u>
1999	99-00				
2000	99-00				
2001	01-02				
2002	01-02				
2003	03-04				
2004	03-04				

**BMP 5 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 06 Coverage: High-Efficiency Washing Machine Rebate Programs**

Reporting Unit: **Casitas Municipal Water District**      Reporting Period: **03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?	No
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An agency must meet one condition to comply with BMP 6.

Condition 1: Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.

**Test for Condition 1**

<u>Year</u>	<u>Report Period</u>	<u>BMP 6 Implementation Year</u>	<u>Rebate Offered by ESP?</u>	<u>Rebate Offered by RU?</u>	<u>Rebate Amount</u>
1999	99-00	1	NO	NO	
2000	99-00	2	NO	NO	
2001	01-02	3	NO	NO	
2002	01-02	4	NO	NO	
2003	03-04	5	NO	NO	
2004	03-04	6	NO	NO	

<u>Year</u>	<u>Report Period</u>	<u>BMP 6 Implementation Year</u>	<u>No. Rebates Awarded</u>	<u>Coverage Met?</u>
1999	99-00	1		YES
2000	99-00	2		YES
2001	01-02	3		YES
2002	01-02	4		YES
2003	03-04	5		YES
2004	03-04	6		YES

**BMP 6 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

<b>BMP 07 Coverage: Public Information Programs</b>	
Reporting Unit: <b>Casitas Municipal Water District</b>	Reporting Period: <b>03-04</b>
<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one condition to comply with BMP 7.

Condition 1: Implement and maintain a public information program consistent with BMP 7's definition.

---

**Test for Condition 1**

---

<u>Year</u>	<u>Report Period</u>	<u>BMP 7 Implementation Year</u>	<u>RU Has Public Information Program?</u>
1999	99-00	2	NO
2000	99-00	3	NO
2001	01-02	4	NO
2002	01-02	5	NO
2003	03-04	6	YES
2004	03-04	7	YES

---

**BMP 7 COVERAGE STATUS SUMMARY:**

**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 08 Coverage: School Education Programs**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one condition to comply with BMP 8.

Condition 1: Implement and maintain a school education program consistent with BMP 8's definition.

---

**Test for Condition 1**

---

<u>Year</u>	<u>Report Period</u>	<u>BMP 8 Implementation Year</u>	<u>RU Has School Education Program?</u>
1999	99-00	2	NO
2000	99-00	3	NO
2001	01-02	4	NO
2002	01-02	5	NO
2003	03-04	6	NO
2004	03-04	7	YES

**BMP 8 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 09 Coverage: Conservation Programs for CII Accounts**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet three conditions to comply with BMP 9.

Condition 1: Agency has identified and ranked by use commercial, industrial, and institutional accounts.

Condition 2(a): Agency is on track to survey 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of date implementation to commence.

OR

Condition 2(b): Agency is on track to reduce CII water use by an amount equal to 10% of baseline use within 10 years of date implementation to commence.

OR

Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.

**Test for Condition 1**

Year	Report Period	BMP 9 Implementation Year	Ranked Com. Use	Ranked Ind. Use	Ranked Inst. Use
1999	99-00	1	YES	YES	YES
2000	99-00	2	YES	YES	NO
2001	01-02	3	YES	YES	YES
2002	01-02	4	YES	YES	YES
2003	03-04	5	YES	YES	YES
2004	03-04	6	YES	YES	YES

**Test for Condition 2a**

Commercial Industrial Institutional

Total Completed Surveys Reported through 2004			
Credit for Surveys Completed Prior to Implementation of Reporting Databases			
Total + Credit			
CII Accounts in Base Year	96	14	21
RU Survey Coverage as % of Base Year CII Accounts			
Coverage Requirement by Year 6 of Implementation per Exhibit 1	4.2%	4.2%	4.2%
RU on Schedule to Meet 10 Year Coverage Requirement	NO	NO	NO

**Test for Condition 2a**

Year	Report Period	BMP 9 Implementation Year	Performance Target Savings (AF/yr)	Performance Target Savings Coverage	Performance Target Savings Coverage Requirement	Coverage Requirement Met
1999	99-00	1			0.5%	NO
2000	99-00	2			1.0%	NO
2001	01-02	3			1.7%	NO
2002	01-02	4			2.4%	NO
2003	03-04	5			3.3%	NO
2004	03-04	6			4.2%	NO

**Test for Condition 2c**

Total BMP 9 Surveys + Credit	
BMP 9 Survey Coverage	
BMP 9 Performance Target Coverage	
BMP 9 Survey + Performance Target Coverage	
Combined Coverage Equals or Exceeds Coverage Requirement?	NO

**BMP 9 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

## BMP 11 Coverage: Conservation Pricing

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **03-04**

### MOU Exhibit 1 Coverage Requirement

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

### An agency must meet one condition to comply with BMP 11.

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing.

Implementation methods shall be at least as effective as eliminating non-conserving 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.

a) Non-conserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates); rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.

b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the longrun marginal cost or the cost of adding the next unit of capacity to the system.

### Test for Condition 1

<u>Year</u>	<u>Report Period</u>	<u>RU Employed Non Conserving Rate Structure</u>	<u>RU Meets BMP 11 Coverage Requirement</u>
1999	99-00	NO	YES
2000	99-00	NO	YES
2001	01-02	NO	YES
2002	01-02	NO	YES
2003	03-04	NO	YES
2004	03-04	NO	YES

### BMP 11 COVERAGE STATUS SUMMARY:

**Water supplier is meeting coverage requirements for this BMP.**

## BMP 12 Coverage: Conservation Coordinator

Reporting Unit:  
**Casitas Municipal Water District**

Reporting Period:  
**03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

---

**Test for Compliance**

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<u>Report Year</u>	<u>Report Period</u>	<u>Conservation Coordinator Position Staffed?</u>	<u>Total Staff on Team (incl. CC)</u>
1999	99-00	YES	1
2000	99-00	YES	1
2001	01-02	YES	1
2002	01-02	YES	2
2003	03-04	YES	2
2004	03-04	YES	2

---

**BMP 12 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 13 Coverage: Water Waste Prohibition**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **03-04**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

An agency must meet one condition to comply with BMP 13.

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

---

**Test for Condition 1**

---

**Agency or service area prohibits:**

<u>Year</u>	<u>Gutter Flooding</u>	<u>Single-Pass Cooling Systems</u>	<u>Single-Pass Car Wash</u>	<u>Single-Pass Laundry</u>	<u>Single-Pass Fountains</u>	<u>Other</u>	<u>RU has ordinance that meets coverage requirement</u>
1999	no	no	no	no	no	no	NO
2000	yes	no	no	no	yes	no	NO
2001	yes	no	no	no	no	yes	NO
2002	yes	no	no	no	no	no	NO
2003	yes	no	no	no	no	no	NO
2004	yes	no	no	no	no	no	NO

**BMP 13 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 14 Coverage: Residential ULFT Replacement Programs**

Reporting Unit: **Casitas Municipal Water District**

**MOU Exhibit 1 Coverage Requirement**

A Reporting Unit (RU) must meet one of the following conditions to be in compliance with BMP 14.

Condition 1: Retrofit-on-resale (ROR) ordinance in effect in service area.

Condition 2: Water savings from toilet replacement programs equal to 90% of Exhibit 6 coverage requirement.

An agency with an exemption for BMP 14 is not required to meet one of the above conditions. This report treats an agency with missing base year data required to compute the Exhibit 6 coverage requirement as out of compliance with BMP 14.

**Status: Water supplier is meeting coverage requirements for this BMP. as of 2004**

<u>Coverage Year</u>	<u>BMP 14 Data Submitted to CUWCC</u>	<u>Exemption Filed with CUWCC</u>	<u>ROR Ordinance in Effect</u>	<u>Exhibit 6 Coverage Req'mt (AF)</u>	<u>Toilet Replacement Program Water Savings* (AF)</u>
1998	No				
1999	Yes	No	Yes		
2000	Yes	No	Yes		
2001	Yes	No	Yes		
2002	Yes	No	Yes		
2003	Yes	No	Yes		
2004	Yes	No	Yes		0.32
2005	No	No	No		
2006	No	No	No		
2007	No	No	No		



\*NOTE: Program water savings listed are net of the plumbing code. Savings are cumulative (not annual) between 1991 and the given year. Residential ULFT count data from unsubmitted forms are NOT included in the calculation.

**BMP 14 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

**BMP 14 Coverage: Residential ULFT Replacement Programs**

Reporting Unit: **Casitas Municipal Water District**

**BMP 14 Coverage Calculation Detail:  
 Retrofit on Resale (ROR) Ordinance  
 Water Savings**

	Single Family	Multi-Family
<b>1992 Housing Stock</b>		
Average rate of natural replacement (% of remaining stock)	.04	.04
Average rate of housing demolition (% of remaining stock)	.005	.005
Estimated Housing Units with 3.5+ gpf Toilets in 1997	2037.29	
Average resale rate		
Average persons per unit		
Average toilets per unit		
Average savings per home (gpd; from Exhibit 6)	40.5	

**Single Family Housing Units**

<u>Coverage Year</u>	<u>Unretrofitted Houses</u>	<u>Houses Sold</u>	<u>Houses Unsold</u>	<u>Sold and Retrofitted</u>	<u>Sold and Already Retrofitted</u>	<u>Unsold and Retrofitted</u>	<u>Gross ROR Savings (AFY)</u>	<u>Nat'l Replacement Only Savings (AFY)</u>	<u>Net ROR Savings (AFY)</u>
1998	1956.21		2027.10			81.08	24.48	24.48	
1999	1878.35		2016.97			77.86	28.02	28.02	
2000	1803.59		2006.88			74.76	31.41	31.41	
2001	1731.81		1996.85			71.78	34.66	34.66	
2002	1662.88		1986.87			68.93	37.79	37.79	
2003	1596.70		1976.93			66.18	40.79	40.79	
2004	1533.15		1967.05			63.55	43.67	43.67	
2005	1472.13		1957.21			61.02	46.44	46.44	
2006	1413.54		1947.43			58.59	49.10	49.10	
2007	1357.28		1937.69			56.26	51.65	51.65	

**Multi Family Housing Units**

<u>Coverage</u> <u>Year</u>	<u>Unretrofitted</u> <u>Houses</u>	<u>Houses</u> <u>Sold</u>	<u>Houses</u> <u>Unsold</u>	<u>Sold and</u> <u>Retrofitted</u>	<u>Sold and</u> <u>Already</u> <u>Retrofitted</u>	<u>Unsold</u> <u>and</u> <u>Retrofitted</u>	<u>Gross</u> <u>ROR</u> <u>Savings</u> <u>(AFY)</u>	<u>Nat'l</u> <u>Replacement</u> <u>Only</u> <u>Savings</u> <u>(AFY)</u>	<u>Net ROR</u> <u>Savings</u> <u>(AFY)</u>
1998									
1999									
2000									
2001									
2002									
2003									
2004									
2005									
2006									
2007									



## SECTION 2 – CONTENTS OF UWMP STEP SEVEN: DEMAND MANAGEMENT MEASURES: CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC) 2001-2002 COVERAGE REPORT

Reported as of 9/19/05

### BMP 01 Coverage: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: <b>Casitas Municipal Water District</b>	Reporting Period: <b>01-02</b>
<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

A Reporting Unit (RU) must meet three conditions to satisfy strict compliance for BMP 1.

Condition 1: Adopt survey targeting and marketing strategy on time

Condition 2: Offer surveys to 20% of SF accounts and 20% of MF units during report period

Condition 3: Be on track to survey 15% of SF accounts and 15% of MF units within 10 years of implementation start date.

#### Test for Condition 1

Casitas Municipal Water District to Implement Targeting/Marketing Program by:	1999	
	<u>Single-Family</u>	<u>Multi-Family</u>
Year Casitas Municipal Water District Reported Implementing Targeting/Marketing Program:		
Casitas Municipal Water District Met Targeting/Marketing Coverage Requirement:	NO	NO

#### Test for Condition 2

		<u>Single-Family</u>	<u>Multi-Family</u>
Survey Program to Start by:	1998	Residential Survey Offers (%)	
Reporting Period:	01-02	Survey Offers $\geq$ 20%	NO

**Test for Condition 3**

	Completed Residential Surveys	
	<u>Single Family</u>	<u>Multi-Family</u>
Total Completed Surveys 1999 - 2002: Past Credit for Surveys Completed Prior to 1999 (Implementation of Reporting Database):		
Total + Credit		
Residential Accounts in Base Year	2,484	
Casitas Municipal Water District Survey Coverage as % of Base Year Residential Accounts		
Coverage Requirement by Year 5 of Implementation per Exhibit 1	4.90%	4.90%
Casitas Municipal Water District on Schedule to Meet 10-Year Coverage Requirement	NO	NO

**BMP 1 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 02 Coverage: Residential Plumbing Retrofit**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one of three conditions to satisfy strict

compliance for BMP 2.

Condition 1: The agency has demonstrated that 75% of SF accounts and 75% of MF units constructed prior to 1992 are fitted with low-flow showerheads.

Condition 2: An enforceable ordinance requiring the replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts is in place for the agency's service area.

Condition 3: The agency has distributed or directly installed low-flow showerheads and other low-flow plumbing devices to not less than 10% of single-family accounts and 10% of multi-family units constructed prior to 1992 during the reporting period.

---

**Test for Condition 1**

---

<u>Report Year</u>	<u>Report Period</u>	<u>Single-Family</u>		<u>Multi-Family</u>	
		<u>Reported Saturation</u>	<u>Saturation ≥ 75%?</u>	<u>Reported Saturation</u>	<u>Saturation ≥ 75%?</u>
1999	99-00	4.00%	NO		NO
2000	99-00	8.00%	NO		NO
2001	01-02		NO		NO
2002	01-02		NO		NO
2003	03-04		NO		NO
2004	03-04		NO		NO

---

**Test for Condition 2**

---

<u>Report Year</u>	<u>Report Period</u>	<u>Casitas Municipal Water District has ordinance requiring showerhead retrofit?</u>
1999	99-00	NO
2000	99-00	NO
2001	01-02	YES
2002	01-02	YES
2003	03-04	YES
2004	03-04	YES

---

**Test for Condition 3**

---

Reporting Period: 01-02

<u>1992 SF Accounts</u>	<u>Num. Showerheads Distributed to SF Accounts</u>	<u>Single-Family Coverage Ratio</u>	<u>SF Coverage Ratio &gt; 10%</u>
2,496			NO
<u>1992 MF Accounts</u>	<u>Num. Showerheads Distributed to MF Accounts</u>	<u>Multi-Family Coverage Ratio</u>	<u>MF Coverage Ratio &gt; 10%</u>

---

**BMP 2 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

**BMP 03 Coverage: System Water Audits, Leak Detection and Repair**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one of two conditions to be in compliance with BMP 3:

Condition 1: Perform a prescreening audit. If the result is equal to or greater than 0.9 nothing more needs be done.

Condition 2: Perform a prescreening audit. If the result is less than 0.9, perform a full audit in accordance with AWWA's Manual of Water Supply Practices, Water Audits, and Leak Detection.

**Test for Conditions 1 and 2**

<u>Report Year</u>	<u>Report Period</u>	<u>Pre-Screen Completed</u>	<u>Pre-Screen Result</u>	<u>Full Audit Indicated</u>	<u>Full Audit Completed</u>
1999	99-00	NO			NO
2000	99-00	NO			NO
2001	01-02	NO			NO
2002	01-02	NO			NO
2003	03-04	NO			NO
2004	03-04	YES	93.1%	No	NO

**BMP 3 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

**BMP 04 Coverage: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	Yes

---

An agency must be on track to retrofit 100% of its unmetered accounts within 10 years to be in compliance with BMP 4.

---

**Test for Compliance**

---

Total Meter Retrofits Reported through 2002  
No. of Unmetered Accounts in Base Year  
Meter Retrofit Coverage as % of Base Year Unmetered Accounts  
Coverage Requirement by Year 4 of Implementation per Exhibit 1 24.0%  
RU on Schedule to meet 10 Year Coverage Requirement YES

---

**BMP 4 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

<b>BMP 05 Coverage: Large Landscape Conservation Programs and Incentives</b>	
Reporting Unit: <b>Casitas Municipal Water District</b>	Reporting Period: <b>01-02</b>
<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

An agency must meet three conditions to comply with BMP 5.

Condition 1: Develop water budgets for 90% of its dedicated landscape meter accounts within four years of the date implementation is to start.

Condition 2: (a) Offer landscape surveys to at least 20% of its CII accounts with mixed use meters each report cycle and be on track to survey at least 15% of its CII accounts with mixed use meters within 10 years of the date implementation is to start OR (b) Implement a dedicated landscape meter retrofit program for CII accounts with mixed use meters or assign landscape budgets to mixed use meters.

Condition 3: Implement and maintain customer incentive program(s) for irrigation equipment retrofits.

---

**Test for Condition 1**

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<u>Year</u>	<u>Report Period</u>	<u>BMP 5 Implementation Year</u>	<u>No. of Irrigation Meter Accounts</u>	<u>No. of Irrigation Accounts with Budgets</u>	<u>Budget Coverage Ratio</u>	<u>90% Coverage Met by Year</u> <u>4</u>
1999	99-00	1				NA
2000	99-00	2				NA
2001	01-02	3				NA
2002	01-02	4				No
2003	03-04	5				No
2004	03-04	6				No

---

**Test for Condition 2a (survey offers)**

---

Select Reporting Period:	01-02
Large Landscape Survey Offers as % of Mixed Use Meter CII Accounts	
Survey Offers Equal or Exceed 20% Coverage Requirement	NO

---

**Test for Condition 2a (surveys completed)**

---

Total Completed Landscape Surveys Reported through	
Credit for Surveys Completed Prior to Implementation of Reporting Database	
Total + Credit	
CII Accounts in Base Year	131
RU Survey Coverage as a % of Base Year CII Accounts	
Coverage Requirement by Year of Implementation per Exhibit 1	3.6%
RU on Schedule to Meet 10 Year Coverage Requirement	NO

---

**Test for Condition 2b (mixed use budget or meter retrofit program)**

---

<u>Report Year</u>	<u>Report Period</u>	<u>BMP 5 Implementation Year</u>	<u>Agency has mixed-use budget program</u>	<u>No. of mixed-use budgets</u>
1999	99-00	1	NO	



2000	99-00	2	NO
2001	01-02	3	NO
2002	01-02	4	NO
2003	03-04	5	NO
2004	03-04	6	NO

<u>Report Year</u>	<u>Report Period</u>	<u>BMP 4 Implementation Year</u>	<u>No. of mixed use CII accounts</u>	<u>No. of mixed use CII accounts fitted with irrig. meters</u>
1999	99-00	1		
2000	99-00	2		
2001	01-02	3		
2002	01-02	4		
2003	03-04	5		
2004	03-04	6		

**Test for Condition 3**

<u>Report Year</u>	<u>Report Period</u>	<u>BMP 5 Implementation Year</u>	<u>RU offers financial incentives?</u>	<u>No. of Loans</u>	<u>Total Amt. Loans</u>
1999	99-00	1	NO		
2000	99-00	2	NO		
2001	01-02	3	NO		
2002	01-02	4	NO		
2003	03-04	5	NO		
2004	03-04	6	NO		

<u>Report Year</u>	<u>Report Period</u>	<u>No. of Grants</u>	<u>Total Amt. Grants</u>	<u>No. of rebates</u>	<u>Total Amt. Rebates</u>
1999	99-00				
2000	99-00				
2001	01-02				
2002	01-02				
2003	03-04				
2004	03-04				

**BMP 5 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 06 Coverage: High-Efficiency Washing Machine Rebate Programs**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed

Agency indicated "at least as effective as" implementation during report period?	No
--	----

An agency must meet one condition to comply with BMP 6.

Condition 1: Offer a cost-effective financial incentive for high-efficiency washers if one or more energy service providers in service area offer financial incentives for high-efficiency washers.

**Test for Condition 1**

<u>Year</u>	<u>Report Period</u>	<u>BMP 6 Implementation Year</u>	<u>Rebate Offered by ESP?</u>	<u>Rebate Offered by RU?</u>	<u>Rebate Amount</u>
1999	99-00	1	NO	NO	
2000	99-00	2	NO	NO	
2001	01-02	3	NO	NO	
2002	01-02	4	NO	NO	
2003	03-04	5	NO	NO	
2004	03-04	6	NO	NO	

<u>Year</u>	<u>Report Period</u>	<u>BMP 6 Implementation Year</u>	<u>No. Rebates Awarded</u>	<u>Coverage Met?</u>
1999	99-00	1		YES
2000	99-00	2		YES
2001	01-02	3		YES
2002	01-02	4		YES
2003	03-04	5		YES
2004	03-04	6		YES

**BMP 6 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

<b>BMP 07 Coverage: Public Information Programs</b>	
Reporting Unit: <b>Casitas Municipal Water District</b>	Reporting Period: <b>01-02</b>
<b>MOU Exhibit 1 Coverage Requirement</b>	
No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one condition to comply with BMP 7.

Condition 1: Implement and maintain a public information program consistent with BMP 7's definition.

---

**Test for Condition 1**

---

<u>Year</u>	<u>Report Period</u>	<u>BMP 7 Implementation Year</u>	<u>RU Has Public Information Program?</u>
1999	99-00	2	NO
2000	99-00	3	NO
2001	01-02	4	NO
2002	01-02	5	NO
2003	03-04	6	YES
2004	03-04	7	YES

---

**BMP 7 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 08 Coverage: School Education Programs**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet one condition to comply with BMP 8.

Condition 1: Implement and maintain a school education program consistent with BMP 8's definition.

---

**Test for Condition 1**

---

<u>Year</u>	<u>Report Period</u>	<u>BMP 8 Implementation Year</u>	<u>RU Has School Education Program?</u>
1999	99-00	2	NO
2000	99-00	3	NO
2001	01-02	4	NO
2002	01-02	5	NO
2003	03-04	6	NO
2004	03-04	7	YES

**BMP 8 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 09 Coverage: Conservation Programs for CII Accounts**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

An agency must meet three conditions to comply with BMP 9.

Condition 1: Agency has identified and ranked by use commercial, industrial, and institutional accounts.

Condition 2(a): Agency is on track to survey 10% of commercial accounts, 10% of industrial accounts, and 10% of institutional accounts within 10 years of date implementation to commence.

OR

Condition 2(b): Agency is on track to reduce CII water use by an amount equal to 10% of baseline use within 10 years of date implementation to commence.

OR

Condition 2(c): Agency is on track to meet the combined target as described in Exhibit 1 BMP 9 documentation.

**Test for Condition 1**

<u>Year</u>	<u>Report Period</u>	<u>BMP 9 Implementation Year</u>	<u>Ranked Com. Use</u>	<u>Ranked Ind. Use</u>	<u>Ranked Inst. Use</u>
1999	99-00	1	YES	YES	YES
2000	99-00	2	YES	YES	NO
2001	01-02	3	YES	YES	YES
2002	01-02	4	YES	YES	YES
2003	03-04	5	YES	YES	YES
2004	03-04	6	YES	YES	YES

**Test for Condition 2a**

Commercial Industrial Institutional

Total Completed Surveys Reported through 2002			
Credit for Surveys Completed Prior to Implementation of Reporting Databases			
Total + Credit			
CII Accounts in Base Year	96	14	21
RU Survey Coverage as % of Base Year CII Accounts			
Coverage Requirement by Year 4 of Implementation per Exhibit 1	2.4%	2.4%	2.4%
RU on Schedule to Meet 10 Year Coverage Requirement	NO	NO	NO

**Test for Condition 2a**

Year	Report Period	BMP 9 Implementation Year	Performance Target Savings (AF/yr)	Performance Target Savings Coverage	Performance Target Savings Coverage Requirement	Coverage Requirement Met
1999	99-00	1			0.5%	NO
2000	99-00	2			1.0%	NO
2001	01-02	3			1.7%	NO
2002	01-02	4			2.4%	NO
2003	03-04	5			3.3%	NO
2004	03-04	6			4.2%	NO

**Test for Condition 2c**

Total BMP 9 Surveys + Credit	
BMP 9 Survey Coverage	
BMP 9 Performance Target Coverage	
BMP 9 Survey + Performance Target Coverage	
Combined Coverage Equals or Exceeds Coverage Requirement?	NO

**BMP 9 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

**BMP 11 Coverage: Conservation Pricing**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

**An agency must meet one condition to comply with BMP 11.**

Agency shall maintain rate structure consistent with BMP 11's definition of conservation pricing.

Implementation methods shall be at least as effective as eliminating non-conserving 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.

a) Non-conserving pricing provides no incentives to customers to reduce use. Such pricing is characterized by one or more of the following components: rates in which the unit price decreases as the quantity used increases (declining block rates); rates that involve charging customers a fixed amount per billing cycle regardless of the quantity used; pricing in which the typical bill is determined by high fixed charges and low commodity charges.

b) Conservation pricing provides incentives to customers to reduce average or peak use, or both. Such pricing includes: rates designed to recover the cost of providing service; and billing for water and sewer service based on metered water use. Conservation pricing is also characterized by one or more of the following components: rates in which the unit rate is constant regardless of the quantity used (uniform rates) or increases as the quantity used increases (increasing block rates); seasonal rates or excess-use surcharges to reduce peak demands during summer months; rates based upon the longrun marginal cost or the cost of adding the next unit of capacity to the system.

**Test for Condition 1**

<u>Year</u>	<u>Report Period</u>	<u>RU Employed Non Conserving Rate Structure</u>	<u>RU Meets BMP 11 Coverage Requirement</u>
1999	99-00	NO	YES
2000	99-00	NO	YES
2001	01-02	NO	YES
2002	01-02	NO	YES
2003	03-04	NO	YES
2004	03-04	NO	YES

**BMP 11 COVERAGE STATUS SUMMARY:**

**Water supplier is meeting coverage requirements for this BMP.**

**BMP 12 Coverage: Conservation Coordinator**

Reporting Unit:  
**Casitas Municipal Water District**

Reporting Period:  
**01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

Agency shall staff and maintain the position of conservation coordinator and provide support staff as necessary.

---

**Test for Compliance**

---

<u>Report Year</u>	<u>Report Period</u>	<u>Conservation Coordinator Position Staffed?</u>	<u>Total Staff on Team (incl. CC)</u>
1999	99-00	YES	1
2000	99-00	YES	1
2001	01-02	YES	1
2002	01-02	YES	2
2003	03-04	YES	2
2004	03-04	YES	2

---

**BMP 12 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 13 Coverage: Water Waste Prohibition**

Reporting Unit: **Casitas Municipal Water District** Reporting Period: **01-02**

**MOU Exhibit 1 Coverage Requirement**

No exemption request filed	
Agency indicated "at least as effective as" implementation during report period?	No

---

An agency must meet one condition to comply with BMP 13.

Implementation methods shall be enacting and enforcing measures prohibiting gutter flooding, single pass cooling systems in new connections, non-recirculating systems in all new conveyer car wash and commercial laundry systems, and non-recycling decorative water fountains.

---

**Test for Condition 1**

---

**Agency or service area prohibits:**

<u>Year</u>	<u>Gutter Flooding</u>	<u>Single-Pass Cooling Systems</u>	<u>Single-Pass Car Wash</u>	<u>Single-Pass Laundry</u>	<u>Single-Pass Fountains</u>	<u>Other</u>	<u>RU has ordinance that meets coverage requirement</u>
1999	no	no	no	no	no	no	NO
2000	yes	no	no	no	yes	no	NO
2001	yes	no	no	no	no	yes	NO
2002	yes	no	no	no	no	no	NO
2003	yes	no	no	no	no	no	NO
2004	yes	no	no	no	no	no	NO

**BMP 13 COVERAGE STATUS SUMMARY:**  
**Water supplier has not met one or more coverage requirements for this BMP.**

Reported as of 9/19/05

**BMP 14 Coverage: Residential ULFT Replacement Programs**

Reporting Unit: **Casitas Municipal Water District**

**MOU Exhibit 1 Coverage Requirement**

A Reporting Unit (RU) must meet one of the following conditions to be in compliance with BMP 14.

Condition 1: Retrofit-on-resale (ROR) ordinance in effect in service area.

Condition 2: Water savings from toilet replacement programs equal to 90% of Exhibit 6 coverage requirement.

An agency with an exemption for BMP 14 is not required to meet one of the above conditions. This report treats an agency with missing base year data required to compute the Exhibit 6 coverage requirement as out of compliance with BMP 14.

**Status: Water supplier is meeting coverage requirements for this BMP. as of 2004**

<u>Coverage Year</u>	<u>BMP 14 Data Submitted to CUWCC</u>	<u>Exemption Filed with CUWCC</u>	<u>ROR Ordinance in Effect</u>	<u>Exhibit 6 Coverage Req't (AF)</u>	<u>Toilet Replacement Program Water Savings* (AF)</u>
1998	No				
1999	Yes	No	Yes		
2000	Yes	No	Yes		
2001	Yes	No	Yes		
2002	Yes	No	Yes		
2003	Yes	No	Yes		
2004	Yes	No	Yes		0.32
2005	No	No	No		
2006	No	No	No		
2007	No	No	No		



\*NOTE: Program water savings listed are net of the plumbing code. Savings are cumulative (not annual) between 1991 and the given year. Residential ULFT count data from unsubmitted forms are NOT included in the calculation.

**BMP 14 COVERAGE STATUS SUMMARY:**  
**Water supplier is meeting coverage requirements for this BMP.**

**BMP 14 Coverage: Residential ULFT Replacement Programs**

Reporting Unit: **Casitas Municipal Water District**

**BMP 14 Coverage Calculation Detail:  
 Retrofit on Resale (ROR) Ordinance  
 Water Savings**

	Single Family	Multi-Family
<b>1992 Housing Stock</b>		
Average rate of natural replacement (% of remaining stock)	.04	.04
Average rate of housing demolition (% of remaining stock)	.005	.005
Estimated Housing Units with 3.5+ gpf Toilets in 1997	2037.29	
Average resale rate		
Average persons per unit		
Average toilets per unit		
Average savings per home (gpd; from Exhibit 6)	40.5	

**Single Family Housing Units**

<u>Coverage Year</u>	<u>Unretrofitted Houses</u>	<u>Houses Sold</u>	<u>Houses Unsold</u>	<u>Sold and Retrofitted</u>	<u>Sold and Already Retrofitted</u>	<u>Unsold and Retrofitted</u>	<u>Gross ROR Savings (AFY)</u>	<u>Nat'l Replacement Only Savings (AFY)</u>	<u>Net ROR Savings (AFY)</u>
1998	1956.21		2027.10			81.08	24.48	24.48	
1999	1878.35		2016.97			77.86	28.02	28.02	
2000	1803.59		2006.88			74.76	31.41	31.41	
2001	1731.81		1996.85			71.78	34.66	34.66	
2002	1662.88		1986.87			68.93	37.79	37.79	
2003	1596.70		1976.93			66.18	40.79	40.79	
2004	1533.15		1967.05			63.55	43.67	43.67	
2005	1472.13		1957.21			61.02	46.44	46.44	
2006	1413.54		1947.43			58.59	49.10	49.10	
2007	1357.28		1937.69			56.26	51.65	51.65	

**Multi Family Housing Units**

<u>Coverage</u> <u>Year</u>	<u>Unretrofitted</u> <u>Houses</u>	<u>Houses</u> <u>Sold</u>	<u>Houses</u> <u>Unsold</u>	<u>Sold and</u> <u>Retrofitted</u>	<u>Sold and</u> <u>Already</u> <u>Retrofitted</u>	<u>Unsold</u> <u>and</u> <u>Retrofitted</u>	<u>Gross</u> <u>ROR</u> <u>Savings</u> <u>(AFY)</u>	<u>Nat'l</u> <u>Replacement</u> <u>Only</u> <u>Savings</u> <u>(AFY)</u>	<u>Net ROR</u> <u>Savings</u> <u>(AFY)</u>
1998									
1999									
2000									
2001									
2002									
2003									
2004									
2005									
2006									
2007									



**SECTION 2 – CONTENTS OF UWMP STEP SEVEN: DEMAND MANAGEMENT MEASURES: CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC) 2004 BMP REPORT**

Reported as of 9/19/05

**Water Supply & Reuse**

Reporting Unit: **Casitas Municipal Water District** Year: **2004**

**Water Supply Source Information**

Supply Source Name	Quantity (AF) Supplied	Supply Type
Mira Monte Well	300	Groundwater
Lake Casitas	19477.96	Local Watershed

**Total AF: 19777.96**

Reported as of 9/19/05

**Accounts & Water Use**

Reporting Unit Name: **Casitas Municipal Water District** Submitted to **CUWCC** Year: **2004**  
 11/01/2004

**A. Service Area Population Information:**

1. Total service area population 7982

**B. Number of Accounts and Water Deliveries (AF)**

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	2678	1655.2	0	0
2. Multi-Family	0	0	0	0
3. Commercial	105	656	0	0
4. Industrial	13	152.6	0	0
5. Institutional	0	0	0	0

6. Dedicated Irrigation	0	0	0	0
7. Recycled Water	0	0	0	0
8. Other	95	398.9	0	0
9. Unaccounted	NA	1010.36	NA	0
<b>TOTAL</b>	2891	3873.06	0	0

**Metered**

**Unmetered**

Reported as of 9/19/05

Reported as of 9/19/05

### **BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers**

Reporting Unit:  
**Casitas Municipal Water District**

BMP Form Status:  
**100% Complete**

Year:  
**2004**

#### **A. Implementation**

1. Based on your signed MOU date, 08/19/1991, your Agency STRATEGY DUE DATE is: 08/18/1993
2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? no
  - a. If YES, when was it implemented?
3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys? no
  - a. If YES, when was it implemented?

#### **B. Water Survey Data**

<b>Survey Counts:</b>	<b>Single Family Accounts</b>	<b>Multi-Family Units</b>
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
<b>Indoor Survey:</b>		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no

5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary	no	no
---	----	----

**Outdoor Survey:**

6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	no	no
a. If yes, in what form are surveys tracked?		None
b. Describe how your agency tracks this information.		

**C. Water Survey Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	8000
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

**E. Comments**

Reported as of 9/19/05

## BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes
  - a. If YES, list local jurisdictions in your service area and code or ordinance in each:  
Casitas MWD Will-Serve Letters specify replacement of high-flow showerheads and toilets.
2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 0%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 0%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

### B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? yes
  - a. If YES, when did your agency begin implementing this strategy? 6/1/2004
  - b. Describe your targeting/ marketing strategy.  
Website, bill stuffers, and a direct quarterly mail piece.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	12	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0

6. Does your agency track the distribution and cost of low-flow devices? yes
  - a. If YES, in what format are low-flow devices tracked? Spreadsheet
  - b. If yes, describe your tracking and distribution system :  
Everyone receiving a device provides an account number, name, and address.

### C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	3000
2. Actual Expenditures	999	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

Material purchased in June of 2004. Distribution did not occur until after July 1, 2004.

Reported as of 9/19/05

## BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year? Yes
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
- a. Determine metered sales (AF) 18449.4
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 19807.96
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.93
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? yes

a. If yes, describe the leak detection program:  
 Subcontractor, using leak detection devices, surveys  
 main lines with district personnel.

**B. Survey Data**

1. Total number of miles of distribution system line.	95.5
2. Number of miles of distribution system line surveyed.	9

**C. System Audit / Leak Detection Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	1800	1800
2. Actual Expenditures	1800	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

**E. Comments**

Reported as of 9/19/05

**BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

1. Does your agency require meters for all new connections and bill by volume-of-use?	yes
2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use?	no
a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?	
b. Describe the program:	
3. Number of previously unmetered accounts fitted with meters during report year.	0

**B. Feasibility Study**

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters?	no
a. If YES, when was the feasibility study conducted? (mm/dd/yy)	



- b. Describe the feasibility study:
- 2. Number of CII accounts with mixed-use meters. 0
- 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

**C. Meter Retrofit Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 9/19/05

**BMP 05: Large Landscape Conservation Programs and Incentives**

Reporting Unit:  
**Casitas**                      BMP Form Status:                      Year:  
**Municipal Water**                      **100% Complete**                      **2004**  
**District**

**A. Water Use Budgets**

- 1. Number of Dedicated Irrigation Meter Accounts: 0
- 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: 0
- 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): 0
- 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): 0
- 5. Does your agency provide water use notices to accounts with budgets each billing cycle? no

**B. Landscape Surveys**

- 1. Has your agency developed a marketing / targeting strategy for landscape surveys? no
  - a. If YES, when did your agency begin implementing this strategy?
  - b. Description of marketing / targeting strategy:

- 2. Number of Surveys Offered. 0
- 3. Number of Surveys Completed. 0
- 4. Indicate which of the following Landscape Elements are part of your survey:
  - a. Irrigation System Check no
  - b. Distribution Uniformity Analysis no
  - c. Review / Develop Irrigation Schedules no
  - d. Measure Landscape Area no
  - e. Measure Total Irrigable Area no
  - f. Provide Customer Report / Information no
- 5. Do you track survey offers and results? no
- 6. Does your agency provide follow-up surveys for previously completed surveys? no
  - a. If YES, describe below:

### C. Other BMP 5 Actions

- 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. no  
Does your agency provide mixed-use accounts with landscape budgets?
- 2. Number of CII mixed-use accounts with landscape budgets. 0
- 3. Do you offer landscape irrigation training? no
- 4. Does your agency offer financial incentives to improve landscape water use efficiency? no

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0

- 5. Do you provide landscape water use efficiency information to new customers and customers changing services? No
  - a. If YES, describe below:
- 6. Do you have irrigated landscaping at your facilities? yes
  - a. If yes, is it water-efficient? yes
  - b. If yes, does it have dedicated irrigation metering? no
- 7. Do you provide customer notices at the start of the irrigation season? no
- 8. Do you provide customer notices at the end of the irrigation season? no

### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	10000

2. Actual Expenditures 0

**E. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**F. Comments**

Reported as of 9/19/05

**BMP 06: High-Efficiency Washing Machine Rebate Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

- 1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? no
  - a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.
- 2. Does your agency offer rebates for high-efficiency washers? no
- 3. What is the level of the rebate? 0
- 4. Number of rebates awarded. 0

**B. Rebate Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	3800
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 9/19/05

## BMP 07: Public Information Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes

a. If YES, describe the program and how it's organized.  
A quarterly mailing is sent to all residents within the District with a quarter page section offering information on water conservation.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	4
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	yes	1
g. Speaker's Bureau	yes	2
h. Program to coordinate with other government agencies, industry and public interest groups and media	no	

### B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	4000	5000
2. Actual Expenditures	2000	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

**BMP 08: School Education Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? yes

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3 <sup>rd</sup>	no	0	0	0
Grades 4th-6 <sup>th</sup>	yes	0	0	0
Grades 7th-8 <sup>th</sup>	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? Yes

4. When did your Agency begin implementing this program? 6/1/2004

**B. School Education Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	2000	2000
2. Actual Expenditures	120	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Purchased materials prior to July 1, 2004 but distributed materials afterwards.

## BMP 09: Conservation Programs for CII Accounts

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

### A. Implementation

- |  |     |
|--|-----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | Yes |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | Yes |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | Yes |

### Option A: CII Water Use Survey and Customer Incentives Program

- |   |    |
|---|----|
| 4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? | No |
|---|----|

CII Surveys	Commercial Accounts	Industrial Accounts	Institutional Accounts
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0
CII Survey Components	Commercial Accounts	Industrial Accounts	Institutional Accounts
e. Site Visit	No	No	No
f. Evaluation of all water-using apparatus and processes	No	No	No
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	No	No	No
Agency CII Customer	Budget (\$/Year)	No. Awarded to	Total \$ Amount

Incentives		Customers	Awarded
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

---

### Option B: CII Conservation Program Targets

---

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	no
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	no
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	0
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	0

### B. Conservation Program Expenditures for CII Accounts

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

### D. Comments

Casitas MWD has few commercial, industrial, and institutional customers. Agency identified and ranked CII account types but did not offer surveys.

Reported as of 9/19/05

### BMP 09a: CII ULFT Water Savings

Reporting Unit:	BMP Form Status:	Year:
<b>Casitas Municipal Water District</b>	<b>100% Complete</b>	<b>2004</b>

1. Did your agency implement a CII ULFT replacement program in the reporting year? Yes  
 If No, please explain why on Line B. 10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply. Potential savings

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Customers with 3.5 gallon tanks or greater.

2. How does your agency advertise this program? Check all that apply. Bill insert  
 Newsletter  
 Telephone  
 Web page  
 Newspapers

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

Bill insert was the most cost effective and response method.

**B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.) Yes

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency? Yes

3. What is the total number of customer accounts participating in the program during the last year ? 12

CII Subsector	Number of Toilets Replaced			
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
4. a. Offices	0	0	0	0
b. Retail / Wholesale	0	0	0	0
c. Hotels	0	0	0	0
d. Health	0	0	0	0
e. Industrial	0	0	0	0



f. Schools: K to 12	0	0	0	0
g. Eating	0	0	0	0
h. Govern- ment	0	0	0	0
i. Churches	0	0	0	0
j. Other	0	0	0	0

5. Program design. Direct distribution

6. Does your agency use outside services to implement this program? No

a. If yes, check all that apply.

7. Participant tracking and follow-up. Telephone

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business 1
- b. Inadequate payback 1
- c. Inadequate ULFT performance 1
- d. Lack of funding 1
- e. American's with Disabilities Act 1
- f. Permitting 1
- g. Other. Please describe in B. 9. 5

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

Afraid ULFT would not meet demand.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

No toilets were replaced until after the July 1, 2004 fiscal year began. Only the marketing of the program began before that date.

### C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

**Budgeted**      **Actual**  
**Expenditure**

a. Labor	3000	1300
b. Materials	27610	200
c. Marketing & Advertising	4000	4000
d. Administration & Overhead	0	0
e. Outside Services	0	0
f. Total	34610	5500

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution	0
b. State agency contribution	0
c. Federal agency contribution	0
d. Other contribution	0
e. Total	0

**D. Comments**

Reported as of 9/19/05

**BMP 11: Conservation Pricing**

Reporting Unit:	BMP Form	
<b>Casitas Municipal Water District</b>	Status:	Year:
	<b>100%</b>	<b>2004</b>
	<b>Complete</b>	

**A. Implementation**

**Rate Structure Data Volumetric Rates for Water Service by Customer Class**

**1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$1100587.21
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$457309.86

**2. Commercial**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$307396.86
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$73847.44

**3. Industrial**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$67533.46
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$14776.44

**4. Institutional / Government**

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

**5. Irrigation**

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

**6. Other**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$147515.21
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$47868.34

**B. Conservation Pricing Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
---	----

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Casitas has implemented a database tracking water allocations as established for each meter. This database also tracks changes in allocations as meters are upgraded in size, and agricultural customers expand their services.

Reported as of 9/19/05

**BMP 12: Conservation Coordinator**

Reporting Unit: <b>Casitas Municipal Water District</b>	BMP Form Status: <b>100% Complete</b>	Year: <b>2004</b>
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**A. Implementation**

- 1. Does your Agency have a conservation coordinator? yes
- 2. Is this a full-time position? yes
- 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ? no
- 4. Partner agency's name:
- 5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position? 40%
  - b. Coordinator's Name Ron Merckling
  - c. Coordinator's Title Water Conservation/Public Information/Legislative Specialist
  - d. Coordinator's Experience and Number of Years 1 year at Casitas
  - e. Date Coordinator's position was created (mm/dd/yyyy) 8/25/2003
- 6. Number of conservation staff, including Conservation Coordinator. 2

**B. Conservation Staff Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	31616	31616
2. Actual Expenditures	31916	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as no

effective as" variant of this BMP?

- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 9/19/05

**BMP 13: Water Waste Prohibition**

Reporting Unit:	BMP Form Status:	Year:
<b>Casitas Municipal Water District</b>	<b>100% Complete</b>	<b>2004</b>

**A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area? yes
  - a. If YES, describe the ordinance:  
Casitas Ordinance 92-5: Prohibits and charges for improper use of water.
  
2. Is a copy of the most current ordinance(s) on file with CUWCC? yes
  - a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:  

CMWD	92-5
------	------

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.
 

a. Gutter flooding	yes
b. Single-pass cooling systems for new connections	no
c. Non-recirculating systems in all new conveyor or car wash systems	no
d. Non-recirculating systems in all new commercial laundry systems	no
e. Non-recirculating systems in all new decorative fountains	no
f. Other, please name	no
  
2. Describe measures that prohibit water uses listed above:  
Ordinance 92-5

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:
 

a. Allow the sale of more efficient, demand-initiated regenerating DIR models.	no
--	----

- b. Develop minimum appliance efficiency standards that:
  - i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no
  - ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no
- c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no
- 4. Does your agency include water softener checks in home water audit programs? no
- 5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

**C. Water Waste Prohibition Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 9/19/05

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2004**

**A. Implementation**

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s)	yes	yes

for replacing high-water-using toilets with ultra-low flush toilets?

**Number of Toilets Replaced by Agency Program During Report Year**

<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	12	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
<b>Total</b>	<b>12</b>	<b>0</b>

6. Describe your agency's ULFT program for single-family residences.

Dwelling units with toilets that use 3.5 gallons or more are eligible to have up to two toilets replaced.

7. Describe your agency's ULFT program for multi-family residences.

Toilets are made available up to two per dwelling unit to replace toilets that use more than 3.5 gallons.

8. Is a toilet retrofit on resale ordinance in effect for your service area? yes

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Casitas MWD, City of Ojai, City of Ventura, and County of Ventura	Casitas Will-serve letters, Ojai Ordinance 672, City of Ventura Sec. 12.120.020, County Ordinance 3904
---	--

**B. Residential ULFT Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	29850	3350
2. Actual Expenditures	2415	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Toilets were suppose to arrive prior to June 30, 2004 but did not arrive until afterward.



## SECTION 2 – CONTENTS OF UWMP STEP SEVEN: DEMAND MANAGEMENT MEASURES: CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC) 2003 BMP REPORT

Reported as of 9/19/05

### Water Supply & Reuse

Reporting Unit: **Casitas Municipal Water District** Year: **2003**

### Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Lake Casitas	18416	Local Watershed
Mira Monte Well	300	Groundwater

**Total AF: 18716**

Reported as of 9/19/05

### Accounts & Water Use

Reporting Unit Name: **Casitas Municipal Water District** Submitted to **CUWCC** Year: **2003**  
 11/01/2004

#### A. Service Area Population Information:

1. Total service area population 7982

#### B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	2678	1657	0	0
2. Multi-Family	0	0	0	0
3. Commercial	105	681.4	0	0
4. Industrial	13	58.6	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	0	0	0	0
7. Recycled Water	0	0	0	0
8. Other	95	407.4	0	0
9. Unaccounted	NA	572.37	NA	0
<b>TOTAL</b>	<b>2891</b>	<b>3376.77</b>	<b>0</b>	<b>0</b>

**Metered**

**Unmetered**



## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: <b>Casitas Municipal Water District</b>	BMP Form Status: <b>100% Complete</b>	Year: <b>2003</b>
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### A. Implementation

- |   |            |
|---|------------|
| 1. Based on your signed MOU date, 08/19/1991, your Agency STRATEGY DUE DATE is:   | 08/18/1993 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys? | no         |
| a. If YES, when was it implemented?   |            |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?  | no         |
| a. If YES, when was it implemented?   |            |

### B. Water Survey Data

Survey Counts:	Single Family Accounts	Multi-Family Units
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
<b>Indoor Survey:</b>		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary	no	no
<b>Outdoor Survey:</b>		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is		None

typically used (Recommended but not required for surveys)

- |  |    |      |
|--|----|------|
| 11. Were customers provided with information packets that included evaluation results and water savings recommendations? | no | no   |
| 12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?                     | no | no   |
| a. If yes, in what form are surveys tracked?   |    | None |
| b. Describe how your agency tracks this information.   |    |      |

### C. Water Survey Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

- |  |    |
|--|----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?  | No |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." |    |

### E. Comments

Reported as of 9/19/05

## BMP 02: Residential Plumbing Retrofit

Reporting Unit:	BMP Form Status:	Year:
<b>Casitas Municipal Water District</b>	<b>100% Complete</b>	<b>2003</b>

### A. Implementation

- |   |     |
|---|-----|
| 1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts?   | yes |
| a. If YES, list local jurisdictions in your service area and code or ordinance in each:<br>Casitas MWD Will-Serve Letters specify replacement of high-flow showerheads and toilets. |     |
| 2. Has your agency satisfied the 75% saturation requirement for single-family housing units?  | no  |
| 3. Estimated percent of single-family households with low-flow showerheads:   | 0%  |

- 4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
- 5. Estimated percent of multi-family households with low-flow showerheads: 0%
- 6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

**B. Low-Flow Device Distribution Information**

- 1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no
  - a. If YES, when did your agency begin implementing this strategy?
  - b. Describe your targeting/ marketing strategy.

<b>Low-Flow Devices Distributed/ Installed</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices? no <ul style="list-style-type: none"> <li>a. If YES, in what format are low-flow devices tracked?</li> <li>b. If yes, describe your tracking and distribution system :</li> </ul>		

**C. Low-Flow Device Distribution Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 9/19/05

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

- 1. Has your agency completed a pre-screening system audit for this reporting year? no
- 2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF) 0
  - b. Determine other system verifiable uses (AF) 0
  - c. Determine total supply into the system (AF) 0
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.00
- 3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
- 4. Did your agency complete a full-scale audit during this report year? no
- 5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
- 6. Does your agency operate a system leak detection program? yes
  - a. If yes, describe the leak detection program:  
Subcontractor, using leak detection devices, surveys main lines with district personnel.

**B. Survey Data**

- 1. Total number of miles of distribution system line. 95.5
- 2. Number of miles of distribution system line surveyed. 0

**C. System Audit / Leak Detection Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	1800	1800
2. Actual Expenditures	2105	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as"

**E. Comments**

Reported as of 9/19/05

## BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

### A. Implementation

- |   |     |
|---|-----|
| 1. Does your agency require meters for all new connections and bill by volume-of-use?                         | yes |
| 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? | no  |
| a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed?  |     |
| b. Describe the program:  |     |
| 3. Number of previously unmetered accounts fitted with meters during report year.                             | 0   |

### B. Feasibility Study

- |  |    |
|--|----|
| 1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? | no |
| a. If YES, when was the feasibility study conducted? (mm/dd/yy)  |    |
| b. Describe the feasibility study:   |    |
| 2. Number of CII accounts with mixed-use meters.   | 0  |
| 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period.  | 0  |

### C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

- |  |     |
|--|-----|
| 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?  | yes |
| a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as." |     |

### E. Comments

Reported as of 9/19/05

## BMP 05: Large Landscape Conservation

## Programs and Incentives

Reporting Unit:

**Casitas  
Municipal Water  
District**

BMP Form Status:  
**100% Complete**

Year:  
**2003**

### A. Water Use Budgets

- |  |    |
|--|----|
| 1. Number of Dedicated Irrigation Meter Accounts:  | 0  |
| 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets:                       | 0  |
| 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF):                     | 0  |
| 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF):                       | 0  |
| 5. Does your agency provide water use notices to accounts with budgets each billing cycle? | no |

### B. Landscape Surveys

- |  |    |
|--|----|
| 1. Has your agency developed a marketing / targeting strategy for landscape surveys? | no |
| a. If YES, when did your agency begin implementing this strategy?                    |    |
| b. Description of marketing / targeting strategy:                                    |    |
| 2. Number of Surveys Offered.  | 0  |
| 3. Number of Surveys Completed.  | 0  |
| 4. Indicate which of the following Landscape Elements are part of your survey:       |    |
| a. Irrigation System Check   | no |
| b. Distribution Uniformity Analysis  | no |
| c. Review / Develop Irrigation Schedules   | no |
| d. Measure Landscape Area  | no |
| e. Measure Total Irrigable Area  | no |
| f. Provide Customer Report / Information   | no |
| 5. Do you track survey offers and results?   | no |
| 6. Does your agency provide follow-up surveys for previously completed surveys?      | no |
| a. If YES, describe below:   |    |

### C. Other BMP 5 Actions

- |  |    |
|--|----|
| 1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program.<br>Does your agency provide mixed-use accounts with landscape budgets? | no |
| 2. Number of CII mixed-use accounts with landscape budgets.  | 0  |
| 3. Do you offer landscape irrigation training?   | no |
| 4. Does your agency offer financial incentives to improve landscape water use efficiency?  | no |

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			No
a. If YES, describe below:			
6. Do you have irrigated landscaping at your facilities?			yes
a. If yes, is it water-efficient?			yes
b. If yes, does it have dedicated irrigation metering?			no
7. Do you provide customer notices at the start of the irrigation season?			no
8. Do you provide customer notices at the end of the irrigation season?			no

#### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

#### E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

#### F. Comments

Reported as of 9/19/05

### BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

#### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers?	no
a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.	

- 2. Does your agency offer rebates for high-efficiency washers? no
- 3. What is the level of the rebate?
- 4. Number of rebates awarded.

**B. Rebate Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 9/19/05

**BMP 07: Public Information Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

- 1. Does your agency maintain an active public information program to promote and educate customers about water conservation? yes
  - a. If YES, describe the program and how it's organized.  
A quarterly mailing is sent to all residents within the District with a quarter page section offering information on water conservation.
- 2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	yes	4
d. Bill showing water usage in comparison to previous year's usage	yes	



- e. Demonstration Gardens no
- f. Special Events, Media Events no
- g. Speaker's Bureau no
- h. Program to coordinate with other government agencies, industry and public interest groups and media no

**B. Conservation Information Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	15000
2. Actual Expenditures	6274.49	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 9/19/05

**BMP 08: School Education Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

- 1. Has your agency implemented a school information program to promote water conservation? no

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3 <sup>rd</sup>	no			
Grades 4th-6 <sup>th</sup>	no			
Grades 7th-8 <sup>th</sup>	no			
High School	no			

3. Did your Agency's materials meet state education framework requirements? no
4. When did your Agency begin implementing this program?

**B. School Education Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 9/19/05

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

1. Has your agency identified and ranked COMMERCIAL customers according to use? Yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use? Yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use? Yes

**Option A: CII Water Use Survey and Customer Incentives Program**

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? No

	<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered				
b. Number of New Surveys Completed				

c. Number of Site Follow-ups of Previous Surveys (within 1 yr)

d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)

<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit	No	No	No
f. Evaluation of all water-using apparatus and processes	No	No	No
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	No	No	No
	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates			
i. Loans			
j. Grants			
k. Others			

---

**Option B: CII Conservation Program Targets**

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5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	No
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	No
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	0
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	0

**B. Conservation Program Expenditures for CII Accounts**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your	

implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

#### **D. Comments**

Casitas MWD has few commercial, industrial, and institutional customers.

Reported as of 9/19/05

#### **BMP 09a: CII ULFT Water Savings**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

1. Did your agency implement a CII ULFT replacement program in the reporting year? No  
If No, please explain why on Line B.10.

#### **A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

2. How does your agency advertise this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

#### **B. Implementation**

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.)

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency?

3. What is the total number of customer accounts participating in the program during the last year ?

CII Subsector	Number of Toilets Replaced			
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
4.				
a. Offices				
b. Retail / Wholesale				
c. Hotels				
d. Health				
e. Industrial				
f. Schools: K to 12				
g. Eating				
h. Government				
i. Churches				
j. Other				

5. Program design.

6. Does your agency use outside services to implement this program?

a. If yes, check all that apply.

7. Participant tracking and follow-up.

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business

b. Inadequate payback

c. Inadequate ULFT performance

d. Lack of funding

e. American's with Disabilities Act

f. Permitting

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

CMWD supplies water to residential and agricultural customers. CII represent a small part of actual water use about 8%.

### C. Conservation Program Expenditures for CII ULFT

1. CII ULFT Program: Annual Budget & Expenditure Data

	<b>Budgeted</b>	<b>Actual Expenditure</b>
a. Labor		
b. Materials		
c. Marketing & Advertising		
d. Administration & Overhead		
e. Outside Services		
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution		
b. State agency contribution		
c. Federal agency contribution		
d. Other contribution		
e. Total		0

### D. Comments

## BMP 11: Conservation Pricing

Reporting Unit:	BMP Form	
<b>Casitas Municipal Water District</b>	Status:	Year:
	<b>100%</b>	<b>2003</b>
	<b>Complete</b>	

### A. Implementation

#### Rate Structure Data Volumetric Rates for Water Service by Customer Class

##### 1. Residential

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$1092077
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$435151.99

##### 2. Commercial

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$320005.1
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$70969.21

##### 3. Industrial

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$26484.24
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$14345.94

##### 4. Institutional / Government

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$0
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$0

##### 5. Irrigation

a. Water Rate Structure	Service Not Provided
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric	\$0

Rates  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$0

**6. Other**

a. Water Rate Structure Increasing Block  
 b. Sewer Rate Structure Service Not Provided  
 c. Total Revenue from Volumetric Rates \$147305.12  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$46506.75

**B. Conservation Pricing Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Casitas has implemented a database tracking water allocations as established for each meter. This database also tracks changes in allocations as meters are upgraded in size, and agricultural customers expand their services.

Reported as of 9/19/05

**BMP 12: Conservation Coordinator**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

**A. Implementation**

- 1. Does your Agency have a conservation coordinator?      yes
- 2. Is this a full-time position?      no
- 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?      no
- 4. Partner agency's name:
- 5. If your agency supplies the conservation coordinator:



- a. What percent is this conservation coordinator's position? 5%
- b. Coordinator's Name Robert Monnier
- c. Coordinator's Title Water Treatment Manager
- d. Coordinator's Experience and Number of Years 11 years at Casitas
- e. Date Coordinator's position was created (mm/dd/yyyy) 8/5/1991
- 6. Number of conservation staff, including Conservation Coordinator. 2

**B. Conservation Staff Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	35345	15133
2. Actual Expenditures	14982	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 9/19/05

**BMP 13: Water Waste Prohibition**

Reporting Unit: **Casitas Municipal Water District**          BMP Form Status: **100% Complete**          Year: **2003**

**A. Requirements for Documenting BMP Implementation**

- 1. Is a water waste prohibition ordinance in effect in your service area? yes
  - a. If YES, describe the ordinance:  
Casitas Ordinance 92-5: Prohibits and charges for improper use of water.
- 2. Is a copy of the most current ordinance(s) on file with CUWCC? yes
  - a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:  
CMWD    Ordinance 92-5

**B. Implementation**

- 1. Indicate which of the water uses listed below are

prohibited by your agency or service area.

- a. Gutter flooding yes
- b. Single-pass cooling systems for new connections no
- c. Non-recirculating systems in all new conveyor or car wash systems no
- d. Non-recirculating systems in all new commercial laundry systems no
- e. Non-recirculating systems in all new decorative fountains no
- f. Other, please name no

2. Describe measures that prohibit water uses listed above:  
Ordinance 92-5

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

- a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no
- b. Develop minimum appliance efficiency standards that:
  - i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no
  - ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no
- c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

**C. Water Waste Prohibition Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

## BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2003**

### A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no

#### Number of Toilets Replaced by Agency Program During Report Year

Replacement Method	SF Accounts	MF Units
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0

---

**Total                    0                    0**

6. Describe your agency's ULFT program for single-family residences.

7. Describe your agency's ULFT program for multi-family residences.

8. Is a toilet retrofit on resale ordinance in effect for your service area? yes

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Casitas MWD, City of Ojai, and City of Ventura	Casitas will-serve letters, Ojai Ordinance 672, City of Ventura Sec. 12.120.020 and County Ordinance 3904
--	---

### B. Residential ULFT Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments



## SECTION 2 – CONTENTS OF UWMP STEP SEVEN: DEMAND MANAGEMENT MEASURES: CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC) 2002 BMP REPORT

Reported as of 8/17/05

### Water Supply & Reuse

Reporting Unit: **Casitas Municipal Water District** Year: **2002**

### Water Supply Source Information

Supply Source Name	Quantity (AF) Supplied	Supply Type
Lake Casitas	19463	Local Watershed

**Total AF: 19463**

Reported as of 8/17/05

### Accounts & Water Use

Reporting Unit Name: **Casitas Municipal Water District** Submitted to **CUWCC** Year: **2002**  
 Submitted on: **11/19/2002**

#### A. Service Area Population Information:

1. Total service area population 7865

#### B. Number of Accounts and Water Deliveries (AF)

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	2819	10297.9	0	0
2. Multi-Family	0	0	0	0
3. Commercial	99	687.7	0	0

4. Industrial	9	99.8	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	0	0	0	0
7. Recycled Water	0	0	0	0
8. Other	91	6946.2	0	0
9. Unaccounted	NA	1434.7	NA	0
TOTAL	3018	19466.3	0	0

**Metered**

**Unmetered**

Reported as of 8/17/05

### BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit:  
**Casitas Municipal Water District**

BMP Form Status:  
**100% Complete**

Year:  
**2002**

#### A. Implementation

- |  |            |
|--|------------|
| 1. Based on your signed MOU date, 08/19/1991, your Agency STRATEGY DUE DATE is:  | 08/18/1993 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?<br>a. If YES, when was it implemented? | no         |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?<br>a. If YES, when was it implemented?  | no         |

#### B. Water Survey Data

<b>Survey Counts:</b>	<b>Single Family Accounts</b>	<b>Multi-Family Units</b>
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
<b>Indoor Survey:</b>		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no

5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary	no	no
---	----	----

**Outdoor Survey:**

6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no
9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	no	no
a. If yes, in what form are surveys tracked?		None
b. Describe how your agency tracks this information.		

**C. Water Survey Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

**E. Comments**

Reported as of 8/17/05

## BMP 02: Residential Plumbing Retrofit

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

### A. Implementation

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts? yes
  - a. If YES, list local jurisdictions in your service area and code or ordinance in each:  
Casitas MWD Will-Serve Letters specify replacement of high-flow showerheads and toilets.
2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
3. Estimated percent of single-family households with low-flow showerheads: 0%
4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
5. Estimated percent of multi-family households with low-flow showerheads: 0%
6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

### B. Low-Flow Device Distribution Information

1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no
  - a. If YES, when did your agency begin implementing this strategy?
  - b. Describe your targeting/ marketing strategy.

Low-Flow Devices Distributed/ Installed	SF Accounts	MF Units
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices? no
  - a. If YES, in what format are low-flow devices tracked?
  - b. If yes, describe your tracking and distribution system :

### C. Low-Flow Device Distribution Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0

2. Actual Expenditures 0

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 8/17/05

**BMP 03: System Water Audits, Leak Detection and Repair**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

**A. Implementation**

1. Has your agency completed a pre-screening system audit for this reporting year? no

2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:

- a. Determine metered sales (AF)
- b. Determine other system verifiable uses (AF)
- c. Determine total supply into the system (AF)
- d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.00

3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes

4. Did your agency complete a full-scale audit during this report year? no

5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no

6. Does your agency operate a system leak detection program? yes

a. If yes, describe the leak detection program: Subcontractor, using leak detection devices, surveys main lines with district personnel.

**B. Survey Data**

1. Total number of miles of distribution system line. 95.5

2. Number of miles of distribution system line surveyed. 9

**C. System Audit / Leak Detection Program Expenditures**



	This Year	Next Year
1. Budgeted Expenditures	2500	10500
2. Actual Expenditures	2500	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 8/17/05

**BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

**A. Implementation**

1. Does your agency require meters for all new connections and bill by volume-of-use? yes
2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no
- a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? 1/1/1956
- b. Describe the program:  
CMWD has always metered and billed by volume-of-use. There has been no retrofit other than to upgrade meters.
3. Number of previously unmetered accounts fitted with meters during report year. 0

**B. Feasibility Study**

1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no
- a. If YES, when was the feasibility study conducted? (mm/dd/yy)
- b. Describe the feasibility study:
2. Number of CII accounts with mixed-use meters. 0
3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

### C. Meter Retrofit Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."  
All water meters at Casitas MWD are metered and read either monthly or bi-monthly. Rates are dependent upon use.

### E. Comments

Reported as of 8/17/05

## BMP 05: Large Landscape Conservation Programs and Incentives

Reporting Unit:

<b>Casitas</b>	<b>BMP Form Status:</b>	<b>Year:</b>
<b>Municipal Water</b>	<b>100% Complete</b>	<b>2002</b>
<b>District</b>		

### A. Water Use Budgets

1. Number of Dedicated Irrigation Meter Accounts: 0
2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: 0
3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): 0
4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): 0
5. Does your agency provide water use notices to accounts with budgets each billing cycle? no

### B. Landscape Surveys

1. Has your agency developed a marketing / targeting strategy for landscape surveys? no
  - a. If YES, when did your agency begin implementing this strategy?
  - b. Description of marketing / targeting strategy:
2. Number of Surveys Offered. 0
3. Number of Surveys Completed. 0

4. Indicate which of the following Landscape Elements are part of your survey:
- a. Irrigation System Check no
  - b. Distribution Uniformity Analysis no
  - c. Review / Develop Irrigation Schedules no
  - d. Measure Landscape Area no
  - e. Measure Total Irrigable Area no
  - f. Provide Customer Report / Information no
5. Do you track survey offers and results? no
6. Does your agency provide follow-up surveys for previously completed surveys? no
- a. If YES, describe below:

### C. Other BMP 5 Actions

1. An agency can provide mixed-use accounts with ETo-based landscape budgets in lieu of a large landscape survey program. Does your agency provide mixed-use accounts with landscape budgets? no
2. Number of CII mixed-use accounts with landscape budgets. 0
3. Do you offer landscape irrigation training? no
4. Does your agency offer financial incentives to improve landscape water use efficiency? no
- | Type of Financial Incentive: | Budget (Dollars/Year) | Number Awarded to Customers | Total Amount Awarded |
|------------------------------|-----------------------|-----------------------------|----------------------|
| a. Rebates                   | 0                     | 0                           | 0                    |
| b. Loans                     | 0                     | 0                           | 0                    |
| c. Grants                    | 0                     | 0                           | 0                    |
5. Do you provide landscape water use efficiency information to new customers and customers changing services? No
- a. If YES, describe below:
6. Do you have irrigated landscaping at your facilities? yes
- a. If yes, is it water-efficient? yes
  - b. If yes, does it have dedicated irrigation metering? no
7. Do you provide customer notices at the start of the irrigation season? no
8. Do you provide customer notices at the end of the irrigation season? no

### D. Landscape Conservation Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### E. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**F. Comments**

Reported as of 8/17/05

**BMP 06: High-Efficiency Washing Machine Rebate Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

**A. Implementation**

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? no
- a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.
2. Does your agency offer rebates for high-efficiency washers? no
3. What is the level of the rebate? 0
4. Number of rebates awarded. 0

**B. Rebate Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 8/17/05

## BMP 07: Public Information Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

### A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? no

a. If YES, describe the program and how it's organized.

2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of Events
a. Paid Advertising	no	
b. Public Service Announcement	no	
c. Bill Inserts / Newsletters / Brochures	no	
d. Bill showing water usage in comparison to previous year's usage	yes	
e. Demonstration Gardens	no	
f. Special Events, Media Events	no	
g. Speaker's Bureau	no	
h. Program to coordinate with other government agencies, industry and public interest groups and media	no	

### B. Conservation Information Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	16000
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Reported as of 8/17/05

## BMP 08: School Education Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

### A. Implementation

1. Has your agency implemented a school information program to promote water conservation? no

2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops
Grades K-3 <sup>rd</sup>	no	0	0	0
Grades 4th-6 <sup>th</sup>	no	0	0	0
Grades 7th-8 <sup>th</sup>	no	0	0	0
High School	no	0	0	0

3. Did your Agency's materials meet state education framework requirements? no

4. When did your Agency begin implementing this program?

### B. School Education Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Reported as of 8/17/05

## BMP 09: Conservation Programs for CII Accounts

Reporting Unit:  
**Casitas Municipal  
 Water District**

BMP Form Status:  
**100% Complete**

Year:  
**2002**

**A. Implementation**

- |  |    |
|--|----|
| 1. Has your agency identified and ranked COMMERCIAL customers according to use?    | no |
| 2. Has your agency identified and ranked INDUSTRIAL customers according to use?    | no |
| 3. Has your agency identified and ranked INSTITUTIONAL customers according to use? | no |

**Option A: CII Water Use Survey and Customer Incentives Program**

4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? No

<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered			
b. Number of New Surveys Completed			
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)			
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)			
<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit			
f. Evaluation of all water-using apparatus and processes			
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives			
<b>Agency CII Customer Incentives</b>	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates			
i. Loans			
j. Grants			

k. Others

---

**Option B: CII Conservation Program Targets**

---

5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option?	No
6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings?	No
7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991.	0
8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991.	0

**B. Conservation Program Expenditures for CII Accounts**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Casitas MWD has few commercial, industrial, and institutional customers.

Reported as of 8/17/05

**BMP 09a: CII ULFT Water Savings**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

1. Did your agency implement a CII ULFT replacement program in the reporting year? No
- If No, please explain why on Line B.
- 10.

**A. Targeting and Marketing**



1. What basis does your agency use to target customers for participation in this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

2. How does your agency advertise this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

## B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.)

2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency?

3. What is the total number of customer accounts participating in the program during the last year ?

CII Subsector	Number of Toilets Replaced			
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
4.				
a. Offices				
b. Retail / Wholesale				
c. Hotels				
d. Health				
e. Industrial				
f. Schools: K to 12				
g. Eating				
h. Government				

i. Churches

j. Other

5. Program design.

6. Does your agency use outside services to implement this program?

a. If yes, check all that apply.

7. Participant tracking and follow-up.

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

a. Disruption to business

b. Inadequate payback

c. Inadequate ULFT performance

d. Lack of funding

e. American's with Disabilities Act

f. Permitting

g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

CMWD supplies water to residential and agriculture customers; CII are a very small part of our customer base.

### **C. Conservation Program Expenditures for CII ULFT**

1. CII ULFT Program: Annual Budget & Expenditure Data

	<b>Budgeted</b>	<b>Actual Expenditure</b>
--	-----------------	-------------------------------

a. Labor

b. Materials

c. Marketing & Advertising		
d. Administration & Overhead		
e. Outside Services		
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

a. Wholesale agency contribution		
b. State agency contribution		
c. Federal agency contribution		
d. Other contribution		
e. Total		0

**D. Comments**

Reported as of 8/17/05

**BMP 11: Conservation Pricing**

Reporting Unit:	BMP Form	
<b>Casitas Municipal Water District</b>	Status:	Year:
	<b>100%</b>	<b>2002</b>
	<b>Complete</b>	

**A. Implementation**

**Rate Structure Data Volumetric Rates for Water Service by Customer Class**

**1. Residential**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$2029329
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$681433

**2. Commercial**

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric	\$317971

Rates  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$68801

**3. Industrial**

a. Water Rate Structure Increasing Block  
 b. Sewer Rate Structure Service Not Provided  
 c. Total Revenue from Volumetric Rates \$44429  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$14122

**4. Institutional / Government**

a. Water Rate Structure Service Not Provided  
 b. Sewer Rate Structure Service Not Provided  
 c. Total Revenue from Volumetric Rates \$0  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$0

**5. Irrigation**

a. Water Rate Structure Increasing Block  
 b. Sewer Rate Structure Service Not Provided  
 c. Total Revenue from Volumetric Rates \$686641  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$142729

**6. Other**

a. Water Rate Structure Increasing Block  
 b. Sewer Rate Structure Service Not Provided  
 c. Total Revenue from Volumetric Rates \$1318311  
 d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources \$552983

**B. Conservation Pricing Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	4500	0
2. Actual Expenditures	2000	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Casitas has implemented a database tracking water allocations as established for each meter. This database also tracks changes in allocations as meters are upgraded in size, and agricultural customers expand their services.

Reported as of 8/17/05

## BMP 12: Conservation Coordinator

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

### A. Implementation

1. Does your Agency have a conservation coordinator?      yes
2. Is this a full-time position?      no
3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?      no
4. Partner agency's name:
5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position?      5%
  - b. Coordinator's Name      Robert Monnier
  - c. Coordinator's Title      Water Treatment Manager
  - d. Coordinator's Experience and Number of Years      11 years at Casitas
  - e. Date Coordinator's position was created (mm/dd/yyyy)      8/5/1991
6. Number of conservation staff, including Conservation Coordinator.      2

### B. Conservation Staff Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	29670	35345
2. Actual Expenditures	19669	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?      no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

**BMP 13: Water Waste Prohibition**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

**A. Requirements for Documenting BMP Implementation**

1. Is a water waste prohibition ordinance in effect in your service area?      yes

a. If YES, describe the ordinance:  
Casitas Ordinance 92-5: Prohibits and charges for improper use of water.

2. Is a copy of the most current ordinance(s) on file with CUWCC?      yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

CMWD      Ordinance 92-5

**B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- a. Gutter flooding      yes
- b. Single-pass cooling systems for new connections      no
- c. Non-recirculating systems in all new conveyor or car wash systems      no
- d. Non-recirculating systems in all new commercial laundry systems      no
- e. Non-recirculating systems in all new decorative fountains      no
- f. Other, please name  
Failure to repair any water leak in a timely manner      no

2. Describe measures that prohibit water uses listed above:  
Ordinance 92-5

**Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

- a. Allow the sale of more efficient, demand-initiated regenerating DIR models.      no
- b. Develop minimum appliance efficiency standards that:
  - i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used.      no

- ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no
- c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no
- 4. Does your agency include water softener checks in home water audit programs? no
- 5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

**C. Water Waste Prohibition Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 8/17/05

**BMP 14: Residential ULFT Replacement Programs**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2002**

**A. Implementation**

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
<b>Number of Toilets Replaced by Agency Program During Report Year</b>		
<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	0	0

3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0

---

**Total            0            0**

6. Describe your agency's ULFT program for single-family residences.

7. Describe your agency's ULFT program for multi-family residences.

8. Is a toilet retrofit on resale ordinance in effect for your service area? yes

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Casitas MWD City of Ojai City of Ventura County of Ventura	Casitas Will-Serve Letters Ojai Ord. 672, City of Ventura Sec. 12.120.020, Co. Ord. 3904
--	--

**B. Residential ULFT Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**





**SECTION 2 – CONTENTS OF UWMP STEP SEVEN: DEMAND MANAGEMENT MEASURES: CALIFORNIA URBAN WATER CONSERVATION COUNCIL (CUWCC) 2001 BMP REPORT**

Reported as of 8/17/05

**Water Supply & Reuse**

Reporting Unit: **Casitas Municipal Water District** Year: **2001**

**Water Supply Source Information**

Supply Source Name	Quantity (AF) Supplied	Supply Type
Lake Casitas	19323	Local Watershed

**Total AF: 19323**

Reported as of 8/17/05

**Accounts & Water Use**

Reporting Unit Name: **Casitas Municipal Water District** Submitted to **CUWCC** Year: **2001**  
 11/19/2002

**A. Service Area Population Information:**

1. Total service area population 7823

**B. Number of Accounts and Water Deliveries (AF)**

Type	Metered		Unmetered	
	No. of Accounts	Water Deliveries (AF)	No. of Accounts	Water Deliveries (AF)
1. Single-Family	2804	9614.1	0	0
2. Multi-Family	0	0	0	0
3. Commercial	98	598.6	0	0
4. Industrial	11	56.3	0	0
5. Institutional	0	0	0	0
6. Dedicated Irrigation	0	0	0	0
7. Recycled Water	0	0	0	0
8. Other	91	8231.3	0	0
9. unaccounted	NA	1232	NA	0

TOTAL 3004 19732.3 0 0  
**Metered Unmetered**

## BMP 01: Water Survey Programs for Single-Family and Multi-Family Residential Customers

Reporting Unit: <b>Casitas Municipal Water District</b>	BMP Form Status: <b>100% Complete</b>	Year: <b>2001</b>
--	--	----------------------

### A. Implementation

- |  |            |
|--|------------|
| 1. Based on your signed MOU date, 08/19/1991, your Agency STRATEGY DUE DATE is:  | 08/18/1993 |
| 2. Has your agency developed and implemented a targeting/ marketing strategy for SINGLE-FAMILY residential water use surveys?<br>a. If YES, when was it implemented? | no         |
| 3. Has your agency developed and implemented a targeting/ marketing strategy for MULTI-FAMILY residential water use surveys?<br>a. If YES, when was it implemented?  | no         |

### B. Water Survey Data

<b>Survey Counts:</b>	<b>Single Family Accounts</b>	<b>Multi-Family Units</b>
1. Number of surveys offered:	0	0
2. Number of surveys completed:	0	0
<b>Indoor Survey:</b>		
3. Check for leaks, including toilets, faucets and meter checks	no	no
4. Check showerhead flow rates, aerator flow rates, and offer to replace or recommend replacement, if necessary	no	no
5. Check toilet flow rates and offer to install or recommend installation of displacement device or direct customer to ULFT replacement program, as necessary; replace leaking toilet flapper, as necessary	no	no
<b>Outdoor Survey:</b>		
6. Check irrigation system and timers	no	no
7. Review or develop customer irrigation schedule	no	no
8. Measure landscaped area (Recommended but not required for surveys)	no	no

9. Measure total irrigable area (Recommended but not required for surveys)	no	no
10. Which measurement method is typically used (Recommended but not required for surveys)		None
11. Were customers provided with information packets that included evaluation results and water savings recommendations?	no	no
12. Have the number of surveys offered and completed, survey results, and survey costs been tracked?	no	no
a. If yes, in what form are surveys tracked?		None
b. Describe how your agency tracks this information.		

**C. Water Survey Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?	No
a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."	

**E. Comments**

Reported as of 8/17/05

**BMP 02: Residential Plumbing Retrofit**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

**A. Implementation**

1. Is there an enforceable ordinance in effect in your service area requiring replacement of high-flow showerheads and other water use fixtures with their low-flow counterparts?	yes
a. If YES, list local jurisdictions in your service area and code or ordinance in each: Casitas MWD Will-Serve Letters specify replacement of high-flow showerheads and toilets.	

- 2. Has your agency satisfied the 75% saturation requirement for single-family housing units? no
- 3. Estimated percent of single-family households with low-flow showerheads: 0%
- 4. Has your agency satisfied the 75% saturation requirement for multi-family housing units? no
- 5. Estimated percent of multi-family households with low-flow showerheads: 0%
- 6. If YES to 2 OR 4 above, please describe how saturation was determined, including the dates and results of any survey research.

**B. Low-Flow Device Distribution Information**

- 1. Has your agency developed a targeting/ marketing strategy for distributing low-flow devices? no
  - a. If YES, when did your agency begin implementing this strategy?
  - b. Describe your targeting/ marketing strategy.

<b>Low-Flow Devices Distributed/ Installed</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Number of low-flow showerheads distributed:	0	0
3. Number of toilet-displacement devices distributed:	0	0
4. Number of toilet flappers distributed:	0	0
5. Number of faucet aerators distributed:	0	0
6. Does your agency track the distribution and cost of low-flow devices? no <ul style="list-style-type: none"> <li>a. If YES, in what format are low-flow devices tracked?</li> <li>b. If yes, describe your tracking and distribution system :</li> </ul>		

**C. Low-Flow Device Distribution Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**E. Comments**

Reported as of 8/17/05

## BMP 03: System Water Audits, Leak Detection and Repair

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

### A. Implementation

1. Has your agency completed a pre-screening system audit for this reporting year? no
2. If YES, enter the values (AF/Year) used to calculate verifiable use as a percent of total production:
  - a. Determine metered sales (AF)
  - b. Determine other system verifiable uses (AF)
  - c. Determine total supply into the system (AF)
  - d. Using the numbers above, if (Metered Sales + Other Verifiable Uses) / Total Supply is < 0.9 then a full-scale system audit is required. 0.00
3. Does your agency keep necessary data on file to verify the values used to calculate verifiable uses as a percent of total production? yes
4. Did your agency complete a full-scale audit during this report year? no
5. Does your agency maintain in-house records of audit results or the completed AWWA audit worksheets for the completed audit? no
6. Does your agency operate a system leak detection program? yes
  - a. If yes, describe the leak detection program:  
Subcontractor, using leak detection devices, surveys main lines with district personnel.

### B. Survey Data

1. Total number of miles of distribution system line. 95.5
2. Number of miles of distribution system line surveyed. 9

### C. System Audit / Leak Detection Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	2000	2500
2. Actual Expenditures	2000	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

**BMP 04: Metering with Commodity Rates for all New Connections and Retrofit of Existing**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

**A. Implementation**

- 1. Does your agency require meters for all new connections and bill by volume-of-use? yes
- 2. Does your agency have a program for retrofitting existing unmetered connections and bill by volume-of-use? no
  - a. If YES, when was the plan to retrofit and bill by volume-of-use existing unmetered connections completed? 1/1/1956
  - b. Describe the program:  
CMWD has always metered and billed by volume-of-use. There has been no retrofit other than to upgrade meters.
- 3. Number of previously unmetered accounts fitted with meters during report year. 0

**B. Feasibility Study**

- 1. Has your agency conducted a feasibility study to assess the merits of a program to provide incentives to switch mixed-use accounts to dedicated landscape meters? no
  - a. If YES, when was the feasibility study conducted? (mm/dd/yy)
  - b. Describe the feasibility study:
- 2. Number of CII accounts with mixed-use meters. 0
- 3. Number of CII accounts with mixed-use meters retrofitted with dedicated irrigation meters during reporting period. 0

**C. Meter Retrofit Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**D. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? yes
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."  
All water meters at Casitas MWD are metered and read either monthly or bi-monthly. Rates are dependent upon use.

**E. Comments**

**BMP 05: Large Landscape Conservation Programs and Incentives**

Reporting Unit:

**Casitas  
Municipal Water  
District**

BMP Form Status:  
**100% Complete**

Year:  
**2001**

**A. Water Use Budgets**

- 1. Number of Dedicated Irrigation Meter Accounts: 0
- 2. Number of Dedicated Irrigation Meter Accounts with Water Budgets: 0
- 3. Budgeted Use for Irrigation Meter Accounts with Water Budgets (AF): 0
- 4. Actual Use for Irrigation Meter Accounts with Water Budgets (AF): 0
- 5. Does your agency provide water use notices to accounts with budgets each billing cycle? no

**B. Landscape Surveys**

- 1. Has your agency developed a marketing / targeting strategy for landscape surveys? no
  - a. If YES, when did your agency begin implementing this strategy?
  - b. Description of marketing / targeting strategy:
- 2. Number of Surveys Offered. 0
- 3. Number of Surveys Completed. 0
- 4. Indicate which of the following Landscape Elements are part of your survey:
  - a. Irrigation System Check no
  - b. Distribution Uniformity Analysis no
  - c. Review / Develop Irrigation Schedules no
  - d. Measure Landscape Area no
  - e. Measure Total Irrigable Area no
  - f. Provide Customer Report / Information no
- 5. Do you track survey offers and results? no
- 6. Does your agency provide follow-up surveys for previously completed surveys? no
  - a. If YES, describe below:

**C. Other BMP 5 Actions**

- 1. An agency can provide mixed-use accounts with no

ETo-based landscape budgets in lieu of a large landscape survey program.  
 Does your agency provide mixed-use accounts with landscape budgets?

2. Number of CII mixed-use accounts with landscape budgets. 0
3. Do you offer landscape irrigation training? no
4. Does your agency offer financial incentives to improve landscape water use efficiency? no

Type of Financial Incentive:	Budget (Dollars/Year)	Number Awarded to Customers	Total Amount Awarded
a. Rebates	0	0	0
b. Loans	0	0	0
c. Grants	0	0	0
5. Do you provide landscape water use efficiency information to new customers and customers changing services?			No
a. If YES, describe below:			
6. Do you have irrigated landscaping at your facilities?			yes
a. If yes, is it water-efficient?			
			yes
b. If yes, does it have dedicated irrigation metering?			
			no
7. Do you provide customer notices at the start of the irrigation season?			no
8. Do you provide customer notices at the end of the irrigation season?			no

**D. Landscape Conservation Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**E. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**F. Comments**

Reported as of 8/17/05



## BMP 06: High-Efficiency Washing Machine Rebate Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

### A. Implementation

1. Do any energy service providers or waste water utilities in your service area offer rebates for high-efficiency washers? no
  - a. If YES, describe the offerings and incentives as well as who the energy/waste water utility provider is.
  
2. Does your agency offer rebates for high-efficiency washers? no
3. What is the level of the rebate? 0
4. Number of rebates awarded. 0

### B. Rebate Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### C. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### D. Comments

Reported as of 8/17/05

## BMP 07: Public Information Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

### A. Implementation

1. Does your agency maintain an active public information program to promote and educate customers about water conservation? no
  - a. If YES, describe the program and how it's organized.
  
2. Indicate which and how many of the following activities are included in your public information program.

Public Information Program Activity	Yes/No	Number of
-------------------------------------	--------	-----------

	<b>Events</b>
a. Paid Advertising	no
b. Public Service Announcement	no
c. Bill Inserts / Newsletters / Brochures	no
d. Bill showing water usage in comparison to previous year's usage	yes
e. Demonstration Gardens	no
f. Special Events, Media Events	no
g. Speaker's Bureau	no
h. Program to coordinate with other government agencies, industry and public interest groups and media	no

### **B. Conservation Information Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### **C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### **D. Comments**

Reported as of 8/17/05

## **BMP 08: School Education Programs**

Reporting Unit: <b>Casitas Municipal Water District</b>	BMP Form Status: <b>100% Complete</b>	Year: <b>2001</b>
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### **A. Implementation**

1. Has your agency implemented a school information program to promote water conservation? no
2. Please provide information on your school programs (by grade level):

Grade	Are grade-appropriate materials distributed?	No. of class presentations	No. of students reached	No. of teachers' workshops

Grades K-3rd	no	0	0	0
Grades 4th-6th	no	0	0	0
Grades 7th-8 <sup>th</sup>	no	0	0	0
High School	no	0	0	0
3. Did your Agency's materials meet state education framework requirements?				no
4. When did your Agency begin implementing this program?				

**B. School Education Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 8/17/05

**BMP 09: Conservation Programs for CII Accounts**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

**A. Implementation**

1. Has your agency identified and ranked COMMERCIAL customers according to use? yes
2. Has your agency identified and ranked INDUSTRIAL customers according to use? yes
3. Has your agency identified and ranked INSTITUTIONAL customers according to use? no

**Option A: CII Water Use Survey and Customer Incentives Program**

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4. Is your agency operating a CII water use survey and customer incentives program for the purpose of complying with BMP 9 under this option? no

<b>CII Surveys</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
a. Number of New Surveys Offered	0	0	0
b. Number of New Surveys Completed	0	0	0
c. Number of Site Follow-ups of Previous Surveys (within 1 yr)	0	0	0
d. Number of Phone Follow-ups of Previous Surveys (within 1 yr)	0	0	0

<b>CII Survey Components</b>	<b>Commercial Accounts</b>	<b>Industrial Accounts</b>	<b>Institutional Accounts</b>
e. Site Visit	no	no	no
f. Evaluation of all water-using apparatus and processes	no	no	no
g. Customer report identifying recommended efficiency measures, paybacks and agency incentives	no	no	no

<b>Agency CII Customer Incentives</b>	<b>Budget (\$/Year)</b>	<b>No. Awarded to Customers</b>	<b>Total \$ Amount Awarded</b>
h. Rebates	0	0	0
i. Loans	0	0	0
j. Grants	0	0	0
k. Others	0	0	0

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**Option B: CII Conservation Program Targets**

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5. Does your agency track CII program interventions and water savings for the purpose of complying with BMP 9 under this option? no

6. Does your agency document and maintain records on how savings were realized and the method of calculation for estimated savings? no

7. Estimated annual savings (AF/yr) from site-verified actions taken by agency since 1991. 0

8. Estimated annual savings (AF/yr) from non-site-verified actions taken by agency since 1991. 0

**B. Conservation Program Expenditures for CII Accounts**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Casitas MWD has few commercial, industrial, and institutional customers.

Reported as of 8/17/05

**BMP 09a: CII ULFT Water Savings**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

1. Did your agency implement a CII ULFT replacement program in the reporting year? No  
If No, please explain why on Line B.10.

**A. Targeting and Marketing**

1. What basis does your agency use to target customers for participation in this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

2. How does your agency advertise this program? Check all that apply.

a. Describe which method you found to be the most effective overall, and which was the most effective per dollar expended.

## B. Implementation

1. Does your agency keep and maintain customer participant information? (Read the Help information for a complete list of all the information for this BMP.)
2. Would your agency be willing to share this information if the CUWCC did a study to evaluate the program on behalf of your agency?
3. What is the total number of customer accounts participating in the program during the last year ?

CII Subsector	Number of Toilets Replaced			
	Standard Gravity Tank	Air Assisted	Valve Floor Mount	Valve Wall Mount
4.				
a. Offices				
b. Retail / Wholesale				
c. Hotels				
d. Health				
e. Industrial				
f. Schools: K to 12				
g. Eating				
h. Govern- ment				
i. Churches				
j. Other				
5. Program design.				
6. Does your agency use outside services to implement this program?				
a. If yes, check all that apply.				
7. Participant tracking and follow-up.				

8. Based on your program experience, please rank on a scale of 1 to 5, with 1 being the least frequent cause and 5 being the most frequent cause, the following reasons why customers refused to participate in the program.

- a. Disruption to business
- b. Inadequate payback
- c. Inadequate ULFT performance
- d. Lack of funding
- e. American's with Disabilities Act
- f. Permitting
- g. Other. Please describe in B. 9.

9. Please describe general program acceptance/resistance by customers, obstacles to implementation, and other issues affecting program implementation or effectiveness.

10. Please provide a general assessment of the program for this reporting year. Did your program achieve its objectives? Were your targeting and marketing approaches effective? Were program costs in line with expectations and budgeting?

CMWD supplies water to residential and agriculture customers; CII are a very small part of our customer base.

**C. Conservation Program Expenditures for CII ULFT**

1. CII ULFT Program: Annual Budget & Expenditure Data

	<b>Budgeted</b>	<b>Actual Expenditure</b>
a. Labor		
b. Materials		
c. Marketing & Advertising		
d. Administration & Overhead		
e. Outside Services		
f. Total	0	0

2. CII ULFT Program: Annual Cost Sharing

- a. Wholesale agency contribution

b. State agency contribution	
c. Federal agency contribution	
d. Other contribution	
e. Total	0

## D. Comments

Reported as of 8/17/05

## BMP 11: Conservation Pricing

Reporting Unit:	BMP Form	
<b>Casitas Municipal Water District</b>	Status:	Year:
	<b>100%</b>	<b>2001</b>
	<b>Complete</b>	

## A. Implementation

### Rate Structure Data Volumetric Rates for Water Service by Customer Class

#### 1. Residential

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$1585076
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$639063

#### 2. Commercial

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$235385
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$65276

#### 3. Industrial

a. Water Rate Structure	Increasing Block
b. Sewer Rate Structure	Service Not Provided
c. Total Revenue from Volumetric Rates	\$21371
d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources	\$14172



**4. Institutional / Government**

- a. Water Rate Structure                      Service Not Provided
- b. Sewer Rate Structure                      Service Not Provided
- c. Total Revenue from Volumetric Rates    \$0
- d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources    \$0

**5. Irrigation**

- a. Water Rate Structure                      Increasing Block
- b. Sewer Rate Structure                      Service Not Provided
- c. Total Revenue from Volumetric Rates    \$459200
- d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources    \$129735

**6. Other**

- a. Water Rate Structure                      Increasing Block
- b. Sewer Rate Structure                      Service Not Provided
- c. Total Revenue from Volumetric Rates    \$1382954
- d. Total Revenue from Non-Volumetric Charges, Fees and other Revenue Sources    \$522320

**B. Conservation Pricing Program Expenditures**

	This Year	Next Year
1. Budgeted Expenditures	10000	4500
2. Actual Expenditures	10000	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? No
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Casitas has implemented a database tracking water allocations as established for each meter. This database also tracks changes in allocations as meters are upgraded in size, and agricultural customers expand their services.

Reported as of 8/17/05

**BMP 12: Conservation Coordinator**

Reporting Unit: **Casitas Municipal Water**                      BMP Form Status:    Year:

**District** **100% Complete** **2001**

**A. Implementation**

- 1. Does your Agency have a conservation coordinator?      yes
- 2. Is this a full-time position?      no
- 3. If no, is the coordinator supplied by another agency with which you cooperate in a regional conservation program ?      no
- 4. Partner agency's name:
- 5. If your agency supplies the conservation coordinator:
  - a. What percent is this conservation coordinator's position?      5%
  - b. Coordinator's Name      Robert Monnier
  - c. Coordinator's Title      Treatment Plant Manager
  - d. Coordinator's Experience and Number of Years      11 years at Casitas
  - e. Date Coordinator's position was created (mm/dd/yyyy)      8/5/1991
- 6. Number of conservation staff, including Conservation Coordinator.      1

**B. Conservation Staff Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	40000	29670
2. Actual Expenditures	29624	

**C. "At Least As Effective As"**

- 1. Is your AGENCY implementing an "at least as effective as" variant of this BMP?      no
  - a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**

Reported as of 8/17/05

**BMP 13: Water Waste Prohibition**

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

**A. Requirements for Documenting BMP Implementation**

- 1. Is a water waste prohibition ordinance in effect in your service area?      yes

a. If YES, describe the ordinance:

Casitas Ordinance 92-5: Prohibits and charges for improper use of water.

2. Is a copy of the most current ordinance(s) on file with CUWCC? yes

a. List local jurisdictions in your service area in the first text box and water waste ordinance citations in each jurisdiction in the second text box:

CMWD Ordinance 92-5

## **B. Implementation**

1. Indicate which of the water uses listed below are prohibited by your agency or service area.

- a. Gutter flooding yes
- b. Single-pass cooling systems for new connections no
- c. Non-recirculating systems in all new conveyor or car wash systems no
- d. Non-recirculating systems in all new commercial laundry systems no
- e. Non-recirculating systems in all new decorative fountains no
- f. Other, please name no  
Failure to repair any water leak in a timely manner yes

2. Describe measures that prohibit water uses listed above:  
Ordinance 92-5

### **Water Softeners:**

3. Indicate which of the following measures your agency has supported in developing state law:

- a. Allow the sale of more efficient, demand-initiated regenerating DIR models. no
- b. Develop minimum appliance efficiency standards that:
  - i.) Increase the regeneration efficiency standard to at least 3,350 grains of hardness removed per pound of common salt used. no
  - ii.) Implement an identified maximum number of gallons discharged per gallon of soft water produced. no
- c. Allow local agencies, including municipalities and special districts, to set more stringent standards and/or to ban on-site regeneration of water softeners if it is demonstrated and found by the agency governing board that there is an adverse effect on the reclaimed water or groundwater supply. no

4. Does your agency include water softener checks in home water audit programs? no

5. Does your agency include information about DIR and exchange-type water softeners in educational efforts to encourage replacement of less efficient timer models? no

### C. Water Waste Prohibition Program Expenditures

	This Year	Next Year
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

### D. "At Least As Effective As"

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no
- a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

### E. Comments

Reported as of 8/17/05

### BMP 14: Residential ULFT Replacement Programs

Reporting Unit: **Casitas Municipal Water District**      BMP Form Status: **100% Complete**      Year: **2001**

#### A. Implementation

	Single-Family Accounts	Multi-Family Units
1. Does your Agency have program(s) for replacing high-water-using toilets with ultra-low flush toilets?	no	no
<b>Number of Toilets Replaced by Agency Program During Report Year</b>		
<b>Replacement Method</b>	<b>SF Accounts</b>	<b>MF Units</b>
2. Rebate	0	0
3. Direct Install	0	0
4. CBO Distribution	0	0
5. Other	0	0
<b>Total</b>	<b>0</b>	<b>0</b>

6. Describe your agency's ULFT program for single-family residences.
7. Describe your agency's ULFT program for multi-family residences.
8. Is a toilet retrofit on resale ordinance in effect for your service area? yes

9. List local jurisdictions in your service area in the left box and ordinance citations in each jurisdiction in the right box:

Casitas MWD City  
of Ojai City of  
Ventura County of  
Ventura

Casitas Will-Serve Letters  
Ojai Ord. 672, City of  
Ventura Sec. 12.120.020,  
Co. Ord. 3904

**B. Residential ULFT Program Expenditures**

	<b>This Year</b>	<b>Next Year</b>
1. Budgeted Expenditures	0	0
2. Actual Expenditures	0	

**C. "At Least As Effective As"**

1. Is your AGENCY implementing an "at least as effective as" variant of this BMP? no

a. If YES, please explain in detail how your implementation of this BMP differs from Exhibit 1 and why you consider it to be "at least as effective as."

**D. Comments**



**SECTION 2 – CONTENTS OF UWMP - STEP EIGHT: EVALUATION OF DMMS NOT IMPLEMENTED**

**SEE CUWCC REPORTS IN SECTION 2 AS WELL AS SECTION 3 – DETERMINATION OF DMM IMPLEMENTATION**



## **SECTION 2 – CONTENTS OF UWMP - STEP NINE: PLANNED WATER SUPPLY PROJECTS AND PROGRAMS**

Casitas uses a safe yield to manage the lake. The safe yield is defined as the amount of water that can be taken from the water supply during the longest or the deepest drought that would not completely minimize the water supply. Casitas has determined that the longest or deepest drought is the one that occurred from 1944 through 1965. This drought defines the safe yield of the Casitas Reservoir. During 2003-04, Casitas undertook a supply and demand study that reevaluated the supply and demand given the drought period from 1945 to 1965. This effort, called the Water Supply and Use Status Report of December 7, 2004, showed that the drought period safe yield was 20,840 acre feet per year for Lake Casitas and the Mira Monte Well. During the same time frame, the report identified the deliveries to the distribution system during such a drought as 21,200 acre-feet per year on the average. This shows a deficit of 360 acre-feet per year or the amount of water that Casitas must find in new supply or through water conservation to be able to supply all customers throughout a twenty-one year drought period.

During the recovery period, from 1966 to 1980, the safe yield during was 19,780 acre-feet per year on the average. The reason for a reduced supply was that additional water was being released for the fish under the March 31, 2003 Biological Opinion of NOAA Fisheries. Water is also being used to fill the lake rather than being made exclusively for customer usage. During the same time frame, the report identified the deliveries to the distribution system during the recovery period as 18,820 acre-feet per year on the average. This leaves a surplus to fill the reservoir of 960 acre-feet per year.

There are some potential concerns with the optimistic surplus view included in the supply and demand report. The first is that the minimum volume of the reservoir is estimated to be 4,000 acre-feet. There is some feeling that the District may have substantial water quality problems at such a low reservoir level. A second concern is the laying down of the sediment at the Robles Diversion facility located on the Ventura River. This year the sediment was laid down in a fashion so that most of the water was not going through the fish passage and diversion works, but was going over the cutoff wall. Should the same situation occur during a drought, the numbers developed above would be less positive. A third issue is the plugging of the fish passage facility screens. Several times this year, the screens plugged due to micro debris and the failure of the brushes. The micro debris prevented all the diversions necessary to deliver the water allowed by the Biological Opinion and thus would reduce the water available.

### **1. Extended Water Conservation for Municipal and Industrial Customers.**

In this program, Casitas plans to complete the Best Management Practices in the District and to have an ongoing program to extend conservation to all the customers of the District. The recent toilet program has saved 6 acre-feet per year. It is expected that the implementation of the rest of the program will save a total of about 18 acre-feet of water per year.

## **2. The SWEAP Program:**

The SWEAP program is a three-stage program, which is to address about 20% of the agricultural users of the District. The first stage is to identify the top 20% of agriculture customers who appear to be using more water than can be justified on their crop report. The District will then work with individual customers to determine the reason for the overuse of their water. The District will then encourage the customer to deal with the reason as soon as possible.

The second stage of the program is to develop a loan/grant program to assist the customer in reducing their water demand to the amount needed based upon 2.5 acre-feet of water per acre per year. This would provide money to recondition wells, put in pressure regulators on the sprinkler systems, put in mini sprinklers, put in ground cover to prevent evaporation of the water, or other incentives to reduce demand.

The third stage is to implement an increasing block rate to cause the agricultural customer to get his water use below the 2.5 acre-feet per acre. This increasing block rate will be implemented in the first stage of the Allocation Program. While the first stage consist of voluntary water conservation, Casitas will use the incentive of additional cost to help the customer get there water use down below the threshold of 2.5 acre-feet per acre per year.

It is expected that this program will assist Casitas in reducing demand by several hundred-acre feet. Such an action would save water and help Casitas overcome a supply deficit during a long-term drought period in the future.

## **3. Move to Stage Two under the incentive program.**

One suggestion to lower water demand is to move to stage two under the incentive rates for the allocation program. Customers billed under a stage two program would be billed at a higher rate once they exceeded their allocation. Allocations for most individual customers are equal to eighty percent of their 1989 water usage. This would provide a disincentive for people to go over their allocation. Currently, this part of the program allows a customer to go over 10% of their allocation before incentives start. Then the incentives charge a rate for all water consumed during that billing period at the percentage over the allocation. For example, if a person used 115% of their allocation, their billing rate would increase 115% for all of the water they purchased for that billing cycle. This price incentive program would encourage greater water conservation for non-agricultural customers that would be subject to it. This program may cause increased complaints from customers that might not understand how we can be in a water shortage if the lake is nearly full. The District would need to inform the public about the long-term drought planning so that they can understand why they are being charged an incentive rate. The other issue is that incentive rates are suppose to balance in overall costs. There are discounts for those who use less than their allocation. In a large rain year, this could have impacts for District revenue and may not achieve much conservation because the rain would decrease water demand.



#### **4. Change in the Allocations:**

Another suggestion is to change customers existing allocations. The allocation program does not make allocations a right, but something Casitas can change. It has been said that the program was set up at 80% of the largest year on record. While it may not be the best program, it does seem to generally follow what the use is today. The question is how one would change the program?

Casitas has looked at changing the group allocation for all agriculture customers. Staff spent about a year putting data together in many ways to try to come up with a way to develop individual allocations for agriculture customers. The results were not encouraging. There are so many different situations that one cannot cover them all. It is expected that the same thing may come out of a general reevaluation of the allocation for all customers. There is value in the effort. When you cannot address them all, there is usually a way of addressing the large users, which could help resolve the problem of developing an equitable program to encourage greater water efficiency. In the next 5 years, it may be helpful to undergo an effort to analyze all customers on their water usage versus their allocation and discuss possible changes.

Another possible option is to view certain types of customers or water usage as a drain on water resources for health, public safety, and fire suppression. If we are to be considered in a semi-permanent water shortage, we should view most non-potable water use as a drain on the more vital water usage needs in the community. This means creating a separate rate structure for non-potable water users to encourage less water usage by such customers.

#### **5. MOU's for Each Purveyor:**

Another idea is to develop memorandum of understanding for each purveyor. These memorandums could provide that a particular type of water waste ordinance be used, it could require the use of any water reserves before coming onto Casitas, it could require participation in a public relations program for water conservation. If an incentive were attached to the program, it may cause other systems to join. Casitas plans to work with other water purveyors to coordinate such a plan in the future.

#### **6. Suggested Projects that Board of Directors could consider in the Future:**

There are additional water supply projects that are not currently planned or approved by the Board of Directors but that may be considered in the future. Some example of such projects could include:

Water banking

Water company management and retrofit and/or rehabilitation to assist wholesale water agencies to rely less on Casitas' water.

San Antonio Recharge Basin

Renegotiated agreement with the City of Ventura to sell less water to the City on an annual basis.

Collection of water from dead end line flushing to be returned to treatment plant.

A much more aggressive leak detection and repair program.

Excavate the north end of Lake Casitas during low water storage.



## **SECTION 2 – CODE CITATIONS – CONTENTS OF UWMP - STEP TEN: DEVELOPMENT OF DESALINATED WATER**

The Casitas Municipal Water District is located on the Pacific Ocean coastline of southwest Ventura County, California. This proximity to the Pacific Ocean does provide an opportunity for the District to consider the development of desalinated water supplies that could supplement surface water supplies and may provide a remedy to the issues of the Rincon system reliability. For the District to move forward with the concept of desalination, there will have to be additional feasibility studies and a positive cost-benefit result from the desalination project. As of June 2005, there are no active District plans for desalination.

The District has recognized that the water demands of the service area have balanced with the local water supplies (surface and groundwater), and that additional growth of water demands will more than likely require alternative supplies of water. The alternative water supply solutions that are available to the District are:

- Importing water from the State Water Project
- Desalination
- Increased water storage
- Reclaimed water
- Cloud seeding; and
- Icebergs.

Each of these solutions has associated costs, benefits, and risks.

The City of Ventura and the Rincon beach area are two specific water service areas to which desalination water supplies may be directly applicable.

### **City of Ventura**

A portion of the City of Ventura is within the boundaries of the Casitas Municipal Water District. The city purchases approximately 6,000 acre-feet of water each year from the District's surface water supply. The annual water demand for the western portion of the city, inside of the District's boundaries, is approximately 7,500 acre-feet. The city had considered desalination in the early 1990's drought, but did not proceed with the implementation of a desalination plant.

There may be opportunities for future joint-agency coordination to build a desalination plant that will supplement surface water supplies and partially meet the demands of this service area. The city's growth projections and the ability of the city's groundwater supplies to keep up with the city's growth may be factors for desalination. The production rate and siting of the plant will require additional feasibility study.

## **Rincon Service Area**

The Rincon service area includes the rural agricultural lands southwest of Lake Casitas to the Pacific Ocean. The coastal communities lie in the 10-mile stretch between the City of Ventura and the Santa Barbara County line. The critical water demands of the area include the 260 homes in La Conchita, Mussel Shoals, Seacliff, Faria and Solimar Beach, and the oil production industry (Conoco, Aera Oil, Mobil Oil, and several other small oil and natural gas production companies in the coastal zone). The residential and industrial annual water demand of the Rincon coastal service area has been approximately 300 acre-feet. The oil industry has a potential for an increase in water demands, based on rising costs of fossil fuels and the profitability of increasing oil production rates. One oil company has recently requested the provision of 550 gallons per minute on a continuous basis. This demand alone would increase the annual water demands of the coastal zone to 897 acre-feet per year. The coastal zone also has approximately 100 acres of agricultural production that is comprised of lemon orchards and flower fields.

The sole source of potable water for the Rincon coastal area is Lake Casitas. Potable water is pumped from the base of the Casitas Dam through a single water transmission pipeline to the inland agricultural areas and to the coastal communities. In addition to the energy costs to pump water to a 900-foot lift, in the past this pipeline has been severed by landslides, which has temporarily left the coastal communities and industries without a reliable supply of water.

A desalination supply to the coastal communities would provide a supply that is not reliant upon the pumping and transmission pipelines from Lake Casitas and provides additional water supply that is not a part of the existing local water supply. An initial estimate of the coastal community desalination plant production is 1 Million Gallons per Day (MGD or 1,121 acre-feet per year (AF/Y)). The plant siting and need for additional pipelines, pumping and storage facilities will require further analysis. The sources of water may include direct withdrawal from the Pacific Ocean, shoreline rainy collectors or wells, and may include various locations from the Ventura River estuary to Mussel Shoals. The brine water outfall discharges may be constructed as new facilities or further investigations may discover existing ocean discharge pipelines that may be converted to brine discharge lines. The District may also determine that this project may be feasible when partnering with the oil companies and/or land developers.



## **SECTION 2 – CONTENTS OF UWMP - STEP ELEVEN: CURRENT OR PROJECTED SUPPLY INCLUDES WHOLESALE WATER**

The Casitas Municipal Water District does not currently receive water from any wholesale agency(s). Casitas anticipates that there may be an opportunity to make a single purchase of 500 acre-feet of water within the next 20 years should certain drought conditions occur. However, this would only be one of several options that could address Casitas' water supply needs. For example, Casitas is looking to implement the Significant Watering Enhancement Agricultural Proposal (SWEAP) that would result in over 200 acre-feet in water savings per year. Several Best Management Practices have not yet been implemented that may also result in additional water savings.

Casitas could purchase 500 acre-feet of water from the Carpinteria Valley Water District. There is an eight-inch pipe connection that currently exists between Casitas and Carpinteria's systems and there is a possibility of a larger pipe being installed if additional flow is needed. Casitas has an emergency water exchange agreement with Carpinteria that remains in place. The Carpinteria Valley Water District identified Casitas in their Water Management Plan as one possible agency it could sell water to in the future. Casitas could make such a purchase during any given five year period due to the storage size of the Lake Casitas Reservoir, which would provide greater flexibility to the Carpinteria Valley Water District to sell their water during a more wet period.

**AGENCY DEMAND PROJECTIONS PROVIDED TO WHOLESALE SUPPLIERS – AF/Y  
(TABLE 16)**

<i>Wholesaler</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
Carpinteria Valley Water District	0	0	500	0	0

The 500 acre-feet of water that could be potentially purchased from the Carpinteria Water District would have three potential sources as indicated in Table 17.

**WHOLESALE IDENTIFIED & QUANTIFIED THE EXISTING AND PLANNED SOURCES  
OF WATER AVAILABLE TO YOUR AGENCY IN – AF/Y (TABLE 17)**

<i>Wholesaler Sources</i>	<i>2010</i>		<i>2015</i>		<i>2020</i>		<i>2025</i>		<i>2030/opt</i>	
	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned	Existing	Planned
<b>(Purchased from USBR – Lake Cachuma)</b>	0	0	0	0	0	167	0	0	0	0
<b>(Purchased from State Water Project)</b>	0	0	0	0	0	166	0	0	0	0
<b>(Local Groundwater)</b>	0	0	0	0	0	165	0	0	0	0

The Carpinteria Valley Water District has three water supplies that total 7,463 acre-feet in a normal year according to their 2004 Urban Water Management Plan as highlighted in Table 21 below. Carpinteria’s water sources do not predict significant impacts from drought because their safe yield anticipates such conditions. During multiple dry years their water supply is not likely to decrease below 6,200 acre-feet per year. Carpinteria’s three water sources are intermingled and include on average 2,813 acre-feet from the United States Bureau of Reclamation that comes from Lake Cachuma, 1,650 acre-feet from the California State Water Project, and 3,000 acre-feet from local ground water sources.

**WHOLESALE SUPPLY RELIABILITY - % OF NORMAL SUPPLY (TABLE 18)**

<b>Wholesaler</b>	<b>Single Dry</b>	<i>Multiple Dry Water Years</i>			
		<b>Year 1</b>	<b>Year 2</b>	<b>Year 3</b>	<b>Year 4</b>
<b>7,463</b>	7,850	6200	6200	6200	6200

**FACTORS RESULTING IN INCONSISTENCY OF WHOLESALER’S SUPPLY (TABLE 19)**

<i>Name of supply</i>	<i>Legal</i>	<i>Environmental</i>	<i>Water Quality</i>	<i>Climatic</i>
<b>State Water Project</b>	District only relies on 1,650 a.f. per year (75% of allotment, which is what the state estimates it can deliver on average.)	None Known	None Known	District only relies on 1,650 a.f. per year (75% of allotment, which is what the state estimates it can deliver on average.)
<b>Bureau of Reclamation – Lake Cachuma</b>	2,813 is not expected to change over the next 20 years.	Organics in Lake could pose issue for treatment.	Water is hard with moderate organic carbons. The major challenge is the formation of disinfections by products in the distribution system.	During a severe drought entitlement could be reduced by 45%.
<b>Local Ground Water</b>	District unlikely to take water beyond safe yield.	None known	No projected water quality issues exist for ground water supply management and reliability.	A drought lasting longer than three years could impact supply.

Since Lake Casitas has a large reservoir and can defer purchasing water for long periods of time the reliability of water supply from Carpinteria’s sources for any given five year period will not be an issue for Casitas. It is likely during the next twenty year period that Casitas will have enough water supply to meet its current demands through other means but if it appears that Casitas is below half full within that period Casitas will have an option to purchase up to 500 acre-feet from Carpinteria within any given five year period.



### SECTION 3 – DETERMINATION OF DMM IMPLEMENTATION

The Casitas Municipal Water District is currently working to implement all of the Demand Management Measures (DMMs).

CMWD's California Urban Water Conservation Council (CUWCC) 1999-2000 Coverage Report indicated only five BMPs were being implemented as shown below:

BMP 1 (Water Survey Programs for Single-family and Multi-family Residential Customers) – Not met one or more coverage requirement.

BMP 2 (Residential Plumbing Retrofit) – Not met one or more coverage requirements.

BMP 3 (System Water Audits, Leak Detection and Repair) – Not met one or more coverage requirements.

BMP 4 (Metering with Commodity Rates for all New Connections and Retrofit of Existing) – **Met coverage requirements.**

BMP 5 (Large Landscape Conservation Programs and Incentives) – Not met one or more coverage requirements.

BMP 6 (High-Efficiency Washing Machine Rebate Programs) – **Met coverage requirements.**

BMP 7 (Public Information Programs) – Not met one or more coverage requirements.

BMP 8 (School Education Programs) – Not met one or more coverage requirements.

BMP 9 (Conservation Programs for CII Accounts) – Not met one or more coverage requirements.

BMP 11 (Conservation Pricing) – **Met coverage requirements.**

BMP 12 (Conservation Coordinator) – **Met coverage requirements.**

BMP 13 (Water Waste Prohibition) – Not met one or more coverage requirements.

BMP 14 (Residential ULFT Replacement Program) – **Met coverage requirements.**

CMWD's status as of 2005 shows that eight BMPs have been implemented and that implementation has begun on four additional BMPs. Implementation of the remaining BMP is scheduled for the fall of 2005. The current status of BMP implementation is as follows:

BMP 1 (Water Survey Programs for Single-family and Multi-family Residential Customers) CMWD will begin implementation in the fall of 2005.

BMP 2 (Residential Plumbing Retrofit) **Meeting coverage requirements.**

BMP 3 (System Water Audits, Leak Detection and Repair) – **Meeting coverage requirements as of 2004.**

BMP 4 (Metering with Commodity Rates for all New Connections and Retrofit of Existing)- **Meeting coverage requirements.**

BMP 5 (Large Landscape Conservation Programs and Incentives) – Initiated implementation in 2004-05.

BMP 6 (High-Efficiency Washing Machine Rebate Programs) – **Meeting coverage requirements.**

BMP 7 (Public Information Programs) – **Meeting coverage requirements.**

BMP 8 (School Education Programs) – Began implementation in 2003-04. Plan to expand program to fulfill requirements by 2006-07 year if deemed feasible.

BMP 9 (Conservation Programs for CII Accounts) Began implementation in 2004-05.

BMP 11 (Conservation Pricing) Meeting coverage requirements.

BMP 12 (Conservation Coordinator) – Meeting coverage requirements.

BMP 13 (Water Waste Prohibition) – Development of an ordinance is underway in 2005.

BMP 14 (Residential ULFT Replacement Program) – Meeting coverage requirements.





## SECTION 4 – WATER SHORTAGE CONTINGENCY PLAN - STEP ONE: STAGES OF ACTION

### Water Shortage Stages, Triggering Mechanisms and Reduction Goals

The Casitas Board of Directors adopted the Water Allocation and Efficiency Program on January 8, 1992 in response to the need to balance supplies and demand through an equitable plan of distribution of existing supplies. Various customer groups, retail agencies and citizens of Casitas’ service area reviewed the program since June 12, 1992. The program reflects the input of those participating in the review process. Casitas’ plan is incremental and predictable allowing adequate time and warning for customers to prepare. The goal of the program is to maximize the efficient use of water while maintaining the current quality of life. Customers are offered choices and economic incentives instead of directives and penalties. The District’s plan includes voluntary and mandatory stages. Stages of the plan will be triggered by a combination of hydrologic conditions within the District. The Board of Directors may implement any particular stage based on lake elevation, previous year’s water use, proximity to the lake’s safe annual yield, and yields available in local groundwater basins. Stage Five may be implemented in the event storage in Lake Casitas is reduced to 65,000 acre-feet. Stage Five may remain in effect until storage reaches 90,000 acre-feet.

**WATER SHORTAGE STAGES, TRIGGERING MECHANISMS & REDUCTION GOALS (TABLE 20)**

Customer Class	Stage	Reduction Goals	Program Type
Residential	1	20%	Voluntary
	2	20%	Mandatory
	3	30%	Rate Incentive
	4	40%	Rate Incentive
	5	50%	Mandatory
Business	1	20%	Voluntary
	2	20%	Mandatory
	3	30%	Rate Incentive
	4	40%	Rate Incentive
	5	50%	Mandatory
Resale	1	20%	Voluntary
	2	20%	Mandatory
	3	30%	Rate Incentive
	4	40%	Rate Incentive
	5	45%	Mandatory
Agriculture	1		Voluntary
	2		Mandatory
	3		Rate Incentive
	4		Rate Incentive
	5	85% of ET	Mandatory
Temporary	1		
	2		
	3		
	4		
	5	No Service Provided	

Not to exceed evapotranspiration (ET) requirements. Penalty per unit over estimated allocation.

## **Water Use Monitoring Procedures**

### Monitoring Procedures – Stages 1 through 4

Water supply conditions, production data and reservoir elevations are recorded daily. Daily and monthly totals are supplied through the Engineering Department and incorporated into the Water Supply Report. Monthly reports include usage and total allocations for each customer category. A list of individual customers whose usage exceeds their allocation is submitted to the Water Conservation Supervisor for monitoring reduction goals.

### Monitoring Procedures – Stage 5

During a Stage 5 water shortage the above procedures will be followed and daily production data will be reported to the General Manager.

### Disaster Shortage

During a disaster shortage production data and reservoir levels will be reported to the field assessment officer hourly and the General Manager daily.

## **Mandatory Prohibition of Water Wasting**

Casitas adopted Ordinance 92-5 on October 14, 1992 adding a water waste regulation to the Rates and Regulations (Appendix III).

## **Disaster Planning**

The County of Ventura Office of Emergency Services incorporates a countywide mutual aid system which is designed to ensure that adequate resources, facilities and other support is provided to water agencies whenever their own resources prove to be inadequate to cope with an emergency.

Casitas approved an Urban Water Management Plan in December 1985. This plan established guidelines of necessary operational procedures during emergencies, water shortages and/or extended drought periods. The plan outlines actions Casitas will implement during catastrophic interruption of water supplies. Please see Section 4 – Water Shortage Contingency Plan - Step Six: Draft Ordinance and Use Monitoring Procedure.



**SECTION 4 – WATER SHORTAGE CONTINGENCY PLAN - STEP TWO:  
ESTIMATE OF MINIMUM SUPPLY FOR NEXT THREE YEARS**

Lake Casitas’ current storage as of August 1, 2005 is 242,491 acre-feet (11,509 acre-feet below full capacity of 254,000 acre-feet, 115,491 acre-feet above half capacity, or 95.5 percent of full capacity. Projections for a three year worst case supply availability is based on the historical worst case three year period of 1989 to 1991 and includes increased demands due to the impact on local ground water sources. Average releases from Casitas Reservoir would be limited to safe annual yield. Three-year worst-case water supply projections are outlined in Table 22.

**THREE-YEAR WORST CASE WATER SUPPLY PROJECTIONS (TABLE 21)**

<i>THREE-YEAR WORST CASE WATER SUPPLY PROJECTIONS (IN ACRE-FEET PER YEAR)</i>				
SOURCES OF SUPPLY	Normal	WORST CASE		
		2006	2007	2008
MIRA MONTE WELL (Groundwater)	300	300	300	300
CASITAS RESERVOIR (Surface Water)	19,381*	21,920	21,920	21,920
IMPORTED STATE WATER	0	0	0	0
<b>TOTALS</b>	19,681	22,220	22,220	22,220
<b>PERCENT SHORTAGE</b>	0%	0%	0%	0%

\*Based on 10-20 inches of rain per year.

During the 1989-91 dry period Lake Casitas realized a drop in the reservoir level of 37 feet for a total reduction of 78,000 acre feet. Projecting the 1989-91 period from Lake Casitas’ current storage of 242,491 acre-feet, provides for a minimum available supply of 164,491 acre-feet, or 65 percent of the reservoir’s capacity.



## **SECTION 4 – WATER SHORTAGE CONTIGENCY PLAN - STEP THREE: CATASTROPHIC SUPPLY INTERRUPTION PLAN**

The County of Ventura Office of Emergency Services incorporates a countywide mutual aid system which is designed to ensure that adequate resources, facilities and other support is provided to water agencies whenever their own resources prove to be inadequate to cope with an emergency.

Casitas approved an Urban Water Management Plan in December 1985. This plan established guidelines of necessary operational procedures during emergencies, water shortages and/or extended drought periods. The plan outlines actions Casitas will implement during catastrophic interruption of water supplies. See Section 4 – Step Six for a copy of the Principles and Guidelines for Emergency Ordinance.



## **SECTION 4 – WATER SHORTAGE CONTIGENCY PLAN - STEP FOUR: PROHIBITIONS, PENALTIES AND CONSUMPTION REDUCTION METHODS**

Casitas adopted the Allocation Program with Ordinance 92-1 on January 8, 1992 and a Water Waste Ordinance 92-5 on October 14, 1992. These ordinances have since been integrated with the Ordinance on Water Rates and Regulations. The purpose of this section is to discuss those ordinances.

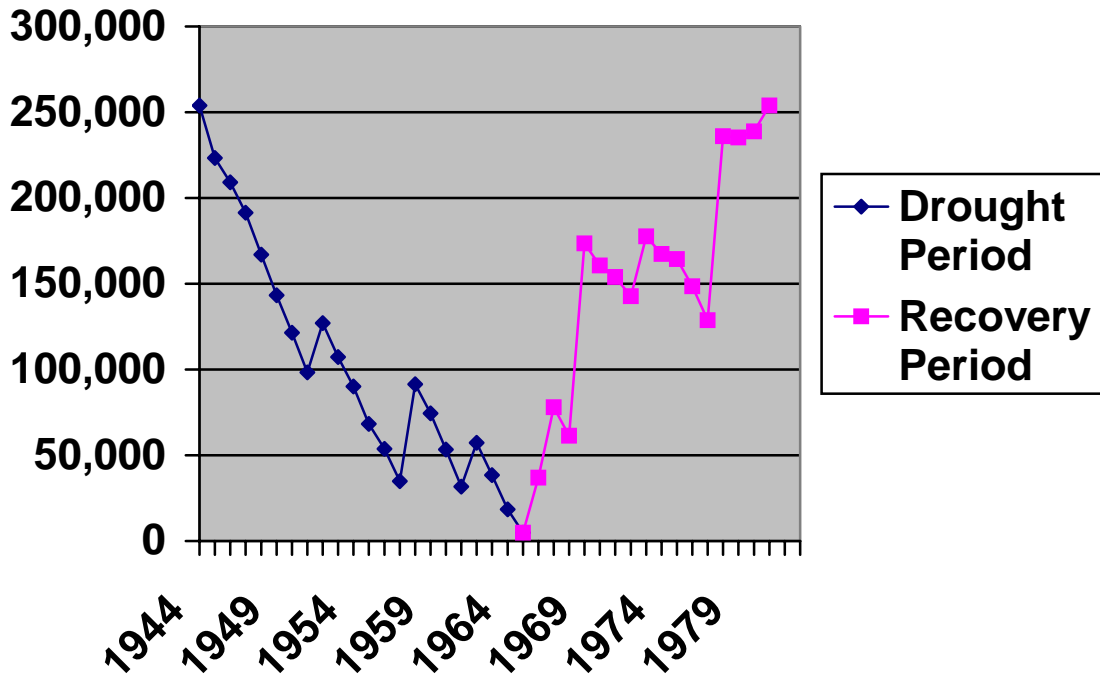
The purpose of the Allocation Program was to provide incentives for customers to help Casitas balance its demands with supplies by providing an allocation to each customer thus tying the customer to the safe yield of the project and then, through a five stage program, provide water conservation incentives to customers to live within their allocation, which could be reduced to assure Casitas stayed within its safe yield.

Casitas has determined, through studies, that the safe yield of Casitas Lake is the average demand that can be put on the Lake through the longest or deepest drought on record. The record drought is from 1944 to 1965. The most recent calculation of the safe yield is in the Water Supply and Use Status Report of December 7, 2004. This report identifies the safe yield of Lake Casitas and Mira Monte Well under a number of supply conditions and for a drought period and a recovery period.

Safe yield during a drought period operating under the Robles Biological Opinion without Matilija Reservoir as a water supply source is 20,840 acre-feet per year while demand is 21,200 acre feet per year. This shows a shortage over a 21-year drought cycle of 360 acre-feet. Additionally, the Board of Directors authorized additional allocations for 50 acre-feet in July 2004, which is likely to bring this total shortage to 410 acre-feet per year. A drought period by definition begins once the lake is full as described in Casitas' *Water Supply and Use Status Report*, December 2004. The drought period will continue until the lake reaches about 4,800 acre-feet of water supply. This would occur during a historical drought period if no additional water conservation or water supply were provided at a level that would equal the 410 acre-feet shortage of water per year.

During the recovery period, the safe yield available is 19,780 acre-feet per year operating under the Biological Opinion without Matilija as a water source while system use is 18,820 acre-feet per year. There appears to be a surplus during this period of 960 acre-feet per year that would be reduced by the same 50 acre-feet per year once the additional services are added should there not be additional supply secured. This surplus water cannot be transferred to a drought period because excess water in a future recovery period is not available when Lake Casitas reaches an all time low of about 4,800 acre-feet. The lake reaches spill at 254,000 acre-feet as described in Casitas' *Water Supply and Use Status Report*, December 2004.

The drought period and the recovery period are based on historical periods. The surplus water from the recovery period cannot not be transferred to the drought period because excess water from a future recovery period is not available when Lake Casitas reaches an all time low, please see Figure 3 – *Drought Period and Recovery Period*.



**FIGURE 3 - Drought Period and Recovery Period – based on actual historical data (acre-feet of available water supply)**

**Consumption Reduction Methods**

The Allocation Program also has a program that limits connections to the available water that the Board has released for use. Casitas is in a semi-permanent period of delay for allocating all new service connections. The Board may release additional water for new services when it becomes available. As a part of this program, the methodology in releasing new services will be adopted as part of this plan. The purpose is to make this methodology clearer in the procedure for the limitation of services. Additionally, there will be a change in the rule allowing no houses on agricultural properties without an additional allocation to one where the customer can, with the elimination of trees, be able to add a house to the property if the offset is two times the amount of water expected for the house usage. These modifications are outlined in Attachment D.

The Allocation Program has a five-stage program to cause consumption reductions. Stage 1 is a voluntary 20% reduction. Stage 2 applies incentive rates to get to the 20% reduction. In Stage 2, all water is charged the rate plus the percentage over the allocation if more than 10% use over the allocation. In Stage 3, it is twice the Stage 2 rates. In Stage 4, it is 5 times the Stage 2 rates. Stage 5 requires a further reduction in water use and applies the Stage 4 rates in getting there. Rates are different for each customer type. It is anticipated that an incentive rate will be applied to customers using more than their allocation in Stage 1.

## **Ordinance 92-5 Water Waste Ordinance**

The water waste ordinance prohibits usage in all stages for such purposes as cleaning sidewalks, driveways, streets, gutters, ditches or other surface drains without a control device on the hose. It also prohibits unrepaired leaks or excessive usage that would cause the water mains to have a water quality problem. In Stage 5, the ordinance prohibits cleaning side walks, driveways, or other paved or hard surfaces, use of water through a hose without a positive shut-off valve on the end of the hose, use of water in decorative fountains, watering landscape or garden watering after 9 a.m. and before 6 p.m., washing down streets with water. Enforcement includes several personal contacts by Casitas, followed by discontinuance of service. There is a charge for shutting off the water.

Example of a draft proposal made to go into the next Stage can be found in Attachment E.

## **Background and overview**

The allocation program was adopted in January 1992. This program provides for a staged approach to ensuring that Casitas stays within Lake Casitas' safe yield. Generally, Stage I asks for voluntary water conservation, that is, requesting a continued 20% reduction of water usage in the district. Stage II through Stage V provides financial incentives for customers to stay within their allocation. The question is when is it appropriate for Casitas to move into a stage higher than Stage I.

The Rates and Regulations for Water Services discusses the stages in the allocation program as follows:

15.3.2.2 Stage 2 allocations shall be implemented upon adoption of this ordinance. Associated Stage 2 water rates shall be implemented at the discretion of the Casitas Board of Directors based upon the General Manager's report on current water storage, current water use, weather conditions, and recurrent hydrologic conditions of the local ground water basins.

15.3.2.3 Stage 3 may be implemented at the discretion of the Casitas Board of Directors based upon the General Manager's report as stated in 15.3.2.2 above and an evaluation of the Stage 2 measured success or assessed potential to achieve the objective of this program.

15.3.2.4 Stage 4 may be implemented at the discretion of the Casitas Board of Directors based upon the General Manager's report as stated in 15.3.2.2 above and an evaluation of Stage 2 and Stage 3s measured success or Stage 2 and Stage 3s assessed potential to achieve the objectives of this program.

15.3.2.5 Stage 5 may be implemented in the event Lake Casitas' storage is reduced to 65,000 acre-feet or less. Stage 5 may remain in effect until Casitas' storage reaches 90,000 acre-feet.

15.3.2.6 The Board of Directors may at their discretion implement a lesser stage of this ordinance based upon the General Manager's report and the assessed potential of the lesser stage to achieve the objectives of this program.

The movement to another stage is based upon the following criteria:

1. Current water storage;
2. Current water usage;
3. Weather conditions;
4. Recurrent hydrologic conditions of the local ground water basins; and
5. Evaluation of prior stages measured success or assessed potential to achieve the objective of this program.

The analysis below is the initial evaluation of these criteria for the Boards consideration.

## **Current water storage**

Current water storage is a critical issue. Casitas must store water to be able to supply its customers through long-term droughts that are historically known to occur in the Southern California area. Casitas has adopted a safe yield based upon a drought that occurred from 1944 through 1965, or a twenty-one year period of decreased rainfall, which actually happened in the hydrology of the Ventura River. The safe yield was the amount of water, on the average, that Casitas could deliver to the system without draining Lake Casitas. Lake Casitas' safe yield has been set at 20,540 acre-feet. Additionally, Matilija Dam's safe yield has been put at 420 acre-feet but it is assumed this will no longer be a supply source after January 1, 2009. While usage could vary due to the demands of customers, the average usage since the last spill was important to determining Casitas' ability to stay within its safe yield.

## **Storage in Lake Casitas**

Storage in Lake Casitas at its maximum is 254,000 acre-feet. Lake storage can, at times of great rainfall, be greater than that due to inlet flows being greater than outlet flows. However, Lake Casitas spills all flows over 254,000 acre-feet and therefore this amount would appear to be a maximum. Casitas has not analyzed the capacity of Casitas' Lake since construction of the dam. Casitas has had silt flows since construction and it is anticipated that the silt has reduced some of the volume of the lake. It is known that the bottom gate on the inlet piping on the face of the dam is now likely below the silt level. Therefore there is some question as to the current capacity of the lake. If silt fills the bottom to gate 1, then Casitas will lose that amount of acre-feet storage.

## **Storage Level**

Another issue is the overall storage level in the lake. As the lake gets farther down, the level itself becomes more and more of a concern. During the drought of 1987 through 1991, the lowest water supply level in the lake was about 129,000 acre-feet.

The issue with water storage capacity in Lake Casitas is influenced by the Biological Opinion (BO). The BO is a federal regulation that outlines water release requirements for the endangered Southern California Steelhead, for the Fish Passage. The Biological Opinion anticipates actions during a shortage period beginning with a level of about 127,000 acre-feet, or half the reservoir capacity. The requirement is to show that Casitas is acting on its shortage needs and that it is doing a good job. Short of some demonstration of Casitas' good intentions, the action to implement reductions to releases will be delayed. This lead to concerns with the Biological Opinion that it acted too little and too late to avoid a problem during a drought. Additionally, Casitas has the problem of customers who have other sources coming on line during an extended drought. This will appear to the federal agencies that Casitas is expanding demand, rather than curtailing the demand. Acting earlier will help demonstrate that Casitas is acting to avoid a problem and will give Casitas some support in demonstrating that it is doing all it can in a drought.

## **Safe Yield**

The safe yield as estimated by U.S. Bureau of Reclamation in their project report at 28,000 acre-feet per year. Casitas hired a contractor, Don Keinland to develop a calculation for the safe yield of the lake. The studies by Mr. Keinland were completed in 1988 and took into consideration the hydrology of the area, the evaporation and rainfall upon the lake, and other impacts to the water supply. The D-20 study indicated that Casitas Lake could withstand a 20-year drought if the average demand does not exceed 21,500 acre-feet per year. The D-20 study assumed that there would be about 17,000 acre-feet left in the reservoir at the end of the drought. Casitas recently completed an updated study on December 7, 2004 that indicates the safe-yield is now 19,780 during a 15-year drought recovery period or 20,840 during a 21-year drought period, this figure includes the 300 acre-feet average annual yield from the Mira Monte well and the 20,540 average annual yield from Lake Casitas. These new figures consider recent changes in diversions such as a the limited time period



remaining for Casitas to divert water from the Matilija Reservoir and the new criteria for diverting water from the Ventura River under the federally directed Robles Biological Opinion operating criteria that calls for more water releases down the Ventura River to assist the endangered Southern California Steelhead Trout.

Many people erroneously compare the safe yield to demands on the water system every year. This comparison is faulty because safe yield is an average, not a one-year number. A better methodology is to tract the average usage since the last spill to compare to the safe yield. This is a gauge of how the average usage is doing against the average usage for an entire 20-year drought.

### **Biological Opinion for the Fish Passage Facility**

An impact upon storage is also the ability to divert water. Casitas has a water right to divert water off the Ventura River. This right to divert was also limited by the interim operating criteria, which operated for 43 years. This ability to divert is affected by the Biological Opinion for the Fish Passage Facility that is being constructed for the endangered steelhead trout. The Biological Opinion required that some of the water that could have been captured in the Robles diversion under the water right and the interim operating criteria must now be bypassed. This amount of water that is to be bypassed is estimated between 1,731 and 3,200 acre-feet per year on the average. The reason for the difference in numbers is that Casitas felt that the 1,731-acre feet estimated by the National Marine Fisheries Service used only direct losses, and did not anticipate the lost opportunity cost of water lost under the interim operating criteria, nor the water lost due to damage to the system. The assumption of the National Marine Fisheries Service was Casitas could use the flows during wet years to make up for the loss of water during the drought. This assumption does not appear to work because the estimate of bypassed water is during the drought.

The water release for fish can be described as a safe yield issue in that it reduces the safe yield because water that could be delivered to the lake during the drought, must now be released downstream. Another way to view the releases for fish is that it is a demand upon the safe yield, which Casitas must meet along with the other supplies in the system. Whether it is reducing the safe yield, or increasing the demands on the supplies of the system, the result is the reduction of water available from the project facilities.

### **Allocations**

Casitas has been developing allocations for all its customers. When the allocation ordinance was adopted it set the allocation of all customers at 80% of 1989 usage. Allocations are a device for Casitas to tie individual customer usages to the safe yield. Since that time, Casitas has been adding new allocations for new customers and additional allocation for existing customers. The allocation reported to the Board during the April 2003 meeting on water supply indicated that allocations amounted to 19,294 acre feet. Casitas knows what the amount of water is introduced into the system and can thus calculate the unaccounted for water. The allocation program can then be used to control the amount of water sold by implementing the different stages, which will impact customer demand for water.

### **Storage in Matilija Dam**

Storage in Matilija Dam is another important aspect of the storage issue. Casitas has a lease for Matilija Dam from the Ventura County Flood Control District, which ends on January 1, 2009. Casitas has long estimated that the safe yield of Matilija Dam was 420 acre-feet per year. Recent calculations of the average water developed by Casitas during 1991 to 2000 has indicated that during this wet period, supplies have been as high as 900 acre-feet per year. There is currently a process being undertaken by the Corps of Engineers and the County of Ventura to remove the Dam. With the elimination of the dam, the yield of the dam would also be eliminated. Casitas is supportive of the Matilija Dam removal project with the caveat that all potential impacts on the District from the project are properly mitigated. The District is actively working with the county to ensure that mitigations are met.

At the present time, Casitas still can use Matilija and its yield, at least through 2008. While it provides a substantial yield during wet years, its value during dry years is minimal.

**Conclusions on Water Storage**

The water storage analysis supports instituting different stages based on a number of factors. The facts supporting this conclusion would be those discussed above. The safe yield of Casitas and Matilija operating under the BO is 20,840 acre-feet per year. However, the yield of Matilija Dam would be little during a drought and would be nothing if it were removed. The allocation for the system through May 2002 is 19,294 acre-feet. The safe yield could be reduced further by potentially unforeseen water releases related to fish passage requirements. The amount of water lost for fish releases is predicted to be 1,791 acre-feet in a wet period or 3,200 acre-feet per year in a dry period. These figures could change if unpredicted problems with the fish passage facility prevent additional diversions from occurring. The Supply and Demand Study indicates a shortage of 360 acre-feet of yield. The level of the lake also argues for an increase in stages should it drop. Casitas needs to show that it has taken some action to deal with high demands in order to show the Fish agencies that it is dealing with a drought and that the customers are dealing with the drought. This can be shown by the implementation of water conservation programs as a permanent condition of Casitas' water supply.

**Current water usage:**

**AVERAGE WATER SUPPLY VS. WATER USAGE 1998-2002 (TABLE 22)**

<i>Calendar Year</i>	<i>Water Introduced into system</i>		<i>Water Sales</i>	<i>Unaccounted Water Loss</i>	<i>% Unaccounted Water Loss</i>
	<i>Casitas Dam</i>	<i>MM Well</i>			
1998	13,410	10	12,467	953	7.10
1999	18,837	8	18,850	-5	.000
2000	17,557	253	18,443	-623	-3.50
2001	17,810	212	16,756	1,266	6.73
2002	22,101	75	20,561	1,615	7.28
<b>Total</b>	<b>89,715</b>	<b>558</b>	<b>87,067</b>	<b>3,206</b>	<b>3.55</b>
<b>Average</b>	<b>17,943</b>	<b>112</b>	<b>17,412</b>	<b>641</b>	<b>3.52</b>

This table says that the average water being put into the system since the last spill in 1998 is 17,943 acre-feet per year. This amount is well below the safe yield of Lake Casitas.

The water usage pattern for the most recent calendar years 2003 and 2004 shows that water sales were as follows;

**RECENT AVERAGE WATER SUPPLY VS. WATER USAGE 2003-2004 (TABLE 23)**

<i>Calendar Year</i>	<i>Water Introduced into System</i>		<i>Water Sales</i>	<i>Unaccounted Water Loss</i>	<i>% Unaccounted Water Loss</i>
	<i>Casitas Dam</i>	<i>MM Well</i>			
2003	16,571	246	15,656	1,161	6.90
2004	20,214	214	19,521	907	4.44

## **Summary;**

The Water Supply and Use Status Report of December 7, 2004 says that Casitas is short 360 acre-feet of water per year in a drought. Matilija dam supplies are excluded due to lack of rainfall during the drought. Fish flows have been included in the report. Current five-year average demands since the last spill are 17,943 acre-feet. The shortage needs to be addressed through a combination of water conservation and water supply functions.

## **Conditions of the local ground water basins:**

There are two ground water basins that are of consideration. The first is the Ventura River ground water basin, which has been described as a water slide with a couple of bumps. If you do not use it, all the water will drain to the ocean within 3 years. The second is the Ojai Basin, which has been described as a tipped bowl. It will only take so much water before it spills water and therefore, has a fixed capacity much like Casitas Lake. The usual rule of thumb is to use surface water before ground water because ground water does not evaporate and is reasonably protected from pollution, and because surface storage fills so quickly as it is usually on a river. For the Casitas area, this rule works backward to maximize use. Use of the ground water basins should be first because they fill so quickly when there is rain, and use the surface storage second because it takes so long to fill due to it being off river storage and now the limitations of the Biological Opinion.

## **Evaluation of prior stage measures:**

Casitas has been in Stage 1, Voluntary Conservation, since the adoption of the program.

## **Modification of the 2003 Rates and Regulations for Water Service**

### **4. ARRANGEMENTS FOR REGULAR WATER SERVICE**

Casitas is in a state of permanent delay in issuing new services. Both the 1991 reports on water supply and the Water Supply and Use Status Report of December 7, 2004 indicate a shortage in supply during a drought. Casitas, in its will serve letters to the County, promises to supply the customer reliably for forty years. The purpose of this requirement is to provide for only the services that Casitas can supply during a long-term drought. Upon report from staff about the availability of water, the Board may release additional water for services for new or existing customers of Casitas.

**4.1 CONDITIONS OF PRIORITY AND PRIORITIES FOR NEW SERVICE AND EXPANDED EXISTING SERVICE AFTER A DELAY.** No new service will be provided to customers until the Board of Directors has determined that new supplies are available. The determination of supplies being available shall be made upon staff recommendation at a regular Board of Directors meeting. The determination that water is or is not available shall be within the determination of the Board of Directors. The determination that a supply is available shall be based upon more detailed information about existing supplies, the availability of new supplies, new water supply projects, or contracts or proposed contracts for additional supplies where, in the opinion of the Board of Directors, the supply of water is definite enough to provide the assurance to the County of Ventura that there is a forty year supply. When the Board of Directors determine that additional new water supplies are available, either from the safe yield of the existing Casitas project supply or additional new supplies, supplies shall be allocated in accordance with the the provisions of 4.2 that are included on page 172.

#### 4.2.AVAILABILITY OF ALLOCATIONS:

4.2.1.PURPOSE OF USE: As water becomes available, 50 percent shall be allocated to applicants for agricultural uses and 50 percent shall be allocated to applicants for municipal and industrial uses. In the event applicants for one type of use are satisfied without utilizing the entire designated allocation, 20 percent of the remaining water will be allocated to other uses each year. Agricultural uses are commercial agricultural uses as defined in Casitas' Rates and Regulations. Municipal and Industrial uses are all other water uses.

4.2.2.SIZE OF ALLOCATION: As water becomes available, no single property owner or applicant for the given type of service (municipal and Industrial or agricultural) shall receive a new water allocation greater than 10 percent of the total new available supply or the minimum standard residential allocation as defined in Casitas' Water Efficiency and Allocation Program (Section 15.3.1), whichever is greater. If the applicant's allocation requirements are not fully met, the applicant may maintain a position of priority until more water is available.

All applicants seeking priority listing shall provide Casitas with a detailed description of the project or use of water for which the water is sought. Applicant shall provide information on peak flow and annual water requirements. Casitas shall determine meter size and amount of allocation based upon reasonable and necessary needs and Casitas' Rules and Regulations.

#### **Additional Changes in the Ordinance shall be as follows:**

4.2.12.EXPANSION OF SERVICE: Customers requiring additional water for second dwellings, also known as "granny flats", development of additional Agricultural lands, or any other projects requiring an increase in water use shall apply for an additional allocation and shall be required to pay all associated application and connection fees. An addition of a house to an agricultural property shall not be an expansion of service if the customer demonstrates to Casitas any of the following:

1. That the property is fully planted or planted and covered with buildings and roads to the extent that agricultural plantings must be removed to accommodate the new house.
2. The property owner agrees in a recordable writing that he is limiting the use of the property to either the number of trees on the property in 1989, 1989 trees plus trees added with additional allocation after 1989, or the water provided by contract with Casitas for agricultural; and that number will be permanently reduced to offset the water use of the proposed construction of the house that is planned.

4.10.5NEW HOUSES. Each new dwelling structure added to any land with service from Casitas shall be required to pay CFC and NWCFC for a 3/4-inch meter despite any allocations above. No connection fee shall be charged if an agricultural property owner can demonstrate in accordance with section 4.2.12 that water use will be reduced.

#### **Addition of Water Waste Ordinance Program**

List the mandatory prohibitions against specific water use practices during water shortages. Prohibitions often include excessive run-off, cleaning paved surfaces with potable water, failure to repair leaks, surface irrigation during restricted hours, etc.



## SECTION 4 – WATER SHORTAGE CONTINGENCY PLAN - STEP FIVE: ANALYSIS OF REVENUE IMPACTS FROM REDUCED SALES DURING SHORTAGES

Casitas’ normal annual income from water sales is \$6,039,440. Twenty-seven percent, or \$1,630,649, is from fixed service charges. Under Casitas’ current “Water Efficiency and Allocation Program”, no significant reductions in revenues are anticipated until Stage Five. In order to lessen the financial impacts during periods of water shortage or disasters affecting water supply, Casitas maintains a \$2.5 million reserve for variation in water sales. Casitas also entered into a thirty-year agreement with the City of Ventura that will ensure a steady income for the District and allow banking of unused water for the city. Analysis of Revenue and Expenditure Impacts (Table 24).

**WATER SALES IN DOLLARS (TABLE 24)**

<i>CASITAS MUNICIPAL WATER DISTRICT</i>					
<i>WATER SALES IN DOLLARS</i>					
<i>CLASSIFICATION</i>	<i>NORMAL</i>	<i>STAGE 2</i>	<i>STAGE 3</i>	<i>STAGE 4</i>	<i>STAGE 5</i>
<b>RESIDENTIAL</b>	\$1,481,513	\$1,481,513	\$1,481,513	\$1,481,513	\$1,081,504
<b>BUSINESS/IND.</b>	400,299	400,299	400,299	400,299	\$292,218
<b>AGRICULTURAL</b>	1,554,653	1,554,653	1,554,653	1,554,653	\$1,134,897
<b>RESALE</b>	2,315,440	2,315,440	2,315,440	2,315,440	\$1,690,271
<b>TEMPORARY</b>	31,925	31,925	31,925	31,925	\$23,305
<b>OTHER</b>	255,609	255,609	255,609	255,609	\$186,595
<b>TOTAL SALES</b>	<i>\$6,039,440</i>	<i>\$6,039,440</i>	<i>\$6,039,440</i>	<i>\$6,039,440</i>	\$4,408,791



## **SECTION 4 – WATER SHORTAGE CONTINGENCY PLAN - STEP SIX: DRAFT ORDINANCE AND USE MONITORING PROCEDURE**

### **Definitions**

A Level One Alert: an emergency condition that will occur in the event of a catastrophe or disaster caused by a natural phenomenon or man-made event such that the availability of the water supply from Lake Casitas on a short-term basis has become unreliable as determined by the General Manager.

### **Declaration of a Level One Alert may be the result of any of the following:**

- Earthquakes
- Power outages
- Chemical/toxic spills in Lake Casitas
- California Department of Health Services' determination groundwater basins are contaminated.
- Sudden deterioration of water quality in Lake Casitas.
- Interruption of service due to pipeline breaks, loss of pumping plants, chlorination stations, etc.
- Immediate hazard to public health.
- Uncontrolled watershed burn resulting in flooding, thereby impacting water served from lake Casitas because of:
  1. High turbidity
  2. Bacteriological quality
  3. High organic content
  4. Damage to distribution system

### **A Level Two Alert:**

An emergency condition will occur in the event that the availability of supply from Lake Casitas becomes unreliable as determined by the Casitas Board. Such a determination would be made as a result of conditions, which impact the water supply over an extended period of time. Declaration of a Level Two alert may be the result of any of the following:

- Low water level of Lake Casitas
- Low water levels in the groundwater basins.
- Increases in demand for Casitas water.
- Abandonment of wells due to low groundwater levels in basins and/or well refurbishing costs.
- Surface diversion resources depleted.
- Records indicate rates of withdrawals of water from Lake Casitas are in excess of the safe yield.
- Lifeline Water Usage.
- Lifeline water usage is the absolute minimum amount of water necessary to sustain human life.
- Baseline Water Usage
- Baseline water usage is an amount of water that will be assigned by Casitas to each service during the implementation of the provisions of the emergency ordinance related to allocations.

**Total Available Water Supply:**

The total amount of water, as determined by the Casitas Board, to be distributed during an emergency condition at either alert level.

**Water Priorities**

The Casitas Board declares by adoption of this Urban Water Management Plan the following water priorities for the distribution of Casitas' water during an emergency condition for both alert levels are:

- Residential and residential resale to water agencies without alternate water sources.
- Irrigation and irrigation resale without alternate water sources.
- Residential resale to water agencies with alternate water sources.
- Irrigation and irrigation resale with alternate water sources.
- Industrial and industrial resale.
- Oil recovery program
- Other

**Establish Baseline**

The Casitas Board will establish a baseline water usage for each residential service, each irrigation service, and each industrial service based upon historical use and/or other fair and equitable bases.

**Provisions To Be Implemented****Level One Alert**

For a period of time as determined by the General Manager, the General Manager may:

- Direct the implementation of appropriate portions of the Interim control Measures to Insure Domestic Water Quality during FY 1985-86 as adopted by the Casitas Board on August 28, 1985, relative to the storage and distribution of Casitas water, including Section F, Regulation of Service.
- Inform all Casitas customers that Casitas water is not to be used for non-life-support purposes; e.g., washing down driveways, sidewalks, etc., or watering any landscaping, etc.
- Direct all irrigation customers and all water agencies, when possible, to utilize their groundwater or other surface water sources and cease using water from Lake Casitas.
- Direct all oil companies to stop taking Casitas water for oil recovery or other non-life-sustaining purposes.
- Direct all other water agencies, which are customers of Casitas to practice water conservation measures similar to those contained herein.
- If appropriate, advise all Casitas customers that Casitas water is to be boiled prior to using as drinking water.
- Other orders as may be deemed appropriate under the existing circumstances.

## **Level Two Alert**

For a period of time as determined by the Casitas Board, the Casitas Board:

- Shall establish the baseline water usage for each service connection.
- Shall establish a water allocation program based on historical uses of Casitas water or other fair and equitable bases, which will establish the amount of water that can be obtained from Casitas by each customer of Casitas, including other water agencies.
- May implement an increasing-block rate structure for any classification of water service.
- Shall require all water agencies taking water from Casitas to implement water conservation measures similar to those contained herein.
- May require other water agencies – as appropriate – to wheel water from their supplies through Casitas’ pipeline to the agencies’ customers currently being served from Casitas’ supplies through a master meter.
- May direct all customers and all other water agencies to utilize their groundwater or other water resources as their sole water source when practicable, and not take any Casitas water during the period of time so established.
- May direct the oil companies to cease taking any Casitas water for secondary oil recovery purposes or other non-life-sustaining purposes.
- May request the Ventura County Board of Supervisors and the Cities of Ojai and San Buenaventura to place a moratorium for all building permits, lot splits or subdivisions within Casitas’ boundaries.
- Shall direct all customers of Casitas who have wells to report the condition of their wells to Casitas when reasonably requested, including the capacity of the well and the quality of the water.

## **Declaration of Emergency**

### **1. Declare Level One Alert**

The General Manager shall have the authority to declare a Level One Alert for an emergency condition and to implement the provisions of the emergency ordinance related to the Level One Alert.

### **2. Alert Level**

The Casitas Board may declare by resolution either a level of one or two alert and implement the appropriate provisions of that alert level.

## **Purpose of Ordinance**

An emergency ordinance shall be adopted in order to provide the Casitas Board and the General Manager with appropriate guidelines, procedures and regulations to implement the above procedures when appropriate. The provisions of the ordinance shall be developed and implemented in a manner to provide water service during emergency conditions to all of Casitas’ customers in a fair and equitable manner.





## SECTION 5 – RECYCLED WATER PLAN -

### STEP ONE: COORDINATION

### STEP TWO: WASTEWATER QUANTITY, QUALITY AND CURRENT USE

### STEP THREE: POTENTIAL AND PROJECTED USE, OPTIMIZATION PLAN WITH INCENTIVES

The Ojai Valley Sanitation District and the City of Ventura provide wastewater collection and treatment within Casitas’ boundaries. The City of Ventura provides a level three treatment for approximately 10,000 acre-feet per year and has initiated several successful recycling projects. The Ojai Valley Sanitation District provides level three treatment for approximately 3,000 acre-feet per year. The Sanitation District built a thirty million dollar tertiary treatment upgrade to its existing plant several years ago. No recycling activities are currently in operation, but opportunities are being explored with local industries and environmental groups.

#### Wastewater Generation and Collection (Table 25)

<i>WASTEWATER GENERATION AND COLLECTION</i>						
	2000	2005	2010	2015	2020	2025
Wastewater collected and treated in service area (mgd)	2.24	2.29	2.34	2.39	2.44	2.49

#### Wastewater treatment MGD (Table 26)

<i>WASTEWATER TREATMENT</i>					
<i>(MILLION GALLONS PER DAY)</i>					
TREATMENT PLANT NAME	LOCATION (CITY)	AVERAGE DAILY (2000)	MAXIMUM DAILY (2000)	YEAR OF PLANNED BUILD-OUT	PLANNED MAX. DAILY VOLUME
OJAI VALLEY SANITARY DISTRICT	OJAI, CA	2.24 MGD	4.91 MGD	N/A	3.0 MGD



## **SECTION 6 – WATER QUALITY IMPACTS ON RELIABILITY**

Water quality impacts on supply reliability and management strategies are minimal. Casitas has two sources of water, Lake Casitas and the Mira Monte well. Surface water supply from Lake Casitas is treated by filtration and chlorination prior to the distribution system. The treatment process ensures that the water meets all state and federal regulations. Casitas' groundwater source represents only 300 acre-feet of water per year compared to the nearly 20,000 acre-feet from Lake Casitas. The well water is blended with lake water at a high ratio with surface water to ensure the maximum contamination level for nitrate is met. The resulting blended water is well below the maximum contamination level for nitrate.



## SECTION 7 – WATER SERVICE RELIABILITY – STEP ONE: PROJECTED NORMAL WATER YEAR SUPPLY AND DEMAND

The following supply and demand data was produced using the water supply and demand data listed on pages 9-10 in Casitas’ Water Supply and Use Status Report found in Attachment C. The water supply numbers listed below remain constant but they may be subject to change in the next twenty-years if Casitas should act to secure additional water supplies by purchasing water from another water agency or through the State Water Project (SWP). Casitas could also develop a desalination plant to secure potable water from the Pacific Ocean. The water demand figures assume a gradual increase in customer demand based on Table 15 assumptions for water demand growth within each of Casitas’ customer categories.

The water supply and demand figures are all based on the Robles Biological Opinion (BO) operating criteria, that is the federal requirements related to releasing water to support the endangered Southern California Steelhead. The numbers also include the assumption that the Matilija Reservoir will no longer be available to supply water. The normal supply water year is based on the Water Supply and Use Status Report. The yield was calculated by setting an annual extraction value that allows for the reservoir to increase from 4,800 acre-feet to 254,000 acre-feet within this period. As a result of having a large reservoir, the assumption is that all years will average the 19,780 acre-feet of supply rather than being able to identify a particular year that would be associated with this amount of supply.

### PROJECTED NORMAL WATER YEAR SUPPLY – AF/Y (TABLE 27)

<b>Supply</b>	19,780	19,780	19,780	19,780	19,780	19,780
<b>% of Normal Year</b>	100%	100%	100%	100%	100%	100%

The Casitas’ Water Supply and Use Status Report predicates future water deliveries during a drought recovery period to be approximately 18,820 acre-feet per year.

### PROJECTED NORMAL WATER YEAR DEMAND – AF/Y (TABLE 28)

	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
<b>Demand</b>	18,820	18,820	18,820	18,820	18,820	18,820
<b>% of Normal Year</b>	100%	100%	100%	100%	100%	100%

**PROJECTED NORMAL YEAR SUPPLY & DEMAND COMPARISON – AF/Y (TABLE 29)**

	<i>2005</i>	<i>2010</i>	<i>2015</i>	<i>2020</i>	<i>2025</i>	<i>2030/opt</i>
<b>Supply totals</b>	19,780	19,780	19,780	19,780	19,780	19,780
<b>Demand totals</b>	18,820	18,820	18,820	18,820	18,820	18,820
<b>Difference (supply minus demand)</b>	960	960	960	960	960	960
<b>Difference as % of Supply</b>	4.85%	4.85%	4.85%	4.85%	4.85%	4.85%
<b>Difference as % of Demand</b>	5.10%	5.10%	5.10%	5.10%	5.10%	5.10%



## SECTION 7 – WATER SERVICE RELIABILITY – STEP TWO: PROJECTED SINGLE-DRY-YEAR SUPPLY AND DEMAND COMPARISON

The following projections are from available supply considering the 1945-1965 drought period based on the Robles BO operating criteria and without the benefit of the Matilija Reservoir as reported in Casitas Water Supply and Demand Study (Attachment C). The projected normal supply for the 1945-1965 period is 20,840 and the projected demand is 21,200 acre-feet. The projected normal water year supply is 19,775 for the recovery period of 1966-1980. The projected normal water year demand for the same period is 18,820 acre-feet. This figure is less than the projected supply in a dry year because more water is required to be released as a requirement of the Robles Biological Opinion during wet years so there is actually less water supply being delivered to Lake Casitas. Again, there is no particular year associated with supply amount because the reservoir is predicted to supply an average amount of water every year within the given recovery or drought period.

### PROJECTED SINGLE DRY YEAR WATER SUPPLY – AF/Y (TABLE 30)

	2005	2010	2015	2020	2025	2030/opt
Supply	20,840	20,840	20,840	20,840	20,840	20,840
Projected normal	19,780	19,780	19,780	19,780	19,780	19,780
% of projected normal	105.36%	105.36%	105.36%	105.36%	105.36%	105.36%

### PROJECTED SINGLE DRY YEAR WATER DEMAND – AF/Y (TABLE 31)

	2005	2010	2015	2020	2025	2030/opt
Demand	21,200	21,200	21,200	21,200	21,200	21,200
Projected normal	18,820	18,820	18,820	18,820	18,820	18,820
% of projected normal	112.65%	112.65%	112.65%	112.65%	112.65%	112.65%

### PROJECTED SINGLE DRY YEAR SUPPLY & DEMAND COMPARISON – AF/Y (TABLE 32)

	2005	2010	2015	2020	2025	2030/opt
Supply totals	20,840	20,840	20,840	20,840	20,840	20,840
Demand totals	21,200	21,200	21,200	21,200	21,200	21,200
Difference (supply minus demand)	(360)	(360)	(360)	(360)	(360)	(360)
Difference as % of Supply	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)
Difference as % of Demand	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)



## SECTION 7 – WATER SERVICE RELIABILITY 2006-2015 – STEP THREE: PROJECTED MULTIPLE-DRY-YEAR SUPPLY AND DEMAND COMPARISON

The following tables project a multiple dry year period occurring between 2006-2010 and compare projected supply and demand during those years. Because supply and demand will vary during the 20-year projection, the law requires UWMPs to project the impact of multiple-dry year periods for each 5-year period during the 20-year projection.

### PROJECTED SUPPLY FOR MULTIPLE DRY YEAR PERIOD ENDING IN 2010 – AF/Y (TABLE 33)

	2006	2007	2008	2009	2010
Supply	20,840	20,840	20,840	20,840	20,840
Projected normal	19,780	19,780	19,780	19,780	19,780
% of projected normal	105.36%	105.36%	105.36%	105.36%	105.36%

### PROJECTED DEMAND FOR MULTIPLE DRY YEAR PERIOD ENDING IN 2010 – AF/Y COMPARED WITH NORMAL DROUGHT RECOVERY YEARS (TABLE 34)

	2006	2007	2008	2009	2010
Demand	21,200	21,200	21,200	21,200	21,200
Projected normal	18,820	18,820	18,820	18,820	18,820
% of projected normal	112.65%	112.65%	112.65%	112.65%	112.65%

### PROJECTED SUPPLY & DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2010 –AF/Y COMPARED WITH NORMAL DROUGHT RECOVERY YEARS (TABLE 35)

	2006	2007	2008	2009	2010
Supply totals	20,840	20,840	20,840	20,840	20,840
Demand totals	21,200	21,200	21,200	21,200	21,200
Difference (supply minus demand)	(360)	(360)	(360)	(360)	(360)
Difference as % of Supply	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)
Difference as % of Demand	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)

The following projects a multiple dry year period occurring between 2011-2015 and compares the projected supply and demand during those years.

**PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2015 – AF/Y COMPARED WITH NORMAL DROUGHT RECOVERY YEARS (TABLE 36)**

	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
<b>Supply</b>	20,840	20,840	20,840	20,840	20,840
<b>Projected normal</b>	19,780	19,780	19,780	19,780	19,780
<b>% of projected normal</b>	105.36%	105.36%	105.36%	105.36%	105.36%

**PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2015 – AF/Y COMPARED WITH NORMAL DROUGHT RECOVERY YEARS (TABLE 37)**

	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
<b>Demand</b>	21,200	21,200	21,200	21,200	21,200
<b>Projected Normal</b>	18,820	18,820	18,820	18,820	18,820
<b>% of projected normal</b>	112.65%	112.65%	112.65%	112.65%	112.65%

**PROJECTED SUPPLY & DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2015 –AF/Y COMPARED WITH NORMAL DROUGHT RECOVERY YEARS (TABLE 38)**

	<i>2011</i>	<i>2012</i>	<i>2013</i>	<i>2014</i>	<i>2015</i>
<b>Supply totals</b>	20,840	20,840	20,840	20,840	20,840
<b>Demand totals</b>	21,200	21,200	21,200	21,200	21,200
<b>Difference (supply minus demand)</b>	(360)	(360)	(360)	(360)	(360)
<b>Difference as % of Supply</b>	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)
<b>Difference as % of Demand</b>	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)



## SECTION 7 – WATER SERVICE RELIABILITY 2016-2025 – STEP THREE: PROJECTED MULTIPLE-DRY-YEAR SUPPLY AND DEMAND COMPARISON

### PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2020 – AF/Y (TABLE 39)

	2016	2017	2018	2019	2020
Supply	21,200	21,200	21,200	21,200	21,200
Projected normal	19,780	19,780	19,780	19,780	19,780
% of projected normal	107.18%	107.18%	107.18%	107.18%	107.18%

### PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2020 – AF/Y (TABLE 40)

	2016	2017	2018	2019	2020
Demand	21,200	21,200	21,200	21,200	21,200
Projected normal	18,820	18,820	18,820	18,820	18,820
% of projected normal	112.65%	112.65%	112.65%	112.65%	112.65%

### PROJECTED SUPPLY & DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2020- AF/Y (TABLE 41)

	2016	2017	2018	2019	2020
Supply totals	20,840	20,840	20,840	20,840	20,840
Demand totals	21,200	21,200	21,200	21,200	21,200
Difference (supply minus demand)	(360)	(360)	(360)	(360)	(360)
Difference as % of Supply	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)
Difference as % of Demand	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)

### PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2025 – AF/Y (TABLE 42)

	2021	2022	2023	2024	2025
Supply	21,200	21,200	21,200	21,200	21,200
Projected normal	19,780	19,780	19,780	19,780	19,780
% of projected normal	107.18%	107.18%	107.18%	107.18%	107.18%



**PROJECTED DEMAND MULTIPLE DRY YEAR PERIOD ENDING IN 2025 – AF/Y  
(TABLE 43)**

	<i>2021</i>	<i>2022</i>	<i>2023</i>	<i>2024</i>	<i>2025</i>
<b>Demand</b>	21,200	21,200	21,200	21,200	21,200
<b>Projected normal</b>	18,820	18,820	18,820	18,820	18,820
<b>% of projected normal</b>	112.65%	112.65%	112.65%	112.65%	112.65%

**PROJECTED SUPPLY & DEMAND COMPARISON DURING MULTIPLE DRY YEAR  
PERIOD ENDING IN 2025- AF/Y (TABLE 44)**

	<i>2021</i>	<i>2022</i>	<i>2023</i>	<i>2024</i>	<i>2025</i>
<b>Supply totals</b>	20,840	20,840	20,840	20,840	20,840
<b>Demand totals</b>	21,200	21,200	21,200	21,200	21,200
<b>Difference (supply minus demand)</b>	(360)	(360)	(360)	(360)	(360)
<b>Difference as % of Supply</b>	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)
<b>Difference as % of Demand</b>	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)



## SECTION 7 – WATER SERVICE RELIABILITY 2026-2030 – STEP THREE: PROJECTED MULTIPLE-DRY-YEAR SUPPLY AND DEMAND COMPARISON

The following tables project a multiple dry year period occurring between 2026-2030 and compare projected supply and demand during those years. (optional) Because supply and demand will vary during the 20-year projection, the law requires UWMPs to project the impact of multiple-dry year periods for each 5-year period during the 20-year projection.

### PROJECTED SUPPLY DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2030 – AF/Y (TABLE 45)

	2026	2027	2028	2029	2030
Supply	21,200	21,200	21,200	21,200	21,200
Projected normal	19,780	19,780	19,780	19,780	19,780
% of projected normal	107.18%	107.18%	107.18%	107.18%	107.18%

### PROJECTED DEMAND FOR MULTIPLE DRY YEAR PERIOD ENDING IN 2030 – AF/Y (TABLE 46)

	2026	2027	2028	2029	2030
Demand	21,200	21,200	21,200	21,200	21,200
Projected normal	18,820	18,820	18,820	18,820	18,820
% of projected normal	112.65%	112.65%	112.65%	112.65%	112.65%

### PROJECTED SUPPLY & DEMAND COMPARISON DURING MULTIPLE DRY YEAR PERIOD ENDING IN 2030- AF/Y. (TABLE 47)

	2026	2027	2028	2029	2030
Supply totals	20,840	20,840	20,840	20,840	20,840
Demand totals	21,200	21,200	21,200	21,200	21,200
Difference (supply minus demand)	(360)	(360)	(360)	(360)	(360)
Difference as % of Supply	(1.73%)	(1.73%)	(1.73%)	(1.73%)	(1.73%)
Difference as % of Demand	(1.70%)	(1.70%)	(1.70%)	(1.70%)	(1.70%)



SECTION 8 – ADOPTION RESOLUTION

CASITAS MUNICIPAL WATER DISTRICT

RESOLUTION NO. 05-64

RESOLUTION SETTING A PUBLIC HEARING TO ADOPT THE URBAN WATER MANAGEMENT PLAN FOR CASITAS MUNICIPAL WATER DISTRICT

WHEREAS, the California Legislature in its 1983-84 Regular Session, adopted the Urban Water Management Planning Act; and

WHEREAS, said Act requires all urban water purveyors with greater than 3,000 service connections or water use or more than 3,000 acre-feet per year served directly to consumers to prepare and submit an urban water management plan to the California Department of Water Resources every five years; and

WHEREAS, the plan shall be reviewed periodically, at least every five years, and Casitas shall make any amendments or changes to its plan which are indicated by the reviews; and

WHEREAS, the original plan was adopted and sent to the California Department of Water Resources in March, 1996.

WHEREAS, it is necessary to set a public hearing for review of the plan; and

WHEREAS, the reviewed plan must be filed with the California Department of Water Resources within thirty days of adoption;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Casitas Municipal Water District as follows:

- 1. The plan entitled "Urban Water Management Plan for Casitas Municipal Water District" dated September, 2005 has been reviewed, modified and is on file in Casitas' office and a public hearing is hereby set for October 26, 2005 for public review of the plan and adoption.
2. Upon adoption, a copy of the Urban Water Management Plan is to be forwarded to the California Department of Water Resources.

ADOPTED this 12th day of October, 2005

[Signature]
President,
Casitas Municipal Water District

ATTEST: [Signature]
Secretary, Casitas
Municipal Water District

**CASITAS MUNICIPAL WATER DISTRICT**

RESOLUTION NO 05-78

**RESOLUTION ADOPTING THE URBAN WATER MANAGEMENT PLAN FOR  
CASITAS MUNICIPAL WATER DISTRICT**

WHEREAS, the California Legislature in its 1983-84 Regular Session, adopted the Urban Water Management Planning Act; and

WHEREAS, said Act requires all urban water purveyors with greater than 3,000 service connections or water use of more than 3,000 acre feet per year served directly to consumers to prepare and submit an urban water management plan to the California Department of Water Resources every five years; and

WHEREAS, the plan shall be reviewed periodically, at least every five years, and Casitas shall make any amendments or changes to its plan which are indicated by the reviews; and

WHEREAS, the original plan was adopted and sent to the California Department of Water Resources in March, 1996.

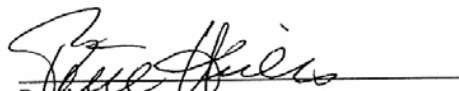
WHEREAS, the reviewed plan must be filed with the California Department of Water Resources within thirty days of adoption;

NOW, THEREFORE, BE IT RESOLVED by the Board of Directors of the Casitas Municipal Water District as follows:


1. The plan entitled "Urban Water Management Plan for Casitas Municipal Water District" dated November 9, 2005 has been reviewed, modified and is on file in Casitas' office and is hereby adopted.

2. A copy of the Urban Water Management Plan is to be forwarded to the California Department of Water Resources.

APPROVED this 9<sup>th</sup> day of November, 2005.

  
\_\_\_\_\_  
President,  
Casitas Municipal Water District

ATTEST:

  
\_\_\_\_\_  
Secretary,  
Casitas Municipal Water District

- (7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.
  - (8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.
  - (9) The quality of source supplies can have a significant impact on water management strategies and supply reliability.
  - (b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.
- 10610.4. The Legislature finds and declares that it is the policy of the state as follows:
- (a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
  - (b) The management of urban water demands 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 actively pursue the efficient use of available supplies.

**CHAPTER 2. DEFINITIONS**

10611. Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.
- 10611.5. "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.
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 plans prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, and reclamation and demand management 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 demand 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.
- 10616.5. "Recycled water" means the reclamation and reuse of wastewater for beneficial use.
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 4 (commencing with Section 116275) of Part 12 of Division 104 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 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 area wide, regional, watershed, or basin wide 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 plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, 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.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

10621.

(a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) 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) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as over drafted or has projected that the basin will become over drafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

- (1) An average water year.
- (2) A single dry water year.
- (3) Multiple dry water years.

For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.

(d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

(e)(1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

- (A) Single-family residential.
- (B) Multifamily.
- (C) Commercial.
- (D) Industrial.
- (E) Institutional and governmental.
- (F) Landscape.
- (G) Sales to other agencies.
- (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.
- (I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

(f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:

- (A) Water survey programs for single-family residential and multifamily residential customers.
- (B) Residential plumbing retrofit.
- (C) System water audits, leak detection, and repair.
- (D) Metering with commodity rates for all new connections and retrofit of existing connections.
- (E) Large landscape conservation programs and incentives.
- (F) High-efficiency washing machine rebate programs.
- (G) Public information programs.
- (H) School education programs.
- (I) Conservation programs for commercial, industrial, and institutional accounts.
- (J) Wholesale agency programs.
- (K) Conservation pricing.
- (L) Water conservation coordinator.
- (M) Water waste prohibition.
- (N) Residential ultra-low-flush toilet replacement programs.

(2) A schedule of implementation for all water demand management measures proposed or described in the plan.

(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.

(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.

(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:

- (1) Take into account economic and non-economic factors, including environmental, social, health, customer impact, and technological factors.
  - (2) Include a cost-benefit analysis, identifying total benefits and total costs.
  - (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
  - (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
  - (h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
    - (i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
    - (j) 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 identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of subdivisions (f) and (g).
    - (k) Urban water suppliers that rely upon a wholesale agency for a source of water, shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water -year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).
- 10631.5. The department shall take into consideration whether the urban water supplier is implementing or scheduled for implementation, the water demand management activities that the urban water supplier identified in its urban water management plan, pursuant to Section 10631, in evaluating applications for grants and loans made available pursuant to Section 79163. The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities.
10632. The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:
- (a) 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 which are applicable to each stage.
  - (b) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.
  - (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.
  - (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.
  - (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.



(f) Penalties or charges for excessive use, where applicable.

(g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, 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.

(h) A draft water shortage contingency resolution or ordinance.

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

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area, and shall include all of the following:

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater 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, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

(e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, 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, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

10634. The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

### **Article 2.5 Water Service Reliability**

10635. (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

### **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. 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 demand management methods and techniques.

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. 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. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. 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. (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the outstanding elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that 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.

(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 actions taken pursuant to Section 10632. 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 Section 10632, 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 and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management 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 urban water management 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 prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

10657. (a) The department shall take into consideration whether the urban water supplier has submitted an updated urban water management plan that is consistent with Section 10631, as amended by the act that adds this section, in determining whether the urban water supplier is eligible for funds made available pursuant to any program administered by the department.

(b) This section shall remain in effect only until January 1, 2006, and as of that date is repealed, unless a later enacted statute, that is enacted before January 1, 2006, deletes or extends that date.



## APPENDIX B OTHER SOURCES

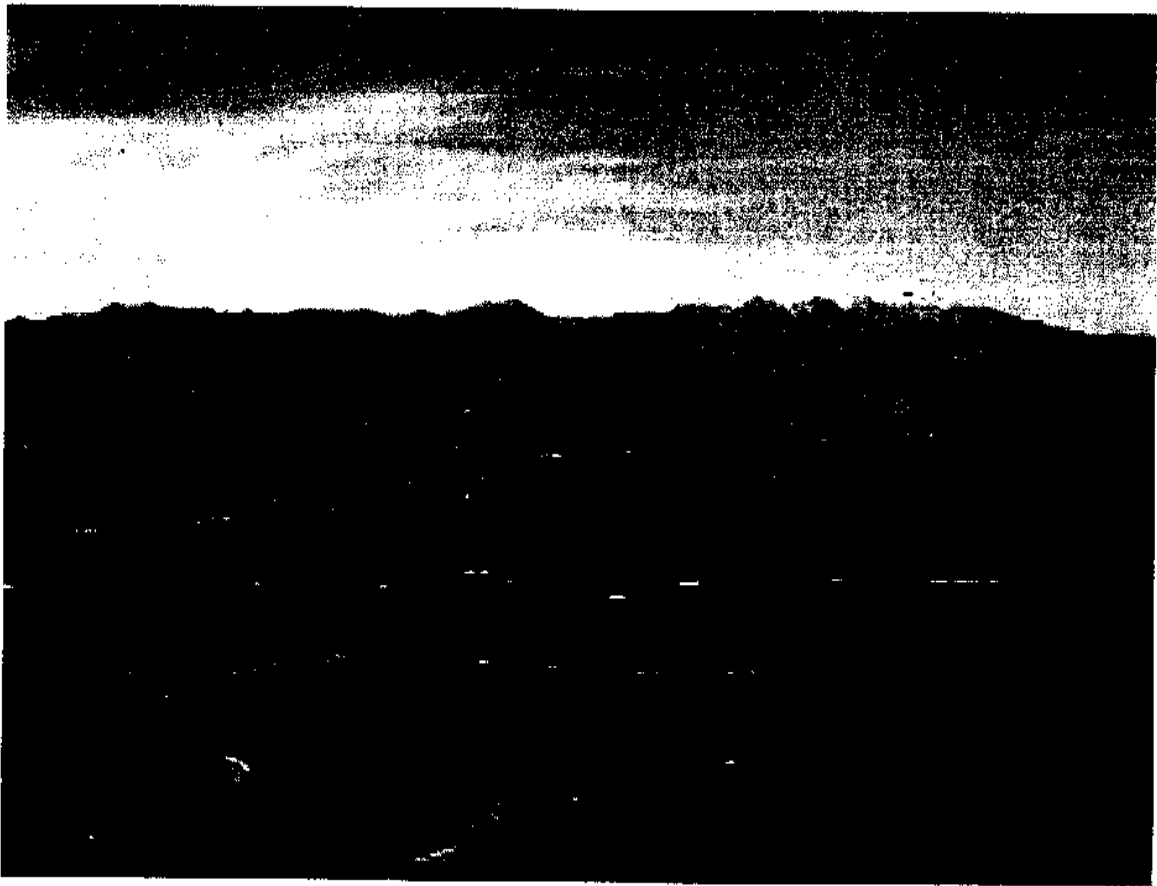
- California Environmental Quality Act - <http://ceres.ca.gov/ceqa/>
- California Land Use Planning Information Network - <http://ceres.ca.gov/planning/>
- The Governor's Office of Planning and Research - <http://www.opr.ca.gov/>
- US Bureau of Reclamation Lower Colorado Regional Office - <http://www.usbr.gov/lc/region/>
- US Bureau of Reclamation Mid-Pacific Region - <http://www.usbr.gov/mp/>
- California Department of Water Resources Bay Delta Office State Water Project Delivery Reliability Report - <http://swpdelivery.water.ca.gov/>
- California Department of Water Resources Division of Planning and Local Assistance Groundwater Management in California - <http://www.dpla.water.ca.gov/cgi-bin/supply/gw/management/hq/main.pl>



## APPENDIX C CASITAS SUPPLY AND DEMAND STUDY

# CASITAS MUNICIPAL WATER DISTRICT WATER SUPPLY AND USE STATUS REPORT

December 7, 2004



Prepared by Staff of the Casitas Municipal Water District:  
Steven E. Wickstrum, Principal Civil Engineer  
Leo Lentsch, Fisheries Biologist and Steelhead Enhancement Program Manager

Reviewed by: John J. Johnson, General Manager, Casitas Municipal Water District

Peer Review By: MBK Engineers – Mark Van Camp  
Entrix – David Blankenhorn

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**CASITAS MUNICIPAL WATER DISTRICT**  
**WATER SUPPLY AND USE STATUS REPORT**

**PURPOSE**

The purpose of this report is to provide information on the status of water supply and use for the Casitas Municipal Water District (Casitas) and suggest strategies for meeting water use in the future.

**BACKGROUND**

Quantifying water supply and use patterns in the Ventura River Basin can be a complicated task. To aide in the understanding of these patterns and their implications to water management activities, this section provides useful definitions of water supply and use terms, describes previous water supply and use studies, and summarizes recent changes to water supply and use within the district.

**USEFUL DEFINITIONS**

**Water Supply:** Quantity of water managed by Casitas.

This term refers to the quantity of surface water and groundwater resources managed by Casitas within the Ventura River Basin.

**Safe Yield:** Rate at which the available water supply can be “safely” depleted.

This term was defined by Meinzer (1) as “the rate at which water can be withdrawn from an aquifer for human use without depleting the supply to such an extent that the withdrawal at this rate is harmful to the aquifer itself, or to the quantity of water, or is no longer economically feasible.” The calculation of safe yield for Casitas is based on the storage volume of Lake Casitas (the aquifer), the surface water and groundwater supply managed by Casitas, and the length of time that the water supply needs to last (i.e. longest drought on record). The safe yield value is an interpolated value that is held constant over the period of the critical drought, bringing the level of storage to the desired minimum volume.

**Water Use:** Quantity of water delivered from Lake Casitas to the conveyance system, as measured at the start of the system at Casitas Dam.

This term is used to describe the volume of water that is directly taken from the available water supply. Casitas measures the rate of water use by quantifying the amount of water delivered to the water distribution system from Lake Casitas. The measurement of water use is performed through the use of accurate flow tube sensors.

**Metered Water Sales:** Quantity of water that is metered and sold at the individual service connections in the water distribution system.

This term refers to the summation of the quantity water measured through water service connections within the Casitas district. The metered water sales are categorized by the type of customer (i.e. residential, business, resale, and agriculture) and summarized on an annual basis.

**Water Allocation:** Quantity of water assigned to service connections.

This term refers to the primary tool used by Casitas to manage the quantity of water used by customers (i.e. metered water sales). Service connections are assigned an allocation (limited quantity of water). Residential, business, industrial, resale, and interdepartmental service connections have individual allocations. Agricultural service connections are combined into a single allocation for the entire group. The allocation program was designed as a price-driven water conservation measure that provides for a base cost that escalates once metered water sales exceed service connection allocations.

#### PREVIOUS WATER SUPPLY AND USE STUDIES

The ability of local water supplies to meet demands was evaluated by the Bureau of Reclamation, in the 1954 evaluation of Ventura River Project, and later by the District during the 1989 drought period. Each of these evaluations considered the ability of Lake Casitas storage, under the hydrology determined as the most critical drought period of record, to meet the water demands of the District's service area. The critical drought period of record is considered to have occurred during 1944 through 1965. The findings of each report are summarized in a memorandum prepared by Richard Barnett, dated June 7, 1989, were as follows:

- 1) The safe yield of Lake Casitas without an integrated Matilija Dam was 21,500 acre-feet, and 21,920 with Matilija Dam as a part of the system;
- 2) The estimated total water supplies in the District service area was 30,907 acre-feet and the water demands for the same service area were approximately 30,320 acre-feet;
- 3) The District should consider implementing a variety of alternatives for balancing water supply and demand.

#### RECENT WATER SUPPLY/USE CHANGES

In 1989, the District's service area was in the middle of a short-term drought that began in 1987 and ended in March 1992. The Ventura River and Ojai groundwater basins were being depleted and Lake Casitas water storage dropped to near fifty percent capacity. The District-wide water usage was beginning to escalate because of the lack of rainfall and the depletion of groundwater supplies. The Casitas Municipal Water District recognized that water use was very rapidly approaching the availability of supply (Barnett Memorandum, June 7, 1989) and that the District needed to apply strategies to meet future water needs. The District moved to a temporary moratorium on providing new water service connections. The moratorium continued for approximately two years until an additional 300 acre-feet of water was developed from Mira Monte Well. The Mira Monte Well supply, therefore, was available for issuance of new water service connections.

During the 1990's, the drought pattern ended with the occurrence of three heavy rainfall years (1992, 1995, and 1998). Lake Casitas and the groundwater basins filled to full capacity. The District continued to issue new service connections on the basis of water made available from the Mira Monte Well supply. The addition of new water service connections in the District's service area grew slowly, averaging approximately 25 new service connections each year for the 1990's.

One major water use change occurred in 1991. The City of San Buenaventura reduced their use of Casitas water due of the lack of filtration treatment of Lake Casitas water supplies. The City purchased 9,510 acre-feet during 1989 and reduced water purchases to only 1,370 acre-feet in 1992. The reduction in metered water sales by the City continued until 1997, when the District finally met the filtration requirements. The City and the District came to agreement that the annual metered water sales to the City from Casitas supplies would be a minimum of 6,000 acre-feet.

In 1997, the National Marine Fisheries Service (NMFS) listed anadromous steelhead in Southern California as endangered under the Endangered Species Act. The Ventura River Basin has been identified as important spawning habitat for Southern California steelhead. A result of this listing was the requirement for the District to construct a fish passage facility at the Robles Diversion Dam and change the Robles Diversion operational release criteria to one that provided additional downstream release of flows for fish passage. The issuance of the Biological Opinion (BO) by the NMFS in March 2003 set into place the revised operational criteria for the Robles Diversion Dam and Fish Passage Facility. The change of operational criteria for the Robles Diversion Facility has caused Casitas to take immediate management actions to ensure the protection of long-term water supplies.

On April 23, 2003, Casitas suspended the issuance of new water service connections. The suspension has remained in effect through June 8, 2004. It will remain in effect as long as deemed necessary by the Casitas Board of Directors. Since suspending new service connections, Casitas has implemented water conservation measures, evaluated potential supplies of additional water, and initiated an evaluation of water supply and use within the district. The purpose of this narrative is to present results of the water supply/use analysis.

Another significant potential change to Casitas water supplies is the future disposition of Matilija Dam. This facility is presently being evaluated for the potential decommissioning and removal. Sediment deposition in the Matilija Reservoir has reduced the water storage volume behind Matilija Dam to approximately 600 acre-feet. NMFS has made the determination that the dam structure is a barrier to steelhead migration. The goals of the project proponents are to promote the migration of steelhead to the upper reaches of the Matilija Creek and enhance movement of sediment to Ventura County beaches. The removal of the Matilija Dam could impact water supply and water quality for both the short term and long term. It is important, therefore, for Casitas to have a clear understanding of these potential impacts.

### **CURRENT WATER SUPPLY AND USE STUDY**

This study evaluated the: (1) potential impact of the Robles BO operating criteria and the removal of Matilija Dam on the Casitas water supply, (2) the effect of predicted water use on the Casitas water supply, and (3) levels of reductions in water use required to balance water supply and use. The study applies hydrology information from 1945 through 1965 as the critical drought period and information from 1966 through 1980 as the reservoir recovery period. These periods have empirical hydrology information that provide an opportunity to model different operating scenarios for the Robles Diversion Facility.

## WATER SUPPLY

The Casitas water supply was evaluated with a reservoir routing model. It included application of the Robles BO Operating Criteria and the 1959 Trial Operating Criteria for Robles Diversion Facility during the drought and reservoir recovery periods. The evaluation also considered the benefit of Matilija Dam to water supply. The methods, assumptions, and summaries that were applied and developed for the water supply evaluations are outlined in **Appendix A**.

## WATER USE

Predictions for Casitas water use were developed for the drought and reservoir recovery periods. Empirical information on the quantity of water delivered to the conveyance system was limited to the post 1959 period. Therefore, a model to predict Casitas water use for the drought (1945-1965) and reservoir recovery (1966-1980) periods was developed. The predicted water use is based on recent historical trends of water use in the District's service area and annual rainfall records for both periods. The methods, assumptions, and summaries that were applied and developed for the water use predictions are outlined in **Appendix B**.

## BALANCING USE WITH SUPPLY

To determine the level of reduction required to balance water use (Appendix B) with water supply (Appendix A), for any operational scenarios that predicted a water shortage, four different scenarios were evaluated. These included: (1) a constant percent reduction in use, (2) a staged reduction in use, (3) an inverse staged reduction in use, and (4) a volume reduction in use. Implementation of any reduction in use, at this point, would rely on the Casitas Allocation Program. Casitas adopted the water allocation program to primarily provide water use guidelines and reductions in the event of a prolonged drought. **Appendix C** provides an assessment of the current level of allocation issued by the District and direction on further action on this program.

## FINDINGS

### CRITICAL DROUGHT PERIOD (1945-1965)

The critical drought study period represents the longest drought on record. Within the Ventura River Basin the longest drought on record occurred between the 1945 and 1965 water years. A numerical summary of the analytical results for the critical drought period is provided in Table 1.

Water Supply and Safe Yield: With the Matilija Dam remaining in operation, the reservoir routing model predicted the annual Lake Casitas safe yield for the 1959 Trial Operating Criteria and the Biological Opinion Operating Criteria at 22,770 and 21,630 acre-feet, respectively. The reduction of the annual safe yield, when moving from the 1959 Operating Criteria to the Robles BO Operating Criteria, is approximately 1,140 acre-feet. The total difference of safe yield volume of water that would accumulate through the change in operational criteria at Robles Diversion Dam over the 21-year critical dry period is 23,940 acre-feet. In the event Matilija Dam is decommissioned and removed, the available supply under the Robles BO Operating Criteria will be further reduced by

790 acre-feet. Under this scenario, the annual safe yield supply for the drought period would be 20,840 acre-feet. The difference between the annual safe yield available supplies under the 1959 Trial Operating Criteria with Matilija Dam and the Robles BO Operating Criteria without Matilija Dam is 1,930 acre-feet.

Predicted Water Use. Predicted water use patterns for this study period illustrated that consecutive dry year water demands could place stress water supplies in Lake Casitas. Based on the rainfall patterns of the critical drought period, the predicted average annual water use is 21,200 acre-feet, as shown on Table B6. The maximum to minimum values of predicted annual water use, based on consecutive dry year trend equation, is 27,057 and 15,610 acre-feet, respectively.

Comparison between Water Supply and Water Use. Water supplies exceeded water use, throughout the study period, in all but one operational scenario: Robles BO operating criteria without benefit of Matilija (Table 1). In this case, water use could exceed supplies by approximately 360 acre-feet per year. Over the 21-year study period, this annual difference could accumulate to a deficiency of supply in the amount of 7,560 acre-feet.

### **RESERVOIR RECOVERY PERIOD (1966 TO 1980)**

The recovery period represents the hydrologic patterns immediately following the critical drought study period. For this analysis, it occurred from the time Lake Casitas would be at its lowest storage volume (as a result of drought conditions) until the reservoir was at full storage capacity. This time period was occurred from the 1965 through the 1980 water years. In actual perspective, this was the actual period that Lake Casitas went from a newly created lake to full capacity. A numerical summary of the analytical results for the reservoir recovery period is provided in Table 2.

Water Supply and Yield: Yield, for this study period, was determined by iteratively applying a constant rate of depletion to the water supply in Lake Casitas until a value was reached where the reservoir filled at the same point in time as the D20 study (February 1980). This approach was applied to each of the operational scenarios. Under the wetter conditions of this study period, the yield values vary from a maximum of 24,180 acre-feet under the 1959 Trial Operating Criteria with Matilija Dam, to a minimum of yield value of 19,780 acre-feet under the BO Operating Criteria without Matilija Dam.

Predicted Water Use. The higher rainfall years represented in the recovery study period tended to reduce water use within the District's service area. The average annual predicted water use for the period is 18,820 acre-feet, as shown on Table B9. The maximum to minimum range of predicted water use, based on consecutive dry year trend equation, are 22,704 and 15,249 acre-feet, respectively. These reduction in predicted water use, from that experienced during the drought cycle, is primarily due to lower quantities of water used for agriculture. For orchard crops, less water is required from Lake Casitas during the wet periods.

Comparison between Water Supply and Water Use. Under all four of the operational criteria conditions studied for the reservoir recovery period, the available yield (water supply) values are higher than the predicted water use values. The conclusion that could be developed is that under actual use conditions, the storage of Lake Casitas may restore to full capacity in less time than with theoretical yield values. The rate at which the reservoir fills would be diminished by moving from

the historical 1959 Operational Criteria to the Robles BO Operating Criteria, and is further diminished with the loss of Matilija Dam. The risk of having Lake Casitas fill at a slower rate is that the reservoir may not achieve full storage capacity before onset of another long-term drought period.

### **BALANCING WATER USE WITH AVAILABLE SUPPLIES**

The application of the Biological Opinion Criteria, at this time, is in place and will be the method by which the District operates the Robles Diversion Dam and Fish Passage Facility. The loss of reservoir storage resulting from the decommissioning of Matilija Dam or the sediment deposition of the remaining storage volume appears to be inevitable. Given these conditions, the District must continue to balance water use with the available water supply. In addition to the many options that have been prescribed by past studies and staff recommendations, this evaluation has further reviewed the application of mandatory reductions to water use during the study period.

Reduced Water Use through Conservation and/or Mandatory Use Curtailment. The District reviewed four different methods of water use reduction (Table 3). The key differences between the methods are the level of reduction and the time at which each reduction was applied. The goal of the reduction is to bring the average annual water use during the critical dry period to as close to the safe yield level of supply availability found with the Robles BO Operating Criteria (20,869 acre-feet) without the benefit of Matilija Reservoir.

The four different magnitudes and sequences of water use reductions were applied to the supply in such a manner that resulted in depleting Lake Casitas to minimum pool storage by the end of the critical dry period. The patterns of each water use reduction are presented in Table 3, along with the summaries for the safe yield and predicted water use values.

Prior to the implementation of any of these programs, the District should carefully consider the acceptability of water use reduction impacts to the water user, the realistic ability to attain such reductions, and the desirable frequency of causing the reductions. It is important to distinguish between curtailment and conservation. Conservation measures should focus on the long-term and lasting efficiencies that do not affect the quality of life. Curtailment measures focus on short term, temporary actions that may impact quality of life. The course of the District should consider the acceptability of the impacts on the quality of life cause by either conservation or curtailment.

### **OTHER FACTORS**

During the study, there were several other issues that deserved acknowledgement and consideration by the District. These issues were not included in the development of the study's data or computations, but may be relevant points to include in the development of strategies and assessment of risks for managing the District's water supplies.

Minimum Lake Elevation. All studies on the Lake Casitas safe yield considered the extraction of water from Lake Casitas to a minimum pool. There may be some impacts that could arise when minimum pool is approached in Lake Casitas, such as:

Water Quality – the degree of the water quality impacts are unknown at this time. There is a potential for concentrating salts, organics, elements (manganese and/or boron) and nutrients as the water volume diminishes to minimum pool. Warm, shallow water may also promote the growth of algae, which in turn could lead to taste and odor problems in the drinking water supply. Storm runoff events into the minimum pool may have elevated turbidity that may exceed the capability of existing water treatment plant. Plant growth in the exposed beach areas of the lake may add to organic loading as the lake recovers its storage and the plant materials decay.

Water Delivery to the Distribution System –a certain level of water storage in Lake Casitas in order to adequately supply water to the distribution system. The District will have to consider other pump facilities (and associated costs), perhaps even barge pumps set into the lake, in order to move water through the treatment plant into the distribution system.

Recreation – the recreational opportunities are likely to be diminished at minimum pool. Boating and fishing would likely be curtailed, and the lack revenue generation from these activities may impact the District’s ability to maintain recreation.

The study has indicated that the change of the minimum pool setting has a direct relationship to the safe yield value. For each 20,000 acre-feet of storage above minimum pool it is desired to add to the lake storage, there is a 1,000 acre-foot reduction impact to the safe yield value. The reduction of the safe yield of Lake Casitas in order to lessen the chance of impacts of minimum pool may not be the District’s preferred solution.

Losses at Robles Diversion Dam. The District is in the process of constructing the fish passage facility. There may be inherent operational problems at the facility that could interfere with ability to divert water to Lake Casitas. These factors have not been quantified and were not included in the study conditions for diversion. The key problems that may occur are (1) the loss of water transfer through the fish screens, the plugging of the fine meshed screen that is used to protect fish from entering the Robles-Casitas Canal, and (2) silt deposition in the diversion facility that may be associated with the loss of Matilija Dam. This may be a target area for the District to document and develop data during future operations of the Robles Diversion and Fish Passage Facility.

Increase in Groundwater Extractions above Robles Diversion Dam. The study included the level of groundwater extraction that has historically occurred above Robles Diversion Dam. If there is an increase in the amount of groundwater extractions, there may be some impact to the amount of water available for diversion to Lake Casitas.

Socio-economic Impacts Associated with Water Use Reductions. The study has developed the values for safe yield and water use, and further reviewed the trends from applying water reductions. There are several issues that the decision-makers must consider when applying the water reduction measures. What level of water use reduction is attainable? What are the acceptable and unacceptable impacts to the water user’s lifestyle and economic interest (agriculture, oil industry, tourism, and the residences of the service area)? Are the requests for water use reduction frequent and/or of long duration? These are questions that should be addressed as the District moves forward with the management of water supplies.

Variability of Supply. The Ventura River system is a highly variable water system with erratic and unpredictable periods of drought and rainfall. It should be noted that there is a large variation in the annual diversions, and thus the ability to restore supply, in both the drought and recovery periods. Table 4 provides a summary of the mean annual diversions, the range and confidence interval (CI) for diversions, under various study conditions. The water supply is highly variable in its occurrence over time. Small changes to climate or the natural sequences of rainfall events from the actual events of both periods can have an impact on the availability of water supply.

System Losses: Water losses occur within the Casitas water distribution system. Theoretically, the difference between water deliveries to the conveyance system and metered water sales represents system losses. **Appendix D** provides an explanation of water losses within the distribution system. Appendix D also provides an explanation of the significant differences between terms used by Casitas, and their relationship to actual data that is recorded by Casitas.

## **CONCLUSIONS AND RECOMMENDATIONS**

The methods and model presented in this study provide decision-makers a tool for determining the level and timing of water use reductions needed to ensure a safe water supply. Water supply and use in the Casitas Municipal Water District has reached a balance and may be moving towards imbalance with the recently proposed changes to the water supply system.

During the course of developing the reservoir model and applying the individual runoff data, staff noted the sensitivity of the regional hydrology to each storm event or series of rainfall events. Given this potential for variation, it needs to be noted that small changes in hydrological patterns could result in different conclusions from this study.

In order to continue to meet future water demands and drought-proof the Casitas Municipal Water District service area, Casitas should actively develop and pursue a water conservation management program and while developing and implementing a strategy to secure alternative water supplies. Casitas should also perform a thorough accounting of the service connection allocations issued to date and propose to make adjustments to those allocations, where adjustments can be reasonably made, to benefit long-term water supply and continued water use by the customer.



Table 1. Predicted available water supply and water use for the Casitas Municipal Water District based on hydrologic conditions for the longest drought on record in the Ventura River Basin (1945-1965 water years).

Predicted Water Supply and Use Drought Period (1945-1965 WY)	1959 Operating Criteria		Robles BO Operating Criteria	
	With Matilija	Without Matilija	With Matilija	Without Matilija
Average Annual Volume of Water <sup>1</sup> (AF/YR)				
<i>Ventura River Supply</i>				
Ventura River Flows (Inflow to Robles Facility)	16,850	16,850	16,850	16,850
Water Loss (Robles Facility Operations)	(1,290)	(1,290)	(1,290)	(1,290)
Water Bypassed at Robles Facility	7,560	8,020	8,700	9,490
Water Diverted to Lake Casitas	8,000	7,540	6,860	6,070
<i>Lake Casitas Supply</i>				
Water Captured from Tributaries	6,000	6,000	6,000	6,000
Net Water Loss (Evaporation-Rainfall)	(2,630)	(2,630)	(2,630)	(2,630)
<i>District Supply and Use: 21-Year Period</i>				
Safe Yield: Available Supply <sup>2</sup> (Lake Casitas plus Mira Monte Well)	22,770	22,310	21,630	20,840
Water Use: Deliveries to Water Distribution System	21,200	21,200	21,200	21,200
Difference between supply and use	1,570	1,110	430	(360)
Total Volume of Water <sup>1</sup> (AF)				
<i>Ventura River Supply</i>				
Ventura River Flows (Inflow to Robles Facility)	353,850	353,850	353,850	353,850
Water Loss (Robles Facility Operations)	(27,090)	(27,090)	(27,090)	(27,090)
Water Bypassed at Robles Facility	158,760	168,420	182,700	199,290
Water Diverted to Lake Casitas	168,000	158,340	144,060	127,470
<i>Lake Casitas Supply</i>				
Water Captured from Tributaries	126,000	126,000	126,000	126,000
Net Water Loss (Evaporation-Rainfall)	(55,230)	(55,230)	(55,230)	(55,230)
<i>District Supply and Use: 21-Year Period</i>				
Safe Yield: Available Supply <sup>2</sup> (Lake Casitas plus Mira Monte Well)	478,170	468,510	454,230	437,640
Water Use: Deliveries to Water Distribution System	445,200	445,200	445,200	445,200
Difference between supply and use	32,970	23,310	9,030	(7,560)

1: Predicted values were based on methods outlined in Appendix A and B. Values presented in this table were rounded to the closest 10 AF. Furthermore, they are subject to revision following peer review.

2: These estimates were based on the same hydrologic period used in the Kienlen D20 study: October 1, 1944 through October 1, 1966. The safe yield was calculated by setting an annual extraction value that forced the reservoir to decrease from 237,890 AF to 4,800 for this period.

Table 2. Predicted available water supply and water use for the Casitas Municipal Water District based on hydrologic conditions for the period immediately following the longest drought on record in the Ventura River Basin (1966-1980 water years).

Predicted Water Supply and Use Recovery Period (1966-1980 WY)	1959 Operating Criteria		Robles BO Operating Criteria	
	With Matilija	Without Matilija	With Matilija	Without Matilija
Average Annual Volume of Water <sup>1</sup> (AF/YR)				
<i>Ventura River Supply</i>				
Ventura River Flows (Inflow to Robles Facility)	45,590	45,590	45,590	45,590
Water Loss (Robles Facility Operations)	(1,690)	(1,690)	(1,690)	(1,690)
Water Bypassed at Robles Facility	22,100	22,850	25,000	26,460
Water Diverted to Lake Casitas	21,800	21,050	18,900	17,440
<i>Lake Casitas Supply</i>				
Water Captured from Tributaries	21,700	21,700	21,700	21,700
Net Water Loss (Evaporation-Rainfall)	(3,670)	(3,670)	(3,670)	(3,670)
<i>District Supply and Use: 15-Year Period</i>				
Yield: Available Supply <sup>2</sup> (Lake Casitas plus Mira Monte Well)	24,180	23,500	21,180	19,780
Water Use: Deliveries to Water Distribution System	18,820	18,820	18,820	18,820
Difference between supply and use	5,360	4,680	2,360	960
Total Volume of Water <sup>1</sup> (AF)				
<i>Ventura River Supply</i>				
Ventura River Flows (Inflow to Robles Facility)	683,850	683,850	683,850	683,850
Water Loss (Robles Facility Operations)	(25,350)	(25,350)	(25,350)	(25,350)
Water Bypassed at Robles Facility	331,500	342,750	375,000	396,900
Water Diverted to Lake Casitas	327,000	315,750	283,500	261,600
<i>Lake Casitas Supply</i>				
Water Captured from Tributaries	325,500	325,500	325,500	325,500
Net Water Loss (Evaporation-Rainfall)	(55,050)	(55,050)	(55,050)	(55,050)
<i>District Supply and Use: 15-Year Period</i>				
Yield: Available Supply <sup>2</sup> (Lake Casitas plus Mira Monte Well)	362,700	352,500	317,700	296,700
Water Use: Deliveries to Water Distribution System	282,300	282,300	282,300	282,300
Difference between supply and use	80,400	70,200	35,400	14,400

1: Predicted values were based on methods outlined in Appendix A and B. Values presented in this table were rounded to the closest 10 AF. Furthermore, they are subject to revision following peer review.

2: These estimates were based on the same hydrologic period used in the Kienlen D20 study to fill the reservoir: October 1966 through February 1980. The yield was calculated by setting an annual extraction value that allowed the reservoir to increase from 4,800 AF to 254,000 AF within this period.

Table 3. Comparisons for the level of reductions in water use needed to balance water supply and use during a critical drought period without the benefit of Matilija Reservoir.

Water Year	Predicted Values		Water Use Reduction Scenarios			
	Safe Yield (AF)	Water Use (AF)	Constant 170% (AF)	Staged 17.26% (AF)	Inverse 4.20% (AF)	Constant 850 AF (AF)
1945	20,840	18,936	18,614	18,936	18,179	18,576
1946	20,840	19,616	19,283	19,616	18,831	19,256
1947	20,840	19,697	19,362	19,697	18,909	19,337
1948	20,840	23,102	22,709	23,102	22,178	22,742
1949	20,840	23,966	23,559	23,966	23,007	23,606
1950	20,840	24,459	24,043	24,459	23,481	24,099
1951	20,840	27,057	26,597	26,597	26,516	26,697
1952	20,840	16,382	16,104	16,104	16,054	16,022
1953	20,840	22,305	21,926	21,926	21,859	21,945
1954	20,840	22,312	21,933	21,933	21,866	21,952
1955	20,840	24,402	23,987	23,987	23,914	24,042
1956	20,840	18,751	18,432	18,263	18,751	18,391
1957	20,840	21,309	20,947	20,755	21,309	20,949
1958	20,840	15,610	15,345	15,204	15,610	15,250
1959	20,840	21,688	21,319	21,124	21,688	21,328
1960	20,840	23,531	23,131	22,919	23,531	23,171
1961	20,840	25,175	24,747	24,520	25,175	24,815
1962	20,840	16,437	16,158	16,010	16,437	16,077
1963	20,840	19,604	19,271	19,094	19,604	19,244
1964	20,840	21,791	21,421	21,224	21,791	21,431
1965	20,840	19,068	18,744	18,572	19,068	18,708
<b>All Years</b>						
<b>Total</b>	<b>437,640</b>	<b>445,193</b>	<b>437,630</b>	<b>438,009</b>	<b>437,758</b>	<b>437,838</b>
Mean	20,840	21,200	20,840	20,858	20,846	20,840
Maximum	20,840	27,057	26,597	26,597	26,516	26,697
Minimum	20,840	15,610	15,345	15,204	15,610	15,250

1. Changes to the level of use reduction correspond with periods when Lake Casitas would drop below 127,000 and 65,000 Af of storage.

Table 4. Variability of Diversions for Study Conditions – Drought and Recovery Periods.

	<b>Annual Diversion Rate (Acre-ft)</b>					
	<b>With Matilija</b>			<b>Without Matilija</b>		
	Mean	95%CI	Range	Mean	95%CI	Range
<b>Drought Period</b>						
1959 Criteria	7,996	±6,087	0 to 57,990	7,534	±5,988	0 to 57,595
Robles BO Criteria	6,861	±5,169	0 to 49,689	6,066	±4,944	0 to 48,058
Difference	1,134	±953	0 to 8,302	1,469	±1,128	0 to 9,557
<b>Recovery Period</b>						
1959 Criteria	21,801	±11,549	589 to 68,645	21,050	±11,430	334 to 66,872
Robles BO Criteria	18,905	±9,953	589 to 58,553	17,438	±9,777	334 to 57,871
Difference	2,895	±1,924	0 to 10,262	3,612	±1,854	0 to 10,331

## Appendix A – Casitas MWD Water Supply Predictions

### Introduction

The reliability of water storage in Casitas Reservoir to adequately meet water use patterns through drought periods is dependent on the hydrology of the Ventura River Basin and the water use demands placed on reservoir storage. It is not possible to predict future weather patterns, and thus the hydrology, to an exact degree. The observation of recent weather and hydrology of the basin may provide adequate information that can be applied to a reservoir routing study. Determining the reliability of a water storage reservoir requires the review of relevant historical hydrology of the drainage basin and the assumption that the hydrology will repeat itself, in some manner, on a reliable basis (Figure A1). Further, determining the reliability of a water storage reservoir must also consider and apply system changes and influences that have or will occur in the foreseeable future.

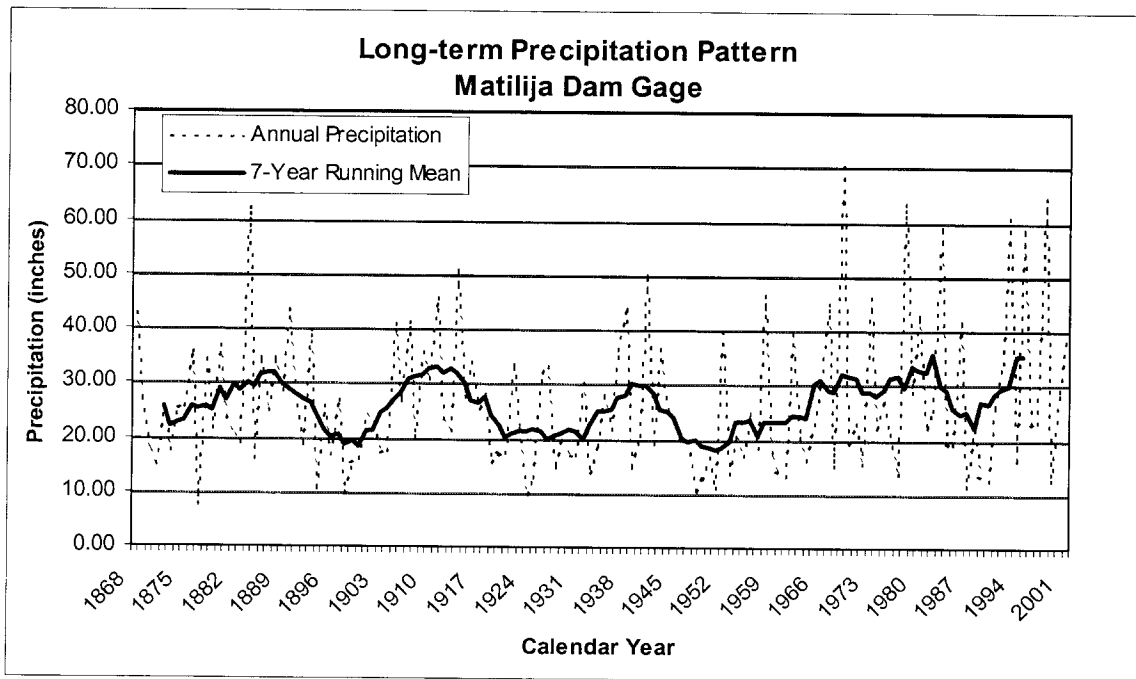


Figure A1. Long-term precipitation pattern as recorded at the Matilija Gage 1868-2001.

The District has compiled, to the best of their knowledge, the assumptions and historical data to develop a reservoir routing model that will consider the changes and influences that are foreseen at this time.

## **Background**

The Ventura River watershed encompasses approximately 228 square miles in western Ventura County as illustrated in Figure A2. The area is subject to a Mediterranean type climate, with long periods of no rainfall followed by short periods of intense rainfall and high runoff peaks (1). The hydrology of the Ventura River system has been well documented since the early 1900's.

In the early 1940's, the agricultural communities in the Ventura River basin realized the inability of the local groundwater supplies to support water uses during drought periods. The first move to supplementing groundwater supplies was construction of Matilija Dam in the late 1940's. It was not long before the community leaders determined that the Matilija Dam project had limited value to water supplies and replenishment of the Ojai groundwater basin, particularly during long-term drought conditions. The next step, that the local communities pursued, to develop reliable water supplies was the construction of the Ventura River Project, under the guidance and initial funding of the United States Bureau of Reclamation.

The key components of the Ventura River Project were the Robles Diversion Dam, Robles-Casitas Canal, Casitas Dam, Casitas Reservoir, and the water distribution system (pipelines, pump plants, and steel reservoirs). Casitas Reservoir provides 254,000 acre-feet of reservoir water storage while Robles diversion system provides a maximum of 500 cubic feet per second conveyance capacity from the Ventura River to Casitas Reservoir. Figure A3 presents a representation of the river and water delivery system. The Casitas Reservoir and Robles diversion system became operable in January 1959. Since the initial operation of the Robles Diversion Dam and canal, the District operated diversions and downstream releases in accordance with a given set of guidelines, formally referred to as the 1959 Trial Operating Criteria (hereafter 1959 Operating Criteria) for the Robles Diversion Dam. The operating criteria provided for a minimum of 20 cfs bypass, when more than 20 cfs was available at Robles Diversion Dam, and criteria for bypassing less than 20 cfs when downstream aquifers were in full condition.

In 1998, the listing of the steelhead as an endangered species, and the desire to return the species to the Ventura River, led to changes in the operating criteria for Robles Diversion Dam (Robles Biological Opinion Operating Criteria: hereafter Robles BO Operating Criteria). In 2002, there developed an interest in the removal of Matilija Dam and restoration of steelhead migration to all mainstem reaches of the Ventura River. The County of Ventura is presently considering the full-scale removal of Matilija Dam.

## **Water Supply Prediction Components**

An adequate water supply study must identify the periods and provide adequate data, and/or relatively sound basis for assumptions, to apply to the reservoir routing for each

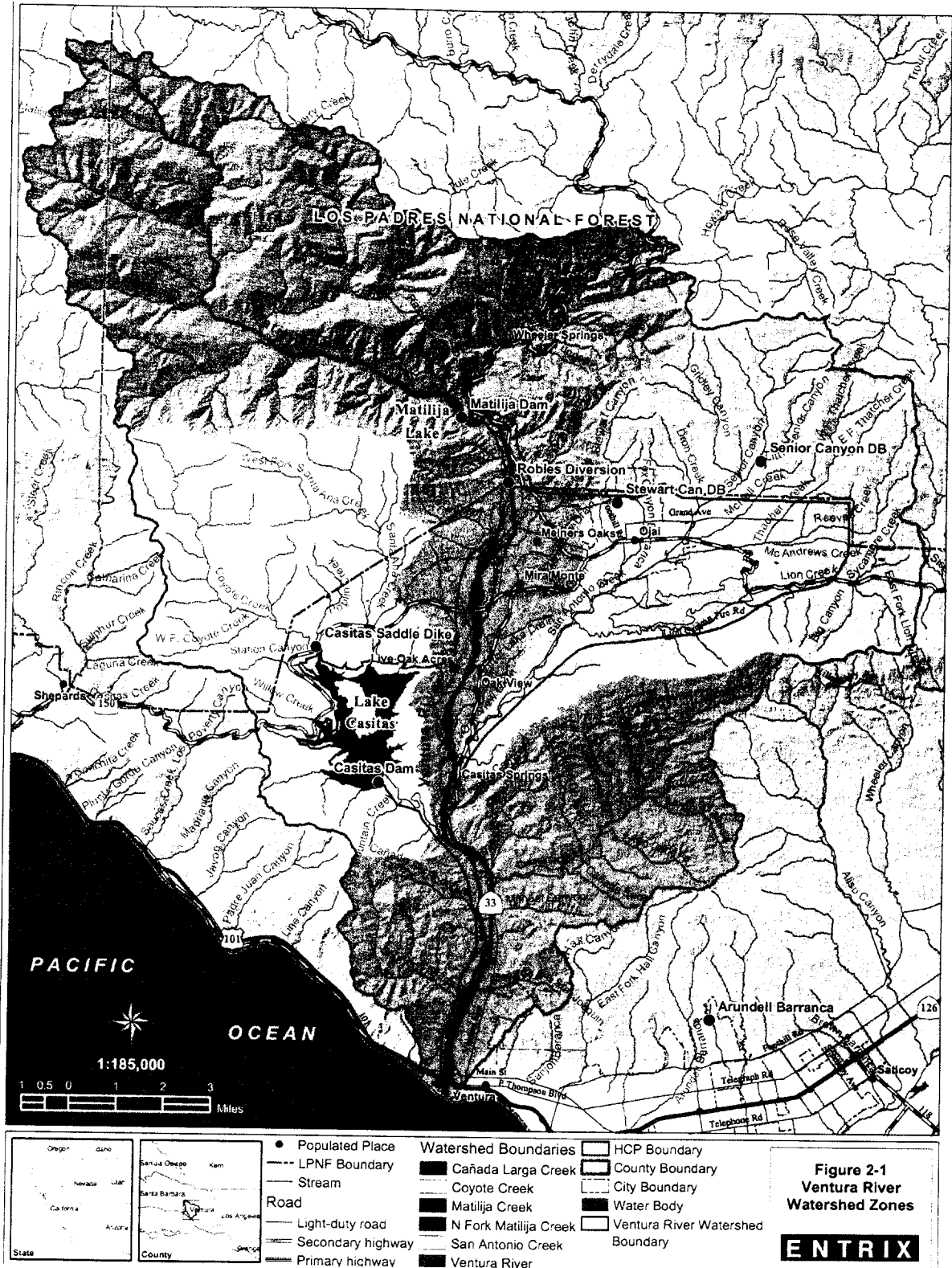


Figure A2. Ventura River Watershed (excerpt from the Habitat Conservation Plan – Entrix)

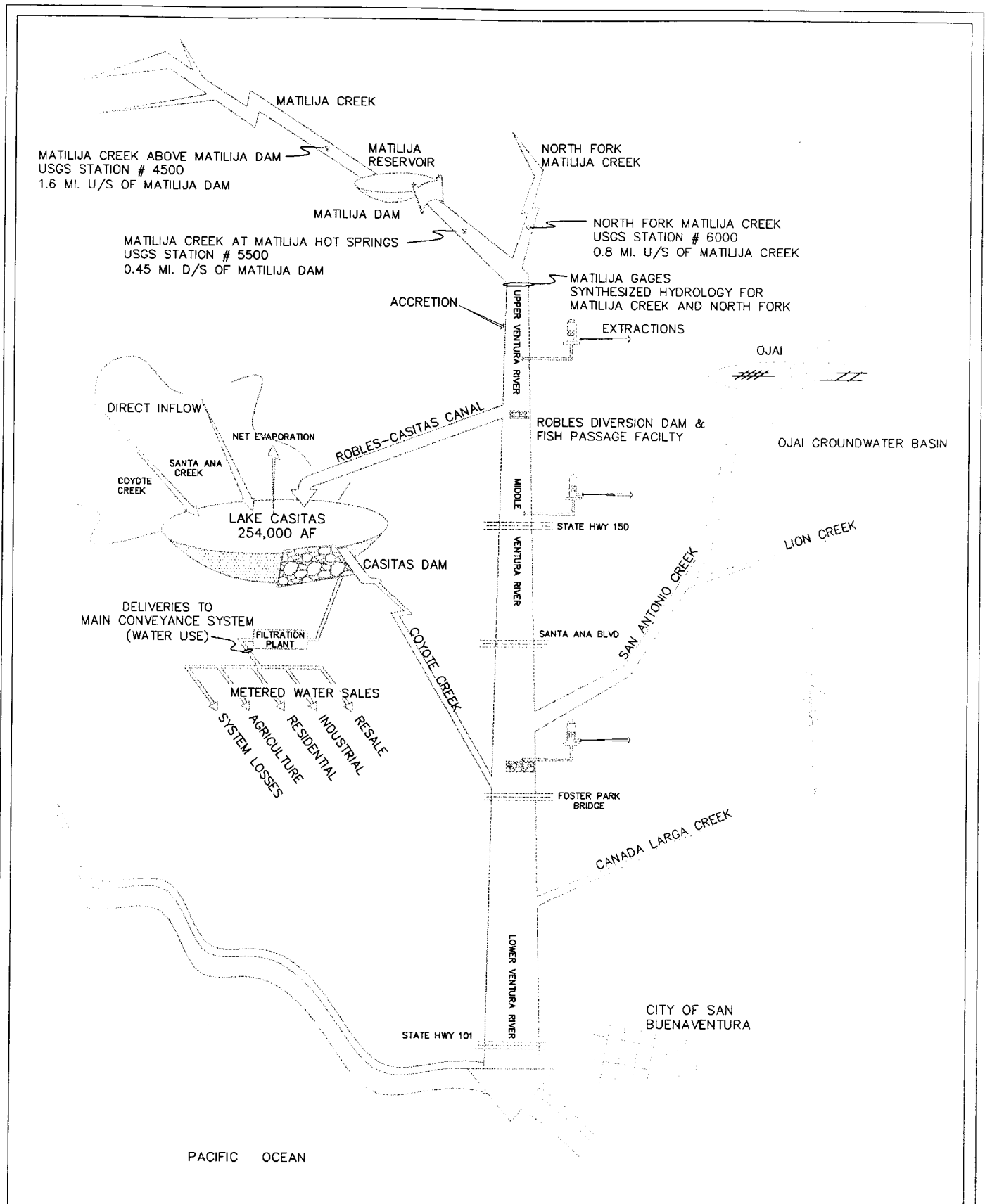


Figure A3. KEY ELEMENTS OF THE VENTURA RIVER WATER SUPPLY



period. The outline provided in this appendix provides the supply data and assumptions that were applied in the reservoir routing analysis.

There are two specific periods that the District is concerned with in the reservoir routing and determination of supply reliability. The first period is the longest period of drought. Assuming the reservoir is at full capacity, test the ability of the reservoir to withstand the longest drought of recent record. The second period is the recovery period of the reservoir from minimum storage level, after the reservoir has experienced the longest drought period, to full stage and ready for the next drought sequence.

The District has identified the period of 1944 through 1965 as the longest period of drought. The hydrology of the period is well documented. Other factors such as the current demands for the water supply are represented by the data gathered for the period. Such data will have to be extrapolated from current conditions to meet the hydrology of the study period.

The period of 1946 to 1980 has been identified as the recovery period. It is known that the Ventura River hydrology during the 1959 to 1978 period contributed to the initial filling of Casitas Reservoir to full capacity. Other factors and data, such as the demand for water supply and evaporation rates, may not be available from the study period or are not representative of current levels of influence. These factors must be reasonably developed from current data and trends, and then applied to the reservoir routing study. Many of these factors have been developed during prior studies and should be considered for this study.

### **Water Supply Prediction Methods**

The analysis of water supply for Casitas Municipal Water District was derived from the methods used by Kienlen in the late 1980s and early 1990 to evaluate a series of alternatives for utilizing water supplies in the Ventura River Basin (Murray, Burns and Kienlen 1990). These methods developed a water balance model for the Ventura River Basin and Lake Casitas that accounted for: 1) surface flows in the Ventura River, Matilija Creek, North Fork Matilija Creek, Coyote Creek, and Santa Ana Creek; 2) groundwater and surface water extraction above Robles diversion; 3) flow accretion above Robles Diversion; 4) operational efficiency of the Robles Diversion; 5) evaporation and rainfall at Lake Casitas; and 6) an estimate of the available supply from Lake Casitas on an annual basis expressed as annual yield. For this analysis, the approach used by Kienlen for the D20 study was used as a basis for the calculations in this analysis. Since Kienlen performed the D20 analysis additional water supplies have been developed, new operational criteria for Robles have been established, methods have been refined, and understanding the role of Matilija Reservoir to Casitas water supply has become more important. Therefore, the methods and/or assumptions used in the Kienlen D20 analysis were modified as appropriate based on current and/or relevant information and methods.

## Ventura River Inflow to Robles

This is an estimate of the volume of water flowing into the Robles facility. It is based on the hydrologic records from USGS gauging stations, operational criteria for Matilija Reservoir, an estimate of the volume of accretion flow between the gages and Robles, and an estimate of the volume of water that is depleted between the gages and Robles.

In review of the data from each gaging station and understanding that the Matilija Dam changed flows entering the Robles Diversion Dam location, the model had to consider development of the Ventura River hydrology with and without the influence of Matilija Dam. Records of flow above Matilija Dam had been gathered until 1969, at which time the station had been destroyed and not replaced. The synthesis of the hydrology has been determined by developing an unencumbered flow (no Matilija Dam) at the Matilija Creek at Matilija Hot Springs station and then combining with the flow recorded at the North Fork Matilija Creek station. Where no records of flow were gathered for above Matilija Dam (the period of 1969 to 1980), a correlation was used to develop the unencumbered flow. The correlations are described in the equations outlined in the following sections. This method provided the baseline hydrology for the upper Ventura River without the influence of the Matilija Dam, which is one of the conditions that was later applied to the scenarios of this study. From the baseline hydrology and the operational criteria for Matilija Dam, a second hydrology was synthesized for the condition of Matilija Dam in operation for the entire study period. To provide accurate estimates for these values, calculations were based on daily values.

The combination of the synthesized hydrology for the Matilija Creek with the records for North Fork of the Matilija Creek has provided the flow values for water at the confluence of the Matilija Creek and the North Fork Matilija Creek. The term used for the combination of the records is "Matilija Gages". To develop the quantity of water that is available at the Robles Diversion Dam, the factors for accretion, upstream flow depletion and facility losses are applied to the "Matilija Gages" hydrology record.

### Drought Period Hydrology – October 1 1944 through September 30 1965

- 1) Matilija Creek hydrology
  - a. Empirical USGS gage records
    - i. #5500: Matilija Hot Springs - October 1 1944 – May 31 1948
    - ii. #4500: Above Matilija - June 1 1948 – September 30 1965
- 2) North Fork Matilija Creek hydrology
  - a. Empirical USGS gage records
    - i. #6000: October 1 1944 – September 30 1965

### Reservoir Recovery Period Hydrology – October 1 1965 through September 30 1980

- 1) Matilija Creek hydrology
  - a. Empirical USGS gage records

- i. #4500: October 1 1965 – September 30 1969
  - ii. #5500: October 1 1973 – October 31 1973
- b. Daily flows predicted from NF Matilija daily USGS records
- i. Loss at Matilija Reservoir = 0.1167%
    - 01) Added to Annual AF estimate for #5500
  - ii. Equation:  $\#5500 = ((\text{Annual AF } 5500 / \text{Annual AF } 4500) * \#4500)$
  - iii. Estimated: October 1 1969 – September 30 1973
  - iv. Estimated: November 1 1973 – September 30 1980
- 2) North Fork Matilija Creek hydrology
- a. Empirical USGS gage records
    - i. #6000: October 1 1964 – September 30 1973
    - ii. #6000: November 1 1973 – September 30 1978
  - b. Flows predicted from Matilija Creek USGS daily records
    - i. Equation:  $\#6000 = (0.00003 * (\#5500^2)) + (0.3158 * \#5500)$
    - ii. Estimated: October 1 1973 – October 31 1973

#### Matilija Reservoir Operations: Influence and Benefit

- 1) Storage Capacity
  - a. Maximum storage: 650 AF
  - b. Minimum storage: 250 AF
- 2) Operational Criteria
  - a. Fill with storm events and available flows
  - b. Reduce to minimum storage once full
    - i. Generally post storm events (Figure A2)
    - ii. Release up to 100-150 cfs

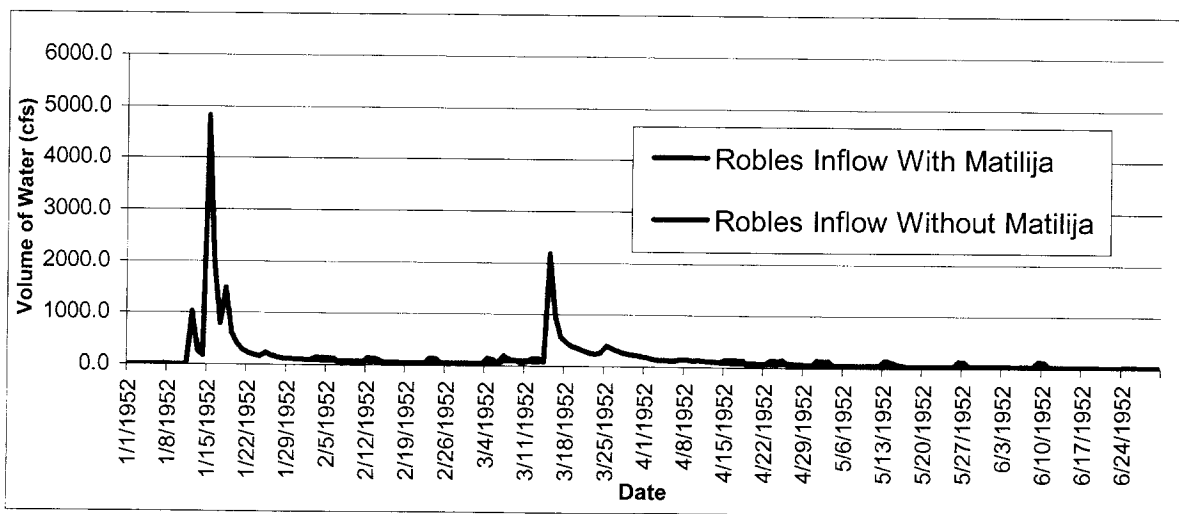


Figure A4. Potential effect of Matilija Reservoir operations on Ventura River flows.

Flow Accretion

This is an estimate of the volume of water that is gained between the USGS gauging stations and the Robles Diversion. Accretion flows would generally occur in association with storm events.

- 1) Variable – associated with rain events
- 2) Applied to average daily combined flow at Matilija and North fork Matilija Creek gages
- 3) Correction Factors: Applied to estimated average daily flow
  - a. 0.05 increase applied to combined records from #5500 and #6000 gages
  - b. 0.11 increase applied to combined records from #4500 and #6000 gages

Flow Depletion /Extraction

This is an estimate of the volume of water that is depleted between the gauges and Robles diversion. The volume of these depletions are generally related to water extractions via wells and surface diversions to beneficial water use, and replenishment of the groundwater aquifer.

- 1) Characteristics: variable on a monthly basis
  - i. October: 7.58% of annual extraction volume
  - ii. November: 5.35% of annual extraction volume
  - iii. December: 4.34% of annual extraction volume
  - iv. January: 4.75% of annual extraction volume
  - v. February: 0.328% of annual extraction volume
  - vi. March: 4.94% of annual extraction volume
  - vii. April: 7.01% of annual extraction volume
  - viii. May: 10.41% of annual extraction volume
  - ix. June: 14.06 % of annual extraction volume
  - x. July: 16.18% of annual extraction volume
  - xi. August: 12.10% of annual extraction volume
  - xii. September: 9.99% of annual extraction volume
  - b. Related to substrate permeability/groundwater recharge and extraction
  - c. Dependent upon direct diversions
- 2) Annual Estimates were used from the Kienlen D20 study
  - a. Drought period:
    - i. Up to 2800 AF/yr
    - ii. Average of 2,168 AF/yr for 1944-1965 period (11.8% of gages)
  - b. Wet period:
    - i. Up to 2,800 AF/yr
    - ii. Average of 1,628 AF/yr for 1966 – 1980 period (3.7% of gages)
  - c. Applied to average daily combined flow values from Matilija and North fork Matilija Creek gages

## Robles Diversion Operations

This is an estimate of the volume of water flowing out of the Robles facility. It is based on the volume of water flowing into the facility (described above), water losses associated with facility operations, the volume of water available for diversion, diversion operational criteria, and the volume of water that bypasses the facility. To provide accurate estimates for these values, calculations were based on daily values.

### Facility Losses

This is the volume of water loss from operating the diversion. It reduces the volume of water available for diversion. It is assumed that the majority of this volume of water goes subsurface and recharges groundwater aquifers.

- 1) Estimates used from Kienlen D20 Study
  - a. Drought period: average 1,321 AF (7.7% of inflow)
  - b. Wet period: average 1,628 AF (3.7% of inflow)
  - c. Applied to average daily flow coming into the Robles facility
- 2) BOR (1959) estimated operational loss for the diversion at 5%

### Water Available for Diversion

This is an estimate of the volume of water coming into the Robles Facility minus the volume of water loss due to operating the facility.

### Volume of Water Diverted

This is the volume of water diverted into the Robles/Casitas Canal based on the 1959 and Robles BO operating criteria.

- 1) 1959 Operating Criteria estimates:
  - a. Operating period
    - i. October 1 through June 30
    - ii. Initiated after surface flows occur at Santa Ana Blvd Bridge
    - iii. Diversion cease when storage volume in Lake Casitas reaches 248,616 acre-feet (2 feet from spill elevation)
  - b. Diversion volume
    - i. Maximum diversion: 500 cfs
    - ii. Minimum diversion: 5 cfs
  - c. Minimum release (if available)
    - i. Surface flow at Santa Ana Blvd. Bridge: release 3 cfs
      1. Assume after 2<sup>nd</sup> storm, and
      2. Drought period: Cumulative Robles inflow >11,000 AF/yr
      3. Recovery period: Cumulative Robles inflow >26,000 AF/yr
    - ii. No surface flow at Santa Ana Blvd. Bridge: release 20 cfs
      1. Kienlen study assumed 20 cfs release/bypass at all times

- 2) Robles BO operating criteria estimates
  - a. Operating period
    - i. Fish passage operating period criteria
      1. January 1 – June 30
      2. Initiate after 1<sup>st</sup> storm event
      3. Initiate if sandbar has breached
    - ii. 1959 operating criteria
      1. Apply whenever fish passage criteria are not met
      2. Initiated after October 1
    - iii. General criteria
      1. Diversions cease when the storage volume in Lake Casitas is 248,616 acre-feet (2 feet below spill elevation)
  - b. Diversion volumes
    - i. Maximum diversion: 500 cfs
    - ii. Minimum criteria: 5 cfs
  - c. Fish releases (if available)
 

(This is the quantity of water released off of the diversion canal to satisfy fish requirements outlined in the Robles BO and based on the volume of water flowing into the Robles Facility)

    - i. Ratcheted release over 12 day period from 171 cfs to 30 cfs
    - ii. Associated with storm events
    - iii. Reduced fish releases would occur if Lake Casitas storage volume drops to < 100,000 AF and again at <65,000 AF through agreement and based on an equitable sharing of the temporary reduction in water allocations to customers (i.e. demonstrated reduction in water use)
    - iv. Will cease if Lake Casitas storage volume is < 17,000 AF and until it reaches a volume of 65,000 AF
  - d. Minimum release (if available)
    - i. 30 cfs after first storm event and until June 30

#### Volume of Water Bypassed.

This is the total volume of water that bypasses the Robles Diversion facility. It includes the volume of water that is not diverted and bypasses the facility as well as the volume of water that is released from the Robles/Casitas canal for steelhead migration in the Ventura River.

- 1) Estimation
  - a. Kienlen D20 study: bypass = Total inflow – loss – diversions
  - b. Drought period: 50.7% of inflow
  - c. Wet period: 52.9% of inflow
  - d. Entire period: 52.1% of inflow

**Lake Casitas Supply**

The supply of water in Lake Casitas is dependent upon inflows from the Robles/Casitas canal, Santa Ana Creek, Coyote Creek, and unnamed tributaries as well as reductions associated with evaporation.

Volume from Robles/Casitas Canal

This is the volume of water diverted to Lake Casitas from the Robles Diversion. It is based on the calculations described above.

Santa Ana Creek

This analysis used estimates from the Kienlen D20 study.

Coyote Creek

This analysis used estimates from the Kienlen D20 study

Unnamed Tributaries

This analysis used estimates from the Kienlen D20 study.

Net Evaporation

This analysis used estimates from the Kienlen D20 study.

**Mira Monte Well Supply**

Annual yield estimated at 300 AF per year.

**Safe Yield: Drought Period – Casitas Municipal Water District**

Safe yield is a risk management tool used to estimate the volume of water that can be withdrawn from a water supply to the extent that the withdrawal is not harmful to recreation, water quality, or physical facilities. Methods for this assessment were based on the previous safe yield studies conducted by the BOR and Kienlen. However, this study accounted for three additional supply factors that were not included in the Kienlen analysis: 1) under the 1959 operating criteria minimum releases could be 3 cfs under specific conditions; 2) Mira Monte well supply; and Matilija Reservoir supply.

- 1) Estimates based of Kienlen D20 study variables and values:
  - a. Timeframe: 21 years – 1945-1965 water years
  - b. Minimum pool: approximately 4800 AF (based on D20 study)
  - c. Monthly Distribution of Yield:
    - i. October: 7.12% of annual yield
    - ii. November: 6.07% of annual yield
    - iii. December: 6.09% of annual yield
    - iv. January: 6.69% of annual yield
    - v. February: 4.5% of annual yield
    - vi. March: 6.41% of annual yield

- vii. April: 7.59% of annual yield
  - viii. May: 9.55% of annual yield
  - ix. June: 10.99 % of annual yield
  - x. July: 13.2% of annual yield
  - xi. August: 12.04% of annual yield
  - xii. September: 9.75% of annual yield
- 2) Water supply from the Mira Monte well was included in the safe yield estimate:
- a. 300 AF per year
  - b. Applied at a constant rate for each month
- 3) Water supply from Matilija Reservoir was estimated.
- 4) Safe yield estimates made for four scenarios
- a. 1959 Operating Criteria
    - i. With and without Matilija
  - b. Robles BO Operating Criteria
    - i. With and Without Matilija

#### **Yield: Recovery Period – Casitas Municipal Water District**

Yield is used to estimate the volume of water that can be withdrawn from a water supply to the extent that the withdrawal allows the reservoir to fill in a timely fashion. Methods for this assessment were based on the timeframe in which the reservoir filled following the longest period on record from previous studies conducted by Kienlen. However, this study accounted for three additional supply factors that were not included in the Kienlen analysis: 1) under the 1959 operating criteria minimum releases could be 3 cfs under specific conditions; 2) Mira Monte well supply; and Matilija Reservoir supply.

- 2) Estimates based of Kienlen D20 study variables and values:
- a. Timeframe: 15 years – 1966-1980 water years
  - b. Initial pool: approximately 4800 AF (based on D20 study)
  - c. Monthly Distribution of Yield:
    - i. October: 7.12% of annual yield
    - ii. November: 6.07% of annual yield
    - iii. December: 6.09% of annual yield
    - iv. January: 6.69% of annual yield
    - v. February: 4.5% of annual yield
    - vi. March: 6.41% of annual yield
    - vii. April: 7.59% of annual yield
    - viii. May: 9.55% of annual yield
    - ix. June: 10.99 % of annual yield
    - x. July: 13.2% of annual yield
    - xi. August: 12.04% of annual yield
    - xii. September: 9.75% of annual yield



- 2) Water supply from the Mira Monte well was included in the safe yield estimate:
  - a. 300 AF per year
  - b. Applied at a constant rate for each month
- 3) Water supply from Matilija Reservoir was estimated.
- 4) Safe yield estimates made for four scenarios
  - c. 1959 Operating Criteria
    - i. With and without Matilija
  - d. Robles BO Operating Criteria
    - i. With and Without Matilija

### **Water Supply Prediction Results**

The following Tables and Figures present summary information from the analysis described above.

Table A.1. Predicted water supply for the 1945-1965-drought period based on the 1959 operating criteria and with the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)													District Available Supply			
	Ventura River						Robles Operations						Lake Casitas				
	Flows Above Robles Diversion			Inflow			Loss			Bypass			Diversion			Tributaries	Net Loss
Matilija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion	Tributaries	Net Loss	Storage Volume								
1945	19222	961	2652	17531	1350	8198	7984	6812	4711	225510	22770						
1946	23289	1164	2611	21842	1682	9339	10821	3377	4529	212710	22770						
1947	12435	622	2035	11021	849	4932	5241	2654	4255	193881	22770						
1948	2822	171	1728	1264	97	1167	0	48	3901	167559	22770						
1949	3564	392	1712	2243	173	1839	232	131	3537	141916	22770						
1950	4785	526	1722	3589	276	2748	565	1378	3145	118244	22770						
1951	1810	199	1356	652	50	602	0	89	2682	93182	22770						
1952	58089	6390	2611	61868	4764	21709	35395	27231	3582	129758	22770						
1953	10343	1138	2342	9139	704	5838	2597	2270	2940	109215	22770						
1954	9916	1091	2183	8823	679	4251	3892	3520	2599	91559	22770						
1955	5139	565	2002	3702	285	3183	234	703	2078	67949	22770						
1956	10412	1145	2131	9426	726	4835	3866	5792	1773	53365	22770						
1957	6822	750	1811	5761	444	2867	2451	1008	1260	33095	22770						
1958	93554	10291	2702	101142	7788	35365	57990	32125	3204	97537	22770						
1959	13670	1504	2157	13016	1002	6487	5527	2909	2374	81130	22770						
1960	4406	485	1668	3222	248	2591	383	936	1834	58298	22770						
1961	2243	247	1189	1300	100	1185	16	150	1307	34687	22770						
1962	57999	6380	2514	61865	4764	32151	24950	27154	2379	61943	22770						
1963	7323	806	2317	5811	447	3731	1633	2338	1554	41891	22770						
1964	4432	487	1702	3217	248	2216	753	863	1029	20008	22770						
1965	8501	935	1935	7500	578	3544	3379	4537	636	4819	22770						
Total	360775	36249	43081	353943	27254	158779	167911	126025	55309		478170						
Mean	17180	1726	2051	16854	1298	7561	7996	6001	2634	97060	22770						

Table A2. Predicted water supply for the 1945-1965-drought period based on the 1959 operating criteria and without the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)														District
	Ventura River							Lake Casitas							
	Flows Above Robles Diversion			Robles Operations				Tributaries	Net Loss	Storage Volume	Available Supply				
Matilija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion									
1945	19179	959	2652	17486	1346	8245	7894	6812	4711	225881	22309				
1946	23283	1164	2611	21836	1681	10826	9329	3377	4529	212050	22309				
1947	12552	628	2035	11145	858	5911	4376	2654	4255	192817	22309				
1948	2830	171	1728	1273	98	1175	0	48	3901	166956	22309				
1949	3496	385	1712	2169	167	1874	128	131	3537	141670	22309				
1950	4858	534	1722	3671	283	2882	506	1378	3145	118400	22309				
1951	1810	199	1356	653	50	602	0	89	2682	93799	22309				
1952	58270	6410	2611	62068	4779	23640	33649	27231	3582	129089	22309				
1953	10060	1107	2342	8824	679	6601	1543	2270	2940	107955	22309				
1954	9941	1094	2183	8852	682	4810	3360	3520	2599	90227	22309				
1955	5169	569	2002	3736	288	3319	128	703	2078	66973	22309				
1956	10460	1151	2131	9479	730	5659	3091	5792	1773	52074	22309				
1957	6732	741	1811	5662	436	3050	2176	1008	1260	31990	22309				
1958	93605	10297	2702	101200	7792	35812	57595	32125	3204	96498	22309				
1959	13591	1495	2157	12929	995	7013	4920	2909	2374	79945	22309				
1960	4424	487	1668	3243	250	2810	183	936	1834	57374	22309				
1961	2292	252	1189	1355	104	1190	61	150	1307	34269	22309				
1962	57924	6372	2514	61782	4757	32798	24226	27154	2379	61262	22309				
1963	7321	805	2317	5809	447	4014	1348	2338	1554	41386	22309				
1964	4503	495	1702	3296	254	2263	780	863	1029	19991	22309				
1965	8435	928	1935	7428	572	3928	2928	4537	636	4813	22309				
Total	360735	36240	43081	353895	27250	168422	158223	126025	55309		468489				
Mean	17178	1726	2051	16852	1298	8020	7534	6001	2634	96449	22309				

Table A.3. Predicted water supply for the 1945-1965-drought period based on the Robles BO operating criteria and with the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)														District
	Ventura River							Lake Casitas							
	Flows Above Robles Diversion			Robles Operations				Tributaries	Net Loss	Storage Volume	Available Supply				
	Matilija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion								
1945	19222	961	2652	17531	1350	10206	5976	6812	4711	224636	21635				
1946	23289	1164	2611	21842	1682	10547	9614	3377	4529	211763	21635				
1947	12435	622	2035	11021	849	4932	5241	2654	4255	194068	21635				
1948	2822	171	1728	1264	97	1167	0	48	3901	168880	21635				
1949	3564	392	1712	2243	173	1839	232	131	3537	144371	21635				
1950	4785	526	1722	3589	276	2748	565	1378	3145	121834	21635				
1951	1810	199	1356	652	50	602	0	89	2682	97906	21635				
1952	58089	6390	2611	61868	4764	28626	28478	27231	3582	128698	21635				
1953	10343	1138	2342	9139	704	5838	2597	2270	2940	109290	21635				
1954	9916	1091	2183	8823	679	4778	3366	3520	2599	92241	21635				
1955	5139	565	2002	3702	285	3183	234	703	2078	69766	21635				
1956	10412	1145	2131	9426	726	5532	3168	5792	1773	55618	21635				
1957	6822	750	1811	5761	444	3148	2169	1008	1260	36201	21635				
1958	93554	10291	2702	101142	7788	43667	49688	32125	3204	93474	21635				
1959	13670	1504	2157	13016	1002	7627	4388	2909	2374	77062	21635				
1960	4406	485	1668	3222	248	2591	383	936	1834	55364	21635				
1961	2243	247	1189	1300	100	1185	16	150	1307	32888	21635				
1962	57999	6380	2514	61865	4764	34519	22582	27154	2379	58910	21635				
1963	7323	806	2317	5811	447	3985	1379	2338	1554	39738	21635				
1964	4432	487	1702	3217	248	2335	634	863	1029	18871	21635				
1965	8501	935	1935	7500	578	3544	3379	4537	636	4817	21635				
Total	360775	36249	43081	353943	27254	182600	144090	126025	55309		454335				
Mean	17180	1726	2051	16854	1298	8695	6861	6001	2634	96971	21635				

Table A4. Predicted water supply for the 1945-1965-drought period based on the Robles BO operating criteria and without the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)														District
	Ventura River					Robles Operations				Lake Casitas					
	Flows Above Robles Diversion		Inflow			Loss		Bypass		Diversion		Tributaries	Net Loss	Storage Volume	
	Matilija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion	Tributaries	Net Loss	Storage Volume	Available Supply				
1945	19179	959	2652	17486	1346	12287	3852	6812	4711	223307	20840				
1946	23283	1164	2611	21836	1681	12594	7560	3377	4529	209175	20840				
1947	12552	628	2035	11145	858	5911	4376	2654	4255	191410	20840				
1948	2830	171	1728	1273	98	1175	0	48	3901	167017	20840				
1949	3496	385	1712	2169	167	1874	128	131	3537	143200	20840				
1950	4858	534	1722	3671	283	2882	506	1378	3145	121399	20840				
1951	1810	199	1356	653	50	602	0	89	2682	98266	20840				
1952	58270	6410	2611	62068	4779	31687	25602	27231	3582	126976	20840				
1953	10060	1107	2342	8824	679	6601	1543	2270	2940	107310	20840				
1954	9941	1094	2183	8852	682	5788	2382	3520	2599	90072	20840				
1955	5169	569	2002	3736	288	3319	128	703	2078	68286	20840				
1956	10460	1151	2131	9479	730	6701	2049	5792	1773	53813	20840				
1957	6732	741	1811	5662	436	3345	1881	1008	1260	34902	20840				
1958	93605	10297	2702	101200	7792	45349	48058	32125	3204	91341	20840				
1959	13591	1495	2157	12929	995	8755	3178	2909	2374	74515	20840				
1960	4424	487	1668	3243	250	2810	183	936	1834	53411	20840				
1961	2292	252	1189	1355	104	1190	61	150	1307	31775	20840				
1962	57924	6372	2514	61782	4757	35778	21247	27154	2379	57256	20840				
1963	7321	805	2317	5809	447	4388	974	2338	1554	38475	20840				
1964	4503	495	1702	3296	254	2299	743	863	1029	18512	20840				
1965	8435	928	1935	7428	572	3928	2928	4537	636	4801	20840				
Total	360735	36240	43081	353895	27250	199265	127379	126025	55309		437640				
Mean	17178	1726	2051	16852	1298	9489	6066	6001	2634	95487	20840				

Table A.5. Predicted water supply for the 1966-1980-recovery period based on the 1959 operating criteria and with the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)														District
	Ventura River							Lake Casitas							
	Flows Above Robles Diversion			Robles Operations				Tributaries	Net Loss	Storage Volume	Available Supply				
	Matilija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion								
1966	55445	2772	2446	55771	2064	18020	35687	21289	1387	37926	24177				
1967	56372	2819	2767	56423	2088	8722	45613	27258	2437	85911	24177				
1968	8024	401	2536	5889	218	4450	1221	2392	1765	65310	24177				
1969	171353	8568	2793	177128	6554	104275	66300	78737	4630	183497	24177				
1970	16807	840	2725	14922	552	7731	6639	4662	3767	168904	24177				
1971	20184	1009	2481	18712	692	10504	7516	7225	3640	158148	24177				
1972	10739	537	2046	9230	341	4269	4619	5394	3345	142578	24177				
1973	58322	2916	2754	58484	2164	22499	33821	33070	4342	184252	24177				
1974	18424	921	2426	16919	626	8593	7700	7417	3936	173398	24177				
1975	23671	1184	2658	22197	821	9419	11957	10670	3940	170361	24177				
1976	9711	486	2167	8029	297	4278	3454	3239	3584	151212	24177				
1977	4977	249	1925	3301	122	2590	589	1056	3164	127285	24177				
1978	135760	6788	2615	139933	5178	66111	68645	73222	5366	244222	24177				
1979	27918	1396	2800	26514	981	9193	16340	11740	4872	246144	24177				
1980	69835	3492	2800	70527	2610	51007	16911	38299	4892	237956	24177				
Total	687544	34377	37939	683982	25307	331662	327012	325670	55067	2377102	362655				
Mean	45836	2292	2529	45599	1687	22111	21801	21711	3671	158473	24177				

Table A6. Predicted water supply for the 1966-1980-recovery period based on the 1959 operating criteria and without the benefit of Matijija Reservoir.

Water Year	Predicted Water Supply (AF)														District
	Ventura River							Lake Casitas							
	Flows Above Robles Diversion			Robles Operations				Tributaries	Net Loss	Storage Volume	Available Supply				
	Matijija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion								
1966	55495	2775	2437	55495	4299	18672	35094	21289	1387	37045	23497				
1967	56267	2813	2767	56267	4336	10198	44031	27258	2437	82243	23497				
1968	8040	402	2536	8040	455	5032	655	2392	1765	61768	23497				
1969	171355	8929	2793	171355	13667	104284	66293	78737	4630	178779	23497				
1970	16800	1848	2725	16800	1226	8790	5574	4662	3767	163672	23497				
1971	20191	2221	2481	20191	1535	10589	7437	7225	3640	153137	23497				
1972	10730	1180	2046	10730	760	4230	4649	5394	3345	138184	23497				
1973	58322	6415	2754	58322	4773	23802	32518	33070	4342	178101	23497				
1974	18421	2026	2426	18421	1388	9739	6551	7417	3936	166596	23497				
1975	23675	2604	2658	23675	1819	10837	10542	10670	3940	162404	23497				
1976	9930	1092	2167	9930	682	4935	3018	3239	3584	143424	23497				
1977	4817	530	1925	4817	263	2683	334	1056	3164	119950	23497				
1978	135694	14926	2615	135694	11396	67816	66872	73222	5366	233727	23497				
1979	27929	3072	2800	27929	2172	9567	15977	11740	4872	235179	23497				
1980	69813	3491	2803	69813	2609	51683	16209	38299	4892	237452	23497				
Total	687478	54326	37934	687478	51378	342858	315755	325670	55067	2291661	352455				
Mean	45832	3622	2529	45832	3425	22857	21050	21711	3671	152777	23497				

Table A.7. Predicted water supply for the 1966-1980-recovery period based on the Robles BO operating criteria and with the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)															District
	Ventura River					Robles Operations					Lake Casitas					
	Flows Above Robles Diversion					Inflow	Loss	Bypass	Diversion	Tributaries	Net Loss	Storage Volume	Available Supply			
	Matilija Gages	Accretion	Extraction													
1966	55445	2772	2446	55771	2064	18020	35687	21289	1387	36443	21184					
1967	56372	2819	2767	56423	2088	16551	37784	27258	2437	79612	21184					
1968	8024	401	2536	5889	218	4450	1221	2392	1765	62024	21184					
1969	171353	8568	2793	177128	6554	112021	58553	78737	4630	175431	21184					
1970	16807	840	2725	14922	552	7850	6520	4662	3767	163732	21184					
1971	20184	1009	2481	18712	692	10504	7516	7225	3640	155997	21184					
1972	10739	537	2046	9230	341	4269	4619	5394	3345	143441	21184					
1973	58322	2916	2754	58484	2164	32221	24099	33070	4342	178309	21184					
1974	18424	921	2426	16919	626	10153	6140	7417	3936	168952	21184					
1975	23671	1184	2658	22197	821	11490	9885	10670	3940	166838	21184					
1976	9711	486	2167	8029	297	4911	2821	3239	3584	150121	21184					
1977	4977	249	1925	3301	122	2590	589	1056	3164	129207	21184					
1978	135760	6788	2615	139933	5178	76373	58383	73222	5366	239268	21184					
1979	27918	1396	2800	26514	981	11264	14269	11740	4872	242051	21184					
1980	69835	3492	2800	70527	2610	52424	15493	38299	4892	239269	21184					
Total	687544	34377	37939	683982	25307	375094	283581	325670	55067	2330695	317760					
Mean	45836	2292	2529	45599	1687	25006	18905	21711	3671	155380	21184					



Table A8. Predicted water supply for the 1966-1980-recovery period based on the Robles BO operating criteria and without the benefit of Matilija Reservoir.

Water Year	Predicted Water Supply (AF)														District
	Ventura River							Lake Casitas							
	Flows Above Robles Diversion			Robles Operations				Tributaries			Net Loss				
	Matilija Gages	Accretion	Extraction	Inflow	Loss	Bypass	Diversion	Storage Volume	Net Loss	Storage Volume	Net Loss	Storage Volume	Available Supply		
1966	55495	2775	2437	55832	2066	22510	31256	37022	1387	21289	37022	19775			
1967	56267	2813	2767	56313	2084	18095	36135	78056	2437	27258	78056	19775			
1968	8040	402	2536	5906	219	5032	655	61296	1765	2392	61296	19775			
1969	171355	8929	2793	177130	6554	112706	57871	173461	4630	78737	173461	19775			
1970	16800	1848	2725	14915	552	10129	4234	160696	3767	4662	160696	19775			
1971	20191	2221	2481	18719	693	10589	7437	153876	3640	7225	153876	19775			
1972	10730	1180	2046	9221	341	4230	4649	142637	3345	5394	142637	19775			
1973	58322	6415	2754	58484	2164	32465	23855	177592	4342	33070	177592	19775			
1974	18421	2026	2426	16916	626	12084	4205	167422	3936	7417	167422	19775			
1975	23675	2604	2658	22201	821	13301	8079	164412	3940	10670	164412	19775			
1976	9930	1092	2167	8259	306	5521	2433	148531	3584	3239	148531	19775			
1977	4817	530	1925	3133	116	2683	334	128772	3164	1056	128772	19775			
1978	135694	14926	2615	139863	5175	78146	56542	236013	5366	73222	236013	19775			
1979	27929	3072	2800	26526	981	15573	9971	235179	4872	11740	235179	19775			
1980	69813	3491	2803	70500	2609	53978	13914	238762	4892	38299	238762	19775			
Total	687478	54326	37934	683918	25305	397043	261570	2303725	55067	325670	2303725	296625			
Mean	45832	3622	2529	45595	1687	26470	17438	153582	3671	21711	153582	19775			

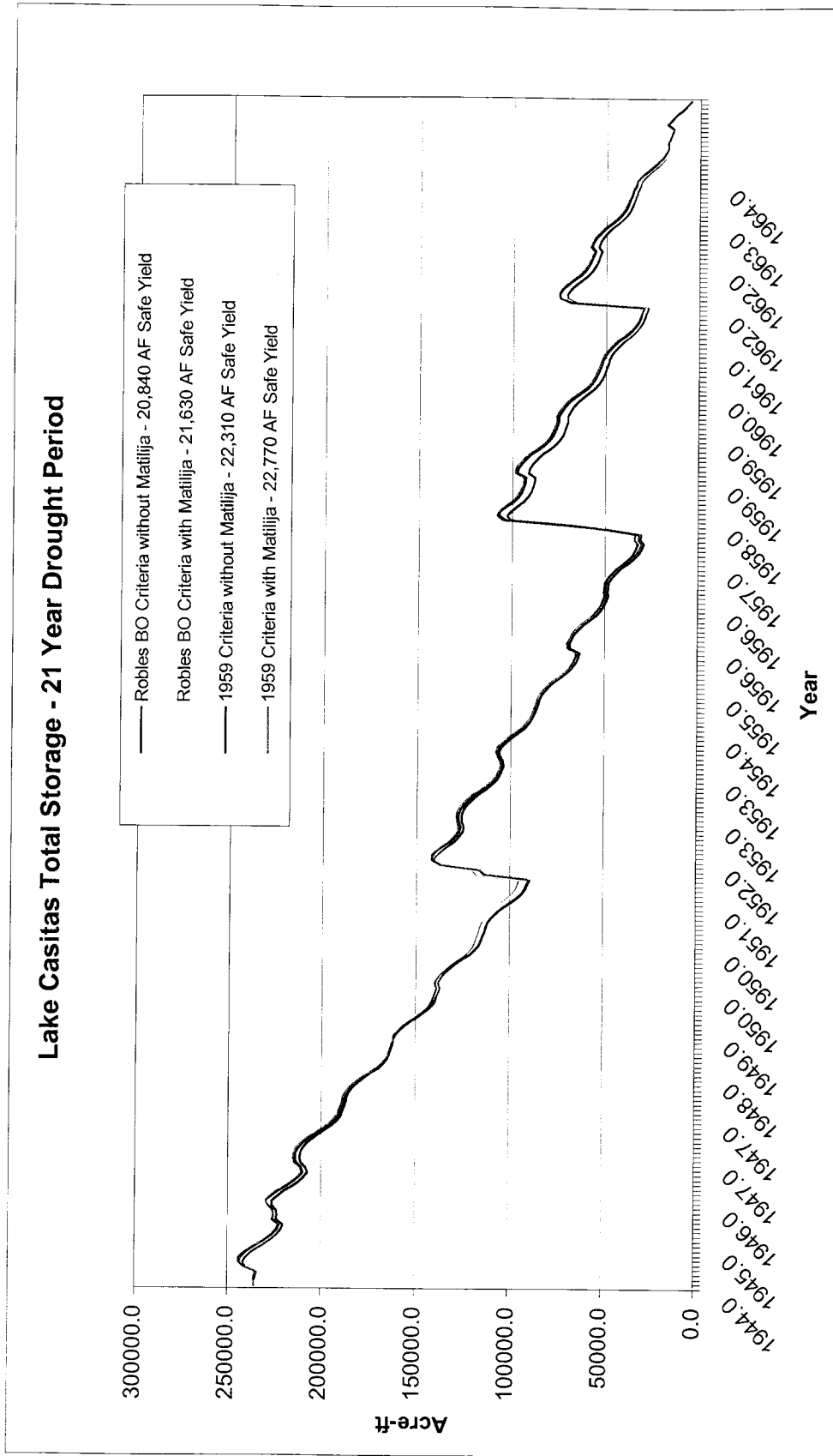


Figure A5. Comparisons of the storage volume in Lake Casitas based on different operating and safe yield scenarios for the longest drought on record.

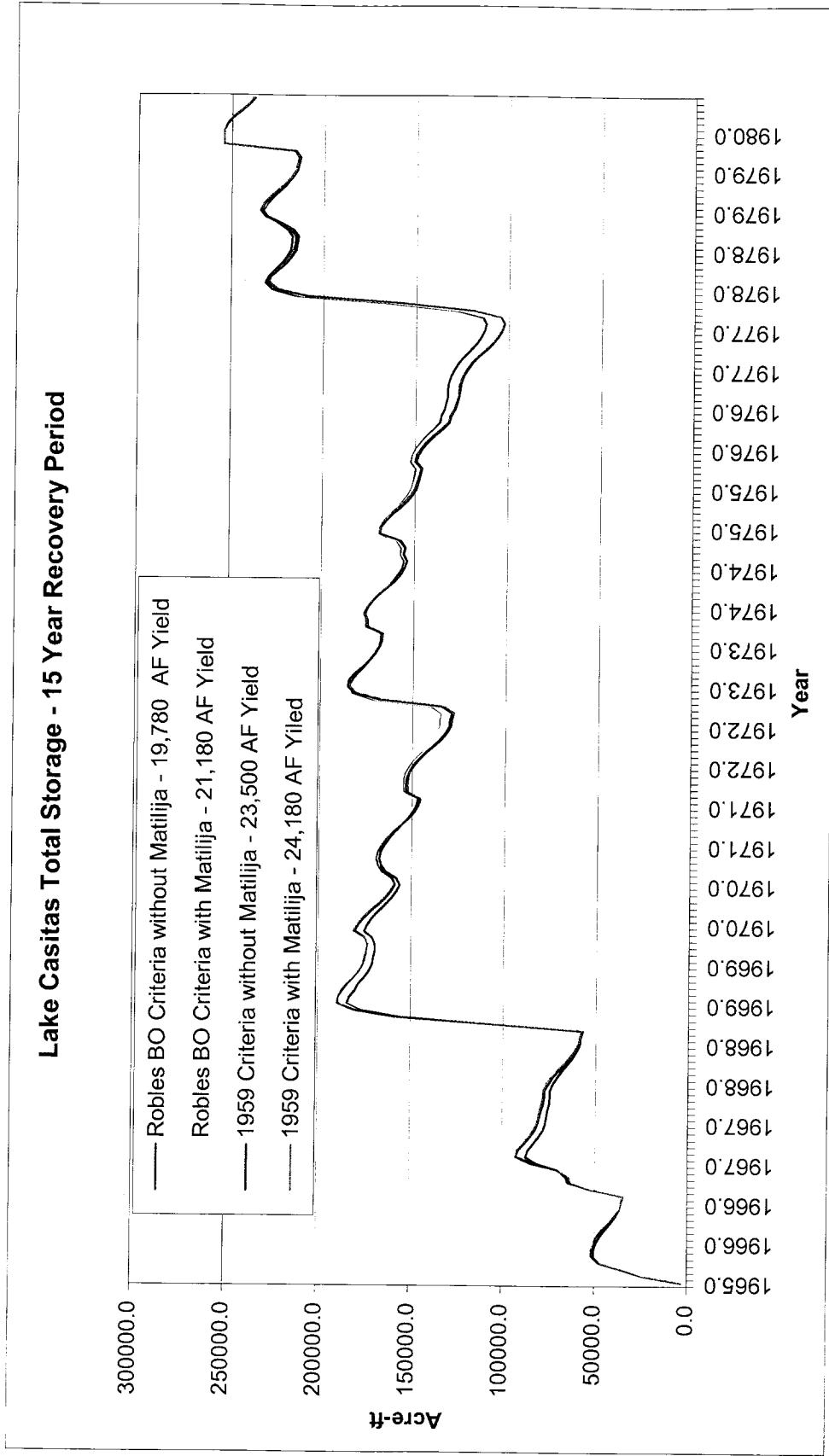


Figure A6. Comparisons of the storage volume in Lake Casitas based on different operating and yield scenarios for the recovery period following the longest drought on record.

## **Appendix B - Casitas MWD Water Delivery and Use Predictions**

The information that is available for the 1945 through 1965 study period is limited to the rainfall and hydrology occurrences in the Ventura River. The Ventura River Project that brought about Lake Casitas and the District's service facilities did not become operational until 1959. Water deliveries from Lake Casitas and customer use during this study period are not available and would not have been at the same level as today. Therefore, the study must predict water deliveries based on present water use and the study period's hydrology.

The following was considered in the development of the water delivery for the study period:

1. The critical drought period is 1945 through 1965;
2. Each year is based on Water Year hydrology data;
3. Good data source for hydrology and annual rainfall exists for the study period;
4. Rainfall data used in this evaluation has been gathered at the Santa Ana weather station, from 1944 to 1959, and the Lake Casitas Recreation Area weather station from 1959 to present;
5. Limited water delivery data for the study period – the District began delivery of water from Lake Casitas in 1959.
6. Water use data during the study period should reflect current level and trends of water delivery and use.
7. Factors that tend to influence the amount of water deliveries are rainfall patterns, irrigation use, municipal and industrial use, resale use, and groundwater availability.
8. Growth may be a factor in the water deliveries and use. The initial years of District (1959-1977), the trend of water use was primarily based on growth and development. During the last 20 years, slow growth has been more representative of the deliveries and use trends.
9. The District does have detailed data on the hydrology, annual rainfall, water delivery and use for the period 1959 to 2002.
10. The District's data for the annual water delivery is in Calendar year format, need to convert data to a water year format in order to apply deliveries to the Supply model.
11. Consider the adjustment of the deliveries where unusual anomalies exist in the data. (The City of San Buenaventura, period 1991 to 1997, to reflect the current agreement to purchase 6,000 acre-feet on an annual basis. This period's actual deliveries to the City were temporarily reduced to below 6,000 acre-feet due to water quality reasons.)
12. The District deliveries include water delivered from Casitas Dam to the main conveyance system and the deliveries from the Mira Monte Water Well.

### **Historical Data**

The Casitas Municipal Water District has an extensive collection of water use and hydrology data that can be applied to the water supply and use analysis. The data, in some cases, needed to be converted into a water year calendar time sequence in order to be consistent with all other data and the time sequence used in the analysis.

The following is a representation of the historical data that has been assembled from District records for the analysis.

Table B1 - lists the water deliveries from Casitas Dam and the Mira Monte Well are presented in a water year calendar format. Also presented are the rainfall totals for each water year.

Figure B1 - illustrates the relationship between the District's deliveries and annual rainfall. It is noted that there appears to be a direct correlation between rainfall and the level of deliveries made by the District.

Figures B2 through B5 were developed to further define and explain the annual variance in water delivery. The District has compiled water use data for each of its major user types and larger customers. The user trends also illustrate the influence of rainfall and at times, the loss of alternative water supplies (i.e. groundwater supplies) on the use patterns. The review of individual use does validate the delivery-rainfall relationship that is illustrated in Figure B1.

Figure B2 - illustrates the water sales patterns for the District's agricultural customers. There appears to be a direct correlation between rainfall and the amount of water sales made to the District's agricultural customers. The District serves water to approximately 5,600 acres of orchard cropland and supplements agricultural groundwater use during periods of drought. When rainfall does not occur, water sales from the District's distribution system supplement the lack of rainfall. The figure also illustrates the coincidence of agricultural water sales with the deliveries from Casitas Dam.

Figure B3 - illustrates the water sales pattern for direct residential customers of the District. As a comparative illustration, the water sales pattern of the agricultural customers is presented. It appears that the residential water sales do not appear to be influenced by annual rainfall variations. It also appears that the growth pattern has been gradual over the recorded 26-year period.

Figure B4 - illustrates the water sales pattern for the two types of resale customers and any relationship between the sales and annual rainfall. The Resale Pumped customer is primarily to other water agencies, such as Ventura River County Water District and Southern California Water Company, that also rely on groundwater supplies to meet demands within their water service areas. The Resale Pumped customers have demanded Lake Casitas supplies generally when they are not able to meet all demands from their groundwater supplies (Ventura River and Ojai). A specific increase in demands from Lake Casitas is noted in the 1989 to 1991 period. The rise in demand was approximately 1300 acre-feet from the base demand in 1989 to the maximum demand in 1991. This change is primarily due to the depletion of groundwater supplies during the drought period.

Figure B4 - provides an insight to the water sales pattern of Resale Gravity. The primary customer in the Resale Gravity is the City of San Buenaventura (Ventura). The City has alternative groundwater supplies from the Ventura River and the groundwater basins in the eastern section of the City. The City has a series of agreements with the District concerning water service. The City has agreed to annually certify that water delivered from the Casitas

system does not supply customers that are outside of the boundaries of the Casitas Municipal Water District. The district boundaries are not contiguous with the City's boundaries, and therefore, many sections of the City are not a part of the original financial setting for repayment of contracts for the Ventura River Project (Lake Casitas). This became an issue in 1990, at the height of a drought period. The City decided to become more reliant on its alternative supplies and drastically reduced its demand on Lake Casitas. The District's water sales to the City went from a high of 9,510 acre-feet in 1989 to a minimum purchase 1,370 acre-feet in 1992, and less than 2,000 acre-feet in each of the following years, until 1997. In 1995, the City and the District agreed to guarantee a stable purchase from the District. In this agreement, the City agreed to purchase at a minimum 6,000 acre-feet annually from Lake Casitas. The City began to meet the minimum demand in 1997 and have continued to do so since that time.

Figure B4 illustrates the water demand fluctuations that resulted from the abovementioned series of events. Besides the municipal and industrial use of the water within the City, the City has a sphere of water service influence that includes oil production. The oil production in this area requires water injection to force the oil out of the geologic formations. The period between the mid 1980's to the mid 1990's experienced a reduction in oil production, and thus a reduction in water demand. The City's in-District water use plummeted from a high of 10,886 acre-feet in 1987 to a low of 7,037 acre-feet in 2002. The City also has plans to develop its water well facilities on the Ventura River. It is likely that the City will be able to maintain a balance of deliveries from Lake Casitas with the use within the common City-District boundaries.

Figure B5 illustrates the historical sales to the Business, Industry, and Other customer types of the District. For the Industry customers, the sales patterns do not appear to be influenced by rainfall patterns. The Business and Other customers are primarily irrigated golf courses, public and private schools, and recreational areas, and may be influenced by rainfall patterns. There are some Business and Other customers that rely on Lake Casitas supply to supplement rainfall in the irrigation of large turf areas that are associated with these customers. In general, the annual water delivery for each of these customers is generally less than 800 acre-feet and the annual variation of demand is seldom greater than 200 acre-feet. There does not appear to be a growth trend in the annual demands from these three customer types.

### **Water Deliveries Adjustment – City of San Buenaventura**

Figure B4 illustrates that there may be several factors that have may have influenced the City of Ventura's water use, other than the influence of annual rainfall events. Several of those factors have been resolved by the agreement of a minimum water demand from Lake Casitas. In the recent years, the City has maintained its minimum demand on Lake Casitas at approximately 6,000 acre-feet. To develop a current Lake Casitas demand trend that may be extrapolated to other study periods, there must be an adjustment of the historical water use data to reflect the current level of demand by the City of Ventura. In Table B2, the water sales to the City of Ventura, for the period of 1991 to 1997, were adjusted to reflect the minimum City of Ventura demand on Lake Casitas of 6,000 acre-feet. The adjustment amount for the City of Ventura was also added to the District's deliveries to main conveyance, and further listed under the column entitled "Adjusted WY Deliveries to Main Conveyance." Figure B6 illustrates the adjustment to the annual water deliveries.

The period prior to 1990 has not been adjusted primarily because the city did not exceed its in-District demand by the deliveries from Lake Casitas. It should be noted that given a future extensive dry period, and/or re-emergence of the oil industry, the City of Ventura demands could potentially increase back to the water deliveries recorded in the 1980's.

### **Trending Deliveries**

From the review of historical data, it appears that the annual rainfall is a key factor that has influenced the District water deliveries. It is also apparent that multiple years of dry conditions cause an escalation of the delivery occurring in any one year. In Table B3, the annual rainfall totals and corresponding water deliveries are ranked from least rainfall to most recorded rainfall. The rainfall data has been gathered at the Lake Casitas Recreation Area and assumed to be a representative influence for the majority of the District's customers. Table B3 lists the data for the 1976 to 2002 and the 1984 to 2002 periods. The later period being more representative of current water use and growth trends.

The rainfall data is further separated and compared for each 10-inch increment of rainfall. The average of rainfall and deliveries for each 10-inch increment and each period is calculated in Table B3 and illustrated in Figures B7 and B8. A polynomial trend line has developed from the graphical representation of the average deliveries for each period. Table B4 uses the trend line from the 1984 to 2002 period and sequential 10-inch rainfall totals to determine the delivery from each rainfall total. The polynomial trend line equation from the 1984 to 2002 period was selected for the linear trend calculations.

In the study period, there are several consecutive dry years. The rainfall and delivery data in Table B1 and Figure B1, for the period of 1984 to 1990 demonstrates that when the system experiences multiple and consecutive dry rainfall years (less than 20 inches), the delivery for the following year tends to escalate with each consecutive dry year. Table B5 presents the rainfall and deliveries for the 1984 to 1990 period. Figures B9 and B10 illustrate the delivery data and linear trend line for the escalation of multiple consecutive dry years. In Figure B10, a shorter period of time is evaluated, removing the heavy rainfall of 1986 from influence on the trend line. Each year in Table B10 was assigned a consecutive dry year multiplier number, and from the trend lines, the deliveries for each year are calculated and compared to the actual delivery data. The slope of line (1,377) from 1986 to 1990 escalating trend line equation, Figure B10, was selected as a representative equation for application to multiple consecutive dry years found in the study period (1945-1965).

### **Modeling Deliveries for the Critical Dry Period**

The objective of the close review of rainfall-delivery response and the development of trend line equations and escalation factors is to be able to predict deliveries for a period of time during which no delivery record exists. In Table B6, the annual rainfall at the Lake Casitas Recreation area is listed for each year of the study period. The polynomial trend equation

$$y=1.7488x^2 - 269.1x + 24300$$

is applied to each annual rainfall and the water delivery is calculated and recorded for each year. For each year during which the annual rainfall is less than 20 inches, a consecutive year multiplier and the escalation slope are applied to the linear trend equation in

$$y=1.7488x^2 - 269.1x + 24300 + (\text{Dry Year Multiplier})(1.377).$$

The water deliveries from each equation are shown in Table B6. Figure B11 illustrates the predicted water deliveries for each equation and the annual rainfall for each year of the study period.

The derivation of an equation to predict a finite number has risk in the confidence that the number would be comparable to actual results. In Table B7, the actual water deliveries for the period 1984 to 1990 is compared to the delivery numbers that are generated from the polynomial and escalating trend equations. As expected, the actual deliveries fall between the two equation lines during the period, as shown in Figure B12. The development of trend deliveries for the period of 1966 through 2003, Table B8 and Figure B13, illustrates a higher confidence of following actual use in the last ten years of historical data.

The deliveries that have been derived in Table B6 are accounted against the available Lake Casitas supply to determine the impacts on Lake Casitas.

### **Modeling Deliveries the Recovery Period**

The supply and demand study for the critical dry period takes the water surface elevation of Lake Casitas to minimum pool. The modeling needs to demonstrate the ability of the hydrology to recover Lake Casitas storage to full capacity, during the wet trend period and under each of the two diversion operating criteria. There is an importance to restore the full capacity of Lake Casitas prior to the onset of another critical dry period. The actual occurrence following 1965, the end of the critical dry period, Lake Casitas reached full storage capacity in 1978. The modeling of the recovery period should include the hydrology experienced during the 1966 to 1978 period and compare the capacity response of Lake Casitas for each of the diversion operational criteria.

For the recovery period, the deliveries were determined from the same trend equations that were used in the critical dry period study. During this recovery period, 1977 was the only year receiving the additional escalating factor. Table B9 provides the prediction of water deliveries for the 1966 to 1978 period, and the actual deliveries made by the District. It is noted that the actual deliveries are much less than the predicted value, primarily because the actual water uses from Lake Casitas were in development and had not matured to the current level of use. The predicted deliveries are based on the current level of water use. Figure B14 illustrates the predicted deliveries for each year of the recovery period. The deliveries that are derived in Table B9 are accounted against the available supply in Lake Casitas for the recovery period.



**Table B1 - Casitas Water Deliveries to the System and Rainfall at Lake Casitas Recreation Area**

Water Year	Rainfall at LCRA (in.)	Deliveries to Main Conveyance System @ Casitas Dam (AF)		Mira Monte Well (AF)	Total Deliveries (AF)
		Casitas Dam (AF)	Mira Monte Well (AF)		
1975	24.05	16,156			16,156
1976	17.23	18,725			18,725
1977	11.98	16,779			16,779
1978	49.66	15,080			15,080
1979	25.64	12,499			12,499
1980	35.15	14,651			14,651
1981	16.99	20,012			20,012
1982	20.34	16,702			16,702
1983	48.22	16,026	0		16,026
1984	16.63	21,832	0		21,832
1985	15.93	20,274	0		20,274
1986	32.2	16,606	0		16,606
1987	9.83	22,339	0		22,339
1988	18.4	21,032	0		21,032
1989	11.85	24,416	0		24,416
1990	8.86	22,454	0		22,454
1991	23.59	17,723	0		17,723
1992	28.53	13,189	129		13,318
1993	43.31	11,694	46		11,740
1994	14.69	15,555	85		15,640
1995	49.04	12,107	78		12,185
1996	16.91	16,135	221		16,356
1997	25.27	18,996	305		19,301
1998	58.78	14,372	0		14,372
1999	10.67	17,942	0		17,942
2000	21.94	23,060	169		23,229
2001	27.86	18,743	130		18,873
2002	8.77	21,066	0		21,066
2003	23.69	16,278	198		16,476

**Figure B1 - Casitas Water Deliveries to the System and Rainfall (1975 to 2003)**

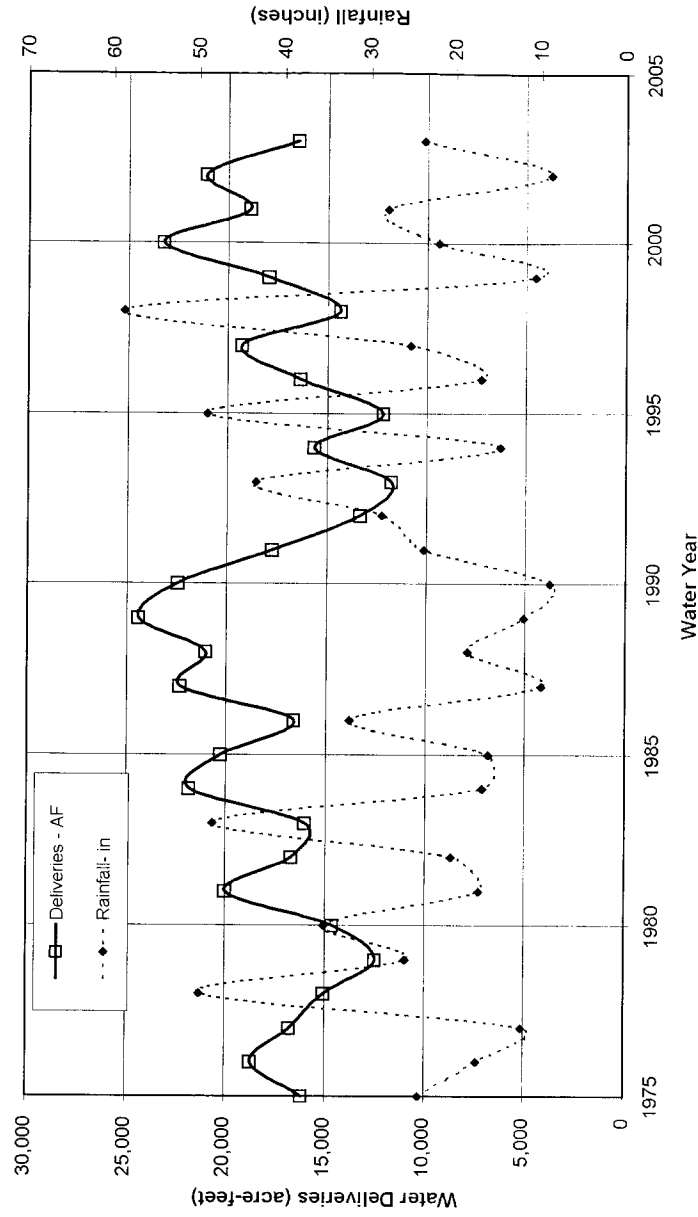


Figure B2 - Historical Deliveries, Agricultural Water Sales and Rainfall  
(1976 to 2002 WY)

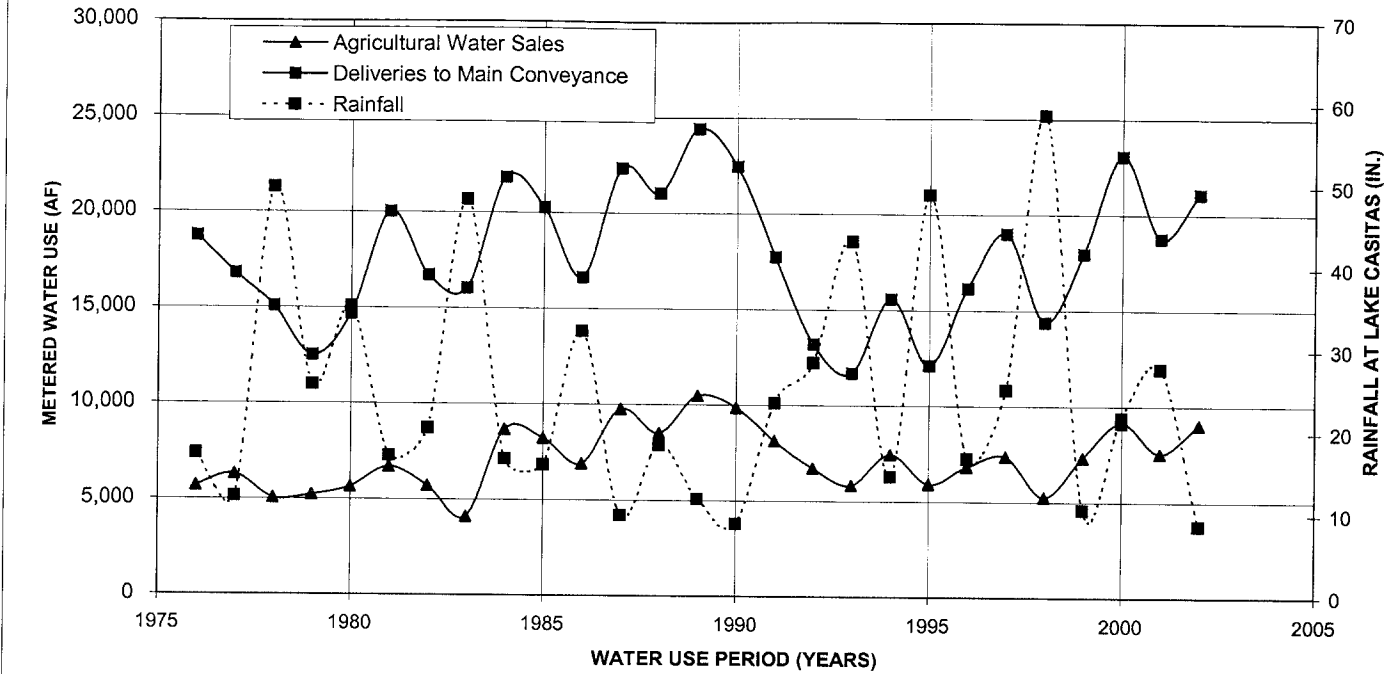
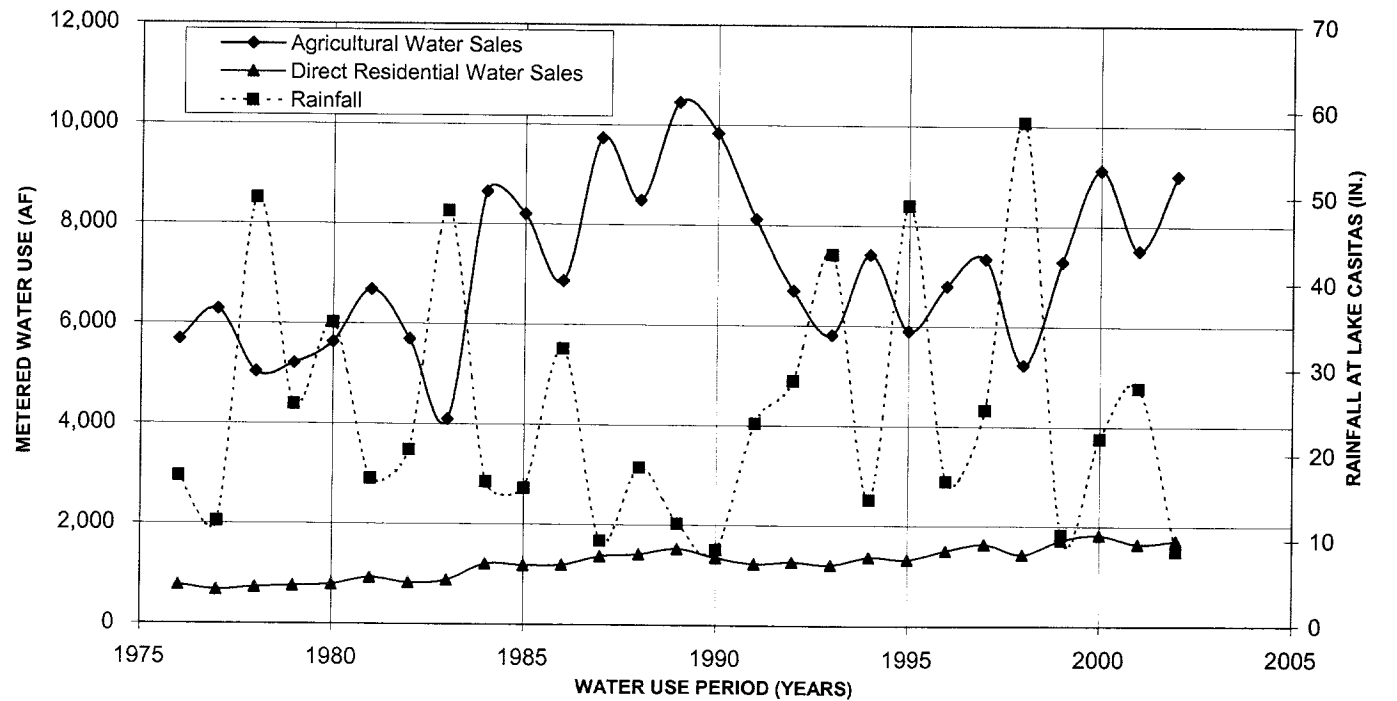
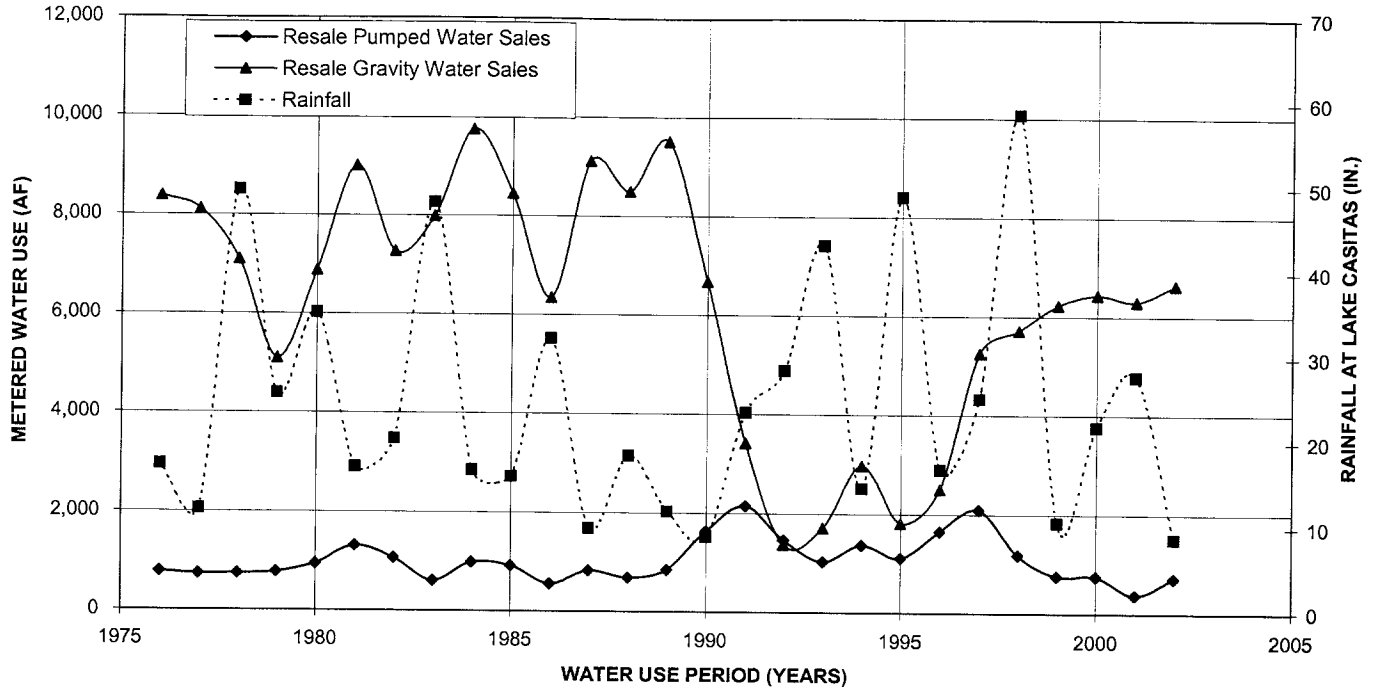


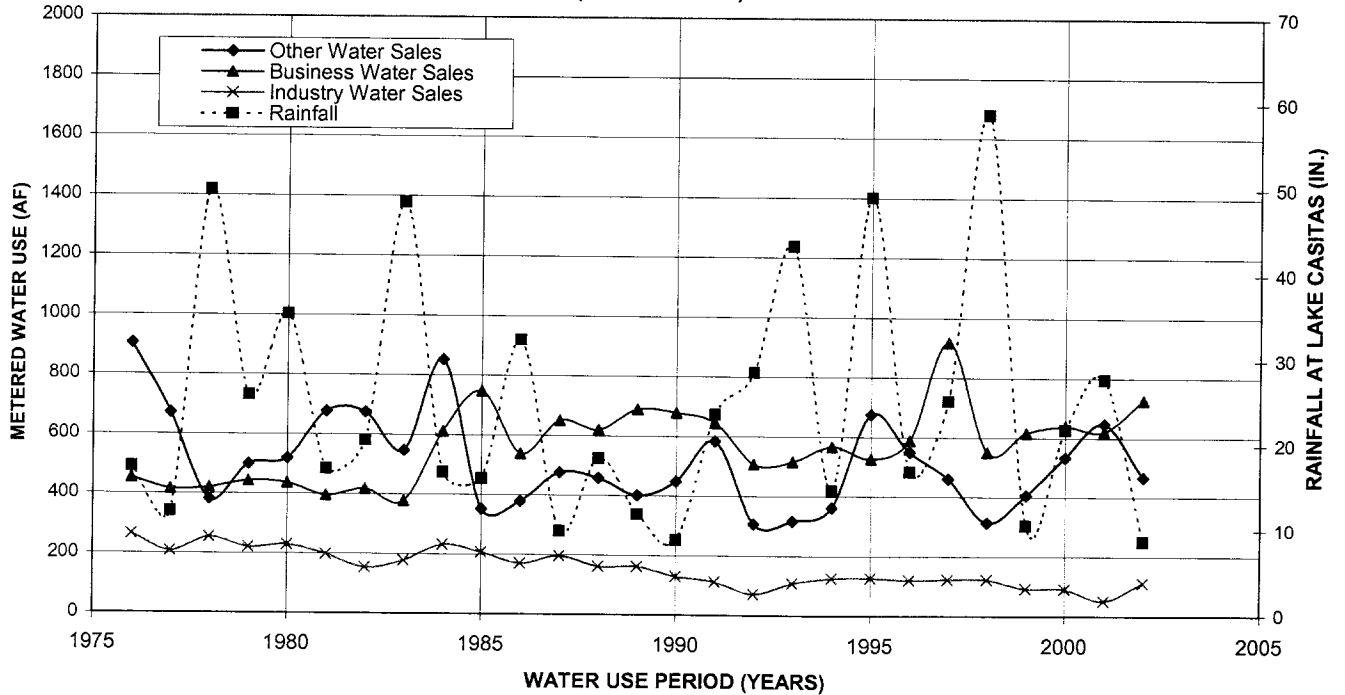
Figure B3 - Historical Agricultural and Residential Water Sales and Rainfall  
(WY1976 to 2002)



**Figure B4 - Historical Gravity and Pumped Resale Water Sales and Rainfall  
(WY 1976 to 2002)**



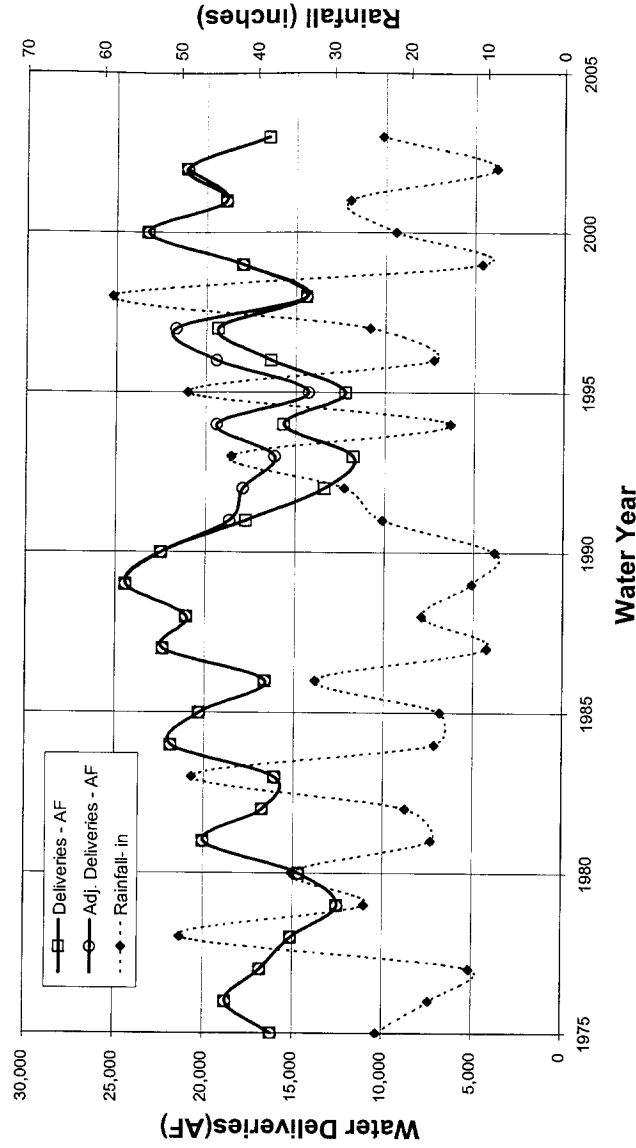
**Figure B5 - Historical Business, Industry and Other Water Sales and Rainfall  
(WY 1976 to 2002)**



**Table B2 - Water Deliveries Adjustment - City of Ventura Agreement for Minimum 6,000 AF Annual Purchase**

Water Year	Rainfall at LCRA (in.)	Deliveries to Main Conveyance (AF)	Water Sales to City of Ventura (AF)	Adjusted Deliveries for the City of Ventura (AF)	*Adjusted WY Deliveries to Main Conveyance (AF)
1975	24.05	16,156			16,156
1976	17.23	18,725			18,725
1977	11.98	16,779			16,779
1978	49.66	15,080			15,080
1979	25.64	12,499			12,499
1980	35.15	14,651			14,651
1981	16.99	20,012			20,012
1982	20.34	16,702			16,702
1983	48.22	16,026			16,026
1984	16.63	21,832			21,832
1985	15.93	20,274	8,591		20,274
1986	32.2	16,606	7,737		16,606
1987	9.83	22,339	7,822		22,339
1988	18.4	21,032	8,629		21,032
1989	11.85	24,416	8,875		24,416
1990	8.86	22,454	8,734		22,454
1991	23.59	17,723	5,073	927	18,650
1992	28.53	13,318	1,408	4,592	17,910
1993	43.31	11,740	1,605	4,395	16,135
1994	14.69	15,640	2,263	3,737	19,377
1995	49.04	12,185	3,943	2,057	14,242
1996	16.91	16,356	2,953	3,047	19,403
1997	25.27	19,301	3,622	2,378	21,679
1998	58.78	14,372	7,189		14,372
1999	10.67	17,942	6,030		17,942
2000	21.94	23,229			23,229
2001	27.86	18,873			18,873
2002	8.77	21,066	6,042		21,066
2003	23.69	16,476			16,476

**Figure B6 - Adjustment to Annual Water Deliveries - City of Ventura Agreement**



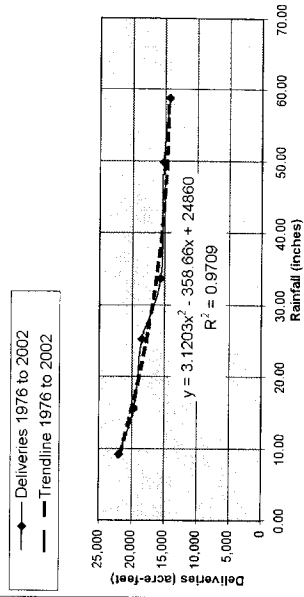
\*Adjusted deliveries includes the difference between the City of Ventura's actual purchase of Lake Casitas water and the requirement for the annual purchase by the City of 6,000 AF from Casitas. City purchases during the 1990's were reduced due to water treatment deficiencies and other. In those years where 6,000AF were not purchased, the additional purchase to get 6,000 AF was added to the actual deliveries and stated in the "Adjusted Deliveries to Main Conveyance" column.

**Table B3 - Casitas Municipal Water District Deliveries - Water Year Ranking  
Rainfall Totals for Periods 1976 to 2002 and 1984 to 2002**

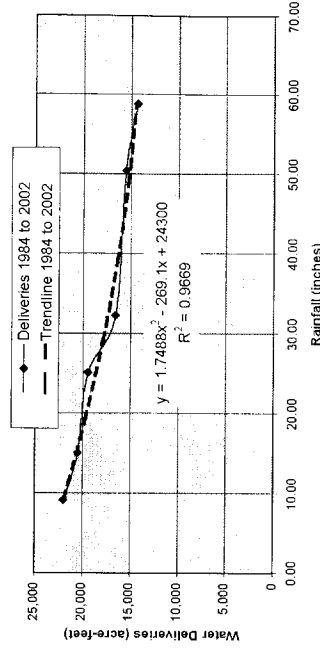
Rainfall Increments	Water Year	Period 1976 to 2002		Period 1984 to 2002	
		Rainfall at LCRA (inches)	Deliveries to Main Conveyance System (AF)	Rainfall at LCRA (in.)	Deliveries to Main Conveyance System (AF)
0-10 inches Rainfall	2002	8.77	21,066	8.77	21,066
	1990	8.86	22,454	8.86	22,454
	1987	9.83	22,339	9.83	22,339
10-20 inches Rainfall	1999	10.67	17,942	10.67	17,942
	1989	11.85	24,416	11.85	24,416
	1977	11.98	16,779	14.69	18,587
20-30 inches Rainfall	1994	14.69	19,377	15.93	20,274
	1985	15.93	20,274	16.63	21,832
	1984	16.63	21,832	16.91	19,633
30-40 inches Rainfall	1996	16.91	19,403	18.40	21,014
	1981	16.99	20,012	21.94	23,060
	1976	17.23	18,725	23.59	18,650
40-50 inches Rainfall	1988	18.40	21,032	23.69	16,476
	1982	20.34	16,702	25.27	21,679
	2000	21.94	23,228	27.86	18,743
> 50 inches Rainfall	1991	23.59	18,650	28.53	17,910
	1997	25.27	21,679	32.20	16,606
	1979	25.64	12,489	43.31	15,986
Average for 0.10 inches Rainfall	1986	32.20	16,606	49.04	16,294
Average for 10-20 inches Rainfall	1980	35.15	14,651	58.78	14,372
Average for 20-30 inches Rainfall	1993	43.31	16,135	9.15	21,953
Average for 30-40 inches Rainfall	1983	48.22	16,026	15.01	20,528
Average for 40-50 inches Rainfall	1995	49.04	14,242	25.15	19,420
Average for greater than 50 inches Rainfall	1978	49.66	15,080	32.20	16,606
	1998	58.78	14,372	50.38	15,551
				58.78	14,372

Note: the adjustment for the City of Ventura Agreement is included in the deliveries for the period 1990-1997.

**Figure B7 - Average Water Deliveries based on 10-inch Rainfall Increments  
1976 to 2002 period**



**Figure B8 - Average Water Deliveries based on 10-Inch Rainfall  
Increments 1984 to 2002 Period**



**Table B4 - Trendline Comparison**

Rainfall (in.)	Deliveries 1976-2002 (AF)	Deliveries 1984-2002 (AF)
10	21,585	21,784
20	18,935	19,618
30	16,908	17,801
40	15,506	16,334

Water Year	Rainfall at LCRA (Inches)	Deliveries to Main Conveyence System Water Year (AF)	Consec. Dry Year	Fig. 9 Trendline Applied to Rainfall (AF)	Fig. 10 Trendline Applied to Rainfall (AF)
1984	16.63	21,832	0	20,309	20,309
1985	15.93	20,274	1	20,978	21,834
1986	32.20	16,606	0	17,448	17,448
1987	9.83	22,339	0	21,824	21,824
1988	18.40	21,032	1	20,462	21,318
1989	11.85	24,416	2	22,399	24,111
1990	8.86	22,454	3	23,616	26,184

Figure B9 - Escalating Trend for 1984 to 1990 Dry Period

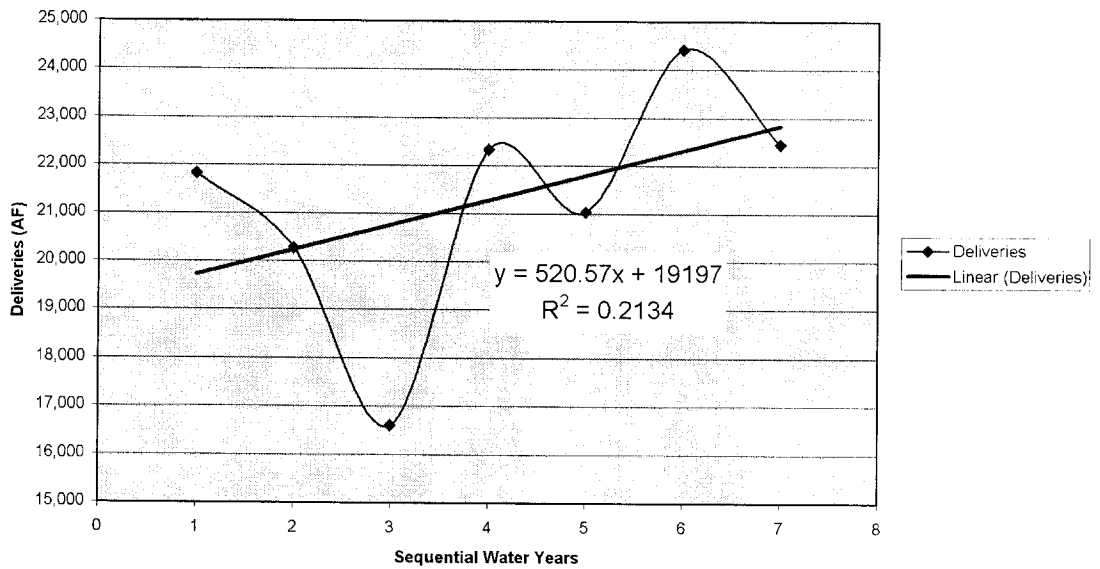
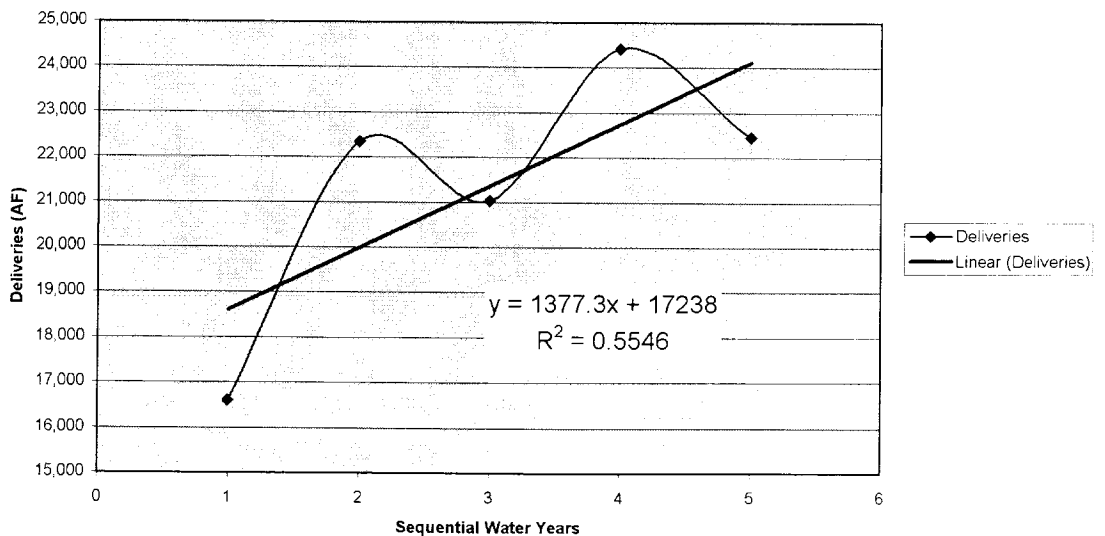
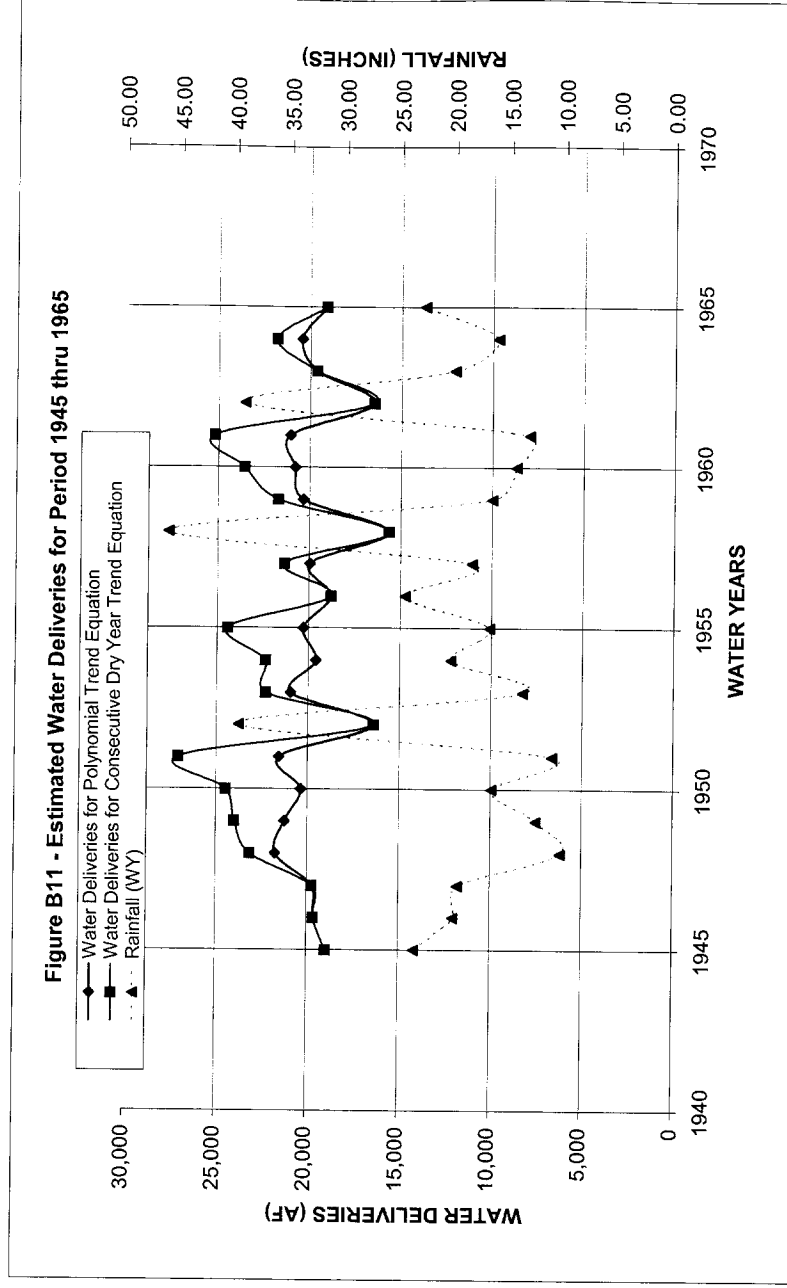


Figure B10 - Escalating Trend for 1986 to 1990 Dry Period



**Table B6 - Estimated Water Delivery Based on Polynomial Trend and Escalating Trend Equations for Period 1945 thru 1965**

Year	Rainfall at LCRA (inches)	Consec. Dry Year Multiplier	Water Deliveries	
			Polynomial Trend Eqn. (AF)	Consec. Dry Year Trend Eqn. (AF)
1945	23.53		18,936	18,936
1946	20.01		19,616	19,616
1947	19.60	0	19,697	19,697
1948	10.25	1	21,725	23,102
1949	12.49	2	21,212	23,966
1950	16.54	3	20,328	24,459
1951	11.01	4	21,549	27,057
1952	39.63		16,382	16,382
1953	13.76	1	20,928	22,305
1954	20.30	2	19,558	22,312
1955	16.81	3	20,271	24,402
1956	24.53		18,751	18,751
1957	18.44	1	19,932	21,309
1958	46.11		15,610	15,610
1959	16.62	1	20,311	21,688
1960	14.45	2	20,777	23,531
1961	13.24	3	21,044	25,175
1962	39.21		16,437	16,437
1963	20.07		19,604	19,604
1964	16.13	1	20,414	21,791
1965	22.83		19,068	19,068
Total			412,150	445,198
Average	20.74		19,626	21,200



**Notes:**  
**Polynomial Trend Equation Delivery** - polynomial equation based on rainfall and historical water use data for the period of 1984 through 2002, with the adjustment of Resale Gravity during the 1991 through 1997 period remaining at a constant 6,000 AF demand throughout period of study. City would use alternate well supplies to supplement loss of Ventura River supply during the study period.

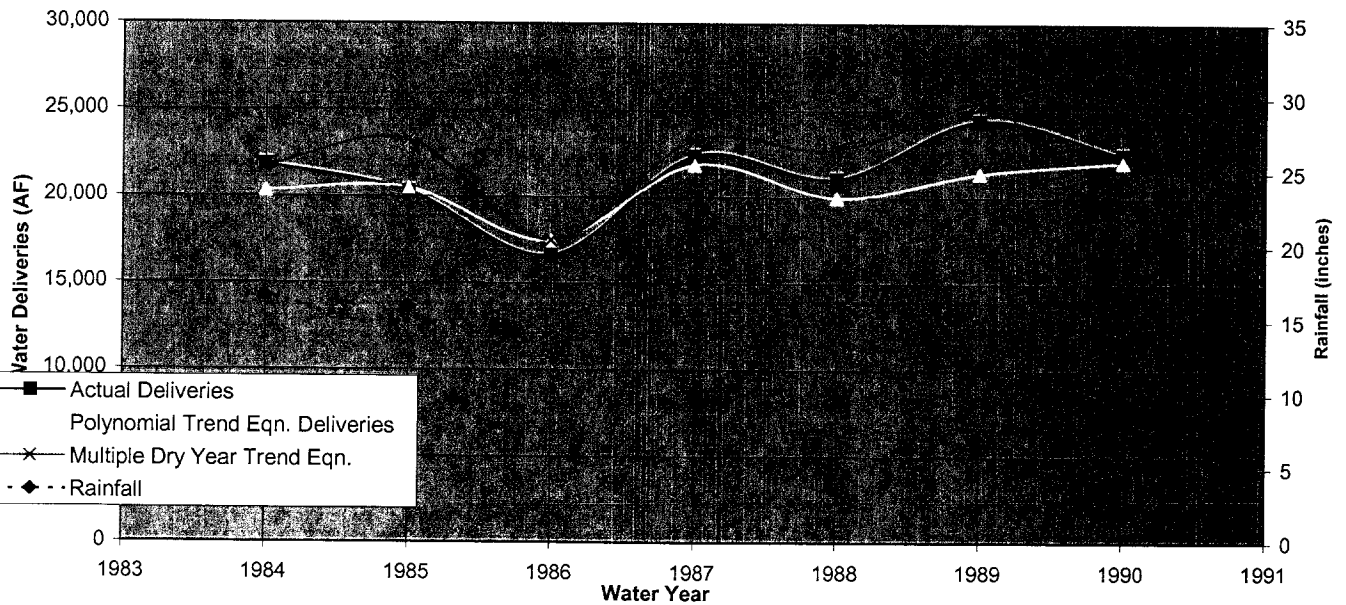
**Consecutive Dry Year Trend Equation Delivery** - use of polynomial trend equation to determine annual water demand, upon first year of less than 20 inches of rainfall add 1377 AF demand to the trend water demand. For the second consecutive year under 20 inches of rainfall, add 2 times 1377 AF to polynomial trend, for the third consecutive year, add three times 1377 AF to polynomial trend. Similar escalation applied to each of the following consecutive years of less than 20 inches of rainfall. Use of consecutive dry year multiplier to escalate delivery for each water year.

Deliveries Verification - apply the polynomial trend equation and the multiple dry year trend equation to the historical rainfall data for the period WY 1984 through WY 1990. Compare the application of trend equations to historical water delivery data for the same period.

The multiple dry year trend equation data followed the actual delivery data, except for the 1990 water year. In 1990, extremely dry year, there may have been an additional reduction in deliveries to the City of Ventura (Resale Gravity) because of alternative supply use. With only 8.86 inches of rainfall in the fourth year of a drought, deliveries would have been expected to rise above the previous year's deliveries.

WY	Rainfall (in.)	Actual (AF)	Polynomial Trend Eqn. (AF)	Dry Yr. Multiplier	Multiple Dry Year Trend Equation (AF)
1984	16.63	21,823	20,309	1	21,686
1985	15.93	20,274	20,457	2	23,211
1986	32.2	16,606	17,448	0	17,448
1987	9.83	22,339	21,824	1	23,201
1988	18.4	21,033	19,941	2	22,695
1989	11.85	24,416	21,357	3	25,488
1990	8.86	22,454	22,053	4	27,561

Figure B12 - Deliveries Verification - Comparison of Trend Equations and Actual Deliveries

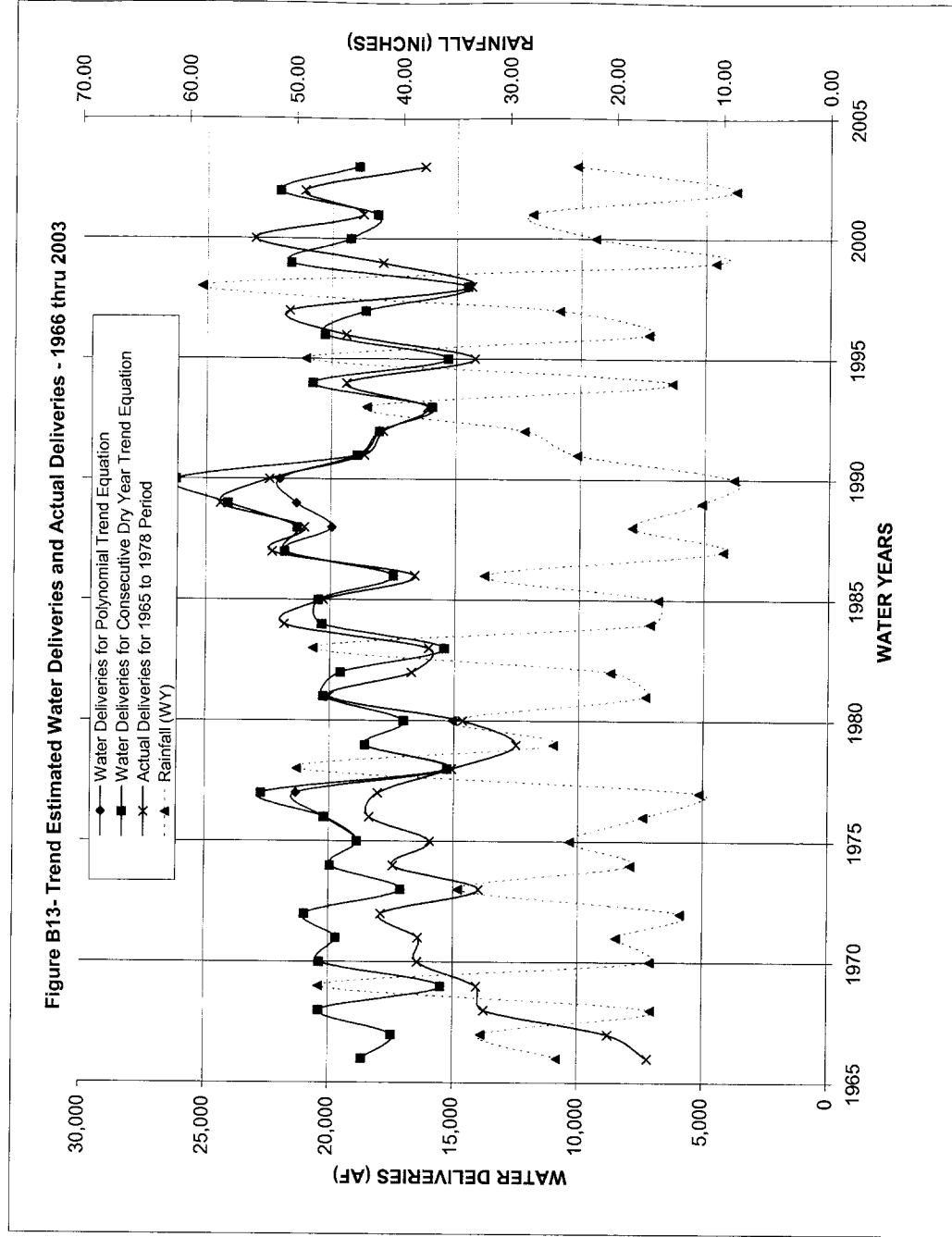




**Table B8 - Trend and Actual Water Delivery Comparison -1966 through 2003**

Year	Rainfall at LCRA (inches)	Consec. Dry Year Multiplier	Water Deliveries	
			Polynomial Trend Eqn. (AF)	Actual (AF)
1966	25.23		18,624	7,162
1967	32.30		17,433	8,759
1968	16.44		20,349	13,729
1969	47.55		15,458	14,040
1970	16.52		20,332	16,417
1971	19.71		19,675	16,392
1972	13.72		20,937	17,878
1973	34.56		17,089	13,963
1974	18.43		19,934	17,400
1975	24.05		18,840	15,937
1976	17.23	0	20,183	18,371
1977	11.98	1	21,327	22,704
1978	49.66		15,249	15,080
1979	25.64		18,550	12,499
1980	35.15		17,002	14,651
1981	16.99		20,233	20,012
1982	20.34		19,550	16,702
1983	48.22		15,390	16,026
1984	16.63		20,309	21,832
1985	15.93		20,457	20,274
1986	32.2		17,448	16,606
1987	9.83	0	21,824	22,339
1988	18.4	1	19,941	21,318
1989	11.85	2	21,357	24,111
1990	8.86	3	22,053	26,184
1991	23.59		18,925	18,650
1992	28.53		18,046	17,910
1993	43.31		15,926	16,135
1994	14.69		20,724	19,377
1995	49.04		15,309	14,242
1996	16.91		20,250	19,403
1997	25.27		18,617	21,679
1998	58.78		14,525	14,372
1999	10.67		21,628	17,942
2000	21.94		19,238	23,060
2001	27.86		18,160	18,743
2002	8.77		22,074	21,066
2003	23.69		18,906	16,278
Total			376,920	315,159
Average			18,879	14,859

Note that the period 1978 thru 1980 was a rare multiple wet year occurrence that is not reflected in the trend equations. Therefore, the Estimated water deliveries are higher than Actual deliveries.

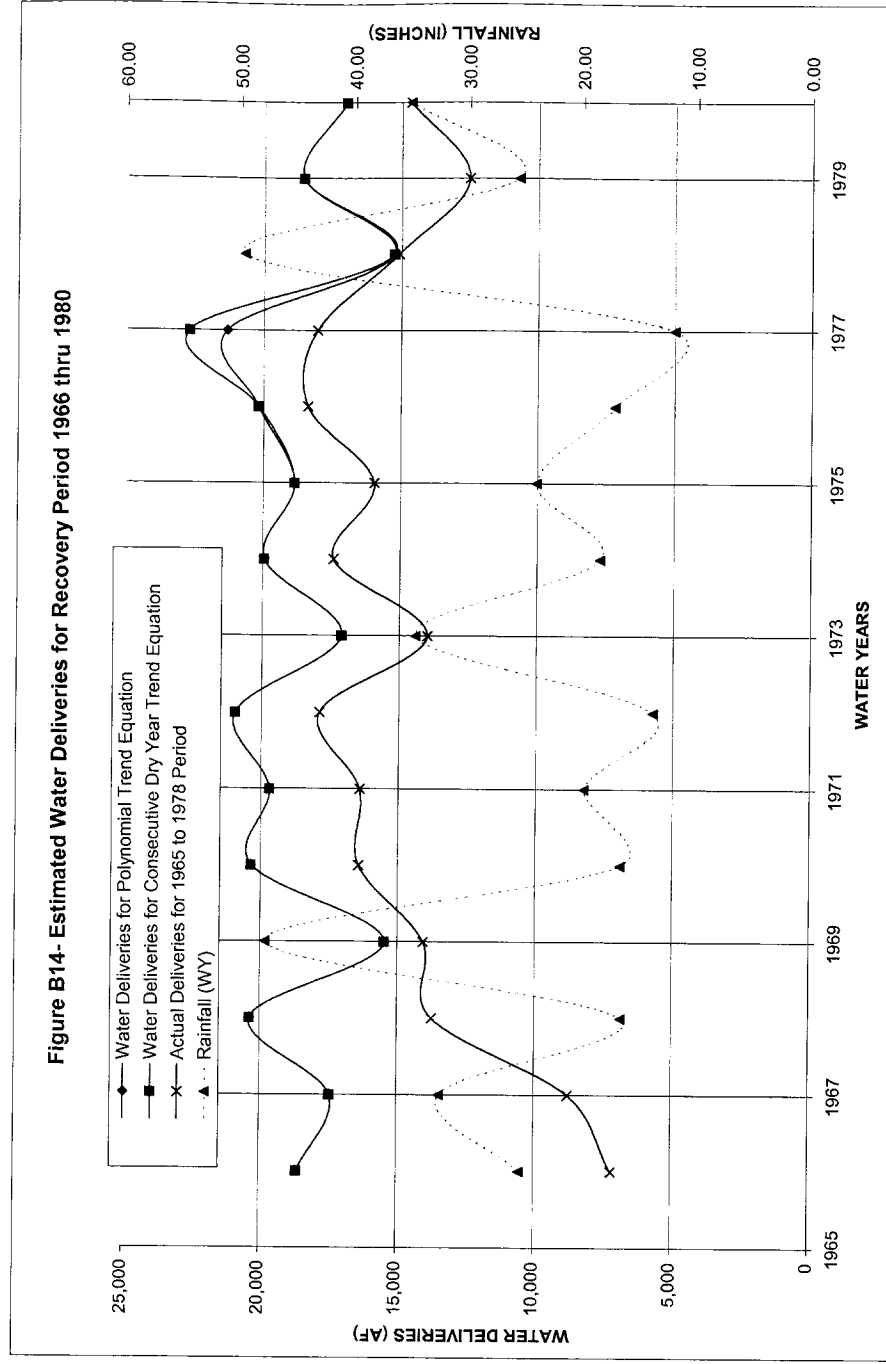


**Figure B13- Trend Estimated Water Deliveries and Actual Deliveries - 1966 thru 2003**

**Table B9 - Recovery Study Period - 1966 through 1980**

Year	Rainfall at LCRA (Inches)	Consec. Dry Year Multiplier	Water Deliveries		
			Polynomial Trend Eqn. (AF)	Consec. Dry Year Trend Eqn (AF)	Actual (AF)
1966	25.23		18,624	18,624	7,162
1967	32.30		17,433	17,433	8,759
1968	16.44		20,349	20,349	13,729
1969	47.55		15,458	15,458	14,040
1970	16.52		20,332	20,332	16,417
1971	19.71		19,675	19,675	16,392
1972	13.72		20,937	20,937	17,878
1973	34.56		17,089	17,089	13,963
1974	18.43		19,934	19,934	17,400
1975	24.05		18,840	18,840	15,937
1976	17.23	0	20,183	20,183	18,371
1977	11.98	1	21,327	22,704	18,035
1978	49.66	1	15,249	15,249	15,080
1979	25.64		18,550	18,550	12,499
1980	35.15		17,002	17,002	14,651
Total for 1966-80			280,981	282,358	220,313
Avg. for 1966-80			18,732	18,824	14,688

**Figure B14- Estimated Water Deliveries for Recovery Period 1966 thru 1980**



Note that the period 1978 thru 1980 was a rare multiple wet year occurrence that is not reflected in the trend equations. Therefore, the Estimated water deliveries are higher than Actual deliveries.

## **Appendix C - Casitas MWD Water Allocation Assignments**

In the aftermath of the District's water shortage emergency of 1989, the District developed a method for implementing a reduction of water use during times of drought. The method considered priorities for water service, equality among similar types of customers, water rate incentives to keep water use from overwhelming available water supplies, and the manner in which the District would meet the additional demands for new water service. The concepts contained in the methods emerged as the District's Water Allocation Program.

The allocation program is a price-driven water conservation measure that can provide a base water use at a reasonable cost rate and escalates water cost rates once the base use (allocation) is exceeded by the customer. The application of the allocation program provides the customer the financial decision to pay more for their water use or conserve water. Without the application of the price-driven structure, the allocation has no bearing on limiting the actual water use that is applied by individual customers. It should be noted that, to date, the District has not implemented the price-driven allocation structure.

The District has assigned water allocations to various users types and individual customers. The initial water allocations were based on the water use from 1989, less twenty percent of that 1989 annual metered use. The District assigned individual allocation to each customer in the residential, business, industrial, resale, and interdepartmental classifications of service. The agricultural classification was assigned an overall allocation based on eighty percent of the total agricultural metered use of 1989. A summary of the allocation assignment is presented in the Standard Current Allocation Status, dated November 12, 1991.

In 1992, the District made available 300 acre-feet of water to be allocated in a limited and controlled manner. The additional water came from the reactivation of the Mira Monte Well and the installation of blending pipeline. The well had historically provided approximately 300 acre-feet to the Mira Monte Mutual Water Company, but use had been discontinued in the early 1980's because of elevated nitrate content in the well water. From 1992 to April 23, 2003, the District issued limited water allocations to new and existing customers.

In 2003, the District made 7 acre-feet of allocations available for assignment to new customers. The allocations came from the removal of the last fourteen homes from the Teague Memorial Watershed. Prior to April 2004, the District had assigned the 7 acre-feet.

In this review of the allocation status, it was found that tracking of the allocations is made difficult by the changes that occurred in tracking systems and personnel responsibilities. In comparing the initial 1991 allocation to the District's accounting records for total allocation as of May 3, 2004, there are several discrepancies in the data. This is an area that needs further attention by staff prior to the application of the allocation program stages. The comparison for the individual user types is presented in Table C1. There are

three distinct user types in Table C1 that have extreme changes in allocations from 1991 to present. Also presented in Table C1 is the fiscal year 2002-2003 water use data for each user type. This data provides an indication of the level of use and a comparison to the allocation assignment for each user type.

The first user type is the Agriculture-Domestic (AD). AD accounts are the agricultural accounts that also have a residence on the same property. These customers are billed at the residential rate for the base amount of water use and billed at the agricultural rate for all water use above the base usage. In 1991, this user type was considered a part of the agricultural user type, and included in the 8,880 acre-foot allocation for the agricultural user type. The District's Administration records does separate the AD from the Agricultural (AG) user type, but the listed totals from the combination of the two types does not equal the initial 1991 allocation assignment for AG. The District's Administration records should reflect the 8,880 acre-feet of original allocation assignment and any additional allocation assignments that occurred after 1992.

The second noted change is in the Interdepartmental (DI) user type category. This particular category is an accounting of the District's metered water use at the Lake Casitas Recreation Area, flushing points, main office, and other District facilities. The use number for 1989 may have also included drought water transfers to the City of Santa Barbara. A recent review of the accounting of the calendar year 1989 metered use for Interdepartmental is 190.35 acre-feet, not the 354 acre-feet expressed in the 1991 "Standard Current Allocation Status". The allocation assignment appears to need further consideration, given the discrepancy between the 1991 allocation assignment and current District records.

The third change is in the Residential allocation assignment, where allocations have increased by 472 acre-feet since 1991. This change appears to be high and a verification of the change is recommended. The change of 472 acre-feet could mean that as many as 1004 minimum allocation changes would have to been made over that last 12 years. This number appears to be high and should be reviewed further by staff. One specific change that did occurred in the residential allocation block was the change of the Taormina Community's single 0.47 allocation into 73 individual 0.47 allocations. This change occurred when the District took over the Taormina service area and the service moved from a single master water meter, with one 0.47 acre-foot allocation, to 73 single water meters at each residence, each with an individual 0.47 allocation.

In summary, it appears that there is a need for the District to perform a detailed accounting of the allocation assignments.

STANDARD  
CURRENT ALLOCATION  
STATUS

November 12, 1991

<u>Customer Type</u>	<u>1989</u>	<u>October 1 Allocation</u>	<u>Current Allocation</u>
Agriculture	11,096	10,081 (-9)	10,081/8,880*
Residential	1,548	1,906 (+23)**	1,238
Business	718	575 (-20)	575
Industrial	160	130 (-20)	130
Interdepartmental	354	282 (-20)	282
Others	213	170 (-20)	170
<del>Residential</del> Pumped	953	763 (-20)	763
Gravity <del>Resale</del>	10,066	<u>6,610</u> (-35)	<u>7,090</u>
Total	25,110	20,518	20,330/19,129
Losses	1,158	1,315	1,315
Total Releases	26,268	21,833	21,645/20,444
Safe Yield	21,920	21,920	21,920/21,920
Remaining	<4,348>	87	275/ 1,476

Issues:

- \* Small trees on Agricultural properties
- \*\* New Residential growth due to pre-April 11,1990 will serves

All values are in Acre Feet

**Table C1 - District Allocation Assignments**

User Code	ALLOCATION ASSIGNMENT		Allocation Change 1991-2004 (AF)	WATER USE	
	1991 Allocation Assignment (AF)	District's Records 5/3/2004 Total Allocation (AF)		CY 1989 (AF)	FY 2002-03 (AF)
AD	0	17	17	4,597	
AG	8880	604	-8,276	11,096	3,378
C	575	605	30	718	681
DI	282	46	-236	354	173
F	0	0	0	0	0
HY	0	0	0	0	0
I	130	146	16	160	58
OT	170	192	22	213	233
R	1238	1,710	472	1,548	1,648
RS	7853	7,717	-136	11,019	7,084
TE	0	0	0	0	18
Sub-Total----->	19,128	11,037	-8,091	25,108	17,870
Mira Monte Well Allocation	300				
<b>Total Allocations</b>	<b>19,428</b>				

Note the "Water Use" is the summation of all individual metered water uses for each user types served by the District.

# **CASITAS** Municipal Water District

## INTER-DEPARTMENTAL MEMORANDUM

DATE: June 6, 1994  
TO: General Manager  
FROM: Conservation Supervisor  
SUBJECT: Allocation Totals - Mira Monte Well

Attached to this memo is a list of customers who have purchased allocations from the water made available by the Mira Monte well project. The first list sorts and totals the allocations by customer classification. The second list sorts and totals the allocations by agency.

ALLOCATION TOTALS - MIRA MONTE WELL

<u>Class (Type)</u>	<u>Last Name</u>	<u>A.F. Allocation</u>
Agriculture	Hudson Roll	2.50 10.0
Total:		12.50
Business	Cuccia Farmont Corp. Happy Valley Foundation Happy Valley School Ojal Valley School	1.30 2.98 0.99 4.00 6.50
Total:		15.77
Residential	Droney Erickson (John) Farmont Corp.  Fruchey Gorman Habitat for humanity Hart Humphrey Klein Kreitzers Mangum Marietta Miles Necochea Oquist Patterson Peets Prain Reyes Richardson (Gilbert) Robinson Ross (Hamm-J) Sanders Sherman Tenpenny Vork Walbridge Warren West	0.47 0.47 1.98 1.98 1.98 1.98 1.98 0.99 1.98 0.47 0.47 0.47 0.99 0.99 0.99 0.99 0.99 0.47 0.99 0.99 0.47 0.47 0.47 0.99 0.47 0.47 0.47 0.47 0.47 0.47 0.47 0.47 0.47 0.47 0.99 0.47 0.47
Total:		32.76
===== Total:	===== =====	===== 61.03



Agency	Last Name	Class (Type)	A.F. Allocation	
Asitas	Cuccia	Business	1.30	
	Ericksen (Jonn)	Residential	0.47	
	Farmont Corp.	Residential	1.98	
		Residential	1.98	
		Business	2.98	
		Residential	1.98	
		Residential	1.98	
		Residential	1.98	
		Residential	1.98	
		Residential	1.98	
		Residential	1.98	
		Residential	0.99	
		Residential	1.98	
		Habitat for humanity	Residential	0.47
		Happy Valley Foundation	Business	0.99
		Happy Valley School	Business	4.00
		Hart	Residential	0.47
		Humphrey	Residential	0.47
		Klein	Residential	0.99
		Marietta	Residential	0.99
		Miles	Residential	0.47
		Necochea	Residential	0.99
		Ojai Valley School	Business	6.50
		Patterson	Residential	0.47
		Peets	Residential	0.47
		Reyes	Residential	0.99
		Richardson (Gilbert)	Residential	0.47
	Robinson	Residential	0.47	
	Roll	Agriculture	10.0	
	Ross (Hamm-J)	Residential	2.00	
	Sanders	Residential	0.47	
	Sherman	Residential	0.47	
	Vork	Residential	0.47	
	Warren	Residential	0.47	
Total:			52.69	
Meiners Oaks	Kreiters	Residential	0.99	
	Mangum	Residential	0.99	
	Oquist	Residential	0.99	
	Prain	Residential	0.47	
	Tenpenny	Residential	0.47	
	Walbridge	Residential	0.99	
Total:			4.90	
Rincon Road and Water	Hudson	Agriculture	2.50	
Total:			2.50	
Senior Canyon	West	Residential	0.47	
Total:			0.47	
Taormina	Droney	Residential	0.47	
Total:			0.47	
Total:			61.03	

Mira Monte Well Allocations  
Totals as of June 1994

Last Name	Class (Type)	APN	A.F. Allocation
Cuccia	Business	034-0-140-165, 295, 405	1.30
Droney	Residential	017-0-342-045	0.47
Erickson (John)	Residential	060-0-420-295	0.47
Farmont Corp.	Business	011-0-052-170	2.98
	Residential	011-0-052-180	1.98
	Residential	011-0-052-220	1.98
	Residential	011-0-260-010	1.98
	Residential	011-0-260-020	1.98
	Residential	011-0-260-030	1.98
Fruchey	Residential	034-0-010-620	0.99
Gorman	Residential	011-0-220-285	1.98
Habitat for humanity	Residential	061-0-034-245	0.47
Happy Valley Foundation	Business	030-0-130-045, 105	0.99
Happy Valley School	Business	030-130-045, 105	4.00
Hart	Residential	060-0-072-325	0.47
Hudson	Agriculture	008-0-180-505	2.50
Humphrey	Residential	061-0-250-095	0.47
Klein	Residential	028-0-112-10, 13	0.99
Kreitzers	Residential	010-0-050-130	0.99
Langum	Residential	018-0-150-195	0.99
Marietta	Residential	061-0-150-030, 270	0.99
Miles	Residential	061-0-013-120	0.47
Necochea	Residential	061-0-055-255	0.99
Ojai Valley School	Business	030-0-020-075	6.50
Oquist	Residential	?	0.99
Patterson	Residential	061-0-012-225	0.47
Peets	Residential	061-0-042-085	0.47
Prain	Residential	017-0-121-270	0.47
Reyes	Residential	030-0-220-275	0.99
Richardson (Gilbert)	Residential	060-0-390-055	0.47
Robinson	Residential	030-0-070-105	0.47
Roll	Agriculture	?	10.0
Ross (Hamm-J)	Residential	035-240-11, 15, 16	2.00
Sanders	Residential	061-0-043-08	0.47
Sherman	Residential	061-0-140-055	0.47
Tenpenny	Residential	017-0-061-250	0.47

Mira Monte Well Allocations  
Totals as of June 1994

Last Name	Class (Type)	APN	A.F. Allocation
Vork	Residential	061-0-055-565	0.47
Walbridge	Residential	017-0-180-580	0.99
Warren	Residential	061-0-055-605	0.47
West	Residential	029-0-020-080	0.47

## Appendix D – System Losses

There have been several terms used in the past to describe the rate of water consumption. The terms most commonly used are “Safe Yield”, “Deliveries to Main Conveyance System”, and “Metered Water Sales”. Quite often, these terms have been used in an interchangeable fashion without the clear understanding of the difference between these terms and their relationships. The following are definitions for each term.

**Safe Yield** – defined by Meinzer (1) as “the rate at which water can be withdrawn from an aquifer for human use without depleting the supply to such an extent that withdrawal at this rate is harmful to the aquifer itself, or to the quality of the water, or is no longer economically feasible.” The concept of safe yield has received considerable criticism and there has been suggestion that the term be abandoned because of its frequent interpretation as a permanent limitation on the permissible withdrawal (2).

Safe yield must be recognized as a quantity determined for a set of controlling conditions and subject to change as a result of changing economic or physical conditions (3). The controlling conditions in determining the safe yield may include precipitation, evaporation, water quality, inflows and outflows over the term of a selected period of time.

The safe yield quantity is a theoretical constant value that is derived from stochastic evaluation of the hydrology. The assumption that is made in stochastic hydrology methods is that the time-hydrology sequence for a known period will repeat itself with some degree of reliability.

**Deliveries to Main Conveyance System** – The Casitas Municipal Water District continuously measures the rate of water delivered from Casitas Dam to the start of the distribution system. The delivery measurements are performed through the use of accurate flow tube sensors that are located at the discharge side of each filter vessel. Each flow tube sensor is regularly calibrated for accuracy. The collected flow tube data is transformed to quantities (acre-feet) of water delivered from Lake Casitas, each and every day of the year.

For the purposes of this study, the terms “Water Use” and “Deliveries” are synonymous with the term “deliveries to main conveyance system”. The study is referencing the water that is directly taken from the Lake Casitas supply.

**Metered Water Sales** – Metered water sales is the summation of all individual water service meters in the water distribution and piping system. In the Casitas Municipal Water District water distribution system, at each point of connection by the consumer, the District has installed individual water meters to continuously measure each consumer’s water use. Each meter in the District is calibrated and read bi-monthly to assure operation of the meters. It should be noted that meters can stop reading flow due to a mechanical malfunction, but rarely do meters record a higher value than the actual usage.

**Differences between Terms**. From the definitions, it is established that the value for safe yield is developed through stochastic hydrology evaluations and it is a theoretical value, and that the

deliveries (or water use) and metered water sales are developed through continuous monitoring of actual annual water consumption.

The difference between deliveries and metered water sales values is commonly referred to as a "system loss". In any water distribution system, there are several factors that can collectively attribute to the loss of water. These factors include, but are not limited to pipeline and service lateral leaks, pump packing leakage, meter failures and/or loss of meter accuracy, accounting errors, and water theft. Even slight errors in meter calibrations or accounting can magnify the losses that are calculated for an entire year.

In Table D1 are the deliveries and metered water sales recorded by the Casitas Municipal Water District for the period of 1976 through 2002, and the system losses that are a result of the difference between the deliveries and metered water sales. It is noted that with the exception of 1992, 1996, and 2000, the loss of water in the Casitas distribution system is generally less than ten percent of the annual deliveries to the system. Given that the higher loss years were not associated with disaster years and loss of pipelines during storm events, the loss is likely attributed to calibration and/or accounting errors.

The District has maintained an annual evaluation of the distribution system to assure that the pipelines are sound and as leak-free as possible. Indeed, the pipelines have been maintained in good condition. There have been occasional pipeline and service line leaks, followed by immediate response to repair by District staff.

1. *Meinzer, O.E.: Outline of Groundwater Hydrology, U.S. Geological Survey Water-Supply Pap. 494, 1923.*
2. *Kazmann, R.G.: "Safe Yield" in Ground-Water Development, Reality or Illusion?, J. Irrigation Drain. Div. ASCE, vol. 82, November 1956 ; see also discussion by McGuinness, Ferris, and Kramsky, in ibid., vol 82, May 1957.*
3. *R. K. Linsley, Jr., M. A. Kohler, J.L.H. Paulhus: Hydrology for Engineer, 3<sup>rd</sup> ed., McGraw-Hill Book Company, page 195.*

Table D1 - Water Deliveries, Metered Use and System Losses

Water Year	Deliveries to Main Conveyance System	Water Sales in System	System Losses	% Loss
	<u>Water Year</u> (AF)	<u>Water Year</u> (AF)	<u>Water Year</u> (AF)	
1976	18,725	17,244	1,481	8%
1977	16,779	17,096	(317)	-2%
1978	15,060	14,661	399	3%
1979	12,499	13,005	(506)	-4%
1980	14,651	15,434	(783)	-5%
1981	20,012	19,184	828	4%
1982	16,702	16,106	596	4%
1983	16,026	14,664	1,362	8%
1984	21,832	22,281	(449)	-2%
1985	20,274	20,051	223	1%
1986	16,606	16,058	548	3%
1987	22,339	22,359	(20)	0%
1988	21,032	20,326	706	3%
1989	24,416	23,589	827	3%
1990	22,454	20,743	1,711	8%
1991	17,723	16,255	1,468	8%
1992	13,318	11,687	1,631	12%
1993	11,740	10,703	1,037	9%
1994	15,640	14,172	1,468	9%
1995	12,185	11,467	718	6%
1996	16,356	13,715	2,641	16%
1997	19,301	17,822	1,479	8%
1998	14,372	14,533	(161)	-1%
1999	17,942	17,111	831	5%
2000	23,229	19,389	3,840	17%
2001	18,873	17,152	1,721	9%
2002	21,066	19,365	1,701	8%
Average	17,820	16,895	925	
Maximum	24,416	23,589	3,840	
Minimum	11,740	10,703	(783)	

Average losses 1976 to 1990

440

Average losses 1999 to 2002

2,023

Note that (##) is a system gain.

## **Appendix E - Peer Reviews**

Upon completion of the initial draft of the Casitas Water Supply and Use Report, the District contracted with Entrix and MBK Engineers to perform an independent peer reviews and evaluations of the report. A written peer review has been prepared by each contractor and submitted to the District. Copies of each peer review are included in this section of the report. The District has considered each peer review and provided a written statement regarding the peer review issues. The written statement on each of the review issues is included in this section of the report. In some cases the comments have resulted in changes to the report, while other comments may have been further clarified or discounted by the District.

## District Comment to the Peer Reviews

The District has reviewed each and every recommendation and comment contained in each peer review. The following are the District's actions and responses to each of the issues that were developed from the two peer reviews:

### MBK Engineers

#### General

- 1) Monthly depletion factor allows Robles inflow to become a negative number, considering limiting to a minimum of zero.

*District comment - The negative inflows are a result of the formulas in developing the river hydrology, influenced by the assumptions made for the flow accretion above Robles Diversion Dam. The negative numbers result when no flow conditions are present above Robles Diversion Dam, generally during the months of July thru October. The range from -0.1 to -0.2 cfs, with one maximum one-day negative number of -3.0 cfs noted for the 1966-1980 period. The occurrence of a negative number in the model is infrequent and occurs during periods that do not influence the quantity of water available for diversion to Lake Casitas. Agreed that the minimum flow should be no less than zero, but minor changes to the model suggested by MBK does not impact the resulting numbers for available supply at Lake Casitas. No adjustments to these numbers have been made by the District.*

- 2) Recommend using monthly evaporation rate applied to end of month lake surface area, more accurately reflect evaporation from Lake Casitas for varying storage levels.

*District comment - For consistency purposes, the District used the evaporation rates from the D-20 study. Agreed that the evaporation rate from a full reservoir is different than that from a near empty reservoir, but the evaporation rates from the reservoir in the D-20 study and a similar reservoir levels in each of the scenarios should be comparable and very near equal. Minor adjustments as suggested will not result in any significant changes to the trends or lake storage values. No adjustments to these numbers are made by the District.*

#### Report

- 1) Recommend adding a table contents to the report.

*District comment - A Table of Contents will be added to the final report.*

- 2) Recommend clarifying the synthesis of Matilija Creek hydrology.

*District comment - the final report shall include the reasoning and logic behind the synthesis of the Matilija Creek hydrology.*

- 3) Explain more thoroughly the flow accretion methodology, identifying that these factors are multipliers.

*District comment - The method for accretion is explained in Appendix A. Add to the description of accretion that the water gained is from minor watersheds located between the USGS gaging stations and Robles Diversion Dam. Clarification of many*



factors in this report is gained by showing the location of the gaging stations on the maps.

- 4) Recommend showing locations of each gaging station on the map.  
*District comment – The map will be revised to show the locations of the key gaging stations in the upper Matilija Creek and Ventura River. The description of these locations will also assist in the explanation of the synthesis of Matilija Creek hydrology. The final report will have the locations of the Matilija Creek stations.*
  - 5) Recommend renaming the column heading currently labeled as “Matilija Gages” to the more accurate “Matilija Creek below North Fork Matilija Creek”.  
*District comment – Rather than confusing the report with the naming of yet a fourth labeled station (non-existent station) being generated from the synthesis of Matilija Creek hydrology, the report will describe the resulting synthesis of the Matilija Creek hydrology as combining to “Matilija Gages”. The use of the term “Matilija Gages” is further clarified by the added discussion regarding the synthesis of the Matilija Creek hydrology. The heading on the tables will remain the same.*
  - 6) On graphs A19 and A20, consider eliminating the symbols on the graph lines. Difficult to differentiate lines.  
*District Comment – the lines in Figures A5 and A6 have been revised, minus the line symbols. The final report will contain the revised figures.*
- 

## Entrix

### Overall Approach

- 1) Need to explain the differences in Tables A1 to A4 start and end points of the drought period and recovery period, and why they differ for each scenario.  
*District Comment – The Peer Reviewer is comparing the start-end points of the D-20 study with the start-end points used in the present analysis. The approach taken in the report was to start the hydrology with the beginning of a water year, October 1945 as in the start of the drought cycle, and end the drought cycle at the end of a water year, September 30, 1965. The D-20 report hydrology sequence started in May 1944 with a full level of storage in Lake Casitas. During the period of May 1944 to October 1944 there were no diversion or rainfall events that would have, under the different scenarios of Robles operating criteria and/or loss of Matilija Dam, caused a change in the rate of decline in Lake Casitas storage levels. The initial starting level of Lake Casitas storage begins with the same storage for October 1, 1994 contained in the D-20 study.*

*The storage volumes for Lake Casitas stated in each of the tables is a water year-end value. So by varying the scenario with Robles Operating criteria and with without*

*Matilija Dam), the water year-end value will vary. The District believes that the period assignment made in the present analysis is appropriate and does not skew the resultant safe yield estimates.*

- 2) Include more information on how the Mira Monte well supply was applied to the supply numbers.

*District comment – Under the sections “Safe Yield: Drought Period” and “Yield: Recovery Period”, the application of the Mira Monte Well supply is described as having been included in the safe yield estimate. The rate of application is stated as being 300 acre-feet per year, constant rate for each month. No further explanation is provided in the final report.*

- 3) Recovery period, if a shorter recovery period occurs, a lower safe yield value than presented would be required to recover the lake in the shorter time. The effect of the length of the recovery period on predicted safe yield could be addressed in a sensitivity analysis.

*District Comment – The analysis performed by the District considered the hydrology and water use patterns that are likely to occur during the recovery period under each scenario for Robles and Matilija Dam and by these occurrences, running the sequence out until full storage capacity is reached at Casitas Dam. The risk is in the event that the recovery cycle is not prolonged to the full term necessary to restore Lake Casitas storage capacity, i.e. the drought cycle restarts in year 8 of the recovery period instead of starting in year 15. This should be a key point for further consideration, but not a part of this analysis.*

#### Water Supply

- 1) Useful to provide a description of the methods used to derive the factors and assumptions used in both the D20 study and this analysis.

*District Comment – The methods for each of the factors is outlined in Appendix A. The description of development of the factors would detract from the actual purpose of the analysis, therefore the District has provided the factors and assumptions without the description of the factor development.*

#### Other

- 2) Minimum Pool – District should monitor conditions at various stages in lake Casitas and use this data to assist in managing potential effects in the future should concerns arise.

*District Comment – So noted. As later discussed with the reviewer, a definite outcome of this analysis should be the heightened awareness of the impacts of lowering lake storage and the need to monitor and plan for the eventuality of these occurrence and minimize the impacts to the water users.*

- 3) Water Loss at Robles associated with the fish screens – sediment at base of screens is most likely problem that will reduce efficiency of the screens. Loss of max. 1,000 AF/day if diversions through fish screens are completely impaired. District should monitor conditions in the channel and after each storm to determine potential impact.

*District Comment – So noted. The value of this assessment stresses the importance of good operation and maintenance practices at Robles Diversion Dam and how other factors (i.e. incoming water impurities such as plant material or sediment) could impact the ability to divert water to Lake Casitas, and thereby impact available water supply in Lake Casitas.*

- 4) Increased groundwater extraction – largest impact to the District’s supply would likely occur during early storm events prior to recharge of the unconfined aquifer upstream of Robles. Not likely to have significant impact.

*District Comment – So noted. Present water rights are limited at this time and recharge of the upper groundwater basin is not likely to differ much given the flashy nature of the upper Ventura River/Matilija Creek system.*

#### Water Demand

- 1) Over-prediction of water use for the period of 1970 to 2003, in comparing the actual water use with the predictive equation. Provides a factor of safety in evaluating water use versus supply.

*District Comment – The reference to over-estimation is evident in Table B8. One of the primary objectives in the development of the water use patterns for each cycle was to adequately predict water use based on the present-day levels of demand. It was recognized very early on that from 1959 through the mid-1980s the water use from Lake Casitas was in a development stage. Therefore, the actual water use data from this development period could not be relied upon to make an estimate of present day water use applied to the model scenarios. In comparing the predicted water use to the actual water use for the period of 1984 to 2003, there is an over-estimation of 6,168 acre feet for the twenty-year period, an annual average of 294 acre-feet. Given the correlations and variability of water use based on the high variability of rainfall events, and their influence on the agricultural water use within the District, the District feels that the methods applied to predict water use, and the resulting data, provide a sound basis for this study.*

- 2) Recommend a discussion of the maximum obligation to the City of Ventura and oil industry, that may add to the water use at a future date.

*District Comment – The City of San Buenaventura and the Casitas Municipal Water District do have a contract that requires the City to annually purchase a minimum of 6,000 acre-feet of Lake Casitas water. The City must also certify that the amount of water purchased from Casitas matches, or is less than, the water consumption within the joint Casitas-City boundaries. This limits the City purchase to no more than this area’s annual water consumption. The water use trends considered the City’s water use escalation that occurred during the drought of the late 1980’s, so this type of escalation related to weather factors is considered in the model. The placement of long-term and permanent demands, such as an insurgence of oil production, may require additional consideration because it was not predicted by the current model and not included in this final report.*

### Water Conservation

- 1) The report should explain the objective of these measures and indicate the intent of these measures is not provide a comprehensive evaluation of potential water conservation and reduction measures for the District.

*District Comment – It was not the intent of this study to develop and present detailed and focused water conservation measures. Rather, in Table 3, the report presents four concepts on the level of reduction needed to balance water supply and demand during the critical drought period, given the scenario of the BO criteria and without the benefit of Matilija Dam. It is likely that detailed and focus water conservation measures and water use planning will result from the details of this report.*

---

JOSEPH D. COUNTRYMAN, P.E.  
GILBERT COSIO, JR., P.E.  
MARC VAN CAMP, P.E.

ANGUS NORMAN MURRAY  
1913 - 1985

CONSULTANTS:  
JOSEPH I. BURNS, P.E.  
DONALD E. KIENLEN, P.E.

November 1, 2004

Mr. Steve Wickstrum  
Casitas Municipal Water District  
11311 Santa Ana Road  
Ventura, CA 93001

**Subject: Review of "Casitas Municipal Water District Water Supply and Use Status Report"**

Dear Steve:

We have completed our review of the report entitled "Casitas Municipal Water District Water Supply and Use Status Report" (report). Based on our review, we believe overall the report is well done and technically accurate. There are a few relatively minor items which we suggest correcting before finalizing the report. However, applying these suggested corrections is not anticipated to greatly affect the results or findings of the report.

The remainder of this correspondence details the findings of our review. We have divided our review into two components. The first part of our review focuses on the analysis performed (modeling) to support the findings in the report. The second portion of our review focuses on the report itself and the presentation of the findings from the analysis.

Analysis

Overall, the analysis supporting this report was appropriately applied and is technically accurate. We commend the preparers on the systematic approach taken in modeling the different scenarios. As a reviewer, this made the methods, approach, and quality of the work easier to verify. This clarity is also important for the eventual acceptance of this work by others.

Particularly noteworthy is the methodology utilized for predicting the water deliveries. With this innovative methodology, not only are the predicted deliveries based on rainfall patterns, but also the longer-term hydrology (drought sequence). It is one thing to recognize this trend, but this analysis incorporates these trends into a predictive tool. This level of sophistication is uncommon, even in tools developed by professional full-time modeling personnel.

We had some questions and concerns of a relatively minor nature regarding the technical analysis supporting the report. These are as follows:

- The monthly depletion factor allows the Robles inflow to become a small negative number during some periods. Please consider limiting the Robles inflow to a minimum of zero, since negative inflows do not physically make sense.
- The Lake Casitas net water loss (evaporation minus rainfall) should not be the same for all scenarios, since the storage levels in Lake Casitas are different for each of these scenarios and evaporation depends upon surface area, and thus storage. We recommend using a monthly evaporation rate (in inches) that can be applied to the end-of-month surface area of Lake Casitas. This will more accurately reflect the expected evaporation from the Lake and will show the differences in evaporative losses between the different scenarios. We would be happy to provide guidance with the evaporation rates, if this path is pursued.

### Report

We conclude that, overall, this is a concise, clearly written report that identifies the key issues of the water supply and its use by the District. The report provides the main methodology and primary results without adding unnecessary details of the analysis to the main body of the report. The appendices are properly organized and presented, so the reader can review the additional details of the analysis, if desired.

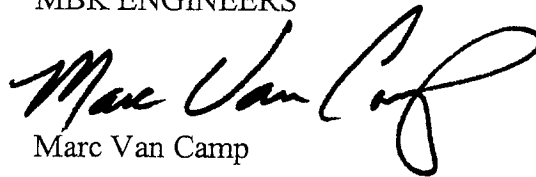
There are a few areas of the report which we believe require clarification. As such, we have recommended clarification or corrective action to these sections. These are detailed, as follows:

- A table of contents in the front of the report would allow portions of the report to be quickly accessed as a reference. We recommend adding a table of contents to the report.
- It is not entirely clear how the Matilija Creek hydrology was synthesized for the period of time without an operable Matilija Creek gage (i.e., when neither USGS #4500 nor #5500 were operable). The report mentions that USGS #5500 was prorated by the annual volume of USGS #4500. Shouldn't this reference to USGS #4500 actually be to USGS #6000, the North Fork Matilija Creek gage? It is also not clear how the annual volumes could be prorated when one of the gages was not operable. The ratio changes from water year to water year, so we assume that these are not long-term average volumes used in prorating. We recommend that this section be clarified in the analysis and report.
- We recommend that the flow accretion methodology used in this study be explained more thoroughly. There are two factors applied depending upon which Matilija Creek gage was operable. We assume this is due to geographical differences between the two gages. Judging from the accretion multipliers applied, USGS #4500 must be further upstream. We recommend showing the locations of all three USGS gages used in this study on a map. Identifying that these factors are multipliers should also be explained in the report.

- In the summary tables A1-A8, we recommend renaming the column heading currently labeled as “Matilija Gages” to the more accurate “Matilija Creek below North Fork Matilija Creek”.
- For the graphs on page A19-A20, please consider eliminating the symbols on the graph lines. It is very difficult to differentiate between the plotting lines with the relative density of these symbols and the closeness of the lines themselves

As mentioned in our review, we believe this is a well written and organized report that can be completed with the minor modifications we have suggested. We hope this review allows you to proceed with your analysis, results, and report in their desired capacities. If you have any questions regarding our review or its findings, please contact me at your convenience.

Sincerely,  
MBK ENGINEERS



Marc Van Camp

BT/bt  
2400/STEVE WICKSTRUM 11.01.2004.DOC

**ENTRIX, Inc.**  
2140 Eastman Avenue, Suite 200  
Ventura, CA 93003  
(805) 644-5948  
(805) 658-0612 Fax

November 18, 2004

Mr. Steve Wickstrum  
Principal Civil Engineer  
Casitas Municipal Water District  
1055 North Ventura Avenue  
Oakview, CA 93022

**RECEIVED**

NOV 24 2004

CASITAS  
MUNICIPAL WATER DISTRICT

**Re: Peer Review of the Casitas Water Supply and Use Report**

Dear Mr. Wickstrum,

ENTRIX, Inc. (ENTRIX) has prepared this letter report to present the results of the peer review of the preliminary draft *Casitas Water Supply and Use Report* (Report) dated June 11, 2004. The Report's objective is to assess the Casitas Municipal Water District's (District) water supply given recent and future changes in water supply and demand including water releases associated with the Robles BO and the potential decommissioning of Matilija Dam. The Report is to be used by the District's governing body to assist in making decisions regarding future water management.

The objective of this peer review is to determine whether the Report accurately projects future water supply and water demand conditions and to evaluate the applicability and appropriateness of the methods utilized to make these projections.

This review presents a brief overview of the Report, a description of the methods used in the review, and the review results. The results of the review are organized into four primary categories: 1) the overall approach of the analysis; 2) the water supply analysis; 3) the water demand analysis; and, 4) the conservation and reduction measures required to balance water supply and use.

**Overview of the Draft *Casitas Water Supply and Use Report***

The Report was developed to assess the potential impacts to the District's water supply associated with the recently adopted operating criteria specified in the Biological Opinion for the Robles Fish Ladder and with the potential removal of Matilija Dam. The Report also evaluates the effect of predicted water use on the District water supply, and conservation and reduction measures required to balance water supply and use. The study evaluated four separate operating scenarios:

- Water supply and use during the critical drought period, defined as between water years 1945 through 1965, with Matilija Dam;




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Principal Civil Engineer  
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- Water supply and use during the same critical drought period without Matilija Dam;
- Water supply and use during the reservoir recovery period, defined as between water years 1966 through 1980, with Matilija Dam; and,
- Water supply and use during the same reservoir recovery period without Matilija Dam.

The results of the Report indicate that the predicted water supply exceeds the estimated water demand for all modeled scenarios, with the exception of critical drought period under the Robles BO operating criteria without the benefit of Matilija Dam. This scenario, which is the most likely, could result in a deficit of approximately 360 acre-feet per year.

### **Review Methods**

The review considered the draft Report, supporting documentation such as spreadsheets used to develop the water supply and bypass estimates, and the *Water Supply and Demand Status Report* prepared by the District's Engineering Department Manager on June 7, 1989. The review consisted of an evaluation of the overall approach used to determine safe yield and the methods, assumptions, and results used in developing the water supply and water demand estimates. The project team involved in the review consisted of the following personnel:

- David Blankenhorn, R.G. – Mr. Blankenhorn served as the project manager and was responsible for reviewing all aspects of the Report. He is a State of California Registered Geologist with over 9 years of experience working on various hydrology projects. Mr. Blankenhorn has significant experience in conducting hydrologic studies in Southern California including the Ventura River Watershed. He was the lead hydrologist in the preparation of the Ventura River HCP for which he evaluated surface water and groundwater hydrology within the lower Ventura River basin and the effects of water diversions and groundwater withdrawal on surface water flows. In addition, Mr. Blankenhorn conducted an evaluation of surface water flows and guidelines for water releases at the Robles Diversion in support of the Biological Assessment prepared by ENTRIX.
- Dr. Daniel Tormey, R.G. – Dr. Tormey assisted in the overall review and evaluation of the Report. He has analyzed water supply issues for withdrawal from the San Joaquin-Sacramento River delta, and locally in the Ventura County area. He has extensive experience analyzing hydrology and sediment transport in California coastal streams and the Sierra Nevada. Dr. Tormey has also conducted a water supply and water demand study in support of a wellfield design for a proposed golf course in the Sacramento area.

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- Woody Trihey - Mr. Trihey assisted in the review of the design for the fish screen and evaluated potential impacts to the District water diversions following installation of the screen. He is a hydraulic engineer with significant hydrology and fish passage enhancement experience including the evaluation of fish screens.
- Dr. Gretchen Greene – Dr. Greene reviewed and evaluated the overall approach of the Report and the methodology used in the water demand analysis. She is a Senior Economist with significant experience in evaluating future water demand.

The review focused on four primary areas: 1) the overall approach of the analysis; 2) the water supply analysis; 3) the water demand analysis; and, 4) the conservation and reduction measures required to balance water supply and use. The Report was evaluated to determine the applicability and appropriateness of the methods and assumptions utilized in its preparation. The review of the water supply analysis included an evaluation of the mean daily flow data used in the water supply analysis, flow losses and additions between the existing stream gauges and the Robles Diversion, estimates of storage and release from Matilija Dam, bypass flows at Robles Diversion associated with the 1959 and BO operating criteria, losses in the Robles Diversion canal, losses at Lake Casitas, and input from tributaries to Lake Casitas. The evaluation of the water demand analysis included a review of the methodology used to predict future water use and a comparison to historic demand data. In addition, the water supply reduction/conservation measures required to balance water supply and use were reviewed to determine the level of reduction associated with each method.

## **Review Results**

The results of the review are described below. The discussion is organized into the four primary review areas: 1) the overall approach of the analysis; 2) the water supply analysis; 3) the water demand analysis; and, 4) the conservation and reduction measures required to balance water supply and use. The comments do not include details such as spelling and typographical errors as it is assumed that the document will be edited prior to the final draft.

### Overall Approach

The overall approach of the study is sound. The study uses a planning scenario the longest drought on record in the Ventura River Basin which was between 1944 and 1965. The safe yield for this period is determined using empirical stream gage data in conjunction with the recent and potential changes in operating conditions associated with the Robles BO and the potential decommissioning of Matilija Dam. The water demand is predicted based on recent use data. The study also evaluates the recovery period following the drought between 1966 and 1980 to determine the safe yield until the reservoir recovers to full storage capacity.

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Several issues, however, need to be clarified in the document as follows:

- In the drought period analysis (Tables A1 to A4), the starting storage in Lake Casitas in year 1945 ranges between approximately 223,000 to 226,000 acre-feet (AF) and the minimum storage is fixed at approximately 4,800 AF. Based on discussions with the District, the starting and ending volumes for each scenario were derived using the storage values utilized in the D20 study at the beginning (October 1, 1944) and ending (September 30, 1965) of the analysis in order to be consistent with that study. Since these values effect the safe yield estimates for each scenario, the document should explain the basis for these values since they differ from the maximum usable storage capacity of 250,000 AF specified in the 1989 memo and the minimum storage capacity of 100 AF used in the D20 study which reportedly corresponds to the estimated storage volume in December 1965 rather than September 1965. In addition, the document should explain why these values vary between each modeled scenario.
- In the recovery period analysis (Tables A5 to A8), the starting storage in Lake Casitas in year 1966 ranges between approximately 36,000 to 38,000 AF and the maximum storage ranges between approximately 237,000 and 239,000 AF. As with the drought period analysis, the District indicated that the starting and ending volumes for each scenario were derived using the storage values utilized in the D20 study at the beginning (October 1, 1965) and ending (September 30, 1980) of the analysis in order to be consistent with that study. Since these values effect the safe yield estimates for each scenario, the document should explain the basis for these values since they differ from the maximum usable storage capacity of 250,000 AF specified in the 1989 memo and the minimum storage capacity of 100 AF used in the D20 study. In addition, the document should explain why these values vary between each modeled scenario.
- Based on discussions with the District, the water supply/safe yield estimates provided in Tables A1 through A8 include the supply provided by the Mira Monte well. However, the Report does not clearly specify that the supply from this well is included in the analysis. Accordingly, a column should be included in these tables to account for the supply from this well or a note should be added to the tables to indicate that the supply from this well is included in the analysis.
- The study results indicate that the lowest safe yield values occur during the recovery periods under the Robles BO operating criteria (21,180 AF with Matilija and 19,780 AF without Matilija). Although the predicted water demand for this period is less than the estimated safe yield, the predicted safe yield for this period would appear to be the limiting factor on water use allocation. The lower safe yield values for the recovery period appear to be caused by increased bypass flows associated with the Robles BO operating criteria and the constraint of the modeling approach which limits the number of

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years (15 years) to achieve full capacity. If a shorter time is allowed for recovery, corresponding to a shorter period between droughts, the safe yield value would be lower than presented in the Report. The effect of the length of the recovery period on predicted safe yield could be addressed in a sensitivity analysis.

The issues described above affect the principal objective of the Report which is to predict safe yield and future water use allocation. Accordingly, these areas should be clearly explained to assist in planning efforts.

### Water Supply

The water supply assumptions and methodology appear sound and empirical data is used where available to model or validate the water supply under the different operating scenarios. However, the analysis relies heavily on the assumptions and factors developed as part of the D20 study. The basis for these assumptions was not available for review; therefore, it was not possible to verify their accuracy/applicability of these factors. It would be useful to provide a description of the methods used to derive these factors.

The assumptions and methodology used for the supply model need to be described in greater detail to allow for easier understanding and comprehension of the analysis. Following an initial review of the document, a meeting was held on September 29, 2004 to clarify the methods and assumptions used to develop the water supply estimates. The meeting was attended by Steve Wickstrum, Leo Lentsch, and Chip Blankenhorn. A copy of the issues discussed in the meeting is provided in Attachment A.

The Report also describes several concerns that could affect water supply which were not quantitatively captured in the analysis. These concerns include the following:

- Impacts associated with operations near minimum pool in Lake Casitas. Operations under these conditions could affect water quality, water delivery, and recreation.
- Water loss at Robles Dam associated with decreased efficiency of water transfer through the fish screens and plugging of the fish screens with fine sediment.
- Increased groundwater extraction above Robles Diversion Dam which may result in increased flow of surface water to groundwater, thereby reducing inflow to Lake Casitas.

A brief discussion of these issues is provided below.

**Minimum pool impacts.** It seems that the most important planning issue is related to the water delivery and distribution infrastructure. If not previously addressed by the District, the District should determine the stages at which the infrastructure could be affected and develop

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a contingency plan in the event that this occurs. With regards to water quality and recreation, the District should monitor conditions at various stages in Lake Casitas and use this data to assist in managing potential affects in the future should the concerns arise.

**Water loss at Robles associated with the fish screens.** ENTRIX reviewed the fish screen design and contacted the design engineer (Tim Buller at Wood-Rogers) to evaluate this issue. Based on a review of the design and discussions with the design engineer, it appears that the existing trash rack should be sufficient to trap large debris moving into the diversion canal. The fish screens include a traveling brush cleaning system which should prevent clogging due to brush. The design engineer indicated that the screen was designed to maintain an approach velocity of approximately 0.4 ft/s and a minimum sweeping velocity of approximately 0.8 ft/s in accordance with California Department of Fish and Game requirements. However, the design engineer indicated that the sweeping velocity would likely be greater than 0.8 ft/s and could be up to 1.5 ft/s. Based on the existing information, the flow velocities appear to be sufficient to transport silts and clays in suspension, but may not be sufficient to transport sands, if present. A thorough analysis of potential impacts would need to consider the suspended sediment concentration and particle sizes in suspension. The slot spacing of the fish screen is 1.75 mm which is within the coarse sand range and is likely greater than the particle sizes that would be in suspension. If an impact were to occur, it would likely be due to sediment deposition at the base of the fish screen and the existing design accommodates for approximately 1 foot of deposition by offsetting the base of the screen 1 foot from the bottom of the canal. There is a potential for this area to be filled during the seasonal operation period which could impact the diversion efficiency and/or the diversion operation if sediment removal is required. The maximum impact on water diversions would be the loss of approximately 1,000 AF/day which is the equivalent to a water diversion rate of 500 cfs (the maximum capacity of the diversion canal) over a 24-hour period. This situation could occur if the entire screen is clogged with sediment and/or debris or the diversion needs to shut-down for maintenance to remove sediment/debris. The District should monitor conditions in the channel during and after each storm event to determine any potential impact.

**Increased groundwater extraction above Robles diversion dam.** Increased groundwater extraction would result in a decrease of the water table elevation and would result in greater infiltration to the subsurface. The greatest use of groundwater would likely occur during the dry season when the diversion is not typically in operation. Assuming that the water table is lowest at the end of the dry season, the largest impact to the District's supply would likely occur during early storm events prior to recharge of the unconfined aquifer situated upstream of Robles. The aquifer in this portion of the basin typically fills relatively quickly, so increased losses would not likely have a significant impact on water supply at Robles.

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### Water Demand

The water demand analysis utilizes a correlation between water use and precipitation to develop a polynomial equation to predict future water demand. The basis for this correlation is sound in that historic data indicates that water use varies significantly with precipitation, primarily because agricultural use is the dominant water user and crops require less irrigation when there is high precipitation. The goodness of fit ( $R^2$  value) for the water demand-precipitation correlation is approximately 0.97, which indicates a strong correlation between these variables.

The predicted water demand equation also includes a dry year multiplier to account for increased water demand associated with consecutive years with less than 20-inches of rainfall. Such a factor makes intuitive sense, since one would expect increasing water demand as a drought advances. The dry year multiplier was developed using the slope of a best fit line correlating recorded water use during the 1986 to 1990 drought. The multiplier is applied by multiplying the number of years with less than 20-inches of rainfall following an initial year with less than 20-inches of rainfall. The goodness of fit ( $R^2$  value) for the dry year multiplier correlation is approximately 0.56, which indicates a relatively poor correlation between variables. The use of the dry year multiplier is good in that it adds a factor of safety to the water use-precipitation equation, but the relatively poor correlation indicates that other factors may be controlling the variation in water demand. In addition, the data used to develop the dry year multiplier includes the actual water use by the City of Ventura (City) between 1986 and 1990 which ranged between 7,737 and 8,875 AF. The dry year multiplier could be refined by adjusting the water use data to include only the minimum requirement to the City of 6,000 AF/year. However, this adjustment is unlikely to improve the correlation.

An evaluation of the predicted water demand and actual demand between 1970 and 2003 indicates that in general this equation overpredicts the actual annual demand by an average of approximately 1,300 AF. The data also indicates that actual water use exceeded the predicted demand in eight years over this period. Although water use is sometimes underpredicted by the equation, the total surplus between the predicted and actual demand between 1970 and 2003 is approximately 44,750 AF.

The predicted water demand for each model scenario utilizes the average water use for the drought period (21,200 AF) and for the recovery period (18,820 AF). The model water demand for each year is derived from the annual precipitation data for these periods. Based on the comparison of the predicted versus actual water demand, these values likely overestimate the water use for these periods which provides a factor of safety in evaluating water use versus supply.

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Principal Civil Engineer  
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One of the issues that was discussed in the meeting held on September 29, 2004 was the supply obligation to the City of Ventura. As discussed in the report, the minimum obligation to the City is 6,000 AF per year; however, the maximum obligation is not specified. The Report states that water use by the City could increase significantly if oil production increases and/or if there is an extensive dry-period. A discussion of the maximum obligation to the City should be included in the document to assist in determining the potential affects on water supply and demand in the future.

#### Water Conservation and Reduction Measures

The Report discusses several water conservation and reduction measures that could be implemented to balance safe yield with predicted water use. However, the focus of these measures is not clearly described. Based on discussions with the District, the objective of these measures is to evaluate options which could be implemented to balance the predicted safe yield with the predicted water use for the critical drought period under the Robles BO operating criteria without the benefit of Matilija Dam. This scenario, which is the most likely, could result in a deficit of approximately 360 acre-feet per year. Accordingly, the Report evaluates options which would provide a reduction of approximately 360 AF/year. The Report should explain the objective of these measures and indicate that the intent of these measures is not to provide a comprehensive evaluation of potential water conservation and reduction measures for the District.

#### Closure

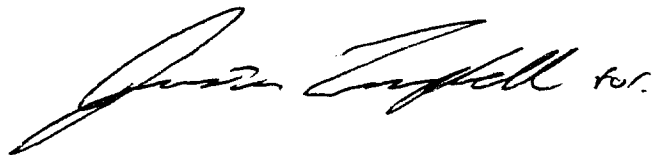
ENTRIX appreciates the opportunity to perform this work for the District. Please call Dan Tormey or Chip Blankenhorn at (805) 644-5948 with any questions or comments.

Sincerely,

**ENTRIX, Inc.**



David B. Blankenhorn, R.G.  
Senior Project Engineer/Geologist



Daniel Tormey, Ph.D., R.G.  
Principal

**ATTACHMENT A  
SEPTEMBER 29, 2004 MEETING MEMO**



# ENTRIX

MEMO

ENTRIX, Inc.  
2140 Eastman Avenue, Suite 200  
Ventura, CA 93003  
(805) 644-5948

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**To:** Steve Wickstrum, Casitas Municipal Water District  
**From:** Chip Blankenhorn, ENTRIX  
**Date:** September 29, 2004  
**Re:** Initial Questions/Comments

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The purpose of this memo is to outline initial questions/comments on the *Water Supply and Use Status Report* dated June 11, 2004. After your review, I would like to discuss these with you prior to preparing our draft peer review report. The questions/comments are separated water supply and water demand/use as follows:

## I. Water Supply

In general, the water supply estimates utilize factors developed as part of the Kienlen D20 study, but the report does not discuss the derivation of these factors. Accordingly, it is difficult to evaluate the applicability of these factors. These factors include the following:

- Reservoir Recovery Period Hydrology:
  - Item 1b is described as “daily flows predicted from NF Matilija daily USGS records”. I am presuming that this is a typo since the header is for Matilija Creek hydrology and gages #4500 and #5500 are situated on Matilija Creek.
  - Item 1bi (loss factor at Matilija Reservoir) – how was this factor derived?
  - Item 1bii - estimation of daily flows for #5500 are calculated by adjusting the flows at #4500 by a ratio of the annual water supply at each gage. Does this ratio represent the average over the overlapping period of record?
  - Item 2bi – how was the equation for #6000 derived?
- Matilija Reservoir Operations – how were the max. and min. storage capacity estimates derived?
- Flow Accretion – how were these factors derived?
- Flow depletion/extraction – how were these factors derived?
- Robles Diversion Operations – how were the facility losses derived and is there more recent data to assist in this estimation?

- Volume of water bypassed – how were these factors derived and how were they utilized in the study? If we are accounting for inflow from gage data, diversions at Robles, and bypass flows associated with the fish releases, then it seems like we can directly calculate annual bypass flows.
- Lake Casitas:
  - How were the estimates from the tributaries derived and what are the estimates from the D20 study (not provided)?
  - Also, with regards to net evaporation, the USBR study utilized an estimate of 3.08 feet/year and the D20 study used 1.9 feet/year. Is more recent data available to update this factor? Also, does the surface area that this factor is applied to vary annually based on storage levels or is an average value used?
  - It does not appear that sedimentation in Lake Casitas was addressed with regards to impacts on storage? Is there data available to estimate the approximate rate of sedimentation which can be used to evaluate potential impacts?

## **II. Water Use/Demand**

- In general, it appears that it is primarily agricultural water use that changes in response to precipitation. Also, there appears to be a slight increasing trend in residential water demand between 1976 and 2002 and a relatively steep demand in gravity water sales between 1997 and 2002. Accordingly, it might be more useful to model these variables separately and sum them to assist in predicting future demand.
- Water sales to the City seem to be a wildcard as future use may revert to pre-1990 if the oil production increases and/or there is an extensive dry-period. What are the obligations to the city beyond the 6000 AF/year minimum?



## **APPENDIX D RULE CHANGE FOR AGRICULTURE HOME ALLOCATION METHODOLOGY**

DRAFT

### Section 15.10 Residences on Agricultural Properties

#### Section 15.10.1 Allocation to all Agricultural Properties:

In 1992, Casitas allocated about 8880 acre feet to all agricultural properties in the district. This was 80% of the amount of water used for agriculture during the 1989 calendar year drought. At the time, Casitas was unable to set individual agricultural allocations because the agricultural customers said that they had a system of rotating crops and that tended to keep the amount of water demand from agricultural customers the same, even though they added and removed crops. The intent here was to allow agricultural properties to change their demands as long as the total for all properties did not change. The issue here was that neither the total agricultural water acreage would expand, nor would there be conversion from agriculture to residential or some other property type.

#### Section 15.10.2 Agricultural Property with Residences:

It has been the case in 1992, that agricultural properties came with houses. Casitas had established a combination water rate to charge residential use on an agricultural property the same as a house would spend up to 17 units of usage. It has been the position of the Board that every owner of an agricultural property would want to live on the property and Casitas should make provision for such houses to come out of the water that is allocated to the agricultural properties in general. This program was not to allow agriculture to convert into houses.

#### Section 15.10.3 Providing Agricultural Property with a Residence:

An agricultural property owner can use allocation from the agricultural property to build a house as long as the property owner follows all of the rules in section 15.10 of this ordinance.

#### Section 15.10.31 Agricultural Property Allocation:

Nothing in this section should be interpreted to prohibit an agricultural property owner from obtaining an allocation for a house on his property off the priority list for allocations.

#### Section 15.10.32 No Expansions of Other Kinds since 1992:

No allowance for allocation shall come out of the agricultural allocation if there has been any expansion on the property since 1992 except for the construction of up to, but not more than, two buildings of any kind. Additionally, expansion shall not be considered if additional allocation was purchased for that expansion prior to the expansion or after the expansion.

#### Section 15.10.33 Expansion if House built then Sold to Others or Agricultural Land sold and then a house is built:

It shall be deemed an expansion if agricultural allocation was used to build a house and that house and or property were sold off since 1992. The limits on building houses shall include houses built and sold off. If agricultural land only is sold and the new owner requests to add a house, the property will relate back to the property sold. If that property already cumulatively has two houses, all new buildings shall be charged allocation charges and meter charges as though they were houses only.

Section 15.10.34 Size of Meter and Allocation:

To build houses on an agricultural property using agricultural water allocation, each property shall have a meter properly sized for the historical water usage on the property. If it is not sized properly for the allocation, the house shall be go to the priority list for allocation for building houses, and no use of the agricultural water allocation will be allowed.

Section 15.10.35 Usage History on the Property:

To build a house, the usage on the property shall show that the water usage for the property does not exceed 2.5 acre feet of water per acre at any time during the last 10 years.

Section 15.10.36 Out of District Usage:

No agricultural property with Out of District Usage will be provided a will serve for a house if they have out of District Usage.

Section 15.10.37 Agricultural Properties where the full acreage is not under agriculture:

If the agricultural property is one where the full acreage is not under full agriculture except for roads and buildings, then the property owner and Casitas will agree on an allocation for the property based upon the historical usage over the last ten years. Any water use over that agreed allocation will be charged at \$1.50 per unit or as the Board may set a higher rate in this code in the future.

Section 15.10.4. Allocation from reduction of agriculture on property:

If, and only if, all the conditions of section 15.10 are complied with, then an agricultural property owner may use allocation from removal of agricultural from his property for the house, and no additional capital facilities charges will be due to obtain a will serve letter for the house



## APPENDIX E DRAFT WATER WASTE ORDINANCE

- DRAFT -

### REGULATION FOR PROHIBITING OF WATER WASTE

**Section 22 WASTEFUL WATER USE** All water provided to customers of Casitas Municipal Water District shall be put to reasonable beneficial use. No water provided by Casitas Municipal Water District shall be wasted.

Prohibitions and charges for improper use of water shall be based on the current stage of the Water Efficiency and Allocation Program.

**Section 22.1 DEFINITION** Waste of water includes, but is not limited to, the following:

- All stages:
  1. The use of water for any purpose **without reasonable control over the application or lacking the intention of using the water for a beneficial use that** results in water flowing down sidewalks, driveways, streets, gutter, ditch or other surface drain.
  2. Permitting water to leak from any device or facility on his/her property. Failure to repair any water leak in a timely manner.
  3. Excessive flows withdrawn from a temporary meter that results in a disturbance of water quality in the distribution system.
  4. Operation of a non-recycled water conveyer car washes after July 1, 2008.
  5. All new commercial laundry facilities without recirculating systems.
  6. Use of non recirculating decorative water fountains.
  7. Use of potable water in single pass cooling systems.
  
- Stage 5
  1. Use of water for cleaning of sidewalks, driveways or other paved or hard surface.
  2. Washing cars, boats, trailers, aircraft, or other vehicles by hose without a shutoff nozzle and bucket except to wash such vehicles at commercial or fleet vehicle washing facilities using water recycling equipment.
  3. Use of water for decorative fountains and ponds.
  4. Outside landscape or garden watering after 9:00 a.m. and before 6:00 p.m.
  5. Washing Streets with District water except in cases of emergency or essential operations.
  6. Failure to use viable alternative available water source by any customer without a contract for a specified amount of water service from the district.

**Section 22.2 ENFORCEMENT** As of January 1, 2006, a District customer allegedly engaged in the wasting of the District's water as defined in Section 22.1 shall be responded to as set forth below.

1. **Upon receipt of reliable information confirming an alleged violation, a written letter of notification shall be issued by the Water Conservation Manager informing the suspected violator of the water conservation ordinance and the importance of water conservation.**
2. **If the violation is a failure to use a viable alternative available water source the Water Conservation Manager shall indicate that the district may discontinue water service to the customer for this violation of the ordinance. Upon reliable information of a second violation a notice shall be sent by mail to the customer by the Water Conservation Manager warning them that their Casitas' water account may be shutoff from water service due to their repeated violation of this ordinance. The letter will also indicate that the customer may appeal based on the merits of the alleged violation to the General Manager upon written request by that customer.**
  - a. **All customers as of July 1, 2005, which the District maintains a contract for a specified amount of water service shall be excluded in perpetuity from the failure to use a viable alternative available water source section of this ordinance.**
  - b. **If other entities providing or with the possibility of providing a viable alternative water source to a Casitas' customer adopts a policy that requires other sources of water (to include Casitas' water) be utilized prior to their water being used then the following will occur:**
    1. **A Casitas' customer shall meet the requirements of this ordinance by making future water purchases based on prorated historical water purchases from such an entity.**
    2. **If a Casitas' customer has not previously purchased water from such an entity then that customer would not be required to purchase water from that entity.**



## APPENDIX F COMMENTS RECEIVED

### Golden State Water Company:

CH2MHill – 325 E. Hillcrest Drive, Suite 125, Thousand Oaks, California 91360-5828 – representing the Golden State Water Company provided the following input:

**Question:** How was a normal year – single dry year derived in Section 7, Step One? What time period was used for making this decision?

**Answer:** The supply available is the same for each year because the Casitas Reservoir can provide an average amount of water each that does not vary from one year to the next. Some water districts have water supply availability that changes each year so they can have a single year's available water supply that is equivalent to a specific historic year's available water supply. Casitas does not provide a specific year because each historic year should be able to provide a particular supply average throughout any 21-year period.

The drought period used was 1945-1965. The drought recovery period used was 1966-80.

**Question:** Why is the draft plan titled the 2005 Urban Water Conservation Plan?

**Answer:** This was a mistake, it should have been titled the 2005 Urban Water Management Plan.

**Question:** Why does Section 7, Step Three not have tables for the years 2016-2021?

**Answer:** This was an error of omission. It will be provided in the final document.

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# CITY OF SAN BUENAVENTURA

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October 18, 2005

## CITY COUNCIL

Casitas Municipal Water District  
1055 Ventura Avenue  
Oak View, California 93022 Attn: Ron Merckling

Brian Brennan, Mayor  
Carl E. Morehouse, Deputy Mayor  
Neal Andrews, Councilmember  
Bill Fulton, Councilmember  
James L. Monahan, Councilmember  
Sandy E. Smith, Councilmember  
Christy Weir, Councilmember

### **RE: Draft 2005 Urban Water Management Plan**

Dear Ron,

The City of Ventura appreciates the opportunity to comment on Casitas Municipal Water District's Draft 2005 Urban Water Management Plan (Casitas UWMP). We understand that you will be conducting a public hearing of the draft plan on October 26th, with subsequent Board approval. Therefore we would like to provide you with the following comments:

- Page 7, the City's reference under Agencies notified should read, "City of Ventura- Don Davis, Utilities Manager".
- Page 12, Table 5, the amount of water identified for oil field recovery is projected to increase seven-fold by 2030. This is a larger number than historical usage trends by Aera Energy suggest.
- Page 16, paragraph 2, it is unclear why agencies with water production in the upper Ventura River basin (Ventura County Water District and Meiners Oaks County Water District) would object to producing water by Casitas from the lower Ventura River basin. Additional explanation of this issue may be helpful.
- Page 21, "Use of Sanitary District Water", the 5th and 6th sentence should read, "A grant application was submitted in June 2005 to the State Water Resources Control Board. It was anticipated that the cost of that study would be \$150,000." The last sentence of that paragraph should read, "There was some concern that this option could be controversial, but they were willing to go to the State Water Resources Control board and negotiate for grant funding."
- Page 82, 103, 124 and 146, under the heading "BMP 14: Residential ULFT Replacement Programs", A9, the ordinance citation for the City of Ventura should read, "San Buenaventura Municipal Code, Section 12.120.020".



- In general, the City of Ventura should be consistently referred to in the document as either "City of Ventura" or "City of San Buenaventura" to eliminate confusion in reading the report.

Please let me know if you have additional questions or concerns. I can be reached at 677-4133.

Sincerely,

Don Davis  
Utilities Manager

Cc: Ron Calkins, Director of Public Works

[waln: UWMP 2005 Comment.doc]

**Response to City of Ventura Comments are as follows:**

**Comment:** Page 7, the City's reference under Agencies notified should read, "City of Ventura- Don Davis, Utilities Manager".

**Response:** This change was made.

**Comment:** Page 12, Table 5, the amount of water identified for oil field recovery is projected to increase seven-fold by 2030. This is a larger number than historical usage trends by Aera Energy suggest.

**Response:** Concern for over estimate was indicated. This figure was derived using the last two years of information on Aera Energy as provided by the City of Ventura.

**Comment:** Page 16, paragraph 2, it is unclear why agencies with water production in the upper Ventura River basin (Ventura County Water District and Meiners Oaks County Water District) would object to producing water by Casitas from the lower Ventura River basin. Additional explanation of this issue may be helpful.

**Response:** A clarification on upper and lower Ventura River was added into this section.

**Comment:** Page 21, "Use of Sanitary District Water", the 5th and 6th sentence should read, "A grant application was submitted in June 2005 to the State Water Resources Control Board. It was anticipated that the cost of that study would be \$150,000." The last sentence of that paragraph should read, "There was some concern that this option could be controversial, but they were willing to go to the State Water Resources Control board and negotiate for grant funding."

**Response:** This change was made.

**Comment:** Page 82, 103, 124 and 146, under the heading "BMP 14: Residential ULFT Replacement Programs", A9, the ordinance citation for the City of Ventura should read, "San Buenaventura Municipal Code, Section 12.120.020".

**Response:** This change was made.

**Comment:** In general, the City of Ventura should be consistently referred to in the document as either "City of Ventura" or "City of San Buenaventura" to eliminate confusion in reading the report.

**Response:** City of Ventura was placed throughout the document.



## APPENDIX G DRAFT SWEAP PROGRAM



# Casitas Municipal Water District

## (SWEAP)



*A program designed to assist agricultural customers to further improve upon their water management practice*



# SWEAP

## *Improving upon agricultural water management practices*

### **Introduction**

The Significant Watering Enhancement Agricultural Program (SWEAP) is a three-year plan that will identify agricultural customers with probable water management issues and then work with them to develop solutions that can be implemented. Casitas believes that there is an opportunity to realize additional water supply by encouraging greater efficiencies in water management practices for all agricultural customers. However, the District should see the greatest water savings by focusing on the minority of agricultural customers who may not presently be adhering to best water management practices.



### **Analysis, Identification and Communication - Year 1**

Staff will identify agricultural customers with probable water management issues through analysis of existing data on water usage per agricultural customer since 1989. Staff plans to communicate with all agricultural customers to determine any potential explanations for what may appear to be excessive water usage for some customers.

The assumptions used during data analysis were based on 1989 crop reports and a 1992 Casitas study incorporating 1989 aerial photo analysis for each agricultural customer's number of planted acres. Staff then determined the number of acres planted for all agricultural customers in 1989. Water rates for each agricultural customer shall be based on their planted 1989 acres and water usage of two-and-a-half (2.5) acre-feet. The basis for this water rate is on past evapotranspiration studies conducted in the area that indicated average efficient water usage needed per crop in the area was 2.5 acre-feet per planted acre. A vast majority of agricultural customers appear to be efficient based on early analysis utilizing this rate.

Staff will review recent water usage to determine how each agricultural customer will be impacted if they are provided 2.5 acre-feet of water per planted 1989 acreage for a period from January 1 to December 31. Beginning on January 1, 2007, a customer that equals or exceeds 110% of the 2.5 acre-foot minimum per acre will pay an additional tiered rate for all exceeding units of water. For example, if their usage exceeds 120% of the 2.5 acre-feet of water per acre per year they would pay the standard Tier 1 rate for all units below 110% and a Tier 2 rate for those units greater than 110% and less than or equal to 120%.

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An agricultural customer with two planted acres that would use five acre-feet of water (or 2,178 units) would pay a standard rate for all their water units purchased until they exceeded five acre-feet of water plus an additional 10%, which would equal 2,396 units. The agricultural customer would then pay a higher rate for each additional unit of water, see table 1 below. The tier one rate is the same as the existing stage one rate so customers that used at or below the average 2.5 acre-feet to 2.75 (10% plus) of water per acre per year would not

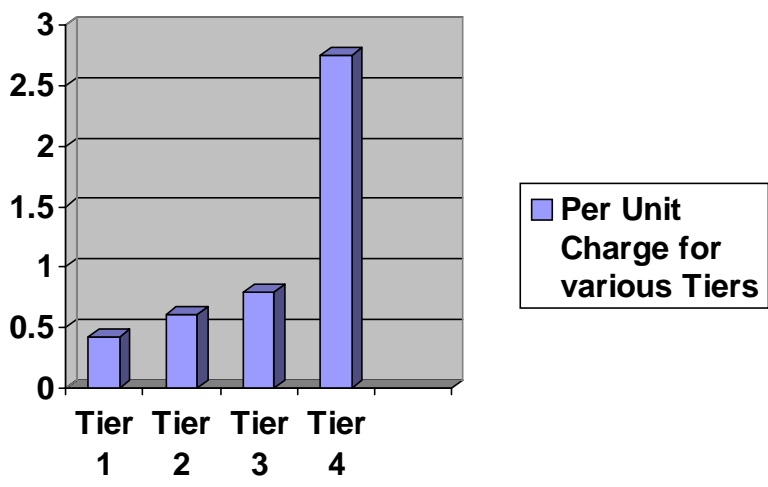
see any change in their water rates. Customers that used greater than 110% to 120% or 2.75 to 3 acre-feet of water per acre would pay an additional 44% for every unit of water in excess of 2.75 acre-feet of water per acre for the year. The 44% increase is the same level of increase that residential customers pay for a tier 2 rate. And, the proposed tier 3 rates for agricultural customers increases another 32%, which is the same increase for tier 3 rates that residential customers pay for their additional units of water consumed. Tier 4 is the same rate as temporary customers. Tier 4 usage is above 3.25 acre-feet of water per acre and is an unsustainable average water usage for the District's agriculture customers considering the limited water supply as reported in the District's peer reviewed Water Supply and Demand study that was completed in December of 2004.

**Table 1: Pricing examples for a 2 acre parcel for a given year.**

Tier	Units of Water Used	% greater than 2.5 acre-feet per acre	Price of water per Tier*	Cost per Tier	Cumulative Total Cost	Existing Rate
1	2,178 units	$U \leq 110\%$	\$0.418 per unit	\$910.40	\$910.40	\$910.40
2	2,614 units	$110 < U \leq 120\%$	\$0.602 per unit	\$262.47	\$1,172.87	\$1,092.65
3	2,831 units	$120\% < U \leq 130\%$	\$0.795 per unit	\$172.52	\$1,345.39	\$1,183.36
4	3,267 units**	$130\% < U$	\$2.752 per unit	\$1,199.87	\$2,545.26	\$1,365.61

\*Includes .02 energy surcharge. \*\*Assumes up to 150% of 2.5 acre-feet of usage or 3.75 acre-feet per acre per year.

**Increasing Block Rate Pricing**



- Individual agriculture water rate to be based on the following:
  - Number of irrigated crop acres in 1989.
  - Two and a half acre-feet of water usage per planted acre.
  - Annual allocation from January 1 to December 31.
  - Pricing to be implemented January 1, 2007

Staff will communicate with individual agricultural customers by outlining for each customer the proposed water rate on their past annual usage. Customers will then have an opportunity to request a reconsideration of their 1989 planted acreage if they can provide a reasonable justification or evidence that Casitas’ data on their planted 1989 acreage plus any additional allocation purchased since that time. Staff will make every effort to get further clarification about watering practices from those customers who appear to have excessive water usage or water usage almost twice that of the average agriculture customer. The letter will make clear that the current one allocation for all agricultural customers shall be maintained at this time. It will also outline their current status as a customer that is currently practicing efficient water management practices or as a customer that may not be implementing efficient water management practices.

Staff will develop a variety of assistance proposals that will include agricultural Best Management Practices (BMPs) such as a grant, rebate and/or loan program to improve wells or irrigation systems, irrigation evaluations, workshops, and water pricing incentives based on water usage.

Staff will communicate all suggested proposals to agricultural customers through the following:

1. Sending out a letter outlining the various assistance proposals to solicit feedback.
2. Organizing a workshop to build a consensus among participants on specific assistance programs.

## Assistance - Year 2

In the second year, staff will aim to further build consensus on how best to improve upon or address agricultural water management practices and begin to implement assistance programs.

Staff anticipates some various reasons for “questionable” water usage, see table 2. Staff will work more closely with agricultural customers who continue to have difficulty in watering at near average levels in an effort to resolve any outstanding issues.

**Table 2: Customer Issues and District Response**

Identified Customer Issue	District Response
Unauthorized Expansion	Refer to Section 4.10.2.1 – Requires customer to purchase additional allocation
Inefficient Irrigation issues	Provide assistance: Evaluations, zero percent financing, or expert referrals etc..
Watering outside District	Refer to Section 15.9 – Requires customer to seek approval from Board and to pay higher rate for exported water.
Well no longer working	Provide assistance: zero percent financing
Allocation issues	If allocation is deficient will require the purchase of additional allocation.



### Incentives - Year 3

In the third year, assistance programs will be expanded and incentives will be put in place to further help individual agricultural customers improve upon their water management practices. All additional revenues generated from incentive rates will be reinvested by the District in to providing assistance to agriculture customers.

Some examples of possible incentives or programs include:

- SWEAP program will only change Stage 1 water rates and will not impact the current Allocation program for Stages 2-5.
- Proposed pricing schedule for Stage 1 will be implemented on January 1, 2007, which will encourage water usage efficiency, reliance upon supplemental water use, discourage unauthorized agriculture expansion, delay the implementation of Stages 2-5, and create additional quantifiable water savings that could be placed toward diminishing the District's federal water release requirements for the fish ladder during a water shortage.
- Funds generated from increased pricing will be designated to fund assistance programs such as increasing the availability and type of evaluations, loans, and grants to assist with upgrading irrigation systems or wells.

### Conclusion

Presently, about 36 percent of non-supplemental agriculture customers are using more than 110% of their proposed allocation. SWEAP will work with these customers to identify and resolve their above average water usage issues. It will create incentives to encourage a greater level of water management efficiency for each customer. It is anticipated that a majority of agricultural customers will want to adopt the SWEAP program because it will not unfairly treat those customers who presently conduct efficient water management practices as well as provide a balanced approach to creating greater efficient irrigation practices for the remainder of agricultural customers.

A successful implementation of SWEAP will create greater water use efficiency, more reliance upon supplemental water, discourage unauthorized agricultural expansions, delay the implementation of Stages 2-5, and give the District additional quantifiable water savings that can be placed toward the District's federal water release requirements for the fish ladder during a drought period.