East Valley Water District

YEAR 2005 URBAN WATER MANAGEMENT PLAN

DECEMBER 5, 2005

(Final Version)

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East Valley Water District
2005 Urban Water Management Plan
Contact Sheet

Date plan submitted to the Department of Water Resources:

_____

Name of person preparing this plan:

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Under Direction of:
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The Water supplier is a: Retailer

Utility services provided by the water supplier include: Water, Sewer Collection

Is This Agency a Bureau of Reclamation Contractor? No

Is This Agency a State Water Project Contractor? No

1.0 Public Participation

Law

> 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 … After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

1.1 Public Involvement

The East Valley Water District has considered Community Involvement Programs in the preparation of its prior updates to the Urban Water Management Plan (UWMP), as well as this current year 2005 update. Historically, the level of community interest in the District's affairs has been minimal. Only when rate increases are considered is there any measurable level of public interest. Water conservation measures are not required of the District's customers as long as there is no emergency water shortage. Thus, the customer base has participatory interest only when there are proposed changes to rates or payment policies, or construction of new facilities. An attempt to involve customers in the planning phase of this process was not undertaken as it was determined that the level of interest would be minimal. A public meeting was noticed and held on October 11, 2005 as a part of the Regular Board Meeting, to notify the public of the Plan's findings and request input. Customers or other members of the public were not in attendance.

1.2 Agency Coordination

Law

> 10620 (d) (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.

The East Valley Water District was originally formed as a California County Water District and currently provides domestic water service and sewer collection within the now incorporated City of Highland. The District also provides service to unincorporated areas of the County of San Bernardino as well as a portion of the City of San

Bernardino. Development codes of these two cities, and the County of San Bernardino have some effect on the service requirements of the District. Each agency has a Water Conservation Element, with requirements for low-water use irrigation systems and planting materials, in their development codes. Each of these agencies have review and approval authority for development plans, which must conform to Title 24 regulations prior to the issuance of building permits.

Coordination between planning, building, and fire departments and the District for development review or permit issuance is minimal. “Will Serve” letters from the District are required by all agencies prior to the issuance of building permits. Since all agencies with planning jurisdiction enforce water conservation requirements, this minimal level of coordination is acceptable to the District and does not presently threaten the District’s water supplies for the foreseeable future.

The District receives supplemental water supplies from the San Bernardino Valley Municipal Water District (SBVMWD), a contractor with the State Water Project (SWP). SWP water is either delivered directly to the District’s water treatment plant, or used for groundwater recharge.

Wastewater treatment is provided by a Joint Powers Authority (JPA) that operates a regional plant. The District is a member of the JPA and the regional treatment plant is operated by the City of San Bernardino. The District currently sends about 8.3 MGD of flow to the plant; there is no purchased capacity right and therefore the plant can serve the District’s ultimate needs. The plant is both operated and located in such a manner that the availability of recycled water to the District is currently non-existent.

The development of this plan included early notification and receiving information from the agencies listed below. Letters sent to each agency are included in Appendix A.

1. SBVMWD (wholesaler)

2. San Bernardino Valley Water Conservation District (native surface water recharge agency)

3. County of San Bernardino

4. City of Highland

5. City of San Bernardino

6. City of Redlands

7. Bear Valley Mutual Water Company

Table 1 summarizes the efforts the District has taken to include various agencies and citizens in its planning process.

Table 1
Coordination and Public Involvement

Entities	Coordination and Public Involvement Actions					
	Helped write the plan	**Was contacted for assistance**	**Was sent a copy of the draft**	**Commented on the draft**	**Attended public meetings**	**Was sent a notice of intention to adopt**
Wholesaler		✓	✓	✓		✓
Retailers		✓	✓			✓
Wastewater Agency		✓				✓
General Public			✓			✓
Public Library						✓

1.3 Plan Adoption

The Urban Water Management Planning Act requires that the District make the UWMP available to the public for review and that a public hearing be held, before adopting the Plan. The Board of Directors set a public hearing and noticed the date in the local newspaper. The Plan was made available for public review at the District offices and a public hearing was held on December 13, 2005. This UWMP was adopted by the Board of Directors following the close of the public hearing.

2.0 Supplier Service Area

Law

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

2.1 Climate

The East Valley Water District is located on the eastern side of the San Bernardino Valley and within the South Coast Air Basin. The climate is a modified Mediterranean type, with hot dry summers and cool, rainy, winters. The climate in southern California is modified by the cold California Current in the Pacific Ocean, the mountain ranges that outline the Los Angeles Basin and interior valleys, and the deserts to the north and east. The California Current causes a cold layer of air to form close to the surface. Because the air above this layer is warm, air within it cannot rise normally, a phenomenon known as an inversion.

On the San Bernardino Valley floor, elevations range from approximately 1,000 feet at the southern end to over 2,000 feet at the northeasterly end. North and east of the District boundaries are the San Bernardino Mountains, rising to elevations in excess of 11,000 feet above mean sea level. The San Gabriel Mountains are to the west. Where these two mountain ranges converge is known as the Cajon Pass.

The San Bernardino Valley and Cajon Pass area have winds characteristic of the region, that are consistently driven by a sea breeze/mountain breeze cycle. The daytime and evening on-shore sea breeze is predominantly southwesterly. At night, the mountaintops and ridges cool sooner than the valley, and the cool air sinks. This reverses the flow so the valley has northerly wind in the late night and early morning hours. The frequency of calm winds (less than 2 miles per hour) and inversion layers is minimal in winter and there is little stagnation in the area to trap pollutants. However, in the warmer summer months, strong inversion layers and high amounts of sunlight reacting with compounds in the air can trap and increase the level of pollutants in the area, peaking in the late afternoon.
From fall through spring, Santa Ana winds affect the region. When surface high pressure exists in the Great Basin and the winds at altitude are oriented north to south,

the combination produces strong northerly winds in the San Bernardino Valley. These winds are typically stronger close to the base of the mountains and can reach hurricane strength where they are funneled through canyons. Below the Cajon Pass, maximum winds over 70 miles an hour can be expected during strong Santa Ana conditions.

Average monthly temperature and rainfall recorded by the Western Regional Climate Center (WRCC) for the San Bernardino Station between 1927 and 2004 are shown in Table 2. Temperatures average 65 degrees Fahrenheit, with summer highs in the mid-90's and winter lows in the upper 30's.

Table 2
Climate

	January	February	March	April	May	June
Average ETo	1.55	2.24	3.72	5.1	6.82	7.8
Average Rainfall	3.1	3.45	2.72	1.28	0.38	0.09
Average Temperature (monthly mean)	52.8	54.8	57.1	61.5	66.3	72

	July	August	Sep.	Oct.	Nov.	Dec.	Annual
Average ETo	8.68	7.75	5.7	4.03	2.1	1.55	57.04
Average Rainfall	0.04	0.16	0.34	0.64	1.39	2.49	16.08
Average Temperature (monthly mean)	78.5	78.7	75	67.4	58.9	53.6	64.72

ETo = Reference Evapotranspiration Rate (in inches/month) for ETo Zone 14
Source: NOAA webpage-www.wrcc.dri.edu/CLIMATEDATA.html (1927-2004)
CIMIC webpage: www.cimis.water.ca.gov/cimis/welcome.jsp

Although temperatures change slowly with the seasons, rainfall varies markedly. Precipitation in the basin is associated with the mid-latitude winter storms that migrate inland from the Pacific Ocean. The historic average annual rainfall (as of the 2003-2004 water year) is 16.3 inches, as recorded at the San Bernardino County Hospital, the most representative gage located within the District. This gage has rainfall records dating back to 1883. During the last two decades, the highest rainfall occurred in the 1997-98 water year (32.7 inches) and the lowest occurred in the 2000-2001 water year (2.3 inches). Typical of this pattern, over 90 percent (about 14.5 inches) of the annual rainfall in the area occurs between October and April. The historic average of rainfall in the January through June period is 11.53 inches and the historic average in the July through December period is 5.25 inches (refer to Appendix B – *Summary of Percentage of Normal Precipitation 1982 – 2004 Water Years).*

2.2 History, Service Area, and Demographics

The East Valley Water District was organized in 1954; the name of the District was changed from East San Bernardino County Water District to East Valley Water District (EVWD) in 1982. The District was originally formed to provide domestic water service to

the then unincorporated and agriculture-based communities of Highland and East Highlands. Over the years, some of the District's service area was annexed to the City of San Bernardino, but service remained with the District primarily due to logistics and cost. In 1987, the City of Highland incorporated. The District's previously agriculture-dominated area is now urbanized with few acres remaining in agriculture. Prior to September 20, 2000, the District's service area was approximately 14,750 acres, or 23 square miles. An annexation in September 2000 increased the District's service area by 3,220 acres, or 21.8 percent. In 2003 and 2005, Sphere of Influence (SOI) changes and annexations to the District resulted in a total SOI of 20,471.2 acres and a service area of 19,234.7 acres. The 1,236.5 acres within the SOI that could be annexed, are either in flood control area or within the boundaries of the U.S. National Forest and demand for water service is not likely to occur at any time (see Figure 1: EVWD Service Area and Sphere of Influence Boundaries).

The District currently provides water and sewer service within its service area to an estimated population of 70,319 (based on average household size of 3.04 and residential meter connections added since 2000). The District's 1987 Water Master Plan predicted that the build-out population for the District's existing Sphere of Influence would be approximately 88,500 by the year 2015. During the late 1980's, California and San Bernardino County were experiencing relatively high growth rates and thus population projections were higher for the 1990's than what actually occurred. Current regional growth rates are projected using the Southern California Association of Governments' (SCAG) growth rate for San Bernardino County of 2.4 percent per annum. This growth rate results in a straight line District population projection of 103,343 in 2020 and 117,495 in 2025.

The City of Highland grew from a population of 34,439 in 1990 to 45,178 in 2000 (CA Dept of Finance, U.S. Census); a growth rate averaging 3.1 percent per year. The City's population increased to an estimate of 49,246 in 2004 and is projected to increase by approximately 1.75% per year over the next five years. The City's buildout population, based on current General Plan land use designations is estimated to be approximately 70,000 persons (including recent annexation areas). The District's population was an estimated 61,566 in 2000 and estimated at just over 70,000 for 2005. New residential water service connections have occurred in the City and County of San Bernardino as well as the City of Highland. The ultimate buildout population of the District's service area will be dependent upon the potential for changes to land use designations on undeveloped land, over time. For purposes of this UWMP, a straight-line projected growth rate of 2.4% per year is used, resulting in a final build-out population of 93,687 (based on General Plan land use designations) by 2020. Projections of population based on the 2.4 percent growth rate and a build-out population estimate based on current land uses designations are shown in Table 3 and 4.

Figure 1: East Valley Water District Boundaries

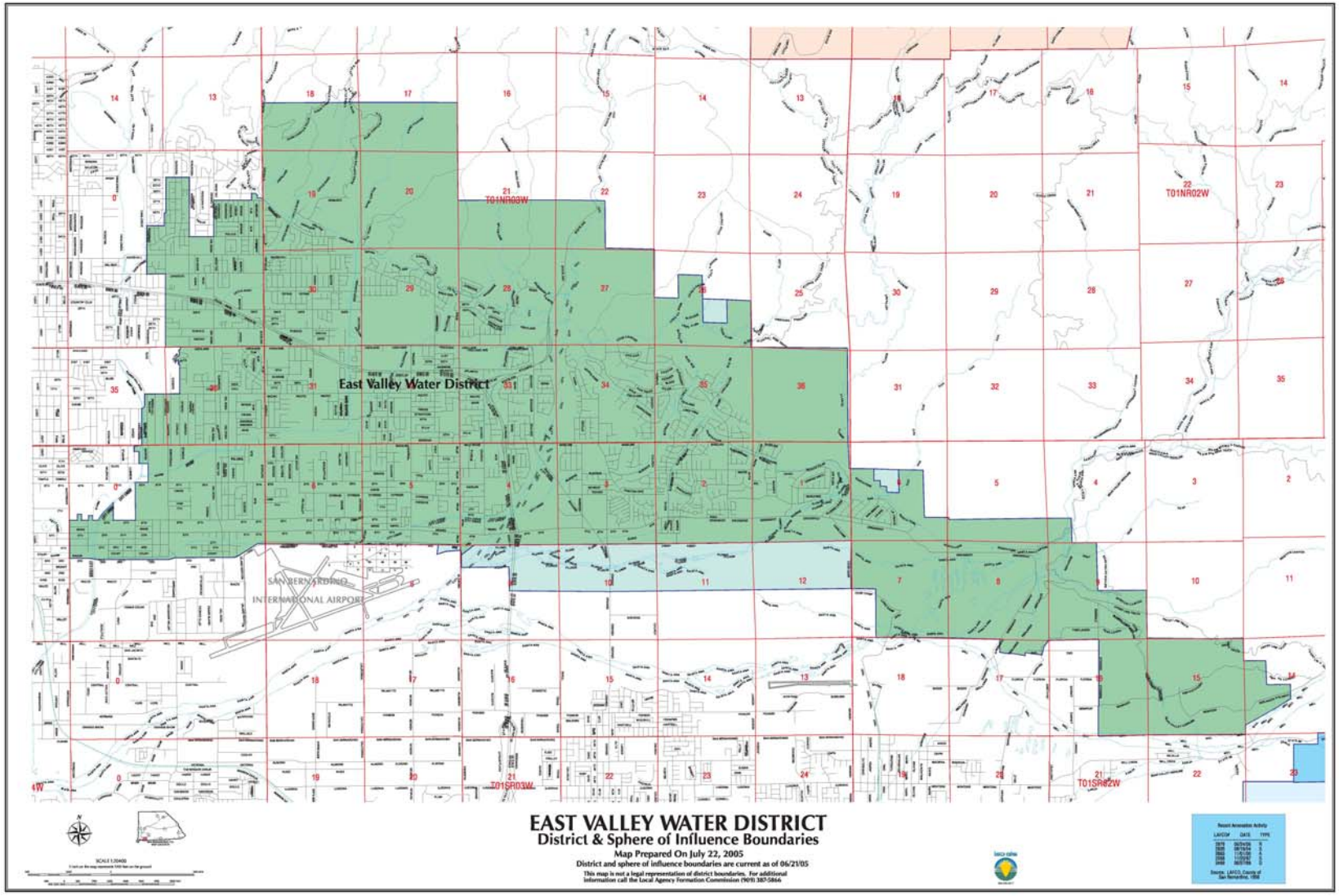


Table 3 Population Projections Based on 2.4 Percent Growth Rate – Straight Line Projection					
	2005	**2010**	**2015**	**2020**	**2025**
Service Area Population	70,319	79,172	89,140	100,363	112,998

Table 4 Population – Projections Based on Build-out Potential with Current Land Use Designations					
	2005	**2010**	**2015**	**2020**	**2025**
Service Area Population	70,319	79,172	89,140	93,687	93,687

The City of Highland estimates its average household size to be 3.04. Should the average household size within the District's service area increase over time, or changes to land use designations occur that result in higher densities, the build out population of 93,687 used for this Plan may be exceeded. The maximum number of dwelling units projected based on land use designations for the Sphere of Influence, in the 1987 Water Supply Plan is 33,400, resulting in a population of 101,536. It is assumed that the planning effort undertaken at that time projected a higher population for the area that was annexed in September 2000. The current projections are also significantly less than estimated in the 1996 UWMP for the Sphere of Influence, but are believed to be more accurate based on current information. Projections beyond the year 2010 will be re-evaluated during the next UWMP planning period.

2.3 Past Drought, Water Demand, and Conservation Information

The District overlies the Bunker Hill Basin where depth to groundwater ranges from 41.8 feet in the northeast of San Jacinto fault to approximately 288 feet southwest of the San Andreas fault in the northeastern portion (Water Year 2003-2004). In the southern portion, depths to groundwater range from 166 in the southwest to approximately 48 feet in the southeast. In March of 1999, the District contracted with Gary S. Rasmussen & Associates to prepare a report for well siting; the following information is taken from that report, entitled *"Assessment of Groundwater Resources for Vertical Well Placement Within the East Valley Water District"* (refer to Appendix A for map of faults and groundwater basins). Groundwater records were researched dating back to a 1905 Mendenhall report. From 1951 to 1977, the Bunker Hill basin was significantly overdrafted. Historic low groundwater conditions occurred throughout the District during the 1960's. Following the years of abnormally high precipitation from 1978 to 1983, groundwater levels rose significantly. Three of the five wettest years on record occurred in this five-year time frame. High groundwater conditions existed with groundwater at or near the surface; static water elevations were at approximately 1,050 feet. During the historic low groundwater conditions between 1963 and 1968, the elevation of

groundwater in the extreme southwest portion of the site was 900 feet. *(Rasmussen, March 1999, pp. 31-32).*

A comparison of current groundwater conditions to historic low conditions indicate that groundwater levels in the central and southwest portion of the District have risen as much as 120 feet since 1968-1999. During that same 30-year period, groundwater levels in the southeast portion of the site have risen as much as 220 feet. This greater increase in groundwater elevations in the southeast portion of the District is considered to be the result of a combination of increased recharge along the Santa Ana River in conjunction with the strong barrier effect produced by Fault K, resulting in a groundwater mound. However, in contrast to most of the area, groundwater levels in the north-central portion of the District have declined up to 250 feet compared with historic low conditions. This decline in levels, northeast of Fault K may be due to a decrease in runoff from local streams and creeks and/or from increased pumping from areas southwest of the San Andreas fault. (*Rasmussen, March 1999, p 33).*

In general, a relative decline in the static groundwater table increases in the central and north-central portions of the District, with the greatest declines occurring in the East Highlands area between Fault K and the south branch of the San Andreas fault. The barrier effect of Fault K is also pronounced in the changed groundwater conditions. Groundwater levels have declined significantly immediately southwest of Fault K, reflecting a flattening of the static groundwater table. Contrary to most of the area, current groundwater conditions in the extreme northwest and southeast portions of the site are at historic high levels. The historically high groundwater conditions in these portions of the site are expected to be due to significant recharge to the groundwater table from percolation basins in the north and east (below Waterman Canyon, along East Twin Creek, and the Santa Ana River), in conjunction with the barrier effect produced by Fault K (*Rasmussen, March 1999, p 33).*

Change in groundwater storage for the San Bernardino Basin area is modeled by several water agencies, with historic data available for evaluating trends and forecasting periods when supplemental water may be needed. The following information in taken from a report entitled *"Change in Groundwater Storage for the San Bernardino Basin Area, Calendar Years 1934 – 2003*", prepared by the San Bernardino Valley Municipal Water District and dated May 2004. The first ("historic") calculation of changes in storage for the years 1934 – 1960 were summarized in the California Department of Water Resources Bulletin 104-5, Meeting Water Demands in the Bunker Hill-San Timoteo Area, Geology, Hydrology, and Operation-Economics Studies, Text and Plates. In 1980, the SBVMWD updated the change in storage calculation to include the years 1961 – 1980. In the early 1990's a new model was developed, and the change in storage is now calculated annually *(SBVMWD, May 2004, p 3).*

The cumulative change in groundwater storage is a measure of the volume of water lost or gained in the San Bernardino Basin Area as compared to the base year of 1934. The annual change in storage is simply a measure of the volume of water lost or gained in the basin during a year. For calendar year 2003, the calculated cumulative change in

storage was a decrease of 322,976 acre-feet and the annual change in storage for 2003 was 6,949 acre-feet during 2002-2003. Between 1999 and 2003, the volume of water in the San Bernardino Basin has decreased by 379,044 acre-feet. This decrease in the cumulative change in storage since 1998 is due to the increase in groundwater production associated with the below average precipitation over the past few years. These dry conditions have caused water agencies to rely more heavily on the basin during the winter months. Figures 2 & 3 show the cumulative and annual change in storage for the years 1934 – 2003 *(SBVMWD, May 2004).*

The East Valley Water District overlies the City Creek sub-basin, which showed the largest annual change (increase) in storage for 2003. The large increase can likely be attributed to: (a) the large specific yield values (pore space available for water storage) in the sub-basin; (b) the reduction in well production due to relatively "wet" conditions over the past ten years; (c) the natural recharge associated with the "wet" conditions; and (d) the artificial recharge of 10,707 acre-feet along the Santa Ana River *(Engineering Investigation, Bunker Hill Basin, 2004-2005).*

During the 1980's and 1990's, the local region experienced drought periods (less than 85 percent of average precipitation) in water years 1983-85, 1987-90, 1994, and 1996 (refer to Appendix A*)*. Most recently, the years 1998-2004 had more severe drought conditions with an average rainfall of 12 inches (60% of normal). The lowest rainfall during that period occurred in 2000-2001 measuring 2.4 inches and highest was 17.1 inches occurring in 2002-2003. The District met its customers' needs during these drought periods through careful conjunctive management of groundwater and surface water supplies, and by purchasing imported water for direct delivery to the Philip A. Disch Surface Water Treatment Plant (Plant 134). Five wells had to be lowered to continue groundwater extraction during this period, but well capacities were not affected. The San Bernardino Basin area continues to provide for a reliable source of groundwater to meet the District's water supply needs because the estimated water in storage in the Bunker Hill Basin (see Section 3.0). At no time has a water shortage been declared as a result of drought conditions.

Figure 2: Cumulative Change in Storage for the San Bernardino Basin Area

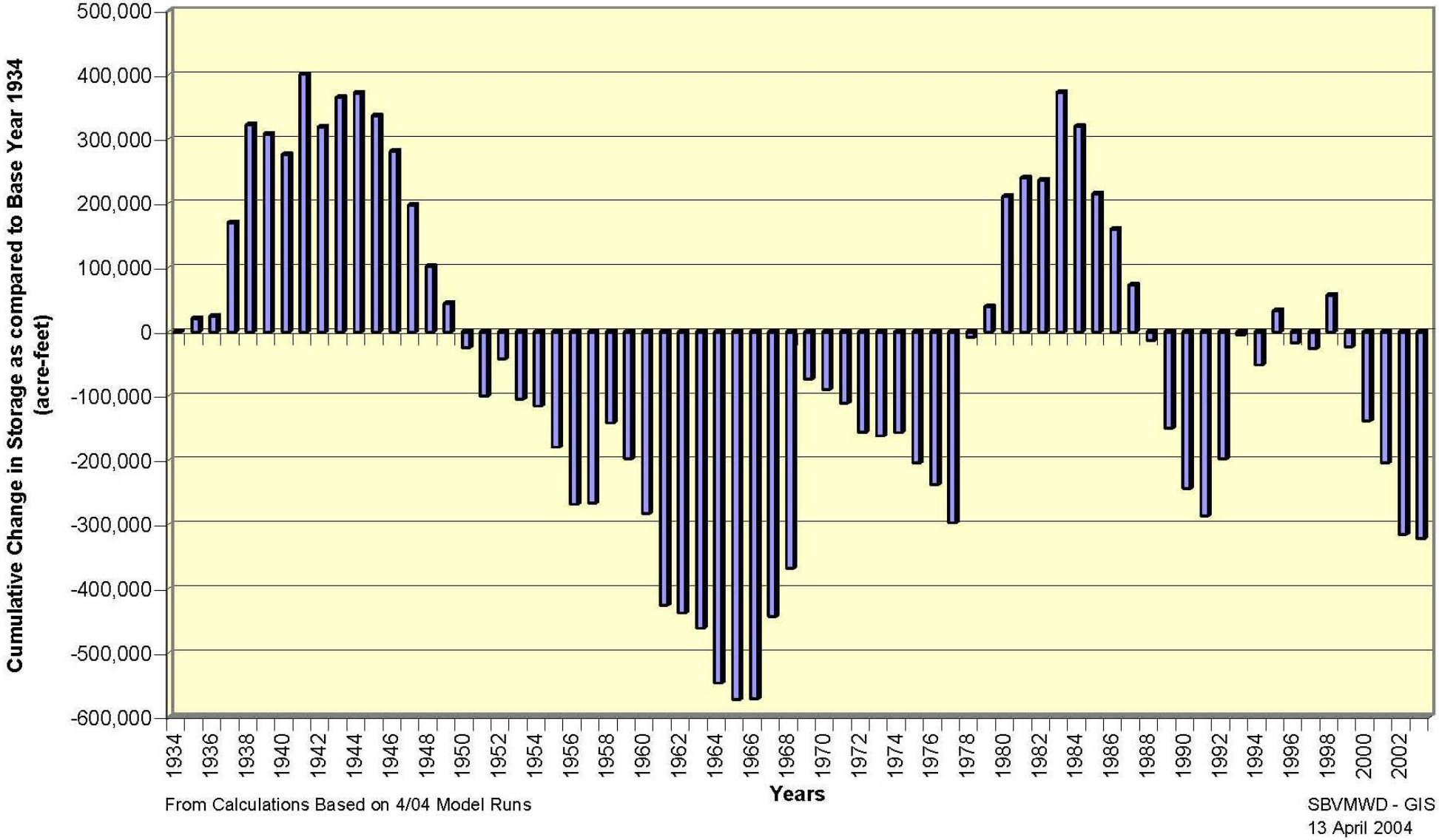
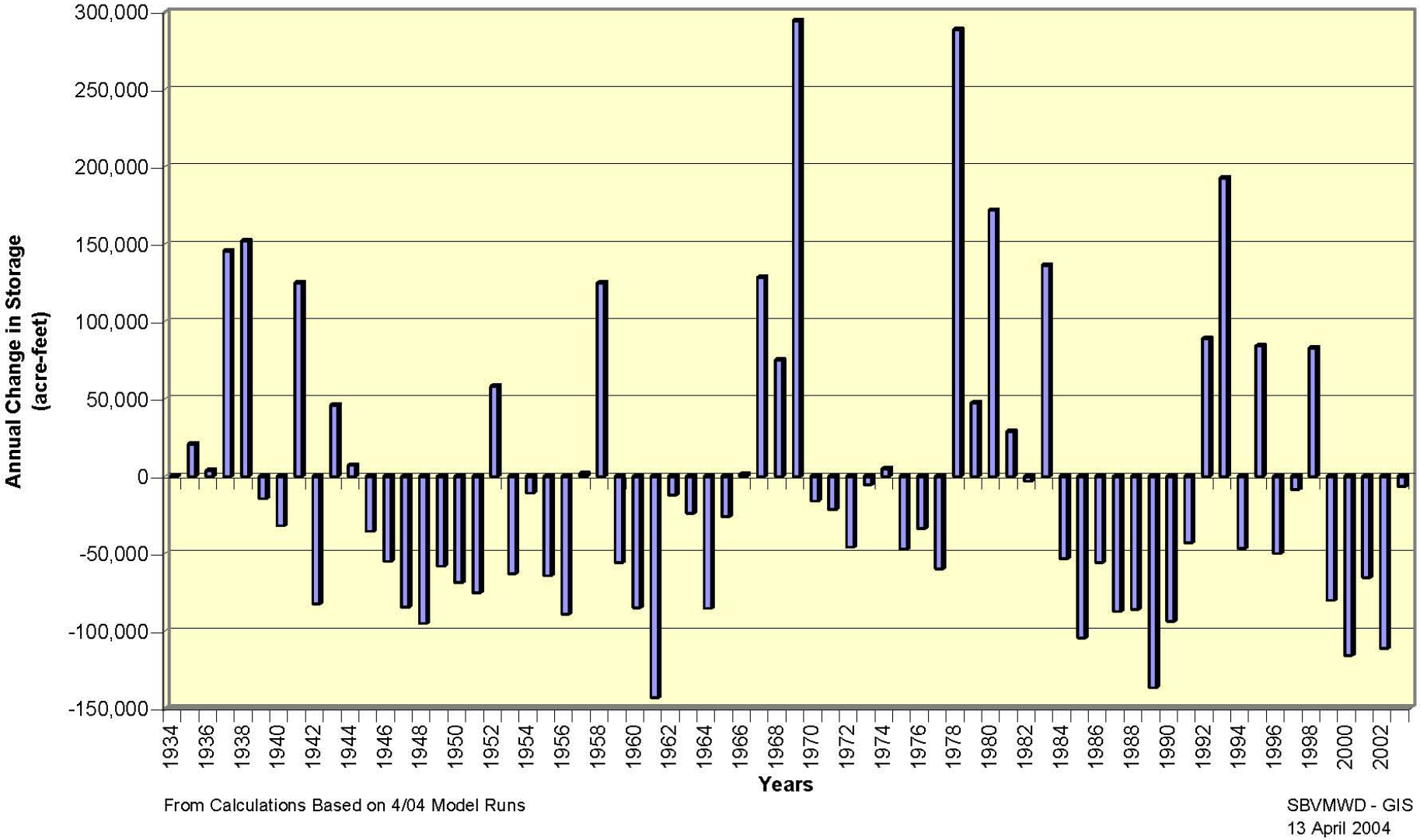


Figure 3: Annual Change in Storage for the San Bernardino Basin Area



3.0 Water Sources (Supply)

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (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 [to 20 years or as far as data is available.]

3.1 Water Supply Sources

The District lies within the Bunker Hill Basin, overlying an aquifer with an estimated 5,000,000 acre-feet of groundwater in storage. The Santa Ana River (SAR) flows through the basin; its headwaters are to the northeast, originating in the San Bernardino Mountains and running southwesterly through the District to the Pacific Ocean. There are four tributaries to the SAR that provide surface flows within the District.

The District presently derives approximately 92 percent of its water supply from 19 groundwater wells currently active and located generally at lower elevations within the District's service area. The wells range from 90 – 470 feet in pumping depth and from 700 – 3,000 gallons per minute (gpm) in capacity. The total rated capacity of these 19 wells is 38.74 million gallons per day (MGD), or 43,395 acre-feet per year. All of these wells were operated during the 1996 –2004 period to meet non-irrigation user demands. The wells in general have provided a stable source of water supply. Past records show that the District has not removed any well from its supply source during drought conditions, although, some wells had to be lowered to continue extraction of ground water.

Groundwater throughout various locations in the Bunker Hill Basin is subject to quality problems resulting from past land uses and drinking water regulations for naturally-occurring organic minerals. The District has two wells (27 and 41) that are currently inactive due to contaminant levels exceeding the Maximum Contaminant Levels (MCLs) for drinking water. Well Number 41 which is currently off-line, may not be functional in the future due to current high levels of nitrate contamination and is therefore not considered as a future source of water in this plan. Well Number 27 is expected to be active in early 2006, with a rated capacity of 800 gpm. The District is currently planning to construct two additional wells (PL 132-5 upgrade of PL 132-2 @ 1,200 GPM and PL 151 @ 2,300 GPM) that will increase total capacity by approximately 5 MGD, or 5,646 acre-feet per year by the year 2007. The projected total well capacity by the Year 2010 will be 49,041 acre-feet per year (all wells pumped at maximum capacity 24 hours/day).

Shown in Table 5 is the total annual production of the District (exclusive of water sales and purchases) as reported to the State Department of Health Services. The five-year period of 2001-05 shows an average of 22,159 acre-feet per year and the ten-year period of 1996 – 2005 shows an average annual production of 21,961 acre-feet.

Table 5
EVWD System Production 1991-2005

Year	Million Gallons	Acre-Feet
1991	6,219	19,087
1992	6,308	19,359
1993	6,457	19,817
1994	6,598	20,248
1995	6,642	20,383
1996	7,113	21,830
1997	7,325	22,479
1998	6,876	21,101
1999	6,986	24,190
2000	8,150	25,012
2001	8,117	24,910
2002	8,210	25,195
2003	8,152	25,017
2004	8,644	26,528
2005	8,399	25,776*
5-Year Average	7,417	22,159
10-Year Average	7,280	21,961

Source: Annual Report to the Drinking Water Program for Large Water Systems Submitted by EVWD.

*2005 Estimated for Last Quarter

The Bunker Hill Basin is adjudicated on a safe yield basis. The District therefore has the opportunity to develop additional wells and over-extract groundwater under specified conditions contained in the stipulated judgment. Groundwater replenishment occurs through natural and artificial recharge. One agency that performs artificial recharge with local native surface waters is the San Bernardino Valley Water Conservation District (Conservation District). The Conservation District diverts Santa Ana River water and Mill Creek water for direct recharge into basins lying easterly and upstream of East Valley Water District. The amount of surface water recharged annually by the Conservation District over the past 30 years has averaged 24,728 acre-feet of Santa Ana River water and 11,145 acre-feet of Mill Creek. The SBVMWD also performs artificial recharge throughout its service area and in the Bunker Hill Basin.

The District has two means of utilizing State Project Water (SPW) – via groundwater replenishment and via direct delivery to the Surface Water Treatment Plant. Santa Ana Surface water is conveyed to the plant via the North Fork Canal. State Project Water is

delivered via a direct connection to the SBVMWD's pipeline and/or a connection to the North Fork canal.

Construction of a 4.0 MGD water treatment plant (Plant 134) was completed in 1996. Plant 134 was designed to treat Santa Ana River water and State Project Water, and will eventually be expanded to 8.0 MGD in the near future. At completion of the plant expansion, the District will have the potential to use only SPW for the plant's water supply, leaving Santa Ana River water available for a future surface water treatment plant. The District has current water rights of 4 MGD of Santa Ana River water with the ability to expand to over 7 MGD with the conversion of remaining agricultural properties and water shares of stock. The District holds rights to direct delivery of native surface water, through stock ownership in the North Fork Mutual Water Company (North Fork MWC). The District is currently the major shareholder in the company and continues to pursue the purchase of additional shares.

The SBVMWD is a State Contractor for State Project Water, with an annual entitlement of 102,600 acre-feet. The SBVMWD has imported State Project Water to meet the demands of its retailers since 1972. The amount of water imported to the Bunker Hill Basin during the past 15 years is shown in Table 6. These amounts of water were imported for both direct deliver and artificial recharge.

Table 6
SPW Imported to Bunker Hill Basin by SBVMWD

Calendar Year	Acre-Feet	Million gallons
1990	18,831	6,136
1991	3,661	1,193
1992	3,358	1,094
1993	4,361	1,421
1994	9,135	2,977
1995	696	227
1996	6,064	1,976
1997	9,654	3,146
1998	1,878	612
1999	13,097	4,268
2000	19,107	6,226
2001	27,056	8,816
2002	72,183	23,521
2003	28,785	9,380
2004	38,974	12,700

Table 7 shows the amount of SPW the District has taken direct delivery of since the Philip A. Disch Surface Water Treatment Plant came on-line.

Table 7 SPW Direct Delivery to District Plant 134	
Calendar Year	**Acre-Feet**
1996	844
1997	1630
1998	185
1999	2544
2000	0
2001	0
2002	0
2003	941
2004	1834

A summary of all sources of water available to the District is shown in Table 8. Current available well capacity is shown as groundwater; inter-tie capabilities exists for emergency purposes, as discussed in Chapter 4.0 and are estimated herein as net zero; local surface water is stockholdings in North Fork MWC; and 2.5 percent of the SBVWMD's entitlement to SPW is estimated for direct delivery to the treatment plant. The District in its effort to minimize dependence on State Project Water has assumed minimum future deliveries from the State in estimating future supplies. As shown later in this Plan, the District has the ability to meet demands with no reliance on SPW.

Table 8 Current and Planned Water Supplies - AFY					
Water Supply Sources	**2005**	**2010**	**2015**	**2020**	**2025**
Imported SPW (from SBVMWD) [1]	4,481	8,961	8,961	8,961	8,961
Supplier produced groundwater	43,395	49,041	49,041	49,041	49,041
Surface water (potable) [2]	4,481	4,481	7,841	7,841	7,841
Exchanges In or out	0	0	0	0	0
Total	***52,357***	***62,483***	***65,843***	***65,843***	***65,843***

Notes:
1) Assumes increased purchases for water treatment plant.
2) Water rights to Santa Ana River.

3.2 Recycled Water

The District provides sewage collection service to its customers. Wastewater treatment is provided by a regional wastewater treatment plant, located downstream and outside of the District's sphere of influence. A Joint Powers Agreement (JPA) was reached in 1957 between the East Valley Water District and the neighboring City of San Bernardino for the City to treat all sewage generated within the East Valley Water District service

area. Consequently, the District is not responsible for the disposal of treated wastewater and cannot implement a Water Reclamation Plan. The San Bernardino Regional Wastewater Treatment Plant, however, does address wastewater reclamation and reuse as a condition of its federal grant. An average day demand of approximately 7.3 MGD of sewage is collected by the District and treated at the regional plant.

In 1995, the City of San Bernardino began operation of a Rapid Infiltration/Extraction Tertiary Treatment System (RI/X) to provide treatment of up to 41.0 MGD of secondary effluent from the existing plants of the City of San Bernardino and the City of Colton. A JPA was formed for operation of this regional tertiary plant; the District is a member through its JPA with the City of San Bernardino. The RI/X plant is located approximately six miles westerly and downstream of the District's western-most boundary.

The JPA responsible for the RI/X plant actively pursues markets for the tertiary water as a means of reducing the demand for local groundwater supply. The location of the plant makes providing water to customers upstream of the plant (e.g. the East Valley Water District) cost-prohibitive. Therefore, no recycled water is estimated as a potential future supply for the District to meet its demands.

4.0 Reliability Planning

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.
>
> 10631 (c) 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 replace that source with alternative sources or water demand management measures, to the extent practicable.
>
> 10631 (c) Provide data for each of the following: (1) An average water year, (2) A single dry water year, (3) Multiple dry water years.
>
> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (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.

4.1 Reliability

The costs of demand management or supply augmentation options to reduce the frequency and severity of shortages are now high enough that planners must look more carefully at the costs of unreliability to make the best possible estimate of the net benefit of taking specific actions, hence the term “reliability planning.” Reliability is a measure of a water service system’s expected success in managing water shortages.

To plan for long-term water supply reliability, planners examine an increasingly wide array of supply augmentation and demand reduction options to determine the best courses of action for meeting water service needs. Such options are generally evaluated using the water service reliability planning approach. In addition to climate, other factors that can cause water supply shortages are earthquakes, chemical spills, and energy outages at treatment and pumping facilities. City planners include the probability of catastrophic outages when using the reliability planning approach.

Reliability planning requires information about: (1) the expected frequency and severity of shortages; (2) how additional water management measures are likely to affect the frequency and severity of shortages; and (3) how available contingency measures can reduce the impact of shortages when they occur.

4.2 Frequency and Magnitude of Supply Deficiencies

As previously shown, the District currently has several reliable sources of water supply. Conditions affecting the District's supplies have previously occurred in two areas:

- Cut-backs to SPW entitlements
- Groundwater contaminants exceeding MCLs

The District currently supplements its local supply with State Project Water deliveries to meet less than 10 percent of its total demand; some years there is no need for State Project Water. During times of State-wide drought conditions, the availability of SPW may be reduced. These conditions are normally known in advance, providing the District with the opportunity to plan for no available SPW. To date, these conditions have not resulted in a deficiency of total available supply to the District.

Contamination of local groundwater supplies has been a known condition in the Bunker Hill Basin since the early 1980's. To date, the District has not been able to use several wells due to contaminant levels exceeding MCLs for PCE, nitrates, or fluoride. As needed, water from other wells, or exchanges with other agencies (through inter-ties) are activated for blending to meet MCLs and water demands. At no time has the occurrence of wells being out of service due to groundwater contamination resulted in a deficiency of total available supply.

4.3 Plans to Assure a Reliable Water Supply

The District's available groundwater supply currently exceeds current and projected demands. However, realizing that future conditions could occur that may simultaneously impact more than one source of supply, the District has plans to increase its available groundwater supplies as needed to replace sources no longer available due to water quality constraints or drought conditions. The options of drilling new wells and constructing well-head treatment facilities are being and will continue to be actively pursued and budgeted for. The District has plans to drill two additional wells, raising the total capacity by approximately 5 MGD, or 5,646 acre-feet per year. These wells will both be on-line prior to the year 2010.

Over the past fifteen years, the District has experienced problems with groundwater contamination resulting from previous operations of the military and industrial facilities. Currently, three wells have contaminant levels exceeding MCLs. Studies of the movement of groundwater plumes of contamination are indicating that in time, these wells may again meet MCLs as the contaminants are treated or move downgradient. Such movement however threatens other wells within the District's system.

Groundwater treatment is an economically viable alternative for the treatment of volatile organic compounds (VOCs), nitrates, and uranium; the District's primary contaminant problem is nitrates. The capital and operational costs of well development compared to the cost of groundwater treatment facilities for VOCs and nitrates indicate that the development of groundwater treatment facilities is currently a cost-effective means of attaining additional water supply. However, the District is continuing to install new wells for additional water supply.

To manage the long-term potential for continued groundwater contamination, the District has an on-going land acquisition program. Agreements are also in place for the leasing of lands to develop new wells, reservoirs, and booster pump stations. Sites are selected for the development of new wells based on knowledge of the plumes' movement, land availability and engineering feasibility.

4.4 Reliability Comparison

Table 9 discusses the supply reliability during the historic single and dry water years. The climatic data for water year 2002-03 closely relates to the normal or average water conditions. This year is therefore considered as the normal water year for purposes of analysis in this report. The historic records indicate that the period between 2000-2002 was the multiple-dry-water years. The data shown below are based on a single dry year having a 25% reduction in supply and each of the multiple dry years having a 15% reduction. Only groundwater sources of supply are shown.

Table 9
Groundwater Supply Reliability - AF Year

		Multiple Dry Water Years (Water Year)		
Average / Normal Water Year (2003)	**Single Dry Water Year 2002**	**2000**	**2001**	**2002**
43,395	32,546	36,886	36,886	36,886
% of Normal	25%	15%	15%	15%

4.5 Three Year Minimum Water Supply

The driest three-year historic sequence that has recently occurred was water years 1999-2000 through 2001-2002 (refer to Appendix A). In 2002, the District had 19 production wells and associated pumping facilities with a total rated capacity of 38.74 MGD, or 43,395 acre-feet per year. Table 10 shows the District's water supply (based on Table 9) and water use (as metered) during this multiple-year dry period.

Table 10 District Water Supply and Demand During Multiple Dry Water Years		
YEAR	**SUPPLY**	**DEMAND (Deliveries)**
2000	36, 886	21,646
2001	36, 886	21,646
2002	36, 886	19,854
Unit of Measure: Acre-feet/Year		

During this period, and during the 1977 driest year on record for the State, the District was impacted only by lowered groundwater levels and increased pumping costs. The District had full capability to use all non-contaminated wells within its system, as well as relying on reduced local surface water and imported water supplies.

For the purpose of this plan, Table 11 estimates all available water supplies reduced during drought conditions. The water supply projections consider a 15 percent reduction in the water available from various groundwater and surface water resources. The normal year supplies total 47,303 acre-feet of water including imported State Project Water; a 15 percent reduction decreases the supply to 40,208 acre-feet. Available water supplies during normal and drought conditions are compared to the water demand each year in Chapter 6.

Table 11 Three-Year Estimated Minimum Water Supply - AF Year				
Source	**Normal (2003)**	**Year 1**	**Year 2**	**Year 3**
State Project Water Purchased from SBVMWD	941	800	800	800
Exchanges/Transfers	-	-	-	-
Groundwater Production	43,395	36,886	36,886	36,886
Local surface water	2,967	2,522	2,522	2,522
Total	47,303	40,208	40,208	40,208

4.6 Transfer or Exchange Opportunities

Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The District has emergency water supply interties to two adjacent water purveyors (the City of San Bernardino and the City of Riverside) to meet needs during periods of

lowered groundwater levels (see Table 12). The intertie at Plant 107 also provides water that the District uses for a blending source to reduce nitrate levels and maintain a source of production. Water is exchanged frequently (through Plant 11A and Plant 107) with the City of San Bernardino. The District and the City exchange water annually, averaging approximately 750 acre-feet per year. The District exchanges water with the City at rates that currently net zero additional supply.

Table 12
Transfer and Exchange Opportunities - AF Year

Transfer Agency	Transfer or Exchange	Short Term Proposed Quantities	Long Term Proposed Quantities
City of San Bernardino (107)	Water to EVWD	750	1000
City of San Bernardino (11A)	Water from EVWD	(750)	(1000)
Total		0	0

The District also maintains an intertie system with several other adjacent water agencies for mutual aid purposes used infrequently for emergency purposes and are currently not accounted for as additional water supply.

5.0 Water Use Provisions

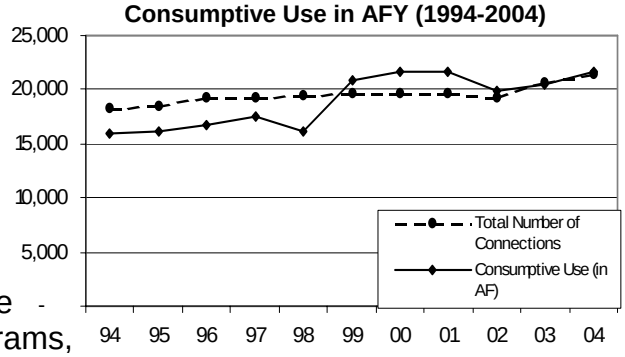
Law

> 10631. A plan shall be adopted in accordance with this chapter and shall do all of the following:
>
> 10631 (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; and (I) Agricultural.
>
> (2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

5.1 Past, Current and Projected Water Use

All of the District's non-agricultural customers are metered; therefore water use is determined by meter records that are read and entered monthly. Meter readings include source meters as well as customer meters. The District meters and records the water use for the categories that include single-family meters, multi-family meters, commercial, landscape and others. Since the year 2002, multi-family meters are incorporated in the single-family meter classification. There are no industrial users; the few light industrial users are included with commercial as well as the few governmental/institutional water users.

Figure 4: Number of Metered Connections and Consumptive Use in AFY (1994-2004)



The active service meters in 2004 totaled 21,462**.** In 1995, active meters totaled 18,447. Since 1995, new connections have been added at an average rate of about 1 to 1.5 percent per year. The average growth rate of the meters in all the sectors has been 1.3 percent per year (figure 4). With new plumbing efficiency standards, landscape guidelines, and other conservation programs,

metered water use has increased by 3 percent per year between 1994 and 2004. Table 13 illustrates Past, Current, and Projected Water Use (2000 – 2025) by number of meters and water use in acre-feet per year.

Table 13
Past, Current and Projected Water Deliveries

	2000		2005		2010	
	metered		metered		metered	
Water Use Sectors	**# of accounts**	**Deliveries AFY**	**# of accounts**	**Deliveries AFY**	**# of accounts**	**Deliveries AFY**
Single family [a]	15,949	11,845	19,302	18,240	21,732	20,537
Multi-family	950	4,125	0	0	0	0
Commercial [b]	2,525	2,142	2,884	2,447	3,247	2,755
Industrial	0	0	0	0	0	0
Institutional/gov	0	0	0	0	0	0
Landscape	211	1,489	241	1,701	271	1,915
Agriculture	0	0	0	0	0	0
Other [c]	1	2,045	1	2,336	1	2,630
Total	19,636	21,646	22,428	24,724	25,251	27,837

Table 13 (continued) Past, Current and Projected Water Deliveries

	2015		2020		2025	
	metered		metered		metered	
Water Use Sectors	**# of accounts**	**Deliveries AFY**	**# of accounts**	**Deliveries AFY**	**# of accounts**	**Deliveries AFY**
Single family [a]	24,468	23,123	25,716	24,302	25,716	24,302
Multi-family	0	0	0	0	0	0
Commercial [b]	3,656	3,102	3,842	3,260	3,842	3,260
Industrial	0	0	0	0	0	0
Institutional/gov	0	0	0	0	0	0
Landscape	306	2,156	321	2,266	321	2,266
Agriculture	0	0	0	0	0	0
Other [c]	1	2,961	2	3,112	2	3,112
Total	28,430	31,341	29,881	32,940	29,881	32,940

[a] Multi-family included in Single-family as of 2002.
[b] Includes 1,084 (1999) fire services for residential accounts. Between 1991 and 1999 phased from residential to commercial.
[c] Other category is no longer used except for Plant 11A which is water sold Wholesale to Others.

Note: Meter service growth rate is same as projected population growth rate (2.4%/annum 2000-2015; 1%/annum 2016-2020)

Table 14 shows the total unaccounted water losses which been estimated to be about 10 percent of total production. These losses result from leaks in the pipes and inaccuracy in meter reading. The net water consumption in the District is projected to be 26,963 acre-feet per year in 2005 and increasing to 35,923 in year 2020, which is also assumed to be the build-out year with no future population growth (see table 15).

Table 14
Additional Water Uses and Losses - AF Year

Water Use	2000	2005	2010	2015	2020	2025
Unaccounted-for system losses ***(10% of total supply)***	391.5	2,238.8	2,520.7	2,838.0	2,982.8	2,982.8
Total	391	2,239	2,521	2,838	2,983	2,983

Table 15
Total Water Use - AF Year

Water Use	2000	2005	2010	2015	2020	2025
Total of Tables 12, 13, 14	24,091	26,963	30,357	34,179	35,923	35,923

5.2 Residential Sector

Approximately 80 percent of the District's metered customers are residential. The land use development trend within the District's service area has historically been from agriculture to residential. Therefore, a continuing increase in residential customers is expected.

The 1996 UWMP reported that the average consumptive use within the District had been declining and was then about 232 gallons per capita per day (gpcpd). Based on the year 2004 metered data, average daily use was approximately 178 gpcpd, which can be attributed to a wet fall/winter of 2004.

The total residential water use estimated for year-end 2005 is 6,289.4 million gallons (18,240 acre-feet). This represents 80.5 percent of the total metered water use; 59.43 percent being single-family and 21.1 percent being multi-family.

5.3 Commercial Sector

The number of commercial meters reported by the District includes fire service meters that are at both residential and commercial properties. These meters are only used for testing and during the event of a structure fire; metered flow is therefore incidental. The commercial water use reported is therefore applied to approximately 1,275 actual water users. These include retail, services, and restaurants. Schools and public buildings are also included in the commercial meter classification. These customers represent 12 percent of the current total metered services and 10 percent of total consumptive use.

5.4 Landscape/Recreational Sector

The District's Irrigation/Landscape customers represent approximately 1 percent of the current metered services and 7 percent of the consumptive water use. These customers include parks, large commercial, community and institutional landscape areas, and schools.

5.5 Agricultural Sector

The agricultural sector of the District is diminishing and expected to become a minimal water user within the next ten years. These customers are not metered and receive delivery of North Fork water through a system of canals. In time, with the continued conversion of land uses, the District anticipates that the ownership of North Fork MWC stock will all be treated at the Philip A. Disch Surface Water Treatment Plant (or other future treatment plants) and used as part of the supply to meet residential demands.

6.0 Supply and Demand Comparison Provisions

Law

> 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 the state, regional, or local agency population projections within the service area of the urban water supplier.

6.1 Supply and Demand Comparison

Tables 16 through 18 compare current and projected water supply and demand. The projections indicate that in average precipitation years, the District has sufficient water supply to meet its customers' needs, through 2025.

Table 16
Projected Normal Water Supply - AF Year

(from table 8)	2010	2015	2020	2025
Supply	62,483	65,843	65,843	65,843
% of year 2003	144%	152%	152%	152%

Table 17
Projected Normal Water Demand – AF Year

(from table 15)	2010	2015	2020	2025
Demand	30,357	34,179	35,923	35,923
% of year 2003	149%	168%	176%	176%

Table 18 Projected Supply and Demand Comparison - AF Year				
	2010	**2015**	**2020**	**2025**
Supply totals	62,483	65,843	65,843	65,843
Demand totals	30,357	34,179	35,923	35,923
Difference	32,125	31,663	29,920	29,920
Difference as % of Supply	51%	48%	45%	45%
Difference as % of Demand	106%	93%	83%	83%

Tables 19 through 21 show the impact on the District's supplies and ability to meet demands during a single dry year period between 2010 and 2025. The single and multiple dry years reduction in supply estimates are as presented in Chapter 4.0; The years for the multiple-year demand projections are between 2005 – 2025 as shown in Tables 22 through 33.

Table 19 Projected Single Dry Year Water Supply - AF Year				
	2010	**2015**	**2020**	**2025**
Supply	46,862	49,382	49,382	49,382
% of projected normal year 2003	108%	114%	114%	114%

Table 20 Projected Single Dry Year Water Demand – AF Year				
	2010	**2015**	**2020**	**2025**
Demand	27,727	31,218	32,486	32,811
% of projected normal year 2003	136%	153%	159%	161%

Table 21 compares the effect of single dry year period occurring between 2010 and 2025 on water supply and demand, assuming reduction of available resources by 25 percent of normal. This analysis demonstrates that such reductions in supply will still provide sufficient amount of water to meet the demand. Even with the projected reduced supplies, the District would have approximately 17,762 acre-feet of surplus water on an average, in each of the dry water years. Such supply reductions could occur during in an extended drought condition or as a result of discovering additional wells affected by groundwater contamination.

Table 21 Projected Single Dry Year Supply and Demand Comparison - AF Year				
	2010	**2015**	**2020**	**2025**
Supply totals	46,862	49,382	49,382	49,382
Demand totals	27,727	31,218	32,486	32,811
Difference	19,135	18,164	16,896	16,571
Difference as % of Supply	40.8%	36.8%	34.2%	33.6%
Difference as % of Demand	69.0%	58.2%	52.0%	50.5%

The following tables (Tables 22 through 33) consider the supply-demand analysis for multiple dry water years from 2005-2025. The underlying assumption is a 15 percent reduction in the supply of water from the normal precipitation years.

During 2006-2009, the water available with a 15 percent reduction is estimated to be 44,503 acre-feet per year (see Tables 22 through 25). With the addition of new wells in 2010, the available supply after reduction would be 53,110 acre-feet. Customer demands are projected to be 52 percent of the total supply in 2010.

Table 22
Projected Supply During Multiple Dry Year Period Ending in 2010 - AF Year

	2006	2007	2008	2009	2010
Supply	44,503	44,503	44,503	44,503	53,110
% of projected normal year 2003	103%	103%	103%	103%	122%

Table 23
Projected Demand Multiple Dry Year Period Ending in 2010 - AFY

	2006	2007	2008	2009	2010
Demand	25,218	25,823	26,443	27,078	27,727
% of projected normal year 2003	124%	127%	130%	133%	136%

Table 24
Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2010- AF Year

	2006	2007	2008	2009	2010
Supply totals	44,503	44,503	44,503	44,503	53,110
Demand totals	25,218	25,823	26,443	27,078	27,727
Difference	19,285	18,680	18,060	17,425	25,383
Difference as % of Supply	43.3%	42.0%	40.6%	39.2%	47.8%
Difference as % of Demand	76.5%	72.3%	68.3%	64.4%	91.5%

A similar trend would continue between 2011 and 2015. The available water supplies are estimated to remain constant at 53,110 acre-feet per year between 2011 and 2014. The District would have surplus supplies of 23,893 acre-feet per year on an average.

Table 25
Projected Supply During Multiple Dry Year Period Ending in 2015 - AF Year

	2011	2012	2013	2014	2015
Supply	53,110	53,110	53,110	53,110	55,966
% of projected normal year 2003	122%	122%	122%	122%	129%

Table 26
Projected Demand Multiple Dry Year Period Ending in 2015 – AF Year

	2011	2012	2013	2014	2015
Demand	28,393	29,074	29,772	30,487	31,218
% of projected normal year 2003	139%	143%	146%	150%	153%

Table 27
Projected Supply and Demand Comparison During Multiple Dry Year Period
Ending in 2015- AF Year

	2011	2012	2013	2014	2015
Supply totals	53,110	53,110	53,110	53,110	55,966
Demand totals	28,393	29,074	29,772	30,487	31,218
Difference	24,717	24,036	23,338	22,624	24,748
Difference as % of Supply	46.5%	45.3%	43.9%	42.6%	44.2%
Difference as % of Demand	87.1%	82.7%	78.4%	74.2%	79.3%

The slower growth rate expected in the City of Highland between 2016-2020 would impact the demand for water. The District's projected surplus water supply would be between 23,480 acre-feet per year and 24,748 acre-feet per year (see Tables 28 through 30).

Table 28
Projected Supply During Multiple Dry Year
Ending in 2020 - AF Year

	2016	2017	2018	2019	2020
Supply	55,966	55,966	55,966	55,966	55,966
% of projected normal year 2003	129%	129%	129%	129%	129%

Table 29
Projected Demand Multiple Dry Year Period
Ending in 2020 – AFY

	2016	2017	2018	2019	2020
Demand	31,218	31,531	31,846	32,164	32,486
% of projected normal year 2003	153%	155%	156%	158%	159%

Table 30
Projected Supply and Demand Comparison During Multiple Dry Year Period
Ending in 2020- AF Year

	2016	2017	2018	2019	2020
Supply totals	55,966	55,966	55,966	55,966	55,966
Demand totals	31,218	31,531	31,846	32,164	32,486
Difference	24,748	24,436	24,120	23,802	23,480
Difference as % of Supply	44.2%	43.7%	43.1%	42.5%	42.0%
Difference as % of Demand	79.3%	77.5%	75.7%	74.0%	72.3%

The demand for water is assumed to be constant between 2021 and 2025 as it is expected that the City of Highland would reach its build-out population in 2020. The available water supply for the District would be 55,966 acre-feet per year. The District would have sufficient supplies to meet the projected water demand of 32,811 acre-feet per year.

Table 31 Projected Supply During Multiple Dry Year Period Ending in 2025 - AF Year					
	2021	**2022**	**2023**	**2024**	**2025**
Supply	55,966	55,966	55,966	55,966	55,966
% of projected normal year 2003	129%	129%	129%	129%	129%

Table 32 Projected Demand Multiple Dry Year Period Ending in 2025 – AFY					
	2021	**2022**	**2023**	**2024**	**2025**
Demand	32,811	32,811	32,811	32,811	32,811
% of projected normal year 2003	161%	161%	161%	161%	161%

Table 33 Projected Supply and Demand Comparison During Multiple Dry Year Period Ending in 2025- AF Year					
	2021	**2022**	**2023**	**2024**	**2025**
Supply totals	55,966	55,966	55,966	55,966	55,966
Demand totals	32,811	32,811	32,811	32,811	32,811
Difference	23,156	23,156	23,156	23,156	23,156
Difference as % of Supply	41.4%	41.4%	41.4%	41.4%	41.4%
Difference as % of Demand	70.6%	70.6%	70.6%	70.6%	70.6%

The analysis shows that even with an increase in demand over the next 20 years, the District has surplus water supplies of 22,733 acre-feet annually on average during dry-water years. This projected dry year surplus would be sufficient to meet demands even if the projected use (availability) of state project water (approximately 9,000 AF) were reduced to zero. During the years 2020 and 2025 when the District would reach its build-out population, the supply would still be sufficient to meet the demand. The District therefore has a reliable long-term water supply and can meet demands even in the event of water shortages. Nonetheless, certain Best Management Practices have been implemented and a Water Shortage Contingency Plan has been adopted by the Board of Directors in response to AB 11X (1991). Analysis of other Demand Management Measures (as recommended by DWR) are presented in the following section.

7.0 Water Demand Management Measures

Law

> 10631 (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:
> (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:
> (j) Urban water supplies 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).

The District is committed to implementing water conservation education programs and continues to make system improvements to minimize system water loss. This Section discusses water conservation programs considered and implemented by evaluating the various Best Management Practices to reduce the water demand. The District would consider the BMPs for implementation based on the cost of the program and the dollar value of the water saved (brought to the net present value).

The most significant constraint faced by the District in actual implementation of the programs is the limited authority. Water conservation measures can be implemented by the Cities (Highland and San Bernardino) or by forming partnerships with the municipalities.

In addition, the District is not a signatory to the Memorandum of Understanding regarding Urban Water Conservation in California (MOU) and is therefore not a member of the California Urban Water Conservation Council (CUWCC). The District has nevertheless responded to SB 553 requirements where 14 Best Management Practices (BMPs) be considered when water supply projections fail to meet demand projections.

The District does not project a water shortage situation and not all BMPs will be implemented. The following discussion is based on the report "*BMP Costs & Savings Study-A Guide to Data and Methods for Cost-Effectiveness Analysis of Urban Water Conservation Best Management Practices*", adopted by the California Urban Water Conservation Council (CUWCC) in December 2003. The technical data pertaining to the cost of equipment, studies and other information for implementing the Demand Management Measures (DMM) has been derived from this report and worksheets are included in Appendix D. A discussion of each BMP is presented below.

BMP 1 -- Interior and Exterior Water Audits for Single Family and Multi-Family Customers

The District responds to requests from customers to conduct system audits for reported high water usage. These audits entail a field review by meter readers of landscaping appearance and possible irrigation system leaks, and an interview with the customer to determine if there are inside leaking faucets, toilets, water heaters, etc.

Additionally, if field personnel notice apparent leaks, customers may be left a door-tag notice to check for leaks. Complete landscaping audits are not conducted by the District because new construction is minimal and the cities and county require the use of water saving landscaping for all new development (the City of San Bernardino enforces its water efficient landscaping requirements for any new expansion over 25 percent of existing floor space).

These systems audits are a cost-effective means of reducing water loss from undetected leaks. They are performed as a part of the customer service functions and account for approximately 10 percent of the customer service personnel's duties.

CUWCC also considers undertaking Residential Surveys and retrofitting Hot Water Demand Units as part of this BMP. The District currently does not carry out residential surveys; therefore an estimate of savings by implementation of such a DMM was studied. The analysis assumed that each year 1,500 households would be surveyed resulting in cumulative water savings of 92.41 acre-feet between 2006 and 2010. This implies a savings of water production costs of $7,582 while the total program cost would be $297,718 (assuming an inflation rate of 1.5% per year).

Hot water demand units have the potential to reduce water use when fixed with faucets or showers as they deliver hot water without having to drain the cold water sitting in the pipes between the water heater and the fixture. The analysis assumes that at the end of the program in 2010, 30% of the households would be retrofitted with this device. Four gallons of water would be saved per run based on the CUWCC technical report. The District would provide a rebate of $20 per device to the customers. The total cost for implementing this program would be more than $200,000 in present value while the total water saved is estimated to be 1,162 acre-feet (value of saved water $95,284).

The total water savings from implementing this BMP would be 1,255 acre-feet between 2006 and 2010 at a total cost of $507,294. The value of water saved would be $102,936. It is currently outside the financial and administrative capacity of the District to implement such a program.

BMP 2 -- Plumbing Retrofit

Plumbing retrofits imply graywater conservation, residential retrofits of low-flow showerheads, toilet replacement devices, faucet aerators and providing Ultra Low Flush Toilets to residential customers. It is to be noted that the District is a County Water District and therefore has no jurisdiction over building codes. The District can only provide rebates for a very limited number of programs and would require partnerships with the cities of Highland and San Bernardino, and the County of San Bernardino for full implementation of retrofit programs.

The analysis derived the equipment cost and rebates from the CUWCC publication, "*BMP Costs & Savings Study-A Guide to Data and Methods for Cost-Effectiveness Analysis of Urban Water Conservation Best Management Practices*". The water savings resulting from retrofitting 3,000 devices each year between 2006 and 2010 would cost approximately $27.61 million (in present value). The total water saved was calculated as 2,242 acre-feet, saving production costs to the District of $183,988 during the 2005-2010 period. The high cost of program implementation in relation to the net savings make this program financially unfeasible at present.

BMP 3 -- Distribution System Water Audits, Leak Detection and Repair

The most recent water audit conducted by the District indicated that approximately ten percent of the total water produced is unaccounted for, with a majority estimated as attributable to leaks within the system. The remaining water loss is attributed to non-metered uses (see below) and metering error. Uses which are not metered but that can consume large quantities of water are:

- Flushing of new lines – from new construction.
- Fire Department use, including training.
- Street sweeping.

- Illegal use of water by construction contractors (the District meters water provided to construction sites and issues penalties for all unauthorized or unmetered uses of water).

The District responds immediately to notices that a leak is occurring. Field personnel (e.g. meter readers, operators) are trained to recognize potential main line leaks. Leaks are repaired until the problem becomes chronic. Pipelines with chronic leak problems are replaced. Additionally, the District maintains an active main replacement program. This is a cost-effective means of reducing water loss due to leakage. It is estimated that approximately 100 acre-feet is “saved” annually.

To determine the extent of and potential for system leaks, the District conducts a regular system audit and mass balancing of water production to water use records. The goal is to minimize water losses and thereby increase overall system efficiencies. Annual reports that are prepared for the State Department of Health Services with production and consumption metered use are presented to the General Manager as well. These system audits are an integral part of the routine system reporting function and are not separately accounted for. The cost-effectiveness is determined by the District’s ability to plan for and implement programs that provide for a more efficient means of reducing water loss. The District currently budgets $185,000 (FY 05-06) for system audits, leak detection and repair. Sufficient revenue is and will continue to be allocated for the audit programs.

BMP 4 -- Metering with Commodity Rates

The District meters all water customers and has a uniform rate structure for all users of its domestic water supply system. The rate is established to provide revenue to cover the costs of administrative and operational functions, system maintenance and replacement, public information, and regulatory requirements.

A meter replacement program is necessary so that older meters not functioning properly are replaced and thereby provide accurate water use readings for both the customer and the water purveyor. Improperly performing meters may be of benefit to either the customer or the water purveyor. In cases where the improperly functioning meter is benefiting the customer, a truer reading of water use provided by a new meter could result in some measure of water conservation. It is difficult to determine what such a saving would be as it is dependent upon how poorly the meter was functioning. However, a 10-year rolling meter replacement program should provide accurate readings, realization of water awareness behavior by the customers, and accurate revenue recovery by the water purveyor on a continuous basis.

The District has an ongoing meter calibration, repair and replacement program. When failed meters are discovered, lost revenue from erroneous billings (for up to a one-year period) is regained by estimating water usage with historical billing data. Likewise, the District may credit customers for high reading meters. The District replaces bad meters as identified, and all customer meters are on a 10-year roll-over program. The annual budget for this program is $375,000.

In 1996, a program was initiated to replace all 5/8” residential meters with 3/4" meters as a part of the ongoing meter replacement program. The District has found that with the current system pressures, significant loss of metered water occurs from magnetic shear. This phenomenon causes meter dials to spin too slowly when irrigation systems kick on and thus, all water used is not metered or billed. The capturing of this unaccounted for water on meter records will improve the District’s ability to determine actual per capita use and determine future demand requirements.

BMP 5 -- Landscape Water Conservation Requirements

The District provides water service to the City of Highland, areas within the City of San Bernardino, and unincorporated areas of the County of San Bernardino. Development codes of the two cities and the County include a Water Conservation Element with requirements for low-water use irrigation systems and planting materials. Each of these agencies have review and approval authority for development plans; this is not within the jurisdiction of the District and therefore a landscape water conservation ordinance is not in place.

A cost-savings analysis was conducted based on the assumptions from the CUWCC publication on *BMP Cost and Savings Study*. The study assumed that the total cost of the project would be $2,035/acre (in present value for 2006) and would result in approximately 445 gallons/day of water savings. If such a program is implemented by other agencies the cost of landscape conservation on approximately 50 acres of open space in the City of Highland would total $101,773 in 2006 and result in net savings of 25 acre-feet of water with a production cost of $2,045. The analysis was run for one year only to estimate the program cost. There are limited large landscape parcels in the City of Highland (e.g. no golf courses) and a conservation program is not within the District’s purview.

BMP 6 – High Efficiency Washing Machine Rebate Programs

To date, this program has not been given consideration by the District. The percentage of owner-occupied residential units in the District is estimated to be less than 50 percent. It is assumed that more clothing laundering is done in laundromats of apartment units or private laundromat businesses, than in homes and therefore a residential rebate program would likely have a very low participation rate.

The water savings and cost of program implementation from this BMP was calculated based on the assumptions from the CUWCC. The analysis assumed that by the end of 2010, 15 percent of the customers would have high-efficiency washing machines and the District would provide a rebate of $100 per customer. Based on this analysis, total water savings at the end of 2010 amounted to 149 acre-feet and total program costs were $458,945 resulting in a net cost of $446,749 to the District, over the five-year period. This program is not presently given further consideration. Following future data analysis, consideration may be given to a program for the commercial laundromats.

BMP 7 -- Public Information

Since February 1985, all new customers to the District have been given an information packet. This packet includes general information on the District's background, water conservation recommendations, landscape irrigation, explanations of water rates, sewer rates and current billing procedures. This information has been incorporated into a brochure that will be handed out to all new customers and provided to the Chamber of Commerce and community groups. The brochure will be updated approximately every 4 to 5 years.

The District's Annual Water Quality Report also provides water use information to its customers. In addition to an explanation of the District's annual water quality sampling results, information is provided on available water sources, supply quantities, and general public issues of concern. *The Pipeline* has been a regular publication of the District since 1994. This newsletter is published annually and apprises customers of current issues related to this District. A second edition of the Pipeline is produced as the Annual Consumer Confidence Report. During times of California drought conditions, or locally threatened water supplies, this newsletter will be used to inform customers of water saving recommendations.

The estimated cost of producing this printed information is estimated at $50,000 annually and is reasonable in light of the benefit provided to customers and the resulting impact of increased efficiency in customer water use. An estimate of 20 acre-feet annually is used for the cost/benefit analysis.

BMP 8 -- School Education

The District participates with other local water agencies in Water Awareness Month activities. These activities have included the distribution of public education materials at conferences, radio spots (e.g. public service announcements), and participation in community school programs. In the past, the District has also supported the local community while developing public recognition, by sponsoring an advertising board at the minor league baseball stadium. During Water Awareness Month, the District sponsors an art contest at local schools. Winning entries are reproduced in an annual calendar.

During drought conditions that may be affecting other areas of the State, the District will often be requested by school districts to provide a presentation on water awareness. These presentations will educate students on local water supply conditions and stress the wise use of water at all times. In addition to school education during periods of water shortages throughout the State, the District will provide speakers when requested by local schools. The presentations focus on the wise use of water, water supply and water quality conditions related to the District. Participation has been at the elementary and middle school levels. The District also provides presentations to local community groups and service clubs, and is a member of the local speaker's bureau.

The District sponsors tours of its facilities throughout the year. These are provided to various members of the community, such as City Councils, County Board of Supervisors, Chambers of Commerce and Senior groups. The tours serve to educate the public regarding the importance of the District's water supply, the facilities required to provide potable water, and regulatory influences on the cost of providing water.

The District's education program with an annual budget of $40,000 is a cost-effective means of providing long-term beneficial impacts to the local water supply by providing early education to young water uses and providing the community with exposure to a topic of high interest. An estimate of 10 acre-feet annually is used for the cost/benefit analysis.

BMP 9 – Conservation Programs for Commercial, Industrial and Institutional

Conservation programs for the Commercial, Industrial and Institutional (C.I.I.) entail C.I.I. surveys, installing self-closing faucets, urinals and ultra-low flush toilets. Commercial, industrial, and institutional users represent less than 20 percent of the total water use within the District. No formal programs are established for these users, however, the District responds to customer requests for water audits. Water audits often result in the identification of leaks.

The analysis incorporates several assumptions for each of the DMMs in this section. The main assumptions are that each year, one percent of the C.I.I. customers would be surveyed and all new C.I.I. customers would install self-closing faucets and low-flow valve urinals. An estimated 30 percent of customers would replace equipment each year between 2006 and 2010. The District would offer rebates of $5 and $20 for the low-flow valve urinals and self-closing faucets respectively.

The total program cost of installing self-closing faucets and low flow valve urinals would be approximately $200,000 with an estimated savings of 156 acre-feet between 2006-2010. The value of water saved with a production cost of $82 per acre-feet would be $12,806.

Replacement and installation of Ultra Low Flush Toilets in C.I.I. facilities as part of this BMP is based on the assumption that 15 percent of the total C.I.I. customers by the end of the year 2010 would replace facilities. The total cost to the District would be $185,360 resulting in a net savings of 288.4 acre-feet of water. The avoided production cost of water saved would be $23,652.

The C.I.I surveys aim at reducing water consumption through implementing programs based on recommendations by customers. The survey questionnaire addresses potential water saving from sanitation, irrigation, kitchen, industrial, cooling towers, laundry, wastewater cooling and others. The estimates on implementing this program were drawn from the CUWCC guidelines and manipulated to reflect the District's actual customer base. The total survey cost (based on CUWCC estimates for consultant) would be $256,880 and the resulting water savings would be estimated at $172,735. The study estimates water savings, which could differ between various regions

depending on the climatic conditions. C.I.I uses in the District account for only 10% of the total customers and do not significantly impact the water demand Therefore, implementing this DMM may not be a feasible option.

The total estimated cost of this BMP would be $660,961 while the cost of total water saved is $209,321 (2,551 acre-feet between 2006-2010). A majority of the water savings under this BMP is from the C.I.I. surveys.

BMP 10 – Wholesale Agency Programs

The District is a retailer and relies on any water conservation programs for wholesalers to be implemented by the San Bernardino Valley Municipal Water District. The UWMP Guidelines require that the water provider assess the cost-benefit associated with DMMs not currently being implemented. Therefore, the costs and benefits associated with the implementation of Ultra Low Flush Toilets is assessed in BMP 9.

BMP 11 -- Conservation Pricing, Water Service and Sewer Service

All of the District's customers are metered. The present rate structure is a straight rate and the same rate is applied to all customers and all levels of consumption. Sewer collection service is provided by the District. The rate structure is a flat rate for residential and metered for commercial customers.

For the purpose of this analysis, the effect of change in price of water on consumer demand is based on the CUWCC guidelines listed in Section 2.6 Conservation Pricing. The majority of EVWD's customers are residential water users. Other sectors such as commercial, industrial, institutional and others are not considered in the analysis (due to unavailability of data to measure their response to this DMM). The moderate climatic conditions year around in California have marginal effect on the demand of water during summer and winter seasons. Therefore, the price elasticity factor for summer is considered as average. With the factors provided in the report and assuming a ten percent increase in current water rates, the cumulative water savings in the single-family residential sector would be 1,453 acre-feet and 253 acre-feet in the multi-family sector. The total cost of the program implementation (changes to billing system) is estimated as $100,000 (one year only, non-recurring cost) while the value of total water saved between 2006 and 2010 would be $140,022 in present value.

An informal survey of surrounding water purveyors showed that nearly all water retailers in the area have not implemented water conservation pricing. One agency that had recently implemented a rate structure to encourage water conservation stated that although a significant amount of data is not yet available, it does not appear that customer behavior has changed. Therefore, the District is presently not considering implementing this program as the agency that has implemented conservation pricing did not show encouraging results regarding water savings.

BMP 12 -- Water Conservation Coordinator

The District contracts with a public relations firm to coordinate public information and education programs. The number of water conservation programs implemented by the District does not currently warrant a full-time position. However, if such a position becomes necessary in future the total cost added to the District budget until 2010 is estimated to be $275,000. The water savings associated with this measure is currently included in BMP-7.

BMP 13 -- Water Waste Prohibition

The District has an ordinance in place that prohibits water waste during times of water shortages. That ordinance is included herein in Appendix C.

BMP 14 -- Ultra-low Flush Toilet Replacement

The District does not provided a residential toilet replacement incentive program, however water displacement bags for older-model toilets have been provided during periods of southern California droughts, as part of a Water Awareness program. Ultra-low flush toilets are now a requirement of Title 24 and provided in all new construction. Building permits issued by all planning jurisdictions within the District's service area require conformance with Title 24. Thus, water demands of the District's customers have decreased since the adoption of the regulatory amendments. For the purpose of this report, the cost-benefit analysis associated with the residential ultra-low flush toilets has been considered in the BMP-2 (Residential Plumbing Retrofit).

Summary

Table 34 lists the Cost-Benefit analysis of all the Best Management Practices evaluated. The total cost of implementing the BMPs is estimated to be over $32 million dollars between 2006 and 2010 saving 9,078 acre-feet of water at a production cost of $744,865. As the East Valley Water District is a special district with limited powers, implementing most of the Demand Management Measures under these BMPs are outside the purview of the District. Partnerships with the Cities of Highland and San Bernardino, and the County would be alternative methods for implementing some of these BMPs. Those measures that are feasible and not cost prohibitive are being implemented by the District.

Table 34: Cost-Benefit Analysis

BMPs			Cumulative values for 2006-2010			
	Best Management Practice (BMPs)	**Demand Management Measures (DMMs)**	**Program Cost[1]**	**Estimated Total Water Savings (Acre-feet)**	**Avoided Cost of Water Saved**	**Difference Cost/(Benefit)**
1	**Water survey programs for single-family residential and multi-family residential customers**	DMM 2.4-Hot Water Demand Unit, DMM 2.8-Residential Surveys	**$507,294**	1,255	**$102,936**	$404,358
2	**Residential plumbing retrofit**	DMM 2.2-Graywater, DMM 2.7-Residential Retrofits, DMM 2.9-Ultra Low Flow Flush Toilets	**$27,610,702**	2,242	**$183,988**	$27,426,715
3	**System water audits, leak detection, and repair**		**$953,169**	500	**$41,025**	$912,144
4	**Metering with commodity rates for all new connections and retrofit of existing connections**	DMM 2.5-Metering (Analysis run, budget used)	**$1,932,100**	500	**$41,025**	$1,891,075
5	**Large landscape conservation programs and incentives**	DMM 2.16-Large Landscape Devices	**$101,773[2]**	25	**$2,045**	$99,728
6	**High-efficiency washing machine rebate programs**	DMM 2.3-High Efficiency Washing Machine	**$458,945**	149	**$12,196**	$446,749
7	**Public information programs**		**$257,613**	100	**$8,205**	$249,408
8	**School education programs**		**$206,091**	50	**$4,103**	$201,988
9	**Conservation programs for CII accounts**	DMM 2.10-CII Surveys, DMM 2.13-Self Closing Faucets, DMM 2.14-Ultra Low Flush Toilets (CII), DMM 2.15-Urinals	**$660,961**	2,551	**$209,321**	$451,640
10	**Wholesale agency programs**		***Included in BMP 9***			
11	**Conservation pricing**	DMM 2.6-Conservation Pricing	**$100,000**	1,707	**$140,022**	($40,022)
12	**Water conservation coordinator**		***Included in BMP7***			
13	**Water waste prohibition**	Emergency Program	The District has a Water Waste Ordinance; there are no annual program costs. Water savings would occur on unplanned emergency basis only.			
14	**Residential ultra-low-flush toilet replacement programs**	DMM 2.9-Ultra Low Flow Flush Toilets	***Included in BMP 2***			
	TOTAL-ALL BMPs		**$32,788,649**	9,078	**$744,865**	$32,043,784

* Production Cost of Water - $82/acre-feet

[1] Present Value of DMMs or Budget
[2] One year Cost/benefit

8.0 Water Shortage Contingency Plan

Law

> 10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:
>
> 10632 (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…
>
> 10632 (g) [An analysis of the impacts of each of the] proposed measures to overcome those [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.

8.1 District Adopted Contingency Plan

A Water Shortage Contingency Plan was originally prepared by the District in 1992, in response to Assembly Bill 11X (AB 11X) signed into law on October 14, 1991. The bill requires urban water suppliers providing municipal water directly or indirectly to more than 3,000 customers, or supplying more than 3,000 acre-feet of water annually, to draft a water shortage contingency plan in case of a drought for the sixth consecutive year. Plan elements mandated by AB 11X are addressed therein. The Plan was subsequently incorporated into the District's Ordinance No. 345 (rescinded by Ordinance No. 355) as Section 15 – Water Conservation. This section of the Ordinance addresses water conservation measures the District has adopted for 1) normal conditions, 2) threatened water supply conditions, and 3) emergency water shortage conditions. The ordinance sets forth a three-stage water shortage contingency plan for the conservation of water. This plan includes voluntary and mandatory conservation measures; key elements are included herein.

Stage 1 – Normal Conditions: Normal conditions shall be in effect when the District is able to meet all the water demands of its customers in the immediate future. During normal conditions, all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes.

Stage 2 – Threatened Water Supply Condition: In the event of a threatened water supply shortage which could affect the District's ability to provide water for ordinary domestic and commercial uses, the Board of Directors shall hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to

present their respective needs to the District. The Board may then by resolution, declare a water shortage condition to prevail, and the following conservation measures shall be in effect:

Exterior Landscape Plans – Exterior landscape plans for all new commercial and industrial development shall provide for timed irrigation and shall consider the use of drought resistance varieties of flora. Such plans shall be presented to and approved by the District prior to issuance of a water service letter.

Excessive Irrigation and Related Waste – No customer of the District or other person acting on behalf of or under the direction of a customer shall cause or permit the use of water for irrigation of landscaping or other outdoor vegetation, plantings, lawns or other growth, to exceed the amount required to provide reasonable irrigation of same, and shall not cause or permit any unreasonable or excessive waste of water from said irrigation activities or from watering devices or systems. The free flow of water away from an irrigated site shall be presumptively considered excessive irrigation and waste as defined in Section 3 herein (*Of Ordinance No. 351, Section 15*).

Agricultural Irrigation – Persons receiving water from the District who are engaged in commercial agricultural practices, whether for the purpose of crop production or growing of ornamental plants shall provide, maintain and use irrigation equipment and practices which are the most efficient possible. Upon the request of the General Manager, these persons may be required to prepare a plan describing their irrigation practices and equipment, including but not limited to, an estimate of the efficiency of the use of water on their properties.

Commercial Facilities – Commercial and industrial facilities shall, upon request of the General Manager, provide the District with a plan to conserve water at their facilities. The District will provide these facilities with information regarding the average monthly water use by the facility for the last two year period. The facility will be expected to provide the District with a plan to conserve or reduce the amount of water used by that percentage deemed by the Board of Director to be necessary under the circumstances. After review and approval by the General Manager, the water conservation plan shall be considered subject to inspection and enforcement by the District.

Parks, Golf Courses, Swimming Pools, and School Grounds – Public and private parks, golf courses, swimming pools and school grounds which use water provided by the District shall use water for irrigation and pool filling between the hours of 10:00 p.m. and 6:00 a.m.

Domestic Irrigation – Upon notice and public hearing, the District may determine that the irrigation of exterior vegetation shall be conducted only during specified hours and/or days, and may impose other restrictions on the use of

water for such irrigation. The irrigation of exterior vegetation at other than these times shall be considered to be a waste of water.

Swimming Pools – All residential, public and recreational swimming pools, of all size, shall use evaporation resistant covers and shall recirculate water. Any swimming pool which does not have a cover installed during periods of non-use shall be considered a waste of water.

Run-off and Wash-down – No water provided by the District shall be used for the purposes of wash-down of impervious areas, without specific written authorization of the General Manager. Any water used on premises that is allowed to escape the premises and run off into gutters or storm drains shall be considered a waste of water.

Vehicle Washing – The washing of cars, trucks or other vehicles is not permitted, except with a hose equipped with an automatic shut-off device, or a commercial facility so designated on the District's billing records.

Drinking Water Provided by Restaurants – Restaurants are requested not to provide drinking water to patrons except by request.

Stage 3 – Water Shortage Emergency: Mandatory Conservation Measures – In the event of a water shortage emergency in which the District may be prevented from meeting the water demands of its customers, the Board of Directors shall, if possible, given the time and circumstances, immediately hold a public hearing at which customers of the District shall have the opportunity to protest and to present their respective needs to the Board. No public hearing shall be required in the event of a breakage or failure of a pump, pipeline, or conduit causing an immediate emergency. The General Manager is empowered to declare a water shortage emergency, subject to the ratification of the Board of Directors within 72 hours of such declaration, and the following rules and regulations shall be in effect immediately following such declarations:

Prohibition – Watering of parks, school grounds, golf courses, lawns, landscape irrigation, washing down of driveways, parking lots or other impervious surfaces, washing of vehicles, except when done by commercial car wash establishments using only recycled or reclaimed water, filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes are prohibited.

Restaurants – Restaurants shall not serve drinking water to patrons except by request.

Construction Meters – No new construction meter permits shall be issued by the District. All existing construction meters shall be removed and/or locked.

Commercial Nurseries and Livestock – Commercial nurseries shall discontinue all watering and irrigation. Watering of livestock is permitted as necessary.

The Ordinance provides for exceptions under certain circumstances, establishes enforcement provisions, defines the methods for declaring and terminating water conservation stages, and provides for the form of notices and decisions of the Board of Directors. The specific water supply conditions for triggering the District's mandated conservation measures and the expected reduction in water use are summarized below in Table 35.

Table 35
Water Shortage Contingency Plan – Implementation Plan

Stage	Percent Shortage	Conservation Measures	Expected Overall Reduction
1	Normal Conditions	Voluntary prevention of waste and reduce consumption	--
2	Up to 15% Supply Reduction	Declaration of water shortage condition; implementation of water conservation measures	10%
3	15% to 50% Supply Reduction	Declaration of water shortage emergency; mandatory conservation measures	Up to 50%

Penalties

In the implementation of the water shortage contingency plan, the California Water Code Section 31029 makes any violation of the District's Ordinance a criminal misdemeanor and upon conviction thereof, the violator will be subject to punishment by fine, imprisonment or both as may be allowed by law.

In addition to criminal penalties, violators of the mandatory provisions of the ordinance will be subject to civil action initiated by the District, as summarized below:

First Violation -- Issuance of written notice of violation of water user.

Second Violation -- A $100 surcharge is imposed on the water meter.

Third Violation -- A $200 surcharge and/or installation of a flow restrictor on the water meter.

Subsequent Violations -- Discontinuance of service.

In the unlikely event of a severe and extended shortage, the District would have to implement other alternatives to provide enough water to its constituents. The primary and most desirable alternative would be to develop its surface water supply to make the most use of the District's entitlements to the local surface waters. Factors that affect the feasibility of surface water development include growth of future water demands (after

water shortage is over), progress of additional stock acquisition in water companies holding rights to surface waters, and the investment in treatment facilities.

The District completed construction of a 4.0 MGD water treatment plant at the old City Creek Water Treatment Plant site. Future surface water supply alternatives include expansion of the use of Santa Ana River and City Creek water, up to the plant's capacity of 8.0 MGD. The District currently has land available for the construction of a second treatment plant that could use Santa Ana River water.

8.2 Revenue and Expenditure Impacts and Measures to Overcome Impacts

The District's 2005-06 Water Budget projects total revenue of $12,980,300 and expenses (inclusive of debt service and capital projects) of $13,105,714. The source of supply budget is $550,000, and pumping, treatment and transmission costs are budgeted at $2,912,000. For the past fifteen years, the District has implemented an aggressive capital reserve budgeting process. Each year, funds are budgeted to the restricted cash account for purposes of capital improvements needed during emergency conditions. The restriction is that the fund is available only for emergency supply situations. Table 36 provides a summary of the budget and the projected revenue impacts that would occur as a result of 10 percent and 25 percent water shortage conditions that would reduce revenues from water sales (Note: the 2005-06 FY budget projects expenses, including capital construction, exceed revenues by $154,714). Any shortfalls in revenue would be made up by the use of reserve funds or deferral of capital improvement projects.

In the event of a water shortage, a three-point program (in order of preference) has been developed to meet the fiscal shortfall as a result of reduced water revenues:

a. Reduce operation and maintenance expenses.

b. Defer selected capital improvement projects until water shortage situation improves.

c. Utilize the restricted capital reserve account for critical capital improvement projects needed to meet demands.

Supplemental Emergency Plan

The Water Shortage Contingency Plan adopted by District Ordinance is designed for implementation during drought conditions. Other emergency water shortages could occur as a result of earthquake, flood, fire, or other disasters affecting power supply or the distribution system, and thus the District's ability to provide a potable water supply. Additionally, the water supply could be affected by continued degradation of the groundwater from contaminants.

Table 36
Impact of Emergency Water Shortage on District Revenues and Expenses (FY 2000-01 Budget)

	NORMAL	(10%)	(25%)
OPERATING REVENUES	STAGE 1	STAGE 2	STAGE 3
Water Sales	8,913,300	8,021,970	6,684,975
Meter Charges	2,842,000	2,842,000	2,842,000
Connection, Fees, etc.	1,030,000	1,030,000	1,030,000
Other	195,000	195,000	195,000
TOTAL REVENUES	12,980,300	$12,088,970	$10,751,975
	NORMAL	(10%)	(25%)
OPERATING EXPENSES	STAGE 1	STAGE 2	STAGE 3
SOURCE OF SUPPLY:			
Water Testing	120,000	120,000	120,000
Purchased Water	225,000	202,500	168,750
Groundwater Charge	145,000	130,500	108,750
Assessments	60,000	54,000	45,000
	550,000	507,000	442,500
PUMPING:			
Fuel and Power	2,200,000	1,980,000	1,650,000
Maintenance	200,000	200,000	200,000
Material and Supplies	45,000	45,000	45,000
	2,445,000	2,225,000	1,895,000
WATER TREATMENT:			
Treatment Chemicals	30,000	30,000	30,000
Maintenance	30,000	30,000	30,000
Material and Supplies	17,000	17,000	17,000
Contracted Treatment	200,000	200,000	200,000
	277,000	277,000	277,000
TRANSMISSION AND DISTRIBUTION:			
Maintenance	55,000	55,000	55,000
Material and Supplies	135,000	135,000	135,000
	190,000	190,000	190,000
CUSTOMER ACCOUNTS:			
Materials and Supplies	45,000	45,000	45,000
	45,000	45,000	45,000
TELEMETRY:			
Maintenance	25,000	25,000	25,000
	25,000	25,000	25,000
PERSONNEL:			
LABOR	2,365,000	2,365,000	2,365,000
BENEFITS	906,000	906,000	906,000
	3,271,000	3,271,000	3,271,000
GENERAL AND ADMINISTRATIVE:			
Directors' Fees and Expenses	51,500	51,500	51,500
Fuel and Power	90,600	90,600	90,600
Office Supplies, Postage and Insurance	424,000	424,000	424,000
Vehicle Maintenance and Fuel	173,600	173,600	173,600
Outside Services	522,100	522,100	522,100
DOHS and Regulatory Fees	20,000	20,000	20,000
Other	328,950	328,950	328,950
	1,610,750	1,610,750	1,610,750
DEBT SERVICE	2,818,464	2,818,464	2,818,464
CAPTIAL PROJECTS (Construction)	1,873,500	1,686,150	1,405,125
TOTAL EXPENSES	$13,105,714	$12,655,364	$11,979,839
NET IMPACT	($154,714)	($592,764)	($1,249,839)

The District has in place back-up power supplies at critical locations within the distribution system. Due to South Coast Air Quality Management Board rules and economic restraints, a back-up power supply source at every plant within the District's system is not feasible. The District maintains portable pumps that can be used to transfer water interzonally, but cannot be used for production. Currently, the District's storage capacity of 25.5 million gallons would provide a potable supply for customers' non-irrigation uses (assumes implementation of Water Shortage Contingency Plan) for an estimated two to three days. A Mutual Aid Agreement with surrounding water agencies is also in place for the provision of water supply and/or manpower.

The District's plan to respond to such emergency situations is adopted herein and discussed below.

Disaster Response

In the event of a natural or man-made disaster that could affect the District's ability to provide a potable water supply for up to thirty days, the following measures will be implemented as required:

1. The District's Boil Water notification program will be activated. The notice will be provided to local radio stations and newspapers. The Sheriff's Department/City of Highland Police Department will be contacted to broadcast messages throughout neighborhoods. Customers will be notified of supplemental sources of water for cooking and drinking (e.g. swimming pools, water heaters, and bottled water).

2. Irrigation uses of water will immediately be prohibited. Enforcement will occur through a cooperative effort with the Sheriff's Department/City of Highland Police Department and the media.

3. The Mutual Aid Agreement with Upper Santa Ana Water Resources Association will be implemented. The General Manager will contact general managers from surrounding agencies to obtain assistance in providing manpower for repairs and/or a supplemental supply of water.

4. Arrowhead Drinking Water Company will be contacted to begin delivery of potable water tanks to selected sites within the District's service area. The trucks will be manned by District personnel to distribute water to customers for drinking purposes.

5. A public information program will be initiated. The General Manager will appear on local television and provide daily reports to the local newspaper and radio stations. Members of the Board of Directors will speak to local service clubs and chambers of commerce.

APPENDIX A

NOTIFICATION LETTERS & PUBLIC AGENCY COORDINATION

SAN BERNARDINO COUNTY SUN

399 D ST, SAN BERNARDINO, CA 92401
Telephone (909) 388-3960 / Fax (909) 381-3976

This space for filing stamp only

Justine Hendricksen
EAST VALLEY WATER DISTRICT
PO BOX 3427
SAN BERNARDINO, CA - 92413

SBS #: 873344

PROOF OF PUBLICATION

(2015.5 C.C.P.)

State of California)
County of SAN BERNARDINO) ss

Notice Type: HRGSB - NOTICE OF HEARING-SB

Ad Description: Notice of Public Meeting

I am a citizen of the United States and a resident of the State of California; I am over the age of eighteen years, and not a party to or interested in the above entitled matter. I am the principal clerk of the printer and publisher of the SAN BERNARDINO COUNTY SUN, a newspaper published in the English language in the city of SAN BERNARDINO, county of SAN BERNARDINO, and adjudged a newspaper of general circulation as defined by the laws of the State of California by the Superior Court of the County of SAN BERNARDINO, State of California, under date 06/20/1952, Case No. 73084. That the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to-wit:

10/01/2005

Executed on: 10/01/2005
At Los Angeles, California

I certify (or declare) under penalty of perjury that the foregoing is true and correct.

Helen Tang

Signature

EAST VALLEY WATER DISTRICT
NOTICE OF PUBLIC MEETING

NOTICE IS HEREBY GIVEN that a Public Meeting at a regularly scheduled Board Meeting of the East Valley Water District will be held on Tuesday, October 11, 2005, at 2:00 p.m. at 3654 E. Highland Avenue, Suite 12, Highland, California. The purpose of this Public Meeting is to discuss the preparation of the District's Urban Water Management Plan (UWMP).

The information in the Urban Water Management Plan will show the existing and future water supply and demands within the District, as well as, the water conservation measures and enforcement plans, which are part of the District's rules and regulations for water service. The District (as part of the Urban Water Management Planning Act) encourages the active involvement of the District's customers prior to and during the preparation of the UWMP.

Persons wishing to submit extensive testimony at the meeting are requested to submit written comments to the Board of Directors by October 6, 2005, so that the board may adequately address the comments.

For more information, you may contact the East Valley Water District at the above address, or by telephone at (909) 885-4900.

By: Robert E. Martin
General Manager/Board Secretary
10/01/2005

SBS-873344#

East Valley Water District

P.O. Box 3427, San Bernardino, CA 92413

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Donald D. Goodin
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Edward S. Negrete
Director
Glenn R. Lightfoot
Director
Robert E. Martin
General Manager
Paul R. Dolter
District Engineer
Brian W. Tompkins
Chief Financial Officer

August 22, 2005

Mr. Tom Crowley
San Bernardino Valley Water
Conservation District
1630 West Redlands Boulevard
Redlands, CA 92373

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Crowley,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

East Valley has initiated its Year 2005 Update of the UWMP and is soliciting your agency's input. Our consultant, Cheryl Tubbs, Lilburn Corporation may be contacting you to collect data and information necessary for compiling the Plan Update. In the interim, please contact me at (909) 888-8986, or Cheryl Tubbs at (909) 890-1818 if you would like to provide us with any information concerning our plan update.

We would also encourage you to provide us with written or verbal comments between now and late September. We will also hold a public meeting at a regularly scheduled Board meeting in early October so that interested members of the public may also provide input. It is presently anticipated that a Draft Plan will be available for review in October. Please let us know if you would like to receive a copy of the Draft Plan.

Sincerely,

Ronald Buchwald

Ron Buchwald
Assistant District Engineer

RB/lh
Cc: Cheryl Tubbs, Lilburn Corp.

Administration (909) 885-4900, Fax (909) 889-5732 • Engineering (909) 888-8986, Fax (909) 383-1481
Customer Service (909) 889-9501, Fax (909) 888-6741 • Finance (909) 381-6463, Fax (909) 888-6741

East Valley Water District

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Chief Financial Officer

August 22, 2005

Mr. Bob Tincher
San Bernardino Valley Municipal
Water District
1305 South E Street
San Bernardino, CA 92408

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Tincher,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

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Sincerely,

Ronald Buchwald

Ron Buchwald
Assistant District Engineer

RB/lh
Cc: Cheryl Tubbs, Lilburn Corp.

East Valley
Water District

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August 22, 2005

Mr. Doug Headrick
City of Redlands
Municipal Utilities Department
35 Cajon Street
Redlands, CA 92373

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Headrick,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

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Brian W. Tompkins
Chief Financial Officer

August 22, 2005

Mr. Mike Huffstutler
Bear Valley Mutual Water Co
101 East Olive
Redlands, CA 92373

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Huffstutler,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

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Ron Buchwald
Assistant District Engineer

RB/lh
Cc: Cheryl Tubbs, Lilburn Corp.

East Valley
Water District

P.O. Box 3427, San Bernardino, CA 92413

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Chief Financial Officer

August 22, 2005

Mr. Sam Racadio
City of Highland
27215 Baseline Road
Highland, CA 92346

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Racadio,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

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Chief Financial Officer

August 22, 2005

Mr. Bernie Kersey
City of San Bernardino Municipal
Water Department
300 North D Street
San Bernardino, CA 92401

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Kersey,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

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Chief Financial Officer

August 22, 2005

Mr. Mark Uffer
San Bernardino County
385 North Arrowhead Ave
Fifth Floor
San Bernardino, CA 92415-0110

SUBJECT: 2005 Update of East Valley Water District's Urban Water Management Plan

Dear Mr. Uffer,

Before December 31, 2005, East Valley Water District ("East Valley"), as a supplier of domestic water to more than 3,000 customers, is required to update its existing Year 2000 Urban Water Management Plan (UWMP) and submit the Plan to the State Department of Water Resources (DWR). DWR carries out the Urban Water Management Planning Act and reviews plans submitted by water suppliers every five years. DWR encourages urban water suppliers to solicit input from other water suppliers, water management agencies, and relevant public agencies that would have an interest or "stake" in water supply and long-range planning to meet urban demands.

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APPENDIX B
DATA FROM SBVWCD ENGINEERING INVESTIGATION 2003-2004

- Percentage of Normal Precipitation
- Bunker Hill Sub-Basins and Faults

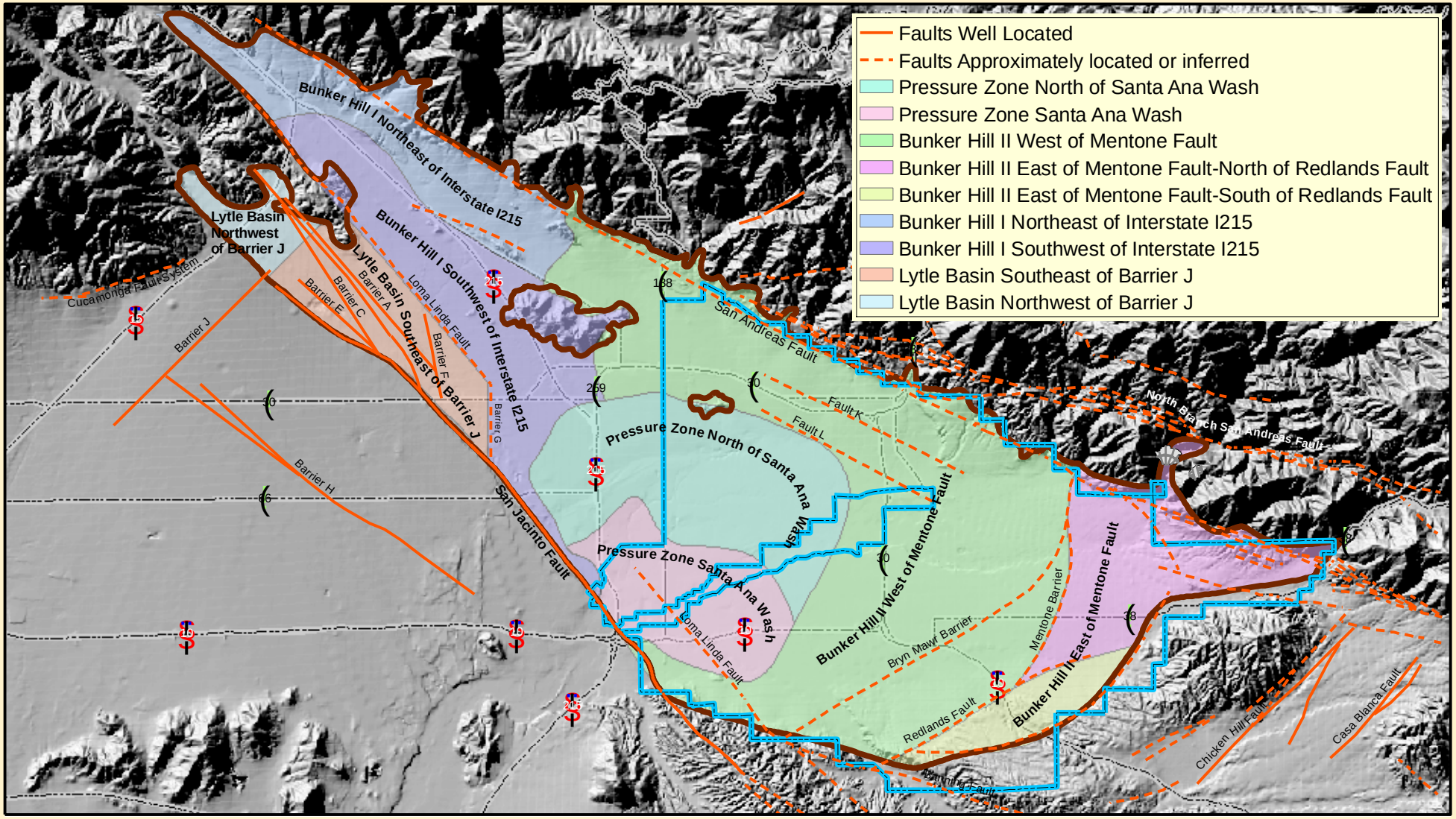
Summary of Percentage of Normal Precipitation

1983 to 2004 (Water Year - Oct. to Sept.)

Station	Historic Annual Avg. [in]	1982 -1983 [in]	1983 -1984 [in]	1984 -1985 [in]	1985 -1986 [in]	1986 -1987 [in]	1987 -1988 [in]	1988 -1989 [in]	1989 -1990 [in]	1990 -1991 [in]	1991 -1992 [in]	1992 -1993 [in]	1993 -1994 [in]	1994 -1995 [in]	1995 -1996 [in]	1996 -1997 [in]	1997 -1998 [in]	1998 -1999 [in]	1999 -2000 [in]	2000 -2001 [in]	2001 -2002 [in]	2002 -2003 [in]	2003 -2004 [in]
Big Bear Dam	36.2	41.7	19.3	NA	40.3	19.2	28.9	20.8	17.6	34.8	38.9	81.9	28.7	52.7	24.4	30.0	51.7	14.2	20.6	21.4	9.2	38.1	19.6
Camp Angelus	30.0	51.4	23.6	26.6	30.1	20.5	5.0	17.2	17.9	26.4	28.2	61.1	17.2	46.7	26.0	29.0	49.5	16.1	21.1	21.5	7.7	35.4	13.2
City Creek Ranger Station	20.4	NA	NA	NA	28.1	11.7	23.6	20.7	18.0	26.4	30.2	55.9	19.1	47.6	19.4	25.2	40.7	9.8	18.1	12.7	0.0	0.0	0.0
Crafton Hills	11.8	18.4	NA	5.9	12.6	9.0	12.1	10.0	6.3	12.3	10.7	23.0	5.5	27.1	7.8	16.7	25.6	7.3	6.4	10.5	2.5	17.6	9.5
Del Rosa Ranger Station	18.1	37.9	11.3	15.4	20.1	9.5	18.9	13.2	12.9	8.8	24.2	41.4	12.3	27.7	14.2	17.3	37.3	8.3	12.7	16.6	6.1	19.7	13.0
Devore CDF	27.3	54.9	21.5	24.0	36.8	12.4	17.9	NA	15.0	20.4	31.3	64.0	15.4	45.4	20.6	33.1	45.1	13.6	8.0	15.5	10.9	35.4	16.4
Fallsvale	29.3	43.9	19.0	16.9	29.6	23.0	20.3	3.5	16.0	22.5	36.0	71.9	24.7	54.9	22.1	33.8	53.0	16.3	21.2	15.3	6.5	37.5	25.2
Lake Arrowhead	40.2	73.9	27.1	30.8	50.6	23.7	40.4	28.5	26.6	23.7	45.2	85.0	28.2	74.5	30.8	36.5	72.8	18.1	25.8	28.6	10.7	36.5	22.7
Loma Linda FD	10.6	NA	6.1	9.2	13.2	7.4	10.5	8.8	7.7	7.2	13.4	25.6	11.0	19.0	7.2	9.8	22.7	5.1	7.7	6.4	2.5	14.5	8.1
Lytle Creek at Foothill	13.5	34.8	8.9	10.2	16.0	7.0	13.0	3.9	8.5	15.5	14.9	31.6	9.2	25.5	12.2	13.8	25.8	6.3	9.8	12.1	4.0	13.6	7.2
Lytle Creek Fire Station	25.6	50.0	12.6	19.0	27.6	11.2	22.4	12.8	17.9	32.1	49.1	87.7	20.5	47.6	24.5	23.1	52.2	11.8	20.4	18.3	4.5	4.5	12.1
Mentone CDF	12.4	21.6	5.1	7.7	12.0	9.2	8.9	8.6	6.1	12.6	15.9	23.9	8.4	17.1	9.4	15.7	27.1	4.3	9.1	10.2	4.1	15.0	10.4
Mill Creek Intake #3	NA	33.9	19.4	21.0	26.5	16.3	8.5	15.8	14.0	24.9	29.1	16.8	15.1	44.8	20.0	22.6	42.6	NA	NA	NA	NA	NA	NA
Oak Glen	26.9	50.4	18.8	22.0	26.0	19.3	21.5	17.8	17.7	26.9	30.8	58.0	18.8	57.9	20.0	30.4	49.5	11.3	17.1	12.3	6.7	14.3	18.4
Oak Glen Conservation Camp	26.8	44.8	18.9	NA	27.9	13.1	16.5	NA	NA	22.9	14.4	61.8	18.9	43.0	22.5	35.5	55.2	19.6	19.2	22.5	5.6	15.4	0.0
Redlands - Roth	12.2	24.2	5.0	8.7	9.3	7.8	11.2	8.1	7.2	13.3	15.0	25.6	10.1	20.5	8.1	10.8	22.2	6.5	7.4	10.4	3.4	12.2	9.2
Redlands Country Club	13.8	27.8	8.2	10.7	13.4	8.8	14.2	10.7	8.6	14.5	16.1	29.4	12.6	19.8	8.5	9.0	17.2	6.3	5.7	10.0	4.0	16.5	11.6
San Bernardino CDF	16.9	39.9	11.1	16.1	20.1	9.3	18.3	12.9	10.6	15.5	21.9	37.4	4.5	20.3	15.8	16.2	34.3	9.3	13.6	16.6	5.3	5.3	5.3
San Bernardino Co. Hospital	16.3	32.4	10.8	12.9	17.9	8.1	13.5	12.6	8.1	15.5	16.5	30.8	11.7	24.1	11.9	18.6	32.7	8.0	11.1	2.3	3.6	17.1	10.5
Santa Ana Pumphouse #3	17.2	33.9	14.2	11.9	15.9	12.3	14.7	NA	10.3	15.8	18.4	23.0	15.9	24.9	11.1	16.6	28.0	7.0	6.8	8.6	3.2	18.2	9.4
Yucaipa CDF	15.9	33.7	9.8	10.7	13.0	11.0	11.3	9.7	NA	11.2	17.9	34.2	11.4	30.2	10.5	15.6	24.7	7.6	11.1	9.9	5.7	19.5	11.8
Yucaipa Valley Water District	16.2	30.8	9.7	12.3	15.2	10.6	NA	NA	NA	17.0	18.7	18.1	12.5	25.2	10.9	16.9	28.6	9.9	9.6	9.7	5.3	19.5	11.1
Redlands Daily Facts	12.8	28.1	8.0	10.4	11.3	9.1	12.7	8.9	7.7	13.8	16.0	28.0	12.1	21.3	8.2	12.6	27.2	6.1	7.9	10.3	3.6	16.0	9.2
Big Bear City	13.6	26.7	17.6	13.2	19.1	10.2	10.6	9.4	10.2	17.8	14.0	22.9	11.5	18.6	11.2	12.1	16.8	6.5	4.8	20.1	3.3	12.6	7.7
Percent of Normal	**100%**	**188%**	**69%**	**74%**	**110%**	**62%**	**81%**	**63%**	**63%**	**93%**	**117%**	**214%**	**73%**	**173%**	**78%**	**103%**	**182%**	**49%**	**64%**	**69%**	**25%**	**94%**	**56%**

Average	**20.18**

Source: San Bernardino County Department of Transportation/Flood Control



State Plane
NAD 83, Zone V, feet
30 M DEM

0 0.5 1 2 3 4 Miles

Sub-Areas of Bunker Hill Basin

Engineering Investigation
February 2005

Source: SBVWCD GIS

SBV WATER CONSERVATION DISTRICT
OUR NAME IS OUR MISSION

Figure 6

• APPENDIX C

WATER SHORTAGE PLAN INFORMATION

District Ordinance No. 355

ORDINANCE NO.355

AN ORDINANCE OF THE EAST VALLEY WATER DISTRICT RESCINDING ORDINANCE NO. 351 ENTITLED "AN ORDINANCE ESTABLISHING RULES AND REGULATIONS FOR WATER SERVICE, ESTABLISHING A WATER DEPARTMENT, PROVIDING FOR INSTALLATION AND CONNECTION TO DISTRICT WATER MAINS, REGULATING THE USE OF CROSS CONNECTION".

Be it ordained by the Board of Directors of the East Valley Water District, that Ordinance No. 351 is amended as follows:

SECTION 1. INDEX

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SECTION 2. GENERAL PROVISIONS

2.01 **Short Title** - This Ordinance may be cited as the "East Valley Water District Water Regulations and Service Ordinance".

2.02 **Purpose** - This Ordinance is intended to provide rules and regulations applicable to the administration and operational activities of the District. This Ordinance may be amended from time to time by action of the Board of Directors of the East Valley Water District.

2.03 **Enabling Statues** - This Ordinance is adopted pursuant to the applicable provisions of Division 12 of the Water Code and Division 5, Chapter 7, Title 5, Division 2 of the Government Code, and further pursuant to the Constitution of the State of California. The District is further authorized by Water Code Section 31027 to prescribe and define by Ordinance those restrictions, prohibitions and exclusions it may determine to be necessary pursuant to the California Constitution Article X, Section 2 and Water Code Sections 312026, 375-277 and 1009 to restrict the use of District water during threatened or existing water shortages. It is therefore the intent of the Board of Directors to establish by this Ordinance those procedures and policies necessary to the orderly administration of a water conservation program to prohibit waste to restrict the use of water during a water shortage emergency.

2.04 **Application** - This Ordinance shall apply to all water facilities constructed, maintained, and operated by the District.

2.05 **Enterprise** - The District will furnish and/or make available, a system, plant, works, and undertaking used for and useful in, the delivery of water for the District's service area, including all annexations thereto, lands, easements, rights in land, contract rights and franchises.

2.06 **Separability** - If any section, subsection, sentence, clause, phrase, or portion of this Ordinance or the application thereof to any person or circumstances are for any reason held to be unconstitutional by any court of competent jurisdiction, such

decision shall not affect the validity of the remaining portions of this Ordinance or the application of such provision to other persons or circumstances. The governing body hereby declares that it would have passed this Ordinance or any section, sub-section, sentence, clause or phrase hereof irrespective of the fact that one or more sections, subsections, sentences, clauses or phrases be declared to be unconstitutional.

2.07 **Words and Phrases** - For the purpose of this Ordinance all words used herein in the present tense shall include the future; all words in the plural number shall include the singular number; and all words in the singular number shall include the plural number.

2.08 **Posting** - Upon adoption, this Ordinance shall be entered in the minutes of the governing body and certified copies hereof shall be posted in three (3) public places and/or published in a newspaper of general circulation in the District service area within ten (10) days following its passage.

2.09 **Means of Enforcement** - The District hereby declares that the procedures contained herein are established as a means of enforcement of the terms and conditions of its ordinances, rules and regulations and not as a penalty.

2.10 **Notices** - Whenever a notice is required to be given under this Ordinance, unless different provisions are specifically made herein, such notice may be made either by personal delivery thereof to the person to be notified or by deposit in the U.S. mail in a sealed envelope, postage prepaid, addressed to such person at his last known business or residence address as the name appears in public records or other records pertaining to the matter to which the notice is directed. Service by mail shall be deemed to have been completed at the time of deposit in the post office.

Proof of giving any notice may be made by the certificate of any officer or employee of the District or by affidavit of any person over the age of eighteen years, which shows service in conformity with the Ordinance or other provisions of law applicable to the subject matter concerned.

2.11 **Effect of Heading** - The title, division or section headings contained in this Ordinance shall not be deemed to govern, limit or modify in any manner the scope, meaning or intent of any section or subsection of this Ordinance.

SECTION 3. DEFINITIONS

3.01 **Applicant** - The person making application hereunder who must be either (a) the owner of the subject premises, (b) the agent or customer authorized in writing to make application hereunder on behalf of the owner of the subject premises or, © a licensed plumber or contractor authorized in writing to make application hereunder for the subject premises.

3.02 **Board** - The Board of Directors of the East Valley Water District.

3.03 **Connection** - The pipeline and appurtenant facilities such as the curb stop, meter and meter box, all used to extend water service from the main to the premises, the laying thereof and the tapping of the main. Where services are divided at the curb or property line to serve several customers, each such branch service shall be deemed a separate service.

3.04 **Cost** - The cost of labor, materials, transportation, supervision, engineering, and all other necessary overhead expenses.

3.05 **County** - The County of San Bernardino, California.

3.06 **Customer** - Any person supplied or entitled to be supplied with water service by the District.

3.07 **Customer's Service Valve** - A valve independent of the District's facilities located in the customer's piping as close to the meter as practicable, the operation of which will control the entire water supply from the meter.

3.08 **Cross Connection** - Any physical connection between the piping system from the District service and that of any other water supply that is not, or cannot be, approved as safe and potable for human consumption, whereby water from the unapproved source may be forced or drawn into the District's distribution mains.

3.09 **District** - The East Valley Water District, San Bernardino County, California.

3.10 **District Engineer** - A Registered Civil Engineer of the State of California.

3.11 **Financial Officer** - The Treasurer appointed by the Board of Directors.

3.12 **General Manager** - The General Manager of the District.

3.13 **Governing Body** - The Board of Directors of the East Valley Water District.

3.14 **Inspector** - The person who shall perform the work of inspecting water facilities under the jurisdiction or control of the District.

3.15 **Main** - A water line in a street, highway, alley or easement used for public and private fire protection and for the general distribution of water.

3.16 **Owner** - The person owning in fee title, or in whose name the legal title to the property appears, by deed duly recorded in the County Recorder's office, or the person in possession of the property or buildings under claim of, or exercising acts of ownership over same for himself or, as executor, administrator, guardian or trustee of the owner.

3.17 **Permit** - Any written authorization required pursuant to this or any other regulation of the District.

3.18 **Person** - Any human being, individual, firm, company, partnership, association and private or public or municipal corporation, the United States of America, the State of California, a district and any political subdivision, or governmental agency.

3.19 **Premises** - A lot or parcel of real property under one ownership, except where there are well defined boundaries or partitions such as fences, hedges or other restrictions preventing the common use of the property by several tenants, in which case each portion shall be deemed separate premises. Apartment houses and office buildings may be classified as single premises.

3.20 **Private Fire Protection Service** - Water service and facilities for building sprinkler systems, hydrants, hose reels and other facilities installed on private property for fire protection and the water available therefor.

3.21 **Public Fire Protection Service** - The service and facilities of the entire water supply, storage and distribution system of the District, including the fire hydrants affixed thereto, and the water available for fire protection, excepting house service connections and appurtenances thereto.

3.22 **Regular Water Service** - Water service and facilities rendered for normal domestic, commercial and industrial purposes on a permanent basis, and the water available therefor.

3.23 **Residential** - Any single family unit, any duplex or triplex family unit not requiring licensing for occupancy and operation.

3.24 **Secretary** - The Secretary to the Governing Body.

3.25 **Temporary Water Service** - Water service and facilities rendered for construction work and other uses of limited duration, and the water available therefor.

3.26 **Waste** - Any unreasonable or non beneficial use of water, or any unreasonable method of use of water, including, but not limited to, the specific uses prohibited and restricted by this Ordinance as hereinafter set forth.

3.27 **Water Department** - The Board of Directors of the District performing functions related to the District's water service, together with the General Manager, the District Engineer, the Financial Officer and any other duly authorized representative.

3.28 **Water Supply Shortage** - Any water shortage caused by drought or any other threatened or existing water shortage, disaster or facility failure, earthquake, loss of electrical power, pipeline breakage, or other condition which results in or threatens to result in the District's inability to meet the water demands of its customers.

3.29 **Water User** - Any person, firm, partnership, association, corporation or political entity using water obtained from the water system of the District.

3.30 **Water** - That water supplied by the East Valley Water District.

SECTION 4. WATER DEPARTMENT

4.01 **Creation** - A Water Department is hereby created comprising the Directors, the General Manager, the Financial Officer and District Engineer and such other employees and assistants as may be hired therefor.

4.02 **General Manager** - The General Manager, as provided for in the Water Code Section 30580, shall have full charge and control of the maintenance, operation and construction of the water works and water distribution system of the District.

4.03 **District Engineer** - The position of District Engineer is hereby created. The District Engineer shall regularly inspect all physical facilities related to the District water system, to see that they are in good repair and proper working order, and to note and report violations of any ordinances or water regulations.

4.04 **Violation, Repairs** - The District Engineer shall promptly report any violation or disrepair to the General Manager. If the work required is in the nature of an emergency, he shall take whatever steps are necessary to maintain service to the consumers pending action by the General Manager.

4.05 **Supervision** - The District Engineer shall supervise all repair or construction work authorized by the Board or General Manager and perform any other duties prescribed by the Board or General Manager.

4.06 **Performance of Duties** - The foregoing duties of the District Engineer may be performed by the General Manager or by an additional employee or employees as designated by the District Engineer and/or General Manager.

4.07 **The Financial Officer** - The Financial Officer shall install and maintain a system of auditing and accounting that shall completely and at all times show the financial condition of the District. Furthermore the Financial Officer shall compute, prepare and mail bills as hereinafter prescribed, make and deposit collections, maintain proper books of account, collect, account for, refund deposits, and do whatever else is

necessary or directed by the General Manager to set up and maintain an efficient and economical accounting system and perform any other duties now and hereafter prescribed by the Board of Directors.

SECTION 5. GENERAL RULES

5.01 **Standards** - The Governing Body may, from time to time, adopt standard requirements for the design, construction, repair and maintenance, or connection to the District's water system.

5.02 **Violation Unlawful** - Following the effective date of this Ordinance, it shall be unlawful for any person to connect to, construct, install, provide, maintain or use any other means of water facilities from any building in the area serviced with water by said District except by connection to water facilities in the manner as provided for in this Ordinance. Any violation of this Ordinance will be subject to the provisions of this Section, at the discretion of the District Engineer or General Manager.

5.03 **Notice** - Wherever or whenever practicable under the particular circumstances and pursuant to the discretion of the District Engineer or General Manager, any person found to be violating any provision of this or any other ordinance, resolution, rule or regulation of the District shall be served by the Inspector or other authorized person with written notice stating the nature of the violation and providing a reasonable time limit for the satisfactory correction thereof. Said time limit shall be no less than two, nor more than seven working days unless otherwise specified. The offender shall, within the period of time stated in such notice, permanently cease all violations. Upon being notified by an authorized representative of the District of any defect arising in any water facility or of any violation of this Ordinance, the person or persons having charge of said work shall immediately correct the same. All persons shall be held strictly responsible for any and all acts of agents or employees done under the provisions of this other Ordinance, Resolution, Rule or Regulation of the District.

5.04 **Protection from Damage** - No unauthorized person shall maliciously, willfully, or negligently break, damage, destroy, uncover, deface or tamper with any structure, appurtenances or equipment which is a part of the District's water works. Any person violating this provision shall be subject to the penalties provided by law.

5.05 **Investigation Powers** - The officers, inspectors, manager and any duly authorized employees of the District shall carry evidence establishing his position as an authorized representative of the District and upon exhibiting the proper credentials and identification shall be permitted to enter in and upon any and all buildings, industrial facilities and properties to which the District is furnishing water or has been requested to furnish water for the purpose of inspection, re-inspection, observation, measurement, sampling, testing or otherwise performing such duties as may be necessary in the enforcement of the provisions of the ordinances, resolutions, rules and regulations of the District pursuant to the authorization contained in the required application for water service.

5.06 **Noncompliance with Regulations** - As an alternative method of enforcing the provisions of this or any other ordinance, resolution, rule or regulation of the District, the District shall have the power to disconnect the user or subdivision water service from the water mains of the District. Upon disconnection, an authorized representative of the District shall estimate the cost of disconnection from and reconnection to the system, and such user shall deposit the cost, as estimated, of disconnection and reconnection before such user is reconnected to the system.

5.07 **Liability for Violation** - Any person violating any of the provisions of the ordinances, rules or regulations of the District shall become liable to the District for any expense, loss or damage, occasioned by the District by reason of such violation.

5.08 **Relief on Application** - When any person by reason of special circumstances, is of the opinion that any provision of the ordinances, rules or regulations of the District is unjust or inequitable as applied to him or his premises, he

may make written application to the Governing Body stating the special circumstances, citing the provision complained of and requesting suspension or modification of that provision as applied to him or his premises. If such application is approved, the Governing Body may, by resolution, suspend or modify the provision complained of, as applied to such person or premises, to be effective as of the date of the application and continuing during the period of the special circumstances.

5.09 **Relief on Own Motion** - The Governing Body may, on its own motion, find that by reason of special circumstances, any provisions of its ordinances, rules or regulations should be suspended or modified as applied to a particular person or premises and may, by resolution, order such suspension or modification for such premise or person during the period of such special circumstances or any part thereof.

5.10 **Maintenance of Water Pressure and Pressure Conditions** - The Board shall not accept any responsibility for the maintenance of pressure and it reserves the right to discontinue service while making emergency repairs, or other work required on the water system as determined by the General Manager and/or the District Engineer. Consumers dependent upon a continuous supply should provide emergency storage. All applicants for service connections or water service shall be required to accept such conditions of pressure and service as are provided by the distribution system at the location of the proposed service connection, and to hold the District harmless for any damages arising out of low pressure or high pressure conditions or interruptions of service.

5.11 **Tampering with District Property** - Except as otherwise specifically authorized by the General Manager, no one, except an employee or representative of the District shall at any time in any manner operate the curb cocks or valves, main cocks, gates or valves of the District's system; or interfere with meters or their connections, street mains or other parts of the water system.

5.12 Charge for Violation - Failure of a customer to comply with all or any part of this ordinance or any other ordinance, resolution or order fixing rates and charges of this District, a charge for which has not hereafter been specifically fixed, shall be discontinued and the water shall not be supplied such customer until he shall have complied with the rules and regulations, rate or charge which he has violated.

5.13 Water System - The District will furnish as system, plant, works and undertakings used for and useful in obtaining, conserving and disposing of water for public and private uses, including all parts of the Enterprise, all appurtenances to it, lands, easements, rights in land, water rights, contract rights, franchises, and other water supply, storage and distribution facilities and equipment.

5.14 Number of Services per Premises - The applicant may apply for as many services as may be reasonably required for his premises provided that the pipeline system for each service be independent of the others and that they not be interconnected.

5.15 Water Waste - No customer shall knowingly permit leaks or waste of water. Where water is wastefully or negligently used on a customer's premises, seriously affecting the general service, the District may discontinue the service if such conditions are not corrected after giving notice of violation as provided in Section 5.03 herein.

5.16 Responsibility for Equipment on Customer Premises - All facilities installed by the District on private property for the purpose of rendering water service shall remain the property of the District and may be maintained, repaired or replaced by the Water Department without consent or interference of the owner or occupant of the property. The property owner shall use reasonable care in the protection of the facilities.

5.17 Damage to Water Facilities - The customer shall be liable for any damage to the service facilities when such damage is from causes originating on the

premises by an act of the customer or his tenants, agents, employees, contractors, licensees or permittees, including the breaking or destruction of locks by the customer or others on or near a meter and any damage to a meter that may result from hot water or steam from a boiler or heater on the customer's premises. The District shall be reimbursed by the customer for any such damage promptly on presentation of a bill.

5.18 **Ground Wire Attachments** - All individuals or business organizations are forbidden to attach any ground wire or wires to any plumbing which is or may be connected to a service connection or main belonging to the District. The District will hold the customer liable for any damage to its property occasioned by such ground wire attachments.

5.19 **Control Valve on Customer Property** - The customer shall provide a valve on his side of the service installation as close to the meter location as practicable to control the flow of water to the piping on his premises. The customer shall not use the service curb stop to turn water on and off for his convenience.

5.20 **Unsafe Apparatus** - Water service may be refused or discontinued to any premises where apparatus or appliances are in use which might endanger or disturb the service to other customers.

5.21 **Cross Connections** - Water service may be refused or discontinued to any premises where there exists a cross connection as defined in Section 9 of this Ordinance.

5.22 **Fraud or Abuse** - Service may be discontinued if necessary to protect the District against fraud or abuse.

5.23 **Interruption in Service** - The District shall not be liable for damage which may result from an interruption in service from a cause beyond the control of the Water Department.

5.24 **Ingress and Egress** - Representatives from the Water Department shall have the right of ingress and egress to the customer's premises at reasonable hours for any purpose reasonably connected with the furnishing of water service.

5.25 **Installation of Services** - Only duly authorized employees or agents of the District shall be authorized to install service connections. All service connections shall comply with the specifications of the District. Meters will be installed in the public right of way, or within an acceptable easement, and shall be owned by the District. No rent or other charge will be paid by the District for a meter or other facilities, including connections. All meters will be sealed by the District at the time of installation and no seal shall be altered or broken except by one of the District's authorized employees or agents.

5.26 **Change in Location of Meters** - Meters moved for the convenience of the customer will be relocated at the customer's expense. Meters moved to protect the District's property will be moved at District expense.

5.27 **Size and Location** - The District reserves the right to determine the size of service connections and their location with respect to the boundaries of the premises to be served. Service installations will be made only to property abutting on distribution mains as have been constructed in public streets, alleys or easements or to extensions thereof as herein provided. Services installed in new subdivisions prior to the construction of streets in advance of street improvements must be accepted by the applicant in the installed location.

5.28 **Curb Cock** - Each service connection installed by the District shall be equipped with a curb cock or wheel valve on the inlet side of the meter. Such valve or curb cock is intended for the exclusive use of the District in controlling the water supply through the service connection pipe. If the curb cock or wheel valve is damaged by the customer's use to an extent requiring replacement, such replacement shall be at the customer's expense.

5.29 <u>Access to Meters</u> - The District reserves the right to enter upon the applicant's premises for the purpose of reading, repairing or replacing the water service meter. The applicant shall be solely responsible for the control of all animals which may pose a potential threat to District employees and shall be liable for any injury to District employees resulting from unrestrained animals. Should an applicant for new service fail to properly restrain animals present on his property, the District may, upon written notice, refuse to install or turn on service until such time as the District determines that a threat to its employees no longer exists. In the case of existing customers, where District employees may encounter some personal risk in attempting to read a meter (due to the presence of unrestrained animals or otherwise), upon notification to the customer, the employee is not required to read the meter and the customer's bill will be estimated based upon an average of the most recent 6 months consumption recorded at the customer's service. The meter will be read quarterly in the presence of the customer or someone of his choosing so that over estimates and under estimates of use may be rectified on the bill.

SECTION 6. APPLICATION FOR WATER SERVICE

6.01 <u>Application for Water Service</u> - The property owner or his agent designated in writing, shall make application for regular water service by personally signing an Application for Water Service form provided by the District and pay the necessary fee for connection to the District's facilities as prescribed in the latest Resolution on Fees adopted by the Board of Directors.

6.02 <u>Water Service to Customers other than Property Owners</u> - Water Service to other than property owners shall be made as follows:

6.02.01 <u>Property Owner's Signature</u> - If the Property owner rents the premises to a tenant, the tenant may have water service and other services instituted in the tenant's name, provided that reasonable efforts are made to secure the property

owner's signature on the application for service and the tenant provides the District with a copy of the rental agreement. In any event, the tenant must provide the District with the property owner's name, mailing address and telephone number.

6.02.02 **Owner Responsibility** - Whether or not a property owner signs the District's application for service form, the property owner is not relieved of his or her responsibility for unpaid water charges for the subject property as provided in this ordinance and pursuant to California Water Code Section 31701.5, et..seq.

6.03 **Payment of Delinquent Charges** - As a precondition to receiving water service from the District, the applicant for service shall pay any and all unpaid charges that have accrued on any closed accounts previously held by the applicant with the District as well as pay any and all delinquent charges that have accrued on any open accounts currently held by the applicant with the District.

6.03.01 **Commercial, Retail or Multi-Unit** - A security deposit for each single family unit, each commercial or retail unit, or a multi-unit complex shall be deposited at the time application is made. The District may, for its convenience, include the required security deposit on the customer's first months' billing.

6.04 **Security Deposit** - A security deposit for each single family residential unit, commercial or retail unit, or multi-unit complex shall be deposited at the time application for water service is made. The District may, at its sole election, include the required security deposit on the customer's first billing invoice.

6.04.01 **Single Family Residential** - A security deposit for a single family residential unit may not be required if the person requesting service is a new residential applicant who is determined by the District to be creditworthy. The determination of an applicant's creditworthiness shall be based solely upon criteria developed by the District and may be appealed in the manner set forth in Section 11 herein. However, during the life of the account, the District may, in its sole discretion, require any customer, regardless of whether he or she was previously found to be creditworthy, to post a full

security deposit with the District any time there are three delinquencies within any consecutive six-month period or as a precondition to reinstatement of service anytime after being locked off for nonpayment.

6.04.02 **Security Deposit Refund** - Refunds of security deposits will be performed in the manner set forth below. Such refunds will be credited to any account held by the customer with the District in lieu of a refund check. Interest on the security deposits shall remain the sole property of the District and will not be included in any refund.

6.04.02.01 **Single Family Residential** - The District shall refund each security deposit to a residential customer as follows:

a. Where funds have been on deposit for one year in a customer's account and there have been no delinquency payments on any of the customer's accounts with the District during that year.

b. Within thirty (30) days after the applicant provides written notice to terminate water services, or when a new property owner tenders a full deposit for the same property, in which case the refunded deposit shall first be applied toward the unpaid balances in any account held by the customer with the District before the remaining sum, if any, is refunded to the customer.

6.04.02.02 **Commercial, Retail or Industrial** - The District shall refund the security deposit for commercial, retail or industrial connections as follows:

a. Where funds have been on deposit for one year in a customer's account and there has been no delinquency payment on any of the customer's accounts with the District during that year, upon the customer's request, one-half of the deposit will be refunded to the customer by means of a credit on the account. However, if the customer is delinquent on any payment thereafter, the District may, at its sole option, charge back the credited amount.

b. Within thirty (30) days after the applicant provides written notice to terminate water services, or when a new property owner tenders a full deposit for the same property, in which case the refunded deposit shall first be applied toward the unpaid balances in any account held by the customer with District before the remaining sum is refunded to the customer.

6.05 **Change in Customer's Equipment** - Customers who make any material change in the size, character of, extent of the equipment or operations utilizing water service, or whose change in operations results in a significant increase in the use of water shall immediately give the District written notice of the nature of the change and, if necessary, amend their application.

6.06 **Domestic, Commercial and Industrial Service Connections** - It shall be unlawful to maintain a connection excepting in conformity with the following:

6.06.01 **Multiple Building** - Multiple house or buildings under one ownership and on the same lot or parcel of land may be supplied through the same service connection, provided that the service connection shall be of such size to adequately serve said houses or buildings.

6.06.02 **Single Connection** - Not more than one service connection for domestic or commercial supply shall be installed for one building, except under special conditions.

6.06.03 **Different Owners** - A service connection shall not be used to supply any adjoining property, or property across a street, alley or easement.

6.06.04 **Divided Property** - When property provided with a service connection is divided, the service connection shall be considered as belonging to the lot or parcel of land which it directly enters.

6.07 **Service Connection Maintenance** - The service connection extending from the water main to the meter, meter box and curb cock or wheel valve, shall be

maintained by the District. All pipes and fixtures extending or lying beyond the meter box shall be installed and maintained by the owner of the property.

6.08 Damage through Leaking Pipes and Fixtures - When turning on a water supply as requested to a house or property which is vacant, the District will make a reasonable attempt to ascertain if water is running on the inside of the building. If such is found to be the case, the water will be left shut off at the curb cock or the private shutoff. The District's jurisdiction and responsibility ends at the property line and the Board will in no case be liable for damages occasioned by water running from open or faulty fixtures, or from broken or damaged pipes inside the property line.

6.09 Damage to Meters - The District reserves the right to set and maintain a meter on any service connection. The water customer shall be held liable for any damage to the meter due to his negligence or carelessness.

6.10 Main Extension Required - The District may provide for all main extensions upon application for service and payment of required charges. Customer may elect to extend mains providing the work meets District standards according to agreements between the customer and the District.

6.10.01 Application - Any owner of one or more lots, parcels, or a sub-divider of a tract of land desiring the extension of one or more water mains to serve such property, shall make written application therefor to the District. Said application shall contain the legal description of the property to be served, tract number, and any additional information which may be required by the District, and may be accompanied by a map showing the location of the proposed connections.

6.10.02 Investigation - Upon receipt of the application requesting the District to install facilities, the District shall make an investigation and survey of the proposed extension and estimate the cost thereof.

6.10.03 **Dead-end Lines** - No dead-end lines shall be permitted, except at the discretion of the General Manager, and in cases where circulation lines are necessary they shall be designed and installed by the District as part of the main extension.

6.10.04 **Specifications and Construction** - The size, type and quality of materials and location of the lines shall be specified and approved by the District. .

6.10.05 **Property of District** - Upon completion of such installation as approved by the District, the facilities shall be dedicated and become property of the District.

6.10.06 **Connections** - The applicant shall, at his cost, provide all connections to buildings and private water systems, as herein provided.

SECTION 7. TEMPORARY SERVICE

7.01 **Duration of Service** - Temporary service connections shall be disconnected and terminated within six months after installation unless an extension of time is granted in writing by the General Manager or the District Engineer.

7.02 **Security Deposit** - The applicant shall deposit, in advance, the estimated cost of the temporary service. Upon discontinuance of service, the actual cost shall be determined and an adjustment made as an additional charge, refund or credit.

7.03 **Installation and Operation** - All facilities for the temporary service to the customer shall be made and operated and in accordance with District instructions. District may, at its discretion, restrict or terminate the service.

7.04 **Responsibility for Meters and Installations** - The customer shall use all possible care to prevent damage to the meter or to any other loaned facilities of the District which are involved in furnishing the temporary service from the time they are installed until they are removed. If the meter or other facilities are damaged, the cost of making repairs shall be paid by the customer. The customer shall give notice to the

District in writing at least forty eight (48) hours prior to the time the customer or other person is through with the meter or meters and the installation.

7.05 **Supply from Fire Hydrant** - An applicant for temporary use of water from a fire hydrant must apply for a temporary water service and pay a hydrant meter deposit. The applicant shall also pay for the water used in accordance with the meter readings, at the rates prescribed by the Board.

7.06 **Unauthorized Use of Hydrants** - Tampering with any fire hydrant for the unauthorized use of water therefrom or for any other purpose is a misdemeanor, and subject to a fine per occurrence as may be set by the Board.

7.07 **Meter Availability** - The Applicant shall make the hydrant meter available as prescribed by the District for reading on a monthly or bi-monthly basis.

7.08 **Pools and Tanks** - When an abnormally large quantity of water is desired for filling a swimming pool or for other purposes, arrangements must be made with the District prior to taking such water. Permission to take water in unusual quantities will be given only if it can be safely delivered through the District's facilities and if other consumers are not inconvenienced thereby.

7.09 **Responsibility for Equipment** - The customer shall, at his own risk and expense, furnish, install and keep in good and safe condition all equipment that may be required for receiving, controlling, applying and utilizing water, and the District shall not be responsible for any loss or damage caused by the improper installation of such equipment, or the negligence or wrongful act of the customer or any of his tenants, agents, employees, contractors, licensees or permitees in installing, maintaining, operating or interfering with such equipment. The District shall not be responsible for damage to property caused by faucets, valves and other equipment which are open when water is turned on at the meter, either originally or when turned on after a temporary shutdown.

SECTION 8. FIRE PROTECTION

8.01 **Public Fire Protection** - The following pertains to the use of District facilities for public fire protection:

8.01.01 **Use of Fire Hydrants** - Fire Hydrants are for use by the District or by organized fire protection agencies pursuant to contract with the District. Other parties desiring to use fire hydrants for any purpose must first obtain written permission from the Water Department prior to and shall operate the hydrant in accordance with instructions issued by the Water Department. Unauthorized use of hydrants will be prosecuted according to law.

8.01.02 **Moving of Fire Hydrants** - When a fire hydrant has been installed in the location specified by the proper authority, the District has fulfilled its obligation. If a property owner or other party desires a change in the size, type or location of the hydrant they shall bear all costs of such changes, without refund. Any change in the location of a fire hydrant must be approved by the proper authority.

8.02 **Private Fire Protection Service** - The following pertains to the use of District facilities for private fire protection systems:

8.02.01 **Payment of Cost** - The applicant for private fire protection service shall pay the total actual cost of installation of the service from the distribution main to the service location including the cost of a detector check meter or other suitable and equivalent device, valve and meter box, said installation to become the property of the District.

8.02.02 **No Connection to Other Systems** - There shall be no connection between this fire protection system and any other water distribution system on the premises.

8.02.03 **Use** - There shall be no water used through the fire protection service except to extinguish fires and for testing the fire fighting equipment.

8.02.04 **Charges for Water Used** - Any consumption recorded on the meter will be charged as provided in District Resolutions except that no charge will be made for

water used to extinguish fires where such fires have been reported to the fire department.

8.02.05 **Monthly Rates** - The monthly rates for private fire protection shall be established from time to time by Resolution of the Board of Directors.

8.02.06 **Water for Fire Storage Tanks** - Occasionally water may be obtained from a private fire service for filling a tank connected with the fire service, but only if written permission is secured from the District in advance and an approved means of measurement is available.

8.02.07 **Violation of Agreement** - If water is used from a private fire service in violation of the agreement or this Ordinance, the District may, at its option, discontinue and remove the service.

8.02.08 **Valve** - When a fire service connection is installed, the valve governing same will be closed and sealed and remain so until a written order is received from the owner of the premises to have the water turned on.

8.02.09 **Meter** - If the District does not require a meter, and if water is used through a fire service connection for any other purpose than extinguishing fires, the District shall have the right to place a meter on the fire service connection at the owners expense and assess the appropriate capacity fees, or shut off the entire water supply from such premises.

8.02.10 **Additional Service** - The District shall have the right to take a domestic, commercial or industrial service connection from the fire service connection at the curb to supply the same premises as those to which the fire service connection belongs. The Board shall also have the right to determine the proportion of the installation costs properly chargeable to each service connection, if such segregation of costs shall become necessary.

8.02.11 **Check Valve** - The Board reserves the right to install on all fire service connections a check valve of a type approved by the National Board of Fire

Underwriters and to equip the same with a by-pass meter at the expense of the owner of the property.

SECTION 9. CROSS CONNECTION CONTROL

9.01 Cross Connections - The purpose of this paragraph is to protect the public potable water supply systems of the East Valley Water District by establishing a Cross Connection Control Program to effect the control of cross connections, actual or potential, thereby isolating within the customer's private water system or internal piping, contaminants or pollutants which could back flow or back siphon into the District's water supply system.

The regulations relating to cross connections as established in the California Administrative Code, Title 17 and as amended from time to time, insofar as these regulations are applicable to the protection of the water supply of this District are hereby adopted, incorporated herein by reference and made a part hereof.

9.02 Determination of Cross Connection - Upon the determination by the East Valley Water District that a back flow prevention device is required in the customer's private piping system for the safety of the public water supply system, the customer shall immediately install such a device within thirty (30) days of being notified by the District, in the manner and location prescribed by the District at his own expense.

9.03 Failure to Install Prescribed Device - Failure to install said device as prescribed shall constitute grounds for discontinuance of water service to the premises. No water service shall be installed or maintained by the District to any premises on which there exists or there is suspected to exist a cross connection between the public water supply and other piping, fixtures, appliances, equipment, drains or any system which might cause contamination or pollution through back flow or back-siphonage, unless such service is protected by the installation of a back flow prevention device acceptable to the District.

9.04 **Installation, Inspection, Testing and Maintenance** - All back flow prevention devices shall be inspected and tested at least annually for proper operation. Inspection and testing shall be performed by a licensed plumbing contractor certified to test and repair back flow prevention devices. The results of each test including repairs shall be reported on a form provided by the District.

9.04.01 **Repair of Defective Devices** - In the event that the device is found to be defective, the customer shall cause the necessary repairs and/or replacement to be made at his expense. The owner shall have an acceptance test performed after repairs and/or replacements have been made to confirm proper operation of the device. All annual inspections, testing, acceptance tests after installation, repair and/or replacement shall be at the expense of the owner.

9.04.02 **No service Unless Properly Protected** - A water service connection to any premise shall not be installed or maintained unless the public water supply system is protected in accordance with the laws of the State of California and this Ordinance. If a back flow prevention device has not been installed, tested and maintained in accordance with the provisions of this Ordinance, or if a back flow prevention device has been removed or bypassed, or if an unprotected cross connection exists on the premises, water service shall be discontinued and not restored until such conditions or defects have been corrected.

9.04.03 **Installation Required** - Upon the determination by the District that a back flow prevention device is required on a customer's water service line, it shall be installed immediately behind the meter and before the first branch line leading off the service line.

9.05 **Cross Connection Control Criteria** - Criteria examined to determine whether a back flow prevention device is required shall include, but not be limited to the following:

9.05.01 **Auxiliary Water Supply** - A premise being or to be served water by the District having an auxiliary water supply of a quality which is not acceptable to the District as an additional source.

9.05.02 **Industrial Hazards** - A premise on which industrial fluids or other objectionable substances are being handled in a manner as to create an actual or potential hazard to the public water supply.

9.05.03 **Inspection not Possible** - A premise whose internal piping system has cross connections that cannot be corrected or controlled or the system is not accessible for inspection to make a determination of the existence of a cross connection.

9.06 **Degree of Hazard** - The type of back flow prevention device required shall be based upon the degree of hazard existing upon the customer's premise. The degree is considered to be those defined as follows:

9.06.01 **Severe** - A cross connection, actual or potential, involving fluid, chemical or substance capable of causing death or the spreading of disease or illness. These premises shall be isolated from the public water supply system by an approved Air Gap.

9.06.02 **Moderate** - A cross connection, actual or potential within a customer's piping system handling potable water which has a high probability of becoming contaminated with any substance. Under these conditions the public water supply system shall be protected by an approved Reduced Pressure Principle Device.

9.07 **Typical Facilities**

Sewage Plants	Air Gap
Sewage Lift Stations	Reduced Pressure Device
Mortuaries	Reduced Pressure Device
Hospitals	Reduced Pressure Device
Convalescent Homes	Reduced Pressure Device
Plating Plants	Reduced Pressure Device
Cooling Towers	Reduced Pressure Device

Air Conditioning (Chemical Pots)	Reduced Pressure Device
Cleaners	Reduced Pressure Device
Bottling Company	Reduced Pressure Device
Multi-storied Building(over 50' high)	Double Check Valve Device
Sprinkling Systems(Chemical entrained)	Double Check Valve Device
Mobile Home Parks	Double Check Valve Device
Mobile Home Parks (Sewer line and Cleanout conditions	Reduced Pressure Device
Steam Facilities	Reduced Pressure Device

9.08 **Approved Devices** - The District shall maintain and make available a list of approved back flow prevention devices which may be installed for the protection of the public water supply system.

9.09 **Enforcement** - Service of water to any premise shall be discontinued by the District if a back flow prevention device required by the rules and regulations of the District is not installed, tested and maintained or if defects are found in the installed back flow prevention device or if it is found that a back flow prevention device has been removed or bypassed or if unprotected cross connections exist on the premises. Service will not be restored until such condition or defects are corrected. The District representative assigned to inspect the premises relative to possible cross connection hazards, shall carry proper credentials of his office, upon exhibition of which, he shall have the right of entry during usual business hours to inspect any and all buildings and premises in the performance of his duty. This right of entry shall be a condition of the premises will not constitute a menace to health, safety and welfare to the people throughout the District's water system.

SECTION 10. CUSTOMER BILLING PROCEDURES

10.01 **Establish Rates and Charges** - The Board of Directors shall from time by resolution, establish rates and charges for water and other service provided by the East Valley Water District.

10.02 Charges - Water charges shall begin when a water service connection is installed and the meter is set or an existing service is requested to be turned on, unless the water is otherwise ordered to be left shut off when the service connection is ordered or installed. Thereafter, the District may transfer to the account, which is established for such service, any delinquent and/or unpaid charges from other closed or open accounts which are held by the customer and/or property owner with the District.

10.03 Liability for Water Used - The property owner shall be held liable for water used until the District is notified in writing to discontinue service or to transfer the account to another property owner.

10.04 Liens for Unpaid Bills - All unpaid bills will be made a lien against the property pursuant to these rules, regulations and California Water Code Section 31701.5 et.seq.

10.05 Owner Liability - The property owner remains responsible for all charges owed to the District whether or not the property owner actually lives on the premises or signs the application for water service form.

10.06 Billing Period - The regular billing period will be monthly.

10.07 Meter Reading - Meters will be read as nearly as possible on the same day of each month.

10.08 Billing of Separate Meters not Combined - Separate bills will be rendered for each meter installation. The District may, for its own convenience, consider each register of compound meters as a separate service and bill each as provided for herein.

10.09 Opening and Closing Bills - Opening and closing bills for less than the normal billing period shall consist of charges for actual water consumption and a proration of the availability charge.

10.10 Payment of Bills - Bills for metered water service shall be rendered at the end of each billing period and due and payable upon presentation. If full payment is

not received at the business office of the District on or before the due date, the bill shall become past due and delinquent.

10.11 **Delinquency Notice** - A delinquency notice shall be mailed to customers whose accounts are delinquent, warning that service is subject to disconnection unless payment is received within fifteen (15) calendar days from the date of mailing of the delinquent notice. The delinquency notice shall indicate the amount due, including delinquent charges, and the total amount which must be paid. Notice of any delinquency in a tenant's account shall also be sent to the owner of the property.

10.12 **Removal of Delinquency** - At the end of each calendar year the District shall remove one delinquency from the record of each account that has one or more delinquencies.

10.13 **Suit** - All unpaid rates, charges and penalties herein provided may be collected by suit.

10.14 **Costs** - Defendant shall pay all costs of suit in any judgment rendered in favor of the District, including reasonable attorney's fees.

10.15 **Upon Vacating Premises** - Customers desiring to discontinue service should so notify the District in writing three (3) business days prior to vacating the premises. Unless discontinuance of service is ordered, the customer shall be liable for on-going charges whether or not any water is used, up until time of requested discontinuance of service.

SECTION 11. COMPLAINTS AND DISPUTED BILLS

11.01 **Right to Meet** - Should a customer have a complaint with regard to water service, the District rules, regulations, resolutions, ordinances, or dispute the accuracy of a bill for water service or other charges, for any reason whatsoever, the customer has the right to meet with the Financial Officer or General Manager to

discuss the dispute and present any evidence the customer has to support their position.

11.02 **Arrangement of Meeting** - To arrange such a meeting, the customer shall contact the District office, either in writing or by telephone during normal business hours as may be set by the Board.

11.03 **Presentation of Evidence** - The customer may be accompanied by a friend, attorney, or other representative to meet with the Financial Officer or General Manager and may present any evidence they may have to support their position.

11.04 **Unresolved Disputes** - If the customer is unable to resolve his dispute with the Financial Officer or General Manager he may submit the complaint in writing, along with a full and detailed explanation to the Board of Directors for resolution.

11.05 **Appearances Before the Board of Directors** - The customer may appear before the Board of Directors at the next regularly scheduled Board meeting by notifying the District Secretary prior to the Board meeting either by telephone or in writing of the date he wishes to attend and what the dispute regards. The customer may then present the complaint and any evidence in support of his position and ask for a decision by the Board.

11.06 **Delays on Action** - The Board shall act promptly to resolve the dispute, but may delay a resolution of the dispute to the time of its next regular meeting in order to investigate the dispute or receive special reports related to the dispute.

11.07 **Further Delays** - Any further delays must be freely and willingly agreed to by the customer.

11.08 **Decision of the Board** - The decision of the Board of Directors shall be final. Should the Board not render a decision within sixty (60) days of application to the Board, this failure to act shall be deemed a denial of the requested action, unless both parties have agreed to extend the resolution period.

11.09 Discontinuance of Service - No water or other service shall be discontinued pending the final resolution of a dispute.

11.10 Adjustment for Fast Meter Errors - If a meter tested at the request of a customer is found to be more than five percent (5%) fast, the excess charges for the time service was rendered the customer requesting the test, or for a period of six months, whichever shall be the lesser, shall be refunded to the customer.

11.11 Adjustment for Slow Meter Errors - If a meter tested at the request of a customer is found to be more than ten percent (10%) slow and shows evidence of tampering, the District may bill the customer for the amount of the undercharge based upon corrected meter readings for the period, not exceeding six months, that the meter was in use.

11.12 Non-Registering Meters - If a meter is found to be not registering, the charges for service shall be based on the estimated consumption. Such estimates shall be made from previous consumption for a comparable period or by such other method as is determined by the District and its decision shall be final.

SECTION 12. DISCONNECTION FOR NONPAYMENT

12.01 Disconnection for Non-Payment - Water service shall be discontinued if payment for water service is not made within fifteen (15) calendar days of the date of mailing the delinquent notice. At least forty-eight (48) hours prior to termination, the District will make a reasonable attempt to notify the resident of the affected property by leaving a notification tag at the property. At no time shall the District discontinue water service at a time when the District offices are closed.

12.02 Complaint Procedures for Disconnection - Service disconnection for non-payment of bills or for violation of any of the District's rules, regulations, ordinances or resolutions is subject to the complaint procedures specified in Section 11 herein.

12.03 **Refusal or Neglect to Pay Debt** - Any amount due is a debt to the District and any person, firm or corporation failing, neglecting, or refusing to pay this debt may be subject to a civil action for the amount due in a court of competent jurisdiction.

12.04 **Lien Against Property for Non-Payment** - Any unpaid debt will be deemed a lien against the real property to which service is rendered as specified herein and California Water Code Section 31701.5 et.seq.

12.05 **Service Charges for Violations** - If water service is discontinued for violation of any of the District's rules, regulations, resolutions or ordinances, service shall not be re-instituted until the violations have been corrected and all applicable service charges and fees as provided for herein paid.

12.06 **Partial Payments** - A partial payment of a delinquent account may be accepted and credited to a customer's account, but such partial payment shall not be cause for removing the account from a delinquent status and shall not preclude the meter from being turned off for delinquency.

12.07 **Authorization for Continuance of Service for Delinquent Accounts** -

The General Manager or his designee may authorize continuation of service to a delinquent account if financial arrangements satisfactory to the District have been established.

SECTION 13. ADDING DELINQUENT CHARGE TO TAX ROLL

13.01 **Report of Delinquent and Unpaid Charges** - A report of delinquent and unpaid charges for water and other services which have been liened for thirty (30) days or more on July 1st of each year shall be prepared and submitted to the Board for consideration as tax liens. The unpaid and liened charges listed in said report for each parcel of property shall be fixed at the amount listed in said report.

13.02 **Adoption and Filing of Report** - The Secretary shall file with the County Assessor of the County of San Bernardino and the Board of Supervisors of the

County of San Bernardino, in the time and manner specified by the County Assessors and Board of Supervisors, a copy of such written report with a statement endorsed thereon over the signature of the Secretary, that such a report has been adopted and approved by the Board of Directors and that the County Assessor shall enter the amount of such charges against the respective lots or parcels of land as they appear on the current assessment roll.

13.03 **Collection of Delinquent and Unpaid Charges** - The County Assessor shall include the amount of charges on bills for taxes levied against their respective lots and parcels of land and thereafter, the amount of such unpaid and delinquent charges shall be collected at the same time and in the same manner by the same person as, together with and not separately from the general taxes, if any, for the District or the County of San Bernardino and shall be delinquent at the same time and thereafter be subject to the same delinquency penalties.

SECTION 14. CHARGES

14.01 **Charges** - All charges described herein shall be adopted by Board resolution.

14.02 **Consumption Charge** - The consumption charge is the charge per hundred cubic feet for all water registered by the customer's water service meter.

14.03 **Delinquency Charges** - A delinquent charge shall be added to each delinquent account at the time any amount becomes delinquent, provided that no delinquent charge shall be made on any account which at the time has no delinquencies of record. When a delinquent charge is made, such charge shall be added to the delinquent account as of the date the account becomes delinquent and the charge shall become an inseparable part of the amount due as of that time.

14.04 **Disconnect/Reconnect Charge** - The disconnect/reconnect charge is the charge which covers the reasonable District costs for disconnection and

reconnection of service connections which are in violation of the provisions contained herein.

14.05 **Fire Hydrant Installation Charge** - The charge for installation of fire hydrants as may be required.

14.06 **Fire Service Installation Charge** - The charge for installation of fire services as may be required.

14.07 **Fire Service Standby Charge** - The fire service standby charge is the monthly standby charge per inch diameter of the District fire service meter. Water use through this service is limited to emergency fire requirements only.

14.08 **Inspection Charge** - Where a customer service connection or facility requires inspection by District personnel, the customer shall be charged for such inspection.

14.09 **Meter Test Charge** - The meter test charge is the charge which covers the District costs for removing, bench testing, and reinstalling the water meter to be tested. The initial charge will be waived; the charge for the second and subsequent tests are established as provided for in District resolutions.

14.10 **Security Deposit Charge** - The Security deposit is the charge which insures payment of minimum District charges. Upon discontinuance of service the security deposit shall be applied to reduce any unpaid charges outstanding on any accounts held by the customer with the District. The amount of deposit required shall be established by the Board of Directors in the resolution on fees. The security deposit shall be refunded to the customer as provided in Section 6.04.02 herein.

14.11 **Special Facility Charge** - A special facility charge shall be required for development of limited service area whenever special facilities, including but not limited to, booster stations, hydropneumatic stations and pressure regulators are required. The charge to be made to a developer or owner of land that is considered by the District to be within a limited service area shall be based upon the developer's or landowner's

proportionate share of the cost of the installation of such special facility. Such proportionate share to be borne by the developer or landowner shall be based on the percentage of such development to the entire limited service area to be served by the special facilities; and the difference between the cost of facilities to serve the same number of acres or area under normal conditions and the cost of facilities to serve the acreage or area under special conditions at a higher cost.

14.12 <u>System Charge</u> - The system charge is the monthly availability charge applicable to all metered services.

14.13 <u>Unauthorized Use of Water Charge</u> - The unauthorized use of water charge shall be charged to any person, organization or agency for each unauthorized use of District water, or for tampering in any manner with any meter belonging to the District, in which tampering shall affect the accuracy of such meter.

14.14 <u>Water Main Extension Charge</u> - The charge for water main extension is the charge for the replacement or construction of the water main fronting on the property to be served.

14.15 <u>Water Service Connection Charge</u> - The water service connection charge is the charge for the type and size of water service connection desired. Such regular charge shall be paid in advance by the applicant. The water service connection charge shall consist of an installation charge and a capacity charge. Where there is no regular charge, the District reserves the right to require the applicant to deposit an amount equal to the estimated cost of such service connection.

14.15.01 <u>Installation Charge</u> - The installation charge shall represent the District's cost to furnish and install the specified service.

14.15.02 <u>Capacity Charge</u> - The capacity charge is a fee for that incremental portion of the entire water system and District facilities that will be used by a new service.

14.16 **Water System Design Charge** - A non-refundable water system design charge shall be required for all main extensions, service connection and/or special facilities requiring the preparation of engineering plans and drawings.

14.17 **Water System Plan Check Charge** - The water system plan check charge is a fee for the District's time and effort spent insuring the plans submitted for main extensions or other water facilities meet the District's needs and conform to the District's standards.

14.18 **Construction Water Charge** - The construction water charge is a temporary flat rate water charge. It is only available during the construction phase of a new building for services 1" in diameter or less. It is available for a period not exceeding six months in length.

14.19 **Fire Flow Test Charge** - The fire flow test charge is a flat rate to cover the District's time and effort for testing parts of the water system to obtain fire flow test data and calculate results as requested.

14.20 **Valve Deposit** - The valve deposit is a refundable charge that is used to insure all valve cans and caps are constructed to final grade before a water system construction project is complete. The fee will be returned when valve cans and caps are constructed to final grade by the developer's contractor and verified by the District.

14.21 **Easement Processing Charge** - The easement processing charge is the charge to cover the District's cost to review and approve an applicant's easement request.

14.22 **Service Initiation Charge** - The service initiation charge is a non-refundable charge which covers the reasonable District costs for initiating water service.

14.23 **Returned Check Charge** - A returned check charge is a charge which covers the reasonable administrative cost and banking charges for processing a returned check.

SECTION 15 WATER CONSERVATION

15.01 Waste or Nuisance Water and Other Substances - It is unlawful for any person, firm or corporation to deposit, drain, wash, allow run or divert into or upon any public road, highway, street or alley, drainage ditch, storm drain or flood control channel owned by or controlled by any public agency within the District, any water, mud, or sand except that, upon written application of any person filed with the District and approved by the General Manager, the District may, upon such terms and conditions as it may deem advisable to impose, including the charging of a fee therefor, grant a permit to such person to be any of the acts prohibited by this section, provided the same shall not be detrimental to the public health, safety or welfare. For purposes of enforcement of this Section, the owner of the meter or property which is the source of the waste or nuisance water or other substance as defined herein is considered the party responsible for any violations cited hereunder.

15.02 Conservation Measures - Stage No.1 Normal Conditions: Voluntary Conservation Measures - Normal conditions shall be in effect when the District is able to meet all the water demands of its customers in the immediate future. During normal conditions all water users should continue to use water wisely, to prevent the waste or unreasonable use of water, and to reduce water consumption to that necessary for ordinary domestic and commercial purposes.

15.03 Stage No. 2 - Threatened Water Supply Shortage - In the event of a threatened water supply shortage which could affect the District's ability to provide water for ordinary domestic and commercial uses, the Board of Directors shall hold a public hearing at which consumers of the water supply shall have the opportunity to protest and to present their respective needs to the District. The Board may then, by resolution, declare a water shortage condition to prevail, and the following conservation measures shall be in effect:

15.03.01 <u>Exterior Landscape Plans</u> - Exterior landscape plans for all new commercial and industrial development shall provide for timed irrigation and shall consider the use of drought resistance varieties of flora. Such plans shall be presented to and approved by the District prior to issuance of a water service letter.

15.03.02 <u>Excessive Irrigation and Related Waste</u> - No customer of the District or other person acting on behalf of or under the direction of a customer shall cause or permit the use of water for irrigation of landscaping or other outdoor vegetation, plantings, lawns or other growth, to exceed the amount required to provide reasonable irrigation of same, and shall not cause or permit any unreasonable or excessive waste of water from said irrigation activities or from watering devices or systems. The free flow of water away from an irrigated site shall be presumptively considered excessive irrigation and waste as defined in Section 3 herein.

15.03.03 <u>Agricultural Irrigation</u> - Persons receiving water from the District who are engaged in commercial agricultural practices, whether for the purpose of crop production or growing of ornamental plants shall provide, maintain and use irrigation equipment and practices which are the most efficient possible. Upon the request of the General Manager, these persons may be required to prepare a plan describing their irrigation practices and equipment, including but not limited to, an estimate of the efficiency of the use of water on their properties.

15.03.04 <u>Commercial Facilities</u> - Commercial and industrial facilities shall, upon request of the General Manager, provide the District with a plan to conserve water at their facilities. The District will provide these facilities with information regarding the average monthly water use by the facility for the last two year period. The facility will be expected to provide the District with a plan to conserve or reduce the amount of water used by that percentage deemed by the Board of Directors to be necessary under the circumstances. After review and approval by the General Manager, the water

conservation plan shall be considered subject to inspection and enforcement by the District.

15.03.05 **Parks, Golf Courses, Swimming Pools and School Grounds** - Public and private parks, golf courses, swimming pools and school grounds which use water provided by the District shall use water for irrigation and pool filling between the hours of 10:00 p.m. and 6:00 a.m.

15.03.06 **Domestic Irrigation** - Upon notice and public hearing, the District may determine that the irrigation of exterior vegetation shall be conducted only during specified hours and/or days, and may impose other restrictions on the use of water for such irrigation. The irrigation of exterior vegetation at other than these times shall be considered to be a waste of water.

15.03.07 **Swimming Pools** - All residential, public and recreational swimming pools, of all size, shall use evaporation resistant covers and shall re-circulate water. Any swimming pool which does not have a cover installed during periods of non-use shall be considered a waste of water.

15.03.08 **Run-off and Wash-down** - No water provided by the District shall be used for the purposes of wash-down of impervious areas, without specific written authorization of the General Manager. Any water used on a premises that is allowed to escape the premises and run off into gutters or storm drains shall be considered a waste of water.

15.03.09 **Vehicle Washing** - The washing of cars, trucks or other vehicles is not permitted, except with a hose equipped with an automatic shut-off device, or a commercial facility so designated on the District's billing records.

15.03.10 **Drinking Water Provided by Restaurants** - Restaurants are requested not to provide drinking water to patrons except by request.

15.04 **Stage No. 3- Water Shortage Emergency: Mandatory Conservation Measures** - In the event of a water shortage emergency in which the District may be

prevented from meeting the water demands of its customers, the Board of Directors shall, if possible, given the time and circumstances, immediately hold a public hearing at which customers of the District shall have the opportunity to protest and to present their respective needs to the Board. No public hearing shall be required in the event of a breakage or failure of a pump, pipeline, or conduit causing an immediate emergency. The General Manager is empowered to declare a water shortage emergency, subject to the ratification of the Board of Directors within 72 hours of such declaration, and the following rules and regulations shall be in effect immediately following such declarations:

15.04.01 **Prohibition** - Watering of parks, school grounds, golf courses, lawn water, landscape irrigation, washing down of driveways, parking lots or other impervious surfaces, washing of vehicles, except when done by commercial car wash establishments using only recycled or reclaimed water, filling or adding water to swimming pools, wading pools, spas, ornamental ponds, fountains and artificial lakes are prohibited.

15.04.02 **Restaurants** - Restaurants shall not serve drinking water to patrons except by request.

15.04.03 **Construction Meters** - No new construction meter permits shall be issued by the District. All existing construction meters shall be removed and/or locked.

15.04.04 **Commercial Nurseries and Livestock** - Commercial nurseries shall discontinue all watering and irrigation. Watering of livestock is permitted as necessary.

15.05 **Implementation and Termination of Mandatory Compliance Stages** - The General Manager of the District shall monitor the supply and demand for water on a daily basis to determine the level of conservation required by the implementation or termination of the Water Conservation Plan Stages and shall notify the Board of Directors of the necessity for the implementation or termination of each stage. Each declaration of the Board of Directors implementing or terminating a water conservation

stage shall be published at least once in a newspaper of general circulation, and shall be posted at the District offices. Each declaration shall remain in effect until the Board of Directors otherwise declares, as provided herein.

15.06 **Exceptions - Application for Exception Permits** - The General Manager may grant permits for uses of water otherwise prohibited under the provisions of this Ordinance if he finds and determines that restrictions herein would either:

15.06.01 **Hardship** - Cause an unnecessary and undue hardship to the water user or the public; or

15.06.02 **Emergency** - Cause an emergency condition affecting the health, sanitation, fire protection or safety of the water use or of the public.

15.06.03 **Exemptions Granted** - Such exceptions may be granted only upon written application therefor. Upon granting such exception permit, the General Manager may impose any conditions he determines to be just and proper.

15.07 **Enforcement, Inspection** - Authorized employees of the District, after proper identification may, during reasonable hours, inspect any facility having a water conservation plan, and may enter onto private property for the purpose of observing the operation of any water conservation device, irrigation equipment or water facility. Employees of the District may also observe the use of water or irrigation equipment within the District from public rights-of-way and as alleged violations are reported to the District.

15.08 **Criminal Penalties for Violation** - Water Code Section 31029 makes any violation of this Ordinance a misdemeanor and upon conviction thereof, the violator shall be punished by imprisonment, fine or by both such fine and imprisonment as may be allowed by law.

15.09 **Civil Penalties for Violation** - In addition to criminal penalties, violators of the mandatory provisions of this Ordinance shall be subject to civil action initiated by the District as follows:

15.09.01 **First Violation** - For a first violation, the District shall issue a written notice of violation to the water user violating the provisions of this Ordinance. The notice shall be given pursuant to the requirements of Section 15.10 below.

15.09.02 **Second Violation: $100.00 Surcharge** - For a second violation of this Ordinance within a 12 month period, or failure to comply with the notice of violation within the period stated, a surcharge of $100.00 is hereby imposed for the meter through which the wasted water was supplied.

15.09.03 **Third Violation: $200.00 Surcharge and/or Installation of a Flow Restrictor** - For a third violation of this ordinance within a 12 month period, or for continued failure to comply within 30 days after notice of an imposition of second violation sanctions, a one month penalty surcharge in the amount of $200.00 is hereby imposed for the meter through which the wasted water was supplied. In addition to the surcharge, the District may, at its discretion, install a flow-restricting device at such meter with a one-eighth inch (1/8") orifice for services up to one and one half (1-1/2") inch size, and comparatively sized restrictors for larger services, on the service of the customer at the premises at which the violation occurred for a period of not less than forty-eight (48) hours. The charge to the customer for installing a flow-restricting device shall be based upon the size of the meter and the actual cost of installation but shall not be less than that provided in the District's Rules and Regulations. The charge for removal of the flow-restricting device and restoration of normal service shall be as provided in the District's Rules and Regulations.

15.09.04 **Subsequent Violations: Discontinuance of Service** - For any subsequent violation of this Ordinance within the twenty-four (24) calendar months after a first violation as provided in Section 15.09.2 hereof, the penalty surcharge provided in Section 15.09.3 hereof shall be imposed and the District may discontinue water service to that customer at the premises or to the meter where the violation occurred. The charge for reconnection and restoration of normal service shall be as provided in the

Rules and Regulations of the District. Such restoration of service shall not be made until the General Manager of the District as determined that the water user has provided reasonable assurances that future violations of this Ordinance by such user will not occur.

15.10 **Notice - First Violation** - For a first violation, written notice shall be given to the customer and/or property owner personally or by regular mail.

15.10.01 **Subsequent Violations** - If the penalty assessed is a surcharge for a second or third violation, notice may be given by regular mail.

15.10.02 **Violations Involving Installation of Flow-Restrictors or Discontinuance of Water Service** - If the penalty assessed is, or includes, the installation of a flow restrictor or the discontinuance of water service to the customer for any period of time, notice of the violation shall be given in the following manner:

15.10.02.1 **Personal Service** - By giving written notice thereof to the occupant and/or property owner personally; or if the occupant and/or property owner is absent from his/her place of residence and from his/her assumed place of business, by leaving a copy with some person of suitable age and discretion at either place, and sending a copy through the United States mail addressed to the occupant and/or owner at his/her place of business or residence; or

15.10.02.2 **Posting** - If such place of residence and business cannot be ascertained, or a person of suitable age or discretion cannot be located, then by affixing a copy in a conspicuous place on the property where the failure to comply is occurring and also by delivering a copy to a person there residing, if such person can be found, and also sending a copy through the United States mail addressed to the occupant at the place where the property is situated and the owner if different.

15.10.03 **Form of Notice** - All notices provided for in this Section shall contain, in addition to the facts of the violation, a statement of the possible penalties for each

violation and a statement informing the occupant/owner of his/her right to hearing on the violation.

15.11 Hearing - Any customer or property owner against whom a penalty is levied pursuant to this ordinance shall have a right to a hearing, in the first instance by the General Manager, with the right of appeal to the Board of Directors, on the merits of the alleged violation upon the written request of that customer within fifteen (15) days of the date of alleged violation. At the next regularly scheduled meeting, the customer may then appear and present any evidence in support of his position and ask for a decision by the Board.

15.12 Delays on Action - The Board shall act promptly to resolve the dispute, but may delay a resolution of the dispute to the time of its next regular meeting in order to investigate the dispute or receive special reports related to the dispute.

15.13 Decision of the Board - The decision of the Board of Directors shall be final. Should the Board not render a decision within sixty (60) days of application to the Board, this failure to act shall be deemed a denial of the requested action, unless both parties have agreed to extend the resolution period.

SECTION 16. EFFECTIVE DATE

This Ordinance shall become effective upon adoption.

APPROVED AND ADOPTED this 27th day of January, 1997

ROLL CALL VOTE:

Ayes: **Directors**
Noes:
Absent:
Abstain:

Kip E. Sturgeon, President

ATTEST:
Robert E. Martin, Secretary

APPENDIX D

DEMAND MANAGEMENT MEASURES WORKSHEETS

Cost-Benefit Analysis

BMPs			Cumulative values for 2006-2010			
	Best Management Practice (BMPs)	Demand Management Measures (DMMs)	Program Cost[1]	Estimated Total Water Savings (Acre-feet)	Avoided Cost of Water Saved	Difference Cost/(Benefit)
1	Water survey programs for single-family residential and multi-family residential customers	DMM 2.4-Hot Water Demand Unit, DMM 2.8-Residential Surveys	$507,294	1,255	$102,936	$404,358
2	Residential plumbing retrofit	DMM 2.2-Graywater, DMM 2.7-Residential Retrofits, DMM 2.9-Ultra Low Flow Flush Toilets	$27,610,702	2,242	$183,988	$27,426,715
3	System water audits, leak detection, and repair		$953,169	500	$41,025	$912,144
4	Metering with commodity rates for all new connections and retrofit of existing connections	DMM 2.5-Metering (Analysis run, budget used)	$1,932,100	500	$41,025	$1,891,075
5	Large landscape conservation programs and incentives	DMM 2.16-Large Landscape Devices	$101,773[2]	25	$2,045	$99,728
6	High-efficiency washing machine rebate programs	DMM 2.3-High Efficiency Washing Machine	$458,945	149	$12,196	$446,749
7	Public information programs		$257,613	100	$8,205	$249,408
8	School education programs		$206,091	50	$4,103	$201,988
9	Conservation programs for CII accounts	DMM 2.10-CII Surveys, DMM 2.13-Self Closing Faucets, DMM 2.14-Ultra Low Flush Toilets (CII), DMM 2.15-Urinals	$660,961	2,551	$209,321	$451,640
10	Wholesale agency programs		*Included in BMP 9*			
11	Conservation pricing	DMM 2.6-Conservation Pricing	$100,000	1,707	$140,022	($40,022)
12	Water conservation coordinator		*Included in BMP7*			
13	Water waste prohibition	Emergency Program	The District has a Water Waste Ordinance; there are no annual program costs. Water savings would occur on unplanned emergency basis only.			
14	Residential ultra-low-flush toilet replacement programs	DMM 2.9-Ultra Low Flow Flush Toilets	*Included in BMP 2*			
	TOTAL-ALL BMPs		$32,788,649	9,078	$744,865	$32,043,784

* Production Cost of Water - $82/acre-feet

[1] Present Value of DMMs or Budget
[2] One year Cost/benefit

2.2 Graywater BMP-2

Program cost

Equipment costs of typical	**1994 $**
Plumbing parts	121
Tank parts	233
Pump	150
Drip parts or	253
Leachfield parts	230
Total drip	757
Total leachfields	734

Program costs	**Whitney et al. (1999)**		**2005**
Capital costs	$5400/site	including $1250 for equipment, $4150 for labor	**$6,419**
Energy cost/pump	$100	over 15 year	
Back-wash water	$20	over 15 year	

Water Savings Calculation Formula

S=PPH*Graywater_PPH_Day*Percent_Irrigation_Saved

S=gpd/HH system

		DWR 1994
	showers,bathtubs and wash basins	25 gal/day/occupant
	clothes washers	15gal/day/occupant
	percent_irrigation_saved	4 to 8.5 months/year irrigation

	Savings gpd/system
with 6 months irrigation and 3.0 persons/HH	60

				SAVINGS				
Year	No. of HHs	No. of new HHs	HHs with graywter systems	per HH/ gpd/system	all HHs /gpd (assuming 800HH are added each year)	all HHs/gallons per year/system	Total water savings (only new HHs)	Total Water saved (Cumulative)
2005	23,362	23,362	3,504	60	48,000	17,520,000	17,520,000	17,520,000
2006	23,922	561	800	60	48,000	17,520,000	17,520,000	17,520,000
2007	24,497	574	800	60	48,000	17,520,000	17,520,000	35,040,000
2008	25,085	588	800	60	48,000	17,520,000	17,520,000	52,560,000
2009	25,687	602	800	60	48,000	17,520,000	17,520,000	70,080,000
2010	26,303	616	800	60	48,000	17,520,000	17,520,000	87,600,000
Total water saved (gallons)								**262,800,000**
Total water saved (acre-feet)								**807**

Assuming at the end of the program in 2010 15% of HHs will have graywater systems installed
This implies an addition of 800 systems approximately every year

2.2 Graywater — BMP 2

	Item	Utilities Unit	Utilities Unit Cost	Utilities Subtotal	Utilities Time (year)	Contractors Unit	Contractors Unit Cost	Contractors Subtotal	Contractors Time (year)	
A	**Administration**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal	800	$6,419	$5,135,200						$5,135,200
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			$ 6,500					$	6,500
	6 Other (specify)									
	Subtotal								$	6,500
C	**Direct Implementation**									
	1 Direct Labor									
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments									
	5 Travel									
	6 Other (specify)									
	Subtotal									
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total								$	5,141,700

2.2 Graywater BMP 2

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, and Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006					$5,141,700	$5,141,700
1	2007					$5,141,700	$5,218,826
2	2008					$5,141,700	$5,297,108
3	2009					$5,141,700	$5,376,565
4	2010					$5,141,700	$5,457,213
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total						**$25,708,500**	**$26,491,411**

2.3 High Efficiency Washing Machines BMP-6

Program Costs

Supplier program costs may include
Staff time to develop rebate program
Rebate costs
Administration
Contractors
Marketing

Washing machine costs		*Assumptions*
Type	Retail price $ 1998	6.7 loads/week
Front loading	700-1600	60% loads using warm/hot water
Top loading	300-600	$0.0835 per kWh
		$0.002011 per gallon of water
		$0.002362 per gallon of wastewater

Water Savings Calculation Formula

S=Savings_per_Load*Water_Use_per_load*Loads_per_Person*PPH

S=gpd/machine
SF PPH
MF PPH 25% for maximum fill
Savings_per_Lo 10% for minimum

Water use per load
Loads per person-.3 loads per capita per day to .45 loads per day

Rough calculations
Savings in gpd/machine/HH **11.058** *.3 loads per person*
48.5 gallons/load

				SAVINGS				
Year	No. of HHs	No. of new HHs	HHs with high efficiency Washing machines (15% of totalHHs)	per HH/ gpd/machine	all HHs /gpd (assuming 800HH are added each year)	all HHs/gallons per year/machines	Total wter savings (only new HHs)	Total Water saved (Cumulative)
2005	23,362	23,362	3,504	11	8,846	3,228,936	3,228,936	3,228,936
2006	23,922	561	800	11	8,846	3,228,936	3,228,936	3,228,936
2007	24,497	574	800	11	8,846	3,228,936	3,228,936	6,457,872
2008	25,085	588	800	11	8,846	3,228,936	3,228,936	9,686,808
2009	25,687	602	800	11	8,846	3,228,936	3,228,936	12,915,744
2010	26,303	616	800	11	8,846	3,228,936	3,228,936	16,144,680
Total water saved (gallons)								**48,434,040**
Total water saved (acre-feet)								**149**

Assuming at the end of the program in 2010 15% of HHs will have new high efficiency washing machines
This implies an addition of 800 washing machines approximately every year

2.3 High Efficiency Washing Machines — BMP-6

	Item	Utilities Unit	Utilities Unit Cost	Utilities Subtotal	Utilities Time (year)	Contractors Unit	Contractors Unit Cost	Contractors Subtotal	Contractors Time (year)	Total
A	**Administration**									
	1 Direct labor	20	$30.00	$600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			$6,500						$6,500
	6 Other (specify)									
	Subtotal									$6,500
C	**Direct Implementation**									
	1 Direct Labor	40	$30	$1,200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	800	$100	$80,000						$80,000
	5 Travel									
	6 Other (specify)									
	Subtotal									$81,200
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									**$88,300**

2.3 High Efficiency Washing Machines BMP-6

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement & Verification	Total	Present Value Total (1.5%)
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$81,200	$0	$88,300	$88,300
1	2007	$600	$6,500	$81,200	$0	$88,300	$89,625
2	2008	$600	$6,500	$81,200	$0	$88,300	$90,969
3	2009	$600	$6,500	$81,200	$0	$88,300	$92,333
4	2010	$600	$6,500	$81,200	$0	$88,300	$93,718
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total Costs							**$458,945**

2.4 Hot Water Demand Unit

Program Costs

$500/unit		1996	2006	
	$208	1999 without labor	**$241.22**	with 2.5% inflation rate

Saving figures only for retrofits
Depends on the layout of the water system-radial, straight line and also on the distance between fixtures from the trunk line/water heater
Shorter branches are better

Water Savings Calculation formula

S=Cold_Start_hot_Water_Runs*Savings_per_Run*Plumbing_Factor
S=gpd/hot water demand unit
Cold_Start_Hot_water_Runs=PPH*Hot_Water_Runs*Scale_Factor

Hot_Water_Runs	number of times water is heated up at the faucet	6/person/day or 4/person/day	
Scale_factor	degree to which hot water runs are reduced as persons per household increases-likelihood of wa	.8-1.0	**used .8**
Savings_Per_Runs	1-4 gal		
Plumbing Factor	ability of HH to realise savings because of the configuration of the plumbing system and its ability to take advantage of hot water demand unit	.75-1	**used .75**

Savings in gpd/hot water demand unit **43.776**

				SAVINGS				
Year	No. of HHs	No. of new HHs	HHs with Hot Water Demand Unit (30% of totalHHs)	per HH/ gpd/machine	all HHs /gpd (assuming 1580HH are added each year)	all HHs/gallons per year/hot water unit	Total water savings (only new HHs)	Total Water saved (Cumulative)
2005	23,362	23,362	3,504	44	69,166	25,245,619	25,245,619	25,245,619
2006	23,922	23,922	1,580	44	69,166	25,245,619	25,245,619	25,245,619
2007	24,497	574	1,580	44	69,166	25,245,619	25,245,619	50,491,238
2008	25,085	588	1,580	44	69,166	25,245,619	25,245,619	75,736,858
2009	25,687	602	1,580	44	69,166	25,245,619	25,245,619	100,982,477
2010	26,303	616	1,580	44	69,166	25,245,619	25,245,619	126,228,096
Total water saved (gallons)								**378,684,288**
Total water saved (acre-feet)								**1,162**

Assuming at the end of the program in 2010 30% of HHs will have the hot water unit
This implies an addition of 1580 hot water units approximately every year

2.4 Hot Water Demand Unit — BMP 1

		Utilities				Contractors				
	Item	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	*Total*
A	**Administration**									
	1 Direct labor	20	$30	$600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			6,500						$6,500
	6 Other (specify)									$6,500
	Subtotal									
C	**Direct Implementation**									
	1 Direct Labor	40	$30	$1,200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	1580	$20	$31,600						$31,600
	5 Travel									
	6 Other (specify)									
	Subtotal									$32,800
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									**$33,400**

2.4 Hot Water Demand Unit

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, and Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$32,800	$0	$39,900	$39,900
1	2007	$600	$6,500	$32,800	$0	$39,900	$40,499
2	2008	$600	$6,500	$32,800	$0	$39,900	$41,106
3	2009	$600	$6,500	$32,800	$0	$39,900	$41,723
4	2010	$600	$6,500	$32,800	$0	$39,900	$42,348
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
16	2019						
17	2020						
18	2021						
19	2022						
20	2023						
21	2024						
22	2025						
Total						**$199,500**	**$209,575**

2.5 Metering BMP-4 BMP-11

Program Costs

Staff time to develop meter program
and new rate structure
Meter and installation costs, if supplier pays
Administration
Contractors
Marketing

Leblanc(1997)

Meter purchase and installatic		2006
Indoor	$210	$262
Outdoor	$450	$562
Avergae		$412

Bishop and Weber(1995)

Install meter in new construction	$175	$230

Water Savings Calculation Formula

S=Household_Water_Consumption*Savings_Percent

HH_Water_Consumption	Pre-metering consumption	
Savings_Percent	Percent savings assumed to result from meterin	20-40%

No. of connections in 2004	19,615	Consumption/HH (in million gallons/yr)	0.23
2004 consumption (million-gallons)	4,454	Consumption/HH (in gallons/yr)	227,074

					SAVINGS					
Year	No. of HHs	No. of new HHs	old HHs	new HHs	per old HH (gpyr)	per new HH (gyr)	all old HHs /gpy	all new HHs /gpy	Total water savings/year	Total Water saved (Cumulative)
2005	23,362	23,362	3,504		45,415	90,829	159,145,341	-	159,145,341	159,145,341
2006	23,922	561	3,504	561	45,415	90,829	159,145,341	50,926,509	210,071,850	210,071,850
2007	24,497	574	3,504	574	45,415	90,829	159,145,341	52,148,745	211,294,086	421,365,936
2008	25,085	588	5,840	588	45,415	90,829	265,242,234	53,400,315	318,642,550	740,008,485
2009	25,687	602	5,840	602	45,415	90,829	265,242,234	54,681,923	319,924,157	1,059,932,642
2010	26,303	616	4,672	616	45,415	90,829	212,193,788	55,994,289	268,188,076	1,328,120,719
Total water saved (gallons)										3,759,499,631
Total water saved (acre-feet)										11,538

Assuming all old HHs install new meters by 2010 — old households-20% savings
Assuming all new HHs will install new meters — new households 40% savings

2.5 Metering		BMP-4					
Elapsed Year	Calendar Year	Adminis-tration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, & Verification	Total	Present Value Total (1.5% inflation)
	2003						
	2004						
	2005						
0	2006					$375,000	$375,000
1	2007					$375,000	$380,625
2	2008					$375,000	$386,334
3	2009					$375,000	$392,129
4	2010					$375,000	$398,011
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							$1,932,100

2.6 Conservation Pricing BMP-4, 11

Program and Device/Activity Cost Estimates

10% increase in price

Water Savings

Water Savings=Price_Elasticity*Change_in_real_price_of_water*Expected_water_demand

DeltaP x Eta(single family, price)	=	.10 x (-.10)	approx. one percent decrease in SF winter use
DeltaP x Eta(single family, price)	=	***.10 x (-.20)***	***approx. two percent decrease in SF summer use***
DeltaP x Eta(multiple family, price)	=	.10 x (-.05)	approx. 0.5 percent decrease in MF winter use
DeltaP x Eta(multiple family, price)	=	***.10 x (-.10)***	***approx. one percent decrease in MF summer use***

	Estimated Water Consumption in AFY		Water Savings		
	Single Family	Multi-Family	Single Family	Multi-Family	Total
2006	13,853	4,825	(277)	(48)	(325)
2007	14,186	4,941	(284)	(49)	(333)
2008	14,526	5,059	(291)	(51)	(341)
2009	14,875	5,181	(297)	(52)	(349)
2010	15,232	5,305	(305)	(53)	(358)
Total water saved (in AFY)					**(1,707)**

Estimate for implementation-changes to billing system (one year only) *$100,000*

2.7 Residential Plumbing Retrofits — BMP-1.2

Program Costs

Staff time to contact building departments, developers and plumbing supply outlets
Retrofit Kits: showerheads, toilet displacement devices, and installation costs
Administration
Contractors
Marketing

Low flow showerhead kits		$2	-1995
Low flow showerheads, direct install	$10-15		-1995

Water Savings Calculation Formula

Retrofit Device Savings

Device	Initial Savings	method 1 device life span	method 2 Device decay rate per year
Low flow showerheads	5.5 gpd	3-7 years	20-30 %
Toilet displacement devices	4 gpd	2-5 years	40-60 %
Faucet aerators	1.5 gpd	1-3 yrs	40-60 %
Toilet leak detection	.64 gpd (8 gpd per repaired leaking toilet; 8 percent of toilets leak)	7-10 yrs	1-2 %
Other household leak check	.5 gpd (12.4 gpd per HH repair; 4 percent of HHs with leaks)	7-10 yrs	1-2 %
Turf audit	12.2	4 yrs	40-60 %
Turf audit with timer	25.9 gpd (12.2 gpd for turf audit plus13.7 if timer)	4 yrs	40-60 %
Source	**field studies**	**judgment**	**judgment**

Water Savings = Device_savings*Probability_of_installation*lifespan

Savings/device/gpd 46.56
Probability=60%
Lifespan=5 years

				SAVINGS				
Year	No. of HHs	No. of new HHs	HHs with Retrofit	per HH/ gpd/machine	all HHs /gpd (assuming 1580HH are added each year)	all HHs/gallons per year/hot water unit	Total water savings (only new HHs)	Total Water saved (Cumulative)
2005	23,362	23,362	3,000	47	73,565	26,851,152	26,851,152	26,851,152
2006	23,922	561	3,000	47	73,565	26,851,152	26,851,152	26,851,152
2007	24,497	574	3,000	47	73,565	26,851,152	26,851,152	53,702,304
2008	25,085	588	3,000	47	73,565	26,851,152	26,851,152	80,553,456
2009	25,687	602	3,000	47	73,565	26,851,152	26,851,152	107,404,608
2010	26,303	616	3,000	47	73,565	26,851,152	26,851,152	134,255,760
Total water saved (gallons)								**402,767,280**
Total water saved (acre-feet)								**1,236**

Assuming each year 3000 devices will be retrofitted

2.7 Residential Plumbing Retrofits — BMP-2

		Utilities				Contractors				
	Item	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	
A	**Administration**									
	1 Direct labor	20	30	600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			6500						$6,500
	6 Other (specify)									
	Subtotal									$6,500
C	**Direct Implementation**									
	1 Direct Labor	40	30	1200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	3000	5	15000						$15,000
	5 Travel									
	6 Other (specify)									
	Subtotal									$16,200
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									$23,300

2.7 Residential Plumbing Retrofits BMP-2

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, and Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$16,200	$0	$25,306	$26,462
1	2007	$600	$6,500	$16,200	$0	$25,308	$26,861
2	2008	$600	$6,500	$16,200	$0	$25,310	$27,266
3	2009	$600	$6,500	$16,200	$0	$25,312	$27,677
4	2010	$600	$6,500	$16,200	$0	$25,314	$28,095
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							$136,361

2.8 Residential Surveys BMP-1,2,6,10,14

Program and Device/Activity Cost Estimates

Program costs
Staff time (if not contracted out)
Survey equipment and devices
Administration
Contractors
Marketing

Other costs	**1995 (A&N Technical Services)**
Survey, targeted indoor/outdoor	
Survey, untargeted indoor	40
Low flow showerheads, kit	2
Moisture sensor, residential	125
Irrigation timer, residential	230
Swimming pool/spa covers	5-150
Low flow showerheads, direct install	$10-15

CCWD 1994
Cost of Residential Audit

Action		**Hours**	**Costs**
Labor			
	audit	1.25@15.43/hr	$19
	administrative costs		$6
	labor subtotal		$25
Equipment			
	showerhead	0.61@$2.49	$2
	toilet dam	1.54@$1.20	$2
	bucket (1993 only)		
	faucet aerator		
	information material		$4
	hose nozzel		$1
	milage	17 mi.@$.28/mi.	$5
	equipment subtotal		$13
Total			**$38**

Calculations

water savings=Survey_Savings*Number_of_Surveys

Savings	**16,500**	
	Survey savings	*11 gpd*
	No. of surveys	*1500/yr*

11000gpd per 1000 surveys=(5.5gpd+4gpd+1.5gpd)*1000 surveys

Year	Savings (gallons/day)	Savings (gallons/year)
2005	16,500	6,022,500
2006	16,500	6,022,500
2007	16,500	6,022,500
2008	16,500	6,022,500
2009	16,500	6,022,500
2010	16,500	6,022,500
Total		**30,112,500**
Acre-feet		**92**

2.8 Residential Surveys BMP-1,2,6,10,14

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement & Verification	Total	Present Value Total (1.5%)
	2003						
	2004						
	2005						
0	2006	$1,500	$38			$56,640	$56,640
1	2007	$1,500	$38			$56,640	$58,056
2	2008	$1,500	$38			$56,640	$59,507
3	2009	$1,500	$38			$56,640	$60,995
4	2010	$1,500	$38			$56,640	$62,520
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							$297,718

2.9 Ultra Low Flush Toilets (Residential) BMP-1,2,13,14

Program Costs

Staff time to administer rebate program
Rebate incentive
Administration
Contractors
Marketing

Sector	Toilet cost	Installation	Rebate	Other costs	Participant costs	*Supplier costs*	Total society costs
Single family rebate	120	70	75	40	115	***115***	230
Single family direct	60	65		40	35	***130***	165
Multi-family direct	60	55		40	35	***120***	155

Source: CUWCC guidelines

Water Savings Calculation Formula

Savings calculation primary method: toilet savings adjusted for HH density
S (sf)=6.693*Persons_Dwelling-0.529*(Persons_dwelling)^2+7.826
S (mf)=19.138*Persons_Unit-0.942*(Persons_unit)^2+2.181

Savings per HH gpd 7.53

				SAVINGS				
Year	No. of HHs	No. of new HHs	HHs with Hot Water Demand Unit (30% of totalHHs)	savings per HH/ gpd/machine	all HHs /gpd (assuming 1580HH are added each year)	all HHs/gallons per year/machines	Total wter savings (only new HHs)	Total Water saved (Cumulative)
2005	23,362	23,362	3,504	3,504	2,452,988	895,340,756	895,340,756	895,340,756
2006	23,922	561	1,580	8	11,893	4,340,900	4,340,900	4,340,900
2007	24,497	574	1,580	8	11,893	4,340,900	4,340,900	8,681,800
2008	25,085	588	1,580	8	11,893	4,340,900	4,340,900	13,022,700
2009	25,687	602	1,580	8	11,893	4,340,900	4,340,900	17,363,600
2010	26,303	616	1,580	8	11,893	4,340,900	4,340,900	21,704,500
Total water saved (gallons)								**65,113,499**
Total water saved (acre-feet)								**200**

2.9 Ultra Low Flush Toilets (Residential) — BMP-1,2,13,14

		Utilities				Contractors				
	Item	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	*Total*
A	**Administration**									
	1 Direct labor	20	$30	$600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			$6,500						$6,500
	6 Other (specify)									
	Subtotal									$6,500
C	**Direct Implementation**									
	1 Direct Labor	40	$30	$1,200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	1580	$115	$181,700						$181,700
	5 Travel									
	6 Other (specify)									
	Subtotal									$182,900
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									$190,000

2.9 Ultra Low Flush Toilets (Residential) BMP-1,2,13,14

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, & Outreach	Direct Implementation	Evaluation, Measurement, & Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$182,900	$0	$190,000	$190,000
1	2007	$600	$6,500	$182,900	$0	$190,000	$192,850
2	2008	$600	$6,500	$182,900	$0	$190,000	$195,743
3	2009	$600	$6,500	$182,900	$0	$190,000	$198,679
4	2010	$600	$6,500	$182,900	$0	$190,000	$201,659
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							$982,931

Program Costs

	Analyst survey	Consultant Survey	Water efficiency study
Average survey cost	$600	**$1,484**	$8,121
Average potential savings/y	3.3 AF	**8.4 AF**	35.9 AF

Cost of Saved Water ($/AF)

100% of average potential	43	42	54
80% of average potential	54	52	67
60% of average potential	72	70	89
40% of average potential	108	105	134
20% of average potential	216	210	268

Total cost=cost of survey+cost of implementation

Water Savings Calculation Formula

S=Use*SavingsPotential*ImplementationPercentage

S=savings in gpd per site from cooling towers
Use=water consumption in gpd

SavingsPotential is the technical potential for water savings identified by the water survey (percent savings from pre-program use)
ImplementationPercentage=percent savings potential that is implemented

End Use	Use	Percentage Potential Savings
Sanitary	9.3	24.6
Cooling	10.8	14.2
Irrigation	15.7	22.5
Other	64.2	38.7

Water Use/Connection in AFY	
Commercial	0.85
Irrigation	7.06

	Total Connections		Estimated connections		Water Use (AFY)		Savings	
	Commercial	Irrigation	Commercial	Irrigation	Commercial	Irrigation	Commercia	Irrigation
2005	2,884	241	29	2	24	17	9	383
2006	2,953	247	30	2	25	17	10	392
2007	3,024	253	30	3	26	18	10	401
2008	3,097	259	31	3	26	18	10	411
2009	3,171	265	32	3	27	19	10	421
2010	3,247	271	32	3	28	19	11	431
Savings							**51**	**2,056**
Total Savings								**2,107**

Assuming only 1% of the connections will be surveyed

2.10 CII Surveys		BMP-9			
Elapsed Year	Calendar Year	No. of CII surveys	Cost/survey	Total	Present Value Total
	2003				
	2004				
	2005				
0	2006	32	$1,484	$47,488	$47,488
1	2007	33	$1,484	$48,627	$49,357
2	2008	34	$1,484	$49,795	$51,300
3	2009	34	$1,484	$50,990	$53,319
4	2010	35	$1,484	$52,213	$55,417
5	2011				
6	2012				
7	2013				
8	2014				
9	2015				
10	2016				
11	2017				
12	2018				
13	2019				
14	2020				
15	2021				
16	2022				
17	2023				
18	2024				
19	2025				
Total					$256,880

2.13 Self-Closing Faucets BMP-9 CII

Program Costs

Faucet and purchase of faucets	*1995*		*2006*
Administration	Infrared	$200	$238
Contractors	Spring Valve	$50	$59
Marketing			

Water Savings Calculation Formula

S (high to IRLow)=Washes_per_Day*(GP_Wash_High_Flow_Faucet-GP_Wash_IRSelfClosing_Faucet)

S=savings per day
Washes_per_Day=avg washes per day at a faucet during working day
gallons_per_Wash=units of gpd per self closing faucet

WATER USE

Gallons_per_Wash		
old high flow faucets	.5gpd	Behling and Bartlucci 1992
New faucets	.33 gpd	Behling and Bartlucci 1993
New facuets with IR self closing	.2 gpd	McCuen 1975, 1988
New faucets with spring self closing	.25 gpd	McCuen 1975, 1989
	working days/year	*260*

Savings in g/year 650

					SAVINGS					
Year	No. of Commercial est.	No. of new Comm.	Old connections	New connections	per old connection (gpyr)	per new connection (gyr)	all old Clls /gpy	all new Clls /gpy	Total water savings/year	Total Water saved (Cumulative)
2005	2,884	23,362	930		650	650	604,500	-	604,500	604,500
2006	2,953	69	930	69	650	650	604,500	44,990	649,490	649,490
2007	3,024	71	930	71	650	650	604,500	46,070	650,570	1,300,060
2008	3,097	73	930	73	650	650	604,500	47,176	651,676	1,951,736
2009	3,171	74	930	74	650	650	604,500	48,308	652,808	2,604,544
2010	3,247	76	930	76	650	650	604,500	49,467	653,967	3,258,511
Total water saved (gallons)										9,764,340
Total water saved (acre-feet)										30

Assuming 30% of old connections will have self closing faucets
All new connections will have self-closing faucets

2.13 Self-Closing Faucets — BMP-9

	Item	Utilities Unit	Utilities Unit Cost	Utilities Subtotal	Utilities Time (year)	Contractors Unit	Contractors Unit Cost	Contractors Subtotal	Contractors Time (year)	
A	**Administration**									
	1 Direct labor	20	$30	$600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			$6,500						$6,500
	6 Other (specify)									
	Subtotal									$6,500
C	**Direct Implementation**									
	1 Direct Labor	40	$30	$1,200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	1003	$20	$20,060						$20,060
	5 Travel									
	6 Other (specify)									
	Subtotal									$21,260
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									$28,360

2.13 Self-Closing Faucets BMP-9

Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, and Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$21,260	$0	$28,360	$28,360
1	2007	$600	$6,500	$21,260	$0	$28,360	$28,785
2	2008	$600	$6,500	$21,260	$0	$28,360	$29,217
3	2009	$600	$6,500	$21,260	$0	$28,360	$29,655
4	2010	$600	$6,500	$21,260	$0	$28,360	$30,100
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							**$150,118**

2.14 Ultra Low Flush Toilets (CII) BMP-10

Program Costs

Staff time to administer rebate progr *ULF toilets retail (1995): $150-$170*

Rebate incentive *2006* *$178*

Administration

Contractors

Marketing

Water Savings Calculation Formula

Monthly_water_use (ccf)=f(Number_of_retrofits_installed, Net_irrigation_requirements, region, season, time_trend)

					SAVINGS					
Year	No. of Commercial est.	No. of new Comm.	old connections	new connections	per old connection (gpyr)	per new connection (gyr)	all old CIIs /gpy	all new CIIs /gpy	Total water savings/year	Total Water saved (Cumulative)
2005	2,884	-	465		11,680	11,680	5,431,200	-	5,431,200	5,431,200
2006	2,953	69	465	69	11,680	11,680	5,431,200	808,439	6,239,639	6,239,639
2007	3,024	71	465	71	11,680	11,680	5,431,200	827,841	6,259,041	12,498,680
2008	3,097	73	465	73	11,680	11,680	5,431,200	847,710	6,278,910	18,777,590
2009	3,171	74	465	74	11,680	11,680	5,431,200	868,055	6,299,255	25,076,845
2010	3,247	76	465	76	11,680	11,680	5,431,200	888,888	6,320,088	31,396,933
Total water saved (gallons)										**93,989,687**
Total water saved (acre-feet)										**288**

Assuming 30% of old connections will have self closing faucets
All new connections will have self-closing faucets

2.14 Ultra Low Flush Toilets (CII) BMP-10

		Utilities				Contractors				
	Item	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	*Unit*	*Unit Cost*	*Subtotal*	*Time (year)*	
A	**Administration**									
	1 Direct labor	20	$30	$600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			$6,500						$6,500
	6 Other (specify)									
	Subtotal									$6,500
C	**Direct Implementation**									
	1 Direct Labor	40	$30	$1,200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	538	$50	$26,900						$26,900
	5 Travel									
	6 Other (specify)									
	Subtotal									$28,100
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									$35,200

2.14 Ultra Low Flush Toilets (CII)					BMP-10		
Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, and Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$28,100	$0	$35,200	$35,200
1	2007	$600	$6,500	$28,100	$0	$35,200	$35,728
2	2008	$600	$6,500	$28,100	$0	$35,200	$36,264
3	2009	$600	$6,500	$28,100	$0	$35,200	$36,808
4	2010	$600	$6,500	$28,100	$0	$35,200	$37,360
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							$185,360

2.15 Urinals BMP-9

Program costs

	1995 A&N Technical Services		2006
Faucet and purchase of faucets	Low Flow Valv	$20	$24
Administration	Waterless Urir $100-$400		
Contractors			
Marketing			

Water Savings Calculation Formula

S=Flushes_per_day*(GP_Flush_High_Flow_Urinal - GP_Flush_Low_Flow_Urinal)

* for replacing with waterless urinal, GP_Flush_Waterless=0

S=savings per day in gallons

Savings 7.5 *10 flushes per day and low flush valve replaces high flush valve*

					SAVINGS					
Year	No. of Commercial est.	No. of new Comm.	old connections	new connections	per old connection (gpyr)	per new connection (gyr)	all old Clls /gpy	all new Clls /gpy	Total water savings/year	Total Water saved (Cumulative)
2005	2,884	23,362	930		2,738	2,738	2,545,875	-	2,545,875	2,545,875
	-	-								
2006	2,953	69	930	69	2,738	2,738	2,545,875	189,478	2,735,353	2,735,353
2007	3,024	71	930	71	2,738	2,738	2,545,875	194,025	2,739,900	5,475,253
2008	3,097	73	930	73	2,738	2,738	2,545,875	198,682	2,744,557	8,219,810
2009	3,171	74	930	74	2,738	2,738	2,545,875	203,450	2,749,325	10,969,135
2010	3,247	76	930	76	2,738	2,738	2,545,875	208,333	2,754,208	13,723,344
Total water saved (gallons)										41,122,895
Total water saved (acre-feet)										126

Assuming 30% of old connections will have self closing faucet.
All new connections will have self-closing faucets

2.15 Urinals — BMP-9

	Item	Utilities Unit	Utilities Unit Cost	Utilities Subtotal	Utilities Time (year)	Contractors Unit	Contractors Unit Cost	Contractors Subtotal	Contractors Time (year)	
A	**Administration**									
	1 Direct labor	20	$30	$600						$600
	2 Benefits & Overhead									
	3 General and Administrative Costs									
	4 Travel									
	5 Other (specify)									
	Subtotal									$600
B	**Marketing, Advertising, and Outreach**									
	1 Direct labor									
	2 Benefits & Overhead									
	3 Brochures and Marketing Material									
	4 Training materials (for canvasses/installers)									
	5 Letters, Postage, Mailing Costs			$6,500						$6,500
	6 Other (specify)									
	Subtotal									$6,500
C	**Direct Implementation**									
	1 Direct Labor	40	$30	$1,200						$1,200
	2 Benefits & Overhead									
	3 Materials									
	4 Rebates or other payments	1003	$5	$5,015						$5,015
	5 Travel									
	6 Other (specify)									
	Subtotal									$6,215
D	**Evaluation, Measurement, and Verification**									
	1 Measurement: tracking of water use									
	2 Verification: field inspections									
	3 Evaluation: savings analysis									
	4 Other (specify)									
	Subtotal									
	Total									**$13,315**

2.15 Urinals			BMP-9				
Elapsed Year	Calendar Year	Administration	Marketing, Advertising, and Outreach	Direct Implementation	Evaluation, Measurement, and Verification	Total	Present Value Total
	2003						
	2004						
	2005						
0	2006	$600	$6,500	$6,215	$0	$13,315	$13,315
1	2007	$600	$6,500	$6,215	$0	$13,315	$13,515
2	2008	$600	$6,500	$6,215	$0	$13,315	$13,717
3	2009	$600	$6,500	$6,215	$0	$13,315	$13,923
4	2010	$600	$6,500	$6,215	$0	$13,315	$14,132
5	2011						
6	2012						
7	2013						
8	2014						
9	2015						
10	2016						
11	2017						
12	2018						
13	2019						
14	2020						
15	2021						
16	2022						
17	2023						
18	2024						
19	2025						
Total							$68,602

2.16 Large Landscape Devices BMP-5

Program Costs

Landscape measurement
Financial incentives
Administration
Contractors
Marketing

Mean reported costs of conservation (CUWCC 1999)

	per customer		*per acre*	
Action	*initial*	*ongoing*	*initial*	*ongoing*
Adjusted timers	482	247	137	77
Upgrade equipment	2571	1540	953	54
Repaired irrigation system	793	2571	560	399
External audit	45	126	43	46
Other	185	77	141	80
Total			*$1,834*	

Total Program Cost

2006	*$2,035*	*$101,773*

Water Budget Program	$50-300/site	
Water Survey Costs	$500-1500/site	
Cost of Audit for site with 1 acre of turfgrass	$309.80	$15,490.00

Water Savings Calculation Formula

Water_Savings=Savings_per_acre * Acres_per_site * Number_of_sites

	GD	MGY	AFY
Total Savings=gallons/d	**22,250**	**8.1**	**24.9**

Savings per acre=445 gpd
Total acreage=50 acres