



South Tahoe Public Utility District

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December 30, 2005

Department of Water Resources
Urban Water Management Plan Administration
P.O. Box 942836
Sacramento, CA 94236

Dear Staff:

I have enclosed the District's Urban Water Management Plan (UWMP), which was submitted in 2002 to serve as our current UWMP submittal for 2005.

The South Tahoe Public Utility District's water situation is singularly unique by most standards in California. Basically, we are in a totally isolated basin, which is part of the Nevada watershed and supplies no water to downstream California users. The Tahoe Regional Planning Agency (TRPA) has limited growth within our service area to near zero. In addition, we have an aggressive water conservation program that has achieved extremely low per household usage. In fact, water production demand, even during peak summer demand periods, has decreased the last three years.

Due to the unique nature of our basin, the fact we submitted our last UWMP in 2002, and in the interest of financial stewardship, we respectfully request your department accept this plan until 2010, at which time it would be appropriate to submit an updated plan.

Sincerely,

Dennis Cocking
Public Information Officer

**South Tahoe Public Utility District
Urban Water Management Plan**

June 2002



Adopted August 1, 2002

**South Tahoe Public Utility District
Urban Water Management Plan
2000 Update
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Section I Introduction

This document represents South Tahoe Public Utility District's (STPUD; or District) **Urban Water Management Plan** (UWMP) as required by the California Urban Water Management Planning Act (California Water Code Division 6, Part 2.6, Section 10610). This submittal fulfills the District's requirement to update its Plan.

During the review of this Plan, two recurring themes will become apparent. First, the challenges of the South Tahoe Public Utility District to meet its water demand obligations in recent years fall into the water *quality* category not the water *quantity* category. The service area is located in a wonderfully water-rich region of the state that is only minimally effected by drought, but has been subject to water supply contamination. Second, the District is located in an isolated area of the state in terms of water supply. In fact, the District lies within a watershed which flows into Nevada, not California, and is regulated under the Truckee River Operating Agreement and a bi-state compact with Nevada. At 100+ miles east of the Central Valley and 6,200 feet elevation, there are no opportunities to seek additional water from California's huge state or federal water projects. The District meets these challenges with sound, yet flexible planning practices and a water conservation program tailored to its locale.

The District's water supply is exclusively groundwater. Over the past six years the District has experienced the loss of one-third of its active wells due to MTBE contamination, reducing the production by 13 wells. The catastrophic water supply interruption scenario which is the subject of Section VIII has been a reality in our service area. While working to restore the potability of contaminated water and implement meaningful conservation measures, the District is also pursuing reimbursement of costs through legal means from those responsible for the contamination.

The District has been promoting water conservation since 1982. The water conservation programs have targeted residential, commercial, and vacationing water users in this resort community. Through public and school education, low water use fixture promos, staged water use restrictions, water educator patrols, leak detection, an award-winning demonstration garden, and landscape audits the District continues its efforts for improved water efficiency.

Section II
Public Participation/Agency Coordination
(§10642; §10620)

Plan Adoption

The staff of the South Tahoe Public Utility District prepared this update of its Urban Water Management Plan. The updated plan was adopted by the Board of Directors on August 1, 2002, and will be submitted to the California Department of Water Resources. The District was unable to meet the December 31, 2000 deadline for its UWMP due to three years of intense litigation over the MTBE contamination of its water supply. The case went to Superior Court in San Francisco last fall; the trial may last several more months.

Public Participation

The South Tahoe Public Utility District has actively encouraged public participation in its water management planning efforts, hosting annual public hearings to describe new capital water projects, budgets, rates, conducting "open house" and neighborhood meetings at new facilities. A citizen's advisory group was established to assist the District in developing a Groundwater Management Plan to prevent further contamination of groundwater.

The District staff works with the City of South Lake Tahoe staff to maximize landscape water use efficiency at ball fields and public parks especially during periods of water use restrictions. The agencies have cooperated in finding landscape uses for water that does not meet drinking water standards, thereby freeing up additional potable water for the community.

For this update, legal public notices and mailings were used to ensure full participation by District customers and interest groups, as well as other local water and planning agencies. A public meeting was held on August 1, 2002, to allow for review and comment on the draft plan before the Board's approval (Appendix A).

Section III Supplier Service Area (§10631a)

Climate Characteristics

At 6,200 feet elevation, the residents in the STPUD service area enjoy distinct seasons. The four sharply defined seasons bring a continual round of variety and at the same time greatly affect water use. High temperatures in December/January/February average about 40° F., lows about 16° F.. California's Sierra Nevada snow falls in great quantities from late November to early April. The average cumulative winter snow pack is 216 inches, nearly 20 feet.

The summer months, which coincide with the heaviest tourism, are very dry and sunny, though daytime average temperatures are only in the 70°'s. The total rainfall for the four-month period June - September averages only 5 inches.

Spring and fall temperatures are very similar, as are both seasons' rainfall, though March - May averages cooler temps and more precipitation than the fall.

The total average annual precipitation is 32.91 inches, however, consistent with the rest of California, there are wide swings off of "normal."

Over a 50-year period of Lake Tahoe's recorded weather data, 80% of the days have had sunshine. The probability runs from December/January/February low of 75% days with sunshine to a June/July/August high of 93% days with sunshine. An average year will provide approximately 240 cloudless days and another 75 days with mixed sun/clouds, and just 50 days with precipitation.

Table 1- Climatic Data, Monthly Averages and Records

	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Avg. High	39°F	41°F	44°F	51°F	60°F	69°F	78°F	78°F	71°F	61°F	47°F	40°F
Avg. Low	15°F	17°F	21°F	25°F	31°F	37°F	41°F	40°F	35°F	28°F	22°F	16°F
Rec. High	60°F (1990)	62°F (1977)	70°F (1988)	76°F (1981)	84°F (1986)	90°F (1988)	99°F (1988)	96°F (1981)	94°F (1988)	84°F (1988)	70°F (1999)	63°F (1990)
Rec. Low	-28°F (1993)	-29°F (1989)	-10°F (1971)	-1°F (1975)	7°F (1974)	21°F (1988)	25°F (1976)	25°F (1974)	19°F (1984)	11°F (1971)	-6°F (1975)	-29°F (1972)

WorldClimate.com ,derived from NCDC Cooperative Stations, 38.81°N 120.01°W . Precip. By Resource Conservation District, South Lake Tahoe

Demographic Profile

STPUD is a California Special District established in 1950. The 27,000 acre service area covers the south shore of Lake Tahoe from Emerald Bay on the west, Christmas Valley on the south, the California-Nevada stateline to the east, and Lake Tahoe on the north. Originally the services of the District were limited to wastewater collection, treatment, and disposal. In the mid-1970's the District began to acquire private water companies and presently is the single largest water purveyor within the Lake Tahoe basin.

The population within the STPUD service area consists of residents in the City of South Lake Tahoe and in the Montgomery Estates, Tahoe Paradise, Meyers, Angora Highlands, Fallen Leaf Lake, and Christmas Valley portions of eastern El Dorado County.

STPUD provides wastewater collection, treatment, and disposal to 17,000 customers, 13,000 of which are also water customers. The vast majority of District water customers –80%--are residential.

Tourism forms the economic base of our community. Though the beauty and recreational opportunities have lured millions of visitors to South Lake Tahoe each year in recent history, the real beginnings of development were the during Nevada's silver mining years of the 1850s and 1860s. Early pioneers struggled to carve out a year round existence, with more and more summer cabins being built during the first half of the 20th century. Small communities grew throughout the region and roads and schools were built. South Tahoe Public Utility District was voted into existence by 79 "yes" votes in September 1950. The City of South Lake Tahoe incorporated in 1965. A large influx of full time residents in the 1950s, 1960s and 1970s found the "jewel of the Sierra." Modest summer-only cabins with native vegetation have given way to larger and larger, 2-story full time residences with lawns.

The Politics of Growth

An understanding of the STPUD service area is incomplete without a discussion of the federal bi-state agency which determines growth throughout the region.

More than a hundred years ago, conservationists voiced concern about the impacts of tourism, ranching, and logging on the Lake Tahoe environment. Their wish to make Lake Tahoe a national forest or park didn't gain enough support in Washington D.C., primarily because much of the land in the Lake Tahoe basin was already privately owned and had been developed or logged. Many thought it was too late to preserve Lake Tahoe.

But conservationists continued lobbying for environmental protection as logging and ranching waned, ski resorts expanded, and high-rise Stateline casinos were built. The debate came to a climax in the late 1960s after two decades of rapid growth. The governors and lawmakers in California and Nevada approved a bi-state compact which created a regional planning agency to oversee development at Lake Tahoe. In 1969, the United States Congress ratified the agreement and created the Tahoe Regional Planning Agency (TRPA). TRPA was the first bi-state regional

environmental planning agency in the country.

The bi-state compact, as revised in 1980, gave TRPA authority to adopt environmental quality standards and to enforce ordinances designed to achieve the standards. The standards, or “thresholds” are in nine categories: water and air quality; soil conservation; vegetation; fisheries; wildlife; scenic quality; noise; and recreation. The thresholds were adopted by the TRPA Governing Board in 1982 along with 36 indicators which measure the success of the standards. The Governing Board adopted a long-range regional plan in 1984 amidst concerns of both environmentalists and developers. Law suits were immediately filed in federal court and the judge effectively ordered a moratorium on new building at Lake Tahoe which lasted from 1984 - 1987. After three years of negotiations, the lawsuit was settled and the TRPA’s 1987 Regional Plan was adopted, creating a 20-year planning horizon, with 5-year benchmark Evaluation Reports on the levels of attainment for each of the thresholds. The Regional Plan is in effect today. A new Regional Plan will be adopted for the next planning horizon 2007-2027. The majority of TRPA’s thresholds remain out of attainment.

Since 1987 the limit for residential development in the STPUD service area has been 116 single family dwellings per year (out of 300 per year for the entire Lake Tahoe basin). Recently the TRPA recommended a lower level of residential development—225 for the Lake Tahoe basin, about 87 for the District’s service area— to be extended through 2006, contingent on key environmental recommendations. Note: This figure includes any multi-family dwellings that may be approved (i.e., a triplex would be considered 3 of the allowed dwellings.)

Commercial development is also very strictly allocated in a complex manner which assigns square footage in approved “community plan areas” and which is contingent on progress of the basinwide \$900 million Environmental Improvement Program. There is only 150,000 sq. ft. of new commercial development recommended for the entire Lake Tahoe basin through 2006.

Redevelopment

The most significant commercial development in the District’s service area over the past ten years has been redevelopment projects which *replace* old, dilapidated and out-dated strip development with high-quality lodging and related guest facilities. Two large redevelopment projects have been completed, two are currently under construction, with more projects on the planning horizon. While there is an overall reduced number of overnight lodging rooms in the redevelopment project areas (using modern water conserving fixtures) the overall occupancy is anticipated to be significantly higher. In addition, there is landscaping planned to beautify redeveloped sites. The District was able to participate in the extensive environmental review process, commenting on Redevelopment Agency’s estimate of water use. The result of the community’s redevelopment effort in terms of water is a moderate net increase in demand.

Population

The District’s current year-round population base is about 31,500. Over the next decade, the population of the Lake Tahoe region portion of El Dorado County, which corresponds to the

District's service area, is expected to grow slowly to about 32,800, representing an average annual growth rate of only .4%. This slow growth is in stark contrast to California's annual growth rate of 1.25% and El Dorado County's overall annual growth rate of 3.43%. Applying the same .4% level of growth to a 20- year horizon the District's population base will be about 34,100 in 2020.

Table 2 - Population Projection

El Dorado County, Lake Tahoe Region	1990	2000	2005	2010	2015	2020
STPUD Service Area	29,652	31,514	32,150	32,793	33,455	34,121

2001 Threshold Evaluation Report (draft in circulation), Tahoe Regional Planning Agency

Visitors to the District's service area, especially during the summer season, can easily double the population numbers above. The demand spikes created by warm weather, irrigation, and summer weekend visitors create the peak water demand that drives the sizing of all the District's water production, storage, and distribution facilities.

Business Diversity

Tourism is the major industry in the District's service area. Visitors traveling to the Lake Tahoe region provide nearly three-fourths of all jobs and over two-thirds of total earnings both directly through visitor spending and indirectly through the spending of the businesses and employees serving the visitors. Table 3 describes employment and labor income by industry.

Table 3 - South Lake Tahoe Employment & Labor Income by Industry

Industry	No. of Jobs	Percentage	Labor Income (in \$1,000)	Percentage
Agriculture & Agricultural Services	126	0.8%	\$ 1,020	0.3%
Construction	901	5.7%	32,677	9.9%
Food Processing	5	0.0%	103	0.0%
Misc. Manufacturing	73	0.5%	1,452	0.4%
Transportation	272	1.7%	6,312	1.9%
Publishing & Communications	217	1.4%	6,386	1.9%
Public Utilities	192	1.2%	14,091	4.3%
Trade	2,407	15.3%	49,843	15.1%
Motels/Eating & Drinking	2,988	19.0%	44,166	13.4%
Finance, Insurance, & Real Estate	1,199	7.6%	19,033	5.8%
Amusement & Recreation	3,040	19.3%	30,779	9.3%

Industry	No. of Jobs	Percentage	Labor Income (in \$1,000)	Percentage
Business Services	662	4.2%	16,905	5.1%
Medical/Education/Social Services	1,668	10.6%	50,200	15.2%
Federal Govt.	192	1.2%	5,859	1.8%
State Govt	29	0.2%	1,287	0.4%
Local Govt.	1,293	8.2%	38,341	11.6%
Totals	15,766	100.0%	\$329,699	100.0%

Social, Economic & Institutional Assessment, Watershed Assessment, TRPA, by Jones & Stokes Associates 1999

Section IV
Water Sources
(§10631b)

Water Supply Sources/Production

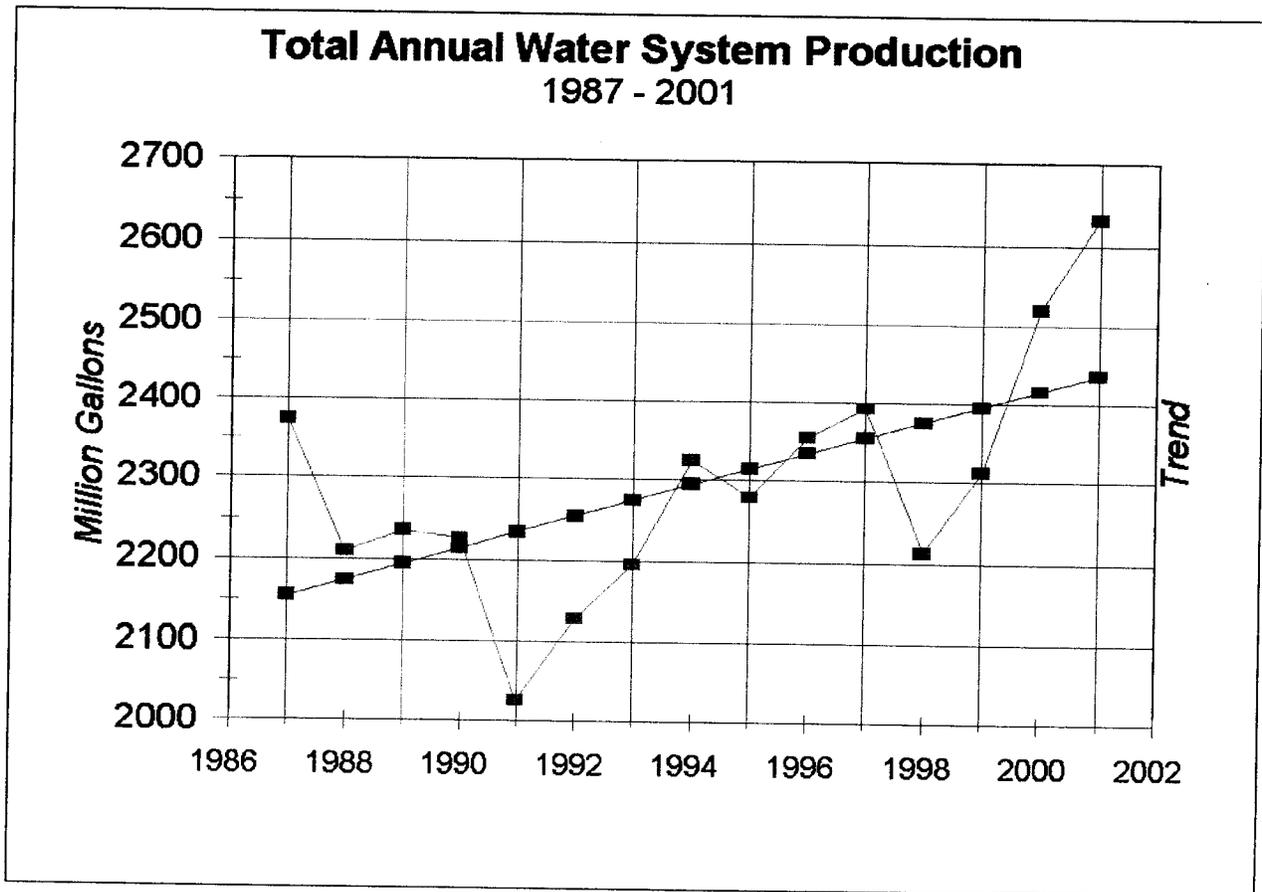
The water supplied by the District comes entirely from 28 municipal wells pumping groundwater from the South Lake Tahoe basin. These waters are regulated under the Truckee River Operating Agreement and a bi-state compact with Nevada. This compact sets a maximum 23,000 and 11,000 acre feet, respectively, for California and Nevada water use that is still far from being reached. With strictly limited development (discussed in Section III), and less than 3,000 vacant parcels remaining in the District's service area, it is highly unlikely this maximum will ever be met. (See Appendix B, Water Allocation for the South Tahoe Public Utility District Service Area, March 1994)

Table 4 - Current and Projected Water Supplies

Water Supply Sources	2000 MG	2005 MG	2010 MG	2015 MG	2020 MG
Purchased from USBR					
Purchased from DWR					
Purchased from wholesaler					
Supplier produced groundwater	2,519.40	2,720.98	2,835.79	2,955.45	3,080.15
Supplier produced surface diversions					
Transfers/Exchanges In					
Recycled Water					
Other					
Total	2,519.40	2,720.98	2,835.79	2,955.45	3,080.15

The estimates in Table 4 incorporate the projected levels of population, allocated development, redevelopment, and increased irrigation as well as the trend established by historical production data below.

Graph 1 - Annual Water System Production 1987 - 2001 (Appendix C)



Current Water Supply

The District currently operates 28 wells. The complex water system is operated as 20 different pressure zones. These zones are served and supplied from the water sources directly and from 16 booster pumping stations and 22 storage tanks. The total combined storage capacity is 9.9 MG. The system is interconnected to four neighboring domestic water utilities: Lukins Brothers Water System; Tahoe Keys Water System, Edgewood Water Company, and Lakeside Park Mutual Water Company. While there have been opportunities in the past for transferring emergency water through these interties, there are only two small resale meters through which Tahoe Keys Water buys a minimal amount of water *from* the District on an ongoing basis.

In 1996, the fuel additive methyl tertiary butyl ether (MTBE) was detected in one of the District's wells. Since then, 13 previously active wells were shut down due to MTBE contamination or the threat of contamination, another well's production was cut in half to avoid contamination, and one new well was unable to be put into service (until summer 2002) due to MTBE plumes. The current status of the District's wells and their capacity follows:

Table 5 - Well Sources, Capacity & Status

Well Name	Status	Capacity (gallons/min.)	Max. Production (gallons/day)	Comments
Airport	Active	787	1,133,280	
Al Tahoe No. 2	Active	2,750	3,960,000	Capable of 2,900.
Arrowhead No. 1	Destroyed	170	-	Destroyed due to MTBE contamination
Arrowhead No. 2	Destroyed	630	-	Destroyed due to MTBE contamination
Arrowhead No. 3	Active 6/2002	800	1,152,000	Treating for MTBE removal
Bakersfield	Active	1,574	2,266,560	Capable of 1,700 gpm for temporary use.
Blackrock No. 1	Inactive	38	54,720	MTBE threatened
Blackrock No. 2	Inactive	127	182,880	MTBE threatened
Chris	Active	93	133,920	
Clement	Inactive	180	259,200	MTBE threatened
College	Standby*	1,100	1,584,000	Uranium >MCL, use limited to emergency 15 days max./year
Country Club	Active	195	280,800	
Elks Club	Active	192	276,480	
Glenwood	Active	800	1,152,000	To be put in operation - Summer 2002

Well Name	Status	Capacity (gallons/min.)	Max. Production (gallons/day)	Comments
Helen No. 1	Inactive	112	161,280	MTBE threatened
Helen No. 2	Active, Threatened	250	360,000	MTBE threatened
Industrial No. 2	Active	111	159,840	
Julie	Inactive	205	295,200	MTBE contamination
Martin Avenue	Active	338	486,720	
Mountain View	Active	165	237,600	
Paloma	Active, Threatened	2,750 <1,575>	1,677,600 <2,268,000>	Operating at half capacity -1,165 gpm due to MTBE plume nearby.
South Upper Truckee No. 1	Active	408	587,520	
South Upper Truckee No. 2	Active	390	561,600	
South Y	Inactive	200	288,000	MTBE contamination
Sunset	Active	671	966,240	
Tata No. 1	Inactive	308	443,520	MTBE contamination
Tata No. 2	Inactive	73	105,120	MTBE contamination
Tata No. 3	Inactive	168	241,920	MTBE contamination

Well Name	Status	Capacity (gallons/min.)	Max. Production (gallons/day)	Comments
Tata Lane	Inactive	75	108,000	MTBE contamination
Valhalla	Active	1,000	1,440,000	
Total 28 Operable Wells	Active = 17 Inactive or threatened = 11 Standby = 1 Destroyed = 2	Active = 11,689 Inactive = 3,861 Standby = 1,100	Active = 16,832,160 Inactive = 4,407,840 Standby = <u>1,584,000</u> Total = 22,824,000	

STPUD Water Operations, Boyle MTBE Water System Impacts 2000

Addressing the challenges that MTBE contamination has caused the District has been enormous in scope. The District completed a comprehensive Master Plan Update, MTBE Water System Impacts and Mitigation Evaluation, September 2000, addressing the restoration of water production lost to contamination. The options studied include constructing new wells, securing surface water rights, purchasing water, rehabilitating its wells, conserving water, and installing treatment facilities to remove MTBE from District wells. A further examination of the reliability of our water resource is made in Section VIII, Inconsistent Water Sources.

Section V
Transfer or Exchange Opportunities
(§10631d)

The South Tahoe Public Utility District is by far the largest domestic water utility in the South Lake Tahoe area. This is true on both sides of the California-Nevada border. There are four potential water purveyors bordering the District's water system that could be considered potential sellers of water. These four public water systems, with which the District maintains emergency interties, are:

- Edgewood Water Company, Nevada
- Lakeside Park Mutual Water Company, California
- Lukins Brothers Water Company, California
- Tahoe Keys Mutual Water Company, California

The District thoroughly evaluated the opportunities for water purchase during the MTBE Water System Impacts and Mitigation Evaluation study. In fact, during May 2000, the District executed a wholesale agreement with the Lukins Brothers Water Company to temporarily overcome MTBE-related water quality problems by purchasing water through existing emergency interconnections for a fixed term for a fixed amount of compensation. However, purchasing water, except as interim or emergency supplies is not a viable option to mitigate the MTBE problems or other supply deficiencies on a long-term basis and has not been used.

Table 6 - Water Purchase Evaluation

Potential Water Source	Major Reasons
Edgewood Water Company	<ul style="list-style-type: none"> ▶ Treated lake water may contain low levels of MTBE. ▶ Inadequate surface water treatment to meet State of California requirements. ▶ Edgewood Water wishes to keep their excess water rights for their own future growth needs. ▶ Water purchase would not restore the reliability of the District's specific pressure zones that it had before MTBE impacts.

Potential Water Source	Major Reasons
Lakeside Park Mutual Water Company	<ul style="list-style-type: none"> ▶ Insufficient capacity in their surface water treatment plant to supply treated lake water. ▶ Lakeside Mutual wishes to keep their excess surface water rights for future growth. They do not want to sell/lease raw lake water rights. This may be negotiable but would involve limited amounts of water. Their peak demands will always occur during the summer season too. ▶ Water purchase would not restore the reliability of the District's specific pressure zone that it had before MTBE impacts.
Tahoe Keys Mutual Water Company	<ul style="list-style-type: none"> ▶ Unwilling to sell any of their excess groundwater. ▶ Selling water might adversely impact their mutual water company status. ▶ Increasing the pressure in their aging water system may cause pipeline leaks. ▶ Tahoe Keys Water does not want to chlorinate their wells to supply the District with chlorinated water. ▶ Water service would not restore the reliability of the District's specific pressure zone that it had before MTBE impacts. ▶ The consumers of the mutual water company may become concerning having their water system connected to the District's water system since there are MTBE problems that may impact them by a backflow condition.
Lukins Brothers Water Company	<ul style="list-style-type: none"> • Several of Lukins' wells are threatened by MTBE, therefore impacting the reliability of the supply. • Existing excess well capacity is too small to solve the MTBE impacts for the District's adjacent pressure zone. • Extensive water system/pipeline improvements would be necessary to mitigate the total loss of water in the effected pressure zone. • Additional pumping facilities would need to be installed to adequately supply the District's effected pressure zone • Water service would not restore the reliability of the District's specific pressure zones that it had before MTBE impacts.

Section VI
Past, Current, and Projected Water Use
(§10631e)

Connections

The District currently serves water to almost 12,500 homes and multi-family accounts and about 500 commercial and government sites. The large majority of the District's customers are unmetered residential customers that are assessed quarterly flat water rates. Although there are a small number of unmetered commercial customers, the majority of the commercial customers are metered and are assessed metered water rates. The service area population data (.4% annually) coupled with strict development limits (87 - 116 single family dwellings per year, including multi-family dwellings, all of which are not in the District's water service area), and redevelopment projects vs. new development, result in very modest projections.

Table 7 - Number of Connections by Type

Customer Type	1990	1995	2000	2005	2010	2015	2020
Single Family Residential	10,303	10,862	11,312	11,767	12,222	12,677	13,132
Multi-family Residential	969	1,093	1,104	1,119	1,134	1,149	1,164
Commercial	772 Includes metered multi-family	643	590*	590*	602	614	626
Industrial							
Other Water Systems	2	2	2	2	2	2	2
Totals	12,046	12,600	13,007	13,478	13,960	14,442	14,924

STPUD Annual Reports, DWR Public Water System Statistics, Customer Service Records

*Through redevelopment, dozens of small commercial water customers are being replaced by a few new large customers.

Projected Water Use

Projected water use estimates are based on the small increases to our customer base and the trend of increased residential landscaping.

Table 8 - Projected Water Use by Customer Class (in millions of gallons)

Water Use Class	1991/2	1995	2000	2005	2010	2015	2020
Single Family Residential	931.09	1091.56	1194.74	1306.17	1391.15	1442.94	1494.64
Multi-family Residential	222.32	337.27	340.43	345.77	352.49	359.52	365.38
Commercial	695.24 Includes metered multi-family	536.77	652.31	710.83	718.96	764.20	815.07
Industrial							
Other Water Systems	3.30	3.30	3.30	3.30	3.30	3.30	3.30
System losses	277.79	297.28	328.61	354.91	369.88	385.49	401.76
Totals	2,129.74	2279.17	2519.31	2720.98	2835.79	2955.45	3080.15

Brown & Caldwell Water Rate Study, 1995; Customer Service Records, Water Operations Records

Section VII
Reliability Comparison
(§10631c)

Unlike the majority of California's water retailers, the District's water supply volumes simply are not affected by single or multiple dry water years. The wells that serve as the water supply are very literally *supported* by Lake Tahoe, the largest alpine lake in North America. A recent groundwater study confirms this. With a depth of 1,646 feet, surface area of 191 square miles, Lake Tahoe contains about 39.75 trillion gallons of water.

Despite the lake level dropping 10 feet during the last prolonged drought of 1985-1991, the draw-down level of District wells was less than 4 feet and only in a few wells.

The following table demonstrates that the District does not have supply deficiencies related to dry weather.

Table 9 - Supply Reliability (values in million gallons)

		Multiple Dry Water Years		
Average/Normal Water Year: 1985 - 2001	Single Dry Water Year 1991	Year 1 1988	Year 2 1989	Year 3 1990
4,437.64	4,437.64	4,437.64	4,437.64	4,437.64

Note: The District's firm source capacity is now 6,924.78.

Section VIII
Inconsistent Water Sources
(§10631c)

MTBE

Since 1996, contamination of groundwater by the fuel additive MTBE has caused the closure of 13 wells, over one-third of the District's water sources. Gasoline/ MTBE leaks from South Lake Tahoe area gas stations tanks travels easily through porous granitic soil into groundwater supplies. MTBE is a suspected carcinogen and even at low levels the chemical causes a foul taste and odor.

The District has made enormous efforts to combat this menace. First, the District lobbied legislators and government officials to ban the use of MTBE as a fuel additive. Though a statewide ban has recently been postponed from January 2003 to January 2005, the District was successful in enlisting the help of El Dorado County and the City of South Lake Tahoe to create a MTBE-free zone at South Lake Tahoe that began April 1999. Next, the District changed operational criteria to meet water demand, while at the same time it began to develop a plan to restore water production. The MTBE Water System Impacts and Mitigation Evaluation Report was completed by the District and Boyle Engineering in September 2000 (Boyle Evaluation). The Boyle Evaluation recommended treating the MTBE contaminated wells. The District will begin treatment of the Arrowhead Well No. 3 using advanced oxidation (hydrogen peroxide/ozone) this month (May 2002).

The District began drilling test wells to site new production wells.. Unfortunately, the District has had no success due to groundwater contamination by MTBE and natural occurring contaminants such as arsenic and manganese, with the exception of a well on U.S. Forest Service property.

In November 1998 the District filed a lawsuit against oil companies and gasoline retailers seeking compensation for damage to its water supply.

Interim Response

On April 15, 1999 the District Board of Directors (Board) adopted an MTBE Policy that prohibits the delivery of drinking water containing detectable concentrations of MTBE except in strictly limited circumstances. The last paragraph of the MTBE Policy states: "Staff will prepare a contingency plan to establish the priority for the utilization of wells placed on standby status because of MTBE. The contingency plan shall ensure that only wells with the lowest concentrations, if any, of MTBE are activated to meet emergency needs." (Appendix D)

On May 6, 1999 the District's Board of Directors adopted a Water Shortage Operations Contingency Plan to minimize the possibility of operating wells with low levels of MTBE contamination. Extreme operational and water conservation measures were approved, if necessary, before a decision would be made to use MTBE tainted wells or aquifers, while still

complying with all state and federal laws for drinking water quality. The Water Shortage Operations Contingency Plan employed the District's staged water conservation provisions to achieve a drastic decrease in demand, if necessary. (Appendix E)

Since the MTBE problem began, the District has drilled two new wells, Arrowhead No. 3 and Valhalla Well. Arrowhead No. 3 requires treatment for MTBE removal and is just now being put into service. Valhalla Well was drilled to only temporarily meet the loss of water due to MTBE contamination.

During 2000, the District obtained a temporary emergency water supply standby source for its Gardner Mountain pressure zone from the Lukins Brothers Water Company. However, the District did not use the standby source.

Production Loss due to MTBE Contamination

The table below lists the 10 wells that are currently inactive due to MTBE contamination.

Table 10 - Production Loss MTBE

Well Name	Capacity (gallons/min.)	Max. Production (gallons/day)
Blackrock No. 1	38	54,720
Blackrock No. 2	127	182,880
Clement	180	259,200
Helen No. 1	112	161,280
Julie	205	295,200
Paloma (portion of prod.)	1,575	2,268,000
South Y	200	288,000
Tata Lane	75	108,000
Tata No. 1	308	443,520
Tata No. 2	73	105,120
Tata No. 3	168	241,920
Totals	3,061	4,407,840

Production Loss due to Aging Wells

Some older wells have lost production over the past decade due to plugged screens caused by corrosion and sediments. Glenwood Wells Nos. 1 - 4 are being destroyed and replaced with one well on the same site. Martin Well may be redrilled, depending on water quality. Industrial No. 1 and Mountain View Wells may be replaced by new wells drilled in the same pressure zone as will

South Upper Truckee Wells No. 1 and 2.

Mitigation of Inconsistent Water Supply Sources

In the Boyle Evaluation, three basic options were considered to restore the District's water supply. First, the District could attempt to obtain new water supplies by securing surface water supplies, installing new wells, or purchasing water from a third party. Second, the District could attempt to use its remaining water resources in a more effective way by rehabilitating its wells, conserving water, or using similar strategies. And finally, the District could install treatment facilities to remove MTBE from District wells. *The determination of the exhaustive Boyle Evaluation is that treatment is the only viable option.*

Action Summary

To accommodate future growth demands of the water system, two new wells are proposed to be sited in areas with no known MTBE groundwater threats. New pipelines, emergency power facilities, and other appurtenances are also needed to convey newly developed water to the various pressure zones where the water was lost.

The District's consultants, Boyle Engineers, recommended wellhead treatment to remove MTBE from District wells. Installation of an advanced oxidation well treatment at Arrowhead Well No. 3 is now underway. The treatment option offers the additional advantage of mitigating MTBE impacts on the aquifer the District has used to supply water to its customers. By extracting and treating large volumes of drinking water, the District may gradually reduce MTBE concentrations in the aquifer and reduce the likelihood of future impacts on down-gradient wells. If the District were to abandon the MTBE-impacted/threatened wells, it may permanently lose a very significant portion of the available groundwater aquifer system for the South Lake Tahoe area.

The District may eventually pursue reactivating 2,718 AFY surface water rights to Cold Creek (unused since 1991, but which may be available) with the intention of transferring such rights to Lake Tahoe, after the Truckee River Operating Agreement is completed sometime in the unforeseeable future.

Water metering analyses have been conducted in 1995 and 2001. At this time metering is not cost-effective. However, with the advent of MTBE contamination and poor results from test wells, the fragility of District drinking water supplies lessens the value of a strict cost/benefit analysis in determining the wisdom and utility of installing water meters. The District will continue to study and update this information. Meanwhile, the District maintains initial capital funding for system-wide metering in its five-year capital budget forecast.

Pending Water Quality Concerns

New regulations for arsenic, uranium/radon, and other volatile chemicals also require careful consideration. Seven of the District wells will be impacted and require treatment or removal if the

state arsenic maximum contaminate level is set at 5 ppb; two wells will require treatment at the federal standard of 10 ppb. Two wells exceed the current uranium standard of 20 pCi/L and may eventually also require treatment if they are to be used.

Section IX
Three-Year Minimum Water Supply
(§10632b)

As discussed at length in previous sections, the District minimum water supply should not be based on a historic sequence of “driest” years, but rather associated with diminished supply due to water quality issues. Therefore, the following chart illustrates the conditions that existed from 1998 - 2001 due to MTBE contaminated/threatened wells being out of service. The District does not anticipate this water availability scenario occurring again.

Table 11 - Three-Year Estimated Minimum Water Supply (in million gallons)

Three-Year Minimum Water Supply		
Year 1	Year 2	Year 3
6,143.74	6,143.74	6,143.74

Section X

Water Supply Reliability

The District's peak water demand, and therefore its supply reliability, is driven by tourism and landscape irrigation, not climatic shortages/vulnerabilities. As described in Section III, summer visitors can easily double the population during the busy weekends in the summer months. Therefore, trimming the highest peak water use during the tourist and irrigation season is the main focus of the staged water conservation restrictions outlined in Section XIII.

Meeting maximum day demands in the District's various pressure zones during the summer months requires operational storage capacity and the ability to move water between interconnected pressure zones. The maximum day demands for each water pressure zone do not always occur on the same day.

It is operationally and financially prudent for the District to utilize its staged water conservation restrictions to trim peak water use. This strategy has been successful in the past ten years. Stage 2 restrictions qualifies as the first tier of restrictions (odd-even outdoor watering), and is used as the gauge below:

Table 12 - Water Shortage Expectations

Water Shortage Expectations	
Number of times the District expects to enter a Stage 2 (1 st tier) Water Shortage over 20 years due to seasonal water demand	20

Section XI
Water Recycling: Wastewater System Description
Wastewater Generation, Collection & Treatment
Wastewater Disposal & Recycled Water Uses
Encouraging Recycled Water Use
(§10633a-f)

History/Porter Cologne Act

From very modest beginnings in 1951 which included two 18,000 gallon redwood septic tanks, the District's wastewater collection/treatment/recycling processes have grown to a 7.7 mgd advanced secondary operation serving 17,000 customers. The District's award winning collection system and wastewater treatment plant produces an average 4.5 mgd, 100% of which is recycled. *However, the Porter-Cologne Act of 1968 requires that all wastewater be exported out of the Tahoe basin watershed, leaving no opportunities for re-use within our service area except for catastrophic fire suppression in a small limited area.* (Appendix F)

Since 1968 the District has delivered its high quality treated effluent through a 26 mile export system, over 7,400 ft. Luther Pass (a lift of 1,200 ft.), to Alpine County. The recycled water is stored during the winter months in 3,800 acre foot Harvey Place Reservoir and distributed to six ranches for irrigation purposes in the dry summer months.

When the District first built the water reclamation facilities, Alpine County provided the most feasible disposal site and was the only area willing to take the water. In return for helping the District, Alpine County and its 1,000 residents receive many benefits. The free recycled water is distributed all summer and fall. The six ranches stay green, allowing for extra cuttings of hay. The District pays an annual mitigation fee in excess of \$100,000 to Alpine County and stocks local fisheries.

Master Planning for the Future

Opinions at the District and throughout California have changed since 1967. Recycled water is now valued as a precious resource by drought-conscious Californians. In 2000 the District began a Master Plan for the recycled water system to extend over the next twenty years. In addition to evaluating the physical facilities and contractual issues, the District is also ready to seek a benefit in return for the valuable recycled water.

Flow Data, Trend

The following chart and table shows wastewater flows for the past ten years. The flat trend line is reflective of slow growth, low-water use fixtures, redevelopment vs. development, and improvements in the collection system. The existing 7.7 mgd plant will likely serve through build-out of undeveloped lots within the service area.

Graph 2 - Average Daily Wastewater Flow Trend

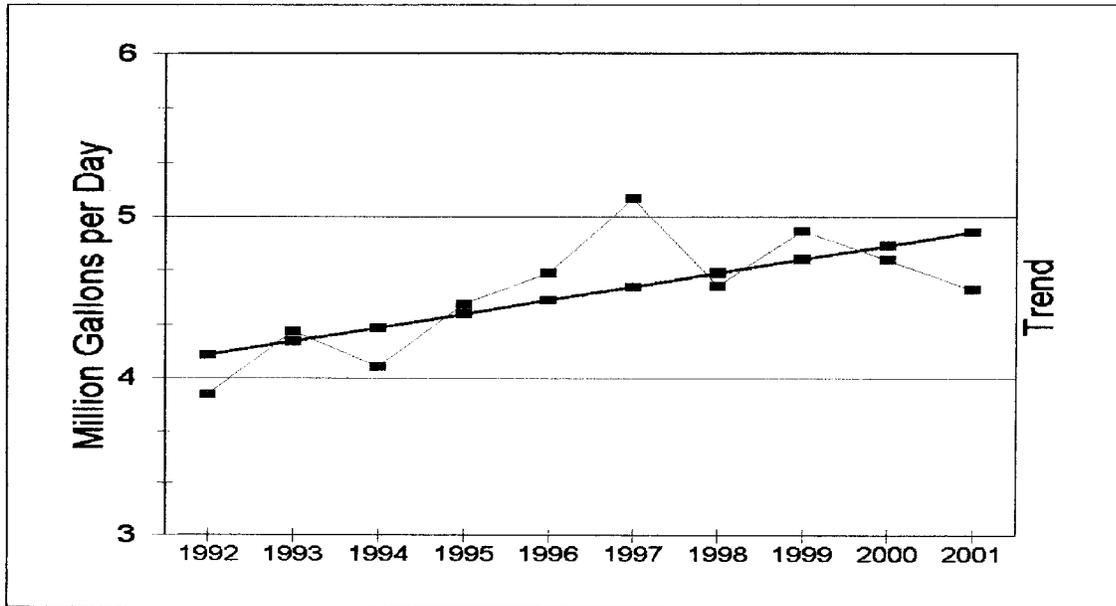


Table 13 - Sewer Flows Fiscal Years 1992 - 2001 (in million gallons)

Year	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001
Annual Flow	1,426	1,566	1,487	1,630	1,699	1,864	1,668	1,792	1,728	1,663
Avg. Monthly Flow	119	131	124	136	142	155	139	149	144	139
Average Daily Flow	3.90	4.29	4.07	4.46	4.65	5.11	4.57	4.91	4.73	4.55

STPUD Comprehensive Annual Financial Report, fiscal year ended 6/30/2001

Recycled Water Optimization Plan

Despite the prohibition of recycling within the District’s own service area, through a special legislative act in 2000, the District was able to install 6 fire hydrants along a short section of its export pipeline. These hydrants provide emergency fire suppression to a small residential community (that does not have municipal water service) and the District’s critical wastewater pumping station at the base of Luther Pass. The availability of recycled water in the event of a catastrophic fire in this heavily forested area provides a level of security to the residents, the District and the Lake Valley Fire Department. Three additional hydrants in Alpine County provide similar fire protection as the export line makes its way to Harvey Place Reservoir.

Section XII
Supply and Demand Comparison Provisions
(§10635a)

The supply and demand volumes illustrate the District's overall abundant supply vs. demand that is growing relatively slowly. The 2000 supply shows the minimum water supply due to MTBE contamination; years 2005-2020 show production restored. While there are plans for adding additional well sources over time, the District staff anticipates the new wells will replace old wells as they are abandoned.

Table 14 - Supply and Demand Projections to 2020 (in million gallons)

Projections	2000 MG	2005 MG	2010 MG	2015 MG	2020 MG
Supply	6,143.74	7,502.94	7,502.94	7,502.94	7,502.94
Demand	2,519.40	2,720.98	2,835.79	2,955.45	3,080.15
Excess Supply	3,624.34	4,781.96	4,667.15	4,547.49	4,422.79

STPUD Water Operations, Lab

The following table illustrates the supply when compared to average, single, and multiple year diminished supply that was established in Section VIII, Reliability Comparison

Table 15 - Supply Reliability and Demand Comparison Three Scenarios (in million gallons)

	Average/Normal Water Year (1985 - 2001)	Single Dry Water Year 1991	Multiple Dry Water Years		
			Year 1 1988	Year 2 1989	Year 3 1990
Supply Totals	4,437.64	4,437.64	4,437.64	4,437.64	4,437.64
Demand Totals	2,245.62	2,025.76	2,209.77	2,235.53	2,226.39
Difference	2,192.02	2,411.88	2,227.87	2,202.11	2,211.25

STPUD Water Operations, Lab

Section XIII
**Water Shortage Contingency Plan: Preparation for Catastrophic Water
Supply Interruption**
(§10632)

The District prepared its Emergency Response and Recovery Plan (Emergency Plan) in 1999 in accordance with Government Code Section 8607.2(c). In the portion of the Emergency Plan that addresses hazard assessment and vulnerability analysis the District cited contamination of the water supply as an event that would have significant “weight” as a disaster and provides guidance during an emergency including the actions in Table 14. However, the Emergency Plan does not and cannot fill the need for specific operating procedures during specific disasters due to its multi-zonal makeup and the innumerable possible response options available depending on the emergency.

A Water Shortage Operations Contingency Plan (Water Shortage Plan) was adopted by the District Board of Directors on May 6, 1999 to specifically reduce water demand due to contamination/threat by MTBE. (Appendix E) Extreme operational and water conservation measures are described in the Water Shortage Plan. Progressively strict water conservation stages, as provided by the District’s Administrative Code Section 3.4 (Appendix G), are an integral component of the District’s Water Shortage Plan.

Between the Emergency Plan and the Water Shortage Plan, the District is well prepared to operate effectively in the face of a catastrophic water supply interruption.

Table 16 - Preparation Actions for a Catastrophe

Examples of Actions	Check if Discussed
Determine what constitutes a proclamation of a water shortage	✓
Stretch existing water storage	✓
Obtain additional water supplies	✓
Develop alternative water supplies	✓
Determine where the funding will come from	✓
Contact and coordinate with other agencies	✓
Create an Emergency Response Team/Coordinator	✓
Create a catastrophe preparedness plan	✓
Put employees/contractors on-call	✓
Develop methods to communicate with the public	✓
Develop methods to prepare for water quality interruptions.	✓

Stages of Action

The District's has 5 water conservation stages beginning with normal conditions and progressing to a water emergency:

Stage 1 - Normal Conditions. During periods of adequate water supply, customers are to practice water conservation so that water is not wasted.

- Water Users shall not allow water to leave the property by draining onto adjacent properties or impervious surfaces.
- Water Users shall repair all leaks in plumbing and irrigation systems.
- Hoses shall not be used for washing motor vehicles without a shut-off nozzle. Continuous discharge from hose nozzle are prohibited. Exceptions: commercial car washing or commercial service stations, and where the health, safety, and welfare of the public is dependent upon frequent vehicle cleaning, such as garbage trucks and vehicles that transport food.
- Citizens are encouraged to report signs of water leaks and water waste.
- The use of water to irrigate non-landscaped, natural vegetation or undeveloped property is prohibited unless necessitated by fire prevention considerations in cases of severe fire danger.

Stage 2 - Minor Supply Shortage. All the stage 1 restrictions apply, and also the following shall apply:

- Odd-even watering schedule.
- Water shall not be used to wash sidewalks, driveways, parking areas, tennis courts, decks, patios, or other improved areas, except in conjunction with driveway repair and sealing, or to alleviate immediate fire or sanitation hazards.
- All commercial establishments where food or beverages are provided shall serve water to their customers only when specifically requested by the customer.

Stage 3 - Severe Water Supply Shortage. All the stage 1 and 2 restrictions apply, and also the following shall apply:

- Irrigation is prohibited on weekends.
- The filling with water of outdoor swimming pools which are not covered during periods of non-use is prohibited.
- The operation of any ornamental fountain or similar decorative water structure is prohibited unless a recycling system is used and a notice to the public of such recycling system is prominently displayed.

Stage 4 - Critical Water Supply Shortage. All the stage 1, 2, and 3 restrictions apply, and the Board may designate specific areas for further restrictions as follows:

- Outdoor irrigation of all vegetation including lawns and landscaping is limited to once per week, except more frequent irrigation of public facilities may be permitted pursuant to Section 3.4.16.
- No water shall be used for irrigating landscaping for new construction.

- Use of water from fire hydrants shall be limited to fire fighting and/or other activities immediately necessary to maintaining the health, safety and welfare of the community, as determined by the District or other government entity with appropriate jurisdiction.

Stage 5 - Water Emergency. All the stage 1, 2, 3, and 4 restrictions apply, and the Board may designate specific areas for further restrictions as follows:

- The use of water for other than domestic and commercial use is prohibited except irrigation of public facilities may be permitted pursuant to Section 3.4.16.
- The use of water for dust or dirt control, grading and road construction purposes is prohibited.
- The use of water for flushing of fire hydrants, except for emergency purposes, as determined by the District or other government entity with appropriate jurisdiction, is prohibited.
- The use of water for air conditioning purposes, where an alternative source of fresh air is available, is prohibited.

Table 17 - Water Supply Shortage Stages and Conditions

Water Conservation Stages				
Stage 1	Stage 2	Stage 3	Stage 4	Stage 5
Water Supply Conditions				
Normal - 0%	Minor - 2%	Severe - 5%	Critical - 15%	Emergency - 50%

Penalties

The District staff, under direction of the General Manager, is empowered to enforce compliance with the staged conservation measures. It is unusual that water users exceed a first violation.

First Violation - For a first violation within one year, the District shall issue a written warning to the Water User.

Second Violation - For a second violation within one year, a fine of \$100 shall be added to the Water User 's bill at the property where the violation occurred.

Third Violation - For a third violation within one year, a fine of \$200 shall be added to the Water User's bill at the property where the violation occurred. In addition to the fine, the Board or the General Manager may require installation of a flow-restricting device on the Water User's service connection.

Fourth Violation - For a fourth and any addition additional violations within one year, a fine of \$500 shall be added to the Water User 's bill at the property where the violation occurred and the District may discontinue the Water User's water service at the property where the violation

occurred in accordance with District procedures. Re-connection shall be permitted only when there is reasonable protection against future violations such as a flow-restricting device on the customer's service connection as determined in the District's discretion.

Revenue and Expenditure Impacts

As largely a flat rate system, impacts on revenues would be minimal. The District has routinely employed seasonal water educators that assist existing staff in enforcing water conservation measures.

Reduction Measuring Mechanism

Reductions would be determined by daily recording of water production at wells. Frequency of such production monitoring can easily be increased.

Measures to Overcome Impacts

The District is seeking reimbursement of millions of dollars from those responsible for lost production due to contamination by MTBE.

Section XIV

Demand Management Measures

(§10631)

The District is committed to developing and implementing aggressive water conservation programs that fit the needs of the resort community it serves. The District recognizes the value and necessity of public education in its effective community outreach and communications programs. An excerpt from the District's mission statement expresses this core value:

“...the District will strive to share information with our customers to foster and maintain a well informed community.”

The District's water conservation programs are successful because they target the local resident, vacationing guests, and commercial customers alike. Californians, as a group, are very drought conscious citizens. Often a tourist will call to check on the level of water restrictions the local water company has in effect.

Current Water Conservation Measures

- Water Audits upon request - Water Audits are conducted for all customers upon request and are free of charge. Audits can result in cost-savings to metered customers. Our water auditors are trained and certified by Cal Poly, San Luis Obispo.
- Waterline Replacement - During the past 10 years, the District has conducted a very aggressive leaky mainline replacement program, replacing an average of 15,000 feet of old waterlines per year.
- Table Tents for Restaurants - Advertises “water upon request only”
- Water Conservation Poster Contest - School drawing contest conducted in association with the Soroptomists Club. Winning drawing is made into a poster and distributed throughout the service area.
- Free/low cost (up to 5 baths free per applicant) showerheads available to residential and hotel/motels.
- Summertime cooperative water awareness with local radio station KOWL- morning water report.
- “Talk of Tahoe” show in spring/summer focuses on water awareness, staged restrictions in effect.
- School tours feature water conservation/awareness.

- Newspaper articles feature water conservation program, water educators.
- **Demonstration Garden** - The community's 3½ acre demonstration garden, located at Lake Tahoe Community College, was featured in Sunset Magazine and won the first place award from the Tahoe Regional Planning Agency. It is an ongoing resource for local residents and visitors who are planning and re-planning their landscape design.
- **No Native!** - Landscaping awareness program encouraging native and low-moisture requirement landscaping.
- **Wildflower seed distribution** - free wildflower seed mix in partnership with Tahoe Resource Conservation District.
- **Firefest/Home Show** water conservation booth for public.
- **Earth Day** event participation focuses on water conservation
- **Day of the Young Child** at Lake Tahoe Community College includes water conservation.
- **Low-flow Fixture Requirements/Staged Water Restrictions** - Provisions in the District's Administrative Code providing for low water use plumbing fixtures and progressive water restrictions.
- **Recycling** - The District recycles 100% of its reclaimed wastewater.

(See Examples - Appendix H)

Alternative Conservation Measures

The District studied the cost of installing water meters in 1995 in connection with its Water Rate Study. (Appendix I). A subsequent analysis was made this year by the District's Chief Financial Officer in connection with her Masters Degree. Both studies arrive at the same conclusion: it is not cost-effective for the District to meter at this time. The short irrigation season at Lake Tahoe is the variable that determines this outcome. Additionally, according to our most recent customer survey, 66% of our customers prefer the flat rate. However, with the advent of MTBE contamination and poor results from test wells, the fragility of District drinking water supplies lessens the value of a strict cost/benefit analysis in determining the wisdom and utility of installing water meters. The District will continue to study and update this information. Meanwhile, the District maintains initial capital funding for system-wide metering in its five-year capital budget forecast.