California Water Service Company

2005 Urban Water Management Plan

Bear Gulch District

FINAL

December 31, 2005

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Date plan submitted to the Department of Water Resources: January 9, 2006

Name of person preparing this plan: **Tom Salzano, Water Resources Planning Supervisor**

Phone: **(408) 367-8340**

Fax: **(408) 367-8427**

E-mail address: **tsalzano@calwater.com**

District Office:	**California Water Service Company – Bear Gulch District** **3351 El Camino Real, Suite 190** **Atherton, CA 94027-3844**
District Manager:	**Mr. Darin Duncan**
District Phone:	**(650) 367-6800**

1 Introduction

California Water Service Company is an investor-owned public utility supplying water service to 1.7 million Californians through over 440,000 connections. Its 25 separate water systems serve over 50 communities from Chico in the north to the Palos Verdes Peninsula in Southern California. In 2000, California Water Service Company merged with the Dominguez Services Corporation incorporating several northern and southern California water systems. California Water Service Group, California Water Service Company's parent company, is also serving communities in Washington, New Mexico and Hawaii. Rates and operations for districts located in California are regulated by the California Public Utilities Commission (CPUC) and are set separately for each of the systems. California Water Service Company incorporated in 1926 and has provided water service to the Bear Gulch District since 1936.

1.1 Purpose

California Water Code §10644(a) requires urban water suppliers to file with the Department of Water Resources, the California State Library, and any city or county within which the supplier provides water supplies, a copy of its Urban Water Management Plan, no later than 30 days after adoption. California Water Service Company will follow the California Water Code and file an Urban Water Management Plan at least once every five years on or before December 31, in years ending in five and zero.

The 2005 Urban Water Management Plans are due December 31, 2005. All urban water suppliers as defined in Section 10617 (including wholesalers), either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet annually are required to prepare an Urban Water Management Plan.

This UWMP is a foundation document and source of information for a Water Supply Assessment and a Written Verification of Water Supply. An UWMP also serves as:

- A long-range planning document for water supply,
- Source data for development of a regional water plan, and
- A source document for cities and counties as they prepare their General Plans.
- A key component to Integrated Regional Water Management Plans.

1.2 Public Review

California Water Service Company completed a draft of the Urban Water Management Plan for Bear Gulch district on August 8, 2005. The draft was sent to the Cities and County listed in Table 1.3-1 for review and comment. Copies of the draft plan were available at the California Water Service Company Corporate Office in San Jose and at the district office for public review and comment.

California Water Service Company conducted a formal public meeting to present information on its general rate case request to the CPUC. Presentation of the second draft copy of this Urban Water Management Plan was included in the proceedings and serves as a public review of the Urban Water Management Plan. The public hearing was held on November 14, 2005 at the following location:

City of Menlo Park Senior Center
110 Terminal Avenue
Menlo Park, CA 94025

The public meeting occurred at 7:00 p.m. The room was reserved from 1:00 p.m. to 10:00 p.m.

Proof of the public hearing is presented in Appendix A

1.3 Plan Adoption

Final comments were received by December 2, 2005. The final plan was adopted by the Vice President of Engineering & Water Quality on December 31, 2005, and was submitted to California Department of Water Resources within 30 days of approval. Appendix A presents a copy of the signed Resolution of Plan Adoption.

Table 1.3-1 summarizes California Water Service Company's level of activity to include various agencies in the planning process of this Urban Water Management Plan

Table 1.3-1: Coordination with Appropriate Agencies (Table 1)

	Commented on the draft	Was sent a copy of the draft plan	Was sent a notice of intention to adopt	Not Involved / No Information
City of Atherton		✓	✓	
City of Portola Valley		✓	✓	
City of Woodside		✓	✓	
City of Menlo Park		✓	✓	
County of San Mateo		✓	✓	
San Francisco Public Utilities Commission		✓	✓	
Other water suppliers				✓
Bay Area Water Supply and Conservation Agency	✓	✓	✓	

The agencies listed in Table 1.3-1 have also been sent a copy of the final version of this report.

In addition to the resolution, Appendix A also contains the following:
- Letters sent to and received from various agencies regarding this plan
- Minutes of public meeting
- The review sheet check list from Department of Water Resources.

1.4 Water Management Tools

California Water Service Company uses the following water management tools to maximize water resources for the Bear Gulch district.

- Hydraulic analysis will be used to identify limitations in the water distribution network and provide recommendations if main replacement is required.
- SCADA/Water measurement provides information as to how the district is operating and gives a historical record of district, including water levels. California Water Service Company maintains detailed records including the water sales and the customer service connection by sector and used this information for future projections.
- Geographical Information Systems (GIS) will be used to combine several sources of information and allow land usage management tools to provide insight into the growth of the district.
- Water quality data analysis provides a detailed compositional analysis of the water and provides information on potential supply shortfalls that can result from mineral intrusion or contamination.
- Water Supply and Facilities Master Plan provided details into the district from a global perspective and evaluates the major equipment and facilities replacement schedule, and identifies long term projects.

1.5 BAWSCA Membership

California Water Service Company is a member of The Bay Area Water Supply and Conservation Agency. The Bay Area Water Supply and Conservation Agency (BAWSCA) was created on May 27, 2003 to represent the interests of 26 cities and water districts, and two private utilities, in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System.

BAWSCA is the only entity having the authority to directly represent the needs of the cities, water districts and private utilities (wholesale customers) that depend on the regional water system. BAWSCA provides the ability for the customers of the regional system to work with San Francisco on an equal basis to ensure the water system gets fixed, and to collectively and efficiently meet local responsibilities.

BAWSCA has the authority to coordinate water conservation, supply and recycling activities for its agencies; acquire water and make it available to other agencies on a wholesale basis; finance projects, including improvements to the regional water system; and build facilities jointly with other local public agencies or on its own to carry out the agency's purposes.

Compliance with the Urban Water Management Planning Act lies with each agency that delivers water to its customers. In this instance the responsibility for completing an UWMP lies with the individual BAWSCA member agencies. BAWSCA's role in the development of the 2005 UWMP updates is to work closely with its member agencies and the SFPUC to maintain consistency between the multiple documents being developed and to ensure overall consistency with the Water System Improvement Program (WSIP) and the associated environmental documents.

1.6 Plan Organization

This plan is organized as described in the following outline. The corresponding provisions of the California Urban Water Management Planning Act are included as references. Tables in this plan have cross references to the tables as listed in the "Guidebook to Assist Water Suppliers in the Preparation of a 2005 Urban Water Management Plan" prepared by the California Department of Water Resources.

Section	Executive Summary	Act Provision
Contact Sheet	List of Contact Persons	
Chapter 1	Introduction This chapter describes the requirement and the purpose of the Urban Water Management Planning Act, plan adoption, schedule, and management tools.	§10620 (d)(1)(2) §10620 (f) §10621 (a-b) §10635 (b) §10642 §10644 (a) §10645
Chapter 2	Service Area Information This chapter describes the district service area and includes area information, population estimate, and climate description.	§10631 (a)
Chapter 3	Water Sources This section includes a detail discussion of the water supply sources including a section on the water quality	§10631 (b-c) §10633 (a-e) §10634
Chapter 4	Water Shortage Contingency Plan This chapter describes the District's planning during water shortages during drought and emergency situations.	§10632 (a-g)
Chapter 5	Water Use Provisions This chapter describes the water supply projection methodology used to estimate water demand and supply requirements to 2030 in five year increments.	§10631 (e)(1)(2) §10631 (k)
Chapter 6	Supply And Demand Comparison This chapter discussed the water supply outlook for the district under different hydrologic conditions in accordance with DWR guidelines. Specifically, supply and demand comparisons in five year increments to 2030 under normal, dry year and multiple dry year conditions are presented in this section.	§10631 (h-i) §10635 (a)
Chapter 7	Water Demand Management Demand management measures used to benchmark conservation methods is described in this chapter.	§10631 (j) §10631 (g)
References	References The source of any information used in this plan is listed in this section	-
Appendix A	Resolution To Adopt The Urban Water Management Plan This section includes the following: 1) Resolution 2) Letters to and comments from various agencies 3) Minutes from the public hearing 4) DWR Checklist	§10621(b) §10642 §10644 (a)
Appendix B	Service Area Map This appendix includes the service area map of the district as filed with the Public Utilities Commission	-
Appendix C	Water Supply, Demand, And Projection Worksheets This section includes spreadsheet used to estimate the water demand for the district.	-
Appendix D	California's Ground Water Bulletin 118 Sections from the Department of Water Resources Bulletin 118 is included as a reference and details the basin for the district	§10631 (b)(1-4)
Appendix E	Tariff Rule 14.1 Water Conservation And Rationing Plan This section contains the tariff rule for reference	-
Appendix F	Local Ordinance Number 02681 This section contains the ordinance number for reference	-

Section	Executive Summary	Act Provision
Appendix G	Water Efficient Landscape Guidelines The guideline for water efficient landscape that California Water Service Company uses at its properties, including renovations, is contained in this section.	-
Appendix H	SFPUC Urban Water Management Plan This section contains the San Francisco Public Utilities Commission - Urban Water Management Plan for 2005 for reference.	§10631 (b)(1-4)
Appendix I	CUWCC Annual Reports This sections contains the reports filled with the California Urban Water Conservation Council	§10631 (j)
Appendix J	BMP Economic Analysis Assumptions Worksheets for each BMP is presented in this section.	-
Appendix K	Wholesale Customers Demand Projection/DSS Modeling Information for the Customers Demand Projection/DSS Modeling is presented in this section.	-

1.7 Implementation of Previous UWMP

California Water Service Company has 25 separate water service districts and maintains separate plans for each district. The plans have been divided into 3 groups, which each group being updated on a 3 years cycle, as approved by the Public Utilities Commission. The last Urban Water Management Plan for Bear Gulch District was published in 1998 as part of the general rate case.

The BMP programs outlined in that plan and the status of each program as of 2004 is listed in Table 1.7-1.

Table 1.7-1: Proposed 1998 Conservation Programs

Program	Program Implemented
BMP 01 Residential Survey	CPUC has not approved to implement this BMP
BMP 02 Plumbing Retrofit	On-going
BMP 07 Public Education	On-going
BMP 08 School Education	On-going
BMP 09 CII Programs	CPUC has not approved to implement this BMP
BMP 14 ULFT Rebate	On-going

2 Service Area Information

2.1 District Description

The Bear Gulch District is located in San Mateo County approximately 30 miles south-southeast of the City of San Francisco. The area served includes the communities of Atherton, Portola Valley, Woodside, portions of Menlo Park, and adjacent unincorporated portions of San Mateo County including; West Menlo Park, Ladera, North Fair Oaks, and Menlo Oaks. The area's climate is mild with an average maximum temperature of 74.5°F, an average minimum temperature of 43.8°F, and average total precipitation of 29.96 inches.

The location and general area map of the district is shown in Figure 2.1-1. The system is bordered on the north by Redwood City; on the east by Palo Alto, Stanford University, and unincorporated Santa Clara County; and on the south and west by unincorporated San Mateo County. A service area map is included in Appendix B.

The San Andreas Fault rift zone forms the major geologic features of the area as it passes through the western portion of the service area along with the Monta Vista Fault Line. Figure 2.1-2 shows the location if the closest fault lines to the district (Ref. 1). A major earthquake occurring on any of these faults may disrupt water service.

Elevations in the service area range from just over sea level on the eastern boundary to nearly 1,100 feet above sea level on the western boundary. This marked variation in elevation requires 33 separate pressure zones for effective system operation. Much of the terrain that bounds the service area on the west is too steep for any type of development.

The San Francisquito Creek and its tributaries provide the principal source of drainage to the area. Bear Gulch Creek, one of these tributaries, drains a 1,500-plus acre watershed of which the Company owns 1,306 acres. Storm runoff carried by this creek is captured via two separate diversion facilities on the creek providing the only local source of supply available to the district.

The major transportation links through the District are Interstate 280, U.S. Highway 101, El Camino Real, Woodside Road, and Alpine Road. The Dumbarton Bridge connects the area to the East Bay communities.

Figure 2.1-1: General Location of Bear Gulch District

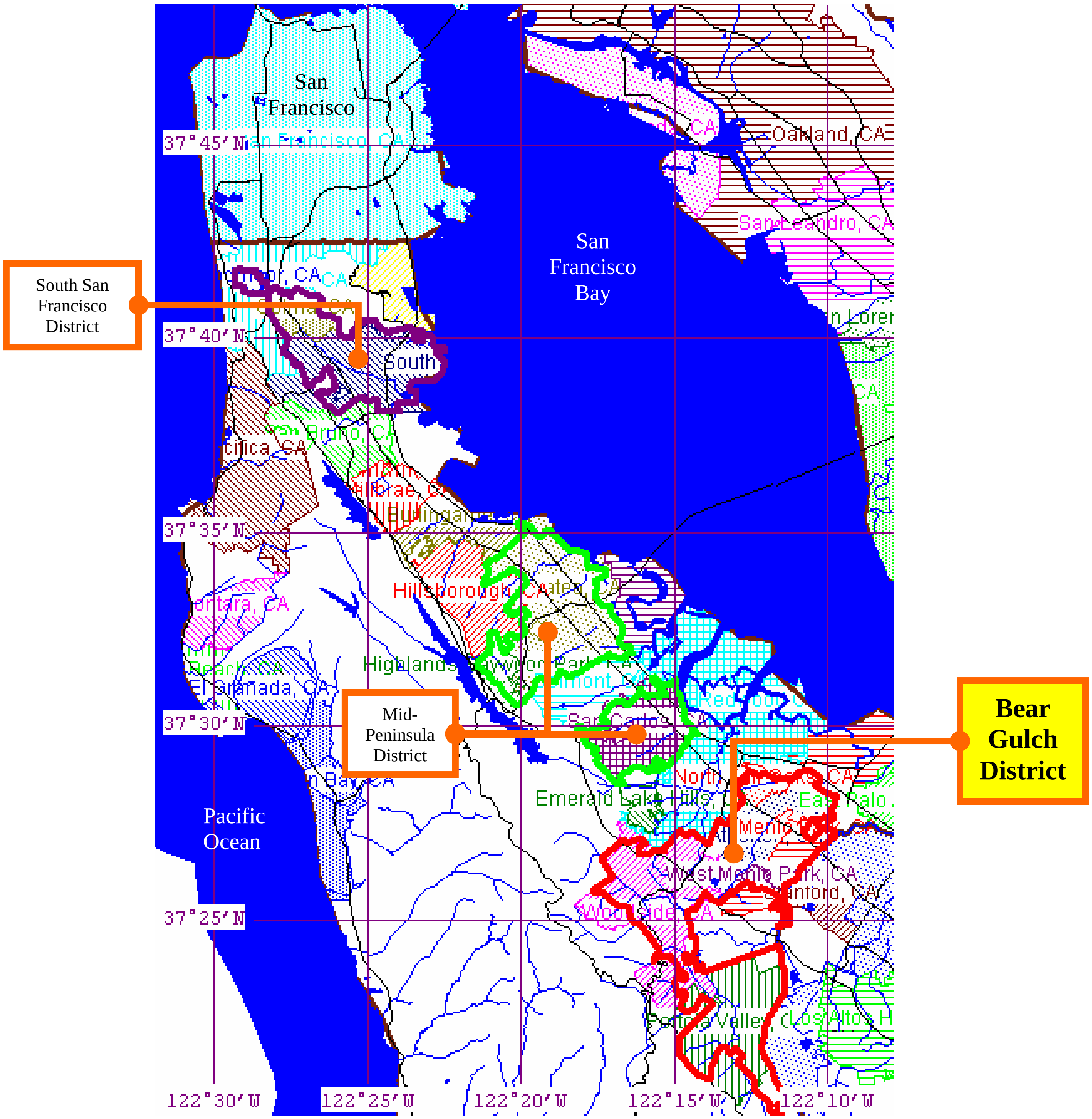
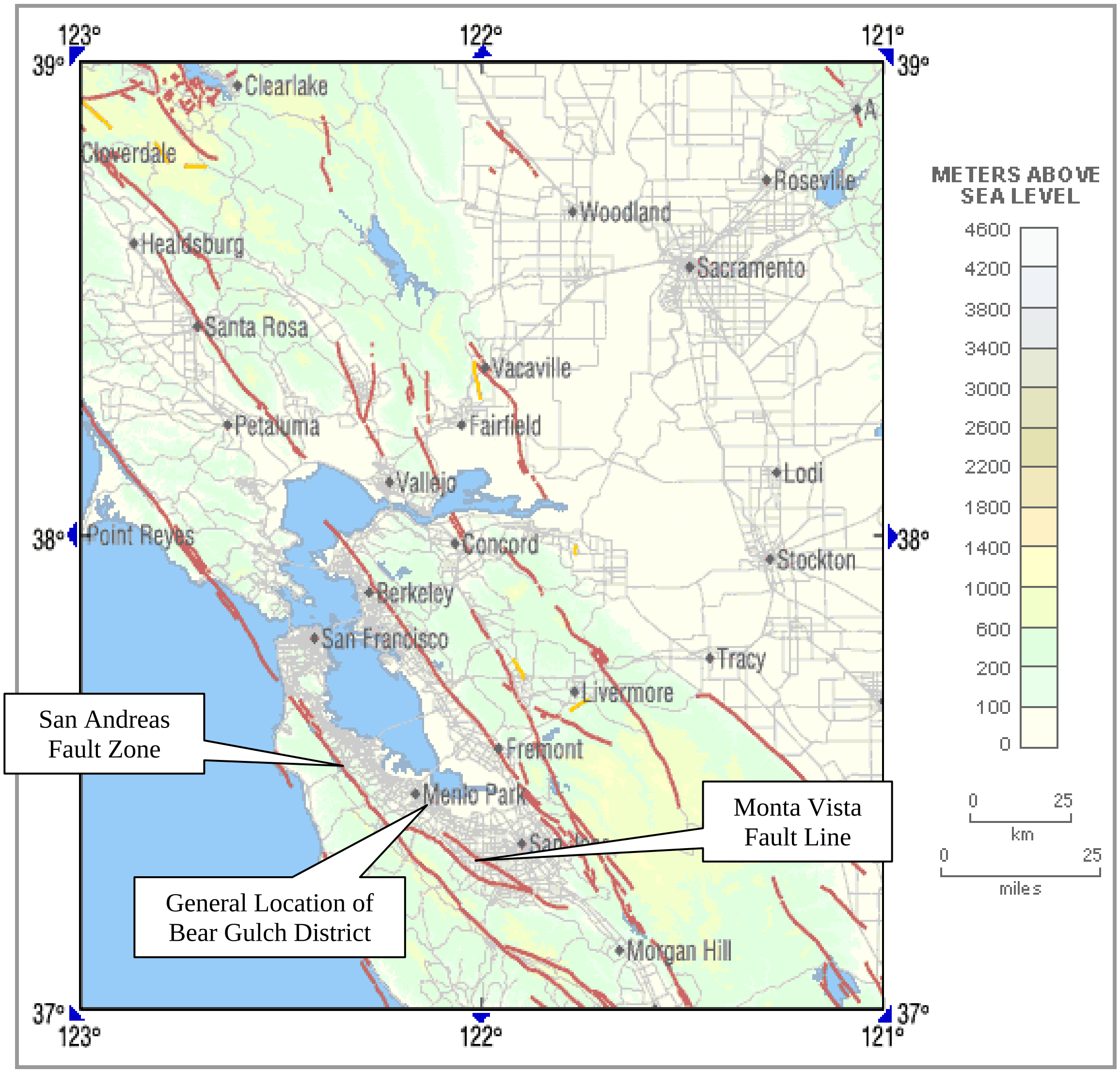


Figure 2.1-2: Active Fault Lines



2.2 Service Area Population

Estimate of the population serviced by California Water Service Company is based on overlaying the 2000 U.S. Census Tract Block data with the service area map (SAM), as shown in Figure 2.2-1. A summary of the census data for the Year 2000 is shown in Table 2.2-1. LandView 5 and MARPLOT ® software were used to generate the data (ref. 7)

Figure 2.2-1: Approximated SAM with US Census 2000 Tract Map

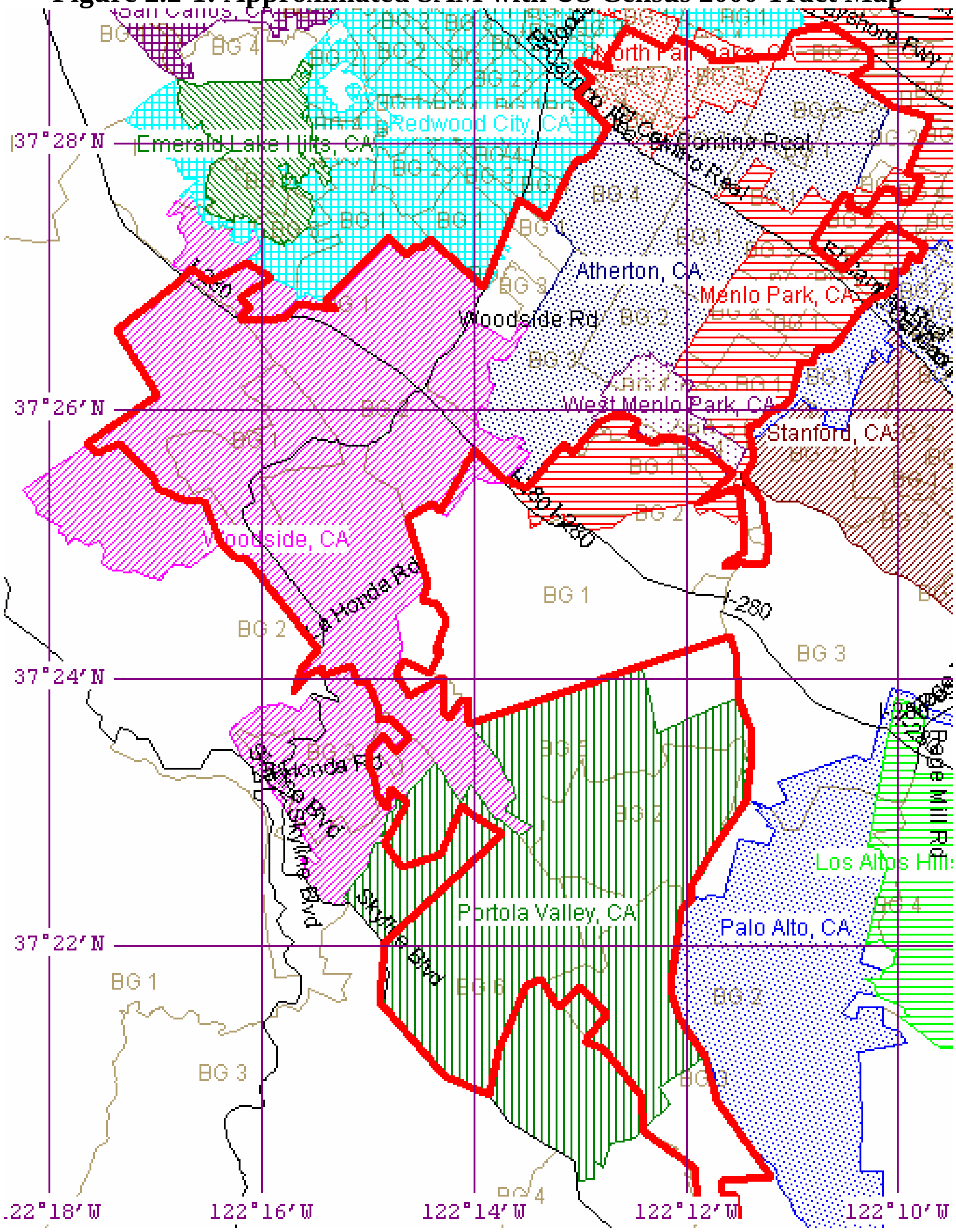


Table 2.2-1: Summary of Census 2000 Data			
	Census Tract Blocks	Population	Housing Units
Bear Gulch Service Area	642	53,885	19,956

In 2000 the service count for the district was 17,099 for single family and multifamily residences. Using the ratio of given population and the service count yield a population density of 3.151 persons per residential service (single family residential services and multifamily units).

California Water Service Company estimates that the average population for 2004 in the Bear Gulch District has increased to approximately 54,350. California Water Service Company bases this estimate on the average annual service connection count, and on the assumption that density has remained unchanged since the census was conducted. California Water Service Company estimates the service area's population could reach 59,220 by 2030. Table 2.2-2 lists the population growth in 5 year increments.

Table 2.2-2: Population - Current and Projected (Table 2)						
	2005	2010	2015	2020	2025	2030
Service Area Population	55,560	56,280	57,000	57,730	58,470	59,220

Most of Portola Valley, Woodside, and the upper elevations of Atherton contain hilly, tree-covered terrain. The land use in this area is low-density, single family housing and open space. The lower elevations of Atherton are relatively flat and typically consist of low-density single family residences with some commercial development present along El Camino Real. The Menlo Park portion of the service area is also relatively flat and is zoned to provide a land use mixture of single family and multifamily residential housing along with more substantial commercial use. Few changes have occurred in recent years that affect land use. Recent growth has occurred in Menlo Park through the redevelopment of lots containing single family units that are converted into multi-residential facilities.

The Bear Gulch District service area has many areas containing open space. The steep terrain present in these areas and the established land use function for the areas prevent development. Among the largest of these areas are the San Francisco State Fish and Game Refuge (watershed lands that feed the Crystal Springs Reservoir), the California Water Service Co. watershed lands, Huddart County Park, Wunderlich County Park, Windy Hill Open Space, Jasper Biological Preserve, Stanford University, and the San Francisco Bay National Wildlife Refuge.

Due to the steep hillsides, narrow roads and the difficulty of providing fire protection, future development in the hilly areas is limited.

Most of the land that is available for development in Menlo Park is projected for industrial use; however, this area lies outside California Water Service Company's service area. Some small areas of redevelopment from single family residential into multifamily residential may occur on a minimal basis within the service boundaries.

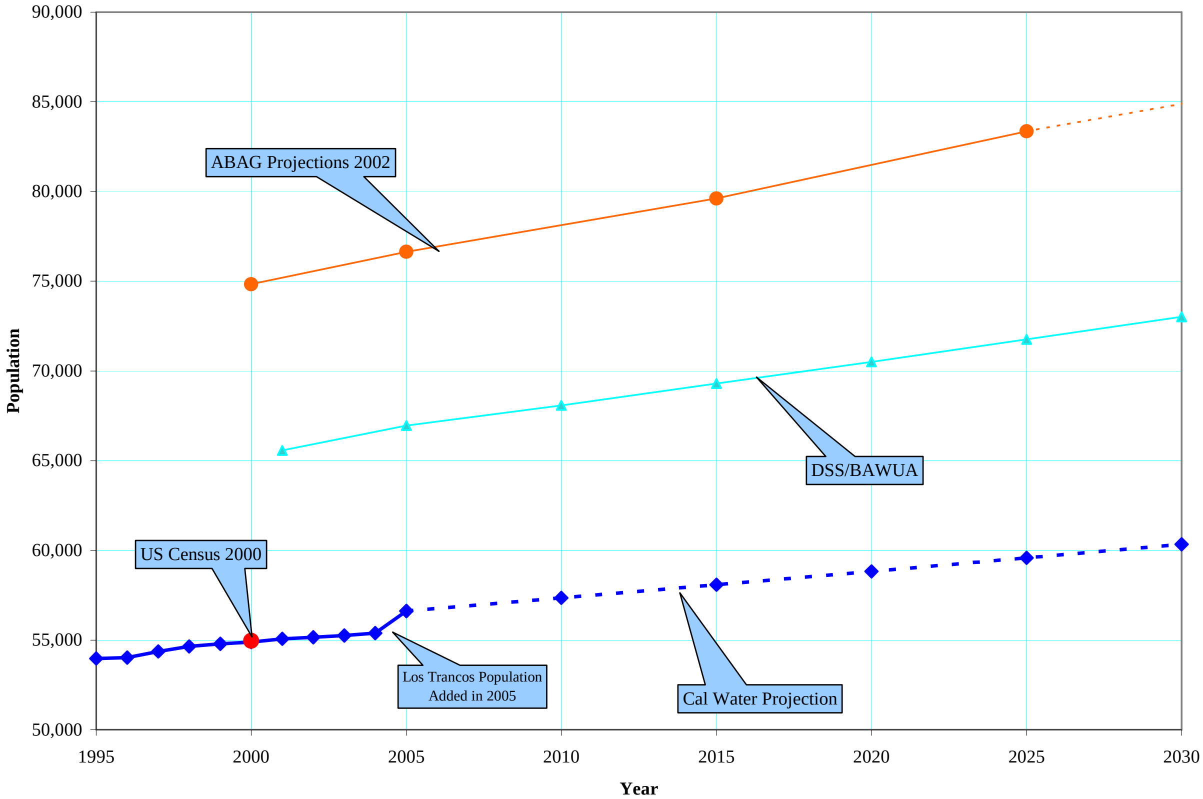
The few remaining acres of land in Atherton available for development are planned for low-density residential use and will probably be constructed on an individual basis. Very little development is expected within the service area of the Bear Gulch District. Woodside and Portola Valley are almost exclusively residential. Due to various development restrictions, the future land use of these areas will probably be very low density, similar in nature to the present land use.

It is difficult to accurately determine the population residing in the district, because several cities are only partially served by the district and census data on unincorporated county property is not always reported separately, but instead lumped into a single county value. Therefore, for the purposes of this study, it has been assumed that the population density per service will not vary over time or by community and that the service connection growth is an appropriate value to forecast growth. This study used the average annual services present in the district during a calendar year as the value for service connections within the district.

The population estimates for the district are compared to projections made by other governmental agencies, as shown in Figure 2.2-2. The two additional projections are from San Mateo County - Census & Housing Data Sourcebook (Ref. 2), and BAWSCA's Decision Support System Model (DSS) which is discussed in Section 3.5.1.

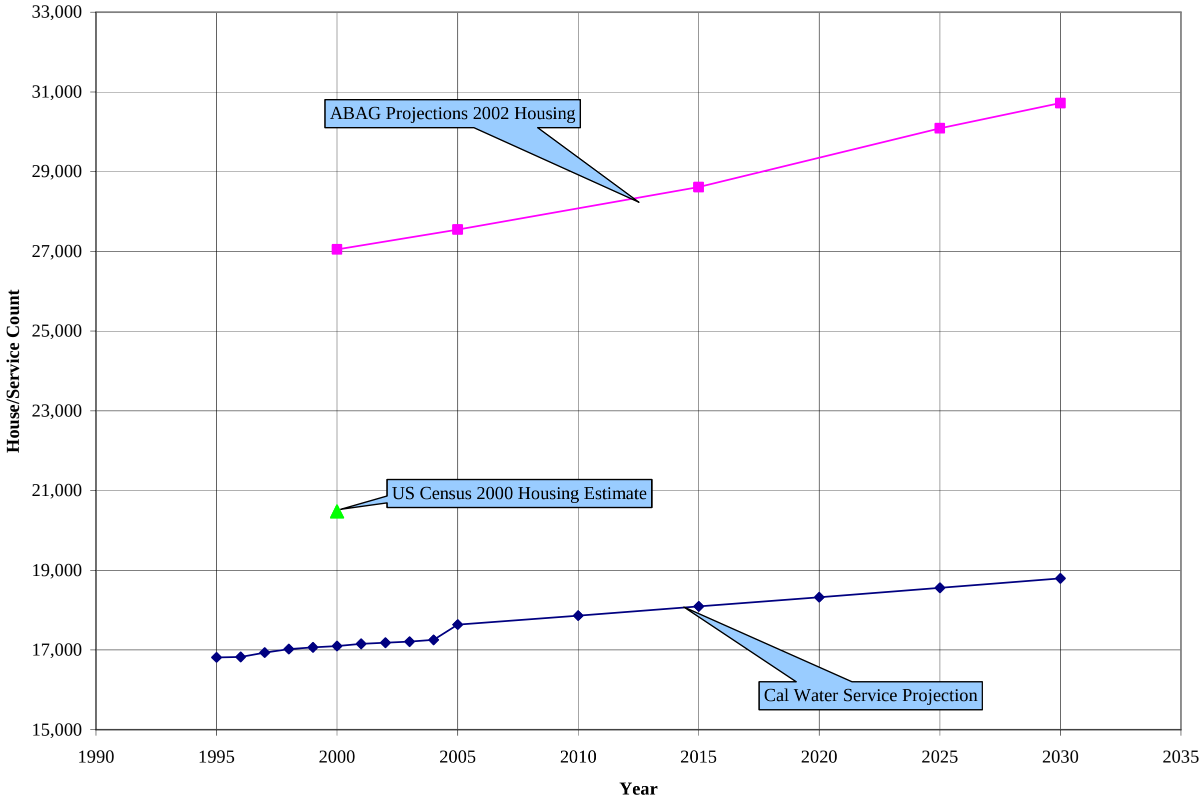
The projection from the San Mateo County reference uses Association of Bay Area Governments (ABAG) "Projection 2002" and includes population counts based on the city boundaries that are outside the service area of Bear Gulch District, thus the population estimate is greater than the district population. The DSS/ABAG projection shows a population estimate that is higher than the district population as well, which is due to the initial conditions for the DSS model having changed since the DSS model was first created and when this plan was written. Even though the initial conditions for the ABAG and DSS are different as compared to the Census 2000, a comparison of the three projections shows that the growth rate is identical to each other.

Figure 2.2-2: Estimated Population Comparison



Similarly the housing count was estimated by comparing the US Census 2000, the San Mateo County / ABAG "Projection 2002", and the service counts for the Bear Gulch District, Figure 2.2-3. The US Census 2000 housing units estimate is based on summarizing the individual census blocks enclosed within the service area of the district. The ABAG housing projection shows greater housing units since the city boundaries are outside of the service area of the District. The service counts are the recorded and projected service connections (service meters) to which the district provided water service. The values are lower then the US Census because the Census totals all of the housing units (single and multifamily residences), whereas the district service meter counts may have one meter that serves several housing units, such as duplexes or apartments. As with the population estimate discussed previously, the growth rates for the two projections are consistent with each other.

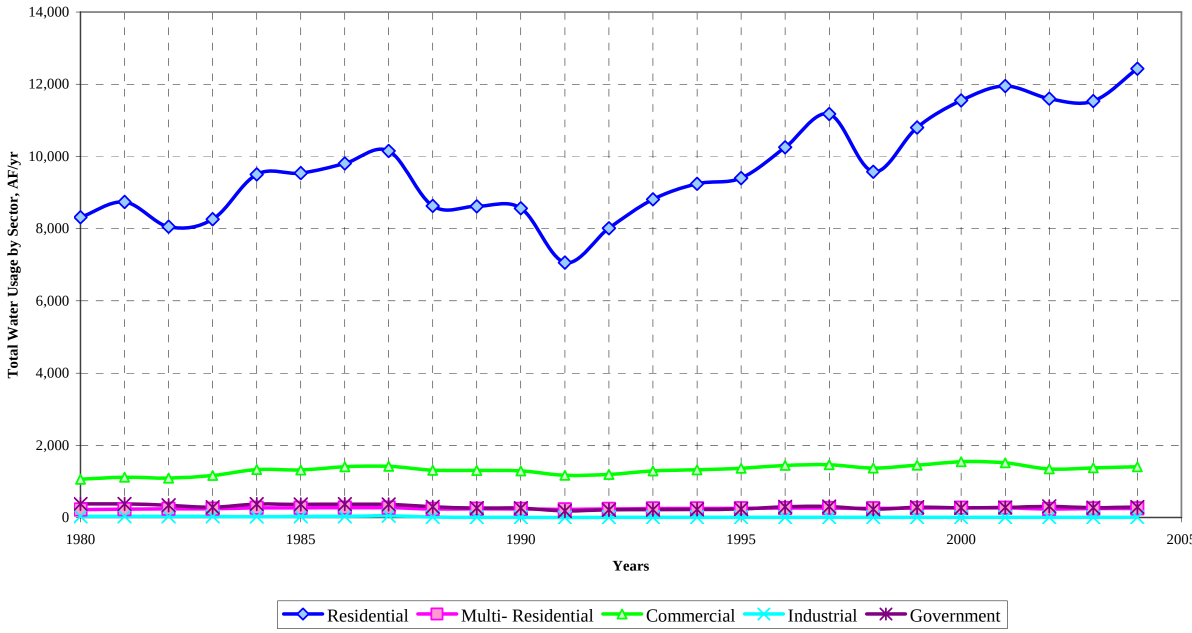
Figure 2.2-3: Estimated Housing Comparison



2.2.1 Other Demographic Factors

The demographic makeup of the district is mostly single family residential as shown in Figure 2.2-4. The single family residential sector has remained at a fairly constant growth. The remaining sectors, multifamily residential, commercial, industrial, and governmental make up a small percentage of the district and have remained constant for some time. Additional discussion is provided in Section 5.

Figure 2.2-4: Water Usage by Sector



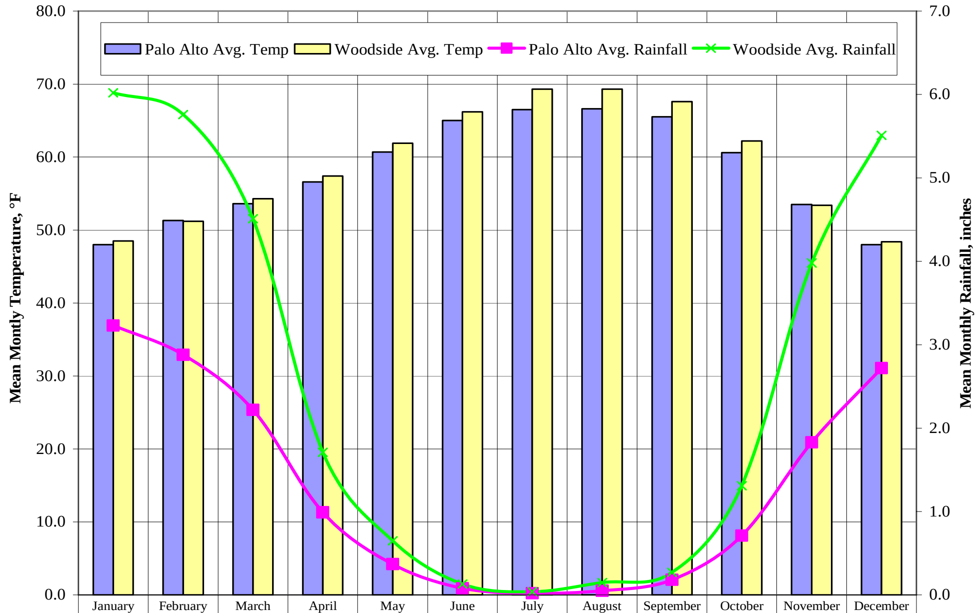
2.3 Climate

The following table lists the average annual conditions for the best locations representing the Bear Gulch District. The Woodside station is located in upper elevations of the representative of the western part of the district, while the Palo Alto weather station is closer to sea level which is representative of the eastern part of the district. Additional climate data is provided in Appendix C, worksheet 18.

Table 2.3-1: Climate (Table 3)					
	Standard Average ETo	Woodside		Palo Alto	
		Average Temperature	Average Rainfall	Average Temperature	Average Rainfall
Annual	46.31	59.1	30.03	58.0	15.28

Figure 2.3-1 displays the average monthly temperature and rainfall (Ref. 3). The graph illustrates the cool, modestly wet, winters and warm dry summers.

Figure 2.3-1: Average Monthly Temperature and Rainfall (Table 3)

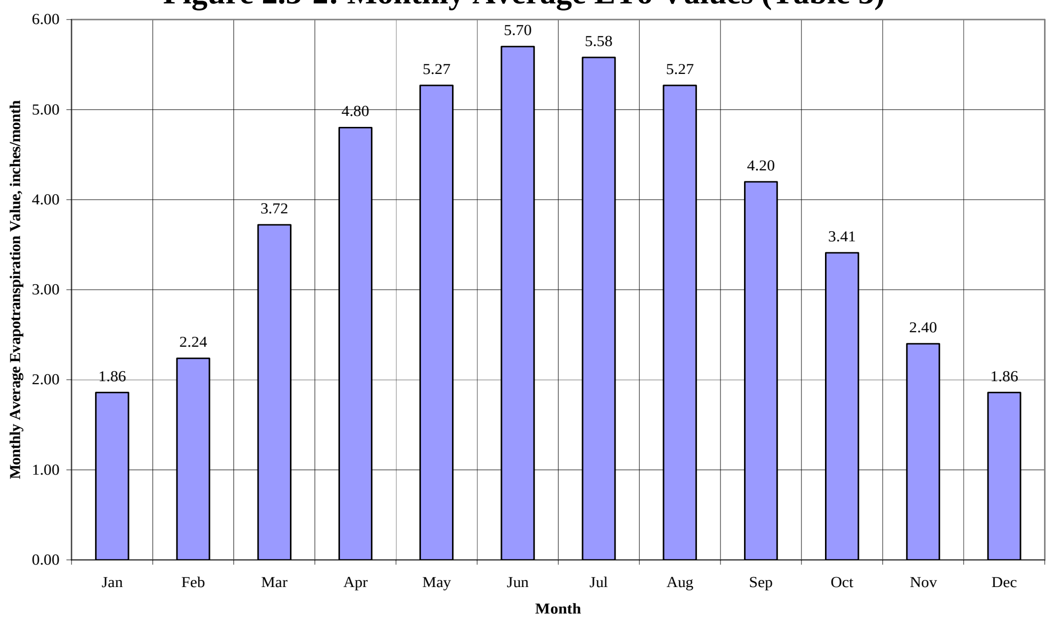


	January	February	March	April	May	June	July	August	September	October	November	December
Palo Alto Avg. Temp	48.0	51.3	53.6	56.6	60.7	65.0	66.5	66.6	65.5	60.6	53.5	48.0
Woodside Avg. Temp	48.5	51.2	54.3	57.4	61.9	66.2	69.3	69.3	67.6	62.2	53.4	48.4
Palo Alto Avg. Rainfall	3.2	2.9	2.2	1.0	0.4	0.1	0.0	0.1	0.2	0.7	1.8	2.7
Woodside Avg. Rainfall	6.02	5.76	4.51	1.71	0.65	0.13	0.04	0.15	0.27	1.31	3.98	5.51

Figure 2.3-2 displays the monthly average evapotranspiration values for the area of the district (Ref. 4). Evapotranspiration values estimate the amount of water loss by the combination of two separate processes: evaporation from soil surface and transpiration by plants.

Additional climate data is provided in Appendix C, worksheet 18.

Figure 2.3-2: Monthly Average ETo Values (Table 3)



3 Water Sources

The water furnished to customers in the Bear Gulch District is a combination of purchased water and treated surface water. The projected water supply source and volume is summarized in Table 3-1.

Table 3-1: Planned Water Supplies (Table 4) (AFY)

Water Supply Sources	2005	2010	2015	2020	2025	2030
San Francisco Public Utilities Commission	13,051	12,519	12,560	12,901	12,981	13,174
Supplier produced groundwater	0	0	0	0	0	0
Supplier surface diversions	1,534	1,534	1,534	1,534	1,534	1,534
Transfers in or out	0	0	0	0	0	0
Exchanges In or out	0	0	0	0	0	0
Recycled Water (projected use)	0	0	0	0	0	0
Desalination	0	0	0	0	0	0
Total	**14,585**	**14,053**	**14,094**	**14,435**	**14,515**	**14,708**

3.1 Imported Water

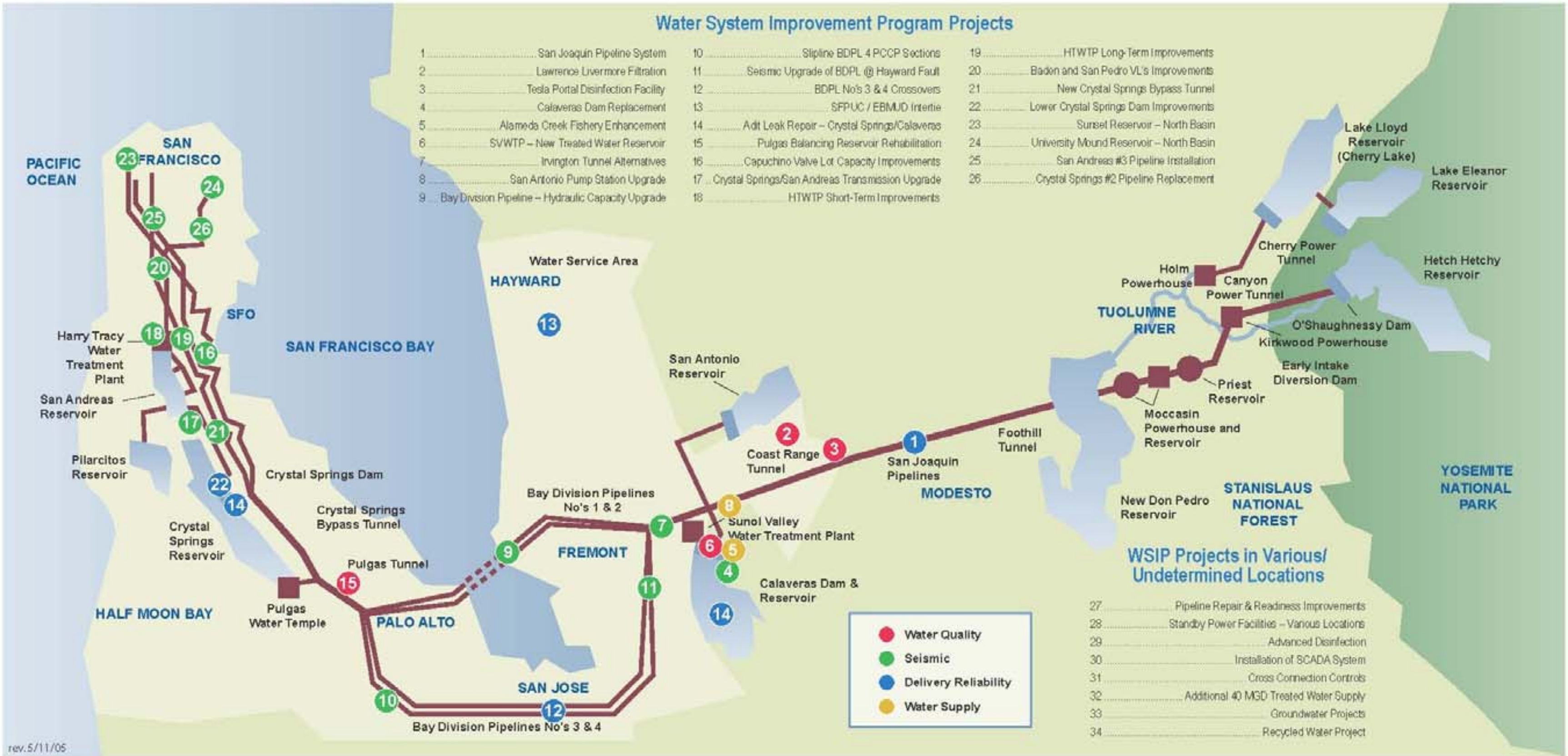
California Water Service Company receives water from the City and County of San Francisco's regional system, operated by the San Francisco Public Utilities Commission (SFPUC), Figure 3.1-1. This supply is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watersheds and facilities in Alameda and San Mateo Counties. The 2005 Urban Water Management Plan for SFPUC has been provided in Appendix H

The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to firm-up its water supplies.

The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from Hetch Hetchy. In practice, the local watershed facilities are operated to capture local runoff. The local reservoirs include: Crystal Springs Reservoirs, San Andreas Reservoir, Pilarcitos Reservoir, Calaveras Reservoir, and San Antonio Reservoir.

The Raker Act, which authorized the Hetch Hetchy project, prevents a privately owned utility from receiving water from the Hetch Hetchy system, but allows local sources to be purchased. In addition, the California Water Service Company is subject to the Supplemental Agreement and Master Sales Contract, see Section 3.5.1

Figure 3.1-1: SFPUC Water System Improvement Program (WSIP) Projects



The water purchased is treated by SFPUC prior to delivery to California Water Service Company. The district takes delivery from SFPUC from seven metered connections with four SFPUC transmission lines.

Additional description of the Water Supply Improvement Program and the associated Program Environmental Impact Reports is discussed further in the following sections of this report.

Water Supply Improvement Program (WSIP)

In order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply, the SFPUC is undertaking a Water System Improvement Program (WSIP). The WSIP will deliver capital improvements aimed at enhancing the SFPUC's ability to meet its water service mission of providing high quality water to its customers in a reliable, affordable and environmentally sustainable manner.

The origins of the WSIP are rooted in the "Water Supply Master Plan" (April 2000). Planning efforts for the WSIP gained momentum in 2002 with the passage of San Francisco ballot measures Propositions A and E, which approved the financing for the water system improvements. Also in 2002, Governor Davis approved Assembly Bill No. 1823, the Wholesale Regional Water System Security and Reliability Act. The WSIP is expected to be completed in 2016.

Figure 3.1-1, shown above, indicates the locations of the various capital improvement projects which comprise the WSIP.

Program Environmental Impact Report (PEIR)

A Program Environmental Impact Report (PEIR) is being prepared under the California Environmental Quality Act (CEQA) for the Water Supply Improvement Program. A PEIR is a special kind of Environmental Impact Report under CEQA that is prepared for an agency program or series of actions that can be characterized as one large project. PEIRs generally analyze broad environmental effects of the program with the acknowledgment that site-specific environmental review may be required at a later date.

Projects included in the WSIP will undergo individual project specific environmental review as required. Under CEQA, project specific environmental review would result in preparation of a Categorical Exemption, Negative Declaration or Environmental Impact Report. Each project will also be reviewed for compliance with the National Environmental Policy Act and local, state and federal permitting requirements as necessary.

3.2 Surface water

Surface water supplies 10 percent of the district's water requirement and is collected from the Bear Gulch Creek via two diversion facilities and stored in Bear Gulch Reservoir prior to use. This surface water is treated at the outlet of the Bear Gulch Reservoir prior to entry into the distribution system. Diversions are limited in time and quantity of use by the California Water Resource Control Board through a license on the lower Station 3 diversion (Application A006753, License 005441) and a permit on the upper diversion (Application A014313, Permit 008816). The surface water flows from the watershed that lies in the western portion of the district.

The upper diversion is the Woodside Diversion Dam located on Bear Gulch Creek on the western edge of the service boundary. This facility captures and diverts a portion of the surface runoff generated from the 1,500 plus acre watershed of which the Company owns 1,305.9 acres. From the dam, the captured surface runoff flows by gravity through a 16" transmission main to the Bear Gulch Reservoir.

Lower Bear Gulch Creek Diversion Dam is located 2.5 miles downstream from the Woodside Dam. The surface water is pumped from a clearwell behind the dam by two booster pumps at Station 3 into the 16" transmission main and then flows to the Reservoir by gravity.

The surface water is treated at the Company's treatment facility located adjacent to the Bear Gulch Reservoir. The water is clarified, filtered, and chloraminated in compliance with the Surface Water Treatment Rule and the Safe Drinking Water Act, and then pumped into the distribution system. The treatment plant, which was placed into operation in 1977, has a rated capacity of six million gallons per day. The annual production from the reservoir ranges from a high of 2,812 AF (916 MG) to a low of 319 AF (103 MG) per year.

3.3 Groundwater

California Water Service Company does not have any groundwater wells to supply water for Bear Gulch District.

The district is situated on the following basin:
- San Francisco Bay Hydrologic Region
- Santa Clara Valley Basin
- San Mateo Sub-basin
- Groundwater Basin Number: 2-9.03

3.3.1 Basin Boundaries and Hydrology

The San Mateo sub-basin occupies a structural trough, sub-parallel to the northwest trending Coast Ranges, at the southwest end of San Francisco Bay. San Francisco Bay constitutes its eastern boundary. The Santa Cruz Mountains form the western margin of the San Mateo basin. The Westside basin bounds it on the north and its southern limit is defined by San Francisquito Creek. The basin is composed of alluvial fan deposits formed by tributaries to San Francisco Bay that drain the basin (Ref. 5).

A detailed description of the basin is given in the California's Ground Water Bulletin 118, see Appendix D.

3.4 Recycled Water

Wastewater from Bear Gulch's service area communities is treated at the South Bayside System Authority (SBSA) Treatment Plant. The SBSA Treatment Plant treats wastewater flows generated from the San Carlos, Belmont, Redwood City, Atherton, Menlo Park, East Palo Alto, Woodside, and numerous unincorporated areas in San Mateo County. Municipal wastewater is generated in the SBSA service area by residential and commercial sources.

3.4.1 Wastewater Collection

Atherton, Menlo Park, Portola Valley, Woodside, and portions of Redwood City own and operate their collection systems and the wastewater flows are treated at the SBSA Treatment Plant. The SBSA owns and operates the regional sewer interceptor lines and the associated pump stations. The wastewater from other areas is also treated at the SBSA Treatment Plant in Redwood City.

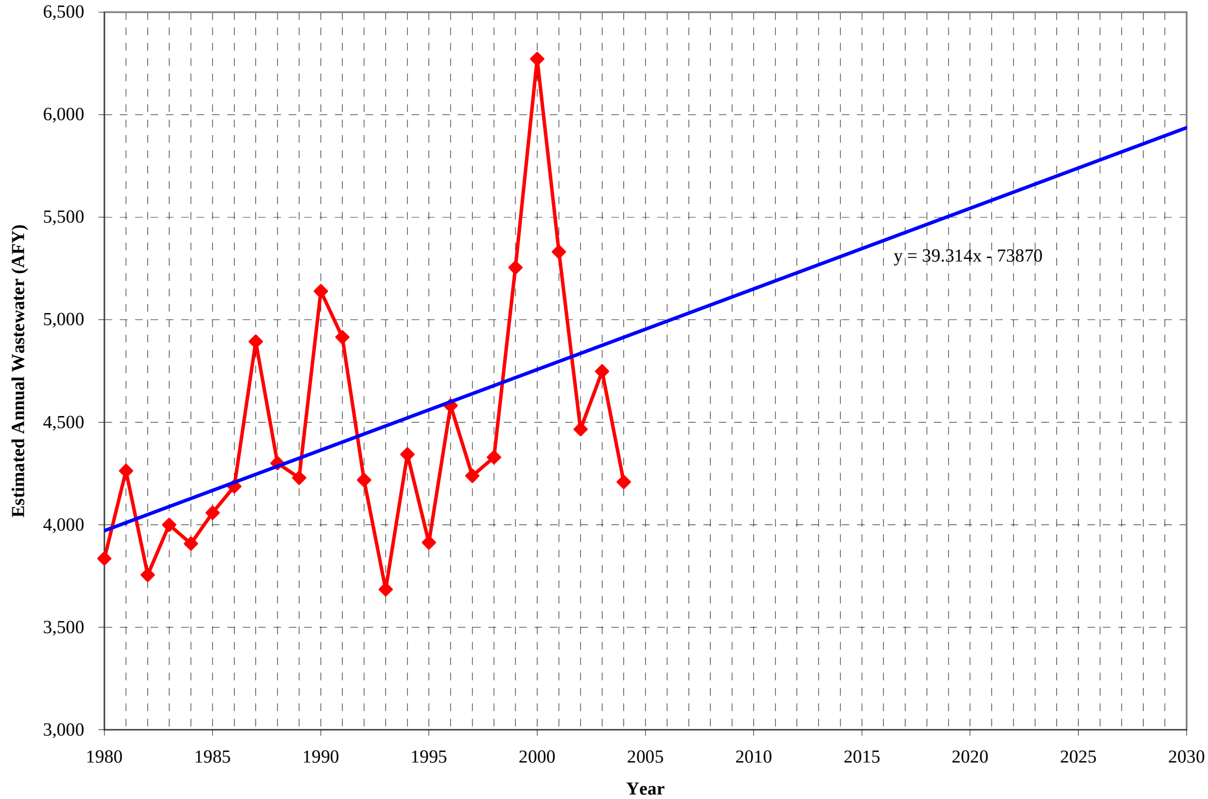
3.4.2 Estimated Wastewater Generated

The quantity of wastewater generated is proportional to the population and the water use in the service area. An estimate was obtained by annualizing 90% of the January water use for single and multifamily residences. A linear equation was then used to project to the year 2030. Estimates of the wastewater flows for the future conditions in Cal Water's Bear Gulch service area are presented in Table 3.4-1. Figure 3.4-1 presents the linear projection along with the individual yearly data from 1980 to the present.

Table 3.4-1: Disposal of Wastewater (non-recycled) AF Year (Table 34)

Method of disposal	Treatment Level	2005	2010	2015	2020	2025	2030
Deep-water outfall to San Francisco Bay	Primary, secondary (activated sludge), dual media filtration, disinfection, and de-chlorination	4,960	5,160	5,350	5,550	5,750	5,940
	Total	4,960	5,160	5,350	5,550	5,750	5,940

Figure 3.4-1: Estimated District Annual Wastewater Generated



3.4.3 Wastewater Treatment and Recycling

The SBSA Plant provides the wastewater service for the communities of San Carlos, Belmont, Redwood City, Atherton, Menlo Park, East Palo Alto, Woodside, portions of San Mateo, and numerous unincorporated areas in San Mateo County. The wastewater at the SBSA Plant undergoes a primary, secondary (activated sludge), dual media filtration, disinfection, and de-chlorination treatment before being discharged to the deep-water outfall in the San Francisco Bay.

The SBSA Plant has a capacity to treat 33,000 AF/Y (29.5 mgd) but currently receives 22,400 AFY (20 mgd) from residential and commercial customers in the SBSA service area. SBSA is currently providing reclaimed water to sites located in and owned by the City of Redwood City. The reclaimed water is conveyed through piping that was installed in the mid-1980s in anticipation of the ultimate implementation of a water recycling program in the area. Currently, nine landscaped sites are irrigated with 26.5 acre-feet per year of reclaimed water. The recycled water is not distributed in the Cal Water service area.

3.4.4 Potential Water Recycling in District

It is anticipated that new reclaimed water customers will be acquired for the SBSA Plant in the near future due to the First Step Recycled Water Program 2000 (Ref. 6). After two years of the First Step Recycled Water Program, a recycled water feasibility study will be done to determine if, when, and how the Redwood City infrastructure system may be expanded to distribute recycled water. SBSA has designated Portola Valley and other neighboring areas as potential future service areas. The projected recycled water demands in the SBSA service area will not be determined until the First Step Recycled Water Program has been evaluated in a recycled water feasibility study. Under current conditions, the projected recycled water supply for Cal Water's Bear Gulch service area in the next 25 years is 0 acre-feet/year, however upon completion of the First Step Program, the recycled water supply will be reevaluated and the potential supply may change. Recycled water incentive programs have not been provided by Cal Water because Cal Water does not own or operate the reclaimed water system. The First Step Program may establish incentives as it moves forward.

3.5 Water Supply Reliability

Figure 3.5-1 shows the annual rainfall compared to historical average. The average annual rainfall for the district is 26.7 inches for Woodside, and 14.5 inches for Palo Alto. The most recent driest year occurred in 2003 when the combined rainfall for the two stations was 45% below average (11.8 inches). This is taken as the Single Dry Year. The Multiple Dry-Water Years based on the most recent and consecutive lowest annual rainfall totals which occurred from 1988 to 1990. This period coincides with the drought conditions that California experienced during 1987-1992.

The water supply for the Bear Gulch District has been reliable during low rainfall periods. Table 3.5-1 shows that during single dry year periods, the demand has remained the same, and during multi-dry years, the demand has reduced by 20%

The base year for the water-year is shown in Table 3.5-2.

Figure 3.5-1: Comparison of Annual Rainfall to Historical Average

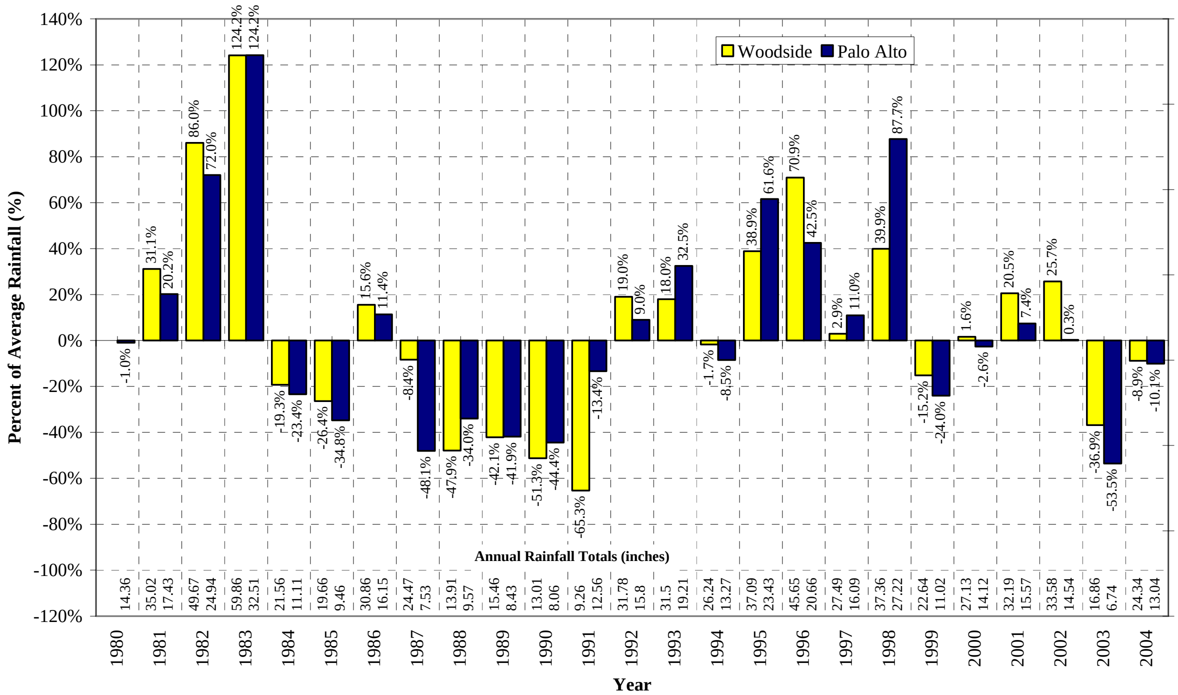


Table 3.5-1: Supply Reliability (Table 8) AF Year				
Average / Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
		Year 1	Year 2	Year 3
14,149	13,826	10,979	11,241	11,048
% of Normal	97.7%	77.6%	79.4%	78.1%

Table 3.5-2: Basis of Water Year Data (Table 9)	
Water Year Type	**Base Year**
Average Water Year	2000
Single-Dry Water Year	2003
Multiple-Dry Water Years	1988, 1989, 1990

Although the historical record shows that the demand can be met by the supply, several factors posed against a reliable source is listed in Table 3.5-3.

Table 3.5-3: Factors Resulting In Inconsistency of Supply (Table 10)				
Name of supply	**Legal**	**Environmental**	**Water Quality**	**Climatic**
San Francisco Public Utilities Commission	✓			
Bear Gulch Reservoir	✓	✓	✓	✓

3.5.1 Purchased Water

California Water Service Company serves two additional districts in the San Francisco peninsula (South San Francisco, and Mid-Peninsula), in addition to serving the Bear Gulch District, The three districts rely on the San Francisco Public Utility Commission (SFPUC) as the main water source.

Previously, California Water Service Company had a contractual agreement with the SFPUC to purchase up to 47,400 AFY (42.32 mgd) of water per year for all three peninsula districts. This amount was set based on the SFPUC's locally generated supply, since the Raker Act, which authorized the construction of the Hetch-Hetchy Project, excludes investor-owned utilities, like Cal Water, from purchasing water produced by the Hetch-Hetchy Project. In 1984, California Water Service Company, along with 29 other Bay Area water suppliers, signed a "Settlement Agreement and Master Water Sales Contract (Master Contract)" with San Francisco, supplemented by an individual Water Supply Contract.

These contracts provide for a 206,106 AFY (184 mgd annual average basis), Supply Assurance to the SFPUC's wholesale customers collectively. This allocation was reached through negotiation in the early 1990s between the SFPUC and Bay Area Water Users Association (BAWUA), the predecessor organization BAWSCA. California Water Service Company's individual Supply Assurance Allocation (SAA) for the three districts is 39,642 AFY (35.39 mgd). The supply from SFPUC is expected to be adequate and reliable through at least the expiration of the 25-year contract in 2009. Additionally, the acquisition of the Los Trancos County Water District in July 2005 will allow the transfer of its SAA to California Water Service Company. Los Transos SAA is 123.22 AFY (0.11 MGD), which makes California Water Service Company's total Supply Assurance Allocation (SAA) for the three districts equal to 39,765 AFY (35.5 MGD).

Although the Master Contract, and accompanying Water Supply Contract, expires in 2009, the Supply Assurance (which quantified San Francisco's obligation to supply water to its individual wholesale customers) survives their expiration and continues indefinitely. The Master Contract provides for the SAA to the SFPUC's wholesale customers subject to reduction in the event of drought, water shortage, earthquake, other acts of God, or rehabilitation and maintenance of the system. The Master Contract does not guarantee that San Francisco will meet peak daily or hourly customer demands when their annual usage exceeds the Supply Assurance. The SFPUC's wholesale customers have agreed to the allocation of the 184 mgd Supply Assurance among each agency, with each entity's share of the Supply Assurance set forth on a schedule adopted in 1993.

The SFPUC can meet the water demands of its retail and wholesale customers in wet and normal years, however; the Master Contract allows the SFPUC to reduce water deliveries during droughts, emergencies, and for scheduled maintenance activities. The Interim Water Shortage Allocation Plan (IWSAP) between the SFPUC and its wholesale customers adopted in 2000 provides that the SFPUC determines the available water supply in drought years for shortages of up to 20% on an average, system-wide basis. This plan is described in more detail in Section 4.2.

SFPUC in cooperation with the members of the Bay Area Water Supply and Conservation Agency (BAWSCA) is preparing a Water Supply and Facilities Master Plan for the service area. As a BAWSCA member, California Water Service Company has provided 2030 demand projections and evaluated potential alternative local water supplies.

For the last two years Cal Water worked with the SFPUC and BAWSCA in the development of SFPUC's Capital Improvement Plan. This effort has included development of demand projections and throughout this development, California Water Service Company has concurred to various calculations produced with the model. These concurrences cover projected service area population, customer water demand, conservation program levels and a best estimate of purchases from the SFPUC. The values concurred are consistent with and are within the range of values contained in this Plan. Copies of these concurrence statements and the associated values are included in this Plan in Appendix K.

The water demand projections were developed as part of a series of technical studies performed in support of the Capital Improvement Program for the SFPUC Regional Water System: SFPUC Wholesale Customer Water Demand Projections (URS 2004); SFPUC Wholesale Customer Water Conservation Potential (URS 2004); SFPUC Wholesale Customer Recycled Water Potential (RMC 2004); and SFPUC 2030 Purchase Estimates (URS 2004).

Water demand projections for the wholesale were developed using an "End Use" model. Two main steps are involved in developing an End Use model: (1) Establishing base year water demand at the end-use level (such as toilets, showers) and calibrating the model to initial conditions; and (2) Forecasting future water demand based on future demands of existing water service accounts and future growth in the number of water service accounts.

Establishing the base-year water demand at the end-use level is accomplished by breaking down total historical water use for each type of water service account (single family, multifamily, commercial, irrigation, etc.) to specific end uses (such as toilets, faucets, showers, and irrigation).

Forecasting future water demand is accomplished by determining the growth in the number of water service accounts in a wholesale customer service area. Once these rates of change were determined, they were input into the model and applied to those accounts and their end water uses. The DSS model also incorporates the effects of the plumbing and appliance codes on fixtures and appliances including toilets (1.6 gal/flush), showerheads (2.5 gal/minute), and washing machines (lower water use) on existing and future accounts.

3.5.2 Surface Water

The Bear Gulch Reservoir relies on rainfall and surface runoff as its water supply. During dry periods, the reservoir will not replenish, thus the district will be required to purchase additional water from SFPUC. As previously mentioned, California Water Service Company diverts surface water from two locations on Bear Creek. The first of these points is a dam called the Upper Diversion from which water is gravity fed to the reservoir. The second is a pump station (Station 3) downstream. Bear Creek is a critical habitat for Steelhead which are listed as threatened under the Federal Endangered Species Act.

California Water Service Company has been working with the California Department of Fish and Game (CDFG) and the National Oceanic & Atmospheric Association's National Marine Fisheries Service (NOAA Fisheries) to resolve concerns with both diversion facilities. These concerns include bypass flow requirements, screening of inlets, and fish passage issues. California Water Service Company's goal is to reach an agreement with CDFG and NOAA Fisheries that will be mutually agreeable. Solutions may include capital improvements at both sites and operational changes. Depending on the terms of the final negotiated agreement, California Water Service Company may be required to release additional flows at either or both of the diversion points. This could result in a reduction in the use of local surface supplies.

3.5.3 Water Quality

Water delivered to customers in the Bear Gulch District meets all federal and state drinking water regulations. The U.S. Environmental Protection Agency (EPA) under the authorization of the Federal Safe Drinking Water Act of 1974 sets drinking water standards. The California Department of Health Services (DHS), which can either adopt the USEPA standard or establish state standards that are more stringent, enforces the EPA mandated drinking water regulations.

There are two types of drinking water standards: Primary and Secondary. Primary standards are designed to protect public health by establishing Maximum Contamination Levels (MCLs) for substances in water that are determined to be harmful to human health. MCLs are established conservatively for each contaminant based on health effects that may occur if a person were to drink two liters of the water per day for 70 years. Secondary standards are based on the aesthetic qualities of the water, such as taste, odor, color, and mineral content. These standards, established by the State of California, specify limits for substances that may affect the aesthetics and consumer acceptance of the water.

Aluminum is the only outstanding issue cited by the DHS. Aluminum is a byproduct of the treatment process at the Bear Gulch Reservoir (see Section 3.2). California Water Service Company monitors for aluminum compliance on a monthly basis.

Cryptosporidium is a concern in surface water supplies. Currently, California Water Service Company relies on a Concentration x Time (CT) method to determine the effective removal of the cryptosporidium. As a precautionary measure to assure effective removal, Cal Water is planning to add an Ultra Violet (UV) disinfection treatment. The UV disinfection is expected to be operational in October 2005.

4 Water Shortage Contingency Plan

California Water Service Company has and currently meets the demand for the Bear Gulch District. However, the sources for the district may be limited due to climate changes in addition to unforeseen failures or forces of nature, such as earthquakes or regional power failures. During such events, significant shortages in water supply may occur. As such, a contingency plan for significant shortages is described in the following section.

4.1 Stages of Action

California Water Service Company has developed a four-stage rationing plan. The plan includes voluntary and mandatory stages. Approval from the CPUC must be obtained prior to implementation of mandatory restrictions, section 4.1.2.

Table 4.1-1: Consumption Reduction Methods (Table 27)

Consumption Reduction Methods	Stage When Method Takes Effect	Projected Reduction (%)
Voluntary	1	10
Voluntary or Mandatory	2	20
Mandatory	3	35
Mandatory	4	50

4.1.1 Actions to Be Undertaken By California Water Service Company

The following outline lists the actions to be taken during periods when a reduction in consumption is required:

Stage 1

- California Water Service Company maintains an ongoing public information campaign consisting of distribution of literature, speaking engagements, monthly bill inserts, and conservation messages printed in local newspapers.
- Educational programs in area schools are also ongoing.

Stage 2

- California Water Service Company will aggressively continue its public information and education programs.
- Ask consumers for 10 to 20 percent voluntary or mandatory water use reductions.
- Prior to implementation of mandatory reductions, obtain approval from CPUC.
- Lobby for passage of drought ordinances by appropriate governmental agencies.

Stage 3

- Implement mandatory reductions after receiving approval from CPUC.
- Maintain rigorous public information campaign explaining water shortage conditions.

- Water use restrictions go into effect; prohibited uses can include watering resulting in gutter flooding, using a hose without shutoff device, filling of pools or fountains, etc.
- Limiting landscape irrigation by restricting the hours of the day and or days of the week during which water for irrigation can be used.
- Monitor production weekly for compliance with necessary reductions.
- Installation of a flow restrictor on the service line of customers who consistently violate water use restrictions.

Stage 4

- All of steps taken in prior stages intensified.
- Discontinuance of water service to customers who consistently violate water use restrictions.
- Monitor production daily for compliance with necessary reductions.
- More restrictive conditions for, or a prohibition of, landscape irrigation.

4.1.2 Mandatory Prohibitions

Due to California Water Service Company's investor-owned status, it is not authorized to pass any ordinances. However, conservation ordinances have been implemented by municipalities at the urging of California Water Service Company (see Appendix F). California Water Service Company's Bear Gulch District participates with 29 other member agencies in the Bay Area Water Supply and Conservation Agency. The Agency coordinates school education and public information programs, as well as other water management activities.

Should conditions warrant mandatory reductions, California Water Service Company will request authority to add Tariff Rule 14.1, Mandatory Water Conservation Plan (see Appendix E), to existing tariffs for a district. Included in Rule 14.1 is Section A. Conservation - Nonessential or Unauthorized Water Use which prohibits use of water for filling or refilling of swimming pools, use of water that results in flooding or runoff in gutters, etc.

4.1.3 Consumption Limits

California Water Service Company maintains extensive water use records on individual metered customer accounts. These records are reviewed in the districts on a daily basis to identify potential water loss problems.

4.1.4 Monitoring Procedure during Periods of Water Shortages

The following procedures will take place during all stages of water shortages:

- Daily production figures are reported to and monitored by the district managers on a daily basis.
- Allocation for each customer is the percentage of the quantity of water used by such customer during the comparable billing periods during the historical base period (usually a non-drought year). Customer classes may have differing allocations. Percentage reductions may vary seasonally.

- Each customer will be notified of their allotment for the succeeding three months in their monthly bill. Any customer may appeal their allocation on the basis of use or incorrect calculation. Appeals shall be processed in the district on a case by case basis.
- No customer will receive a monthly allocation of less than 6 CCF (hundred cubic feet) and no dwelling unit will receive a monthly allocation of less than 4 CCF.

4.1.5 Penalties or Charges for Excessive Use

For all customers, an excess use penalty per CCF of water used in excess of the applicable allocation during each billing period shall be charged. A distinction may be made between residential and non-residential penalties. California Water Service Company, after one written warning, shall install a flow-restricting device on the service line of any customer observed by Cal Water personnel to be using water for any non-essential or unauthorized use defined in Section A of Tariff Rule 14.1 (see Appendix E).

Table 4.1-2: Penalties and Charges (Table 28)

Penalties or Charges	Stage When Penalty Takes Effect
Written warning	1
Flow-restricting device	3
Discontinuance of water service	4

4.1.6 Analysis of Revenue and Expenditure Impacts

California Water Service Company is an investor-owned water utility and, as such, is regulated by the CPUC. On March 8, 1989, the Commission instituted an investigation to determine what actions should be taken to mitigate the effects of water shortages on the State's regulated utilities and their customers. In decision D. 90-07-067, effective July 18, 1990, the Commission authorized all utilities to establish memorandum accounts to track expenses and revenue shortfalls caused both by mandatory rationing and by voluntary conservation efforts. Subsequently, D. 90-08-55 required each class A utility (more than 10,000 connections) seeking to recover revenues from a drought memorandum account to submit for Commission approval, a water management program that addresses long-term strategies for reducing water consumption. Utilities with approved water management programs were authorized to implement a surcharge to recover revenue shortfalls recorded in their drought memorandum accounts.

However, the Commission's Decision 94-02-043 dated February 16, 1994, states:

> *10. Now that the drought is over, there is no need to track losses in sales due to residual conservation.*
> *11. The procedures governing voluntary conservation memorandum accounts (see D.92-09-084) developed in this Drought Investigation will no longer be available to water companies as of the date of this order.*
> *12. Procedures and remedies developed in the Drought Investigation that are not specifically authorized for use in the event of future drought in these Ordering Paragraphs will no longer be available to water*

companies as of the date of this order except upon filing and approval of a formal application.
(CPUC Decision 94-02-043, Findings of Fact, paragraphs 10-12)

It was at this time that Cal Water significantly curtailed conservation activities in its districts. At the time that triggers for voluntary or mandatory reductions should occur in the future, Cal Water will determine if a filing to the CPUC is necessary to enforce the reductions and to begin tracking lost sales from the required reductions.

4.1.7 Implementing the Plan

Section 357 of the Water Code requires that suppliers that are subject to regulation by the CPUC shall secure its approval before imposing water consumption regulations and restrictions required by water shortage emergencies.

4.1.8 Supply Shortage Triggers

The majority of the Bear Gulch District's water supply is purchased from the SFPUC. Rationing stages will be implemented at the request of SFPUC due to any reduction of supply. Triggers stated herein automatically implement the appropriate stage of Action unless the CPUC adopts findings to implement a less restrictive Stage. Shortages may trigger a change in stage at any time.

4.2 Shortage Allocation Plan

The SFPUC can meet the demands of its retail and wholesale customers in years of average and above-average precipitation. The Master Contract allows the SFPUC to reduce water deliveries to wholesale customers during periods of water shortage. Under the Master Contract, reductions to wholesale customers are to be based on each agency's proportional purchases of water from the SFPUC during the year immediately preceding the onset of shortage, unless this formula is supplanted by a water conservation plan agreed to by all parties.

The Master Contract's default formula discouraged SFPUC's wholesale customers from reducing purchases from SFPUC during periods of normal water supply through demand management programs or development of alternative supplies. To overcome this problem, SFPUC and its wholesale customers adopted an Interim Water Shortage Allocation Plan (IWSAP) in calendar year 2000 (Appendix H). This IWSAP applies to water shortages up to 20% on a system-wide basis and will remain in effect through June 2009.

The IWSAP has two components. The Tier One component of the IWSAP allocates water between San Francisco and the wholesale customer agencies collectively. The IWSAP distributes water between two customer classes based on the level of shortage.

Table 4.2-1: Shortage Allocation Plan		
Level of System Wide Reduction in Water Use Required	Share of Available Water	
	SFPUC Share	Suburban Purchasers Share
5% or less	35.5%	64.5%
6% through 10%	36.0%	64.0%
11% through 15%	37.0%	63.0%
16% through 20%	37.5%	62.5%

The Tier Two component of the IWSAP allocates the collective wholesale customer share among each of the 28 wholesale customers. This allocation is based on a formula that takes three factors into account, the first two of which are fixed: (1) each agency's Supply Assurance from SFPUC, with certain exceptions, and (2) each agency's purchases from SFPUC during the three years preceding adoption of the Plan. The third factor is the agency's rolling average of purchases of water from SFPUC during the three years immediately preceding the onset of shortage.

The IWSAP allows for voluntary transfers of shortage allocations between SFPUC and any wholesale customer and between wholesale customer agencies. Also, water "banked" by a wholesale customer, through reductions in usage greater than required, may also be transferred.

The IWSAP will expire in June 2009 unless extended by San Francisco and the wholesale customers. The projected amount of water which California Water Service Company expects to receive from SFPUC during dry years after 2010 [shown in Table 4.2-2] has been calculated by SFPUC on the assumption that the Plan will in fact be extended.

Table 4.2-2: SFPUC System Wide Cutback						
		Purchase Request Year 2005	One Critical Dry Year	Multi Dry Years		
				Year 1	Year 2	Year 3
System -Wide Shortage in Percent		0%	10%	10%	20%	20%
BAWSCA Allocation	MGD	177.9	157.4	157.4	136.8	136.8
	AFY	199,273	176,310	176,310	153,235	153,235
CalWater	MGD	38.25	31.32	31.32	27.23	27.23
	AFY	42,845	35,083	35,083	30,501	30,501
CalWater Percent Reduction From Normal		0.0%	18.1%	18.1%	28.8%	28.8%

Currently, the IWSAP does not have any provisions for system wide cut backs for greater then 20%. If a severe drought or a catastrophic event should occur, and such cut back is mandatory, SFPUC, BAWSCA, and other water agencies/users would renegotiate the IWSAP and determine the percentage of water that would be allocated to California Water Service Company.

4.3 Three-Year Minimum Water Supply

Table 4.3-1 lists the minimum water supply for the next three years. The normal year is based on the current imported and surface water production values for 2004. For the three years, the 5–year water purchase and production average was chosen as the minimum supply for each source.

Table 4.3-1: Three-Year Estimated Minimum Water Supply (Table 24) AF Year

Source	Normal	Year 1	Year 2	Year 3
SFPUC	14,316	13,100	13,100	13,100
Bear Gulch Reservoir	692	1,128	1,128	1,128
Total	15,008	14,228	14,228	14,228

4.4 Catastrophic Water Supply Interruption

There are currently four emergency connections with neighboring water systems. These connections will help to prevent the complete interruption of service in the event of a failure of water supply facilities by allowing water to be delivered to either system.

There are also several locations where portable boosters can be used between the Menlo Park system and the Cal Water distribution system, as well as several locations where the potential for fire hydrant inter-connections exists. It is anticipated that SFPUC water will be available through the duration of this study. However, in the event of an outage, there will be 10.04 million gallons of distribution system storage to meet a projected high average day demand of 15.2 million gallons.

The water stored in Bear Gulch Reservoir is not potable and should not be included in this calculation of available, usable storage. Its availability as a potable water supply is limited by the actual quantity in storage and the production capability of the filter plant. The plant may be completely out of operation if the event that caused the outage of the SFPUC supplies also resulted in an outage at the treatment plant. The filtration plant is equipped with a system bypass line, which could be activated to provide a source of water for fire flows during an emergency.

Construction of additional emergency storage is desirable. Increased storage would most likely occur as replacements or additions at existing sites. Given that the existing tanks are adequate for normal domestic use, the purpose of these tanks would be for emergency storage, or to enable the Company to take advantage of time-of-use power rates.
In the future, SFPUC may put peaking restrictions on their customers although no plans exist currently. Flow to the upper zones can be controlled by the number of pumps running at some of the intermediate booster stations. If supply is stretched or peaking restrictions are enacted, additional storage will be built so that peak-hour demand may be met from system storage.

Cal Water has implemented emergency preparedness programs to protect facilities in the event of emergencies such as earthquakes, power outages, fires, and large main breaks. Disasters such as the 1989 Loma Prieta earthquake and the 1991 Oakland Hills fire have placed the subject of emergency preparedness high on the list of company and customer concerns.

Mains, tanks, and pump stations are designed to deliver fire flows for normal residential, commercial, and industrial fires. Most storage tanks are designed to provide fire flows for minimum two hour duration. Facilities are not designed to handle wild fires such as the Oakland Hills fire, nor extended power outages such as could be possible after a major forest fire, earthquake, or other disaster.

There are 23 portable boosters and two portable generators available company wide. Two of the portable booster pumps are located in the Bear Gulch District, with a total of nine in the neighboring Cal Water districts; depending on the circumstances, those not in use could be transported to Bear Gulch during an emergency.

All Company field offices, including Bear Gulch, have backup generators for emergency radio, telephone, lights, fuel pumping, and computer control. Base radio transmitters have emergency power backup either by generator power or battery backup.

Cal Water has an Emergency Response Plan in place that coordinates overall company response to a disaster in any or all of its districts. In addition, the Emergency Response Plan requires each district to have a local disaster plan that coordinates emergency responses with other agencies in the area.

4.5 Transfer or Exchange Opportunities

California Water Service Company is not pursuing water transfers or exchanges at this time. However, during water rationing periods, or emergency conditions, California Water Service Company may consider water transfer entitlements and or banked water from neighboring agencies.

5 Water Use Provisions

5.1 Distribution of Services

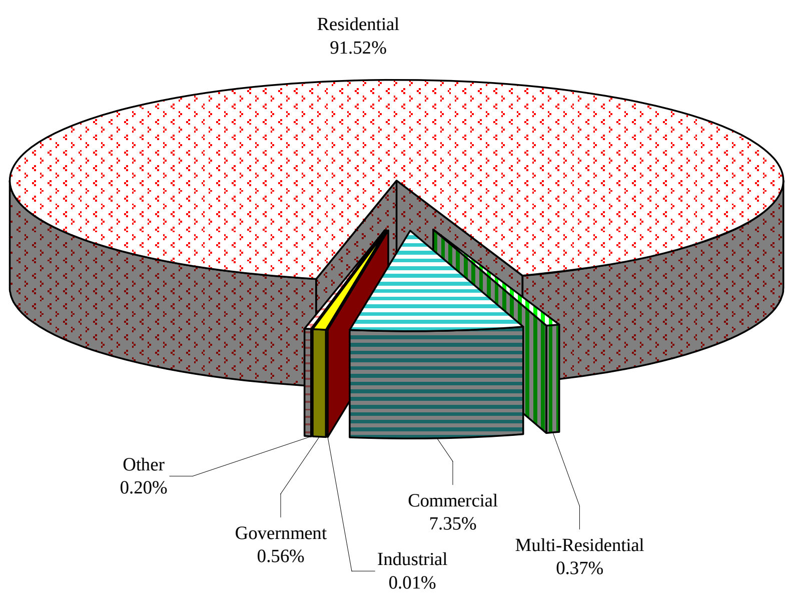
California Water Service Company designates the different customers as follows:

- Single Family Residential
- Multifamily Residential
- Commercial
- Industrial
- Government
- Other

The residential sector of CWS water service customers includes permanent single and multifamily residents. Service for seasonal customers was not considered.

The land within the Bear Gulch District is used predominantly for residential and commercial purposes. Single family residences account for 91.5 percent of all services, multifamily residences represent 0.4 percent, and commercial services 7.3 percent. Thus, 98.8 percent of the services are residential and commercial. The remaining one percent includes industrial, government and other temporary functions such as construction. Further discussion of service counts is provided in section. The distribution of services for the Year 2004 is shown in Figure 5.1-1.

Figure 5.1-1: Distribution of Services (2004)



5.2 Historical and Current Water Demand

Demand per service was established as a function of historical sales and service data. Projected demand is the mathematical product of total projected services and demand per service. Historical sales values are illustrated in Figure 5.2-1. Historical demand values are illustrated in Figure 5.2-2.

With the values shown in the figure stated above, the combined demand per service for all services has been calculated, see Figure 5.2-3. The demand per service has ranged from 230,000 to 280,000 for the past ten years, and tends to vary with changes in the climatic conditions and available supply. Even though drought conditions were present as early as 1984 and 1985, the response and curtailment of water demand did not happen until 1991 after the public was informed of the serious conditions that required the implementation of a 25 percent mandatory rationing program. With the conclusion of the long-term drought conditions, the district has experienced a continual increase in demand toward pre-drought levels. It was expected that demand would remain below pre-drought levels, as a result of implementing physical conservation mechanisms. However, due to the large landscape irrigation use component, limited rainfall in the spring of 1997 and demand in this community, the demand per service in 1997 reached pre-drought levels. More recently, demand reached greater than historical levels in three out of the past five years.

The Company has set the goal of a 10 percent reduction in demand (based on pre-drought response conditions of 1987), and expects to achieve this goal through public education and various conservation programs. This reduction was taken into consideration when computing and describing the range of overall system demand.

Figure 5.2-1: Historical Sales

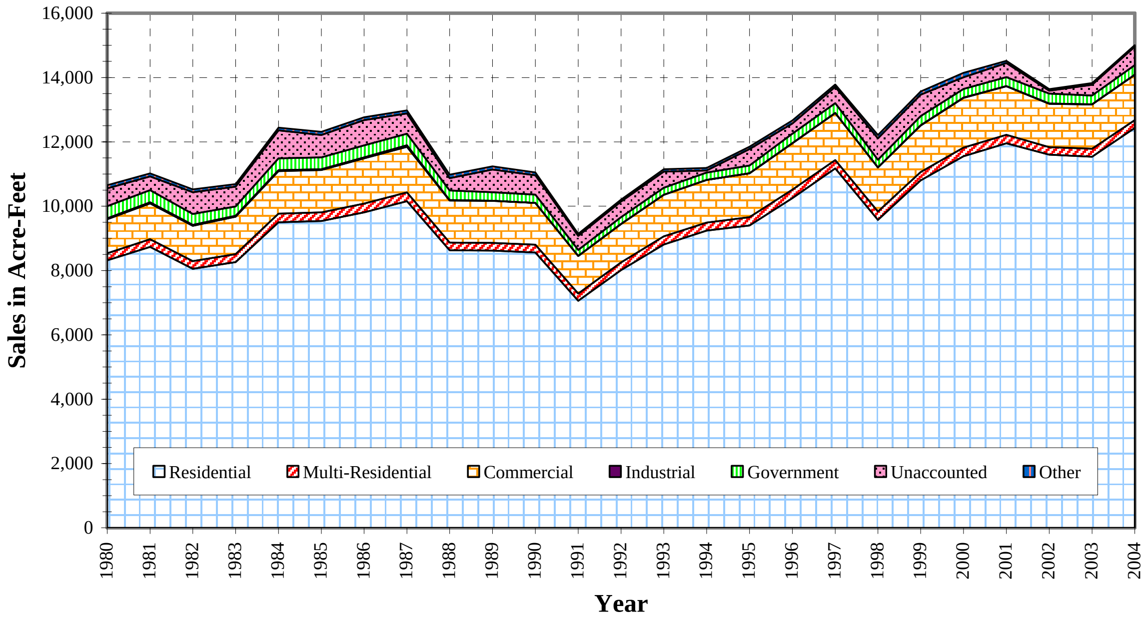


Figure 5.2-2: Historical Service Counts

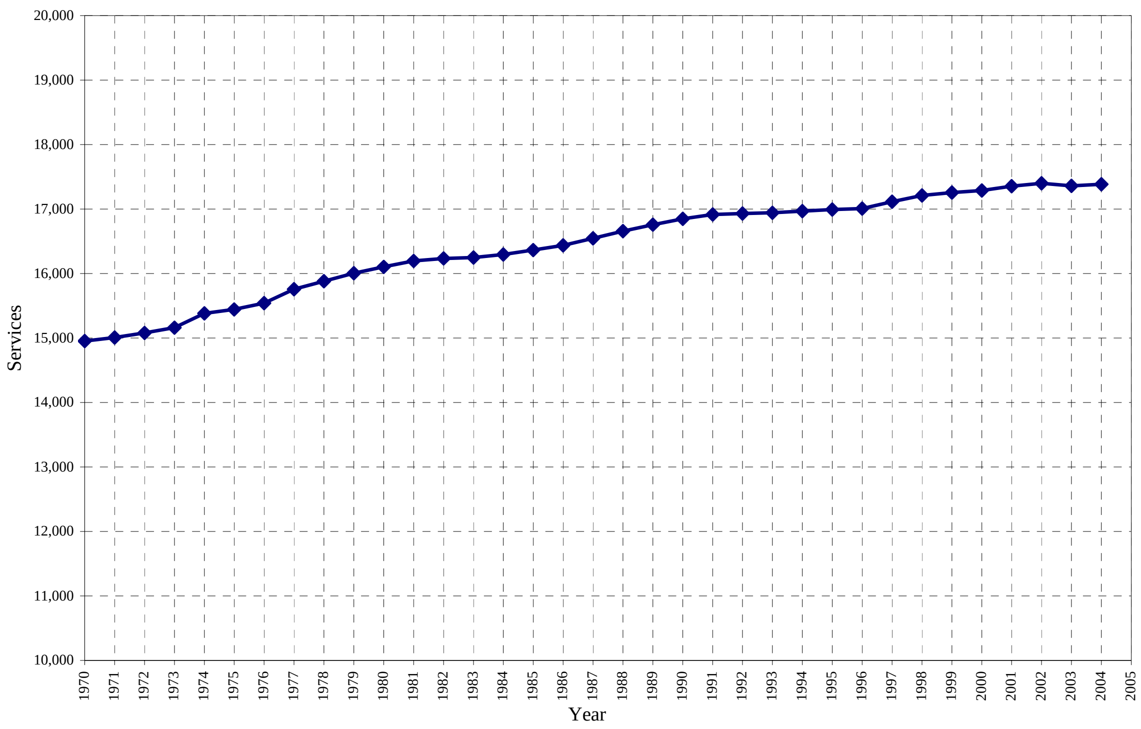
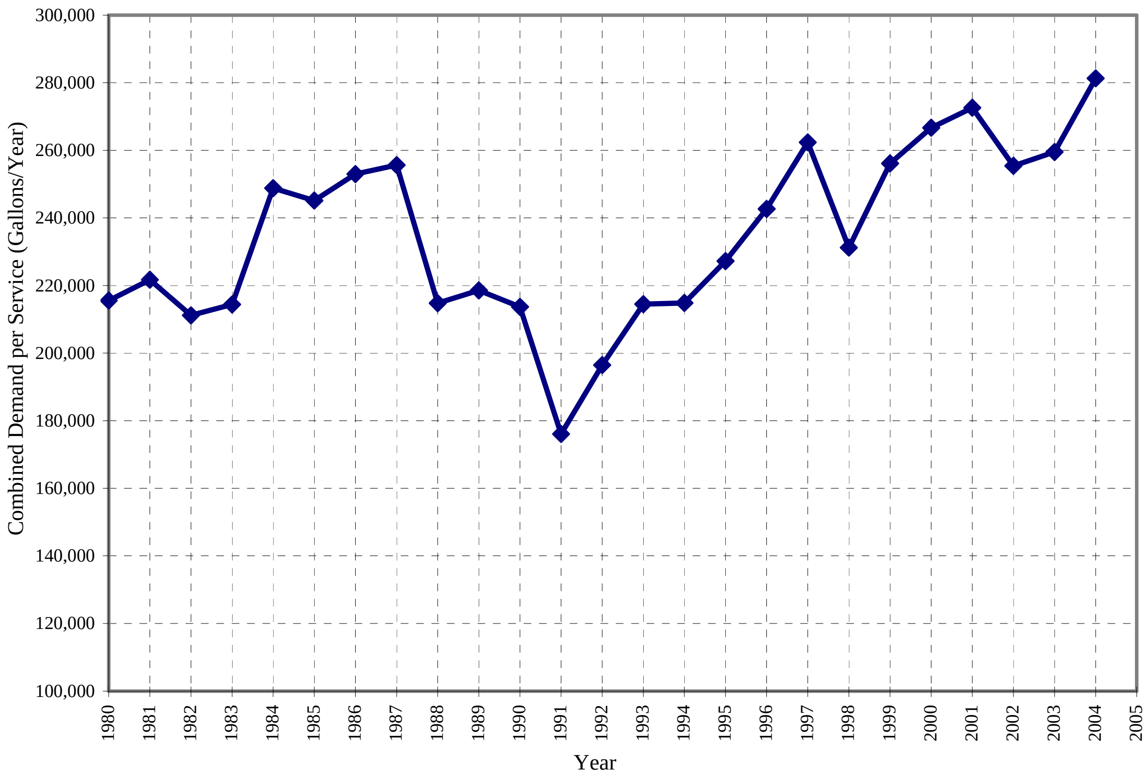


Figure 5.2-3: Historical Demand per Service



5.3 Per Capita Water Demand

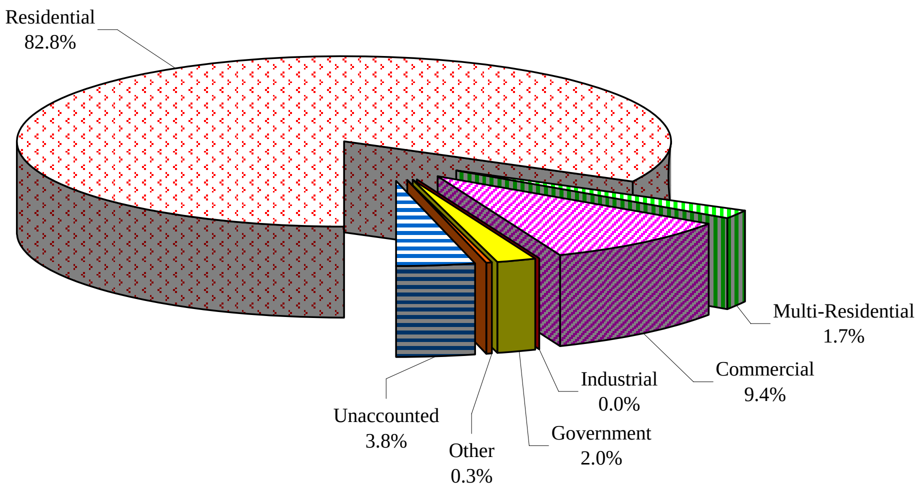
Based on the end of 2004 year total demand, the per-capita water use in the district is summarized in Table 5.3-1. In comparison, the "All Uses" value is above the San Francisco regional average for 1990 of 193 gallons/day, while the "Residential Use" value is above the regional average of 106 gallons/day. These two conditions are a result of the above noted dominance by the residential customer class and by the fact that the residential communities served by the district are affluent with large well-landscaped homes.

Table 5.3-1: Per Capita Water Demand (2004)

Units	All Users	Residential
Million Gallons	4,890	4,131
Estimated Population	55,390	55,390
Gallons/Person in Year	88,290	74,586
Gallons Per Capita Per Day	241.9	204.3
Gallons Per Capita Per Minute	0.168	0.142

Commercial and residential water uses represent the two smallest demand per service segments in the district, yet due to the large number of services involved, when combined they use 94 percent of the total demand (82.8% and 1.7% residential, and 9.4% commercial), see Figure 5.3-1. Unaccounted for water averages 3.8 percent, which is well within acceptable levels.

Figure 5.3-1: Percent of Total Demand by Type of Use (2004)



5.4 Historical and Projected Water Demand

Two growth patterns were considered in this planning study. These two patterns represent the continuation of the short-term (5-year) average service connection growth rate and the continuation of the long-term (10-year) average service connection growth rate. The projected growth in services resulting from the application of these growth rates and comparison to actual historical services is shown in Figure 5.4-1.

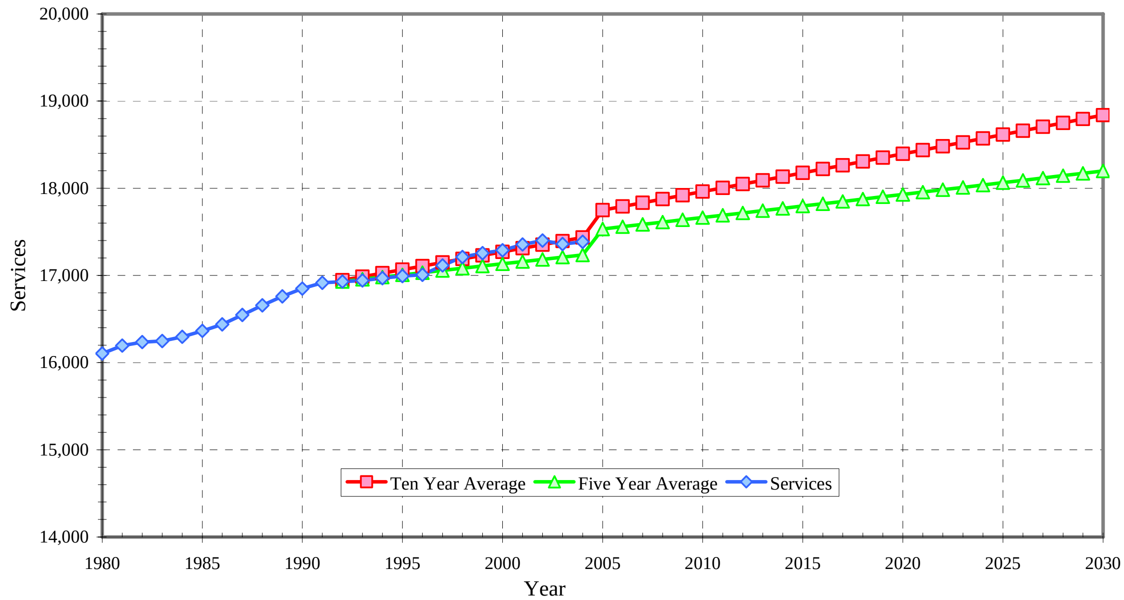
The short-term growth rate, calculated from the most recent five-year period (2000 to 2004), exhibits an overall annual average growth rate of 0.15 percent. Each customer class, such as residential, commercial and other uses, tends to grow at a different rate (see Worksheet 2, Appendix C). Therefore, the application of short-term growth as a factor in the projection of annual number of service connections was done on the basis of customer class.

The long-term growth pattern was derived from the ten-year period 1995 to 2004. This period resulted in an overall annual average service connection growth rate of 0.24 percent. This pattern also employed the customer class factor in projecting service connection increases.

The long-term, adjusted ten-year average growth pattern was chosen to establish the demand projection scenarios. This growth pattern was chosen because it is more representative of actual growth in the Bear Gulch District and it compares more favorably with the projected growth rate determined by ABAG.

In forecasting total system demand, the projected number of services for each customer class was multiplied by the minimum, average, and maximum demand per service for that customer class. This process was employed because of the significantly greater than average demand per service associated with certain uses. Residential and commercial demand is approximately 220,000 and 350,000 gallons per year per service, respectively, while the annual demand per service for multifamily residential, industrial, government and other uses all approach or exceed 1 million gallons per service per year.

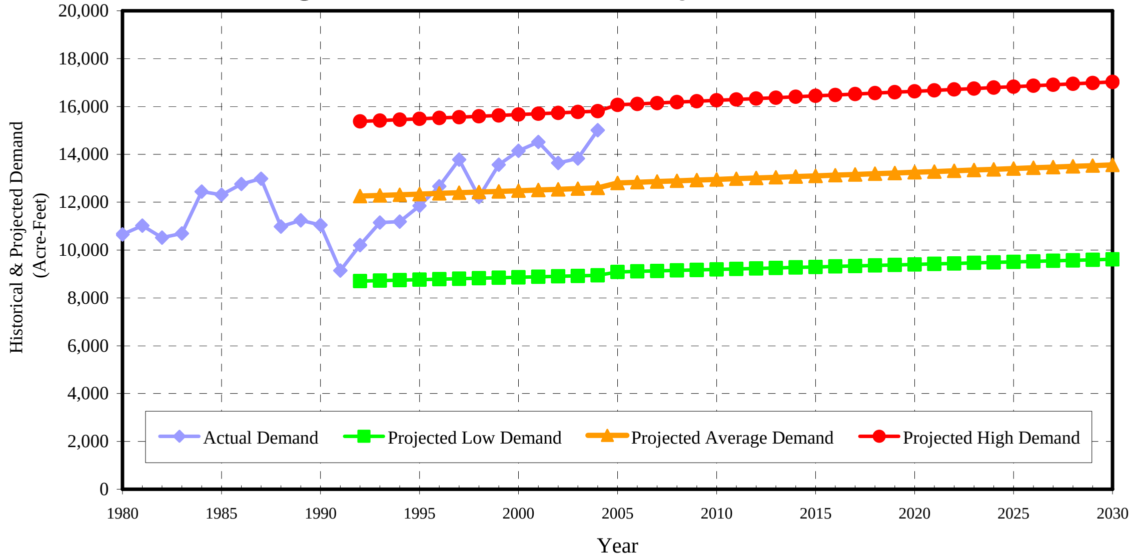
Figure 5.4-1: Historical & Projected Services



The projected services were adjusted to reflect the anticipated acquisition of the Los Trancos County Water District. Cal Water anticipates the service area and its 272 services will be incorporated into the Bear Gulch District in July 2005.

Three demand projection scenarios were used to develop a range of projected demand for the Bear Gulch District. As previously discussed, the long-term, ten-year average service connection growth pattern was applied to three different sets of demand per service data. Data generated through each scenario is compiled and located in Appendix C, Worksheets 10, 11, and 12). Comparative demand data for the three scenarios is illustrated in Figure 5.4-2.

Figure 5.4-2: Historical & Projected Demand



5.4.1 Scenario 1

The Company applied the long-term average growth pattern to the lowest demand per service values, occurring in each customer class since 1981. This scenario projects an annual demand for the year 2030 of 9,541 AF (without system losses). This scenario illustrates, based on actual demand values, that the residents of the Bear Gulch District can achieve a twenty percent reduction from average demand and thirty percent reduction from maximum annual demand. While this level of demand reduction was not sustained for very long, it is reasonable to believe that if the need was present this level could be maintained without threat to public health and safety. This scenario provides a valid bottom end for the projected demand range and is summarized in Table 5.4-1.

5.4.2 Scenario 2

The long-term average growth pattern was combined with the average annual demand per service values. This scenario projected total demand for the year 2030 at 12,981 AF (without system losses). As indicated previously in this report, the demand per service varies by type of use, and therefore the total demand was calculated using each individual demand per service. This scenario represents the most likely demand if the Company's conservation goals are achieved. The scenario is summarized in 5 year increment in Table 5.4-2.

5.4.3 Scenario 3

The long-term average growth pattern was applied to the highest annual demand per service. The projected 2030 total demand for Scenario 3 is 16,022 AF (without system losses). The scenario is summarized in 5 year increment in Table 5.4-3.

Table 5.4-1: Past, Current, and Projected Water Deliveries for Scenario 1 (Table 12a)

		Water Use Sectors	Single family	Multifamily	Commercial	Industrial	Institutional/Gov.	Landscape	Agriculture	Other	Total
2000	metered	# of accounts	15,816	64	1,276	1	97	-	-	35	17,289
		Deliveries AFY	11,553	268	1,544	7	269	-	-	139	13,780
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2005	metered	# of accounts	16,250	66	1,301	1	101	-	-	30	17,749
		Deliveries AFY	7,441	231	1,137	3	171			35	9,018
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2010	metered	# of accounts	16,459	67	1,302	1	103	-	-	30	17,962
		Deliveries AFY	7,537	234	1,138	3	173			36	9,121
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2015	metered	# of accounts	16,671	68	1,303	1	104	-	-	31	18,178
		Deliveries AFY	7,634	237	1,139	3	175			36	9,224
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2020	metered	# of accounts	16,885	69	1,304	1	105	-	-	31	18,395
		Deliveries AFY	7,732	240	1,140	3	177			37	9,329
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2025	metered	# of accounts	17,102	70	1,305	1	106	-	-	31	18,615
		Deliveries AFY	7,832	243	1,141	3	179			37	9,435
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2030	metered	# of accounts	17,322	70	1,306	1	108	-	-	32	18,839
		Deliveries AFY	7,932	246	1,141	3	181			38	9,541
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-

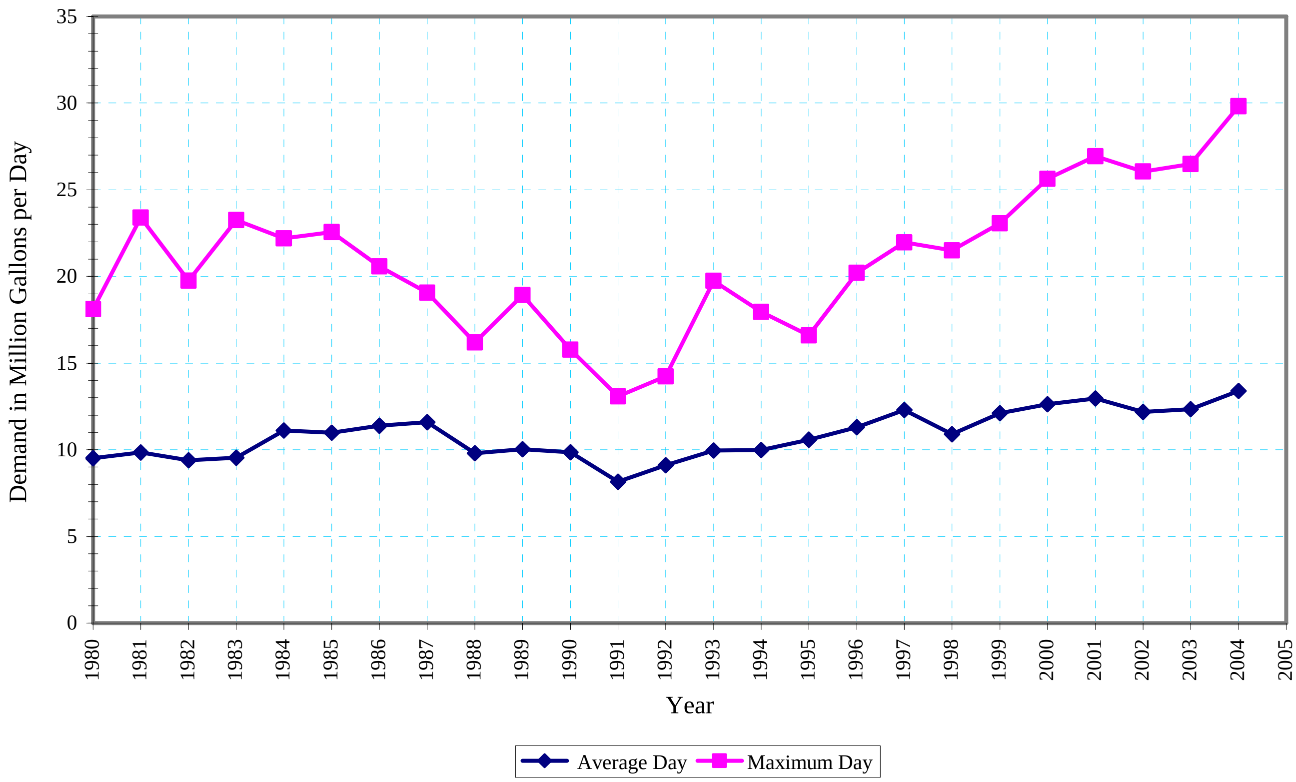
Table 5.4-2: Past, Current, and Projected Water Deliveries for Scenario 2 (Table 12b)												
		Water Use Sectors	Single family	Multifamily	Commercial	Industrial	Institutional/Gov.	Landscape	Agriculture	Other	Total
2000	metered	# of accounts	15,816	64	1,276	1	97	-	-	35	17,289
		Deliveries AFY	11,553	268	1,544	7	269	-	-	139	13,780
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2005	metered	# of accounts	16,250	66	1,301	1	101	-	-	30	17,749
		Deliveries AFY	10,245	262	1,356	5	291	-	-	101	12,260
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2010	metered	# of accounts	16,459	67	1,302	1	103	-	-	30	17,962
		Deliveries AFY	10,376	265	1,357	5	294	-	-	102	12,399
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2015	metered	# of accounts	16,671	68	1,303	1	104	-	-	31	18,178
		Deliveries AFY	10,510	268	1,358	5	298	-	-	103	12,542
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2020	metered	# of accounts	16,885	69	1,304	1	105	-	-	31	18,395
		Deliveries AFY	10,645	271	1,359	5	302	-	-	104	12,686
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2025	metered	# of accounts	17,102	70	1,305	1	106	-	-	31	18,615
		Deliveries AFY	10,782	275	1,360	5	305	-	-	106	12,832
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2030	metered	# of accounts	17,322	70	1,306	1	108	-	-	32	18,839
		Deliveries AFY	10,921	278	1,361	5	309	-	-	107	12,981
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-

		Table 5.4-3: Past, Current, and Projected Water Deliveries for Scenario 3 (Table 12c)									
		Water Use Sectors	**Single family**	**Multifamily**	**Commercial**	**Industrial**	**Institutional/Gov.**	**Landscape**	**Agriculture**	**Other**	**Total**
2000	metered	# of accounts	15,816	64	1,276	1	97	-	-	35	17,289
		Deliveries AFY	11,553	268	1,544	7	269	-	-	139	13,780
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2005	metered	# of accounts	16,250	66	1,301	1	101	-	-	30	17,749
		Deliveries AFY	12,695	292	1,574	8	386			168	15,123
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2010	metered	# of accounts	16,459	67	1,302	1	103	-	-	30	17,962
		Deliveries AFY	12,858	296	1,575	8	391			170	15,298
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2015	metered	# of accounts	16,671	68	1,303	1	104	-	-	31	18,178
		Deliveries AFY	13,023	300	1,577	8	396			172	15,476
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2020	metered	# of accounts	16,885	69	1,304	1	105	-	-	31	18,395
		Deliveries AFY	13,191	303	1,578	8	400			174	15,654
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2025	metered	# of accounts	17,102	70	1,305	1	106	-	-	31	18,615
		Deliveries AFY	13,361	307	1,579	8	405			176	15,836
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-
2030	metered	# of accounts	17,322	70	1,306	1	108	-	-	32	18,839
		Deliveries AFY	13,533	311	1,581	8	410			179	16,022
	unmetered	# of accounts	-	-	-	-	-	-	-	-	-
		Deliveries AFY	-	-	-	-	-	-	-	-	-

5.5 Average Day and Maximum Day Demand

The historical values for average and maximum days from 1980 to the present are shown in Figure 5.5-1. The average day to maximum day ratio has increased over the last five years. The ten-year average is 1.96:1 while the five-year average ratio has increased to 2.12:1. While both ratios are growing, the maximum day ratio is growing faster. This may be due to a change in irrigation practices of the large landscapes in the service area.

Figure 5.5-1: Average Day & Maximum Day



The average day demand in the Bear Gulch District to the year 2030 in 5 year increments is estimated using the projected demand and anticipated service connection counts for each scenario. The maximum day demand was calculated using the product of the average day and 2.12, (maximum to average ratio). The resulting values are shown in Table 5.5-1.

Table 5.5-1: Average Day and Maximum Day Demand							
	Projected Annual		Average Day		Maximum Day		Max. Day To
Projected	Demand	Demand	Demand	Use Per	Demand	Use Per	Ave. Day
Year	(AF)	(MG)	(MG)	Service (gal)	(MG)	Service (gal)	Ratio
2005							
Scenario 1	9,086	2,961	8.11	457	17.23	970	2.12
Scenario 2	12,803	4,172	11.43	644	24.27	1,368	2.12
Scenario 3	16,069	5,236	14.35	808	30.46	1,716	2.12
2010							
Scenario 1	9,189	2,994	8.20	457	17.42	970	2.12
Scenario 2	12,951	4,220	11.56	644	24.55	1,367	2.12
Scenario 3	16,255	5,297	14.51	808	30.82	1,716	2.12
2015							
Scenario 1	9,293	3,028	8.30	456	17.62	969	2.12
Scenario 2	13,100	4,269	11.69	643	24.83	1,366	2.12
Scenario 3	16,443	5,358	14.68	808	31.17	1,715	2.12
2020							
Scenario 1	9,398	3,062	8.39	456	17.82	969	2.12
Scenario 2	13,251	4,318	11.83	643	25.12	1,366	2.12
Scenario 3	16,634	5,420	14.85	807	31.54	1,714	2.12
2025							
Scenario 1	9,505	3,097	8.49	456	18.02	968	2.12
Scenario 2	13,404	4,368	11.97	643	25.41	1,365	2.12
Scenario 3	16,828	5,483	15.02	807	31.90	1,714	2.12
2030							
Scenario 1	9,613	3,132	8.58	456	18.22	967	2.12
Scenario 2	13,559	4,418	12.10	643	25.71	1,364	2.12
Scenario 3	17,024	5,547	15.20	807	32.27	1,713	2.12

5.6 Summary of Purchased Water

California Water Service Company does not provide water to other agencies nor has any plans to due so in the future. Additional water uses such as saline barriers, or groundwater recharge are not currently being or planned to occur.

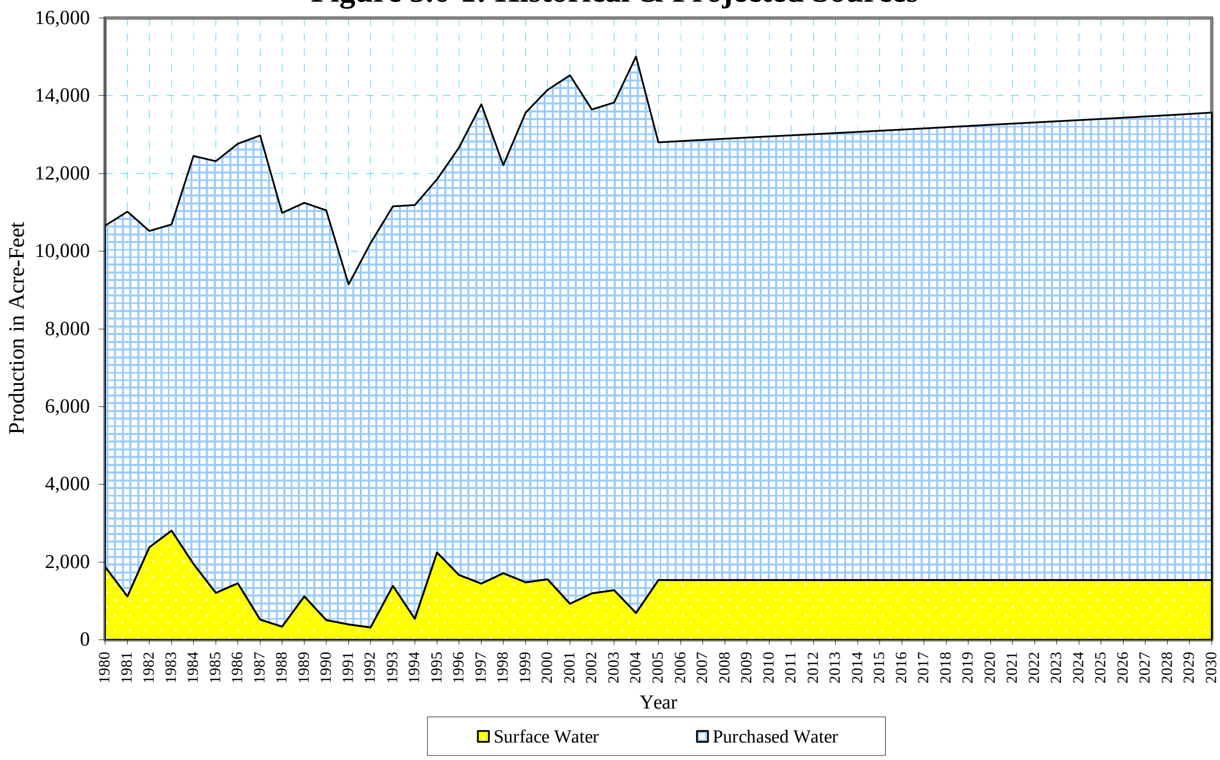
Table 5.6-1 lists other water uses in the district not discussed in Table 5.4-1 to 5.4-3. The projected values are based on average conditions.

Table 5.6-1: Additional Water Uses and Losses - AF Year (Table 14)							
Water Use	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Saline barriers	-	-	-	-	-	-	-
Groundwater recharge	-	-	-	-	-	-	-
Conjunctive use	-	-	-	-	-	-	-
Raw water	-	-	-	-	-	-	-
Recycled	-	-	-	-	-	-	-
Unaccounted-for system losses	369	545	551	558	565	572	578
Total	369	545	551	558	565	572	578

The past, current, and projected water deliveries based on average projected consumption rate is presented in Table 5.6-2 and shown graphically in Figure 5.6-1 by water source type.

Table 5.6-2: Total Water Use - AF Year (Table 15)							
Water Use	**2000**	**2005**	**2010**	**2015**	**2020**	**2025**	**2030**
Total of Tables 12, 13, 14	14,150	12,805	12,951	13,100	13,251	13,404	13,559

Figure 5.6-1: Historical & Projected Sources



The ten-year (1995-2004) average day demand for purchased water in the three districts is 39,032 AFY (34.85 MGD). The five-year (2000-2004) average day demand for purchased water in the three districts is 41,304 AFY (36.87 MGD). Every year since 2000, California Water Service Company's combined purchases from the SFPUC have exceeded Cal Water's SAA of 35.5 MGD.

The Company projects that the average water requirements for the Bear Gulch District in the year 2030 will be 13,559 acre-feet per year. Approximately 12,025 AF of this total average annual demand will be satisfied by the purchased supply from SFPUC, and an average of 1,534 AF will be satisfied from the surface supply.

Total projected SFPUC purchases by the three Cal Water peninsula districts for the year 2030 is 37,754 AF assuming the conservation goal is achieved. This annual demand would generate an average day demand of 33.70 MGD, below the contractual limitation. If the company's conservation goal is not achieved and the highest demand condition is realized, then the 2030 annual demand on SFPUC could reach 47,567 AF. This annual demand would generate a high average day demand on SFPUC of 42.47 MGD, a level well in excess of our current 35.55 MGD supply assurance allocation

In summary, the projected demand to be supplied by San Francisco Public Utilities Commission for the Bear Gulch is shown in Table 5.6-3. The low demand represents the minimum purchase water volume when the potential reduction by conservation by the customers can be met. The average scenario represents the normal amount of the demand provided that the 10% conservation goal is maintained. The high demand scenario represents the purchase volume if customer demand patterns returned to pre-drought non-conservation practices.

Table 5.6-3: Agency Demand Projections To Wholesale Suppliers (Table 19) AFY

Wholesaler	Demand	2010	2015	2020	2025	2030
SFPUC	Low	7,655	7,759	7,864	7,971	8,079
	Average	11,417	11,566	11,717	11,870	12,025
	High	14,721	14,909	15,100	15,294	15,490

6 Supply and Demand Comparison

An assessment of the reliability of its water service to the district during normal, dry, and multiple dry water years is included in this section. The water supply and demand assessment compares the total water supply sources available (SFPUC and local supply) with the total projected water use over the next 20 to 25 years. The water service reliability assessment is based upon the information provided by the SFPUC for the imported water and the historical record for the local supply

The values presented in this section are not intended to create a right or entitlement to water service or any specific level of water service and is not intented to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

The purchased supply is shared by the three districts divided equally based on total demand excluding the local supply. The percentage to each district is recalculated for each of the given years due to changes in the supply available and demand required. Detailed spreadsheet calculations are presented in Appendix C.

6.1 Normal Year Comparison

Tables 6.1-1, 6.1-2, and 6.1-3 compare the current and projected water supply and demand based on average demand (Scenario 2). The tables indicate that during average precipitation years the district has sufficient water to meet the demand of the customer through 2030. The values are based on continued commitment to conservation programs and for the local supply to have full production capacity.

Table 6.1-1: Projected Normal Water Supply - AF Year (Table 40)

	2010	2015	2020	2025	2030
SFPUC	12,519	12,560	12,901	12,981	13,174
Local Supply	1,534	1,534	1,534	1,534	1,534
Total Supply (from Table 3-1)	14,053	14,095	14,435	14,515	14,708
% of Normal Year	99.3%	99.6%	102.0%	102.6%	104.0%

Table 6.1-2: Projected Normal Water Demand - AF Year (Table 41)

	2010	2015	2020	2025	2030
Demand (from Table 5.6-2)	12,951	13,100	13,251	13,404	13,559
% of year 2005	101%	102%	103%	105%	106%

Table 6.1-3: Projected Supply and Demand Comparison - AF Year (Table 42)

	2010	2015	2020	2025	2030
Supply totals	14,053	14,094	14,435	14,515	14,708
Demand totals	12,951	13,100	13,251	13,404	13,559
Difference	1,102	994	1,184	1,111	1,149
Difference as % of Supply	8%	7%	8%	8%	8%
Difference as % of Demand	9%	8%	9%	8%	8%

6.2 Single Dry-Year Comparison

Examining the operational record of the district, the district demand would be greater during a single-dry year than during a normal rainfall year. The water demand would increase due to maintenance of landscape and other high water uses that would normally be supplied by precipitation.

Tables 6.2-1, 6.2-2, and 6.2-3 compare the current and projected water supply and demand based on higher than average consumption rate. The local supply has been cutback by 20% due to lack of rainfall which is based on operation records for the district in a single dry year. The demand has been calculated based on single dry year demand per service for the district.

The tables show that supply is very marginal in meeting the demand for the district. Water conservation measures have not been aggressively pursued and would have to be in order to reduce demand. The previous chapter discussed a high demand rate (Scenario 3) in which the district demand was calculated based high demand per service in the historical record. In such a scenario, the demand would exceed the supply by 12 to 13 percent. Mandatory conservation and reduction would be required in such an event as outlined in the Water Shortage Contingency Plan, Section 4.

Table 6.2-1: Projected Single Dry-year Water Supply - AF Year (Table 43)

	2010	2015	2020	2025	2030
SFPUC	13,255	13,269	13,593	13,647	13,820
Local Supply	1,278	1,278	1,278	1,278	1,278
Total Supply	14,533	14,547	14,871	14,925	15,098
% of projected normal	103.4%	103.2%	103.0%	102.8%	102.6%

Table 6.2-2: Projected Single Dry-year Water Demand - AF Year (Table 44)

	2010	2015	2020	2025	2030
Demand	14,305	14,476	14,650	14,826	15,004
% of projected normal	110.5%	110.5%	110.6%	110.6%	110.7%

Table 6.2-3: Projected Single Dry-year Supply and Demand Comparison (Table 45) AFY

	2010	2015	2020	2025	2030
Supply totals	14,533	14,547	14,871	14,925	15,098
Demand totals	14,305	14,476	14,650	14,826	15,004
Difference	228	70	221	99	94
Difference as % of Supply	2%	0%	1%	1%	1%
Difference as % of Demand	2%	0%	2%	1%	1%

6.3 Multiple Dry-Year Comparison

During multiple dry-years, the supply can be curtailed by mandatory cutbacks by SFPUC and reductions in local water supply. The demand would fluctuate in conjunction with the change in supply by stricter enforcement of conservation methods as outlined in Section 4.

Tables 6.3-1, 6.3-2, and 6.3-3 compare the projected water supply and demand for the projected years between 2006 and 2010.

The purchased supply projected by SFPUC anticipates a 10% cutback for 2006 – 2007, and 20% cutback for 2008 – 2009. The local supply in the tables below has been represented to follow the recorded operation during the single and multi-dry years for the district.

Knowing that the main supply has been curtailed, the demand has been established based on lowest consumption rate that occurred for the district during the multi dry year (i.e. 1990). As shown in the table the supply is very marginal during 2006 and 2007. The demand is further reduced to its overall lowest consumption rate since 1980 (scenario 1) for the years 2008 and 2009. The comparison for these years shows the supply is greater than the demand by 10 to 12 percent.

Table 6.3-1: Projected Supply During Multiple Dry Year To 2010 (Table 46) AFY

	2006	2007	2008	2009	2010
SFPUC	10,482	11,318	9,152	9,609	12,373
Local Supply	1,278	337	1,118	504	1,534
Total Supply	11,760	11,655	10,270	10,113	13,908
% of projected normal	84.7%	83.8%	73.6%	72.3%	99.2%

Table 6.3-2: Projected Demand Multiple Dry Year To 2010 (Table 47) AFY

	2006	2007	2008	2009	2010
Demand	11,666	11,694	9,148	9,168	11,778
% of projected normal	90.9%	90.9%	71.0%	71.0%	90.9%

Table 6.3-3: Projected Supply And Demand Comparison To 2010 (Table 48) During Multiple Dry Year Period - AFY

	2006	2007	2008	2009	2010
Supply totals	11,760	11,655	10,270	10,113	13,908
Demand totals	11,666	11,694	9,148	9,168	11,778
Difference	94	(38)	1,123	944	2,130
Difference as % of Supply	0.8%	-0.3%	10.9%	9.3%	15.3%
Difference as % of Demand	0.8%	-0.3%	12.3%	10.3%	18.1%

Tables 6.3-4, 6.3-5, and 6.3-6 compare the projected water supply and demand from 2011 to 2015.

The purchased supply projected by SFPUC anticipates a normal supply for 2011, a cutback of 10% for 2012 and 2013, and 20% cutback for 2014. The local supply in the tables below has been represented to follow the recorded operation during the single and multi-dry years for the district.

Since that the main supply has been curtailed, the demand has been established based on lowest consumption rate that occurred for the district during the multi dry year (i.e. 1990). As shown in the table the supply has a good margin for 2011, and small margin for 2012 and 2013. The demand is further reduced to its overall lowest consumption rate since 1980 (Scenario 1) for the year 2014 which makes the supply to become greater then the demand by 14 percent.

Table 6.3-4: Projected Supply During Multiple Dry Year To 2015 (Table 49) AFY

	2011	2012	2013	2014	2015
SFPUC	12,539	11,891	11,520	10,273	12,386
Local Supply	1,278	337	1,118	504	1,534
Total Supply	13,817	12,228	12,638	10,777	13,921
% of projected normal	98.3%	86.8%	89.5%	76.1%	98.1%

Table 6.3-5: Projected Demand Multiple Dry Year To 2015 (Table 50) AFY

	2011	2012	2013	2014	2015
Demand	11,806	11,834	11,862	9,272	11,919
% of projected normal	91.0%	91.0%	91.0%	70.9%	91.0%

Table 6.3-6: Projected Supply And Demand Comparison To 2015 (Table 51) During Multiple Dry Year Period - AFY

	2011	2012	2013	2014	2015
Supply totals	13,817	12,228	12,638	10,777	13,921
Demand totals	11,806	11,834	11,862	9,272	11,919
Difference	2,011	395	776	1,505	2,002
Difference as % of Supply	15%	3%	6%	14%	14%
Difference as % of Demand	17%	3%	7%	16%	17%

Tables 6.3-7, 6.3-8, and 6.3-9 compare the projected water supply and demand from 2016 to 2020.

The purchased supply projected by SFPUC anticipates a normal supply for 2016, and a cutback of 10% for 2017 to 2019. The local supply in the tables below has been represented to follow the recorded operation during the single and multi-dry years for the district.

Knowing that the main supply has been curtailed, the demand has been established based on lowest consumption rate that occurred for the district during the multi dry year (i.e. 1990). As shown in the table the supply has a good marginal during 2016 to 2020. The demand does not need to be further reduced to make the supply greater then the demand.

Table 6.3-7: Projected Supply During Multiple Dry Year To 2020 (Table 52) AFY

	2016	2017	2018	2019	2020
SFPUC	12,725	12,352	11,806	12,218	12,694
Local Supply	1,278	337	1,118	504	1,534
Total Supply	14,083	13,064	13,054	13,044	14,229
% of projected normal	99.0%	91.6%	91.3%	91.0%	99.1%

Table 6.3-8: Projected Demand Multiple Dry Year To 2020 (Table 53) AFY

	2016	2017	2018	2019	2020
Demand	11,947	11,976	12,004	12,033	12,062
% of projected normal	91.0%	91.0%	91.0%	91.0%	91.0%

Table 6.3-9: Projected Supply And Demand Comparison To 2020 (Table 54) During Multiple Dry Year Period - AFY

	2016	2017	2018	2019	2020
Supply totals	14,083	13,064	13,054	13,044	14,229
Demand totals	11,947	11,976	12,004	12,033	12,062
Difference	2,136	1,088	1,050	1,011	2,167
Difference as % of Supply	15.2%	8.3%	8.0%	7.8%	15.2%
Difference as % of Demand	17.9%	9.1%	8.7%	8.4%	18.0%

Tables 6.3-10, 6.3-11, and 6.3-12 compare the projected water supply and demand from 2021 to 2025.

The purchased supply projected by SFPUC anticipates a normal supply for 2021, a cutback of 10% for 2022 and 2023, and a cutback of 20% for 2024. The local supply in the tables below has been represented to follow the recorded operation during the single and multi-dry years for the district.

Since that the main supply has been curtailed, the demand has been established based on lowest consumption rate that occurred for the district during the multi dry year (i.e. 1990). As shown in the table, the supply has a good margin during 2021 to 2023. The demand is further reduced to its overall lowest consumption rate since 1980 (Scenario 1) for the year 2024, which makes the supply greater than the demand by 16.5 percent.

Table 6.3-10: Projected Supply During Multiple Dry Year To 2025 (Table 55) AFY

	2021	2022	2023	2024	2025
SFPUC	12,860	12,660	12,111	10,856	12,747
Local Supply	1,278	337	1,118	504	1,534
Total Supply	14,138	12,997	13,229	11,360	14,281
% of projected normal	98.2%	90.1%	91.5%	78.3%	98.3%

Table 6.3-11: Projected Demand Multiple Dry Year To 2025 (Table 56) AFY

	2021	2022	2023	2024	2025
Demand	12,090	12,119	12,148	9,484	12,206
% of projected normal	91.0%	91.0%	91.0%	70.9%	91.1%

Table 6.3-12: Projected Supply And Demand Comparison To 2025 (Table 57) During Multiple Dry Year Period - AFY

	2021	2022	2023	2024	2025
Supply totals	14,138	12,997	13,229	11,360	14,281
Demand totals	12,090	12,119	12,148	9,484	12,206
Difference	2,047	877	1,081	1,877	2,075
Difference as % of Supply	14.5%	6.7%	8.2%	16.5%	14.5%
Difference as % of Demand	16.9%	7.2%	8.9%	19.8%	17.0%

Tables 6.3-13, 6.3-14, and 6.3-15 compare the projected water supply and demand from 2021 to 2025.

The purchased supply projected by SFPUC anticipates a normal supply for 2026, a cutback of 5% for 2027 and 2028, and a cutback of 20% for 2029. The local supply in the tables below has been represented to follow the recorded operation during the single and multi-dry years for the district.

Since that the main supply has been curtailed, the demand has been established based on lowest consumption rate that occurred for the district during the multi dry year (i.e. 1990). As shown in the table, the supply has a good margin during 2026 to 2028. The demand is further reduced to its overall lowest consumption rate since 1980 (Scenario 1) for the year 2029, which makes the supply greater than the demand by 21.5 percent.

Table 6.3-13: Projected Supply During Multiple Dry Year To 2030 AFY

	2026	2027	2028	2029	2030
SFPUC	12,912	12,973	12,423	11,151	12,911
Local Supply	1,278	337	1,118	504	1,534
Total Supply	14,190	13,310	13,541	11,655	14,445
% of projected normal	98.6%	92.2%	93.6%	80.4%	99.4%

Table 6.3-14: Projected Demand Multiple Dry Year To 2030 AFY

	2026	2027	2028	2029	2030
Demand	12,236	12,265	12,294	9,591	12,353
% of projected normal	92.1%	92.1%	92.1%	71.7%	92.2%

Table 6.3-15: Projected Supply And Demand Comparison To 2030 During Multiple Dry Year Period - AFY

	2026	2027	2028	2029	2030
Supply totals	14,190	13,310	13,541	11,655	14,445
Demand totals	12,236	12,265	12,294	9,591	12,353
Difference	1,955	1,045	1,247	2,063	2,092
Difference as % of Supply	13.8%	7.9%	9.2%	17.7%	14.5%
Difference as % of Demand	16.0%	8.5%	10.1%	21.5%	16.9%

6.4 Planned Water Supply Projects and Programs

As a result of recent improvements at the Bear Gulch treatment plant, this facility will be available for operation more often than in the past. For this reason, the projections of annual production from the treatment plant have been set at 1,534 AF rather than the average reservoir production.

The treatment plant's design capacity is 6.0 MGD. If adequate water was available and the plant could operate continuously through the year, it could produce as much as 2,190 MG (6,720 AF). The Company established an operational guideline, restricting drawdown of the reservoir level to a rate of 0.3 feet per day. This guideline limits the treatment plant operation when inflow to the reservoir is minimal, to between 1.0 and 2.0 MGD.

As part of the Water Supply Master Plan, the Company is presently studying methods to increase supplies from the watershed and the potential for using groundwater sources. Improvements to the diversion facility at the Woodside Diversion Dam have been designed and scheduled for installation. These improvements will enable the Company to obtain accurate stream flow data at this facility, thus gaining a better understanding of the dynamics of this stream, permitting more efficient operation of the diversion facility, and allowing further study of potential facility improvements.

In the sense of maximizing production from the treatment plant and maximizing diversions and storage, the most advantageous period of time to operate the treatment plant would be in the winter when flows from the diversion facilities are being received. However, during such rainy periods the demand for water in the portion of the distribution system that receives treatment plant water generally drops significantly. The Company is investigating methods of increasing the seasonal distribution of treated water in order to maximize the treatment plant efficiency. The investigation includes determining the feasibility of deliveries to other water utilities, expanding the area effectively served by the treatment plant, and investigating the validity of the operational guideline on reservoir drawdown.

Cal Water will continue its annual main replacement program to upgrade and improve the distribution system of the Bear Gulch District. To meet the average day and maximum day requirements of our customers, new booster stations and storage facilities will be constructed and replaced as needed. A Water Supply and Facilities Master Plan is planned for 2006, which includes the development of a hydraulic model. This planning document will analyze in detail water supply and distribution system reliability issues and determine what capital improvements are required to address anticipated growth, improve system reliability, and replace aging infrastructure.

The Bear Gulch District may have to alter the way it diverts water out of its watershed and into its reservoir, which may involve extensive modifications to its diversion facilities. Cal Water is negotiating currently with the California Department of Fish and Game and NOAA Fisheries (National Marine Fisheries Service, National Oceanic and Atmospheric Administration).

Future water supply projects are summarized in Table 6.4-1.

Table 6.4-1: Future Water Supply Projects (Table 17)		
Project Name	**Projected Start Date**	**Projected Completion Date**
Ultra violet (UV) Disinfection Unit at Filter Plant	In Progress	October 2005
Storage Facilities	Planning stage	n/a
Booster Pumps	Planning stage	n/a

6.4.1 Desalinated Water

Currently, there are no plans for the development of desalinated water in Bear Gulch District by California Water Service Company; however, the opportunity exists due to the district's location to San Francisco Bay and/or brackish wells and for the plant discharge to be used by the local salt evaporators.

7 Water Demand Management

7.1 California Urban Water Conservation Council

California Water Service Company is a CUWCC member. Annual reports are attached in Appendix I. The reports are considered complete by the CUWCC website.

7.2 Water Conservation Best Management Practices

Water conservation is a method available to reduce water demands, thereby reducing water supply needs for the Bear Gulch District. This chapter presents an analysis of water conservation best management practices (BMPs) and a description of the methods and assumptions used to conduct the analysis.

The unpredictable water supply and ever increasing demand on California's complex water resources have resulted in a coordinated effort by the DWR, water utilities, environmental organizations, and other interested groups to develop a list of urban BMPs for conserving water. This consensus-building effort resulted in a Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), as amended September 16, 1999, among parties, which formalizes an agreement to implement these BMPs and makes a cooperative effort to reduce the consumption of California's water resources. Table 7.2-1 presents the BMPs as defined by the MOU. The MOU is administered by the California Urban Water Conservation Council (CUWCC).

The MOU requires that a water utility implement only the BMPs that are economically feasible. If a BMP is not economically feasible, the water utility may request an economic exemption for that BMP. The BMPs as defined in the MOU are generally recognized as standard definitions of water conservation measures. California Water Service Company (Cal Water) is a signatory of the MOU. As a signatory of the MOU, Cal Water has agreed to implement the BMPs as defined in Exhibit 1 of the MOU that are cost beneficial and complete such implementation in accordance with the schedule assigned each BMP. Cal Water must submit to the CUWCC a report every two years describing BMP implementation.

Table 7.2-1: Water Conservation Best Management Practices	
No.	BMP Name
1	Water survey programs for single family residential and multifamily residential connections.
2	Residential plumbing retrofit.
3	System water audits, leak detection and repair.
4	Metering with commodity rates for all new connections and retrofit of existing connections.
5	Large landscape conservation programs and incentives.
6	High-efficiency washing machine rebate programs.
7	Public information programs.
8	School education programs.
9	Conservation programs for commercial, industrial, and institutional accounts.
10	Wholesale agency assistance programs.
11	Conservation pricing.
12	Conservation coordinator.
13	Water waste prohibition.
14	Residential ULFT replacement programs.

7.3 Economic Analysis Methodology and Assumptions

An economic analysis was conducted for six of the 14 BMPs that are described in the MOU (i.e. BMP nos. 1, 2, 5, 6, 9, and 14). Economic analyses were not done for BMPs 3, 7, 8, 10, 11, 12, and 13 because they are essentially non-quantifiable, but essential to the success of those BMPs that are quantifiable. An economic analysis was not done for BMP 4 since this BMP has been fully implemented.

Assumptions used in the economic analysis for each BMP are described in Appendix J. Directly beneath each assumption is a brief description of the rationale and/or supporting evidence for that assumption. Common assumptions for all BMPs are the value of conserved water ($600/ac-ft), the real discount rate (6.15%), and the overhead rate (13%). The real discount rate is calculated from the assumed real cost of money (8.82%) and the assumed long-term inflation rate (2.52%) using the precise conversion method (A&N Technical Services 2000, pg A-2). Housing information and a breakdown of the number of connections for each connection category used for the economic analysis are presented in Table 7.3-1 and 7.3-2.

Table 7.3-1: Housing Estimates and Projections		
Year	Single family dwelling units	Multifamily dwelling units
1991	15,416	1,259
1997	15,744	1,284
2000	15,911	--
2005	16,193	--
2010	16,480	--
2015	16,772	--
2020	17,070	--

Table 7.3-2: Connections by Classifications (1997)	
Classification	Connections
Single family	15,744
Multifamily	64
Commercial	1,273
Industrial	1
Institutional	95
Irrigation/landscaping	0
Total	17,177

The economic analysis was performed using a spreadsheet model. A separate, customized worksheet for each BMP is presented in Appendix J. Each BMP economic analysis spreadsheet projects, on an annual basis, the number of interventions and the dollar values of the benefits and costs that would result from implementing a particular BMP. Terms and formulas that are common to all the worksheets are defined in Table 7.3-3.

Table 7.3-3: Definition of Terms Used in the Economic Analysis		
Term	Definition	Comments
BENEFITS:		
Avoided Capital Costs	Capital costs that are avoided by implementing the BMP.	An example is the cost of a well that would not have to be installed due to implementation of the BMP.
Avoided Variable Costs	Variable costs that are avoided by implementing the BMP.	An example is the cost of electricity that would be saved if the BMP were implemented.
Avoided Purchase Costs	Purchase costs that are avoided by implementing the BMP.	An example is the cost of purchasing water that would not be needed due to implementation of the BMP.
Total Undiscounted Benefits	The sum of avoided capital costs, avoided variable costs and avoided purchase costs.	
Total Discounted Benefits	The present value of the sum of avoided capital costs, avoided variable costs and avoided purchase costs.	An annual percentage rate consisting of the cost of borrowing money minus the inflation rate.
COSTS:		
Capital Costs	Capital costs incurred by implementing the BMP.	For example, the cost to purchase and install meters for BMP 4.
Financial Incentives	The cost of financial incentives paid to connections.	Copay or distribution for purchasing low-flow plumbing devices or washing machines are examples of financial incentives.
Operating Expenses	Operational expenses incurred during implementation of the BMP.	
Total Undiscounted Costs	The sum of capital costs, financial incentives, and operating expenses.	
Total Discounted Costs	The present value of the sum of capital costs, financial incentives, and operating expenses.	The discount rate is used to calculate discounted costs from undiscounted costs.
NET PRESENT VALUE	Total discounted benefits minus total discounted costs.	A value greater than zero indicates an economically justifiable BMP.
RESULTS:		
Benefit / Cost Ratio	The sum of the total discounted benefits divided by the sum of the total discounted costs.	A ratio greater than one indicates an economically justifiable BMP.
Simple Pay-Back Period	The number of years required for the benefits to pay back the costs of the BMP, calculated as the sum of the total discounted costs divided by the average annual total discounted benefits.	A low value is considered economically attractive.
Discounted Cost / Water Saved	The present-value cost to save one acre-foot of water, calculated as the sum of the total discounted costs divided by the total acre-feet of water saved over the study period.	A low value is considered economically attractive because it indicates a low implementation cost. Value must be less than the marginal cost of new water to be cost effective.
Net Present Value / Water Saved	The net value of saving one acre-foot of water, calculated as the sum of the net present value divided by the total acre-feet of water saved over the study period.	A high value is considered economically attractive.

7.4 Economic Analysis Results

Table 7.4-1 summarizes the results of the economic analysis in terms of the benefit/cost (B/C) ratio, the simple pay-back period, the discounted cost per ac-ft of water saved, and the net present value (NPV) per ac-ft of water saved for each BMP.

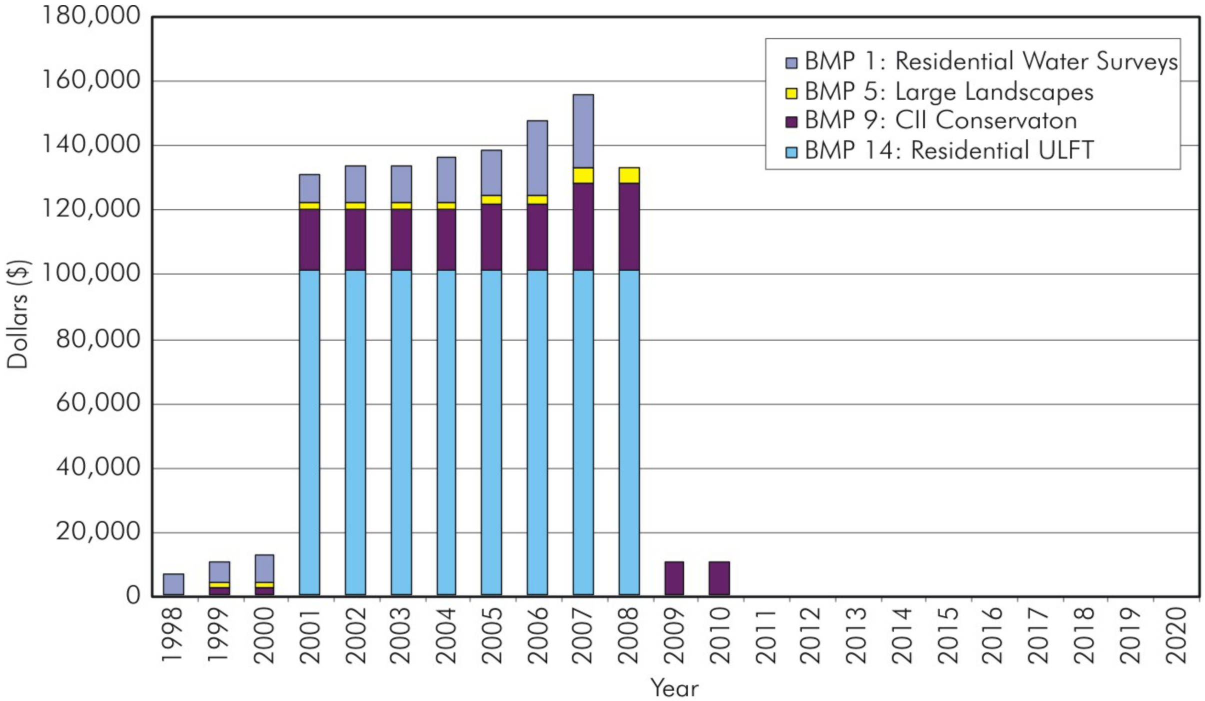
Table 7.4-1: Results Of Economic Analysis

BMP No.	BMP Name	Total discounted cost over study period ($)	Total water saveda (ac-ft)	Benefit / cost ratio	Simple payback period (years)	Discounted cost / water saved ($/ac-ft)	Net present value / water saved ($/ac-ft)
1	Water survey programs for single family residential and multifamily residential connections.	110,226	439	1.9	7	251	224
2	Residential plumbing retrofits.	334,867	490	0.6	23	683	-262
5	Large landscape conservation programs and incentives.	20,871	291	6.2	2	72	375
6	High-efficiency washing machine rebate programs.	147,954	446	0.9	22	332	600
9	Conservation programs for commercial, industrial, and institutional (CII) accounts.	154,727	786	2.0	11	197	193
14	Residential ULFT replacement programs.	660,516	3,032	1.5	13	218	107

Total water saved over study period.

Annual water costs and savings for each of the BMPs with a B/C ratio equal to or greater than one are presented graphically on Figures 7.4-1 and 7.4-2 and summarized in Table 7.4-2. Table 7.4-2 also presents the number of annual interventions required for each BMP for the water system to be in compliance with the MOU for all cost effective BMPs. Interventions and costs shown for BMPs for prior year of 1998, 1999, and 2000, if not completed, would have to be implemented in future years.

Figures 7.4-1 and 7.4-2 and Table 7.4-2 do not include the water savings and costs associated with BMPs 3, 7, 8, 10, 11, 12, and 13 since no specific level of effort is defined in the MOU for these BMPs. BMPs 4 and 11 are already implemented and, therefore, have no cost associated with them. BMP 13 is covered by CPUC General Order 103, and has no cost unless triggered by a water shortage condition.



Note: Costs are undiscounted costs.

Figure 7.4-1: Bear Gulch BMP Implementation Costs

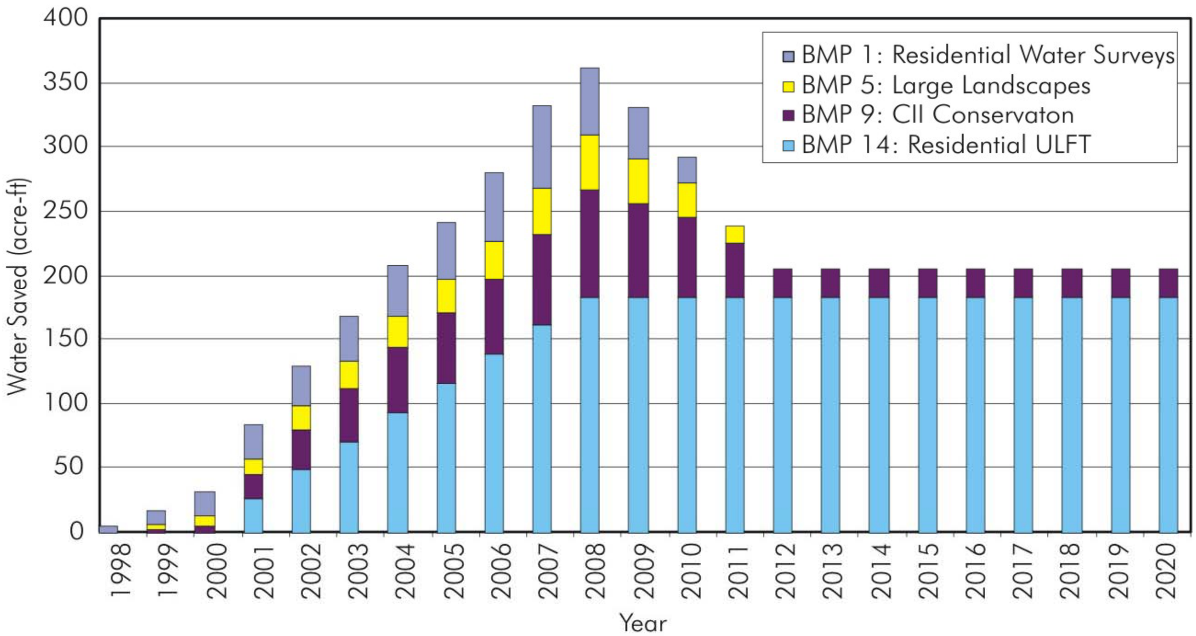


Figure 7.4-2: Bear Gulch BMP Water Savings

Note: Water costs and water savings from BMPs 7, 8, 10, 11, 12, and 13 not included. See text.

Table 7.4-2: Summary Of BMP Annual Interventions, Water Saved, Cost

	BMP 1: Residential water surveys			BMP 2: Residential plumbing			BMP 5: Large landscapes			BMP 6: Washing machine rebates		
Year	Interventions	Water saved	Cost	Interventions	Water saved	Cost	Interventions	Water saved	Cost	Interventions	Water saved	Cost
		(ac-ft/yr)	($/yr)		(ac-ft/yr)	($/yr)		(ac-ft/yr)	($/yr)		(ac-ft/yr)	($/yr)
1998	128	5.5	6,386	B/C<1	B/C<1	B/C<1	0	0	0	B/C<1	B/C<1	B/C<1
1999	128	11.0	6,386				10	4	1,283			
2000	179	18.7	8,940				10	7	1,283			
2001	179	26.4	8,940				14	12	1,797			
2002	230	30.7	11,494				14	17	1,797			
2003	230	35.1	11,494				18	20	2,310			
2004	281	39.5	14,048				18	23	2,310			
2005	281	43.9	14,048				23	26	2,824			
2006	460	53.8	22,988				23	29	2,824			
2007	460	63.7	22,988				37	36	4,620			
2008	0	51.6	0				37	42	4,620			
2009	0	39.5	0				0	34	0			
2010	0	19.8	0				0	26	0			
2011	0	0.0	0				0	13	0			
2012	0	0.0	0				0	0	0			
2013	0	0.0	0				0	0	0			
2014	0	0.0	0				0	0	0			
2015	0	0.0	0				0	0	0			
2016	0	0.0	0				0	0	0			
2017	0	0.0	0				0	0	0			
2018	0	0.0	0				0	0	0			
2019	0	0.0	0				0	0	0			
2020	0	0.0	0				0	0	0			
Total	2,554	439	127,710	0	0	0	205	291	25,669	0	0	0

Note: B/C<1 indicates a benefit to cost ratio less than one.

Table 7.4-2 Summary Of BMP Annual Interventions, Water Saved, Cost (continued)									
	BMP 9: CII conservation			BMP 14: Residential ULFT[a]			Total		
Year	Interventions	Water saved (ac-ft/yr)	Cost ($/yr)	Interventions	Water saved (ac-ft/yr)	Cost ($/yr)	Interventions	Water saved (ac-ft/yr)	Cost ($/yr)
1998	0	0	0	0	0	0	128	5	6,386
1999	3	3	2,330	0	0	0	141	17	9,999
2000	3	6	2,330	0	0	0	192	32	12,553
2001	94	19	19,105	800	26	100,800	1,088	84	130,641
2002	94	32	19,105	800	49	100,800	1,139	128	133,196
2003	94	41	18,639	800	71	100,800	1,142	168	133,243
2004	94	51	18,639	800	93	100,800	1,193	207	135,797
2005	96	54	20,503	800	116	100,800	1,200	240	138,174
2006	96	58	20,503	800	138	100,800	1,379	279	147,114
2007	106	71	27,026	800	160	100,800	1,403	330	155,434
2008	106	83	27,026	800	183	100,800	943	360	132,447
2009	81	73	10,252	0	183	0	81	329	10,252
2010	81	62	10,252	0	183	0	81	291	10,252
2011	0	42	0	0	183	0	0	238	0
2012	0	21	0	0	183	0	0	204	0
2013	0	21	0	0	183	0	0	204	0
2014	0	21	0	0	183	0	0	204	0
2015	0	21	0	0	183	0	0	204	0
2016	0	21	0	0	183	0	0	204	0
2017	0	21	0	0	183	0	0	204	0
2018	0	21	0	0	183	0	0	204	0
2019	0	21	0	0	183	0	0	204	0
2020	0	21	0	0	183	0	0	204	0
Total	951	786	195,709	6,400	3,028	806,400	10,110	4,544	1,155,487

Note: B/C<1 indicates a benefit to cost ratio less than one. [a] BMP 14 interventions prior to 2001 have been implemented.

7.5 Additional Issues

This section describes additional issues required to be addressed by the Urban Water Management Planning Act. Non-economic factors, including environmental, social, health, customer impacts, and technological are not thought to be significant in deciding which BMPs to implement. No water supply projects are currently planned that would supply water at a higher unit cost. Cal Water has the legal authority to implement the BMPs. However, the costs of implementing these BMPs are subject to CPUC approval.

7.6 Previous Water Management Programs

Cal Water has conducted conservation programs in its Bear Gulch District for many years. The Company believes that managing demand is an important element in the overall management of the water supply and has made efforts to promote conservation through educational, informational, and customer assistance activities.

7.6.1 External Measures to Achieve Public Support

Cal Water participates in regional conservation efforts through the Bay Area Water Supply and Conservation Agency. The current status of conservation program activity in the Bear Gulch District is reflected in Table 7.6-1:

Table 7.6-1: Status of Conservation Programs

Conservation Measure	Date Implemented	Program End Date
BMP 02 Plumbing Retrofit (Showerhead, kitchen aerators, hose nozzles)	1991	Ongoing
BMP 06 High Efficiency Washing Machine Rebate	2001	Ongoing
BMP 07 Public Information	1988	Ongoing
BMP 08 School Programs	1990	2004
BMP 14 ULFT Program	1992	2004 (187 replaced)

7.6.2 Internal Measures to Achieve Efficient Water Management

Distribution System Water Audit and Leak Detection Program

Annually, Cal Water completes a prescreening system audit to determine the level of unaccounted for water in each system and to evaluate whether a full-scale system audit is needed. Cal Water uses a simple method to calculate unaccounted for water, subtracting total sales from total water production, and then dividing the result by the total production amount to obtain the percentage of production that is lost. Unaccounted for water in 2004 was 3.8% of demand and has averaged 3.3% over the past ten years.

Cal Water is prepared to conduct full-scale system water audits in the event that unaccounted for water is 10% or more, providing that a full-scale system audit is cost-effective to implement. If cost-effective, a full-scale audit will be implemented using methodology consistent with that described in AWWA's Water Audit and Leak Detection Guidebook.

Water Efficient Landscape Guidelines

In 1992, water efficient landscape guidelines were developed (see Appendix G). These guidelines apply to all landscapes designed for Cal Water properties including renovations. For ease of adoption by districts with a multitude of climates and microclimates, the guidelines are generic and adhere to water efficient landscape (Xeriscape) principles.

7.7 Overall District Conservation Goals

Cal Water recognizes the importance of conservation in managing its water resources. While economic and regulatory constraints of integrating conservation into supply management have proven challenging, Cal Water is participating in efforts to develop demand management strategies, standards, and criteria by working with the California Urban Water Conservation Council. This Council was formed as part of the MOU primarily to oversee the implementation of the BMPs and to improve water conservation practices and analyses. Cal Water is committed to this process and the development of an integrated resource plan.

Cal Water's conservation programs are intended to assist customers in their efforts to use water efficiently as well as to educate them about their water supply. This will lead them to make informed decisions concerning the efficient use of water and enable them to better respond to required reductions in water use should a water shortage or emergency occur. During periods of water shortages, the Company's conservation programs can be expanded and may include more restrictive measures such as mandatory reductions, rationing, and penalties.

7.8 Implementation

Cal Water proposes to run seven conservation programs in the Bear Gulch district at an annual cost of $154,080.00, Table 7.8-1. Before implementing any conservation program, Cal Water must receive approval from the CPUC.

Table 7.8-1: Budget for Conservation Programs				
Program	**2005**	**2006**	**2007**	**Total**
BMP 02, Plumbing Retrofit	$8,620.00	$8,620.00	$8,620.00	$25,860.00
BMP 05, Large Landscape (ET Controller)	$30,540.00	$30,540.00	$30,540.00	$91,620.00
BMP 06, High Efficiency Washing Machine Rebate	$36,850.00	$36,850.00	$36,850.00	$110,550.00
BMP 07, Public Education	$15,433.00	$15,433.00	$15,433.00	$46,299.00
BMP 08, School Education	$14,400.00	$14,400.00	$14,400.00	$43,200.00
BMP 09, CII Conservation Programs	$17,841.00	$17,841.00	$17,841.00	$53,523.00
BMP 14, ULFT Rebate	$30,396.00	$30,396.00	$30,396.00	$91,188.00
Total Per Year	$154,080.00	$154,080.00	$154,080.00	$462,240.00

References

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5. California's Ground Water Bulletin 118, 2003:
   a. San Francisco Bay Hydrologic Region
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7. LandView 5 and MARPLOT ® software, US Census Bureau/Environmental Protection Agency, http://www.census.gov/geo/landview/lv5/lv5.html , http://www.epa.gov/ceppo/cameo/marplot.htm

Appendices