

**CITY OF MILLBRAE
2005
URBAN WATER
MANAGEMENT PLAN**

**City of Millbrae
2005 Urban Water Management Plan
Contact Sheet**

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The water supplier is: San Francisco Public Utilities Commission

The water supplier is a: Retailer

Utility services provided by the water supplier include: Water distribution.

Is this Agency a Bureau of Reclamation Contractor? No

Is this Agency a State Water Project Contractor? No

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- Appendix A. Urban Water Management Planning Act**
- Appendix B. Resolution to Adopt the 2005 Urban Water Management Plan**
- Appendix C. California Urban Water Conservation Council Annual Best Management Practices Report**
- Appendix D. Water Shortage Contingency Plan**
- Appendix E. Ordinance No. 593, Resolution 92-17 and Resolution 97-6**

Section I

Plan Adoption, Public Participation and Planning Coordination

Law¹

10642. Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published ... After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

A. Plan Adoption

On December 12, 2002, the City of Millbrae submitted its final draft of the 2000 Urban Water Management Plan to the California Department of Water Resources. The City of Millbrae prepared this update of its Urban Water Management Plan during the Summer of 2005. On October 25, 2005, a 30-day review period was initiated to receive any public comments regarding the 2005 Urban Water Management Plan. The updated plan was presented on December 13, 2005 to the City Council with a recommendation for its adoption by Resolution, attached as Appendix B, and submitted to the California Department of Water Resources by December 31, 2005. This plan satisfied the requirements of California Water Code Division 5, Part 2.6 (Urban Water Management Planning). The Urban Water Management Plan was also submitted to the State of California Department of Water Resources in electronic format and also forwarded to the State Library.

B. Public Participation

The plan consists of policies, programs, and procedures that have been previously adopted by the Millbrae City Council. Public hearings were held in 1991 for "Water Management Plan," in 1992 for "Water Shortage Contingency Plan," and in 1997 for "Urban Water Management Plan." For this update of the Urban Water Management Plan (UWMP), a 30-day review period was initiated on October 25, 2005 to receive any public comments regarding the 2005 Urban Water Management Plan. The public was provided an opportunity to comment on the 2005 Urban Water Management Plan prior to City Council taking action on the plan's adoption. Notice of the 30-day review period was advertised as specified in California Government Code 6066. After all comments

¹ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

from the public were received, they were reviewed and incorporated and the final draft report was presented and adopted by Millbrae City Council on December 13, 2005. The meeting agenda was posted at least seventy-two hours in advance of the meeting and the City also broadcast City Council meeting agendas and special notices on the local cable system Government Access channel.

C. Agency Coordination

Law

10620 (d) (2) Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.

Coordination within the City

The City of Millbrae is essentially “built-out” with the exception of the Millbrae Station Area Specific Plan (MSASP), the area surrounding the Multi-Model Bay Area Rapid Transit (BART) / Caltrain / SamTrans terminal. The City has undertaken a highly public planning process to shape the future of the properties immediately surrounding this station. The MSASP establishes policies that guide necessary infrastructure improvements to support development and redevelopment.

In addition, plan review sessions with the Community Development Department, Fire Department, Public Works Department, and Parks and Recreation Department are conducted on a regularly scheduled basis when development applications or notification of projects are received. Focused inter-departmental meetings are conducted to review such projects and assess the impacts including those associated with water supply issues.

Interagency Coordination

The City of Millbrae is a member of the Bay Area Water Supply and Conservation Agency (BAWSCA). 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.

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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 Supply Improvement Program (WSIP) and the associated environmental documents.

BAWSCA strives for high quality water and protection of members' customers from severe water shortages. BAWSCA, Board, and staff working together with its membership and the SFPUC, developed the Interim Water Shortage Allocation Plan (IWSAP). The IWSAP sets in place two allocation methods, to be used during system wide drought which water supply reduction is 20%, which will clarify how the available water will be shared between the SFPUC and the collective Suburban Purchasers, and how the water available to the Suburban Purchasers will be allocated. The IWSAP will also allow for "banking" and transfers of SFPUC water during droughts.

Section II

Supplier Service Area

Law²

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

10631. (a) Describe the service area of the supplier, including current and projected population, climate, and other demographic factors affecting the supplier's water management planning. The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier and shall be in five-year increments to 20 years or as far as data is available.

A. Service Area

Many factors affect the amount of water used by an urban society. These factors can include climate, the economic and demographic makeup of the population, the nature of industry and commerce in the area and the conservation ethic of the populace, be it learned or coerced. This section provides a description of the City of Millbrae's location, climate, population and topography.

Location

The City of Millbrae is located on the San Francisco Peninsula approximately fifteen miles south of downtown San Francisco.

The City encompasses an area of approximately 3.2 square miles and is bounded on the east by San Francisco International Airport and San Francisco Bay, on the south by the City of Burlingame, on the north by the City of San Bruno, and on the west by the San Francisco Bay/State of California Fish and Game Refuge which includes the various lakes and reservoirs of the SFPUC.

Climate

Average temperatures in the City of Millbrae range from a low of 40 F in winter to mid 70's in late summer. The warmest temperatures generally occur in September and October. Rainfall at the San Francisco International Airport, which borders the City of Millbrae on the east, averages 19.70 inches per year and is confined to the "wet" season from late October to early May. Except for occasional light drizzles from thick marine stratus clouds, summers are nearly completely dry.

² California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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The following table identifies the average monthly temperatures, precipitation and ETo for the City of Millbrae.

	JAN	FEB	MAR	APR	MAY	JUNE
Average Max. Temp. (F)	55.7	59.1	61.2	63.9	66.8	70.0
Average Min. Temp. (F)	42.4	44.8	46.1	47.6	50.1	52.6
Average Total Precipitation (in.)	4.47	3.59	2.81	1.35	0.38	0.11
Average ETo (in.)	1.83	2.20	3.42	4.84	5.61	6.26

	JULY	AUG	SEPT	OCT	NOV	DEC
Average Max. Temp. (F)	71.4	72.1	73.5	70.2	62.9	56.4
Average Min. Temp. (F)	53.9	54.9	54.7	51.8	47.2	43.1
Average Total Precipitation (in.)	0.02	0.05	0.19	0.98	2.45	3.69
Average ETo (in.)	6.47	6.22	4.84	3.66	2.36	1.83

Population & Demographics

The City's current population is approximately 21,800. Based on Association of Bay Area Government (ABAG) projections, the following table shows the population projection for the City of Millbrae in five year increments starting in year 2010 to year 2030.

Year	2010	2015	2020	2025	2030
Population	22,710	23,055	23,400	23,800	24,200

Currently, the City of Millbrae consists of 47.3% male and 52.7% female. The highest age percentage belongs to the 35 to 44 years old bracket. The racial makeup of the population is 66.4% Caucasian and 29.1% Asian, while the African American population is 1.1%.

The City of Millbrae consists of a variety of different industries. Construction, manufacturing, retail, entertaining and professional services are provided within the City. Retail and professional services provided in the City of Millbrae comprise 11.6% and 14.4%, respectively, of the industries in the City.

Topography

The topography is relatively flat in the eastern part of the City from U.S. Highway 101 near the San Francisco International Airport and San Francisco Bay westerly across El Camino Real (State Route 82) through the center business district. From this point to the west it is hillside with slopes increasing significantly. The ground rises from an approximate elevation of 40 feet at El Camino Real to an elevation of 500 feet in the vicinity of Interstate Highway 280, the western City boundary.

B. Water System

The City of Millbrae owns and operates approximately 70 miles of domestic watermains. Attached to these watermains are 450 fire hydrants, 1,500 valves, including hydrant and line valves, 11 pressure reducing stations, 6 water storage tanks, 2 water pump stations and approximately 6,500 service connections. The City purchases its water from the San Francisco Public Utilities Commission. The water distribution system boundaries are coterminous with the City Limits.

The Water comes from the SFPUC's Hetch Hetchy and local reservoirs and is delivered to Millbrae's distribution systems through five SFPUC turnouts. The water in the higher elevations of the City is stored in five storage tanks. The stored water is distributed throughout the water system to homes and businesses on demand. The storage tanks are capable of storing 2.1 million gallons of water.

Section III

Water Sources (Supply)

Law³

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

10631 (b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments [to 20 years or as far as data is available.

A. Water Supply Sources

City of Millbrae receives water solely from the City and County of San Francisco's regional system, operated by the San Francisco Public Utilities Commission (SFPUC). 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 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.

B. The Hetch Hetchy System

The present SFPUC water supply system evolved through the development of two separate water systems: the Spring Valley Water Company and Hetch Hetchy. The Spring Valley Water Company was established in 1858, developing a spring and several creeks into a local water system. It expanded over the years with the construction of Pilarcitos, San Andreas and Upper and Lower Crystal Springs Dams on the Peninsula, and later with the development of the Pleasanton Well Field, the Sunol Filtration Galleries and the Calaveras Dam in Southern Alameda County.

Very early during San Francisco's development it was recognized that the local water resources would be inadequate to support a burgeoning metropolis and plans for importing water from the Sierra Nevada were born. In the late 1800s, the City decided to develop its own water supply system and culminated in the planning, financing and construction of Hetch Hetchy. Because many of the Hetch Hetchy facilities were to be

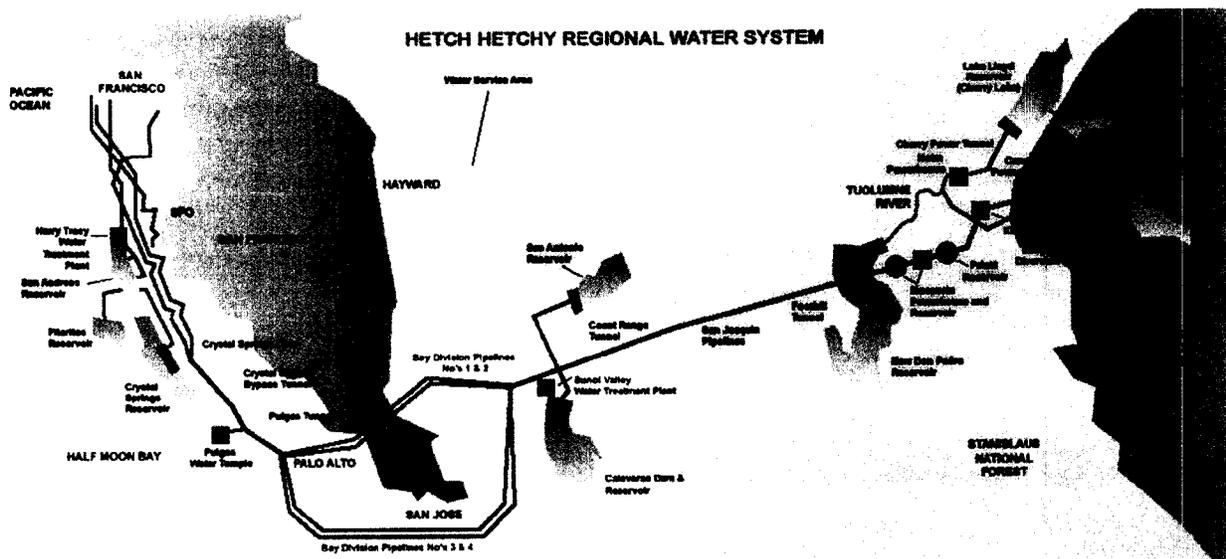
³ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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located within Yosemite National Park, Congressional approval of the project was required. That approval was granted by the Raker Act of 1913.

The construction of Hetch Hetchy began in earnest in 1914, and after almost 20 years of construction, and the acquisition of the Spring Valley Water Company by San Francisco, Sierra Nevada water began flowing into the local distribution system. Through the operation of the two systems, the SFPUC has been able to provide the residents of Bay Area communities with an unfailing supply of pure, potable water from secure sources.

Since the 1930s, the major additions to the SFPUC's water system have been the raising of O'Shaughnessy Dam and development of Lake Lloyd; the construction of additional pipelines across the San Joaquin Valley; and the local construction of Antonio Reservoir in Alameda County and the Bay Division Pipelines 2, 3 and 4. Other local projects included Crystal Springs Pipeline No. 3; Sunol Valley and San Andreas Filtration Plants; and the Crystal Springs Bypass Tunnel and Balancing Reservoir.



C. Local Watershed Production

Prior to the development of Hetch Hetchy, the SFPUC served water demands with a combination of local Bay Area watershed runoff and groundwater. These sources continue to provide a significant portion of the SFPUC's water supply during normal years (about 18 percent on average), but represent a very small portion of deliveries during periods of drought (approximately 6 percent during the 1987-92 drought).

On the San Francisco Peninsula, the SFPUC utilizes Crystal Springs Reservoirs, San Andreas Reservoirs and Pilarcitos Reservoir to capture local watershed runoff. In the Alameda Creek watershed, the SFPUC has constructed the Calaveras Reservoir and San Antonio Reservoir. In addition to using these facilities to capture runoff, they also

provide storage for Hetch Hetchy diversions, and serve as an emergency water supply in the event of an interruption to Hetch Hetchy diversions.

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 water demands that are not met with local runoff require the importation of water from Hetch Hetchy.

Local area water production is dependent on precipitation and ability of the SFPUC to regulate watershed runoff. Based upon yearly runoff, the utilization of water from the local watershed has varied from negligible to approximately 104 mgd.

D. Tuolumne River Supply

Water developed by Hetch Hetchy represents the majority of the water supply available to SFPUC's retail and wholesale customers. During drought, the water received from Hetch Hetchy can amount to over 93 percent of the total water delivered. On average, Hetch Hetchy provides over 80 percent of the water delivered by the SFPUC.

The amount of 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.

On an annual basis, reservoir storage is used to conserve the water and power resources associated with Hetch Hetchy. The annual cycle of operation regulates runoff so that hydroelectric power generation can be enhanced. The reservoir storage provides the SFPUC with year-to-year water supply carryover capability. During dry years the SFPUC has a very small share of Tuolumne River runoff available and local Bay Area watersheds produce very little water. Reservoir storage is critical to the SFPUC during drought cycles since it enables the SFPUC to carry-over water supply from wet years to dry years.

E. Water Supply Volumes

The City of Millbrae has signed a contract with SFPUC, which guarantees the City of Millbrae with enough water for its customers. The SFPUC's Contract Supply Assurance to the City of Millbrae is 3,529 acre-feet per year.

The City of Millbrae tracks its water supply volumes through its SFPUC billings. The City of Millbrae receives bills from SFPUC on a monthly basis. The bills detail how much water has been delivered to the City of Millbrae through its turnouts, where water from the San Francisco Water Department is metered.

The following table shows past, present, and estimated future water supply volumes.

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Water Supply Volumes (Past, Current, Future)	
Year	Volume (ac-ft)
1995	2,885
2000	3,073
2001	3,011
2002	3,024
2003	2,838
2004	2,852
2005	3,326
2010	3,696
2015	3,696
2020	3,696
2025	3,696
2030	3,696

The projected water supply volumes starting with year 2010 are consistent with a Demand Projection Study, which was 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. The forecasted future water demand becomes the water supply volume baseline.

F. Other Water Supply Volumes

Since the City of Millbrae relies solely on SFPUC to provide water to the residents, water supply volumes from sources such as groundwater, recycled water and water through desalination are not applicable.

Section IV

Reliability Planning

Law⁴

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

10631 (c) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable.

10631 (c) For any water source that may not be available at a consistent level of use, given specific legal, environmental, water quality, or climatic factors, describe plans to replace that source with alternative sources or water demand management measures, to the extent practicable.

10631 (c) Provide data for each of the following:

(1) An average water year, (2) A single dry water year, (3) Multiple dry water years.

10632. The plan shall provide an urban water shortage contingency analysis which includes each of the following elements which are within the authority of the urban water supplier:

10632 (b) An estimate of the minimum water supply available during each of the next three-water years based on the driest three-year historic sequence for the agency's water supply.

The City of Millbrae's water supply is dependent on SFPUC system's ability to deliver water during droughts. The following section regarding reliability planning comes from San Francisco's 2000 Urban Water Management Plan.

Reliability is defined by the amount and frequency of water delivery reductions (deficiencies) required to balance customer demands with available supplies in droughts. The SFPUC's Hetch Hetchy supply is vulnerable to periodic, short-term outages. Due to the fact that Hetch Hetchy water is not filtered, it is subject to strict water standards set by the state Department of Health Services. As a result of weather events, turbidity levels can exceed standards requiring the Hetch Hetchy supply to be shut off until levels drop to within standards. Hetch Hetchy supply outages can last a week or longer. During these periods, the SFPUC's entire supply comes from the Sunol Valley water Treatment Plant and the Harry Tracy Water Treatment Plant, both of which are supplied by local reservoirs.

A. Frequency and Magnitude of Supply Deficiencies

The total amount of water the SFPUC has available to deliver to retail and wholesale customers during a defined period of time is dependent on several factors which

⁴ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

generally reduce to a comparison of the amount of water that is available to San Francisco from natural runoff and reservoir storage and the amount of that water that must be released from the SFPUC's system for commitments to purposes other than customer deliveries (e.g., releases below Hetch Hetchy reservoirs to meet Raker Act and fishery purposes).

The 1987-92 drought profoundly highlighted the deficit between the SFPUC's water supplies and its demands. Other than the 1976-77 drought, drought sequences in the past did not seriously affect the ability of the SFPUC to sustain full deliveries to its customers. Based on the 1987-92-drought experience, the SFPUC assumes its "firm" capability to be the amount the system can be expected to deliver during historically experienced drought periods. In estimating this firm capability, the SFPUC assumes the potential recurrence of a drought such as occurred during 1987-92, plus an additional 18 months of limited water availability.

At current delivery levels, the SFPUC system can be expected to experience up to a 20 percent shortage 10 to 15 percent of the time, during multiple-year drought sequences. Therefore, the SFPUC is faced with the necessity to develop a long-term strategy to accommodate or rectify the potential of future water shortages throughout its wholesale and retail operations.

B. Plans to Assure a Reliable Water Supply

As an established major water supplier for the Bay Area region, the SFPUC has a responsibility to secure and manage its existing system supplies and plan for future needs. Given the existing circumstance that the SFPUC's water supplies are less than current system demands and that demand growth is anticipated, the SFPUC and its customers must accept the challenge of an increasing gap between supplies and demands. The SFPUC has prepared a Water Supply Master Plan to address system supply reliability issues. The Plan provides a water resource strategy that includes demand management; development of additional supplies; and facility improvements. As an extension of the Water Supply Master Plan, the SFPUC is currently exploring the possibility of increasing storage capacity at Calaveras Reservoir as a tool for improving supply reliability and potentially contributing to a Bay Area regional solution for meeting water quality objectives.

At this point in time, the City of Millbrae does not plan to replace any type of inconsistent sources with alternative sources or water demand management measures. The City of Millbrae relies solely on SFPUC as a water supplier.

In addition, the business relationship between San Francisco and its wholesale customers is largely defined by the "Settlement Agreement and Master Water Sales Contract (Master Contract)" executed in 1984. The Master Contract primarily addresses the rate-making methodology used by the City in setting wholesale water rates for its wholesale customers in addition to addressing water supply and water shortages for the regional water system. The contract expires on June 30, 2009.

In terms of water supply, the Master Contract provides for a 184 million gallon per day (mgd, expressed on an annual average basis) "Supply Assurance" 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 themselves, with each entity's share of the Supply Assurance set forth on a schedule adopted in 1993. This Supply Assurance survives the termination of the Master Contract in 2009.

The SFPUC can meet the water demands of its retail and wholesale customers in wet and normal years. 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.

C. Normal, Single Dry Year, and Multiple Dry Years Supply (Supply Assurance)

The City of Millbrae receives water from the City and County of San Francisco's regional system, operated by the San Francisco Public Utilities Commission (SFPUC). 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 facilities in Alameda and San Mateo Counties.

In 1984, the City of Millbrae 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, which expire in June 2009, provide for a 184 million gallon a day (mgd, expressed on an annual average basis) Supply Assurance to the SFPUC's wholesale customers collectively. City of Millbrae's individual Supply Assurance is approximately 3,529 acre feet per year. Although the Master Contract and accompanying Water Supply Contract expire 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 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 during droughts, emergencies and for scheduled maintenance activities. The SFPUC and all wholesale customers adopted an Interim Water Shortage Allocation Plan in 2000 to address the allocation of water between San Francisco and wholesale customers in aggregate and among individual wholesale customers during water shortages of up to 20% of system-wide use. This plan, which also expires in June 2009, is described in more detail in Section VIII.

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The SFPUC plans its water deliveries anticipating that a drought worse than the 1987 through 1992 drought may occur. As a result, the SFPUC system operations are designed for providing sufficient carry-over water in SFPUC reservoirs after six years of drought. This design would enable the SFPUC to continue delivering water, although at significantly reduced levels, during and after such a drought.

The SFPUC currently operates under a plan that anticipates three stages of response to water supply shortages, ranging from voluntary customer actions to enforced rationing, the third stage envisioned to occur only during a drought period worse than previously experienced. At current demand levels the SFPUC system can expect shortages of at least 10 to 25 percent in dry years.

The 1987-1992-drought period includes one-year and three-year sequences that are among the worst hydrologic periods projected for the SFPUC system. If within the next year a single dry (critical) year occurs, the SFPUC system deliveries could be reduced by 10 percent as a precaution to continued drought. If within the next three years a critical three-year sequence recurred, the SFPUC system deliveries could be reduced by 10-20 percent. The following table illustrates the City of Millbrae's system water availability from SFPUC for the next three years under differing assumptions of hydrologic conditions.

City of Millbrae System Water Availability				
Average/ Normal Water Year	Single Dry Water Year	Multiple Dry Water Years		
		Year 1 2006	Year 2 2007	Year 3 2008
3,500 100% of Normal	3,150 90% of Normal	3,150 90% of Normal	2,800 80% of Normal	2,800 80% of Normal
Unit of Measure: Acre-feet/Year, based on SFPUC Contract Supply Assurance Quantity				

D. Transfer or Exchange Opportunities

Law

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

10631 (d) Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.

The Water Supply Master Plan provides a discussion of the opportunities for the SFPUC to purchase water for its wholesale and retail operations. The discussion includes purchasing additional Tuolumne River water and water from willing sellers located geographically south of the Delta who possess' water rights or contractual entitlements to water diverted from the Delta. In addition, the Plan identifies potential

opportunities of water purchases from willing sellers upstream of the Delta along the Sacramento, Feather, Yuba, American, San Joaquin Rivers and their tributaries.

However, at this time and the near future, the City of Millbrae is not looking for any exchange or transfer opportunities.

E. Groundwater or Desalination Supply

The City of Millbrae does not use any groundwater, desalination or surface water supply in its water supply system.

F. Supply Projects

The City of Millbrae has conducted a rate study to increase rates to help fund the Capital Improvement Project Program. The City has developed a list of projects for the next ten years, starting with fiscal year 2002-2003. The timeline is outlined in the October 2002 Water and Sewer Rates and Capital Facilities Charges Study by Brown and Caldwell. They types of projects are water distribution improvements, storage tank upgrades, pump station upgrades and water main replacements.

The City of Millbrae is currently designing several water distribution improvement projects. Within the Millbrae Station Area Specific Plan (MSASP), the City of Millbrae plans to extend a waterline from Adrian Road, under U.S. Highway 101, to the Clarion Hotel site to construct a looped system for the redevelopment. This will provide reliability and fire protection to our customers. The water demand would definitely increase due to the redevelopment of the MSASP. Several restaurants and light industrial businesses will occupy the MSASP.

The City of Millbrae also plans to conduct upgrades to the five city-owned storage tanks. The upgrade will consist of seismically retrofitting the storage tanks to protect them from failure during a seismic event. There would be no increase in water demand due to this project; however, it would result in the reliability of supplying water for the customers and for fire protection.

Other projects the City will be conducting are the design and construction of several pressure reducing valve stations to increase water flows to various parts of the City. This would allow the affected parts of the city to receive higher flows to provide them the needed amount of fire flow, in case of fire.

The City has upgraded both pump stations by replacing all pumps, motors, can and barrels and controllers. The upgrades would provide water efficiently to all customers. The upgrades would not increase the demand on the water supply, but the pump stations would deliver water at very efficient rates with less energy consumption.

The most important projects that would increase the reliability and increase supply of water would be the water main replacement projects. Several portions of the water

system are approximately 50 years old, with the potential of leakage. By replacing these water mains, we would expect to have fewer leaks and provide better flow of water through new pipes. Of the course of the 10 years, the City of Millbrae will conduct water main replacements each year.

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.

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.

G. Water Quality

The City of Millbrae is completely dependent on the water quality delivered to its customers from SFPUC. However, the City of Millbrae conducts a comprehensive water quality assurance program. The City of Millbrae collects over forty samples a month throughout our system to monitor water clarity and the level of disinfectant. City staff sends the samples to a state certified laboratory to test for coliform bacteria. The City is pleased to report that all samples have tested negative for coliforms.

Other samples are collected periodically to check for levels of lead and copper, asbestos, disinfection byproducts such as trihalomethane (THM) and general physical components as required by state and federal regulations. The results of this monitoring show that the water supply meets all these health standards.

The City of Millbrae has installed water quality monitoring stations located at all five points of entry to our system. These are monitored by our computerized SCADA (Supervisory Control and Data Acquisition) system that generates an alarm to water supervisors.

Millbrae also conducts an annual water main flushing program. City operations crew flush mains that may develop stagnant water due to slow circulation. This program assures the water delivered is the freshest possible.

The most important way to ensure high quality drinking water is to protect the source. The City of Millbrae relies on SFPUC to conduct a watershed sanitary survey every five years to assure that watershed management practices adequately protect our water source from contamination. The surveys for the unfiltered sources in Yosemite National Park are updated annually. The second round of surveys was completed in 2000.

Regulations require the SFPUC to complete drinking water source assessments by May 2002. The SFPUC waters are vulnerable to potential contamination by wildlife and limited human recreational activity. Historical data show very low levels of contaminants in the watersheds.

As mentioned, the City of Millbrae is completely dependent on the water quality from SFPUC. If the water quality from SFPUC does not comply with standard health regulations, the City of Millbrae has devised an emergency water plan to ensure the safety of its residents. In addition to the emergency water plan, the City of Millbrae uses the "Suburban Customer Water Supply Emergency Operations and Notification Plan" provided by SFPUC to ensure the integrity of the water quality in the system. Depending on the scenario listed, the plan directs the City of Millbrae can also isolate its system by closing the turnouts located on El Camino Real, Park Boulevard and Murchison Avenue and use the water in the City of Millbrae's storage tanks. Notification of residents to decrease water demand would also occur. The plan is very thorough and the City of Millbrae will comply with its provisions.

The City of Millbrae is required to have available to its customers the annual Millbrae Water Quality Report. The 2005 Water Quality Report is available at the Public Works Department or can be viewed at <http://www.ci.millbrae.ca.us/pdf/waterquality2005.pdf>

H. Water Quality Improvements

The City of Millbrae relies on SFPUC to deliver high quality water to its customers. The SFPUC has established a Capital Improvement Program for the next ten years, not 20

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years. The following table is a partial list of SFPUC Water Quality Improvement Projects:

Project	Year
SVWTP-New Treated Water Reservoir	2007
Harry Tracy WTP Short Term Improvements Project-Phase A	2007
Tesla Portal Disinfection Facility	2008
Sunol Treatment Capacity Upgrade	2009
Hetch Hetchy Advanced Disinfection-UV	2011
Lawrence Livermore Filtration	2011
Harry Tracy WTP Short Term Improvements-Phase B	2012

The City of Millbrae has on-going water quality projects, such as installing new waterlines at dead-end to prevent stagnant water. Other water quality improvements may be added over the next ten years. Other yearly projects, related to water quality, are to buy additional Cl₂/Turbidity Instruments and Hydrant Flushing Equipment. To protect water quality, the City conducted a Terrorist Vulnerability Study and plans to install Terrorist Security devices on the pumps and tanks.

Section V

Water Use Provisions

Law⁵

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

10631 (e) (1) Quantify, to the extent records are available, past and current water use, over the same five-year increments described in subdivision (a), and projected water use, identifying the uses among water use sectors including, but not necessarily limited to, all of the following uses:

(A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof; and (I) Agricultural.

(2) The water use projections shall be in the same 5-year increments to 20 years or as far as data is available.

Past, Current and Projected Water Use

The City has 21,800 residents and a small commercial/light industrial sector. There are no agricultural connections. There are large turfed areas served. These include the Green Hills Country Club, Mills and Capuchino High Schools, four elementary schools, one middle school, City maintained athletic fields, and public parks of varying sizes throughout the City.

From the 2000 Urban Water Management Report, the following table shows the categories of service connections:

LAND USE TYPE	# OF CONNECTIONS	% OF TOTAL CONNECTIONS
Residential	5,896	92.92%
Commercial	281	4.43%
Institutional/Governmental	63	0.99%
Landscape/Recreation	47	0.74%
Fire/Other	58	0.92%
TOTAL	6,345	100.00%

⁵ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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The current categories of service connections are distributed as follows:

LAND USE TYPE	# OF CONNECTIONS	% OF TOTAL CONNECTIONS
Residential	5,935	92.42%
Commercial	291	4.53%
Institutional/Governmental	49	0.76%
Landscape/Recreation	59	0.92%
Fire/Other	88	1.37%
TOTAL	6,422	100.00%

The residential sector average 63% of total supply demand although this sector has approximately 92.42% of total system connections. Single-family connections average 3 persons per household; multi-family connections average 2 residents per living unit and 10 living units per connection.

The commercial/light industrial sector accounts for approximately 21% of demand with approximately 4.53% of the connections. The irrigation sector accounts for approximately 5% of supply demand with approximately 0.92% of the system connections.

Institutional/Governmental and Other sectors accounts for approximately 10% of supply demand with less than 2.2% of system connections.

Losses in the system are estimate at 0.4% of the total supply demand. Losses include fire fighting use and system flushing through fire hydrants, water main breaks, and undetected leaks.

By comparing the two tables, the total number of connections has increased from 6,345 to 6,422. The biggest increase was in the fire/other category from 58 to 88 connections. The following table is the project number of connections for the next 25 years.

LAND USE TYPE	2010	2015	2020	2025	2030
Residential	6,332	6,439	6,519	6,599	6,680
Commercial	320	325	330	334	338
Institutional/Governmental	51	53	55	57	60
Landscape/Recreation	60	61	61	62	63
Fire/Other	91	95	99	103	107
TOTAL	6,854	6,973	7,064	7,155	7,248

Projected Demands

The water demand projections for this Urban Water Management Plan 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). Projected water use by Millbrae's retail customers has incorporated forecast data developed by the Association of Bay Area Governments (ABAG) that includes projected population, housing units and employment in Millbrae.

Also incorporated into the forecast demand is the anticipated change in water use within the residential and non-residential sectors due to conservation programs. 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. These programs are consistent with the Memorandum of Understanding Regarding Urban Water Conservation in California, which Millbrae signed in 1991. This document committed Millbrae to the evaluation and implementation of numerous long-term conservation measures, which are, referred to as Best Management Practices (BMPs).

The water demand forecasts show that Millbrae's retail water demand increases into the year 2030 (see table below). Demands are projected to slightly decrease from approximately 3.21 mgd in the year 2010 to approximately 3.19 mgd by the year 2030 due to conservation efforts implemented by the City or residents.

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Projected Water Demands (mgd)*					
Entity	Calendar Year				
	2010	2015	2020	2025	2030
Residential	2.06	2.03	2.02	2.00	2.00
Commercial	0.66	0.66	0.67	0.68	0.68
Institutional/Governmental	0.15	0.15	0.15	0.14	0.14
Landscaping/Recreation	0.15	0.16	0.16	0.16	0.16
Fire/Other	0.20	0.20	0.20	0.21	0.21
Conservation	0.09	0.09	0.10	0.11	0.11
Total Water System Retail Demand	3.30	3.30	3.30	3.30	3.30
Total Water System Purchases (without Conservation)	3.21	3.21	3.20	3.19	3.19

*mgd=1,000,000 gallons per day.

Conversion: 1 mgd = 1,336.8 hcfpd (hundred cubic feet per day)

Total Water System Retail Demand based on 11/04 Demand Study

Section VI

Supply and Demand Comparison Provisions

Law⁶

10635 (a) Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from the state, regional, or local agency population projections within the service area of the urban water supplier.

As previously mentioned the City of Millbrae purchases its water from the SFPUC. The following discussions for the supply and demand comparison of the water supply come from San Francisco's 2000 Urban Water Management Plan.

Supply and Demand Comparison

Table A compares current, and projected City of Millbrae water supply and demand. It indicates that during normal precipitation years, the City of Millbrae has adequate supplies to meet its projected retail and wholesale water demands.

Table A					
Projected City of Millbrae System Supply and Demand Comparison					
Normal Years (Non-drought Years)					
	Current	2010	2015	2020	2025
System Demand Totals	< 3.30	< 3.30	< 3.30	< 3.30	< 3.30
System Supply Totals	3.30	3.30	3.30	3.30	3.30
Difference	0	0	0	0	0
Units of Measure: mgd					

As Millbrae's water demands increase in the future, absent actions to increase the SFPUC system water supplies, the customers will be subjected to an increasing risk of water delivery shortage. A single dry-year (critical) condition following a normal-year could cause the imposition of system-wide water shortages. Table B illustrates the level of first dry-year water delivery shortage that could occur with the projected 5-year increments of water demands.

⁶ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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Table B Projected City of Millbrae System Supply and Demand Comparison Single Dry-year						
	Current	One Critical Dry Year	2010	2015	2020	2025
System Demand Totals	2.58	2.44	3.21	3.21	3.30	3.30
System Supply Total	2.32 90% of Demand	2.20 90% of Demand	2.73 85% of Demand	2.73 85% of Demand	2.81 85% of Demand	2.81 85% of Demand
Difference	0.26	0.24	0.48	0.48	0.49	0.49
Units of Measure: mgd						

Multiple-year drought sequences could subject the customers to greater levels of shortage. Table C illustrates the level of water delivery shortages that would be anticipated if a three-year dry hydrologic condition occurred for the City of Millbrae.

Table C Projected City of Millbrae System Supply and Demand Comparison Multiple Dry-years							
Year	Purchase Request	Single Dry Year	Year 1	Year 2	Year 3	Year 4	Year 5
2005	2.58	2.44	2.44	2.12	2.12	2.12	2.12
2010	3.21	3.21	3.21	2.76	2.76	2.40	2.40
2015	3.21	3.21	3.21	2.80	2.80	2.80	2.80
2020	3.20	3.20	3.20	2.89	2.89	2.52	2.89
2025	3.19	3.19	3.19	2.98	2.98	2.60	2.60
2030	3.19	3.19	3.06	2.67	3.06	2.67	2.67

Units of Measure: mgd

As illustrated in Table A above, during non-critical years the customers will not be curtailed in their deliveries within the reporting period. However, as illustrated in Table B and Table C, during single dry-year or multiple dry-year events the system supply available to the customers may be limited.

The illustrations shown above depict anticipated shortages on a system-wide basis. Historically, system-wide shortages have been applied to customers based on the circumstances occurring at the time. During the 1987-92 drought, procedures included considerations of anticipated impacts upon the systems' end-user use of water. These considerations lead to a differing amount of delivery reduction to each individual customer.

Section VII

Water Demand Management Measures

Law⁷

10631 (f) Provide a description of the supplier's water demand management measures. This description shall include all of the following:

(1) A description of each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following:.....

The City of Millbrae is signatory to the Memorandum of Understanding Regarding Urban Water Conservation in California dated September 1991, and is a member of the California Urban Water Conservation Council (CUWCC). Millbrae as submitted its 2001-2004 annual reports to CUWCC listing its progress towards implementing the various Council Best Management Practices (BMP's). It is attached as Appendix C. The alternative conservative measures in use by the City are set out in the BMP Report.

In compliance with the BMP's, and in accordance with applicable State law(s), the City has an ongoing Water Conservation Program. Chapter 9 of Title 8 of the Millbrae Municipal Code establishes the City's program. Ordinance No. 593 amending the Code to update the City's program in 1993 is attached as Appendix E.

A. Conservation Measures

The conservation measures previously planned or being planned and currently being pursued include those shown below with an implementation schedule and 5-year budgets.

New economic evaluations were not performed on the programs. Experience has shown how effective programs are and available literature on new programs has provided adequate knowledge about the programs to allow prudent planning. The planned budget was developed by this kind of analysis.

⁷ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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**Table D
Conservation Measures**

<u>Conservation Measure</u>	<u>Existing Measure</u>	<u>Proposed Implementation</u>	<u>5-year Budget</u>
Public Information Program:			
I. -Conservation Literature			\$125,000
-Promotional Measures	Yes	Continue	
-Work With large Water Users	Yes	Continue	
-In-School Education	Yes	Continue	
-Information on Federal and State Laws and Programs	Yes	Continue	
II. Water Management Programs			\$100,000
-System-Wide Water Audits	Yes	Continue/Emphasize	
-Leak Detection Program	Yes	Continue/Emphasize	
-Meter Calibration	Yes	Continue	
-Corrosion Control	Yes	Continue	
-Device Distribution Including:	Yes	Continue	
Residential Retrofit Kits			
Residential Showerheads			
Commercial Showerheads			
Garden Nozzles			
-Rebate Program Including:			
Ultra-Low-Flow Toilet			
Residential	Yes	Continue	
Commercial	Yes	Continue	
Horizontal Axis Clothes Washer			
Residential	Yes	Continue	
Commercial	Yes	Continue	
-Meter Replacement		Complete	
-Conservation Pricing	Uniform		

During the previous planning periods, limited attention was possible on audits and leak detection. These areas are planned for emphasis during the next five years. The City has installed a touch read system on its water meters. The new meters accurately measure water delivered and has led to a higher degree of awareness as to actual use and conservation. Pricing was not adjusted to compensate for measured usage changes. The new meter system was augmented with a new utility billing system that provides information and opportunities for further consideration of conservation pricing.

Qualitative and limited quantitative criteria were used to evaluate the water management actions that Millbrae should take. Qualitative criteria include public acceptability, administrative feasibility, likelihood of adoption, and potential for future water savings, as well as expected contributions to overall City goals for increasing both water conservation awareness and knowledge of effective technologies.

Quantitative criteria used were limited to a review of benefit-cost ratio, internal rate of return, net present value, and payback period. The principal criteria used in that analysis were the benefit-cost ratio and the net present value. Each program was also examined from a societal, agency, and participant perspective. The participant perspective for all programs had to pass the criteria of being beneficial to participants. As a public entity, the City of Millbrae is concerned with societal and agency perspectives.

B. Conservation Measures of Effectiveness

Experience has shown that the ability to effectively and quantitatively measure the effectiveness of any particular conservation measure is limited unless large amount of effort and dollars are applied. The City has not tried to be extensive and elaborate in measurements. Certain programs such as rebates for toilet replacements that result in quantified replacements can yield calculated water savings. These kinds of calculations are made. In sum, however, total water consumption is tracked and monitored for various sectors and uses and observations made to see if use patterns could be correlated to any particular activity. The implementation of a specific or "sizable" measure is monitored for its impact. All persons involved in the City's water management from managers to maintenance staff have been trained and are sensitive to waste prevention and water conservation and provide eyes and ears to observe and collect data and the brainpower to reduce that data to useful information that helps evaluate effectiveness. However, calculated by industry standards, by implementing the rebate programs the City of Millbrae has conserved 45.8 acre-feet of water as of June 30, 2005.

C. Program Findings and Planning

The use of water system audits and leak detection has been limited during the past few years as line loss is acceptable within American Water Works Association (AWWA) specifications.

D. Once-through Cooling Systems

Audits have revealed the use of "once-through" cooling systems for cooking areas in some restaurants. Health Code requirements, worker considerations and practical consideration present challenges to changing the situation.

E. Conservation Measure Enforcement

Enforcement is active by inspections and observations by field forces in the Water Division and other staff members who are sensitive to the conservation program. Additionally, the City's plan review process includes explicit consideration of water conservation in all development planning. The development inspection process ensures compliance.

F. Community Involvement

Water management and conservation are routine and periodic subjects for public service announcements, City reports, City activities such as open houses and community forums, and action items before the Planning Commission and City Council. Adequate press and public awareness programs have been implemented in Millbrae.

G. Regional Coordination On Demand Management

BAWSCA and its member agencies look for opportunities to work with other water agencies, including the SFPUC and SCVWD, and leverage available resources in implementing water use efficiency projects. For example, in 2005, the SFPUC and BAWSCA entered into a Memorandum of Understanding (MOU) regarding the administration of a Spray Valve Installation Program. Through this MOU, SFPUC and BAWSCA will work cooperatively to offer and coordinate installation of water conserving spray valves to food service providers in BAWSCA member service areas. Recently the Bay Area Efficient Clothes Washer Rebate Program, a single rebate program offered by all major water agencies in the greater Bay Area including BAWSCA and the SFPUC, was recipient of \$1.5M in Proposition 50 grant funds for implementation as early as FY 2006/2007.

BAWSCA and its member agencies will continue to look to partner with other agencies to develop regional water conservation efforts that look beyond local issues of supply and cost-effectiveness to examine costs, benefits and other related issues on a system-wide level. The goal is to maximize the efficient use of water regionally by capitalizing on variations in local conditions and economies of scale.

Section VIII

Water Shortage Contingency Plan

Law⁸

10632. The plan shall provide an urban water shortage contingency analysis, which includes each of the following elements, which are within the authority of the urban water supplier:

10632 (a) Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply and an outline of specific water supply conditions which are applicable to each stage.

10632 (c) Actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.

10632 (d) Additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.

10632 (e) Consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.

10632 (f) Penalties or charges for excessive use, where applicable.

10632 (g) An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier...[analysis of] proposed measures to overcome those [revenue and expenditure] impacts, such as the development of reserves and rate adjustments.

10632 (h) A draft water shortage contingency resolution or ordinance.

10632 (i) A mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.

During the late 1980's/early 1990's drought continued, the City developed a "Water Shortage Contingency Plan" as an amendment to the City's September, 1991, "Urban Water Management Plan." This plan was adopted by City Council resolution No. 92-17 on January 28, 1992 and updated in the 1996 Plan. As part of the development of this 2005 plan, the Water Shortage Contingency Plan has been revised again and is

⁸ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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attached as Appendix D. Incorporated in our plan is BAWSCA's Interim Water Shortage Allocation Plan (IWSAP).

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 2000. 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:

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.

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The IWSAP will expire in June 2009 unless extended by San Francisco and the wholesale customers. The projected amount of water which the City of Millbrae expects to receive from SFPUC during dry years after 2010 shown in Table B on page 22 has been calculated by SFPUC on the assumption that the Plan will in fact be extended.

Section IX

Water Recycling

Law⁹

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (a) A description of the wastewater collection and treatment systems in the supplier's service area...

A. Recycled Water History

The City of Millbrae's Public Works Department has been instrumental in the development of a water recycling plan. The City of Millbrae's first recycled water project occurred in 1994. A cooperative agreement with the department of Transportation (Caltrans) was executed for the use of recycled water for landscape irrigation of Caltrans property in the vicinity of the Water Pollution Control Plant (WPCP) and for U.S. Highway 101 landscape medians. The WPCP recycled water system is designed to provide disinfected secondary treated "restricted" use recycled water that is suited for this purpose.

In 1996, a truck loading facility was constructed to provide recycled water for roadway dust control and construction soil compaction. From 1996 to present "restricted" use recycled water include the US 101/Millbrae Avenue Interchange Improvement Project, which was completed in 2002. An irrigation system for "restricted" water use has been incorporated into the project plans.

In 1997, the City of Millbrae adopted a "Station Area Specific Plan" for retail, commercial, and residential development in the vicinity of the Millbrae Bart/Caltrain Stations. These projects are in close proximity to the WPCP, thus facilitate distribution of recycled water to these locations. The "Specific Plan" development is expected to occur over the next 10 years. Millbrae is considering establishing conditions of project approval that will require the installation of recycled water systems for landscape, toilet flushing, cooling water towers, and other appropriate uses. To provide recycled water to BART and "Specific Plan" development will entail construction of a new "unrestricted" Title 22 tertiary recycled water system at the WPCP. Plans for construction of this system have been incorporated in the Millbrae Public Works Department Capital Improvement Program. Funding for the system may be problematic.

⁹ California Water Code Division 6, Part 2.6 (Urban Water Management Planning). See Appendix A for a complete copy of the Urban Water Management Planning Act.

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Long-range goals over the next 5 to 10 years include branching out from the BART and "Specific Plan" development to include other identified users with high demand and greatest cost versus benefit ratio.

B. Participation in Regional Recycled Water Planning

Millbrae is an active member of the Northern California Chapter of WaterReuse Association, which helps implement water recycling in California.

C. Wastewater Generation, Collection, Treatment, & Disposal

The Millbrae wastewater collection, treatment and disposal system consists of separate sewer collection system, a Water Pollution Control Plan (WPCP), and joint use force main for discharge into the San Francisco Bay.

The collection system and WPCP serve the approximately 21,800 residents and the businesses in the City. The collection and conveyance system consists of approximately 57 miles of various sized underground sewer pipes and three (3) sewage pumping transport facilities. The WPCP is located on a 4.1-acre site located in the northeast cloverleaf of the Highway 101-Millbrae Avenue Interchange.

The facility operates year round and has a designed dry weather capacity of 3.0 million gallons per day (mgd), with a peak wet weather flow of 9 mgd. The facility provides primary – secondary treatment and disinfection prior to pumping into the Joint Use Force Main (JUFM) and then discharge into the San Francisco Bay.

The Millbrae WPCP produces a limited amount of "restricted" use disinfected secondary recycled water. Disinfected secondary effluent is re-chlorinated and pumped to a 5,000 gallon polyethylene recycled storage tank. Two (2) seven and one-half horsepower pumps are connected downstream of the storage tank to irrigate Caltrans property landscaping and Highway 101 roadway medians in the vicinity of the facility. The system also consists of a truck loading facility by way of 4-inch standpipe located outside the WPCP gate.

The City of Millbrae is allowed to discharge up to an annual average of three (3) mgd. The following table shows past, current and future wastewater volume being treated at the WPCP.

YEAR	2000	2005	2010	2015	2020	2025
Volume (mgd)	2.05	1.86	2.10	2.35	2.60	2.85

With conservation measure and at full build-out, the City of Millbrae projects that approximately 2.85 mgd of wastewater will be treated in year 2025. As you can see, between years 2000-2005, treatment of wastewater has decreased. One reason for the

decrease can be attributed to residents becoming more water wise and conserving water.

D. Recycled Water Use

Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (b) A description of the recycled water currently being used in the supplier's service area, including but not limited to, the type, place and quantity of use.

10633 (c) A description and quantification of the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.

10633 (d) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years.

Recycled Water Currently Being Used. Millbrae can only provide "restricted" use disinfected secondary (23 Most Probable Number [mpn]) recycled water for landscape irrigation and contractor activities such as dust control and soil compaction. Potential uses and distribution of "restricted" use recycled water are limited within the City. Currently, approximately 15,000 gallons per day is being distributed for BART construction activities. It is anticipated this total will increase in 2001 as construction activities increase. The existing Caltrans property irrigation system is currently inoperable from damage during recent roadway construction. The City staff has trucked recycled water from the City's WPCP to irrigate some landscaping and road medians. To expand production and use a tertiary "unrestricted" use recycled water system needs to be constructed at the WPCP.

Potential Uses of Recycled Water. Studies completed by EOA and Kennedy/Jenks Engineers have identified potential sources and use estimates for recycled water in addition to existing uses. The following charts show recycled water use and source/type estimates.

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**Table E
Recycled Water Use Projections (Units in mgd)**

Month	2004 (actual)	2010	2015	2020	2025	2030
Jan	0.0	0.3	0.3	0.5	0.5	1.0
Feb	0.0	0.3	0.3	0.5	0.5	1.0
Mar	0.2	0.4	0.4	0.8	0.8	1.3
Apr	0.2	0.5	0.5	1.0	1.0	2.0
May	0.1	0.5	0.5	1.0	1.0	2.0
Jun	0.3	0.8	0.8	2.0	2.0	4.0
Jul	0.2	1.0	1.0	2.0	2.0	4.0
Aug	0.2	1.0	1.0	2.0	2.0	4.0
Sep	0.2	1.0	1.0	2.0	2.0	4.0
Oct	0.8	1.0	1.0	2.0	2.0	4.0
Nov	0.0	0.5	0.5	1.5	1.5	3.0
Dec	0.0	0.3	0.3	0.8	0.8	1.5

**Table F
Type of Local Recycled Water Use (%)**

Customer	Current	Projected 2010	Projected 2015	Projected 2020	Projected 2025	Projected 2030
Landscape Irrigation	95	80	70	60	50	50
Golf Courses	0	0	5	5	10	10
Construction Activities	5	10	10	15	15	15
Public Open Spaces	0	5	5	10	15	15
Industrial	0	0	0	0	0	0
Commercial	0	10	10	10	10	10
	100	100	100	100	100	100

E. Encouraging Recycled Water Use

Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (e) A description of actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.

Proposed Actions to Encourage Use of Recycled Water

To encourage the use of recycled water in the City, Millbrae is considering establishing the use of recycled water in the conditions of project approval for "Specific Plan" development within the City. These conditions of approval will require, within a geographic area, dual plumbing for the following:

- New or remodeled buildings and all subdivisions (with exception of residential and condominium conversions) with a total of 40,000 square feet, or greater, to install dual plumbing for irrigation, toilet flushing, and industrial processes
- New and existing landscaped area 1,000 square feet or larger, to install dual plumbing for irrigation.

Millbrae has conditions in the BART station construction contract, which requires the use of recycled water for soil compaction and dust control during construction and demolition projects, and a cooperative agreement with Caltrans to supply recycled water for landscape irrigation. The City has insured that irrigation plans were incorporated into the US 101/Millbrae Avenue Interchange Improvement project scheduled for construction in 2001 and BART station scheduled for completion in 2002.

The City Department of Public Works Capital Improvement Program has identified projects to improve the existing recycled water system and distribution system to capture to the fullest extent possible recycled water opportunities as they arise in the City.

Marketing and Financing Strategy. The new MultiModal station is planned to be in revenue service in 2002. The City has adopted an "Area Specific Plan" for development surrounding the new BART/Caltrain station in Millbrae. These projects provide a good opportunity to market and expand recycled water use. Engineering studies completed have determined the infrastructure needed to support the "Area Specific Plan" development. Infrastructure improvements have been scheduled in phases to take place as development unfolds. A tertiary recycled water system is currently planned for construction in 2007 if funding is available.

The Capital Improvements Required to Implement The Area Specific Plan—The Millbrae Water Recycling Water Study completed by Eisenberg, Olivieri & Associates, Inc. (EOA) (1995) evaluated the possibilities of increased uses for recycled water in Millbrae. The study identified the potential to provide 0.3 mgd of recycled water for non-potable uses. The study was conducted in Three (3) Tasks. Task 1 determined the potential recycled water demand for existing the future facilities in Millbrae. Task 2 evaluated the existing Water Pollution Control Plant recycled water system and recycled water quality to determine needed treatment improvements to serve potential users identified in Task 1. Task 3 included conceptual recycled water pipeline alignments to users, and a financial analysis to estimate the financial obligation of various sized water recycling programs for decision maker planning.

The Millbrae Assessment and Determination of Existing Infrastructure Capacity – Task Order C4 completed by Kennedy/Jenks Engineering, Inc. (1999) utilized the EOA study information to evaluate and determine conceptual design tertiary recycled treatment system options and cost estimates for “unrestricted” Title 22 production. Recycled water storage and distribution was not evaluated and is planned for incorporation in future work. Results and information from Kennedy/Jenks Task Order C4 has been incorporated into the Public Works Department Capital Improvement Program and Financial Plans. Citywide Infrastructure Improvements, including a recycled water system are scheduled to be completed in phases over the next 10 years. Currently Millbrae distributes “restricted” disinfected secondary recycled water for dust control and soil compaction at the Millbrae BART/Caltrain station

Economic Considerations. The estimated capital cost for the required 1.0 mgd tertiary system at the WPCP is \$2.2 million dollars. The estimate for the required storage and distribution system is estimated to cost \$5.0 million dollars to reach all identified recycled water users. Annual operation and maintenance costs are estimated to be about \$60,000. The “cost to serve” analysis completed by EOA (1995) showed that in order to “cost minimize” a recycled water distribution system some users would have to be excluded. Ultimately, under each “cost to serve” option identified the City would have to subsidize some level of capital costs through reduced recycled water rates to provide a financial incentive to potential users. There are also reduced potable water supply revenues to consider. This may increase the cost of potable water rates to cover the system fixed costs. The rationale is that all the water customers benefit by the increase in available water supply of potable water, especially during a drought, and therefore they should pay a portion of the costs.

F. Recycled Water Optimization Plan

Law

10633. The plan shall provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. To the extent practicable, the preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies and shall include all of the following:

10633 (f) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems and to promote recirculating uses.

Plan for Optimizing the Use of Recycled Water

As mentioned above, Millbrae is considering establishing conditions of approval that will include requiring installation of dual plumbing in buildings and subdivisions of particular size and for irrigation for "Area Specific Plan" projects. Other plans include:

1. Developing a Recycled Water Master Plan in the near future. This plan will bring together information from studies mentioned in this document and financial plans and include a phased or step approach to implementing recycled water projects and expanding the distribution system over time.
2. Evaluating the potential for Private Public Partnership.
3. Identify and pursue Federal and State grants and funding options for recycled water.