

## **APPENDIX D**

### **2005 WATER SHORTAGE CONTINGENCY PLAN**



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## General

This plan is an update to the 2000 Water Shortage Contingency Plan submitted to the Department of Water Resources on December 12, 2002. The numbers in the following tables are based on 1996-1999 actual numbers. Based on the past 10 years, the 1996-1999 numbers are of historical value due to past drought conditions and high demand usage.

## Section 1: Coordinated Planning

The City of Millbrae is fully dependent on imported water supplied by the San Francisco Public Utilities Commission (SFPUC). Limited storage, no wells, and no current supplemental sources highlight the importance of adequate water supply planning to meet future requirements.

The City of Millbrae participates in the Bay Area Water Supply and Conservation Agency (BAWSCA) that represents the 29 wholesale agencies served by the San Francisco Public Utilities Commission (SFPUC). BAWSCA strives for high quality water and protection of members' customers from severe water shortages.

BAWSCA, working together with its membership and the SFPUC, developed the Interim Water Shortage Allocation Plan (IWSAP). The water shortage plan eliminated the existing contractual penalties to conservation of the Master Contract's shortage allocation provisions and provides a better basis for future planning for the members.

The IWSAP accomplishes four main objectives. First, it establishes agreed-upon percentages that will determine how the available water will be shared during a system-wide drought between SFPUC and the collective Suburban Purchases. Second, it establishes an allocation formula that will determine how the available water will be allocated among the individual Suburban Purchasers themselves. Third, it allows for "banking" of SFPUC water during droughts by those agencies, which use less water than their allocation. Lastly, it allows for the transfer of banked SFPUC water and water allocations among the parties during droughts.

On September 21, 2000, the BAWSCA Board unanimously adopted the shares between the SFPUC and the Suburban Purchasers. On October 24, 2000 the San Francisco Public Utilities Commission adopted IWSAP Tier One Plan. Tier One Plan is the IWSAP between the SFPUC and Suburban Purchasers. On November 15, 2000, the BAWSCA Members adopted a resolution endorsing the IWSAP Tier One and Tier Two Plan and respectfully recommended that each BAWSCA member agency adopt both plans as well. Tier Two Plan, the IWSAP among the Suburban Purchasers, requires adoption by the governing bodies of each BAWSCA member.

Once all governing bodies of BAWSCA members have adopted the Tier One and Tier Two Plans, the IWSAP will supersede the method for allocating shortages among the Suburban Purchasers provided for Section 7.03 (b) of the Master Contract.

This contingency plan is included as required by Section 10631(e) of the California Water Code. This plan is an update of the Plan adopted in 1992, during the latter stages of the 1980's/1990's drought, and updated and adopted in 1997.

It should be recognized that this Plan must be considered as a planning document. At the onset of any subsequent drought, characteristics of use, supply allocations, etc., may have changed significantly from current conditions. It may be necessary to amend this plan upon re-implementation to account for specific changed conditions.

To comply with Section 10631(e)(8), copies of Resolution No. 92-17 and 97-6 are included in Appendix D. These Resolutions approved and adopted the 1992 and 1996 Urban Water Shortage Contingency Plan as a component of their respective Urban Water Management Plan. The contingency plan is being adopted as part of the management plan as required by section 10631(e). Should it become necessary to amend the contingency plan at the onset of a new drought, these Resolutions would be used as models.

## **Section 2: Past, Current and Projected Water Use**

During the years of the drought in the late 1980's and early 1990's, the City of Millbrae had a full time staff to plan and conduct a water conservation program and other water management activities. That staff's efforts of raising awareness and educating the public have carried over into the recent years of adequate water supply. Water consumption has not returned to pre-drought levels.

A staff person who has other responsibilities as well currently implements the City's Water Conservation Program on a part time basis.

Millbrae 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.

The residential sector averages 70% of total system demand although this sector has approximately 93% of total system connections (5,896 of 6,345 total). 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 from approximately 18% of demand with approximately 4.5% of the connections. The irrigation sector accounts for approximately 6% of system demand with less than 0.92% of system connections.

Governmental/Institutional and other sectors accounts for approximately 5% of system demand with less than 1% of system connections.

Losses in the system are estimated at 0.37% of total system demand. Losses include fire fighting use and system flushing through fire hydrants, water main breaks, and undetected leaks.

**Table 1**  
**1996-2000**  
**Potable Water Use (units in HCF\*)**

Type of Service	1996	1997	1998	1999	2000
Residential	891,704	929,272	824,246	892,215	918,845
Commercial	230,017	251,165	234,299	180,241	214,345
Landscape/ Recreation	93,667	107,880	71,413	107,537	83,043
Institutional/ Governmental	15,745	19,660	13,626	6,355	73,579
	1,231,133	1,307,977	1,143,584	1,186,348	1,289,812
	v	v	v	v	
	6.2%	-12.5%	8.4%	8.7%	

\*HCF=Hundred Cubic Feet  
Conversion: 1 HCF = 748 gallons

Table 1 provides an overview of water use over the years 1996-2000. This Table was developed using the data generated from our Finance Office water meter billing records. Projections for years 2010, 2015, 2020, 2025 and 2030 are located on page 19 of the Urban Water Management Plan and based on a November 2004 Demand Study.

The City's contract with SFPUC allows the City to purchase up to 1,464,000 Hundred Cubic Feet (HCF) per year. The City's projected demand for the year 2000 will approach 89% of that figure by drawing 1,301,654 HCF. For the five year period, 1996 through 2000, total system demand has varied from 1,143,584 HCF to 1,307,977 HCF. Average system demand for the last five years has been just under 1,217,000 HCF per year, almost 17% below Millbrae maximum SFPUC contract amount of 1,464,000 HCF.

During the 1997 peak demand year, consumption averaged 56 gallons per capita per day (gpcpd) for single-family residences and 62 gpcpd for multi-family units.

Total system water consumption over the past five years has leveled off somewhat. Current demands are approximately 60 gpcpd for single-family residences. Per capita use for multi-family units had decreased to 55 gpcpd.

Although expansion of Millbrae's service area is limited due to geographical constraints, the area will experience some population and business growth with the development of the Millbrae Station Area Specific Plan. ABAG population projections forecast a 9% increase in population by 2020. Residential demand is projected to increase in year 2010; however, with water conservation, demands will decrease by 3% by year 2025. Commercial and other non-irrigation sectors are expected to experience the same trend in decrease. With normal rainfall patterns over the past few years, irrigation demand is anticipated to increase approximately 0.2% per year.

### **Section 3: Water Supply Shortage**

As previously mentioned, the City of Millbrae is a member of the Bay Area Water Supply and Conservation Association (BAWSCA), an association of twenty-nine member agencies that purchase water from the San Francisco Public Utilities Commission for distribution and resale to member agency customers.

The City of Millbrae is 100% dependent on imported water from SFPUC. The City has little, if any, opportunity for supply expansion due to the impracticalities and cost of new transmission facilities, lack of ground water, environmental constraints, and political realities. This makes supporting the IWSAP developed by the SFPUC and BAWSCA essential for responding to a system wide drought.

In a supply shortage, under the IWSAP, the SFPUC will determine whether voluntary or mandatory actions will be required to reduce purchase of SFPUC water to required levels to meet water supply available. If SFPUC determines that voluntary actions will be sufficient to accomplish the necessary reductions in water use throughout its service area, the SFPUC and the Suburban Purchasers will make good faith efforts to reduce their water purchase to stay within their annual shortage allocations and associated monthly water use budgets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits, or impose a ceiling on further accumulation of bank credits. If the SFPUC determines that mandatory actions will be required to accomplish the necessary reductions in water use in the SFPUC service area, the SFPUC may implement excess use charges.

The annual allocation between the SFPUC and the collective Suburban Purchasers is as shown in Table 2:

<p><b>Table 2</b>  <b>Water Shortage Allocations</b>  <b>Between SFPUC and Suburban Purchasers</b>  <b>(Annual Basis)</b></p>
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<b>Level of System Wide Reduction in Water Use Required</b>	<b>Share of Available Water</b>	
	<b>SFPUC Share</b>	<b>Suburban Purchasers Share</b>
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%

This allocation only applies to shortages of 20% or less. The SFPUC and Suburban Purchasers recognize the possibility of a drought occurring which could create system wide shortages greater than 20 percent despite actions taken by the SFPUC aimed at reducing the probability and severity of water shortages in the SFPUC service area. If the SFPUC determines that a system wide shortage greater than 20 percent exists, the SFPUC and the Suburban Purchasers agree to meet within 10 days and discuss whether a change is required to the allocations set forth in Table 2 in order to mitigate undue hardships that might otherwise be experienced by individual Suburban Purchasers or Direct City and County of San Francisco Water Users. Following these discussions, the water allocation established by the IWSAP or a modified version may be adopted by mutual written consent of the SFPUC and the Suburban Purchasers. If the SFPUC and Suburban Purchasers cannot agree on an appropriate allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then the provisions of the Master Contract will apply unless all of the Suburban Purchasers direct in writing that an allocation methodology agreed to by them be used to apportion the water to be made available to the Suburban Purchasers collectively, in lieu of the provisions of the Master Contract.

SFPUC currently delivers 261 million gallons of water per day (mgd) for all users including the City and County of San Francisco. Of that amount, Millbrae is entitled to approximately 3.15 mgd. Millbrae currently consumes approximately 2.69 mgd.

**Table 3**  
**Customer Type, Normal Annual Demand Including Growth**  
**1000 HCF Non-Drought Conditions**

Customer Type	Connections (2000)	Highest Use (1997)	Actual Use (2000)	Adjusted Avg. Use (1996-99)	gpcpd*
Single-Family	5,656	724.4	726.4	686.2	82.9
Multiple-Family	253	196.1	192.3	189.8	76.7
Commercial	284	251.2	214.4	223.9	
Governmental	32	19.7	30.4	16.4	
Irrigation	48	68.3	79.2	58.0	
Other	61	48.3	47.1	43.1	
<b>Total</b>	<b>6,361</b>	<b>1,308.0</b>	<b>1,289.8</b>	<b>1,217.3</b>	

\*gpcpd -= gallons per capita per day. This is calculated by converting 1000 HCF to gallons that equal 748,000 gallons. For purposes of this report, each single-family connection is assumed to have three residents and multi-family connections consist of 10 units with two residents each (totally 20 people).

**Table 4**  
**Supply Sources and Worst Case Supply Projections**  
**(1000 HCF)**

Source	Annual Contractual Amount	Highest Year Purchase 1997	Average Use Base Year	Projected Worst Case Year 1	Projected Worse Case Year 2	Projected Worse Case Year 3
Local Surface	0	0	0	0	0	0
Groundwater	0	0	0	0	0	0
Imported	1,464	1,307	1,242	994	932	683
Reclaimed	0	0	0	0	0	0
Total	1,464	1,307	1,242	994	932	683
Base Year Supply Shortage				20%	25%	45%

#### **Section 4: Stages of Action**

A five stage-rationing plan which includes voluntary and mandatory stages as shown in Table 5 is planned:

**Table 5**  
**Rationing Stages and Reduction Goals**

Supply Shortage	Stage	Demand Reduction Goal	Type Program
0 - 5%	I	Ongoing Conservation	Voluntary
5+ - 10%	II	10%	Voluntary
10+ - 20%	III	20%	Voluntary
20+ - 30%	IV	25%	Mandatory
30+ - 50+%	V	45%	Mandatory

Priorities for use of available water are:

1. HEALTH AND SAFETY
  - Interior residential use for cooking and sanitation and fire fighting
2. COMMERCIAL/INDUSTRIAL/GOVERNMENTAL
  - Maintain employment levels and economic base
3. EXISTING TURF AREAS IN PARKS, CEMETERIES, GOLF COURSES, ETC.
4. EXISTING LANDSCAPE IRRIGATION
  - Trees and shrubs
5. SIGNIFICANT NEW DEMAND
  - New or replacement landscaping; development resulting in increased demand for Health and Safety.

This plan does not contemplate a moratorium on new connections in priority categories 1. and 2. Because of physical constraints on growth in the City, any significant new construction is likely to replace an existing developed land use with minor increase in demand.

Health and safety water quantity calculations used to determine Millbrae's gallons per capita per day (gpcpd) requirements are shown in Table 6. The total annual amount of water required to meet these needs was calculated for 21,800 residents.

**Table 6**  
**Per Capita Health and Safety Water Quantity Calculations**

	Strictest Rationing	Basic Need	Basic Need	Basic Need	Moderate Conserv	Non Conserv
Shower/Bath	8 <sup>a</sup>	10	12 <sup>c</sup>	12	12	14.5
Toilet	6 <sup>b</sup>	6	6	7	10	15.5 <sup>d</sup>
Shave/Handwash	4	4	4	5	6	8
Kitchen	5	5	5	7	8	9
Laundry	11	12	12	15	15	15
Misc. Consumption	3	3	3	4	4	5
	37gpd	40gpd	45gpd	50gpd	55gpd	68gpd
Annual HCF Per Capita	18hcf	19hcf	22hcf	24hcf	27hcf	33hcf

a=4 min x 2 gpm    b=4 flush x 1.5 gpf    c=5 min x 2.5 gpm    d=3 flush x 5.5 gpf

Referring to Table 6, the per capita water demand per day for Moderate Conservation is 165 gpd for a single-family residence (3 persons per household) and 80 gallons per day for a multi-family unit (2 persons per household). This is 53% of current average usage for a single-family residence and 49% of current average usage for a multi-family unit.

Supply Shortage Triggering Levels

The City of Millbrae's water utility is a distribution system only, with little control over available water supply. However, the City is committed and has legal responsibility to provide for the minimum health and safety needs of its customers. This plan is designed to distribute the minimum of approximately 45% of normal supply under extreme circumstances and during an extended severe water shortage. The following rationing triggering levels are established to ensure the City's water delivery goals. (Table 7)

<b>Table 7</b>			
<b>Water Supply Triggering Levels</b>			
<b>Normal Supply 1,444,213 HCF</b>			

Stage	Shortage	Triggering Level	Goal
I	0 - 5%	Ongoing.	Reduce waste; increase efficiency.
II	5+ - 10%	SFPUC supply is 90-95% of normal.	10% voluntary reduction.
III	10+ - 20%	SFPUC supply is 80-90% of normal.	20% voluntary reduction.
IV	20+ - 30%	SFPUC supply is 65-80% of normal.	25% mandatory reduction.
V	30+ - 50+%	SFPUC supply is 50-65% of normal.	45% mandatory reduction.

Water Supply Allocated by Priority

Table 8 details water supply allocated by priority. Stage I assumes an ongoing effort to conserve via no-waste voluntary practices. Stage II and III represent increasing levels of voluntary rationing to achieve overall reduction levels of 10% and 20%.

Reductions in use for the various stages of the program cannot be applied unilaterally to all classes of users (Residential, Commercial/Industrial, etc.). The

majority of commercial services have a minimal number of plumbing fixtures, which are for the convenience of employees. In these cases, water usage is to meet basic health and sanitation needs and reductions above initial 5% would be an extreme hardship. Also, hotels are within the Commercial category. While the City's Water Conservation Program actively encourages the placement of drought advisory information in rooms, restrooms and on-site restaurants, mandatory reductions in use may result in the necessity to close blocks of rooms resulting in adverse impacts on employment.

In Stages II through V, the heaviest impacts fall on residential customers and irrigation users. This is to be expected as these two uses account for almost 80% of system demand and 94% of total connections.

While Stage III goal is a 20% reduction in overall demand, Residential and Irrigation users are targeted for a 24% reduction in demand. The average per capita consumption in Stage III is still 62 gpcpd which, referring to Table 5, falls in the middle of Moderate Conservation of 55 gpcpd and Non-Conservation of 68 gpcpd.

In Stage IV, the approximate 26% reduction in residential customers usage still provides an average 56 gpcpd. Again referring to Table 5, this value is just above the Moderate Conservation level of 55 gpcpd. In this stage, however, sever restrictions are imposed on irrigation customers requiring a 60% reduction in current demand.

In Stage V, the 45.6% reduction for residential customers allows an average consumption of 43 gpcpd. This figure is just below the mid-range of Basic Need demand or 45 gpcpd.

Additional restrictions are imposed on Commercial users and Governmental/Institution users of 35% and 20% reductions, respectively. At this stage, irrigation customers are cut back 90% of current average use. Only a minimal amount of landscaping would survive this stage.

Throughout the various Stages, and particularly in State IV and V, it is anticipated appeals related to additional needs for occupancy changes, health considerations, licensed residential day care and home health care facilities, and special commercial needs or extraordinary needs to avoid undue economic loss would be heard and decided on a case by case basis. A Water Appeals Board of three citizens appointed by the City Council would be established.

**Table 8: Water Supply Allocated By Priority (1,000 HCF)  
(Based on base year consumption: average 1996-99)**

<b>Stage I Priority</b>	<b>Residential</b>	<b>Com %</b>	<b>Irrigation</b>	<b>Gov/Ins.</b>	<b>Other</b>	<b>Total</b>
Average Use	886.1	230.0	58.0	53.4	14.7	1,242.3
Conservation Use	841.8	218.5	55.1	50.7	14.7	1,180.8
% Reduction	5.0%	5.0%	5.0%	5.0%	---	5%
<b>Stage II Priority</b>	<b>Residential</b>	<b>Com %</b>	<b>Irrigation</b>	<b>Gov/Ins.</b>	<b>Other</b>	<b>Total</b>
Average Use	886.1	230.0	58.0	53.4	14.7	1,242.3
Conservation Use	785.1	218.5	51.4	50.7	14.7	1,120.4
% Reduction	11.4%	5.0%	11.4%	5.0%	---	10%
<b>Stage III Priority</b>	<b>Residential</b>	<b>Com %</b>	<b>Irrigation</b>	<b>Gov/Ins.</b>	<b>Other</b>	<b>Total</b>
Average Use	886.1	230.0	58.0	53.4	14.7	1,242.3
Conservation Use	671.7	218.5	44.0	50.7	14.7	999.6
% Reduction	24.2%	5%	24.2%	5.0%	---	20%
<b>Stage IV Priority</b>	<b>Residential</b>	<b>Com %</b>	<b>Irrigation</b>	<b>Gov/Ins.</b>	<b>Other</b>	<b>Total</b>
Average Use	886.1	230.0	58.0	53.4	14.7	1,242.3
Health and Safety						
Single Family	458.5	0	0	0	0	458.6
Multiple Family	126.9	0	0	0	0	126.9
Commercial	0	218.5	0	0	0	218.5
Irrigation	0	0	23.2	0	0	23.2
New Demand/Appeals	0	0	0	0	54.0 <sup>a</sup>	54.0
Gov't & Other	0	0	0	45.4	0	45.4
System Losses	0	0	0	0	2.3	2.3
Total (1,000 HCF)	585.5	218.5	23.2	45.4	56.3	928.9
% Reduction	33.9%	5.0%	60%	15%	---	25%
<b>Stage V Priority</b>	<b>Residential</b>	<b>Com %</b>	<b>Irrigation</b>	<b>Gov/Ins.</b>	<b>Other</b>	<b>Total</b>
Average Use	886.1	230.0	58.0	53.4	14.7	1,242.3
Health and Safety						
Single Family	359.9	0	0	0	0	359.9
(43 gpd) Multiple	108.1	0	0	0	0	108.1
Commercial	0	149.5	0	0	0	149.5
Irrigation	0	0	5.8	0	0	5.8
New Demand/Appeals	0	0	0	0	24.1 <sup>a</sup>	24.1
Gov't & Other	0	0	0	42.7	0	42.7
System Losses	0	0	0	0	2.3	2.3
Total (1,000 HCF)	468.0	149.5	5.8	42.7	26.4	692.4
% Reduction	45.6%	35%	90%	20%	---	45%

**a. Individual allocations of the total allowed for New Demand/Appeals may be allocated to any classification of use.**

## **Section 5: Voluntary & Mandatory Restriction / Prohibitions on Water Use**

See Drought Demand Management Plan at page 8 of this appendix for specific water use restrictions and prohibitions to be implemented at various supply shortage stages.

## **Section 6: Consumption Limits**

The following allocation method are planned for each customer type for Stages IV and V in the event of an extended drought:

	<u>Stage IV</u>	<u>Stage V</u>
Single-Family	Per capita	Per capita
Multiple-Family	Per capita	Per capita
Commercial	Hybrid percent reduction	Hybrid percent reduction
Governmental	Percent reduction	Percent reduction
Irrigation	Percent reduction	Percent reduction

The Director of Public Works shall calculate each customer's allocation according to the methods described in the Drought Demand Management Plan. Where applicable, allocations shall reflect seasonal patterns. An attempt will be made to notify all customers of their allocation in writing before the effective date of the Water Shortage Emergency. New customers will be notified at the time service begins. Any customer may appeal the basis of his/her allocation. Appeals will be processed using guidelines set forth in the Plan.

The actual allocation method could be influenced by the allocation method and considerations applied by SFPUC.

## **Section 7: Water Rates and Charges for Excessive Use**

Millbrae's current rate structure is provided in Table 9.

Table 10 provides a proposed Excess Water Use Charge Schedule.

**Table 9**  
**Rate Structure (1/1/2000)**

<u>Meter Size</u>	<u>Monthly Readiness to Serve Charge</u>
3/4"	9.56
1"	14.00
1-1 1/2 "	25.00
2"	43.00
3"	81.50
4"	118.50
6"	215.50
8"	307.18
10"	492.14

A usage charge of \$1.90 per HCF is assessed based on meter readings. The proposed excess use schedule is shown in Table 10.

**Table 10**  
**Proposed Excess Water Use Charge Schedule**

<u>% Over Allocation</u>	<u>Excess Use Charge Per HCF</u>
0-10%	\$ 2.00
10.1% - 20%	\$ 5.00
20.1% - greater	\$10.00

Monthly Bill = (Readiness to Serve Charge) + (HCF used)(\$1.90) + excess Use Charge

### **Section 8: Water Shortage Due to Catastrophic Event**

The City of Millbrae has developed an Emergency Response Plan to address water shortages due to a catastrophic event. The following page is a flow chart showing the immediate actions the City of Millbrae will perform during a catastrophic event.

