

2010 Urban Water Management Plan



Town of Hillsborough



FINAL

October 18, 2011

TOWN OF HILLSBOROUGH
PUBLIC WORKS DEPARTMENT

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ACRONYMS AND ABBREVIATIONS

ABAG	Association of Bay Area Governments
AFY	acre-feet per year
baseline	base daily per capita
BAWSCA	Bay Area Water Supply and Conservation Agency
CUWCC	California Urban Water Conservation Council
CWC	California Water Code
CWSRF	Clean Water State Revolving Fund
DMM	Demand Management Measure
DWR	California Department of Water Resources
EBMUD	East Bay Municipal Utility District
EOP	Emergency Operations Plan
FY	Fiscal Year
GPCD	gallons per capita per day
ISA	Interim Supply Allocation
ISL	Interim Supply Limitation
MGD	million gallons per day
MOU	Memorandum of Understanding
PEIR	Program Environmental Impact Report
psi	pound-force per square inch
RWS	Regional Water System
SBX7-7	Water Conservation Act of 2009
SFPUC	San Francisco Public Utilities Commission
Strategy	Long Term Reliable Water Supply Strategy
Tier One Plan	Tier One Water Supply Allocation Plan
Tier Two Plan	Tier Two Water Supply Allocation Plan
UACFG	Upper Alameda Creek Filter Gallery
ULFT	Ultra-Low Flush Toilet
UWMP, Plan	Urban Water Management Plan
UWMP Act	California Urban Water Management Planning Act
<i>UWMP Guidebook</i>	<i>Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan</i>
WCIP	Water Conservation Implementation Plan
WSA	Water Supply Agreement (SFPUC)
WSAP	Water Shortage Allocation Plan
WSIP	Water System Improvement Program

INTRODUCTION

The Town of Hillsborough's ("Town") 2010 Urban Water Management Plan ("UWMP" or "Plan") has been prepared in compliance with the Urban Water Management Planning Act ("UWMP Act"). It updates the Town's 2005 Urban Water Management Plan and addresses changes required by subsequent legislation, including the Water Conservation Act of 2009 ("SBX7-7"). The Town used the California Department of Water Resources' ("DWR") *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan, March 2011* ("UWMP Guidebook") to guide the development of its 2010 UWMP.

I.1 Urban Water Management Planning Act

The UWMP Act contained in California Water Code ("CWC"), Division 6, Part 2.6, Section 10610 requires that UWMPs be prepared every five years by urban water suppliers with 3,000 or more service connections, or that supply 3,000 or more acre-feet per year ("AFY") of water. The Town owns and operates a water utility that serves nearly 11,000 people and supplied approximately 3,364 acre feet in fiscal year ("FY") 2009/10; therefore, the Town must prepare an UWMP. The UWMP Act requires the Town to report, describe, and evaluate:

- Water deliveries and uses;
- Water supply sources;
- Efficient water uses; and
- Demand Management Measures ("DMMs"), including their implementation strategy and schedule.

In addition, SBX7-7 requires the Town to report its base daily per capita ("baseline") water use, urban water use target, interim urban water use target, and compliance daily per capita water use. This enables water agencies and, in turn, the State of California, to set targets and track progress toward decreasing daily per capita urban water use throughout the state.

The UWMP Act directs water agencies in carrying out their long-term resource planning responsibilities to ensure that adequate water supplies are available to meet existing and future demands (CWC 10612 (b)). Urban water suppliers are required to assess water demand and supplies over a 20-year planning horizon and consider various drought scenarios. The UWMP Act also requires that water shortage contingency planning and drought response actions be included in an UWMP. The UWMP is required for a water supplier to be eligible for DWR-administered State grants and loans, as well as assistance during droughts. The preparation and submission of UWMPs must fall in December of years ending in five and zero. However, because of recent changes in UWMP requirements, State law has extended the deadline for the 2010 Plans to July 1, 2011. Although submitted in 2011, 2010 UWMPs will be referred to as 2010 UWMPs because they include 2010 water data and in order to retain consistency with the five-year submittal cycle.

UWMPs are reviewed by DWR staff to determine whether or not they are complete pursuant to the UWMP Act. Results of the DWR review are provided to urban water suppliers through a review letter. The agency may wish to use the review letter to revise their UWMP for re-submittal, as necessary. DWR provides a Legislative Report to the California Legislature one year after UWMPs are due to DWR detailing the status and outstanding elements of the UWMPs. The DWR also prepares reports and provides data for any legislative hearings designed to consider the effectiveness of the submitted UWMP.

The DWR maintains a 2010 Urban Water Management website at www.water.ca.gov/urbanwatermanagement. The website contains a comprehensive guidebook, worksheets, tools, links and other information pertinent to the development and implementation of the 2010 UWMP.

I.2 Changes to the UWMP Act

Several amendments have been added to the UWMP Act since the Town prepared its 2005 Urban Water Management Plan. Following is a summary of significant changes:

- **Notification:** Urban Water Suppliers must provide at least 60 days advance notice of an UWMP public hearing to any city and county within which the supplier provides water (Water Code § 10621(b)).
- **Lower Income Housing Water Use Projections:** UWMPs shall include water use projections for single-family and multifamily residential housing needed for lower income and affordable households. This will assist the water supplier in complying with the existing requirement under Section 65589.7 of the Government Code, which requires suppliers to grant a priority for the provision of service to housing units affordable to lower income households (Water Code § 10631.1).
- **Linkage of State Grants and Loans to Demand Management Measures:** Eligibility for state funded grants or loans made after January 1, 2009 will be conditioned on the implementation of DMMs (Water Code § 10631.5(a)). This applies to grants or loans awarded or administered by DWR, the State Water Resources Control Board, or the California Bay-Delta Authority or its successor agency.
- **Demand Management Measure Compliance:** Members of the California Urban Water Conservation Council ("CUWCC") will be considered in compliance with the DMM evaluation if they comply with all the provisions of the CUWCC's "Memorandum of Understanding" ("MOU") and submit the CUWCC annual reports (Water Code § 10631(j)). Non-members will demonstrate compliance by completing and submitting AB 1420 Self-Certification Tables 1 through 3 to DWR. DWR, in consultation with other agencies and public input, is required to develop eligibility requirements for meeting compliance with DMM implementation (Water Code § 10631.5(b)).
- **Determination of Eligibility:** Repeals existing grant funding conditions of state water management grants or loans on July 1, 2016 unless another statute is enacted. (Water Code § 10631.5(f)).
- **Demand Management Measure Technical Panel:** DWR, with the CUWCC, will convene a technical panel to provide information and recommendations to DWR and the Legislature on new demand management measures, technologies, and approaches (Water Code § 10631.7).
- **Exemplary UWMP Elements:** Requires DWR to recognize exemplary efforts by water suppliers by obligating DWR to identify and report to the DMM Technical Panel "exemplary elements" that achieve water savings significantly above the levels required for state grant or loan funding (Water Code § 10644(c)).
- **Potential Recycled Water Uses:** Indirect potable reuse is to be considered as an option for a potential use of recycled water (Water Code § 10633(d)).
- **Water Conservation Act of 2009:** SBX7-7 requires each urban retail water supplier to develop urban water use targets to help meet the State's goal to reduce water use 20 percent by 2020 (Water Code § 10608.20). SBX7-7 also grants an extension for submission of UWMPs from December 31, 2010 to July 1, 2011.

I.3 Regional Plans and Agreements

Several important regional level changes have also occurred since the adoption of the Town's 2005 UWMP. These changes include:

- The San Francisco Public Utilities Commission ("SFPUC") Water System Improvement Plan ("WSIP") and Program Environmental Impact Report ("PEIR"), adopted in October 2008.

- The 2009 Water Supply Agreement (“WSA”), which authorizes SFPUC Wholesale Customers to adopt a methodology for allocating water that is collectively available to SFPUC’s 26 Wholesale Customers, among each individual Wholesale Customer. This agreement includes the Tier One Drought Implementation Plan.
- The Tier One Water Supply Allocation Plan (“Tier One Plan”), which allocates water from the San Francisco Regional Water System (“RWS”) among San Francisco retail and Wholesale Customers during system-wide shortages of 20% or less.
- The 2010 Tier Two Water Supply Allocation Plan (“Tier Two Plan”), which documents the methodology by which the Tier One Allocation to Wholesale Customers will be allocated among individual agencies during system-wide shortages of 20% or less.
- The Water Conservation Implementation Plan (“WCIP”), which was prepared by Bay Area Water Supply and Conservation Agency (“BAWSCA”) to assist its member agencies in meeting demand management goals.

I.4 Plan Organization

The content and organization of this plan follows the recommended format outlined in the State of California, Natural Resources Agency, Department of Water Resources’ *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan*, which was finalized March 2011.

Introduction

The Introduction describes the UWMP Act and changes to it, introduces regional water plans and agreements that have occurred since the Town’s 2005 UWMP was adopted and describes the Plan’s layout.

Chapter 1: Plan Preparation

This Chapter describes the Plan preparation process, including specific information detailing how the UWMP was prepared, coordinated with other agencies and the public, and adopted.

Chapter 2: System Description

This Chapter describes Hillsborough’s water system. It includes a description of the Town’s climate, population and demographics, its water distribution system, and its organizational structure.

Chapter 3: System Demands

This Chapter describes the Town’s urban water system demands, including its SBX7-7 baseline water use, its 2015 interim water use target and its 2020 urban water use targets.

Chapter 4: System Supplies

This Chapter describes the sources of water available to the Town. It includes a description of each water source, source limitations, water quality, and water exchange opportunities.

Chapter 5: Water Supply Reliability and Water Shortage Contingency Planning

This Chapter compares the Town’s projected water supplies and demands, assesses the overall reliability of future supplies, and water shortage and drought contingency plans.

Chapter 6: Demand Management Measures

This Chapter provides a description for each Demand Management Measure described in California Water Code Section 10631(f), and the Town's past, current and planned implementation of these measures.

Chapter 7: Climate Change

This Chapter considers potential impacts on the Town's future water supply resulting from climate change, and the Town's efforts to combat climate change at the local level.

Chapter 8: Completed UWMP Checklist

This Chapter provides the Town's completed UWMP preparation checklist, as found in the DWR 2010 *UWMP Guidebook*. The checklist ensures all required elements are included in the Town's 2010 UWMP.

CHAPTER 1 – PLAN PREPARATION

This Section describes the Town’s preparation of its UWMP, including identification of authors and contributors to the Plan; notification to and coordination with governmental agencies and the public; and the public hearing process.

1.1 UWMP Team

The Town’s Plan was prepared by its Urban Water Management Plan Team, under the direction of the Public Works Department. The Team included:

- John Mullins, Building Official and Interim Public Works Director
- Elizabeth Cullinan, Planning Director
- Dennis Diemer, Consulting Engineer
- Norm Book, City Attorney
- Ed Cooney, Senior Management Analyst
- Dave Ballestrasse, Assistant Superintendent
- Paul Race, Water Quality Technician

Questions regarding the Town’s 2010 UWMP and its preparation may be directed to:

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1.2 Interagency Notification and Coordination

1.2.1 Notification

The Town notified and coordinated with stakeholder agencies on its 2010 UWMP. The agencies with which the Town coordinated include the SFPUC, BAWSCA and BAWSCA member agencies. The Town sent written notification of its UWMP update to the agencies listed in Table 1-1 on March 25, 2011:

Table 1-1: Agencies That Received Written Notification

Alameda County Water District	City of Millbrae	Foster City
BAWSCA	City of Milpitas	Mid-Peninsula Water District
California Water Service Company	City of Mountain View	North Coast County Water District
City of Belmont	City of Palo Alto	Purissima Hills Water District
City of Brisbane	City of San Bruno	Redwood City
City of Burlingame	City of San Carlos	San Francisco Public Utilities Commission
City of Daly City	City of San Jose	San Mateo County
City of East Palo Alto	City of Santa Clara	South Bayside System Authority
City of Hayward	City of Sunnyvale	Stanford University
City of Menlo Park	Coastside County Water District	Westborough Water District

1.2.2 Bay Area Water Supply and Conservation Agency

BAWSCA was created on May 27, 2003 to represent the interests of the 26 agencies that purchase water on a wholesale basis from the San Francisco Regional Water System. These agencies include cities, water districts, a water company, and a university in Alameda, Santa Clara and San Mateo counties. Collectively, the BAWSCA agencies are referred to as the Wholesale Customers.

BAWSCA is the only entity that has the authority to directly represent the needs of the Wholesale Customers that depend on the San Francisco Regional Water System. Through BAWSCA, the Wholesale Customers can work with the SFPUC on an equal basis to ensure the RWS is rehabilitated and maintained and to collectively and efficiently meet local responsibilities.

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

Compliance with the UWMP 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 2010 UWMP updates is to work closely with its member agencies and the SFPUC to maintain consistency among the multiple documents being developed. The Town coordinated with BAWSCA, participated in BAWSCA sponsored UWMP work groups and consulted with BAWSCA as needed during the development of this UWMP.

1.2.3 Public Engagement and Plan Adoption

The Town encourages community participation in the development of its urban water management plan. On February 14, 2011, the Town provided an update on the Urban UWMP, an overview of the Plan's requirements and a schedule of preparation and adoption at the Town's City Council public meeting. On March 25, 2011, the Town issued its 60 day notice to amend its UWMP and posted the notice on its website (Attachment 1). The Town also posted a schedule for UWMP adoption and a description of the UWMP adoption process on its website (Attachment 2). On September 12, 2011, the Town posted a copy of its draft UWMP on its website and at Town Hall for public review. On September 12, 2011, the Town published a notice of intention for a public hearing to adopt its 2010 UWMP (Attachment 3) and a notice

of intention for a public hearing on its Water Conservation Act (SBX7-7) urban water use targets. On October 10, 2011, the Town held a noticed City Council public hearing on its Draft UWMP, its 2015 and 2020 urban water use targets and its Water Use Reduction Plan, as required by the SBX7-7. The Town adopted the 2010 UWMP on October 10, 2011. The authorized Resolution adopting the UWMP is included as Attachment 4.

Submission of the adopted 2010 UWMP to DWR, BAWSCA, and the California State Library occurred on October 21, 2011. The adopted UWMP was made available to the public via the internet at www.hillsborough.net on the same date of submission to DWR. A printed copy was also available for public review at Town Hall during normal business hours.

Table 1-2: Coordinating Agencies

Agency / Action	Participated in developing the plan	Commented on the draft	Attended public meetings	Was contacted for assistance	Was sent a copy of the draft plan	Was sent a notice of intention to adopt
BAWSCA	✓			✓	✓	✓
San Mateo County						✓
SFPUC	✓			✓	✓	✓
General Public	✓	✓	✓	✓	✓	✓

1.3 Plan Implementation

Hillsborough will implement this UWMP in accordance with the Urban Water Management Planning Act. Implementation will occur through the execution of the Water Use Reduction Plan described in Section 3.3.4.5 of this Plan, the Demand Management Measures described in Chapter 6, the execution of the Water Shortage Contingency Plan (in the event of a water shortage event), described in Section 5.6.2, and other actionable items described herein.

CHAPTER 2 – WATER SYSTEM DESCRIPTION

2.1 Introduction

Demographics, land use, climate and other factors may impact a community's water use. This Chapter includes a description of the Town's governmental organizational structure, demographics, climate and water transmission system.

2.2 Service Area and Organizational Structure

Hillsborough was incorporated May 5, 1910. It is a residential community located in San Mateo County, California. The Town is located west of Highway 101 and El Camino Real and east of Highway 280. It is within a short commute of San Francisco and minutes from San Francisco International Airport. The Town is surrounded by the cities of Burlingame and San Mateo, as well as unincorporated portions of San Mateo. The Town has an area of 6.23 square miles and a current population of 10,825.

The Town is a general law city operating with a Council/Manager form of government. Policy-making and legislative authority are vested in the governing City Council, which consists of a Mayor, a Vice-Mayor and three City Council members. City Council members are elected to overlapping four-year terms, in even numbered years. The City Council members select the Mayor and Vice-Mayor every year. The City Council is responsible, among other things, for passing ordinances, adopting the budget, appointing committee and board members and hiring the City Manager and the City Attorney. The City Manager is responsible for carrying out the policies and ordinances of the City Council, for overseeing day-to-day operations and for appointing department heads.

The Town performs essential services including police protection, building permitting and inspection, land use management, and maintenance of roads, public facilities, water, sewer and storm drainage infrastructures. The Town also funds fire protection services provided by the Central County Fire Department. A map of Hillsborough is provided in Figure 2-1. A map of the region is included in Figure 2-2.

Figure 2-1: Town of Hillsborough Map

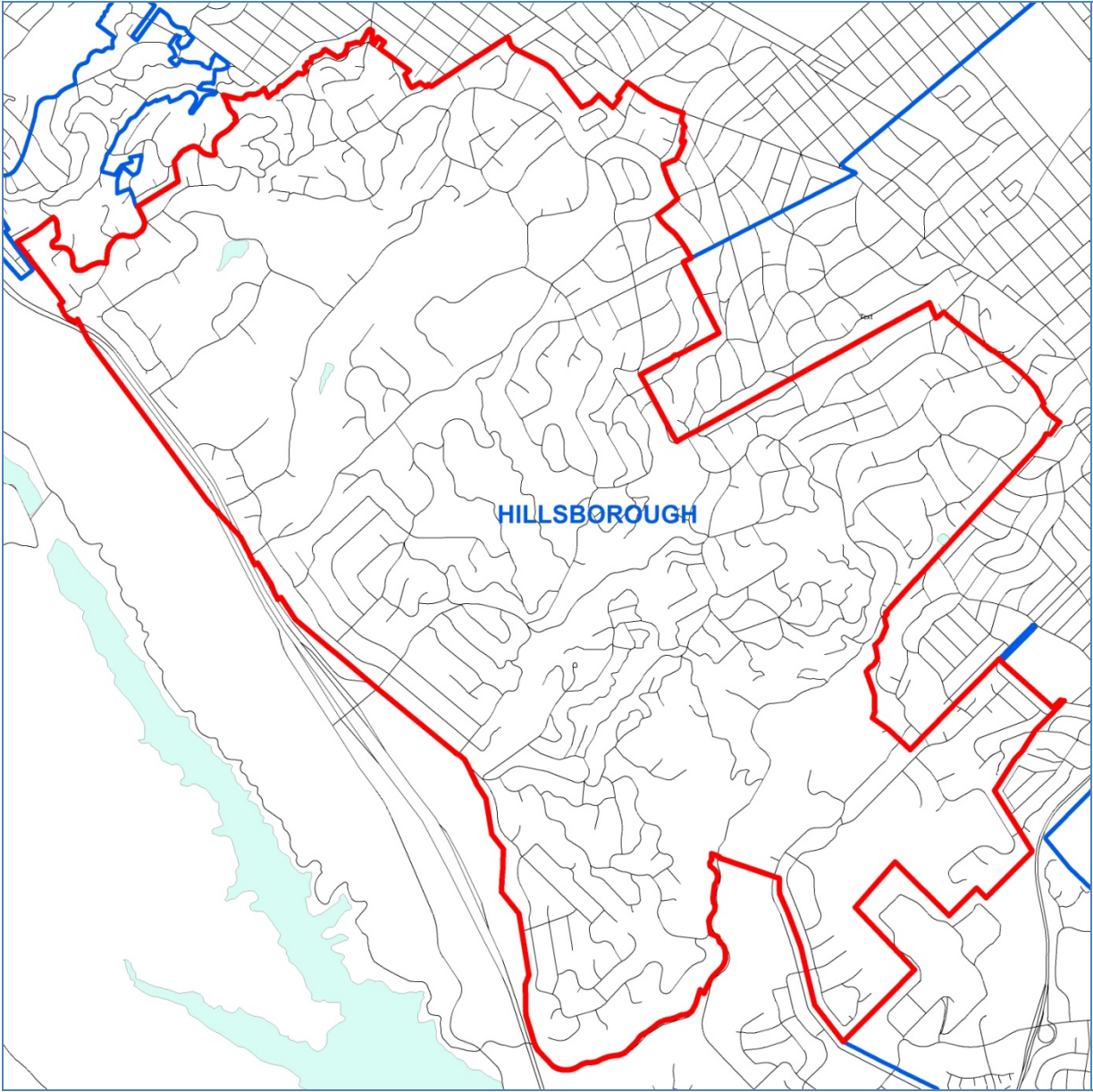
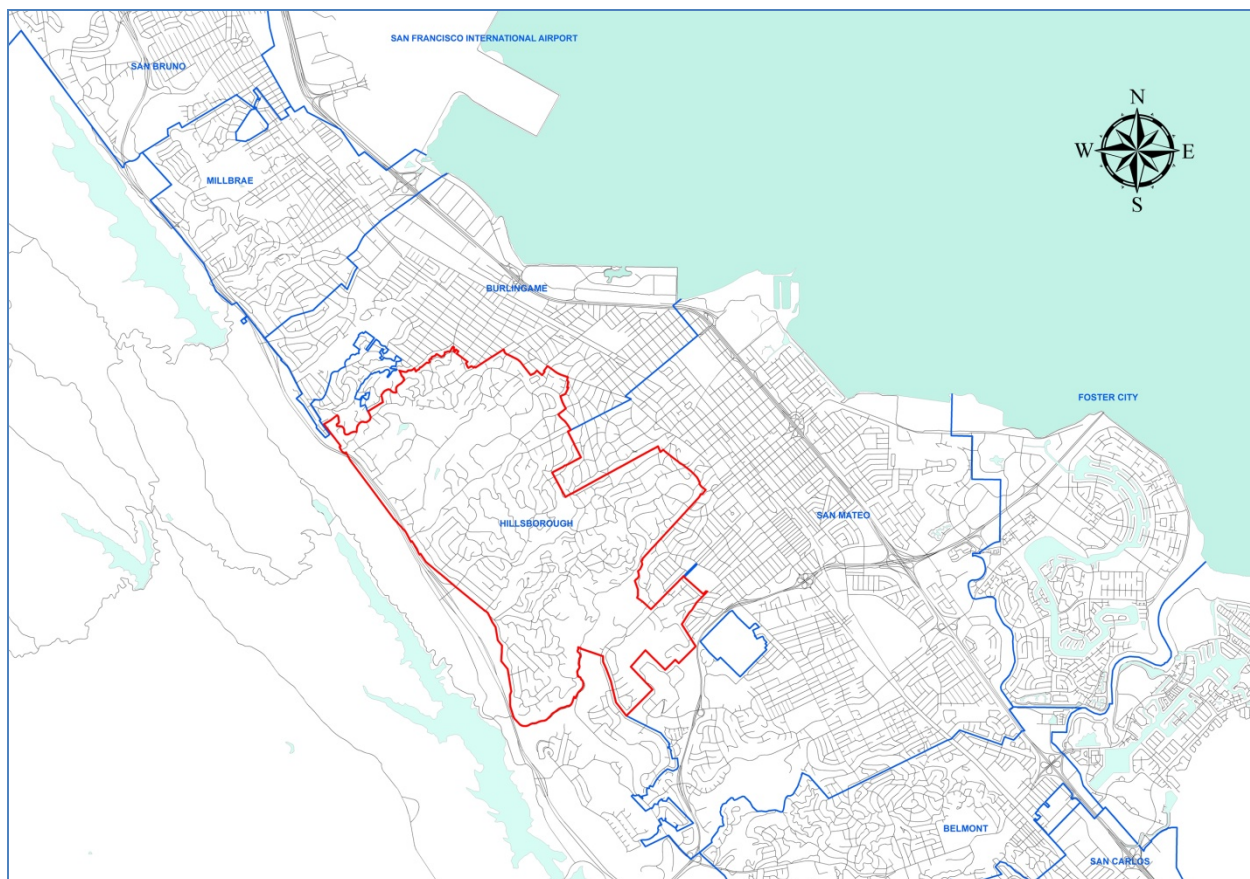


Figure 2-2: Hillsborough and Surrounding Area



2.3 System Description

The Town purchases water from the SFPUC and distributes it through a distribution system which includes the following principal components:

- 9 turnouts connected to SFPUC pipelines.
- 14 active pump stations, constructed between 1949 and 1985, with major rehabilitation of two pump stations completed in 2009.
- 16 pressure zones, with water pressures ranging from 25 pound-force per square inch ("psi") in the Tournament Zone to 230 psi in the Marlborough Zone.
- 17 active storage facilities located on 10 sites throughout the Town. The storage facilities have 8.1 million gallons of storage. 13 were constructed between 1933 and 1978, and the remaining 4 were constructed since 1997. Storage tanks and reservoirs are inspected every 3 to 5 years and have cathodic protection to prevent corrosion and mixers to circulate water.
- 116 miles of water mains, with over 50 percent of the mains older than 50 years, and 2 percent older than 100 years.
- 4,260 service connections to the water system and 1,014 fire hydrants. Nearly all of the water used in the Town (over ninety-five percent) is sold to single-family homes, with the remainder delivered to two golf courses, six schools and town uses.

In general the Town's water facilities are well maintained, but in some cases they have deteriorated with time, or were constructed of obsolete materials or with obsolete technology, or are inadequately sized for current conditions. The Town has in place a Water Master Plan and a ten year Capital Improvement

Project Plan to address such long-term maintenance issues. Significant improvements to the distribution system since 2005 include:

- The completion of Phase III through V of the Town’s Water Main Improvement Project, which included the installation of more than 8 miles of new (replacement) water mains and 65 new water hydrants;
- The installation of 5 new pressure relief valves in 2008;
- The construction of two new 600,000 gallon water tanks at the El Arroyo tank site in 2008;
- The installation of two new pump stations and generators at the Tournament and Skyfarm III pump stations in 2009; and
- The installation of Paxx water tank mixers in four water tanks at three tank site locations.

2.4 Climate

The Town enjoys a temperate climate with mild temperatures and relatively low levels of precipitation. Table 2-1 provides the Western Regional Climate Center’s Historical Climate Summary derived from the nearest applicable weather station to Hillsborough located in the San Francisco International Airport.

Table 2-1: Hillsborough Climate Data

SAN FRANCISCO WSO AP, CALIFORNIA (047769) ¹													
Period of Record Monthly Climate Summary													
Temperature, Precipitation and Snowfall Period of Record: 7/1/1948 to 12/31/2010													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Average Max. Temperature (F)	55.8	59.1	61.2	63.8	66.8	70	71.4	72.1	73.5	70.2	62.9	56.4	65.3
Average Min. Temperature (F)	42.5	45	46.2	47.7	50.3	52.7	54.1	55	54.9	52	47.4	43.3	49.3
Average Total Precipitation (in.)	4.4	3.61	2.8	1.37	0.39	0.11	0.02	0.04	0.18	0.99	2.33	3.78	20.03
Average Total Snowfall (in.)	0	0	0	0	0	0	0	0	0	0	0	0	0
Eto (in.)²	1.86	2.24	3.27	4.80	5.27	5.70	5.58	5.27	4.20	3.41	2.40	1.86	46.30

¹Source: Western Regional Climate Center Data from station #047769.
Percent of possible observations for period of record.

Max. Temp.: 99.9% Min. Temp.: 99.9% Precipitation: 99.9% Snowfall: 92.3% Snow Depth: 92.3%

²Source: Eto Zone Map for State of California, Zone 3

2.5 Population and Demographics

The Town is a residential community whose service area is largely developed. It is comprised almost entirely of single-family residences sited on large, residential parcels. There are four public schools, two private schools and two golf courses. There are two small public parks. There are no existing or planned commercial customers. Hillsborough’s population growth is expected to be very low. Due to low population density and extensively irrigated landscapes on large residential estates, Hillsborough’s water consumption increases fourfold during the summer.

The Town has no commercial, industrial or institutional parcels available for new development. There are approximately 25 parcels out of a total of approximately 4,000 parcels available to build new single-family homes. In addition, three additional large parcels can possibly be subdivided and developed. The maximum number of parcels that could result from this development would be approximately 55 parcels. There are no planned, multi-parcel, residential developments in process at the time of this Plan's writing. There are 3,693 households with 2.93 people per household according to 2010 U.S. Census data.

The population estimates for Hillsborough are based on the process described in the DWR, "Methodologies for Calculating Baseline (Base Daily Per Capita) and Compliance Urban Per Capita Water Use," February 2011, Technical Methodology 2: Service Area Population. The Town is a Category 1 Water Supplier. The population data for 2010 is derived from the 2010 U.S. Census. Table 2-2 shows Hillsborough's current population from the 2010 U.S. Census and population projections from 2015 through 2035 from the Association of Bay Area Governments' ("ABAG") 2009 Population Projections.

Table 2-2: Current Population and ABAG's Population Projections

	2010	2015	2020	2025	2030	2035
Service Area Population	10,825	11,500	12,000	12,500	13,000	13,400

Data Source: US Census Data and 2009 ABAG Population Projections

2.5.1 Revision to ABAG's Population Projections

ABAG and Department of Finance ("DOF") projections for the Town of Hillsborough appear to overstate population growth through 2035. This is based on the fact that the Town is a single-family residential community, has little to no opportunity for multi-family residential or commercial development, and has been virtually built out since the late 1990s. Table 2-3 provides a population projection comparison between the Department of Finance, ABAG and the U.S. Census data (Attachments 5, 6 and 7).

Table 2-3: Historical Population and Population Projection Comparison

Source	1980	1985	1990	1995	2000	2005	2010
US Census	10,372		10,667		10,825		10,825
ABAG					10,825	11,000	11,100
DOF					10,825	10,949	11,400

As can be seen in Table 2-3, the Town's population growth based on U.S. Census data was 453 people from 1980 through 2000 (a population growth rate of 4%), and no increase from 2000 to 2010. However, population projections by ABAG predicted a 275 person increase in population from 2000 to 2010, and DOF projected an increase of 525 people. Given that the Town has a maximum of 55 single-family resident zoned parcels that could be developed, and that the average number of residents per household for the Town of Hillsborough is 2.93 people, the Town would expect that population growth due to new development would not exceed 165 people through 2035. However, ABAG projections show a population growth of 3,525 people between 2000 and 2035. This represents a 24% projected growth rate in the Town of Hillsborough, which is not realistic. A May 18, 2011 letter from Elizabeth Cullinan, Hillsborough's Planning Director, to Marisa Raya, Regional Planner for ABAG, provides further details as to why Hillsborough believes the ABAG population projections are inflated (Attachment 8). Based on this, the Town has modified ABAG population projections for this UWMP, as presented in Table 2-4.

Table 2-4: Hillsborough's Population, Revised

	2010	2015	2020	2025	2030	2035
Service Area Population	10,825	10,869	10,913	10,956	11,000	11,000

CHAPTER 3 – SYSTEM DEMANDS

3.1 Introduction

This section describes Hillsborough’s historical water use and accounts by type; a calculation of its baseline (base daily per capita) water use and interim and urban water use targets, as required by the Water Conservation Act (SBX7-7); the Town’s projected water use by account type; and its water conservation implementation plan. The calculation of future water demands is based on the assumed reduction in per capita daily use from planning for and implementing actions associated with the SBX7-7.

3.2 Historical (Actual) Water Use

The Town is almost exclusively made up of residential water users with larger than the regional average sized homes and parcels. The Town has been effectively built out since the late 1990s, and population growth remained flat, at 10,825, from 2000 to 2010, according to the 2010 U.S. Census. These two facts have created a stable environment for water demand, with the primary drivers in demand changes being weather fluctuations, drought events and water conservation efforts.

Table 3-1 and Figure 3-1 provide historical and present water purchases by the Town by fiscal year. (Attachment 9 provides purchase data on a monthly basis). The Town’s water use peaked in Fiscal Year 1986, dropping drastically during the 1987 to 1992 drought. Water use reached an all-time low in FY 1992, which marked the end of the drought and of the Town’s mandatory rationing efforts. The Town’s water use climbed gradually over time until it reached near 1986 level use in FY 2003. The 2007 to 2010 drought marked another drastic drop in usage to levels not seen since the 1987 to 1992 drought. While the Town anticipates a post-drought rebound, it also expects that present and future State, Regional and Local water conservation regulations, mandates and efforts will limit this rebound and allow the Town to meet its SBX7-7 water use targets. This is discussed in Chapter 5.

Table 3-1: Hillsborough Population and Historical Water Use

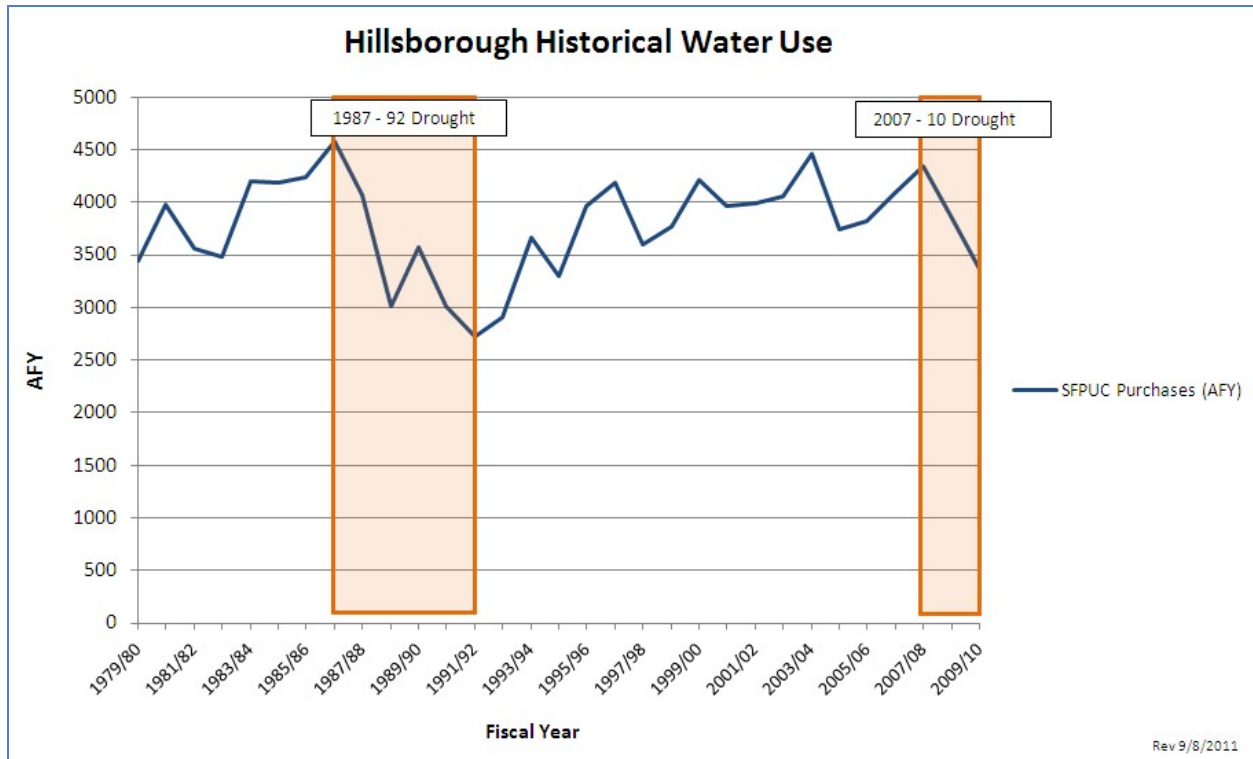
Fiscal Year	Population	CCF	AFY	GPCD	MGD
6/30/1980	10,372	1,497,222	3437.15	295.84	3.068
6/30/1981	10,500	1,729,826	3971.13	337.64	3.545
6/30/1982	10,550	1,548,021	3553.77	300.72	3.173
6/30/1983	10,600	1,514,601	3477.04	292.84	3.104
6/30/1984	10,600	1,828,750	4198.23	353.58	3.748
6/30/1985	10,700	1,823,403	4185.96	349.25	3.737
6/30/1986	10,650	1,844,792	4235.06	355.01	3.781
6/30/1987	10,600	1,995,851	4581.84	385.89	4.090
6/30/1988	10,600	1,771,267	4066.27	342.47	3.630
6/30/1989	10,650	1,314,080	3016.71	252.88	2.693
6/30/1990	10,667	1,553,368	3566.04	298.45	3.184
6/30/1991	10,588	1,309,292	3005.72	253.43	2.683
6/30/1992	10,600	1,184,246	2718.65	228.97	2.427
6/30/1993	10,661	1,265,218	2904.54	243.22	2.593
6/30/1994	10,632	1,598,609	3669.90	308.15	3.276
6/30/1995	10,701	1,434,311	3292.72	274.70	2.940
6/30/1996	10,712	1,728,632	3968.39	330.73	3.543
6/30/1997	10,754	1,822,999	4185.03	347.42	3.736
6/30/1998	10,820	1,565,900	3594.81	296.60	3.209
6/30/1999	10,814	1,641,724	3768.88	311.14	3.365
6/30/2000	10,825	1,836,086	4215.07	347.62	3.763
6/30/2001	10,825	1,725,632	3961.51	326.71	3.537
6/30/2002	10,825	1,736,371	3986.16	328.74	3.559
6/30/2003	10,825	1,765,966	4054.10	334.34	3.619
6/30/2004	10,825	1,944,747	4464.52	368.19	3.986
6/30/2005	10,825	1,630,593	3743.33	308.71	3.342
6/30/2006	10,825	1,665,884	3824.34	315.40	3.414
6/30/2007	10,825	1,786,177	4100.50	338.17	3.661
6/30/2008	10,825	1,893,039	4345.82	358.40	3.880
6/30/2009	10,825	1,674,909	3845.06	317.10	3.433
6/30/2010	10,825	1,465,190	3363.61	277.40	3.003

Water Purchase Data Source: SFPUC Purchase Records

Water Use includes 6/30/2009 and 6/30/2010 water transfers to Burlingame (3,255 CCF in FY '09 and 9,880 CCF in FY '10)

Population Data Source: Department of Finance and US Census Data

Figure 3-1: Historical Water Use, Fiscal Year



3.3 Water Conservation Act of 2009 (“SBX7-7”)

California passed into law SBX7-7 in November 2009. The law requires water providers to set water use targets that will help reduce California’s average per capita daily consumption use 10% in 2015 and 20% by 2020. Suppliers must follow the guidelines set forth in DWR’s *“Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan”*, particularly *Section D, “Baseline and Target Determination”*. This guidance is supplemented by technical methodologies provided in DWR’s *“Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use”*, February 2011. Using these guidelines, each water supplier must set an Interim (2015) and Urban (2020) Water Use Target and assess its progress in meeting them in 2015 and 2020.

3.3.1 Individual and Regional Alliance Targets

In setting and meeting water use targets, the Town shall plan, comply and report on its Urban Water Use Target on a regional (alliance) basis, individual basis, or both. The Town may also choose to update its 2010 Water Use Target Method in 2015.

Although the Town is a member of the Bay Area Water Supply and Conservation Agency (“BAWSCA”), and has the option to form an alliance with one, more, or all of its member agencies, the Town has developed its baseline (base daily per capita) target individually and not as part of a regional alliance. The Town anticipates that it will explore forming an alliance with one or more BAWSCA agencies and, if appropriate, will revise its Target accordingly in its 2015 UWMP. *Methodology 9, “Regional Compliance”* in DWR’s *“Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use,” February 2011* (“DWR Methodologies”) provides detailed guidance for regional compliance with SBX7-7.

3.3.2 Meeting SBX7-7 Requirements

The DWR *UWMP Guidebook* states that there are four overall steps in setting SBX7-7 targets. They are as follows:

- Step 1: Determine Base Daily per Capita Water Use
- Step 2: Determine Urban Water Use Target (2020)
- Step 3: Compare Urban Water Use Target to the 5-year Baseline Water Use
- Step 4: Determine Interim Urban Water Use Target (2015)

3.3.2.1 Step 1: Determine Base Daily per Capita Water Use

Three Technical Methodologies have been developed and provided in the DWR Methodologies to support the determination of base daily per capita water use. They are as follows:

- Technical Methodology 1: Gross Water Use
- Technical Methodology 2: Service Area Population
- Technical Methodology 3: Base Daily per Capita Water Use

Technical Methodology 1: Gross Water Use

Gross water use is a measure of water supplied to the distribution system over a continuous 12 month period from all sources. For Hillsborough, gross water use is equal to water provided the Town by the SFPUC, since Hillsborough has no other sources of water, including recycled water. See Table 3-1 for Hillsborough's historical (gross) water use.

Technical Methodology 2: Service Population Area

Hillsborough is a Category 1 Water Supplier, as defined in Technical Methodology 2. The Town's actual distribution area overlaps substantially ($\geq 95\%$) with Town boundaries during its baseline and compliance years. The Town has revised its ABAG population projections, as described in Section 2.5.1, "Revision to ABAG's Population Projections." See also Table 2-4 in that section for the Town's population data.

Technical Methodology 3: Base Daily per Capita Water Use

Base Daily Per Capita Water Use is defined as average gross water use, expressed in gallons per capita per day ("GPCD"), for a continuous, multiyear base period. The Water Code specifies two different base periods for calculating Base Daily Per Capita Water Use:

The first base period is a ten to fifteen year continuous period, and is used to calculate baseline daily per capita water use. If recycled water is less than 10% of 2008 water delivery (which is the case for Hillsborough, since Hillsborough uses no recycled water), an agency is to use a 10 year period ending no earlier than December 31, 2004 and no later than December 31, 2010.

The second base period is a continuous five-year period, and is used to ensure that each water agency's 2020 urban water use target is below 95% of its five year base per capita water use. Agencies must define their five year baseline using a continuous five-year period ending no earlier than December 31, 2007 and no later than December 31, 2010.

Calculating Base Daily Per Capita Water Use entails four steps:

1. Calculate Gross Water Use for each year in the base period using Methodology 1. Express Gross Water Use in gallons per day.
2. Estimate Service Area Population for each year in the base period using Methodology 2.
3. Calculate Daily Per Capita Water Use for each year in the base period.
4. Calculate Base Daily Per Capita Water Use. Calculate average per capita water use by summing the values calculated in #3, above, and dividing by the number of years in the base period. The result is Base Daily Per Capita Water Use for the selected base period.

Table 3-2 provides the 10 year base daily per capita water use for the Town. Table 3-3 provides the 5 year base period which determines the Town’s minimum water use requirement. Hillsborough’s population showed no growth between 2000 and 2010 per the 2010 U.S. Census.

Table 3-2: Base Daily per Capita Water Use — 10 Year Period¹

Fiscal Year Ending	Population	Gross Water Use (AFY)	Per Capita Water Use (GPCD)	10 Year Average (GPCD)
6/30/1995	10,701	3,293	275	
6/30/1996	10,712	3,968	331	
6/30/1997	10,754	4,185	347	
6/30/1998	10,820	3,595	297	
6/30/1999	10,814	3,769	311	
6/30/2000	10,825	4,215	348	
6/30/2001	10,825	3,962	327	
6/30/2002	10,825	3,986	329	
6/30/2003	10,825	4,054	334	
6/30/2004	10,825	4,465	368	327
6/30/2005	10,825	3,743	309	330
6/30/2006	10,825	3,824	315	329
6/30/2007	10,825	4,100	338	328
6/30/2008	10,825	4,346	358	334
6/30/2009	10,825	3,845	317	334

¹10 year base period ends no earlier than 12/31/2004 and no later than 12/31/10.

3.3.2.2 Step 2: Determine Urban Water Use Target

SBX7-7 provides four methodologies for determining a Supplier’s Water Use Target. They are as follows:

Method 1: Eighty percent of the water supplier’s baseline per capita water use;

Method 2: Per capita daily water use estimated using the sum of performance standards applied to indoor residential use, landscaped area water use, and commercial, institutional and industrial (“CII”) uses;

Method 3: Ninety-five percent of the applicable state hydrologic region target as stated in the State’s March, 2011, *UWMP Guidebook*, and

Method 4: Savings by Water Sector. This method identifies water savings obtained through identified practices and subtracts them from the base daily per capita water use value identified for the water supplier.

The Town analyzed all four methods and determined that Method 1 is the most appropriate method for setting the Town’s Interim and 2020 water use targets. Therefore, the Town’s Urban Water Use Target is 80% of its Base Daily Per Capita Water Use, or $334 \text{ GPCD} \times .80 = 267 \text{ GPCD}$.

3.3.2.3 Step 3: Compare Urban Water Use Target to the 5-year Baseline

SBX7-7 includes a minimum water use reduction requirement to ensure that each water agency’s 2020 urban water use target is below 95% of its 5-year base per capita water use. Agencies may define their

5-year base using a continuous five-year period ending no earlier than December 31, 2007 and no later than December 31, 2010.

Table 3-3: Base daily per capita water use — 5-year period¹

Fiscal Year Ending	Population	Per Capita Water Use (GPCD)	5 Year Average (GPCD)	95% of 5 Year Average (GPCD)
6/30/2002	10,825	329		
6/30/2003	10,825	334		
6/30/2004	10,825	368		
6/30/2005	10,825	309		
6/30/2006	10,825	315	331	314
6/30/2007	10,825	338	333	316
6/30/2008	10,825	358	338	321
6/30/2009	10,825	317	328	311
6/30/2010	10,825	277	321	305

¹5 year base period ends no earlier than 12/31/2007 and no later than 12/31/2010

The Town’s 2020 Urban Water Use Target of 267 GPCD is below 95% of its 5-year base per capita water use of 338 GPCD ($338 \text{ GPCD} \times .95 = 321 \text{ GPCD}$).

3.3.2.4 Step 4: Determine Interim Water Use Target

The Town’s Interim Water Use Target is calculated by adding the 10 year base daily per capita water use to the urban water use target, then dividing by 2. As such, the Town’s Interim Water Use Target is $(334 + 267)/2 = 301 \text{ GPCD}$.

3.3.3 Projected SBX7-7 Targets

As can be seen in Table 3-1, Hillsborough used 3,364 acre-feet of water in Fiscal Year 2009/10, for a per capita average of 277 GPCD. As can be seen in Table 3-4, this is below its 2015 interim water use target of 301 GPCD, and its projected FY 2014/15 water use target of 3,663 AFY. It is also very close to its 2020 water use target of 267 GPCD and a projected water use target of 3,269 AFY. As previously mentioned, the Town of Hillsborough is a residential community that is virtually built out. There is little to no opportunity for an increase in multi-family, commercial, industrial, institutional/governmental or landscape accounts. Therefore, the Town’s projected water use will mainly be affected by weather patterns and water conservation efforts. Hillsborough’s 2015 projection is based on historical water use rebounds seen in previous droughts. However, the drought recovery has not been typical to date, and water use remains low. The Town projects that local and regional water conservation programs, described in Chapter 6, may reduce a post-drought rebound and further ensure that the Town meets its SBX7-7 water use targets in 2015 and 2020.

Table 3-4: Projected SBX7-7 Water Use Targets

	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
Target (GPCD)	301	267	267	267	267
Population ¹	10,869	10,913	10,956	11,000	11,000
Projected AFY	3,663	3,269	3,283	3,296	3,296

¹Hillsborough projected population from Table 2-4

3.3.4 Current and Projected Water Use by Sector

3.3.4.1 Current Water Use

The Town’s current water use by sector is presented in Table 3-5, below. Residential water use accounts for 98% of retail water use.

Table 3-5: 2005 and 2010 Water Deliveries

Water Use Sectors	FY 2004-05 Metered		FY 2009-10 Metered	
	# of Accts	Volume (AFY)	# of Accts	Volume (AFY)
Single-family	4,149	3,494	4,190	3,177
Multi-family	0	0	0	0
Commercial	11	14	11	8
Industrial	0	0	0	0
Institutional / Governmental	15	25	17	23
Landscape	42	46	57	46
Agriculture	0	0	0	0
Other	0	0	0	0
Total	4,217	3,578	4,275	3,254

Source: Hillsborough Finance Department water sales records.

3.3.4.2 Projected Water Use

The Town’s projected water use is presented by category in Tables 3-6 through 3-9, below. Water use projections are based on meeting SBX7-7 target requirements in 2015 and 2020 (301 GPCD and 267 GPCD, respectively), and maintaining 267 GPCD through 2035, as presented in Table 3-4, above.

Water Deliveries

Table 3-6 shows Hillsborough’s metered water deliveries to customers. Ninety-eight percent of Hillsborough’s metered water is projected to be for residential water use. Increases in commercial, institutional/governmental and landscape accounts are anticipated to be non-existent or negligible.

Table 3-6: Hillsborough's Projected Water Deliveries to Retail Customers

Water Use Sectors	FY 2014-15 Metered		FY 2019-20 Metered		FY 2024-25 Metered		FY 2029-30 Metered		FY 2034-35 Metered	
	# of Accts	Vol. (AFY)	# of Accts	Vol. (AFY)	# of Accts	Vol. (AFY)	# of Accts	Vol. (AFY)	# of Accts	Vol. (AFY)
Single-family	4,200	3,436	4,215	3,060	4,230	3,073	4,240	3,086	4,250	3,086
Multi-family										
Commercial	11	11	11	11	11	11	11	11	11	11
Industrial	0	0	0	0	0	0	0	0	0	0
Institutional / Governmental	19	24	19	23	20	23	20	23	20	23
Landscape	60	46	63	45	65	44	65	44	65	44
Agriculture	0	0	0	0	0	0	0	0	0	0
Other	0	0	0	0	0	0	0	0	0	0
Total	4,290	3,517	4,308	3,139	4,326	3,151	4,336	3,164	4,346	3,164

Water Transfers and/or Sales to Other Agencies

The Town of Hillsborough does not typically transfer or sell water to other agencies except in emergencies. In exigent circumstances by agreement adopted in 2005, the Town may exchange water with the City of Burlingame through interconnections between the two water systems. The Town of Hillsborough executed a water transfer to the California Water Service Company in Fiscal Year 2006/07. The total transfer was approximately 10 acre-feet. This water transfer was due to the SFPUC Crystal Springs Pipeline #2 shutdown. The Town also executed a water transfer to the City of Burlingame in 2010. The total transfer from Hillsborough to Burlingame, between May and October 2010 was 30 acre-feet. This water transfer was due to a water tank repair project in the top zone of Burlingame's water distribution system. Table 3-7 shows the amount of water transferred during Fiscal Year 2009/10.

Table 3-7: Hillsborough Water Transfers / Sales to Other Agencies

Water Distributed (AFY)	FY 2004-05	FY 2009-10	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
City of Burlingame	0	7	0	0	0	0	0
Total	0	7	0	0	0	0	0

Other Water Use and Losses

The Town has fairly low water loss: 4% in FY 2004/05 and 3% in FY 2009/10, compared to an industry average of about 10%. Following are brief descriptions of the Town's known water losses:

Water Flushing: Water main flushing is a maintenance operation to control nitrification. Unidirectional Flushing is a water maintenance operation in which water flows through an open hydrant at sufficient velocity to scour mineral and bio-film deposits from the interior walls of water delivery pipes. Both maintenance operations use ten-thousand to one-hundred thousand gallons of water per maintenance flushing event. In February 2011, the Town used Clean Water State Revolving Fund ("CWSRF") forgivable

loan funds to purchase a mobile water flushing, filtration and treatment system called NO-DES (see Attachment 10 and Section 6.5.2). This truck mounted system has the potential to eliminate virtually all water loss due to unidirectional flushing and eliminate water loss due to water quality flushing by 50% or more.

Tank Cleaning: Tank cleaning is an ongoing program to maintain water quality. Water loss may occur from tank draining during cleaning.

Sewer Main Flushing: The Town began an extensive sewer main flushing program beginning in 2009, as a result of a Cease and Desist Order related to Sanitary Sewer Overflows. Sewer main flushing is expected to slowly decline beginning in 2012 as older sewers are repaired and or replaced as part of the Town’s response to the Cease and Desist Order.

Unaccounted for Water: This category includes losses due to water main failures, fire fighting, fire flow testing, water leaks and inaccurate meters; the timing of meter reads between the SFPUC and Hillsborough; and the offset for water storage for the beginning and end of the water year.

Table 3-8 shows Hillsborough’s actual and projected water system losses. System water loss is calculated by subtracting water deliveries and water transfers from total water use.

Table 3-8: Hillsborough Distribution System Water Loss¹

Water Use (AFY)	FY 2004-05	FY 2009-10	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
System Losses ²	165	102	147	131	131	132	132
Total	165	102	147	131	131	132	132

¹Water accounted for in Tables 3-5 through 3-7 is not included in this table.

²Projected system losses assumed to be 4% of total water use.

Total Projected Water Use

Total Water Use is the summation of the subtotals of Tables 3-5 through 3-8, above.

Table 3-9: Hillsborough Total Water Use

Water Use (AFY)	FY 2004-05	FY 2009-10	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
Total Water Deliveries	3,578	3,254	3,517	3,139	3,151	3,164	3,164
Sales to Other Water Agencies	0	7	0	0	0	0	0
Additional Water Uses and Losses	165	102	147	131	131	132	132
Total	3,743	3,364	3,663	3,269	3,283	3,296	3,296

3.3.4.3 Demand Projections Provided to Wholesale Water Suppliers

In April 2009, the SFPUC requested demand projections for all BAWSCA agencies through BAWSCA. The Town provided SFPUC with the best available data available at that time, and stated that it would provide updated demand projections upon completion of its 2010 UWMP and related demand projection analysis. As such, the Town will provide the SFPUC a copy of this Plan upon adoption, along with updated demand projections, as presented in Table 3-10.

Table 3-10: Demand Projections Provided to Wholesale Suppliers

Wholesaler	Contracted Volume	FY 2004-05	FY 2009-10	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
SFPUC (AFY)	4,581	3,743	3,364	3,663	3,269	3,283	3,296	3,296

3.3.4.4 Lower-Income Water Deliveries

Section 10631.1(a) of the CWC requires that water use projections identify the projected water use for lower income single-family households. A lower-income household is defined as 80 percent of median income, adjusted for family size. ABAG’s Initial Vision Scenario for the Sustainable Communities Strategy projects an increase of 30 new housing units per year for the Town of Hillsborough, including low income housing units. For reasons outlined in Section 2.5.1, this is unrealistic. The final version of the Initial Vision Scenario will not be available until Fall 2012. The Town has therefore prepared a reasonable estimate of projected lower income housing units and associated water use, below.

Projected water use of planned lower-income housing (less than 80% of the average median income) is provided in Table 3-11. The Building Department estimates that there are approximately 75 lower income households in FY 2009/10, out of a total of 3,693 households. The Town’s Building Department projects that there will be a total of 288 lower income households in 2035. The Town’s Building Department estimates that there are 1.5 people per household in lower income households, compared to the average 2.92 people per Household in the 2010 U.S. Census. This is due to the fact that lower income households in Hillsborough are typically secondary single-family residential units that are smaller than the Hillsborough’s typical housing stock. The Town assumes similar per capita water use by lower income residences. Future lower-income household water use is estimated by multiplying the planned future housing units for lower income residents by the average number of persons per household and the estimated per capita water use. These demands are already included in Table 3-9, Total Water Use, above.

Table 3-11: Lower-Income Projected Water Demands¹

	FY 2009/10	FY 2014/15	FY 2019/20	FY 2024/25	FY 2029/30	FY 2034/35
Lower Income Total Households¹	75	133	183	223	263	288
Lower Income Projected Water Use² (AFY)	33	63	77	94	110	121

¹80% of the Average Median Income. Lower Income Household projections based on Building Official’s estimate. Estimate based on historical second unit permits from 2006 to 2010 for an average increase of 11.5 households per year through 2015, 10 per year through 2020, 8 per year through 2025, 8 per year through 2030, and 5 per year through 2035.

²Lower Income projected water use is based on Building Official’s estimate of 1.5 people per household multiplied by the Town’s average projected per capita water use. Lower income households in Hillsborough are typically secondary units and have fewer people per household than Hillsborough’s average of 2.9 people per household.

3.3.4.5 Water Use Reduction Plan

Urban retail water suppliers are to prepare a plan for implementing the SBX7-7 and conduct a public hearing which includes consideration of economic impacts of the plan. The plan should provide a general description of how the supplier intends to reduce per capita water use to meet its urban water use target.

As previously described, Hillsborough is a built out, residential community that is below its 2015 water use target and is nearly meeting its 2020 water use target. The Town anticipates a post-drought rebound from its current water use levels. However, the Town projects that local and regional water conservation

programs, along with State water conservation mandates, codes and efforts, will limit this rebound such that the Town will meet its 2015 and 2020 urban water use targets. At the local level, these efforts include the Town's:

- Mandatory Residential Green Building Ordinance, which requires all significant home remodel and new construction projects to meet green building requirements, including water conservation;
- Water Efficiency in Landscaping Ordinance, which requires all significant landscape and new home construction projects to meet minimum outdoor water efficiency landscape and irrigation design standards;
- Water Flushing Conservation Program, which eliminates water loss from unidirectional flushing operations and significantly reduces water loss from water quality flushing operations;
- Leak Detection and Water Loss Avoidance Program, which includes the use of leak detection correlators and loggers throughout the Town's water distribution system to identify, locate and repair water main leaks;
- Demand Management Measures, described in Chapter 6; and
- Participation in BAWSCA's Regional Water Conservation Program, also described in Chapter 6.

The Town will monitor and compare per capita water use to its SBX7-7 water use targets on an annual basis, and will consider and budget for additional conservation programs, as necessary, to meet the water use targets.

CHAPTER 4 – SYSTEM SUPPLIES

4.1 Introduction

This section describes the sources of water available to Hillsborough. It includes a description of the Town’s water sources, source limitations, water quality and water exchange opportunities. Table 4-1 is a summary of the existing and planned quantities of water available to the Town of Hillsborough in five year increments, beginning in 2010. Key considerations are:

- The Town relies completely on the SFPUC water supply. The Town has no planned or developed ground water sources, nor the legal right to pump groundwater under any existing order or decree. Private wells exist for the irrigation of the local golf course and landscape at some private residences. Such well water is not considered an approved potable water source for Hillsborough.
- The Town has no access to or opportunities to develop recycled or desalinated water sources. The Town’s wastewater is treated by the neighboring cities of Burlingame and San Mateo. The Town does not have immediate access to the ocean or bay water for desalination. There is no current or planned development of infrastructure necessary to treat and deliver recycled or desalinated water to Hillsborough.
- There are no planned future water supply projects being developed that are projected to provide an additional source of water for the Town of Hillsborough as of the drafting of this Plan.

Table 4-1 shows Hillsborough’s existing and planned water supply sources discussed below.

Table 4-1: Current and Projected Water Supply

Water Supply Sources	2010 (AFY)	2015 (AFY)	2020 (AFY)	2025 (AFY)	2030 (AFY)	2035 (AFY)
Wholesale Water (SFPUC)	4,581	4,581	4,581	4,581	4,581	4,581
Groundwater/Surface Water	0	0	0	0	0	0
Transfers/Exchanges	0	0	0	0	0	0
Recycled Water	0	0	0	0	0	0
Desalinated Water	0	0	0	0	0	0
Total	4,581	4,581	4,581	4,581	4,581	4,581

4.1.1 Wholesale Water Supply

Hillsborough receives 100% of its water from the SFPUC. A detailed description of the SFPUC water system can be found in Section 4.2. A detailed description of the reliability of the SFPUC water supply is provided in Chapter 5.

4.1.2 Groundwater and Surface Water

The Town has no ground water or surface water sources identified or planned in its service area for the foreseeable future. Hillsborough does not have the legal right to pump groundwater under any existing order or decree.

4.1.3 Transfer Opportunities

The Town of Hillsborough is directly connected to the cities of Burlingame and San Mateo through service connections that may be used during localized emergency situations. However, our neighboring wholesaler agencies also rely solely on SFPUC water. Transfers would only make sense if the water shortage is isolated to the small part of the SFPUC system where it crosses our service area.

Provisions in the Water Supply Agreement between San Francisco and its Wholesale Customers, discussed in Section 4.2.2, and the Tier Two Drought Allocation Plan, discussed in Section 5.5.2, allows the transfer of water among its Wholesale Customers. Further details regarding transfers can be found in the above referenced agreements.

4.1.4 Desalination

Hillsborough has no current or known future opportunities to desalinate water due to its elevation and distance from the ocean. The SFPUC, Santa Clara Valley Water District, East Bay Municipal Utility District ("EBMUD"), Contra Costa Water District, and Zone 7 Water Agencies are exploring the development of regional desalination facilities that could benefit the 5.4 million Bay Area residents and businesses served by these agencies. Additional information about the Bay Area Regional Desalination Project and information on the project can be found at www.regionaldesal.com. A desalination facility may be part of a preferred supply portfolio identified in the BAWSCA Long Term Reliable Water Supply Strategy ("Strategy"), described in Section 4.3.1.

4.1.5 Recycled Water

The Town's Wastewater Division maintains 116 miles of sewer pipe, four pump stations and approximately 2600 manholes. The Town's sanitary sewer system is built out, with much of the infrastructure in place for more than 40 years. The system sees an average annual flow of approximately one million gallons per day from approximately 3,870 sewer accounts. The Town's wastewater flows to treatment plants in the cities of San Mateo and Burlingame. Approximately 500,000 gallons per day flow from 2,110 accounts to the San Mateo Water Treatment Plant. This represents less than 6% of their total received flow. The remaining 500,000 gallons from 1,760 accounts flow to the City of Burlingame's Waste Water Treatment Plant. This represents approximately 10% of their total received flow.

The Town of Hillsborough has no opportunities for recycled water due to its elevation and distance from neighboring treatment facilities. There is no present or planned infrastructure available at either of these facilities to recycle waste water. Nor is there the infrastructure available to transport and distribute recycled water uphill to Hillsborough. The nearest recycled water treatment facility is the Redwood City Recycled Water Treatment Facility located 15 miles south of the Town of Hillsborough.

4.2 SFPUC Water Supply

Following is a description of SFPUC water supply system and its agreements with its Wholesale Customers.

4.2.1 SFPUC Regional Water System Overview

The Town of Hillsborough receives 100% of its water from the City and County of San Francisco's Regional Water System, operated by the 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 assure its water supplies.

The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from Hetch Hetchy. In practice, the local watershed facilities are operated to capture local runoff. The SFPUC operates a RWS that uses 100% surface water sources. The RWS is shown in Figure 4-1.

Figure 4-1: Hetch Hetchy Regional Water System



Source: SFPUC

4.2.1.1 Hetch Hetchy Source

The Hetch Hetchy watershed, an area located in Yosemite National Park, provides approximately 85% of San Francisco's total water needs. Spring snowmelt runs down the Tuolumne River and fills Hetch Hetchy, the largest reservoir in the SFPUC system. This surface water in the Hetch Hetchy Reservoir is treated, but not filtered because it is of such high quality.

4.2.1.2 The Alameda and Peninsula Sources

Together the Alameda and Peninsula watersheds produce about 15% of the total water supply. The Alameda watershed, located in Alameda and Santa Clara Counties, contributes surface water supplies captured and stored in two reservoirs: Calaveras and San Antonio. The Sunol Filter Galleries located near the Town of Sunol, are a groundwater source supplying less than one percent of San Francisco's water. The Peninsula watershed in San Mateo County contributes surface water supplies captured and stored in lower and upper Crystal Springs and San Andreas Reservoirs and in two smaller reservoirs, Pilarcitos and Stone Dam. The six reservoirs in the Alameda and Peninsula watersheds capture rain and local runoff. Some also store Hetch Hetchy water for use by San Francisco. These local water sources and groundwater from the Sunol filter galleries are treated and filtered before delivery.

4.2.1.3 SFPUC Water System Improvement Plan

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 has undertaken the Water System Improvement Plan ("WSIP"), approved October 31, 2008. 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 customers in a reliable, affordable and environmentally sustainable manner. Many of the

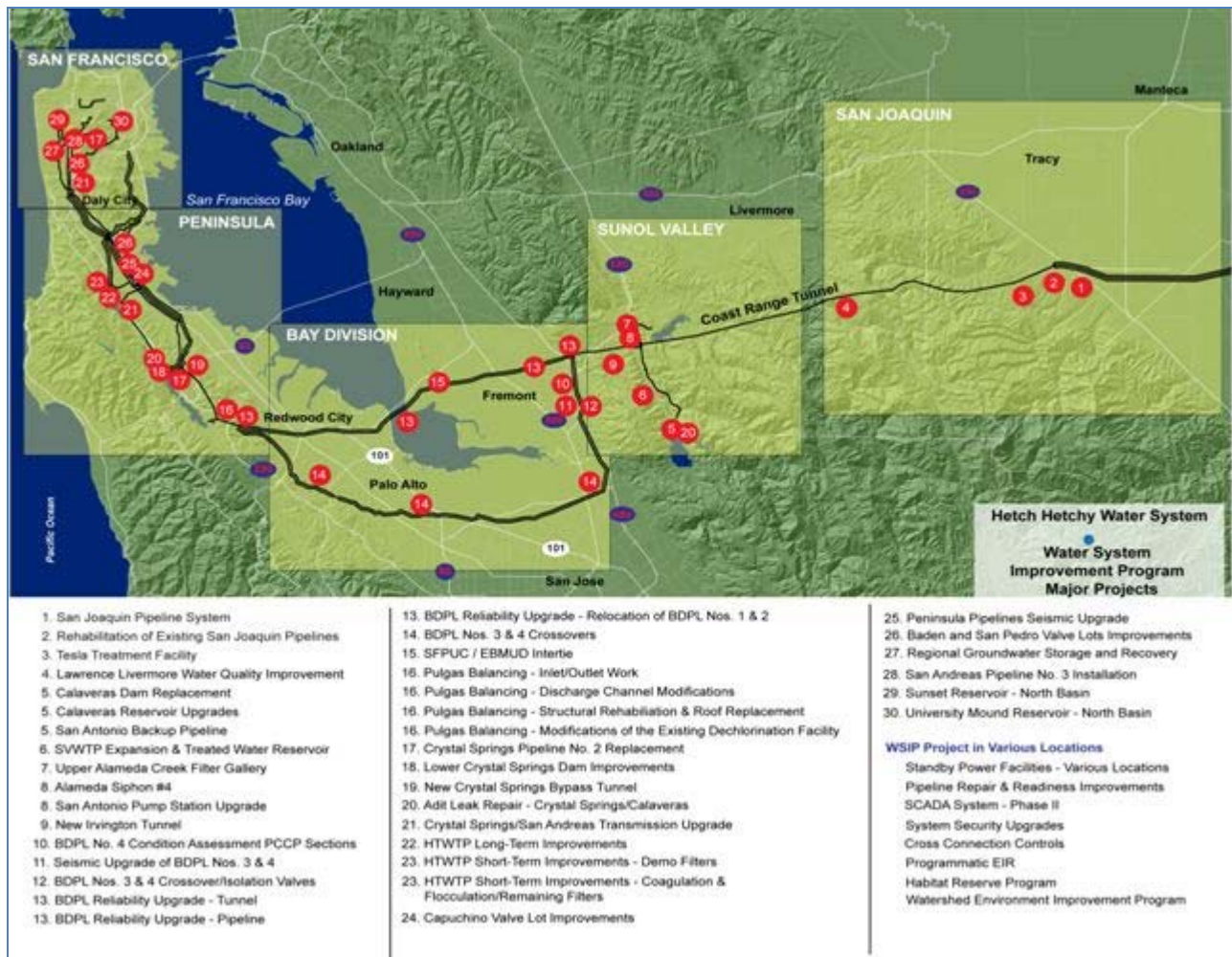
water supply and reliability projects evaluated in the WSIP were originally put forth in the SFPUC's 2000 Water Supply Master Plan.

A Program Environmental Impact Review was prepared in accordance with the California Environmental Quality Act ("CEQA") for the WSIP. The Program Environmental Impact Report, certified in 2008, analyzed the broad environmental effects of the projects in the WSIP at a program level and the water supply impacts of various alternative supplies at a project level. Individual WSIP projects are also undergoing individual project specific environmental review as required.

In approving the WSIP, the Commission adopted a Phased WSIP Variant for water supply that was analyzed in the PEIR. This Phased WSIP Variant established a mid-term water supply planning milestone in 2018 when the Commission would reevaluate water demands through 2030. At the same meeting, the Commission also imposed the Interim Supply Limitation which limits the volume of water that the member agencies and San Francisco can collectively purchase from RWS to 265 million gallons per day ("MGD") until at least 2018. Although the Phased WSIP Variant included a mid-term water supply planning milestone, it did include full implementation of all proposed WSIP facility improvement projects to insure that the public health, seismic safety, and delivery reliability goals were achieved as soon as possible.

As of July 1, 2010, the WSIP was 27% complete overall with the planning and design work over 90% complete. The WSIP is scheduled to be completed in December 2015. A map of the WSIP regional projects is provided as Figure 4-2.

Figure 4-2: SFPUC WSIP Regional Projects



Source: SFPUC

4.2.2 2009 Water Supply Agreement

The business relationship between San Francisco and its Wholesale Customers is largely defined by the Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County entered into in July 2009. The new WSA replaced the Settlement Agreement and Master Water Sales Contract that expired June 2009. The WSA 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 RWS. The WSA has a 25 year term.

In terms of water supply, the WSA provides for a 184 MGD (expressed on an annual average basis) Supply Assurance to the SFPUC's Wholesale Customers, subject to reduction, to the extent and for the period made necessary by reason of water shortage, due to drought, emergencies, or by malfunctioning or rehabilitation of the RWS. The WSA 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 Attachment C to the WSA. The Supply Assurance survives termination or expiration of the WSA and Hillsborough's Individual Water Sales Contract with San Francisco.

The Water Shortage Allocation Plan between the SFPUC and its Wholesale Customers, adopted as part of the WSA in July 2009, addresses shortages of up to 20% of system-wide use. The Tier One Plan allocates water from the RWS between San Francisco Retail and the Wholesale Customers during system-wide shortages of 20% or less. The WSA also anticipated a Tier Two Plan adopted by the Wholesale Customers which would allocate the available water from the RWS among the Wholesale Customers.

4.2.3 Individual Supply Guarantees

As noted above, in 2009, The Town of Hillsborough, along with 25 other Bay Area water suppliers, signed a Water Supply Agreement with San Francisco, supplemented by an individual Water Supply Contract. These contracts, which expire in 25 years, provide for a 184 MGD (expressed on an annual average basis) Supply Assurance to the SFPUC's Wholesale Customers collectively. Hillsborough's Individual Supply Guarantee is 4.09 MGD (or approximately 4,581 AFY). Although the Water Supply Agreement and accompanying Water Supply Contract expire in 2034, the Supply Assurance (which quantifies San Francisco's obligation to supply water to its individual Wholesale Customers) survives their expiration and continues indefinitely. As seen in Table 3-1, Hillsborough has not exceeded its Individual Supply Guarantee.

4.3 Future Water Projects

The Town of Hillsborough has identified no planned additional water supplies to date. However it is participating in BAWSCA's Long Term Reliable Water Supply Strategy ("Strategy").

4.3.1 BAWSCA's Long Term Reliable Water Supply Strategy

BAWSCA's water management objective is to ensure that a reliable, high quality supply of water is available where and when people within the BAWSCA service area need it. A reliable supply of water is required to support the health, safety, employment, and economic opportunities of the existing and expected future residents in the BAWSCA service area and to supply water to the agencies, businesses, and organizations that serve those communities. BAWSCA is developing the Long Term Reliable Water Supply Strategy to meet the projected water needs of its member agencies and their customers through 2035 and to increase their water supply reliability under normal and drought conditions.

The Strategy is proceeding in three phases. Phase I was completed in 2010 and defined the magnitude of the water supply issue and the scope of work for the Strategy. Phase II of the Strategy is currently under development and will result in a refined estimate of when, where, and how much additional supply reliability and new water supplies are needed throughout the BAWSCA service area through 2035, as well as a detailed analysis of the water supply management projects, and the development of the Strategy implementation plan. Phase II will be complete by 2013. Phase III will include the implementation of specific water supply management projects. Depending on cost-effectiveness, as well as other considerations, the projects may be implemented by a single member agency, by a collection of the member agencies, or by BAWSCA in an appropriate timeframe to meet the identified needs. Project implementation may begin as early as 2013 and will continue throughout the Strategy planning horizon, in coordination with the timing and magnitude of the supply need.

The development and implementation of the Strategy will be coordinated with the BAWSCA member agencies and will be adaptively managed to ensure that the goals of the Strategy (i.e., increased normal and drought year reliability) are efficiently and cost-effectively being met.

CHAPTER 5 – WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

5.1 Introduction

The Town of Hillsborough is entirely dependent upon the SFPUC for its water supply. This chapter describes the reliability of this water source, impacts of recent SFPUC actions on supply, SFPUC water shortage allocation planning, and Hillsborough’s water shortage contingency planning in the event of drought or water shortage emergency.

5.2 Reliability of the SFPUC Regional Water System

The SFPUC is very dependent upon the Hetch Hetchy watershed system and associated facilities to provide potable water to its 800,000 retail customers in the city and county of San Francisco, as well as its Wholesale Customers in 26 suburban agencies in Alameda, Santa Clara, and San Mateo counties, including the Town of Hillsborough. The system and its facilities were constructed in the mid-1900s, and many parts of the system are nearing the end of their working life, with crucial portions crossing over or near to three major earthquake faults. In 2002, the SFPUC launched a \$4.6 billion Water System Improvement Program to repair, replace, and seismically upgrade the system’s deteriorating pipelines, tunnels, reservoirs, pump stations, storage tanks, and dams.

The SFPUC’s WSIP provides goals and objectives to improve the delivery reliability of the RWS, including water supply reliability. The goals and objectives of the WSIP related to water supply are:

Program Goal	System Performance Objective
Water Supply – <i>meet customer water needs in non-drought and drought periods</i>	<ul style="list-style-type: none"> • Meet average annual water demand of 265 MGD from the SFPUC watersheds for retail and Wholesale Customers during non-drought years for system demands through 2018. • Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts. • Diversify water supply options during non-drought and drought periods. • Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers.

The adopted WSIP had several water supply elements to address the WSIP water supply goals and objectives. The following provides the water supply elements for all year types and the dry-year projects of the adopted WSIP to augment all year type water supplies during drought.

5.2.1 Water Supply – All Year Types

The SFPUC historically has met demand in its service area in all year types from its watersheds. They are the:

- Tuolumne River watershed;
- Alameda Creek watershed; and

- San Mateo County watersheds.

In general, 85 percent of the supply comes from the Tuolumne River through Hetch Hetchy Reservoir and the remaining 15 percent comes from the local watersheds through the San Antonio, Calaveras, Crystal Springs, Pilarcitos and San Andreas Reservoirs. The adopted WSIP retains this mix of water supply for all year types.

5.2.2 Water Supply – Dry-Year Types

The adopted WSIP includes the following water supply projects to meet dry-year demands with no greater than 20 percent system-wide rationing in any one year:

- Restoration of Calaveras Reservoir capacity;
- Restoration of Crystal Springs Reservoir capacity;
- Westside Basin Groundwater Conjunctive Use; and
- Water Transfer with Modesto Irrigation District / Turlock Irrigation District

In order to achieve its target of meeting at least 80 percent of its customer demand during droughts, the SFPUC must successfully implement the dry-year water supply projects included in the WSIP.

5.2.3 Projected SFPUC System Supply Reliability

The SFPUC has provided information regarding projected RWS supply reliability (Attachment 11). This table assumes that the Wholesale Customers purchase 184 MGD from the RWS through 2030 and the implementation of the dry-year water supply projects included in the WSIP. The numbers represent the wholesale share of available supply during historical year types per the Tier One Plan. This table does not reflect any potential impact to RWS yield from the additional fishery flows required as part of the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project.

5.2.4 Impact of Recent SFPUC Actions on Dry Year Reliability of SFPUC Supplies

In adopting the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project, the SFPUC committed to providing fishery flows below Calaveras Dam and Lower Crystal Springs Dam as well as bypass flows below the Alameda Creek Diversion Dam. The fishery flow schedules for Alameda Creek and San Mateo Creek represent a potential decrease in available water supply of an average annual 3.9 MGD and 3.5 MGD, respectively with a total of 7.4 MGD average annually. These fishery flows could potentially create a shortfall in meeting the SFPUC demands of 265 MGD and slightly increase the SFPUC's dry-year water supply needs. If a shortfall occurs, it is anticipated at the completion of construction of both the Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements project in approximately 2015 and 2013, respectively when the SFPUC will be required to provide the fishery flows.

The adopted WSIP water supply objectives include (1) meeting a target delivery of 265 MGD through 2018 and (2) rationing at no greater than 20 percent system-wide in any one year of a drought. As a result of the fishery flows, the SFPUC may not be able to meet these objectives between 2013 and 2018 without (1) a reduction in demand, (2) an increase in rationing, or (3) a supplemental supply. The following describes these actions.

5.2.4.1 Reduction in Demand

The current projections for purchase requests through 2018 remain at 265 MGD. However, in the last few years, SFPUC deliveries have been below this level, as illustrated in Table 5-1. If this trend continues, the SFPUC may not need 265 MGD from its watersheds to meet purchase requests through 2018. As a result, the need for supplemental supplies of 3.5 MGD starting in 2013 and increasing to 7.4 MGD in 2015 to offset the water supply loss associated with fish releases may be less than anticipated.

Table 5-1: Water Deliveries in the SFPUC Service Area¹

	Unit of Measure	FY 2005-06	FY 2006-07	FY 2007-08	FY 2008-09	FY 2009-10
Total Deliveries	MGD	247.5	257	254.1	243.4	225.2
	AFY	277,235	287,877	284,628	272,643	252,256

5.2.4.2 Increase in Rationing

The adopted WSIP provides for a dry-year water supply program that, when implemented, would result in system-wide rationing of no more than 20 percent. The PEIR identified the following drought shortages during the design drought; 3.5 out of 8.5 years at 10 percent rationing and 3 out of 8.5 years at 20 percent. If the SFPUC did not develop a supplemental water supply in dry years to offset the effects of the fishery flows on water supply, rationing would increase during dry years. If the SFPUC experiences a drought between 2013 and 2018 in which rationing would need to be imposed, rationing would increase by approximately 1 percent in shortage years. Rationing during the design drought would increase by approximately 1 percent in rationing years.

5.2.4.3 Supplemental Supply

The SFPUC may be able to manage the water supply loss associated with the fishery flows through the following actions and considerations:

- Development of additional conservation and recycling;
- Development of additional groundwater supply;
- Water transfer from Modesto Irrigation District and/or Turlock Irrigation District;
- Increase in Tuolumne River supply;
- Revising the Upper Alameda Creek Filter Gallery (“UACFG”) Project capacity²; and
- Development of a desalination project.

5.2.4.4 Meeting the Level of Service Goal for Delivery Reliability

The SFPUC has stated a commitment to meeting its contractual obligation to its Wholesale Customers of 184 MGD and its delivery reliability goal of 265 MGD with no greater than 20 percent rationing in any one year of a drought. In Resolution No. 10-0175 adopted by the SFPUC on October 15, 2010, the SFPUC directed staff to provide information to the Commission and the public by March 31, 2011 on how the SFPUC has the capability to attain its water supply levels of service and contractual obligations. This directive was in response to concerns expressed by the Commission and the Wholesale Customers regarding the effect on water supply of the instream flow releases required as a result of the Lower Crystal Springs Dam Improvement Project and the Calaveras Dam Replacement Project. In summary, the SFPUC has a projected shortfall of available water supply to meet its level of service goals and contractual obligations. The SFPUC has stated that current decreased levels of demand keep this from being an immediate problem, but that in the near future, the SFPUC must resolve these issues. Various activities are underway by the SFPUC to resolve the shortfall problem. SFPUC staff is expected to report back to the Commission September 2011 to provide further information on actions to resolve the shortfall problem.

¹ Reference: SFPUC FY09-10 J-Table Line 9 “Total System Usage” plus 0.7 MGD for Lawrence Livermore National Laboratory use and 0.4 MGD for Groveland. No groundwater use is included in this number. Unaccounted-for-Water is included.

² The adopted WSIP included the Alameda Creek Fishery Enhancement project, since renamed the UACFG project, which had the stated purpose of recapturing downstream flows released under a 1997 California Department of Fish and Game MOU. Implementation of the Upper Alameda Creek Filter Gallery project was intended to provide for no net loss of water supply as a result of the fishery flows bypassed from ACDD and/or released from Calaveras Dam. At the time the PEIR was prepared, the UACFG was described in the context of recapturing up to 6300 acre-feet per year. The UACFG will undergo a separate CEQA process in which all impacts associated with the project will be analyzed fully.

5.3 2018 Interim Supply Limitation

As part of its adoption of the Water System Improvement Program in October 2008, the SFPUC adopted a water supply element, the Interim Supply Limitation, to limit sales from San Francisco RWS watersheds to an average annual of 265 million gallons per day through 2018. The Wholesale Customers' collective allocation under the ISL is 184 MGD and San Francisco's is 81 MGD. Although the Wholesale Customers did not agree to the ISL, the Water Supply Agreement provides a framework for administering the ISL.

BAWSCA has developed a strategy to address each of its member agencies' unmet needs flowing from the ISL through its Water Conservation Implementation Plan and the Long-Term Reliable Water Supply Strategy, separately addressed herein.

5.4 Interim Supply Allocations

The Interim Supply Allocations refers to each individual wholesale customer's share of the Interim Supply Limitation. On December 14, 2010, the SFPUC established each agency's ISA through 2018. In general, the SFPUC based the allocations on the lesser of the projected 2017-18 purchase projections or Individual Supply Guarantees. The ISAs are effective only until December 31, 2018 and do not affect the Supply Assurance or the Individual Supply Guarantees, both discussed separately herein. San Francisco's ISA is 81 MGD. The Town's ISA is 3.72 MGD, or 4,167 AFY.

As stated in the Water Supply Agreement, the Wholesale Customers do not concede the legality of the SFPUC's establishment of the ISAs and Environmental Enhancement Surcharge ("EES"), discussed below, and expressly retain the right to challenge either or both, if and when imposed, in a court of competent jurisdiction.

5.4.1 Environmental Enhancement Surcharge

As part of its FY 2011/12 rate setting process, the SFPUC developed the methodology for a volume based Environmental Enhancement Surcharge for wholesale and retail customers. This surcharge will be unilaterally imposed by SFPUC on individual Wholesale Customers, and SFPUC retail customers, when each agency's use exceeds their ISA and when sales of water to the Wholesale Customers and San Francisco retail customers, collectively, exceeds the ISL of 265 MGD. The SFPUC methodology and amount of this volume-based charge is contained in a May 11, 2011 letter from Charles Perl, Deputy Chief Financial Officer, SFPUC to Art Jensen, Director, BAWSCA (Attachment 12). The Environmental Enhancement Surcharge was adopted as part of SFPUC's FY 2011/12 rate setting process and became effective beginning FY 2011-12.

5.5 Drought Supply

5.5.1 Tier One Drought Allocations

In July 2009, in connection with the Water Supply Agreement, the Wholesale Customers and San Francisco adopted a Water Shortage Allocation Plan to allocate water from the RWS to retail and Wholesale Customers during system-wide shortages of 20% or less (Tier One Plan). The Tier One Plan replaced the prior Interim WSAP, adopted in 2000, which also allocated water for shortages up to 20%. The Tier One Plan also allows for voluntary transfers of shortage allocations between the SFPUC and any wholesale customer and between Wholesale Customers themselves. In addition, water "banked" by a wholesale customer, through reductions in usage greater than required, may also be transferred.

The Tier One Plan, which allocates water between San Francisco and the Wholesale Customers collectively, distributes water based on the level of shortage, as shown in Table 5-2.

Table 5-2: Tier One Plan Water Shortage Distribution

Level of System Wide Reduction in Water Use Required	SFPUC Share of Available Water	Wholesale Customers Share of Available Water
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 One Plan will expire at the end of the term of the Water Supply Agreement, unless extended by San Francisco and its Wholesale Customers.

5.5.2 Tier Two Drought Allocations

The Wholesale Customers have negotiated and adopted the Tier Two Plan, the second component of the WSAP, which allocates the collective wholesale customer share among each of the 26 Wholesale Customers. This Tier Two allocation is based on a formula that takes multiple factors for each wholesale customer into account, including:

- Individual Supply Guarantee;
- Seasonal use of all available water supplies; and
- Residential per capita use.

The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Basis, expressed in millions of gallons per day, which in turn is the weighted average of two components. The first component is the wholesale customer's Individual Supply Guarantee, as stated in the WSA, and is fixed. The second component, the Base/Seasonal Component, is variable and is calculated using the monthly water use for three consecutive years prior to the onset of the drought for each of the Wholesale Customers for all available water supplies. The second component is accorded twice the weight of the first fixed component in calculating the Allocation Basis. Minor adjustments to the Allocation Basis are then made to ensure a minimum cutback level, a maximum cutback level, and a sufficient supply for certain Wholesale Customers.

The Allocation Basis is used in a fraction, as numerator, over the sum of all Wholesale Customers' Allocation Bases to determine each wholesale customer's Allocation Factor. The final shortage allocation for each wholesale customer is determined by multiplying the amount of water available to the Wholesale Customers' collectively under the Tier One Plan, by the Wholesale Customer's Allocation Factor.

The Tier Two Plan requires that the Allocation Factors be calculated by BAWSCA each year in preparation for a potential water shortage emergency. As the Wholesale Customers change their water use characteristics (e.g., increases or decreases in SFPUC purchases and use of other water sources, changes in monthly water use patterns, or changes in residential per capita water use), the Allocation Factor for each wholesale customer will also change. However, for long-term planning purposes, each wholesale customer shall use as its Allocation Factor the value identified in the Tier Two Plan when adopted. The Tier Two Plan will expire in 2018 unless extended by the Wholesale Customers.

5.5.3 SFPUC Supply

When the SFPUC declares a water shortage, Hillsborough may be required to make water use cutbacks. Table 5-3 shows the current level of water supply reliability based on a set of operational, engineering, and hydrological assumptions from SFPUC. Hillsborough has a contractual Individual Supply Guarantee of

4,581 AFY. This amount is not an absolute guarantee. In times of shortage, SFPUC will provide less than the assurance.

Table 5-3: SFPUC Water Supply Reliability During Drought

	Purchase Request Year 2009/10	One Critical Dry Year	Current Deliveries During Multiple Dry Years		
			Year 1	Year 2	Year 3
System-Wide Shortage in Percent	0%	10%	10%	20%	20%
SFPUC Wholesale Allocation (AFY)	206,106	170,934	170,934	148,419	148,419
Hillsborough Allocation Factor		2.07	2.07	2.07	2.07
Wholesale Allocation in MGD	184	152.6	152.6	132.5	132.5
Wholesale Allocation in AFY	3,364	3,364	3,364	3,072	3,072
% of Purchase Request	100.0%	100.0%	100.0%	91.3%	91.3%

Source: SFPUC letter to Nicole Sandkulla dated March 31, 2011. The Allocation Factor is based on the current Tier Two Drought Implementation Plan value of 2.07%. The Allocation Factor will be recalculated by BAWSCA each year as it is based on a variety of factors including historical water purchases over the last 3 years. The drought frequency percentages are based on a repeat of the actual historical hydrological period 1920 through 2002. In 9.6% of years (8 out of 83), there will be at least a 10% system wide cutback based on this information.

Wholesale water demands were very low relative to available supply throughout the Hetch-Hetchy System in 2010. Based on information provided by the SFPUC and application of the Tier One Drought Allocation Plan and the DRIP, our projected drought allocations from the SFPUC in 2010 and immediately thereafter are actually greater than our FY 2009/2010 purchases of 3364 AFY (e.g., our agency is projected to receive up to 3538 AFY under a 10% system-wide rationing). As such, our agency has shown that in 2010, even under extended drought conditions, we are able to receive 100% of our SFPUC purchase projections.

5.5.4 Water Supply and Demand Comparison

Tables 5-4 through 5-6 compare reductions in SFPUC water supplies to Hillsborough relative to projected water demand during a normal water year, a single dry-year and a multiple dry-years. Based on projected demand, Hillsborough should be able to manage up to 20% water cutbacks through the implementation of voluntary water conservation efforts and outreach to its community, even during multiple dry-years. The comparatively high projected water use demands and apparent cutback requirements in 2015 are based upon the unlikely combination of drought bounce-back in water use combined with the near term onset of an extended drought. This is an unlikely scenario. It is more likely that, in the onset of a near term water shortage event, a water use bounce back would be more modest, and less rigorous cutbacks would be required in 2015 than shown in Tables 5-5 and 5-6.

Table 5-4: Hillsborough Projected Water Supply vs. Water Demand, Normal Year

	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
Supply Totals¹	4,581	4,581	4,581	4,581	4,581
Demand Totals²	3,663	3,269	3,283	3,296	3,296
Difference	918	1,312	1,299	1,286	1,286
Difference as % of Supply	20.0%	28.6%	28.4%	28.1%	28.1%
Difference as % of Demand	25.1%	40.1%	39.6%	39.0%	39.0%

¹Table 4-1

²Table 3-9

Table 5-5: Projected Water Supply vs. Water Demand, Single Dry Year

	FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
Supply Totals¹	3,364	3,364	3,364	3,364	3,364
Demand Totals²	3,663	3,269	3,283	3,296	3,296
Difference	(300)	94	81	68	68
Difference as % of Supply	-8.9%	2.8%	2.4%	2.0%	2.0%
Difference as % of Demand	-8.2%	2.9%	2.5%	2.1%	2.1%

¹Table 5-3

²Table 3-9

Table 5-6: Projected Water Supply vs. Water Demand, Multiple Dry Years

		FY 2014-15	FY 2019-20	FY 2024-25	FY 2029-30	FY 2034-35
Multiple-Dry year First Year Supply	Supply totals¹	3,364	3,364	3,364	3,364	3,364
	Demand totals²	3,663	3,269	3,283	3,296	3,296
	Difference	(300)	94	81	68	68
	Difference as % of Supply	-8.9%	2.8%	2.4%	2.0%	2.0%
	Difference as % of Demand	-8.2%	2.9%	2.5%	2.1%	2.1%
Multiple-Dry Year Second Year Supply	Supply totals¹	3,072	3,072	3,072	3,072	3,072
	Demand totals²	3,663	3,269	3,283	3,296	3,296
	Difference	(591)	(197)	(210)	(223)	(223)
	Difference as % of Supply	-19.2%	-6.4%	-6.8%	-7.3%	-7.3%
	Difference as % of Demand	-16.1%	-6.0%	-6.4%	-6.8%	-6.8%
Multiple-Dry Year Third Year Supply	Supply totals¹	3,072	3,072	3,072	3,072	3,072
	Demand totals²	3,663	3,269	3,283	3,296	3,296
	Difference	(591)	(197)	(210)	(223)	(223)
	Difference as % of Supply	-19.2%	-6.4%	-6.8%	-7.3%	-7.3%
	Difference as % of Demand	-16.1%	-6.0%	-6.4%	-6.8%	-6.8%

¹Table 5-3

²Table 3-9

5.6 Water Shortage Contingency Planning

The following sections discuss regional and local contingency planning in the event of water shortage.

5.6.1 SFPUC Emergency Planning and Preparedness

5.6.1.1 SFPUC Planning, Training and Exercise

Following San Francisco’s experience with the 1989 Loma Prieta Earthquake, the SFPUC created a departmental *SFPUC Emergency Operations Plan (“EOP”)*. The *SFPUC EOP* was originally released in 1992, and has been updated on average every two years. The latest plan update was released in Spring 2011. The *EOP* addresses a broad range of potential emergency situations that may affect the SFPUC and that supplements the City and County of San Francisco’s *EOP* prepared by the Department of Emergency Management and most recently updated in 2008. Specifically, the purpose of the SFPUC *EOP* is to describe the department’s emergency management organization, roles and responsibilities, and emergency policies and procedures.

In addition, SFPUC divisions and bureaus have their own *EOPs* that are in alignment with the SFPUC *EOP* and describe each division’s/bureau’s specific emergency management organization, roles and responsibilities, and emergency policies and procedures. The SFPUC tests its emergency plans on a regular basis by conducting emergency exercises. Through these exercises the SFPUC learns how well the plans will or will not work in response to an emergency. Plan improvements are based on exercise and sometimes real world event response and evaluation. Also, the SFPUC has an emergency response training plan that is based on federal, state and local standards, exercise, and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response role.

5.6.1.2 Emergency Drinking Water Planning

In February 2005, the SFPUC Water Quality Bureau published a *City Emergency Drinking Water Alternatives* report. The purpose of this project was to develop a plan for supplying emergency drinking water in the City after damage and/or contamination of the SFPUC raw and/or treated water systems resulting from a major disaster. The report addresses immediate response after a major disaster. Since the publication of this report, the SFPUC has implemented a number of projects to increase its capability to support the provision of emergency drinking water during an emergency. These projects include:

- Public Information and materials for home and business;
- Designation and identification of 67 emergency drinking water hydrants throughout San Francisco;
- Purchase of emergency related equipment including water bladders and water bagging machines to help with distribution post disaster; and
- Coordinated planning with City Departments, neighboring jurisdictions and other public and private partners to maximize resources and supplies for emergency response.

With respect to emergency response for the SFPUC Regional Water System, the SFPUC has prepared the *SFPUC Regional Water System Emergency Response and Recovery Plan*, completed in 2003 and updated in 2006. The purpose of this plan is to describe the SFPUC RWS emergency management organizations, roles and responsibilities within those organizations, and emergency management procedures. This contingency plan addresses how to respond to and to recover from a major RWS seismic event, or other major disaster. This 2003 *Emergency Response and Recovery Plan* complements the other SFPUC emergency operations plans at the Department, Division and Bureau levels for major system emergencies.

The SFPUC has also prepared an *SFPUC-Suburban Customer Water Supply Emergency Operations and Notification Plan*. The plan was first prepared in 1996 and has been updated several times – most recently in July 2010. The purpose of this plan is to provide contact information, procedures and guidelines to be implemented by the following entities when a potential or actual water supply problem arises: the SFPUC Water Supply and Treatment Division (“WS&TD”), Water Quality Bureau (“WQB”), and SFPUC Wholesale Customers, BAWSCA, and City Distribution Division (“CDD” – considered to be a customer for the purposes of this plan). For the purposes of this plan, water quality issues are treated as potential or actual supply problems.

5.6.1.3 Power Outage Preparedness and Response

SFPUC’s water transmission system is primarily gravity fed from the Hetch Hetchy Reservoir to the City and County of San Francisco. Within San Francisco’s in-city distribution system, the key pump stations have generators in place and all others have connections in place that would allow the use of portable generators.

Although water conveyance throughout the RWS would not be greatly impacted by power outages because it is gravity fed, the SFPUC has prepared for potential regional power outages as follows:

- The Tesla disinfection facility, the Sunol Valley Water Treatment Plant, and the San Antonio Pump Station, have back-up power in place in the form of generators or diesel powered pumps. Additionally, both the Sunol Treatment Plant and the San Antonio Pump Station would not be impacted by a failure of the regional power grid because it runs off of the SFPUC hydro-power generated by the RWS.
- Both the Harry Tracy Water Treatment Plant and the Baden Pump Station have back-up generators in place.
- Additionally, as described in the next section, the WSIP includes projects which will expand the SFPUC’s ability to remain in operation during power outages and other emergency situations.

5.6.1.4 Capital Projects for Seismic Reliability and Overall System Reliability

As discussed previously, the SFPUC is also undertaking a 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.

As illustrated previously in Figure 4-2, the WSIP projects include several projects located in San Francisco to improve the seismic reliability of the in-city distribution system, as well as many projects related to the SFPUC RWS to address both seismic reliability and overall system reliability. All WSIP projects are expected to be completed by 2016.

In addition to the improvements that will come from the WSIP, San Francisco has already constructed the following system interties for use during catastrophic emergencies, short-term facility maintenance and upgrade activities, and in times of water shortages:

- A 40 MGD system intertie between the SFPUC and the Santa Clara Valley Water District (Milpitas Intertie); and
- One permanent and one temporary intertie to the South Bay Aqueduct, which would enable the SFPUC to receive State Water Project water.

The WSIP includes intertie projects, such as the EBMUD-Hayward-SFPUC Intertie. The SFPUC and EBMUD have completed construction of this 30 MGD intertie between their two systems in the City of Hayward, as part of the WSIP.

The WSIP also includes projects related to standby power facilities at various locations. These projects will provide for standby electrical power at six critical facilities to allow these facilities to remain in operation during power outages and other emergency situations. Permanent engine generators will be provided at four locations (San Pedro Valve Lot, Millbrae Facility, Alameda West, and Harry Tracy Water Treatment Plant), while hookups for portable engine generators will be provided at two locations (San Antonio Reservoir and Calaveras Reservoir).

5.6.2 Water Emergency Planning, Town of Hillsborough

In the 2005 UWMP, Hillsborough described its Water Shortage Contingency Plan, which addresses the administrative responses to events that could affect the delivery of water to our agency. It describes the actions to be taken by the Mayor, City Council and Public Works managers according to the severity, duration and nature of the shortage.

5.6.2.1 Stages of Action

Hillsborough Public Works has prepared a water shortage contingency analysis below. As discussed in Section 5.2.4.2, the SFPUC supply assurance for a multi-year drought is not expected to decrease water deliveries to its retail customers more than 20%. Based on past experience, Hillsborough Public Works believes that this situation can be handled by voluntary conservation measures alone.

The Public Works Department feels it is prudent to prepare a contingency plan that includes responses when the reduction of available water may be greater than the 20% supply assurance stated by the SFPUC. Planning for these reductions is based on the possibility of catastrophic failure of the water supply system and/or contamination of the water itself. These events could be regional or local in scope. Table 5-7 shows actions for reduction goals of up to 50%.

Table 5-7: Water Supply Shortage Stages and Conditions

Stage No.	Water Supply Condition	% Reduction Goal	Type of Rationing Program
I	Drought	15%	Voluntary
II	Drought	25%	Mandatory
III	System Failure/Contamination	35%	Mandatory
IV	System Failure/Contamination	≥ 50%	Mandatory

Description of Stage Responses

Stage I is a voluntary water consumption reduction program. Hillsborough officials will engage in a public relations campaign and request its customers to adjust their water consumption for outdoor and indoor use. Due to the high ratio of water use in summer compared to winter water usage, customers can easily reduce consumption by employing improved irrigation measures. More modest reductions in consumption are achieved by improving customers' water use habits inside the home. The Town has Water Use Reports for every residential and institutional parcel in the Town. The Reports compare, on a per parcel basis, twenty-four months of actual water use, ideal water use (a water budget), and water rationing allotment should the water shortage worsen and the Town's Water Rationing Ordinance (Attachment 13) be implemented (See Stage II event). The Reports would be provided with water bills so that customers can track their water use against their ideal budget and begin to prepare for the possibility of a Stage II event.

In a Stage II event, Council may be asked to make the finding to enforce the existing Water Rationing Ordinance (Hillsborough Municipal Code 13.16.040). The ordinance limits consumption based on a water allocation formula established following the 1988 drought events. Depending upon the severity of the Stage II event, the Town may consider reading water meters monthly rather than bi-monthly, and provide water use reports on a monthly basis as well.

In a Stage III and IV event, the Public Works Director will recommend to the City Manager and City Council to activate Emergency Response Plan ("ERP"). The ERP lists specific responses to water shortages based on the nature, level and duration of the water shortage event.

A draft "Declaration of Water Shortage Emergency" resolution is provided as Attachment 14. It may be considered by City Council in the event of a water shortage emergency.

The flow charts on the next two pages (Figures 5-1 & 5-2) were prepared to show the response decision process. Hillsborough's ERP has detailed Action Plans that address specific actions to be taken by the water system operators and managers as well as the Town Emergency Operations Center to manage the event.

Figure 5-1 Flowchart – Water Shortage Event Procedures

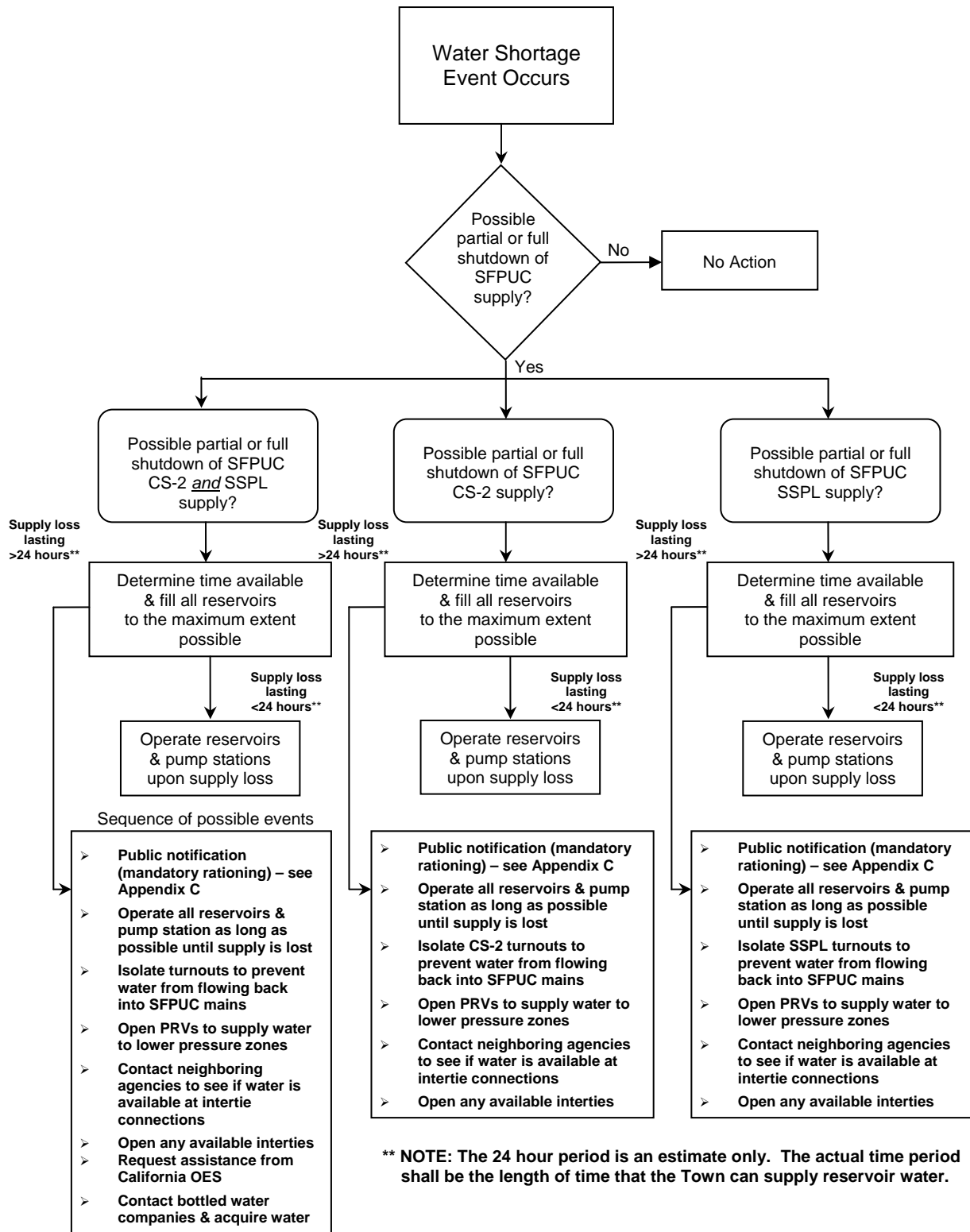
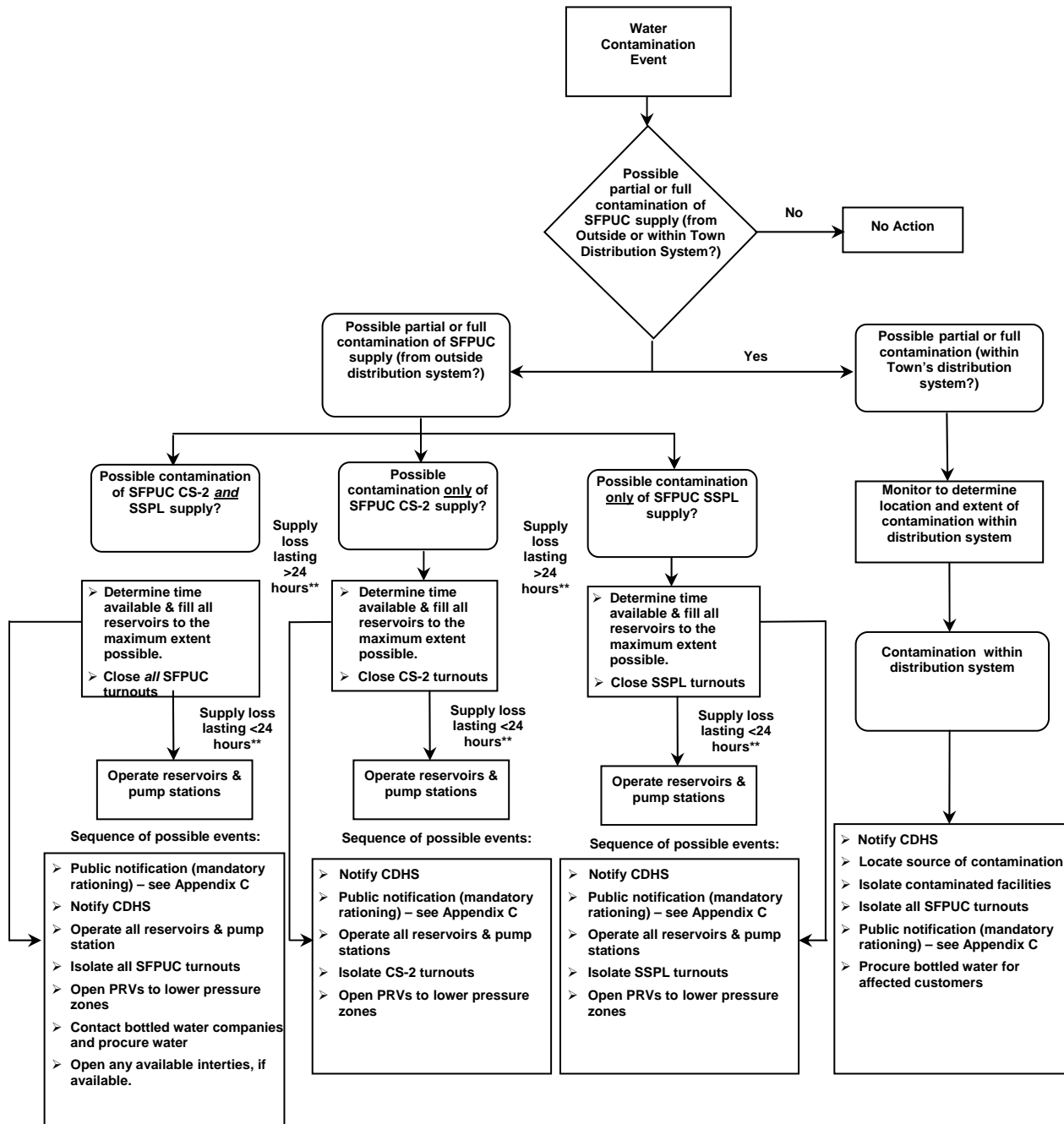


Figure 5-2: Flowchart – Water Contamination Event Procedures



**NOTE: The 24 hour period is an estimate only. The actual time period shall be the length of time that the Town can supply reservoir water.

5.6.2.2 Prohibition, Penalties and Consumption Reduction Method

Hillsborough’s Municipal Code Section 13.16.040 provides for water rationing in the event of drought or water shortage. Progressive rates have been in place for over a decade to discourage high water usage, and can be further amended in the event of a reduction in water supply assurance. Penalties may also be imposed, as they were in the early 1990s when they were needed. Table 5-8 shows Consumptive Reduction Methods and the stages in which they would be considered.

Table 5-8: Consumption Reduction Methods

Examples of Consumption Reduction Methods	Stage When Method Takes Effect
Public education and outreach program	All Stages
Water Use Reports	All Stages
Water rate adjustment	All Stages
Voluntary rationing	Stage I
Mandatory emergency rationing	Stage II (optional), III, IV
Excess Use Fees and Penalties	Stage II - IV
Use prohibitions	Stage II, III, IV

5.6.2.3 Revenue Impacts of Reduced Sales During Shortages

Hillsborough’s water department has two types of expenses: fixed and variable. The water department’s fixed costs are generally comprised of the operation and maintenance of its water system infrastructure. The water department’s variable costs are primarily driven by wholesale water purchase costs from the SFPUC. The water department also has two types of revenue: fixed and variable. The water department’s fixed revenue is primarily based on fixed meter rate fees. The Town’s variable revenue is primarily driven by water sales revenue. The Town’s variable revenue as a percentage of total water revenues was 83% in Fiscal Year 2010/11.

During a water shortage event, The Town’s water consumption and water sales revenue fall, while fixed expenses remain the same or increase slightly. Wholesale purchase costs also fall, but this savings is typically very small when compared to lost revenue. The result is that fixed expenses must be spread over fewer water units sold, which can result in a budget shortfall.

In the event of a Stage II or greater water shortage event, City Council may choose to enforce the Town’s water rationing ordinance. In this event, actual water use will be compared to each customer’s water rationing allotment. The City Council may also consider establishing excess use fees as part of the water shortage event response. Such excess use fees may help offset any potential over-use charges incurred by the Town from the SFPUC. City Council will adjust rates as necessary to sustain balanced water enterprise fund revenues and expenditures during a water shortage event. Table 5-9 summarizes some of the possible measures the Town may use to help mitigate the fiscal impact of a water shortage event.

Table 5-9: Measures to Overcome Water Shortage Revenue Impacts

Names of measures	Summary of Effects
Utilize water sales contingency fund	Defer revenue shortfalls
Rate adjustment	Mitigates revenue loss in retail sales
Excess water use fees	Offset potential over-use charges from SFPUC

5.6.3 Water Quality

The Town conducts programs to assure that its customers receive the highest quality water possible. The results of the monitoring programs are published in our Annual Water Quality Report. This report is mailed before July 1st of the year and is published on our website, www.hillsborough.net.

Compliance monitoring is conducted in accordance with Hillsborough's Sampling Plan submitted to the California Department of Public Health ("CDPH"). It is comprised of collecting samples from throughout our system and reporting the results to the CDPH. This monitoring complies with the Long Term 2 Enhanced Surface Water Treatment Rule, Lead and Copper Rule, and Stage 2 Disinfection Byproducts Rule, which are intended to check for disinfectant residual, presence/absence of coli form and e-coli bacteria, turbidity, lead and copper, and disinfection byproducts.

Hillsborough's Nitrification Control monitoring program is an internal assessment of water quality precursors preceding nitrification. All water systems using chloramines as their primary disinfectant should be aware of the constituents that could degrade over time and result in nitrification. Our Plan is designed to prevent this process from developing by measuring and tracking the trends of key precursors such as monochloramine, free ammonia, temperature and nitrite in our distribution system pipelines and water storage reservoirs.

The SFPUC has established a Rapid notification system with its Wholesale Customers using faxes and pagers to alert them of water quality issues. Drills are held periodically to assess the efficiency of the notification system. Once activated for an actual event, RWS agencies are alerted if a water quality, supply and/or operational issues are occurring in the RWS. Hillsborough water system operators will review the alerts and take appropriate action to protect the water system, supply and quality.

CHAPTER 6 – WATER DEMAND MANAGEMENT MEASURES

6.1 Introduction

This chapter describes the Town's water conservation efforts, including regional water conservation partnerships and the implementation of Demand Management Measures. Hillsborough is implementing all cost effective and applicable DMMs described in the UWMP Act (CWC §10631 (f)(1)), plus additional measures not described therein. Due to lower retail water use and a severe wholesale water rate increase by the SFPUC, the Town has experienced a significant water enterprise fund shortfall since Fiscal Year 2009/2010. To adjust for this, Hillsborough anticipates that it will need to raise retail water rates by as much as 80% over the next five years. These water enterprise fund budget constraints require the Town to focus limited resources on the most effective water conservation measures. Since Hillsborough consists of large single-family homes on large landscaped parcels, outdoor water conservation measures are considered the most cost-effective measures. Effectiveness of the Town's water conservation efforts, including the DMMs, can be measured using the Town's Water Use Reports, which measures weather adjusted water use on a per parcel basis against an ideal water budget (See DMM A).

6.2 Regional Coordination on Demand Management

BAWSCA and its member agencies look for opportunities to work with other water agencies, including the SFPUC and the Santa Clara Valley Water District, and leverage available resources to implement water use efficiency projects. For example, in 2005, BAWSCA and the SFPUC entered into a Memorandum of Understanding regarding the administration of a Spray Valve Installation Program. Through this MOU, BAWSCA and the SFPUC worked cooperatively to offer and coordinate the installation of water conserving spray valves to food service providers throughout the BAWSCA service area. In addition, BAWSCA participates in the Bay Area Efficient Clothes Washer Rebate Program, which is a residential rebate program offered by all of the major Bay Area water utilities. Through participation in this program, BAWSCA and its participating member agencies were the recipients of \$187,500 in Proposition 50 grant funds, which became available in Fiscal Year 2006/2007.

More recently, as part of the Bay Area Integrated Regional Water Management Plan, BAWSCA and the other major Bay Area water utilities submitted a Proposition 84 Implementation Grant Proposal in January 2011 to support regional water conservation efforts that offer drought relief and long-term water savings. The proposed project includes a package of water conservation programs to improve water use efficiency throughout the San Francisco Bay Area. The project provides direct funding, financial incentives (rebates), and/or subsidies for the implementation of programs that achieve reduced water demand by all classes of water users: residential, and commercial, industrial and institutional. Four specific programs were selected for the project because they were determined to provide the most quantifiable and sustainable water savings, including: 1.) Water-Efficient Landscape Rebates, Training and Irrigation Calculator, 2.) High-Efficiency Toilet/Urinal Direct Install and/or Rebates, 3.) High-Efficiency Clothes Washer Rebates, and 4.) Efficient Irrigation Equipment Rebates.

BAWSCA and its member agencies, including the Town of Hillsborough, will continue to look to partner with each other and the other Bay Area water utilities, as appropriate, to develop regional water conservation efforts that extend beyond local interests 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.

6.3 BAWSCA Water Conservation and Implementation Plan

In September 2009, BAWSCA completed the Water Conservation Implementation Plan. The goal of the WCIP is to develop an implementation plan for BAWSCA and its member agencies to attain the water efficiency goals that the agencies committed to in 2004 as part of the Program Environmental Impact Review for the Water System Improvement Plan which is further described in Section 4.2.1.3. The Water System Improvement Plan's goal was expanded to include identification of how BAWSCA member agencies could use water conservation as a way to continue to provide reliable water supplies to their customers through 2018 given the SFPUC's 265 MGD Interim Supply Limitation. The SFPUC imposed the Interim Supply Limitation on October 31, 2008 to limit the volume of water that the BAWSCA member agencies and San Francisco can collectively purchase from the RWS to 265 MGD until at least 2018.

Based on the WCIP development and analysis process, BAWSCA and its member agencies identified five new water conservation measures, which, if implemented fully throughout the BAWSCA service area, could potentially save an additional 8.4 MGD by 2018 and 12.5 MGD by 2030. The demand projections for the BAWSCA member agencies, as transmitted to the SFPUC on June 30, 2010, indicate that collective purchases from the SFPUC will stay below 184 MGD through 2018 as a result of revised water demand projections, the identified water conservation savings, and other actions.

Several member agencies have elected to participate in the BAWSCA regional water conservation programs, and BAWSCA continues to work with individual member agencies to incorporate the savings identified in the WCIP into their future water supply portfolios with the goal of maintaining collective SFPUC purchases below 184 MGD through 2018.

6.4 Demand Management Measures

Following is a list of DMMs described in the Urban Water Management Planning Act (CWC §10631 (f)(1)), and the status of implementation by the Town. A description of each Demand Management Measure can be found in the California Urban Water Conservation Council's Memorandum of Understanding.

6.4.1 Water survey programs for Single-family Residential and Multifamily Residential Customers (DMM A)

The Town began participating in a BAWSCA sponsored outdoor water use survey program in 2008. The program provided Water Use Reports to high-water use customers. The Report compared the customer's actual water use to their ideal water budget and their estimated water ration allotment in the event of a 20% mandatory rationing event. This voluntary program was very successful, demonstrating a fifteen percent reduction in water use on average by high-water use participants. In May 2011, the Water Use Report program was expanded to all Hillsborough residents. The Town used satellite imagery and related technology to establish landscape area and characteristics for every developed Town parcel. Results were tested against and adjusted using Google Earth and on the ground site survey measurements. A Water Use Report was mailed to every Hillsborough resident. Bi-monthly Reports are provided electronically free of charge. An example Water Use Report is provided as Attachment 15.

As part of the above effort, the Town began participating in a BAWSCA sponsored on-site survey program by a water conservation professional to measure landscape areas, assess irrigation system maintenance, test efficiency, check and adjust irrigation controller settings. Participants in the program received a report detailing irrigation system deficiencies and recommended measures to improve performance. The Town combined this program with the San Mateo Energy Upgrade California grant program in April 2011 (See DMM B).

6.4.2 Residential Plumbing Retrofits (DMM B)

In 2007, the Town began participation in the BAWSCA sponsored Water Wise Education Program. This program provides 150 water conservation kits to school age children. The kit contains a:

- Low flow faucet;
- Low flow shower head;
- Toilet leak test; and a
- Survey to return to teachers demonstrating that the retrofits were done and calculating the average water savings of the retrofit.

Please see DMM H for details regarding this program.

In April 2011, the Town was awarded a grant by San Mateo County to conduct energy efficiency audits for 60 Hillsborough homes. As a part of this voluntary program, the Town is providing an irrigation system and indoor water fixture check, along with written recommendations for system improvements, including irrigation schedules, maintenance and repair needs, as well as the recommended installation of low-flow devices. The Town hopes to extend this successful program through the procurement of additional grant funds and as other funding sources are identified.

6.4.3 System Water Audits, Leak Detection, and Repair (DMM C)

In 2008, the Town received a \$49,300 grant from the California Department of Water Resources to conduct a system wide leak detection survey of its entire distribution system. The Town's contracted vendor used leak correlation and listening device equipment and procedures on over ninety miles of water delivery mains and apertures in order to pinpoint system leaks for repair. A total of 13 leaks were discovered and repaired for an annual water savings of 3,145,000 gallons. As part of the DWR grant agreement, the Town also purchased a leak detection listening device and a leak detection correlator/logger system in July 2011. This equipment is used to conduct ongoing leak detection monitoring as part of the Town's regular and ongoing water distribution maintenance activities.

The Town also quantifies the volume of apparent and real water loss on an annual basis, comparing water purchases to water sales. System leaks are repaired as they are discovered. The Town notifies customers immediately when possible leaks on the customer's side of the meter are suspected or discovered.

As seen in Section 3.3.4.2, the Town has low water loss by industry standards. The Town will continue to track apparent and real water loss, and will enhance auditing efforts as issues arise and as budget allows.

6.4.4 Metering with Commodity Rates for All New Connections and Retrofit of Existing Connections (DMM D)

The Town requires metered connections for all new and existing water service customers. The Town encourages separate residential irrigation meters on all new residential construction projects, and requires it as part of any new non-residential construction project. There are no known unmetered connections to the Town's water system, except for a few connections in the Town's Public Works Corporation Yard. The Town bills most of its customers on a bi-monthly basis, and a few large accounts on a monthly basis, using a progressive tiered rate structure.

The Town has a list of meters by make, model and size and tests, repairs and replaces meters as needed in its service area. Given Hillsborough's relatively small size, issues with meter performance are fairly easily identified and addressed as needed.

6.4.5 Large Landscape Conservation Programs and Incentives (DMM E)

The Town is a residential community with only two commercial landscapes, the Burlingame Country Club and the Hillsborough Racquet Club. The Racquet Club has a very small landscaped area and the Burlingame Country Club irrigates primarily through the use of non-potable, non-distribution system surface (pond) water via water rights to Crocker Lake. The Town has converted Town owned and managed landscaping, including landscapes at Town Hall, Public Works corporation yard, public parks, and street medians to low-water using landscaping. The Town conducts annual irrigation maintenance inspections on these facilities.

6.4.6 High-Efficiency Washing Machine Rebate Programs (DMM F)

The Town anticipates participating in the BAWSCA Residential Washing Machine Rebate Program, beginning January 2012. The program provides rebates for the purchase of residential washing machines that are energy and water efficient. The Town anticipates an average of forty rebates per year under this voluntary program.

6.4.7 Public Information Programs (DMM G)

The Town has an active public information program to promote water conservation to its Town citizens. The Town participates in a number of public outreach and education efforts, including regional public information program efforts organized by BAWSCA. The Town also conducts its own extensive, local public education efforts, through various media, including:

- Regular articles in the Town's newsletter;
- Town water conservation webpage (www.hillsborough.net);
- Water Use Reports and water conservation website (www.waterfluence.com/hillsborough);
- Regular inserts and messages in water bills;
- Direct mailings;
- Faucet Hangers with irrigation schedules;
- 2009 and 2011 Environmental (Energy and Water Conservation) Fairs;
- Annual Water Conservation in Landscaping workshops;
- E-notify email messages to approximately half of the Town's residences;
- BAWSCA Landscape Conservation workshops;
- Stanford social marketing study;
- Water Wise Education Program;
- Water conservation brochures and flyers
- Water efficient demonstration garden at Town Hall;
- BAWSCA public outreach campaigns and programs; and
- SFPUC's Water Saving Hero campaign during 2007 – 2010 drought

The Town regularly will continue to work with the public and media to promote water conservation.

6.4.8 School Education Programs (DMM H)

The Town began participation in the BAWSCA sponsored Water Wise Education Program in 2007. This program provided 150 water conservation kits each year to school age children. The Water Wise Education Program annual report estimated an annual average savings of 900,000 gallons of water through this program. In Fiscal Year 2009/10, the Town allocated funding for public school participation

in the BAWSCA Water Wise Education and School Assembly Program. Unfortunately, the Town was notified by the Hillsborough School District that, due to an excess of mandatory educational teaching criteria, it was suspending its participation in the Water Wise Education Program and would not host water conservation school assemblies. The Town is prepared to provide this school water conservation education program and kit to the Hillsborough School District should there be an interest in the future.

6.4.9 Conservation Programs for Commercial, Industrial, and Institutional Accounts (DMM I)

The Town is a residential community. It has no industry or commercial water accounts, except for the Burlingame Country Club and Hillsborough Racquet Club. The Racquet Club has very little water use, and the Country Club irrigates primarily through the use of non-potable, non-distribution system surface (pond) water via water rights to Crocker Lake. The Town has water conservation programs available to the Country Club, including efficient spray valves and irrigation efficiency reports and survey.

The Town has four public schools and two private schools. Beginning in 2007, the Town sponsored an irrigation efficiency survey for all Hillsborough School District campuses and interested private school facilities.

The Town has implemented aggressive water conservation measures in its own municipal operations. These include:

- Drought tolerant plantings in Town Hall, Public Works Corporation Yard and median islands.
- Irrigation system surveys by the median island maintenance companies.
- Irrigation system survey of its Town Hall and Public Works yard.
- Installation of low flow toilet and faucets in Town facilities.

6.4.10 Wholesale Agency Programs (DMM J)

This DMM is not applicable to the Town since it is not a wholesale agency.

6.4.11 Conservation Pricing (DMM K)

The Town has had a progressive tiered rate structure for many years. The Town most recently increased its water rates on April 12, 2011. Eighty-three percent of the Town’s water enterprise fund revenue was generated through its variable, tiered rate water fees in FY 2010/11. The rate structure is provided in Table 6-1, below.

Table 6-1: Town of Hillsborough Water Rates

Unit Block	Block Rate/Unit
0-20 Units	\$4.38
20.1 – 50 Units	\$5.18
50.1 – 100 Units	\$5.94
100.1 – 200 Units	\$7.11
Over 200 Units	\$8.70

The Town also has bi-monthly meter charges to recover fixed costs not related to delivered water or new service connections to ensure system revenue efficiency. Table 6-2 shows the Town’s meter charges as of April 12, 2011.

Table 6-2: Bi-Monthly Meter Rate (Half for Monthly Billings)

Meter Size	Meter Rate / Unit
Up to and including 1-inch meter	\$60
1 1/2-inch meter	\$120
2-inch meter	\$192
3-inch meter	\$360
6-inch meter	\$1,200

The Town also charges for new service connections and for temporary water service. Hillsborough considered a variable rate structure for its waste water service fees. However, because the Town is comprised almost exclusively of very large residential landscaped lots, well over two-thirds of the Town's water use is outdoor water use. Given this high level outdoor water use, an annual flat wastewater rate was considered the most appropriate rate structure. The Town's waste water rates can be seen in Table 6-3.

Table 6-3: Sewer Rate Schedule (Effective July 1, 2010)

Customer / Type	Annual Sewer Rate
Residential	\$1,658
Hillsborough Racquet Club	\$2,487
Cal Trans Rest Stop	\$5,471
Crystal Springs Upland School	\$10,611
Burlingame Country Club	\$25,367
Crystal Spring Golf Club	\$11,938
Hillsborough School District	\$14,425
Nueva School	\$8,456

6.4.12 Water Conservation Coordinator (DMM L)

In 2007, the Town designated its Senior Management Analyst as the Town's Water Conservation Coordinator for the purpose of identifying and implementing high-impact and low cost water conservation measures, as well as tracking, planning and reporting on DMM implementation. The Senior Management Analyst participates in regional water conservation meetings and working groups. This position and its associated efforts have been particularly focused on DMMs that promote outdoor water conservation, which accounts for a majority of the Town's water conservation potential/opportunity. The position has been successful in procuring several water conservation grants, including a grant from the DWR to conduct a system-wide leak detection survey, leak detection listening device and leak detection correlator/logger and a Clean Water State Revolving Fund grant to purchase a mobile water flushing filtration system. The position is also responsible for designing and implementing a Water Use Report and website for every Town resident; coordinating participation with BAWSCA-sponsored regional water conservation programs and efforts, including the BAWSCA Water Conservation Implementation Plan; and maintaining participation in other water conservation programs.

6.4.13 Water Waste Prevention (DMM M)

As part of the Town's building permit process, all new development and substantial remodel projects must comply with the Town's Water Efficiency in Landscaping Ordinance and its Green Building Ordinance. The Water Efficiency in Landscaping Ordinance establishes minimum water efficiency design,

performance, use and maintenance standards for landscapes and irrigation systems (Hillsborough Municipal Code Section 15.29). The Town's Green Building Ordinance requires projects to meet minimum scores on a green building checklist, which includes mandatory indoor and outdoor water conservation measures as a condition of building permit (Hillsborough Municipal Code Section 15.19).

Additionally, Town field staff, including water, street, sewer and building inspection staff notify residents of water waste as they are identified. Water department staff responds to calls notifying the Town of water waste incidents.

6.4.14 Residential Ultra-Low-Flush Toilet Replacement Programs (DMM N)

BAWSCA maintains a subscription, residential Ultra-Low-Flush Toilet ("ULFT") replacement program for its member agencies. The Town does not participate in this program, since it is not deemed a locally cost-effective use of the Town's water conservation budget. The factors leading to this include:

- Hillsborough homes are large, with an average of four or more toilets per residence. According to the U.S. Census, there are only 2.93 persons per household in Hillsborough. This significantly reduces the per unit water savings in most water conservation estimates for ULFT by a factor of two or more.
- Over two-thirds of the Town's water use is for outdoor purposes. Further, Water Use Reports show that outdoor water is used more inefficiently in the Town than is indoor water usage. As such, the Town is focusing budget constrained resources on outdoor water conservation.

6.5 Additional Water Conservation Measures

6.5.1 Water Use Report

In 2008, the Town began a successful pilot program in which 125 high water use residences received detailed water use reports showing their actual water use compared to their ideal water budget. Ideal water use was based on each property's land use characteristics. Based on favorable feedback and water conservation results, the Town expanded this program in 2011 to make water use reports available electronically to all Town residences. The reports are updated on a bi-monthly basis. Section 6.6 further describes the Town's water use reports.

6.5.2 Mobile Water Quality Flushing Filtration and Conservation System

In 2009, the Town prepared and was awarded a \$300,000 Clean Water State Revolving Fund forgivable loan to procure a mobile water quality flushing and filtration system called NO-DES. Traditional water quality and unidirectional flushing is done by opening water hydrants and letting water flow for an hour or more. It was necessary to flush millions of gallons of water down storm drains each year in order to ensure that the water remained clean and safe to drink. The NO-DES unit allows the Town to create a closed loop between two fire hydrants to circulate, filter and treat water at a velocity sufficient to scour the water mains clean. As a result, the Town has reduced its water loss due to unidirectional flushing by over 95% and due to water quality flushing by over 50%. Please See the Town's Press Release, Attachment 10, for more information.

6.6 Evaluation of DMM Effectiveness and Estimate of Conservation Savings

As part of the Town's Water Use Report project, it has gathered water use data on an individual parcel basis. This data is correlated with land use characteristics assessed through GIS satellite imagery as well as on-site land characteristic surveys sufficient to establish statistical confidence and adjustments. The per parcel historical water use data, in combination with its land use characteristics, enables the Town to gauge historical water use against each parcel's ideal water budget on a month-to-month basis. This data is used to identify parcels with high water use as compared to an ideal water use target. It also allows the Town to monitor water use, and estimated over-use, adjusted for weather, through time. This will help the Town to effectively communicate with owners of high-water use parcels. It will also help the Town gauge the efficacy of its programs on a per parcel basis. Budget permitting, this evaluation of water use against ideal water budget will be done on an annual basis, the results of which will be available for reporting in the Town's 2015 UWMP.

CHAPTER 7 – CLIMATE CHANGE

The issue of climate change has become an important factor in water resources planning in the State, and is frequently being considered in urban water management planning purposes, though the extent and precise effects of climate change remain uncertain. As described by the SFPUC in its Final Water Supply Availability Study for the City and County of San Francisco, dated October 2009, there is evidence that increasing concentrations of greenhouse gasses have caused and will continue to cause a rise in temperatures around the world, which will result in a wide range of changes in climate patterns. Moreover, there is evidence that a warming trend occurred during the latter part of the 20th century and will likely continue through the 21st century. These changes will have a direct effect on water resources in California, and numerous studies have been conducted to determine the potential impacts to water resources. Based on these studies, climate change could result in the following types of water resource impacts, including impacts on the watersheds in the Bay Area:

- Reductions in the average annual snowpack due to a rise in the snowline and a shallower snowpack in the low and medium elevation zones, such as in the Tuolumne River basin, and a shift in snowmelt runoff to earlier in the year;
- Changes in the timing, intensity and variability of precipitation, and an increased amount of precipitation falling as rain instead of as snow;
- Long-term changes in watershed vegetation and increased incidence of wildfires that could affect water quality;
- Sea level rise and an increase in saltwater intrusion;
- Increased water temperatures with accompanying potential adverse effects on some fisheries and water quality;
- Increases in evaporation and concomitant increased irrigation need; and
- Changes in urban and agricultural water demand.

According to the SFPUC (2009), other than the general trends listed above, there is no clear scientific consensus on exactly how climate change will quantitatively affect the state's water supplies, and current models of water systems in California generally do not reflect the potential effects of climate change.

Initial climate change modeling completed by the SFPUC indicates that about seven percent of runoff currently draining into Hetch Hetchy Reservoir will shift from the spring and summer seasons to the fall and winter seasons in the Hetch Hetchy basin by 2025. This percentage is within the current interannual variation in runoff and is within the range accounted for during normal runoff forecasting and existing reservoir management practices. The predicted shift in runoff timing is similar to the results found by other researchers modeling water resource impacts in the Sierra Nevada due to warming trends associated with climate change.

The SFPUC has stated that based on this preliminary analysis, the potential impacts of climate change are not expected to affect the water supply available from the San Francisco Regional Water System or the overall operation of the RWS through 2030.

The SFPUC views assessment of the effects of climate change as an ongoing project requiring regular updating to reflect improvements in climate science, atmospheric/ocean modeling, and human response to the threat of greenhouse gas emissions. To refine its climate change analysis and expand the range of climate parameters being evaluated, as well as expand the timeframes being considered, the SFPUC is currently undertaking two additional studies. The first utilizes a newly calibrated hydrologic model of the Hetch Hetchy watershed to explore sensitivities of inflow to different climate change scenarios involving changes in air temperature and precipitation. The second study will seek to utilize state-of-the-art climate modeling techniques in conjunction with water system modeling tools to more fully explore

potential effects of climate change on the SFPUC water system as a whole. Both analyses will consider potential effects through the year 2100.

Hillsborough is taking action at the local level to combat climate change by reducing its municipal and community level greenhouse gas emissions. In 2007, Hillsborough conducted a community and municipal operations emission inventory in coordination with the Bay Area Air Quality Management District, ICLEI and San Mateo County. In 2009, it adopted its Climate Action Plan which sets CO₂e emission reduction targets. In 2009, the Town passed Green Building Ordinances requiring all new commercial and residential construction at a certain threshold to meet minimum green building points on a Build It Green checklist and point system. In 2011, The Town was awarded a grant by San Mateo County to provide BPI related training to its Town Building Department staff, conduct at least fifty home energy audits, and promote the Energy Upgrade California program to the Town's residents through a broad based outreach campaign. Additionally, the Town has significantly improved the energy efficiency of its water delivery system by securing ARRA related energy efficiency grant funds and loans, including:

- **California Energy Commission's ("CEC") Energy Efficiency Loan:** \$908,700 low-interest rate loan to upgrade the Town's SCADA system and replace four inefficient water pump motors and assemblies with high efficiency equipment.
- **CEC Energy Efficiency Block Grant Program:** \$58,463 grant to replace seven inefficient water pump motors and inefficient lighting in Town administration buildings with high efficiency equipment.
- **CEC Small City Energy Efficiency Loan Program:** \$37,812 low-interest rate loan to replace one inefficient water pump assembly and police department lighting with high efficiency equipment.

CHAPTER 8 – COMPLETED UWMP CHECKLIST

The *UWMP Guidebook* provides two versions of a checklist to support water suppliers preparing their UWMP. One checklist is organized according to the law and the second is organized according to subject matter. The checklists contain duplicate information and the water supplier is encouraged to use whichever checklist is more convenient. The Town used the subject matter checklist to guide its preparation of its UWMP. The checklist is provided as Attachment 16 of this document.

ATTACHMENTS