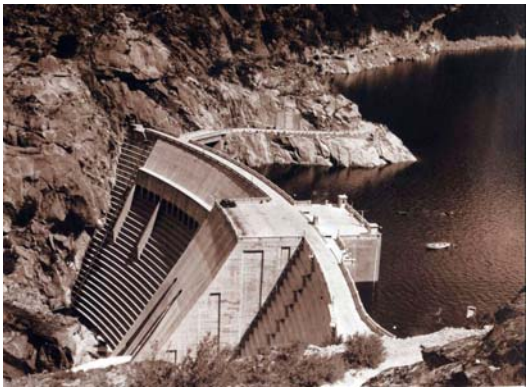
# City of Hayward

# 2010

# URBAN WATER MANAGEMENT PLAN



CITY OF
HAYWARD
HEART OF THE BAY

Preparation of the 2010 Urban Water Management Plan was a collaborative effort on the part of City of Hayward Department of Public Works staff. In particular, the following individuals contributed significantly to the development of this document:

- Robert Bauman, Director of Public Works
- Alex Ameri, Deputy Director of Public Works
- Marilyn Mosher, Administrative Analyst III
- Aparna Chatterjee, Associate Civil Engineer

In addition, staff from the City of Hayward's Department of Development Services, particularly David Rizk and Erik Pearson, provided invaluable insights and planning documents.

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## ACRONYMS

| | |
|---|---|
| ABAG | Association of Bay Area Governments |
| Act | California Urban Water Management Planning Act |
| ACWD | Alameda County Water District |
| AFY | Acre-feet per year |
| BAWSCA | Bay Area Water Supply and Conservation Agency |
| BMP | Best Management Practices |
| CEQA | California Environmental Quality Act |
| CII | Commercial, Industrial and Institutional |
| CIMIS | California Irrigation Management Information System |
| CUWCC | California Urban Water Conservation Council |
| DMM | Demand Management Measure |
| DSS | Demand Site Management Least-Cost Planning Decision Support System |
| DWR | California Department of Water Resources |
| EBDA | East Bay Dischargers Authority |
| EBMUD | East Bay Municipal Utility District |
| ETo | Evapo-transpiration Rate |
| FY | Fiscal Year |
| gpcd | gallons per capita day |
| gpd | gallons per day |
| gpm | gallons per minute |
| ISA | Interim Water Supply Allocation |
| ISL | Interim Supply Limitation |
| IWSAP | Interim Water Shortage Allocation Plan |
| LOS | Level of Service |
| mgd | Million Gallons per Day |

| | |
|---|---|
| MOU | Memorandum of Understanding |
| PEIR | Program Environmental Impact Report |
| RWS | Regional Water System |
| SB | Senate Bill |
| SFPUC | San Francisco Public Utilities Commission |
| UWMP | Urban Water Management Plan |
| WCIP | Water Conservation Implementation Plan |
| WSA | Water Supply Agreement |
| WSAP | Water Supply Allocation Plan |
| WSIP | Water Supply Implementation Plan |

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# URBAN WATER MANAGEMENT PLAN DEVELOPMENT AND ADOPTION

Since the early 1980s, the State of California has required water purveyors that provide 3,000 or more acre feet per year, or have 3,000 or more service connections, to prepare an Urban Water Management Plan (UWMP) every five years. The City of Hayward Water System serves about 32,000 connections and delivers an average of 20,000 acre feet per year, and is required to prepare an UWMP.

The primary purpose of the UWMP is to support long-term water resource planning and determine the availability of water supplies to meet current and future demand. More specifically, the UWMP:

- Quantifies current and future water demands over a 25-year planning horizon;
- Assesses the reliability of water supplies in normal and dry years;
- Describes water shortage contingency plans; and
- Describes current and planned demand management and water conservation efforts

In November 2009, the legislature passed and the Governor signed SB7, formally known as the Water Conservation Bill of 2009, which requires agencies to set targets for reducing urban per-capita usage and achieve reductions by 2015 and 2020. UWMPs were identified as the tool for documenting and tracking progress towards SB7 goals.

Under the normal cycle, the 2010 Urban Water Management Plan would have been due to the State by December 31, 2010. However, the State extended the deadline to July 1, 2011 to give agencies sufficient time to incorporate the requirements of SB7. The 2010 UWMP for Hayward has been prepared and adopted in accordance with all requirements and provisions of the Urban Water Management Planning Act (California Water Code §10610 et seq.). Appendix A contains the Department of Water Resources (DWR) Checklist of UWMP Requirements, cross-referenced to indicate where the requirements are addressed in the document. Appendix B includes a copy of the Urban Water Management Planning Act.

## PUBLIC PARTICIPATION

Public participation in the development of the UWMP was encouraged through postings on the City's website and notices of public hearing. Notices were published in the Daily Review, the local newspaper with the largest circulation in Hayward in early June for two successive weeks, and were posted at City Hall, in Hayward public libraries and on the cable television public access channel. Copies of the draft plan were available for public review and comment prior to the hearing.

## PLANNING COORDINATION

The City of Hayward coordinated with its wholesale water supplier, the San Francisco Public Utilities Commission (SFPUC), in preparation of the UWMP. This coordination was facilitated by the Bay Area Water Supply and Conservation Agency (BAWSCA), which was created in May 2003 to represent the interests of the 26 agencies in Alameda, Santa Clara and San Mateo counties that purchase water on a wholesale basis from the San Francisco Regional Water System (RWS). Collectively, the BAWSCA agencies are referred to as the Wholesale Customers. BAWSCA worked with member agencies and the SFPUC to maintain consistency among the UWMPs in terms of information about SFPUC supplies. The 25 other BAWSCA members were notified of the City's intention to update its UWMP.

The City owns and operates its own wastewater treatment facility and is a member of the East Bay Dischargers Authority (EBDA), a joint powers authority represented by five agencies that dispose treated wastewater through a common outfall to San Francisco Bay. EBDA was notified of the City's intention to update its UWMP.

Hayward's General Plan, adopted in 2002 and most recently amended in June 2010, with the adoption of a revised Housing Element, was used as a resource in developing water demand projections. City's Utilities and Planning staff worked collaboratively in reviewing future potential development and associated water demands. While the City's General Plan served as the principal resource, other pertinent planning documents were considered, such as Association of Bay Area Governments (ABAG) projections and specific area plans.

In addition to the above agencies, the City also notified the East Bay Municipal Utility District (EBMUD) and County of Alameda, of Hayward's intention to update and adopt the UWMP and made copies of the Plan available to these agencies for review.

***Table 1-1***
***Coordination with Appropriate Agencies***

| *Agency* | *Participated in developing the Plan* | *Was sent Notice of Preparation* | *Commented on draft* | *Attended public meetings* | *Was sent copy of draft Plan* |
|---|---|---|---|---|---|
| BAWSCA | X | X | | | X |
| BAWSCA member agencies | | X | | | |
| SFPUC | X | X | | | |
| Hayward Planning | X | X | | X | X |
| EBDA | X | X | | | |
| EBMUD | | X | | | |
| County of Alameda | | X | | | |

The draft 2010 UWMP was made available for public review in early June, 2011 on the City's website, and in the City's Department of Public Works, City Clerk's Office, and Hayward public libraries.

## ADOPTION OF 2010 URBAN WATER MANAGEMENT PLAN

The City of Hayward City Council adopted the 2010 Urban Water Management Plan at its regular meeting on Tuesday, June 21, 2011 after a public hearing, broadcasted on local government access cable television and on the City's website. A copy of the resolution and notices regarding the preparation and adoption of the UWMP are included in Appendix C.

The adopted UWMP is available for review by the public during business hours at the Hayward City Hall and on the City's website. Copies of the UWMP will be mailed to the Department of Water Resources, the California State Library and the County of Alameda within 30 days of the adoption of the UWMP.

## IMPLEMENTATION OF 2010 URBAN WATER MANAGEMENT PLAN

The 2010 UWMP will serve as a core planning document for development of housing and non-residential properties, as well as development and use of water supplies, and will be implemented in accordance with the Urban Water Management Planning Act.

## CONTACT INFORMATION

The 2010 UWMP was prepared under the guidance of Alex Ameri, Deputy Director of Public Works. Contact information is provided below:

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# CHAPTER 2

# WATER SYSTEM DESCRIPTION

This section provides a brief history of the City of Hayward Water System, a description of the local climatic, current and projected population estimates, and development factors that may impact future water demand.

## HISTORY

Hayward is located in Southern Alameda County on the east shore of San Francisco Bay. Hayward was incorporated in 1876 and occupies an area of about 61 square miles. It is generally flat, except for the areas east of Mission Boulevard, where the elevation increases from 100 to 1,500 feet above sea level.

Settlement in the Hayward area began in about 1851 with the opening of a general store in what is now the downtown. Hayward remained essentially a small agrarian town until the end of World War II. Since then, it has undergone substantial changes. A tremendous increase in population occurred in the 1950s and 1960s as a result of the post-war construction boom. Hayward experienced a surge in industrial development during the 1960s and 1970s, which created employment opportunities and balanced, to some extent, the housing that was developed in earlier decades. During the last three decades, Hayward has seen continued residential and industrial growth, mostly in the form of infill development. Today Hayward enjoys a large and diverse industrial sector, including food and beverage and high-technology manufacturing, along with a growing number of biotechnology firms.

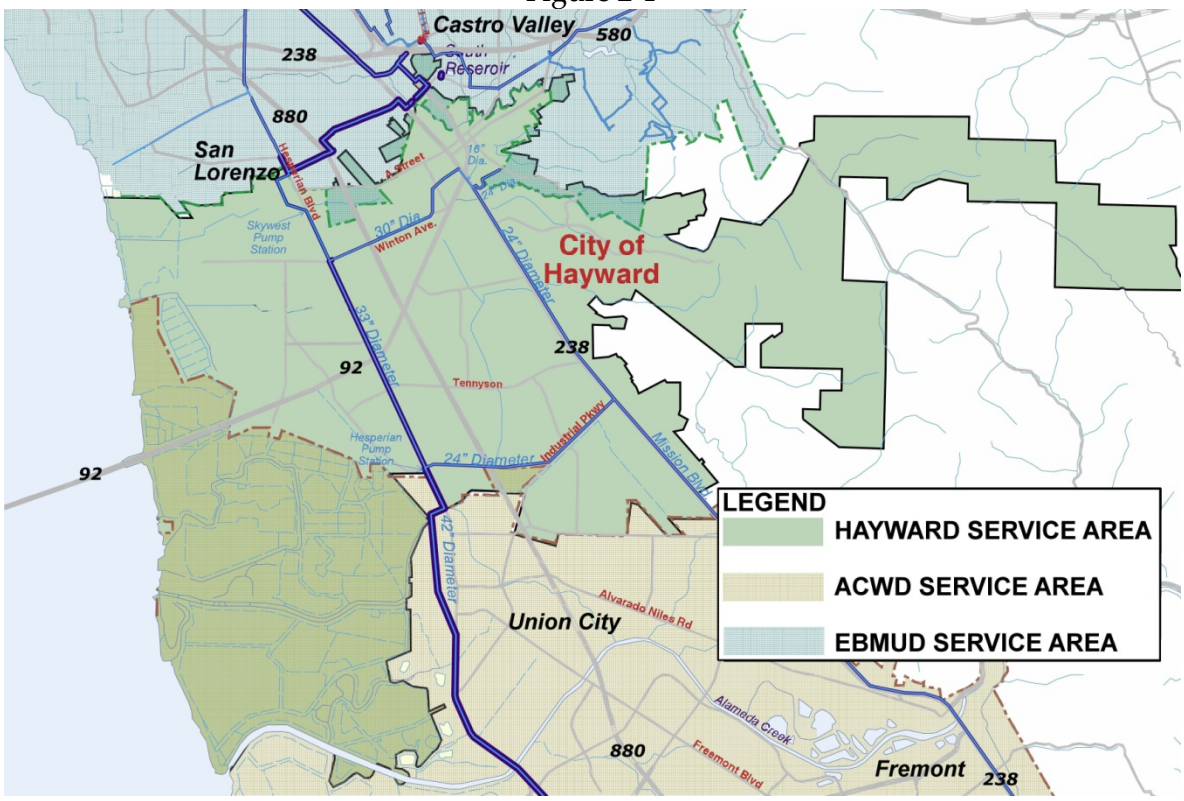
Water service is provided by the City of Hayward for residential, commercial, industrial, governmental, and fire suppression uses. Originally, wells were used to supply Hayward with water. During the 1940s and 1950s, the well water was supplemented by water purchased from San Francisco's Hetch Hetchy system, owned and operated by the San Francisco Public Utilities Commission (SFPUC). In 1962, Hayward entered into an agreement with the SFPUC to purchase all Hayward water from the SFPUC. Hayward constructed over 20 miles of aqueduct in order to deliver Hetch Hetchy water and ceased providing well water in 1963.

## DESCRIPTION OF SERVICE AREA

Hayward is located 25 miles southeast of San Francisco, 14 miles south of Oakland, 26 miles north of San Jose and 10 miles west of the valley communities surrounding Pleasanton. It is surrounded by unincorporated communities of San Lorenzo and Castro Valley in the north, Union City in the south, Pleasanton in the east and the Bay on the

west. The City of Hayward is governed by a City Council, comprised of seven elected members. The City Council serves as the governing body of the Hayward Water System. Figure 2-1 shows the service area boundaries for the City of Hayward Water System.

Figure 2-1




## CLIMATE

Hayward has a Mediterranean coastal climate, with mild and dry summers, and cool winters. Most of the precipitation is received during the winter months, with only very occasional summer showers. Banks of fog often move inland during summer nights from the Pacific Ocean and evaporate during the day. The total water consumed in Hayward is moderately influenced by precipitation and temperature.

Table 2-1 illustrates average evapotranspiration (ET), rainfall, and temperature data. ET is the loss of water to the atmosphere by the combined processes of evaporation (from soil and plant surfaces) and transpiration (from plant tissues), and is an indicator of how much water crops, lawns, gardens, and trees need for healthy growth and productivity. ETo refers to evapotranspiration as measured from a grass surface.

*Table 2-1*
*Climate Characteristics*

| Month | Standard Monthly Average ETo [1] | Average Rainfall (inches) [2] | Average Min Temperature (Fahrenheit) [2] | Average Max Temperature (Fahrenheit) [2] |
|---|---|---|---|---|
| Jan | 1.46 | 2.72 | 42.8 | 57.1 |
| Feb | 2.13 | 3.41 | 45.1 | 59.9 |
| Mar | 2.69 | 2.01 | 47.2 | 63.3 |
| Apr | 3.91 | 1.38 | 48.9 | 64.4 |
| May | 4.97 | 0.47 | 52.8 | 68.5 |
| Jun | 5.85 | 0.09 | 55.4 | 72.0 |
| Jul | 5.94 | 0.00 | 57.8 | 74.4 |
| Aug | 5.20 | 0.02 | 58.3 | 74.6 |
| Sep | 4.66 | 0.13 | 57.3 | 75.2 |
| Oct | 2.84 | 0.92 | 53.3 | 71.1 |
| Nov | 1.83 | 1.47 | 48.1 | 63.5 |
| Dec | 0.98 | 3.56 | 43.1 | 57.9 |
| Annual | 42.46 | 16.18 | 50.8 | 66.8 |

(1) Source: California Irrigation Management Information System (CIMIS), State of California Department of Water Resources, CIMIS Data, Sample Monthly Report for April 1, 2010 – March 31, 2011 taken at Union City Station #171.

(2) Source: 10-Year Monthly Climate Summary for Hayward Executive Airport, Desert Research Institute, Western Regional Climate Center

## SERVICE AREA POPULATION

Hayward's current residential population is about 153,000 (California Department of Finance estimate of January 1, 2010). Table 2-2 summarizes population estimates from the Department of Finance (2010) and Association of Bay Area Governments (ABAG) Projections 2009 (2015 – 2035) for Hayward and are consistent with the population data that was used to develop future water demands.

*Table 2-2*
*Current and Projected Population*

| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Population | 153,000 | 155,600 | 162,200 | 168,800 | 176,500 | 184,600 |

Sources: Dept of Finance estimate for 2010; and ABAG Projections 2009 for 2015-2035,

The vast majority of this population, plus almost all industrial and commercial entities, are served by the City of Hayward Water System. A very small portion of north Hayward, less than 3% of Hayward's total population, is served by the East Bay Municipal Utility District.

## DEMOGRAPHIC AND ECONOMIC TRENDS AFFECTING WATER MANAGEMENT

The water demand projections presented in the UWMP are based, in part, on population and business trends developed by ABAG. The population data in Table 2-2 reflects ABAG projections. Over the next 25 years, increased water demand will result from residential development, including infill, redevelopment, and construction of larger homes. The number of households is expected to increase by about 23% between 2010 and 2035. Water use will be significantly affected by potential development of the Route 238 right-of-way properties, a 356-acre area originally purchased by the State to accommodate construction of the Route 238 bypass. With this project no longer planned as originally envisioned, the City will be implementing a specific plan that blends housing, commercial businesses and open space. Other areas with potential for significant development include the South Hayward BART Station, and the recently annexed Mount Eden Area. California State University East Bay, which has long had its main campus in Hayward, is developing a long-range master plan that will include increased enrollment and increased housing facilities which will impact water demand. Chabot College, a regional community college located in Hayward, has also developed a long-range master plan for growth and development of its academic programs and facilities.

Regarding non-residential water use, ABAG estimates a 37% increase in the number of jobs in Hayward between 2010 and 2035, which is much higher than the projected population growth for the same period, with a significant portion of the new employment occurring in the manufacturing/ wholesale and health/education fields. Smaller overall increases are expected in the retail and professional services. A key General Plan strategy is to focus business attraction and retention efforts on "…employment generators, high performance, fast growing firms and community-service retail, as well as high technology and other industries that will enhance the local economy."

Table 2-3 summarizes population, households, and employment projections through 2035.

***Table 2-3***
***Current and Projected Population, Households, and Employees***

| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Population (1) | 153,000 | 155,600 | 162,200 | 168,800 | 176,500 | 184,600 |
| Households (2) | 47,300 | 49,280 | 51,390 | 53,610 | 55,920 | 58,290 |
| Employees (3) | 71,050 | 72,240 | 78,250 | 84,510 | 91,150 | 97,510 |

Sources: (1) Dept of Finance estimate for 2010; and ABAG Projections 2009 for 2015-2035
(2) ABAG Projections 2009
(3) ABAG Projections 2009

A full discussion of the specific demographic and development issues that may affect water demand is located in Chapter 3, Water System Demands.

# CHAPTER 3

# WATER SYSTEM DEMANDS

This section addresses past, current and projected water use by customer sector and expected water usage patterns. The City's actions related to the Water Conservation Bill of 2009, including development of daily per-capita water use targets, are also addressed in this chapter.

## PROJECTED WATER USE DEVELOPMENT

The water demand projections were developed, in part, through updating the "end use" model (also known as a Decision Support System or DSS model) used to prepare the City's 2005 UWMP. Two main steps are involved in developing and maintaining the model: 1) establishing base-year water demand at the end-use level (such as toilets, showers) and calibrating the model to initial conditions; and 2) forecasting future water demand based on future demands of existing water service accounts and future growth in the number of water service accounts.

Establishing the base-year water demand at the end-use level was accomplished by breaking down total historical water use for each type of water service account (single-family, multi-family, commercial, irrigation, industrial, etc.) to specific end uses, such as toilets, faucets, showers, and irrigation. Forecasting future water demand involved determining the growth in the number of water service accounts. Once these rates of change were established, they were entered into the model and applied to those accounts and their end water uses. The model also incorporated the effects of the plumbing and appliance codes on fixtures, including toilets (1.28 gal/flush), showerheads (2.2 gal/minute), and washing machines (lower water use) on existing and future accounts.

The next step was to evaluate the cost effectiveness and water savings potential of various water conservation measures to determine how much of the projected demand could be met through cost effective demand management. The potential water conservations savings were deducted from the total demand.

Significant modifications were made to the DSS model in 2009 to address additional water conservation measures that could be used to help meet future water supply needs throughout the SFPUC service area. The results of this update, adjusted to reflect current population and employment estimates, form the basis of the water demand projections in the 2010 UWMP.

During the past two years, water use throughout the region, including Hayward, has decreased by more than 10% for reasons that are not fully understood. Water conservation may play a role, but it is also possible that economic and climate conditions have temporarily impacted water use. Because of this uncertainty, it is premature to assume that the reductions are permanent and sustainable; therefore while the model incorporates aggressive

water conservation measures and plumbing code changes, it has not been specifically adjusted to reflect the most recent two-year decline in water use.

Finally, the City considered per-capita water use reductions as part of the Water Conservation Bill of 2009 (SB7). Hayward's current per-capita use is already very low and further reductions will be a challenge, particularly in light of Hayward's interest in attracting and retaining industrial businesses, some of which may require significant quantities of water.

## DEVELOPMENT FACTORS AFFECTING WATER DEMAND

### *Residential*

Hayward's current housing stock, totaling about 48,000 dwelling units, is a mix of single-family detached, condominium, multi-family, and mobile home units. Approximately 65 percent of the total housing units are single-family detached, condominiums, and duplex to fourplex units, with the remainder being multi-family and mobile home units. Hayward is continuing to add housing units through development of vacant parcels and redevelopment of low density properties. ABAG projects that 11,000 households will be added through 2035, a 23% increase over 2010 (*ABAG Projections 2009*).

In the near-term (2010 – 2020), residential development will largely be concentrated within the following major areas:

- Downtown – Approximately 100 high density units
- Cannery Area –Approximately 850 units, mixed single-family and multi-family
- Mt. Eden Area–Older, established neighborhood, recently annexed to the City of Hayward, which could accommodate approximately 350 units on underutilized and vacant parcels
- South Hayward BART Station –Potentially 1800 high density, transit oriented units
- Route 238 Right-of-Way– 350 acres of property purchased by the State for construction of bypass freeway, now no longer planned. Studies indicate that about 2,300 units would be the most likely development scenario.
- Eden Shores – Approximately 160 additional single-family homes
- Mission Boulevard Foothills – Approximately 270 mixed single- and multi-family units
- Stonebrae – Approximately 400 additional executive single-family homes

ABAG Projections 2009 identifies three Hayward areas – the Cannery, Downtown, and South Hayward BART – as Bay Area Priority Development Areas. Based on ABAG's projections, there is potential to double the population and number of households within these three areas by 2035.

Additional housing units will be constructed through infill development and intensification of underutilized properties. Currently, about 53% of the current units are owner-occupied. The

City's Housing Element includes goals and strategies to encourage the development of ownership housing and programs to assist tenants in becoming homeowners.

In addition to the development of new units, the existing housing stock is undergoing significant rehabilitation. Nearly 40% (about 18,000 units) of Hayward's housing stock was constructed prior to 1960. Some of these homes, which remain more affordable than new and existing homes in other Bay Area cities, are being renovated and upgraded over time, including installation of water efficient landscaping where it is currently minimal or non-existent. The City is encouraging renovation efforts with funding programs to clean up and landscape common areas within neighborhoods and to assist homeowners in rehabilitating their private properties.

The composition of housing units (single-family and multi-family) in Hayward through the planning period were accounted for in the residential demand projections, with consideration of new development of both single-family and multi-family units and upgrade of existing properties.

### *Commercial and Institutional*

Commercial businesses include a typical mix of office-type services, specialty and big box retail stores, auto dealerships, eating establishments, and a regional shopping mall. Hayward's economic development goals include continuation of efforts to attract commercial businesses, particularly restaurants and retail stores that will serve City residents, as well as the region.

Hayward is implementing a Downtown Design Plan to maintain the Downtown area as a focal point so that it continues to express the City's history, provide a venue for cultural event vitality, and remain a center for social, political and other civic functions. For example, a new 12-screen movie theater recently opened, and the retail space built as part of the theater complex is expected to be fully occupied in the near term with food-related and other complementary uses. Downtown redevelopment efforts will continue to focus on making it a pedestrian-friendly area with development of retail, residential, and office space.

In addition to Downtown, other areas that have been specifically identified for commercial and mixed-use development and improvements include:

- Cannery Area
- Route 238 Right-of-Way
- Mission-Foothill Corridor
- South Hayward BART Station Area

Hayward is home to two regional public post-secondary educational institutions—California State University East Bay (CSUEB) and Chabot Community College. Both have current student populations of about 14,000. California State University is currently implementing its Facilities Master Plan, which envisions a student population of 18,000 FTEs, and 25,000

students, and additional student housing that will increase the number of beds from the current 1,200 to 5,000 at buildout in 2030. CUSEB has projected possible additional water demand of 400,000 gpd, although water conservation measures may reduce the actual usage.

Chabot College prepared, and is now implementing, a Facilities Master Plan to guide future campus development, including additional teaching space. Although a specific timeline is not provided for development of specific facilities, the expected student population at buildout is 17,500.

### *Industrial*

Hayward has a large and diverse industrial sector, including food and beverage processing, high technology research and manufacturing, an increasing number of biotechnology research and development firms, and a wide range of other businesses. Hayward's central location in the Bay Area, availability of land zoned for industrial use, and relatively reasonable land and lease costs have helped attract a large variety of businesses. There is also significant potential for underutilized properties now occupied by warehouses to be converted to research and development or manufacturing facilities. Job growth in Hayward is expected to be 37% between 2010 and 2035 (*ABAG Projections 2009*).

The Economic Development Element of the General Plan includes strategies to encourage and support further economic growth, both in traditional facilities and in the new information-based economy. Many of these strategies are focused on the types of businesses that may have higher-than-average water usage, such as high technology and biotech facilities. For example, a specific goal is to "…attract and assist medium size firms in recognized growth sectors including retail trade and services and high-tech, biotech, and research and development firms (emphasis added)". Because of the uncertainty regarding the precise types of businesses that will locate in the industrial sector during the planning period, the water demand projections include 400,000 gallons per day over and above normal expected additional industrial water use.

A known new significant water user will be initiating operations within the next three years. Calpine Corporation is currently constructing the Russell City Energy Center, a 600-megawatt combined cycle electric generating facility. Peak water use is expected to be 4,000,000 gpd, most of which will be addressed through the use of tertiary treated recycled water. Calpine's usage is not included in potable water demand projections. However, the City and Calpine are negotiating an agreement whereby the City may deliver potable water as a backup supply in the event that recycled water is not available.

Hayward, like many Bay Area communities, experienced an economic downturn during the last decade, resulting in the closure and reduced production of several major water-using businesses. However, reductions in water use due to changes in the economy are cyclical and occur from time and time, and water demand generally rebounds when the economy improves, and so Hayward has prudently based future demand on normal economic conditions.

## WATER USE TARGETS – SB7 WATER CONSERVATION ACT OF 2009

Senate Bill (SB) 7, formally known as the Water Conservation Act of 2009, was signed into law in November 2009. The intent of this legislation is to reduce urban per capita water use state-wide by 10% by 2015 and 20% by 2020. Local agencies are required to develop per-capita water use targets for these years, based on guidance provided in the California Department of Water Resources *Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use* (October 2010) and *Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan* (March 2011). The full text of SB7 is included for reference in Appendix D.

In general, there are four steps towards establishing per-capita water use targets:

1. Calculate base daily per capita use.
2. Determine per-capita water use using one of four methods.
3. Compare per capita water use target to the minimum water use reduction requirement.
4. Select the per capita water use target or minimum water use reduction, whichever is lower, as the final urban water use target.

### *Calculation of Baseline Daily Per-Capita Usage*

Per-capita water use is defined as the total amount of water supplied to a distribution system during a year, divided by the service area population. For the City of Hayward, the baseline daily per capita use for the purpose of SB7 is the average for a consecutive ten-year period, ending no earlier than December 2004 and no later than December 2010. (SB7 allows for the use of a fifteen-year range if the quantity of recycled water delivered in 2008 is 10% or more of the total supply. This was not the case in Hayward, so the ten-year range is appropriate.) Table 3-1 summarizes the base period ranges.

***Table 3-1***
***Base Period Ranges***

| Base | Parameter | Value | Units |
|---|---|---|---|
| 10- to 15-Year Base Period | 2008 Total Water Deliveries | 19,333,513 | gpd |
| | 2008 Total Volume of Delivered Recycled Water | 0 | gpd |
| | 2008 Recycled Water as a Percent of Total Deliveries | 0 | Percent |
| | Number of Years in Base Period | 10 | Years |
| | Year Beginning Base Period Range | 1995-96 | |
| | Year Ending Base Period Range | 2004-05 | |
| 5-Year Base Period | Year Beginning Base Period Range | 2003-04 | |
| | Year Ending Base Period Range | 2007-08 | |

*Source: SFPUC Billing Records*

Using California Department of Finance population data and billed water consumption from SFPUC, Hayward calculated the average per-capita use for each of the eligible ten-year periods and determined that the optimal base period for Hayward is Fiscal Year 1995-96

through 2004-05. During this period, average daily per-capita use ranged from 122 to 136 gpcd, and the average daily per-capita use in Hayward during this period was 130 gallons per day. Table 3-2 summarizes the population and water use data for each of the ten years within the base period.

*Table 3-2*
*Base Daily per Capita Water Use – 10-Year Range*

| Base Period Year Fiscal Year | Distribution System Population | Daily System Gross Water Use (gpd) | Annual Daily per Capita Water Use (gpcd) |
|---|---|---|---|
| 1995-96 | 127,306 | 16,840,093 | 132 |
| 1996-97 | 130,247 | 17,776,077 | 136 |
| 1997-98 | 133,533 | 17,139,135 | 128 |
| 1998-99 | 135,687 | 17,770,209 | 131 |
| 1999-00 | 140,030 | 18,717,411 | 134 |
| 2000-01 | 142,439 | 18,360,736 | 129 |
| 2001-02 | 143,863 | 17,608,074 | 122 |
| 2002-03 | 144,220 | 17,688,993 | 123 |
| 2003-04 | 144,509 | 19,647,896 | 136 |
| 2004-05 | 145,415 | 18,505,831 | 127 |
| Base Daily Per Capita Water Use (Rounded) | | | 130 |

*Sources: California Department of Finance population estimates; SFPUC billing records*

### *Determine Per-Capita Water Use Targets*

After calculating base daily per-capita water use, agencies must select one of four methods to establish interim and final water use targets, briefly described in Table 3-3:

*Table 3-3*
*Description of Methodologies for Calculating Urban Water Use Targets*

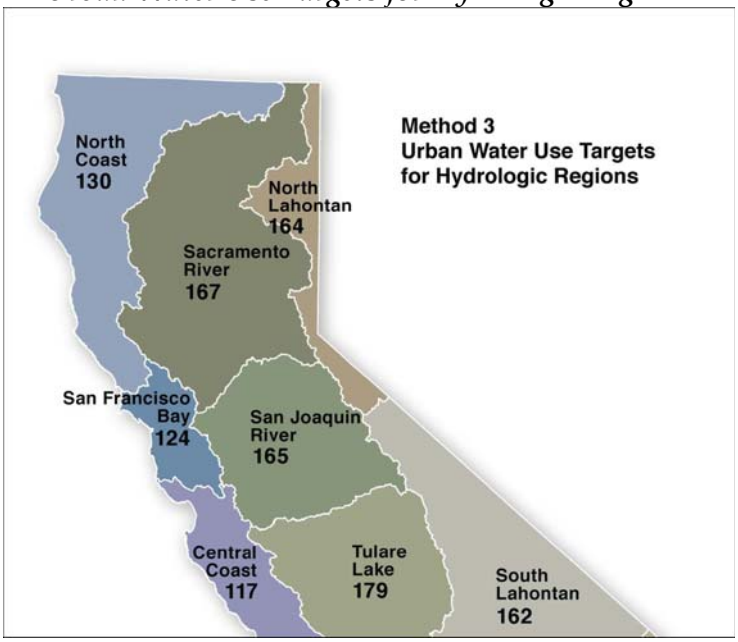
| Method No. | Description |
|---|---|
| 1 | Water use target is set at 80 percent of base daily per capita water use |
| 2 | Water use target is based on achievement of certain performance standards:<br>a) indoor residential water use of 55 gpcd;<br>b) landscape water use efficiency equivalent to the Water Efficient Landscape Ordinance standards; and<br>c) 10 percent reduction in baseline commercial/industrial/ institutional water use |
| 3 | Water use target is set at 95 percent of the applicable State hydrologic region target. |
| 4 | Water use target is set in accordance with a provisional method that totals savings from installation of water meters, specific indoor residential and commercial/ industrial savings, and landscape and water loss savings. |

*Source: Department of Water Resources Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan, March 2011*

Hayward reviewed all of the methodologies and further evaluated two, Methods 1 and 3. Based on the result of this analysis, Method 3, which sets the local target at 95% of the

applicable State hydrologic regional target was selected. Hayward is located in the San Francisco Bay Region, which has an interim 2015 target of 144 gpcd and a 2020 target of 131 gpcd. Using a factor of 95%, Hayward's water use targets for 2015 and 2020, as calculated per Method 3, are 137 gpcd and 124 gpcd respectively (see Figure 3-1).

*Figure 3-1*
*Urban Water Use Targets for Hydrologic Regions*




### *Compare Per-Capita Use Target to Minimum Water Use Reduction Requirement*

SB7 requires that the calculated target be compared to a minimum water use reduction, which is determined by calculating average per capita use during a continuous five-year period, ending no earlier than December 2007 and no later than December 2010. This average is then multiplied by 95%. If this result is lower than the calculated 2020 goal, then the final 2020 per capita use target must be reduced to the minimum reduction requirement.

For the purpose of determining the minimum water use reduction, the most favorable five-year period for Hayward is Fiscal Year 2003-04 through 2007-08. The average use during this time was 128 gpcd, and 95% of this value is 122. Table 3-4 summarizes the five-year average daily per-capita use. The minimum reduction, at 95% of the five-year average is 122 gpcd.

*Table 3-4*
*Daily per Capita Water Use – 5-Year Average*

| Base Period Year Fiscal Year | Distribution System Population | Daily System Gross Water Use (gpd) | Annual Daily per Capita Water Use (gpcd) |
|---|---|---|---|
| 2003-04 | 144,509 | 19,647,896 | 136 |
| 2004-05 | 145,415 | 18,505,831 | 127 |
| 2005-06 | 146,216 | 18,288,217 | 125 |
| 2006-07 | 147,385 | 18,241,540 | 124 |
| 2007-08 | 148,967 | 19,333,513 | 130 |
| Base daily Per Capita Water Use | | | 128 |

*Sources: California Department of Finance population estimates; SFPUC billing records*

### *Select Interim and Final Per-Capita Water Use Targets*

Table 3-5 summarizes the 2015 and 2020 targets for Hayward as calculated by Method 3 and the minimum reduction requirement. Based on the analysis, Hayward's per-capita water use targets are the minimum reduction requirements of 126 gpcd in 2015 and 122 gpcd in 2020

*Table 3-5*
*Water Use Targets*

| Calculation Method | 2015 Interim Target (in gpcd) | 2020 Final Target (in gpcd) |
|---|---|---|
| Method 3 – 95% of Hydrologic Region Goal | 137 | 124 |
| → **Minimum Water Use Reductions** | **126** | **122** |

*Source: City of Hayward calculations*

### *Water Use Reduction Plan*

Hayward's current per capita water use is among the lowest of all the wholesale customers of SFPUC. There are several reasons for this, including climate and development patterns; however, considering that Hayward's service area includes a state university, community college, two major hospitals, and a significant industrial sector, the gross per capita water use is already very low. Hayward's highest per-capita water use during the last ten years was 136 gpcd in FY 2003-04. The average for the last ten years is 127, excluding an unusually low usage of 114 gpcd in FY 2009-10. Assuming a somewhat normal recent per-capita use of 127 gallons, reaching a target use of 122 gpcd would require a 4% reduction in current per-capita use. While this reduction appears to be modest percentage-wise, it would be challenging to further reduce Hayward's already low usage, even if the community were built out and static.

Given the City's goals to attract and retain businesses, improve community appearance, and revitalize neighborhoods, achieving compliance will be especially challenging. Among the General Plan strategies are efforts to encourage intensification of existing underutilized industrial properties with higher water using businesses such as biotechnology, food processing and the like, as well as renovation and landscape upgrades of existing residential and non-residential properties. An overarching consideration will be the need to balance

sustainable future water use with other community priorities and neighborhood improvements. Another priority will be to implement water use reductions across all customer sectors to ensure that no customers are unfairly and disproportionately burdened.

SB7 acknowledges that agencies will need time to evaluate specific strategies and identify resources to achieve compliance with water use targets. However, the following provides information about some of known and potential mechanisms that could be utilized by the City to reduce per-capita use:

- Water Conservation Programs - Hayward's current water conservation program includes:

  - ✓ Rebates for replacement of high usage toilets with high efficiency models and the purchase of water efficient clothes washing machines
  - ✓ Distribution of high efficiency devices, such as showerheads, at no charge to customers
  - ✓ School classroom and assembly programs
  - ✓ Public education and outreach
  - ✓ Free water efficient landscaping classes

  These programs are expected to continue as long as they are cost effective. The City will also evaluate and implement new programs which have demonstrated water savings potential at a reasonable cost. Such programs could include rebates for "smart" irrigation technology, commercial/industrial water conservation surveys and incentives, and sub metering incentives.

- Water Efficiency Standards - Hayward will benefit over time from its recent adoption of indoor water efficiency standards for new construction and remodels and the water efficient landscaping ordinance. These standards mandate installation of the most water conserving fixtures that are available and which have been shown to work effectively. In addition to local efforts, there is legislation at the State level that mandates replacement of existing non-conserving fixtures, such as toilets and showerheads by a certain date. State-wide and national efforts to improve the water efficiency requirements for washing machines, dishwashers, and other water using appliances are also ongoing.

- Water Pricing - A factor that will play an increasing role in water use efficiency in Hayward is the rising cost of purchasing water. SFPUC is anticipating significant increases in wholesale rates due to regional water system improvements, and those costs will need to be passed on to customers. As water rates increase, the economics of water conservation will become more attractive to customers.

- Recycled Water - Hayward is currently developing a recycled water program that could deliver up to 500,000 gpd of tertiary treated wastewater to customers for irrigation and industrial uses. Implementation of the projects involves many factors, including

available funding, but could be effective in reducing Hayward's reliance on SFPUC potable water.

Going forward, new water conservation opportunities will become available as technology evolves. The City will benefit by staying flexible and open to new strategies and ensuring that all customer sectors are provided with incentives and opportunities to reduce water usage.

### *Cost of Compliance with Water Conservation Act of 2009*

A full economic analysis of the cost of implementing water conservation programs to meet SB7 requirements has not yet been completed; however, additional, potentially costly, programming will be needed. These costs will need to be recovered through the City's water rates, which are already expected to increase significantly due to the escalating wholesale water costs. Actual costs will depend on the types of programs, participation levels, economies of scale that may be achieved through regional cooperation, and other factors.

### *Other Compliance Considerations*

As noted earlier in the UWMP, Hayward's current per capita use is among the lowest in the region, particularly for residential use. Since 2005, when the last UWMP was adopted, Hayward's residential per-capita use has ranged from 58 to 72 gpcd, with gross per capita use ranging from 114 to 130 gpcd. Hayward has been within a few gallons of its 2020 Water Use Target of 122 gpcd during the last five years. These numbers were achieved despite the presence of two major educational institutions, with significant daytime-only student populations, two large hospitals, and a large and diverse industrial sector.

While the City fully intends to strive to meet its targets, it also has an interest in economic development within the community and encouraging further development of a vibrant and engaged State university campus and community college. To the extent that these activities impact water demand, the City will be evaluating its industrial process, commercial and institutional water use in the compliance years of 2015 and 2020. As noted in the UWMP guidance, when determining compliance per-capita use, water agencies may consider substantial changes to "*commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period*" and "*institutional water use resulting from new or expanded operations that have occurred during the reporting period*."

Since both industrial process and institutional water use is expected to be an important factor in Hayward's future consumption and considered in evaluation of Hayward's compliance with SB7 in 2015 and 2020, the water demand projections summarized in the next section of this chapter will not be consistent with the water use targets identified in Table 3-4.

### *Regional Compliance with Water Conservation Act of 2009*

The baselines and water use targets reflected in this UWMP are based on compliance with SB7 as an individual agency. The legislation permits water agencies to comply with provisions on

a local or regional basis, or both. Regional alliances may be formed among agencies that purchase water from a common wholesale provider, are members of a regional agency authorized to implement water conservation, or are located in the same hydrologic region. The Bay Area Water Supply and Conservation Agency, of which Hayward is a member, is specifically named in the legislation as an agency that may serve as a regional entity for compliance with SB7. Alliances may be formed by some or all of the BAWSCA agencies. If it is determined in the future that it is in Hayward's interest to form an alliance with some or all of BAWSCA agencies, Hayward would report on such an arrangement in its 2015 UWMP.

## CUSTOMER CLASSIFICATIONS AND ACCOUNTS

Hayward uses the following billing classifications to segregate its water usage:

- Single-family residential – Individually metered single-family dwelling units. May include up to four units on a single property.
- Multi-family residential – Five or more dwelling units, served by a common meter. Also includes mobile home parks.
- Commercial/Government –Non-residential business customers, such as restaurants, stores, and offices, and government entities not classified as industrial.
- Industrial – Non-residential business customers that have industrial operations, such as food and beverage processing, technology, metal finishing, and other uses.

A limited amount of landscape irrigation water is tracked through dedicated irrigation meters; however, since these meters capture only a portion of total landscape use, it is not listed as a separate water use category. As more irrigation meters are installed and more complete data about outdoor water use is available, a separate category may be established in future UWMP updates. Hayward does not have any agricultural customers or sales to other water agencies.

In addition to the billing classifications, Hayward tracks the following water consumption:

- Other Uses – Hydrant meters for construction use and water main flushing.
- Unaccounted for Water Use–Water that is typically unaccounted for, such as water loss due to leaks, under-reading meters, and fire flow tests.

Table 3-6 summarizes the number of accounts by billing classification in the recent past.

*Table 3-6*
*Number of Accounts by Customer Class 2005 - 2010*

| Customer Class | 2005 | 2006 | 2007 | 2008 | 2009 | 2010 |
|---|---|---|---|---|---|---|
| Single-Family | 26,258 | 26,408 | 26,590 | 26,818 | 26,986 | 27,300 |
| Multi-Family | 1,295 | 1,303 | 1,303 | 1,316 | 1,326 | 1,332 |
| Commercial/Institutional | 2,260 | 2,264 | 2,300 | 2,320 | 2,333 | 2,337 |
| Industrial | 1,679 | 1,687 | 1,689 | 1,688 | 1,688 | 1,691 |
| Total | 31,492 | 31,662 | 31,882 | 32,142 | 32,333 | 32,659 |

*Source: City of Hayward billing records*

There has been an overall increase of 3.7% in the number of accounts over the past five years, mainly in the residential sector. Given the economic climate through most of the last decade, it would be expected that the number of accounts may increase at a faster pace with the onset of an economic recovery. The assumed annual rates of growth in accounts are:

- Single Family Residential – 1%
- Multi-Family Residential – 0.5%
- Commercial/Institutional –0.5 %
- Industrial – 0.2%

Table 3-7 summarizes the anticipated number of accounts in five-year increments through 2035.

*Table 3-7*
*Projected Number of Accounts by Customer Class 2010 – 2035*

| Customer Class | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Single-Family | 27,300 | 28,692 | 30,155 | 31,693 | 33,310 | 35,009 |
| Multi-Family | 1,332 | 1,366 | 1,400 | 1,435 | 1,472 | 1,509 |
| Commercial/Institutional | 2,337 | 2,396 | 2,457 | 2,519 | 2,582 | 2,647 |
| Industrial | 1,691 | 1,708 | 1,725 | 1,742 | 1,760 | 1,778 |
| Total | 32,659 | 34,161 | 35,737 | 37,390 | 39,124 | 40,943 |

*Source: City of Hayward billing records and multipliers*

## CURRENT AND PROJECTED WATER DEMAND

Using all of the information developed and summarized in the preceding sections of this chapter, Hayward has developed current and future water demand projections out to 2035, which are summarized below. In accordance with DWR guidance, the current and projected water demands are shown in three parts:

- Water deliveries to customers, by customer class
- Additional water uses and losses
- Total water use

### *Water Deliveries to Customers*

Hayward's past and current water deliveries to customers, based on billed consumption, are summarized in Table 3-8. Table 3-9 shows projected water deliveries, by customer classification, based on the results of the updated demand projections, planned water conservation measures and the City's Recycled Water Facility Plan.

***Table 3-8***
***Water Deliveries by Customer Class 2005 - 2010***

| Customer Class | | Water Use | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** |
| Single-Family | AFY | 7,740 | 7,553 | 7,934 | 7,702 | 7,077 | 7,069 |
| | MGD | 6.9 | 6.7 | 7.1 | 6.9 | 6.3 | 6.3 |
| Multi-Family | AFY | 3,805 | 3,886 | 3,984 | 3,975 | 3,747 | 3,336 |
| | MGD | 3.4 | 3.5 | 3.6 | 3.5 | 3.3 | 3.0 |
| Commercial/Institutional | AFY | 3,288 | 3,118 | 3,420 | 3,754 | 3,376 | 3,088 |
| | MGD | 2.9 | 2.8 | 3.1 | 3.4 | 3.0 | 2.8 |
| Industrial (Potable) | AFY | 3,803 | 3,652 | 3,772 | 3,598 | 3,319 | 2,925 |
| | MGD | 3.4 | 3.3 | 3.4 | 3.2 | 3.0 | 2.8 |
| Total Water Deliveries | AFY | 18,637 | 18,208 | 19,110 | 19,029 | 17,519 | 16,417 |
| | MGD | 16.6 | 16.3 | 17.1 | 17.0 | 15.6 | 14.7 |

*Source: City of Hayward billing records*

***Table 3-9***
***Projected Water Deliveries by Customer Class 2010 - 2035***

| Customer Class | | Water Use | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** |
| Single-Family | AFY | 7,069 | 9,470 | 10,020 | 11,130 | 12,140 | 13,680 |
| | MGD | 6.3 | 8.5 | 8.9 | 9.9 | 10.8 | 12.2 |
| Multi-Family | AFY | 3,336 | 4,400 | 4,530 | 4,660 | 4,800 | 4,970 |
| | MGD | 3.0 | 3.9 | 4.1 | 4.2 | 4.3 | 4.4 |
| Commercial/Institutional | AFY | 3,088 | 3,210 | 3,340 | 3,620 | 3,730 | 4,040 |
| | MGD | 2.8 | 2.9 | 3.0 | 3.2 | 3.3 | 3.6 |
| Industrial (Potable) | AFY | 2,925 | 4,840 | 5,870 | 6,370 | 7,460 | 8,270 |
| | MGD | 2.8 | 4.3 | 5.2 | 5.7 | 6.7 | 7.4 |
| Industrial (Recycled) | AFY | 0 | 3,475 | 3,760 | 3,760 | 3,760 | 3,760 |
| | MGD | 0 | 3.1 | 3.4 | 3.4 | 3.4 | 3.4 |
| Total Water Deliveries | AFY | 16,417 | 25,400 | 27,520 | 29,590 | 31,890 | 34,720 |
| | MGD | 14.7 | 22.7 | 24.6 | 26.4 | 28.5 | 31.0 |

*Sources: City of Hayward DSS Model, updated April 2011 and Recycled Water Facility Plan*

Future water use increases, particularly between 2010 and 2015, may not proceed at the pace shown in the table. Much will depend on the level of development, economic recovery, and rebound from the currently depressed water usage levels. While the actual usages may not be

reflected in the five-year increments as tabulated in Table 3-9, Hayward expects its use at the end of the 25-year planning horizon to be commensurate with the numbers shown.

### *Additional Water Uses and Losses*

Additional water uses include water used for construction meters, water main flushing and fire suppression, as well as system losses. Historically, these other uses comprised 7% to 10% of Hayward's total use. Recently, however, the amount of unaccounted-for water has increased beyond an acceptable level, to as much as 16% of total use in the last two years, prompting the City to undergo a full system water loss audit. This study, which was completed in Spring 2011 and is discussed in Chapter 6, Demand Management, included an evaluation of water use, a leak detection survey on a representative sample of the distribution system, and meter testing. Among other things, the results indicate that Hayward would benefit from replacement of aging meters and further leak detection and repairs efforts. Since Hayward intends to implement strategies to reduce system losses, a factor of 9 percent per year has been included in Hayward's projections for additional water uses and losses in 2015 and beyond.

***Table 3-10***
***Additional Water Uses and Losses 2005 - 2010***

| Description | | Water Use | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** |
| Hydrant and main flushing | AFY | 90 | 42 | 149 | 128 | 71 | 32 |
| | MGD | 0.08 | 0.04 | 0.13 | 0.11 | 0.06 | 0.03 |
| Unbilled and Unaccounted losses | AFY | 2,004 | 2,235 | 1,174 | 2,499 | 3,312 | 3,088 |
| | MGD | 1.8 | 2.0 | 1.0 | 2.2 | 2.9 | 2.8 |
| Total Additional Water Use and Losses | AFY | 2,094 | 2,277 | 1,323 | 2,627 | 3,383 | 3,120 |
| | MGD | 1.9 | 2.0 | 1.2 | 2.3 | 3.0 | 2.8 |

*Source: City of Hayward billing records*

***Table 3-11***
***Projected Additional Water Uses and Losses 2010 - 2035***

| Description | | Water Use | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** |
| Hydrant and main flushing | AFY | 32 | 90 | 100 | 100 | 110 | 120 |
| | MGD | 0.03 | 0.08 | 0.09 | 0.09 | 0.10 | 0.11 |
| Unaccounted for losses | AFY | 3,088 | 2,180 | 2,360 | 2,560 | 2,790 | 3,070 |
| | MGD | 2.8 | 1.9 | 2.1 | 2.3 | 2.5 | 2.7 |
| Total Additional Water Use and Losses | AFY | 3,120 | 2,270 | 2,460 | 2,660 | 2,900 | 3,190 |
| | MGD | 2.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 |

*Source: City of Hayward Demand Projections – Updated April 2011*

### *Total Water Use*

The following table summarizes total water use in the recent past.

***Table 3-12***
***Total Water Use 2005 – 2010***

| Description | | Water Use | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2005** | **2006** | **2007** | **2008** | **2009** | **2010** |
| Total Water Deliveries | AFY | 18,637 | 18,208 | 19,110 | 19,029 | 17,519 | 16,417 |
| | MGD | 16.6 | 16.3 | 17.1 | 17.0 | 15.6 | 14.7 |
| Additional Water Uses and Losses | AFY | 1,827 | 2,236 | 1,247 | 2,607 | 3,333 | 3,118 |
| | MGD | 1.6 | 2.0 | 1.1 | 2.3 | 3.0 | 2.8 |
| Total Water Use | AFY | 20,730 | 20,485 | 20,432 | 21,656 | 20,902 | 19,537 |
| | MGD | 18.5 | 18.3 | 18.2 | 19.3 | 18.7 | 17.5 |

*Sources: Tables 3-8 and 3-10*

As illustrated in Table 3-11, Hayward's water use since adoption of the 2005 UWMP has varied from year to year, with an overall decrease of 6% between 2005 and 2010. The most significant decrease has occurred within the past two years, with a nearly 11% decline. All customer sectors have been impacted. While the reasons are not fully known, decreases in water use could be due in part to weather conditions and a decline in economic and development activity. Given that both economic and climate conditions are cyclical in nature, estimates for the UWMP planning horizon assume resumption of normal development and economic activity, as well as normalized weather conditions. The estimates take into account aggressive water conservation measures; however, as discussed previously in the chapter, are not fully aligned with SB7 water use targets because of the assumed impact of growth in commercial and industrial water demands.

***Table 3-13***
***Projected Total Water Use 2010 - 2035***

| Description | | Water Use | | | | | |
|---|---|---|---|---|---|---|---|
| | | **2010** | **2015** | **2020** | **2025** | **2030** | **2035** |
| Total Water Deliveries | AFY | 16,417 | 25,400 | 27,520 | 29,590 | 31,890 | 34,720 |
| | MGD | 14.7 | 22.7 | 24.6 | 26.4 | 28.5 | 31.0 |
| Additional Water Uses and Losses | AFY | 3,118 | 2,270 | 2,460 | 2,660 | 2,900 | 3,190 |
| | MGD | 2.8 | 2.0 | 2.2 | 2.4 | 2.6 | 2.8 |
| Total Water Use | AFY | 19,537 | 27,670 | 29,980 | 32,200 | 34,790 | 37,910 |
| | MGD | 17.5 | 24.7 | 26.8 | 28.8 | 31.1 | 33.9 |

*Sources: Tables 3-9 and 3-11*

Current and future water use characteristics are illustrated in Figures 3-2 and 3-3. Figure 3-2 shows current (2010) water use among specific customer classifications. Residential water use

currently makes up about 53% of total demand, whereas industrial and commercial usage comprises about 32% of the total.

The ratios among the various customer classes are expected to change during the planning period as system losses decrease, additional housing units are constructed, including some single-family homes on larger lots with more landscaping, renovation and landscaping of existing single-family residential properties, and economic development occurs on vacant and underutilized industrial properties.

**Figure 3-2**

**Water Demand by Use Classification - 2010**

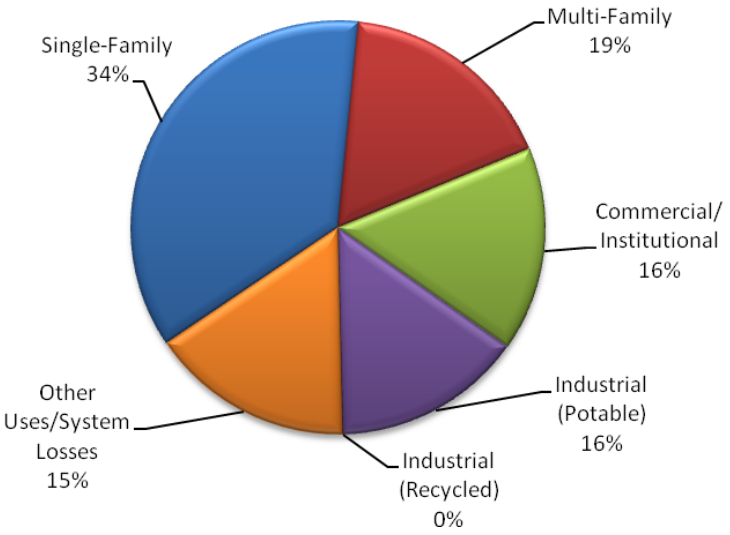
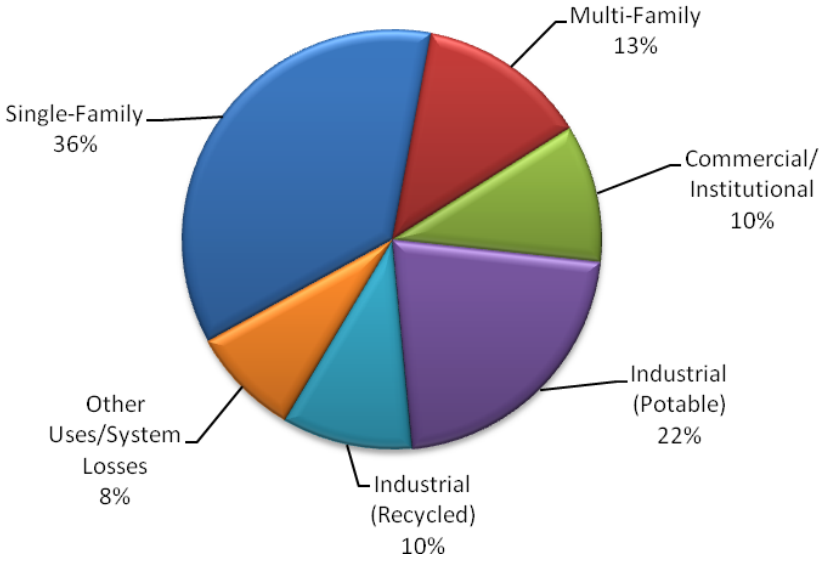



**Figure 3-3**
**Projected Water Demand by Use Classification - 2035**



### WATER USE FOR LOW INCOME HOUSING

The Housing Element of the City's General Plan identifies Regional Housing Needs Allocations (RHNA) by income level, measured as a percent of Area Median Income (AMI). In Hayward, the total number of units allocated for Extremely Low (up to 30% of AMI), Very Low (31% to 50% of AMI), and Low (31% to 50% of AMI) is 1,250, or about 37% of the City's total RHNA. Realistically, this housing is expected to consist entirely of multi-family units. The timing for construction of this housing is uncertain, but for the purposes of the UWMP, it is assumed that roughly one-fifth of the units, or about 250, will be built during each five-year increment in the planning period.

Water usage for these housing units is included in the overall water deliveries projections, shown in Table 3-9. It is expected that the use would decrease over time due to plumbing code changes and water conservation measures. However, the City has maintained a conservative per unit usage of 154 gpd to ensure that adequate supplies are available to meet this critical housing need. Water usage for low income housing is summarized in Table 3-14.

*Table 3-14*
*Low Income Water Demands (in gpd)*

| Housing Type | Water Demands | | | | |
|---|---|---|---|---|---|
| | 2015 | 2020 | 2025 | 2030 | 2035 |
| Multi Family | 38,500 | 38,500 | 38,500 | 38,500 | 38,500 |
| Single Family | 0 | 0 | 0 | 0 | 0 |
| Total | 38,500 | 38,500 | 38,500 | 38,500 | 38,500 |

*Sources: City of Hayward General Plan, Housing Element, June 2010; City of Hayward Demand Projections Updated 4-11*

### SALES TO OTHER AGENCIES

As noted earlier in this chapter, the City of Hayward does not sell, transfer, or otherwise convey water to other water agencies, except for water delivered through the emergency interties established with East Bay Municipal Utility District and Alameda County Water District.

### DEMAND PROJECTIONS PROVIDED TO WHOLESALE AGENCY

In February 2011, Hayward provided the projections shown in Table 3-15 to SFPUC. The actual projected demand was subsequently adjusted slightly downward. The communications between Hayward and SFPUC are included in Appendix E.

*Table 3-15*
*Demand Projections Provided to Wholesale Agency (in mgd)*

| Wholesaler | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|
| SFPUC | 22.0 | 23.6 | 25.8 | 28.1 | 30.7 |

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# CHAPTER 4

## WATER SYSTEM SUPPLIES

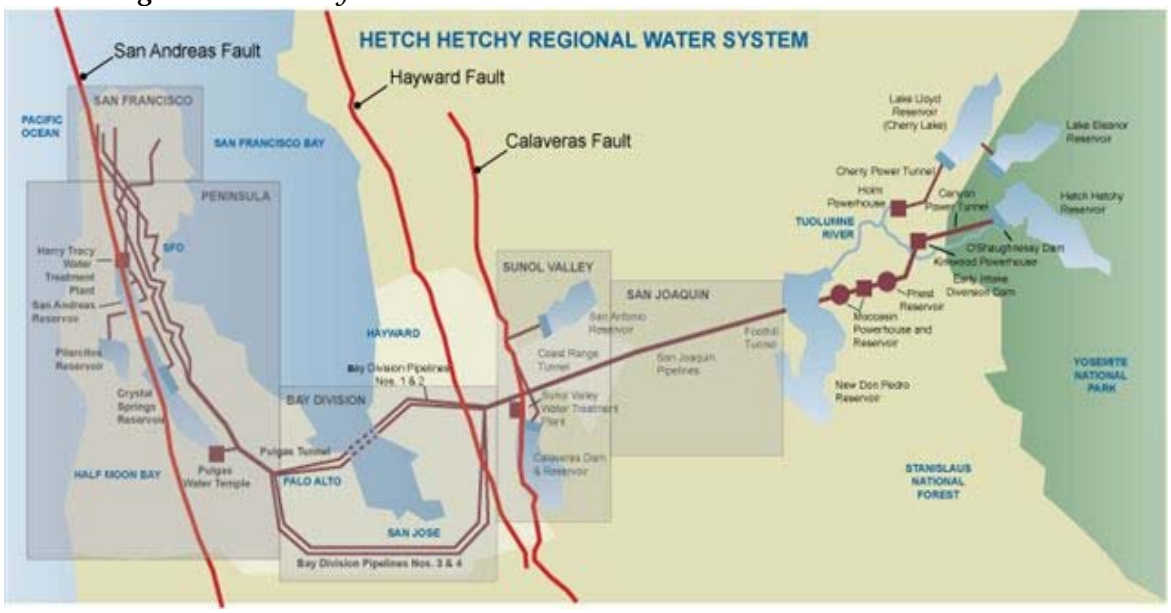
This section describes the City of Hayward's current and future water supplies, both for long-term and short-term (emergency) use.

### PURCHASES FROM SAN FRANCISCO PUBLIC UTILITIES COMMISSION

Hayward's sole source of drinking water since 1963 has been the City and County of San Francisco's Regional Water System (RWS), operated by the San Francisco Public Utilities Commission (SFPUC). The water supplied to Hayward is predominantly from the Sierra Nevada, delivered through the Hetch Hetchy aqueducts, but also includes treated water produced by the SFPUC from its local watershed and facilities in Alameda County.

The amount of imported water available to the SFPUC's retail and wholesale customers is constrained by hydrology, physical facilities, and the institutional parameters that allocate the water supply of the Tuolumne River. Due to these constraints, the SFPUC is very dependent on reservoir storage to firm up its water supplies. The SFPUC serves its retail and wholesale water demands with an integrated operation of local Bay Area water production and imported water from Hetch Hetchy. In practice, the local watershed facilities are operated to capture local runoff. Figure 4-1 illustrates the SFPUC system facilities and routing.

*Figure 4-1*
*SFPUC Regional Water System*



The business relationship between SFPUC 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" (WSA), 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. The WSA with San Francisco, signed by Hayward, along with 25 other Bay Area water suppliers, will expire in 2034.

In terms of water supply, the WSA provides for a 184 million gallon per day (MGD, expressed on an annual average basis) "supply assurance" to the SFPUC's wholesale customers collectively, 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 regional water system. 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.

While the WSA addresses issues of comment interest, such as rate setting and water shortage allocation methodologies, Hayward's individual water supply from SFPUC is governed by a water supply agreement signed by both agencies in 1962. This agreement, which has no termination date, states that SFPUC will provide a sufficient quantity of water to meet the total needs of Hayward's service area on a permanent basis. Section 3.02.C of the WSA recognizes Hayward's agreement with SFPUC, stating that:

> If the total amount of water delivered by San Francisco to Hayward and to the Wholesale Customers listed on Attachment C exceeds 184 mgd over a period of three consecutive fiscal years (i.e. July 1 through June 30), the Individual Supply Guarantees of those Wholesale Customers listed on Attachment C shall be reduced pro rata so that their combined entitlement and the sustained use by Hayward does not exceed 184 mgd. The procedure for calculating the pro rata reduction in Individual Supply Guarantees is set out in Attachment D. [1]

Attachment D of the WSA describes the process for implementing Section 3.02.C if needed. In effect, based on the provisions of the WSA and Hayward's individual water supply agreement with SFPUC, Hayward does not have a numerical limit on the amount of water that may be provided by SFPUC.

[1] Water Supply Agreement Between the City and County of San Francisco and Wholesale Customers, dated July 2009, Section 3.02.C

In February 2011, Hayward provided to SFPUC the anticipated water purchases for 2015 to 2035, as listed in Table 3-15 in the previous chapter. Subsequent to providing the anticipated water purchases, the demand projections were refined. On March 31, 2011, SFPUC provided an analysis of its supply reliability, which is discussed in detail in Chapter 5.

## RECYCLED WATER

This section discusses Hayward's recycling water planning efforts, potential use of recycled water to meet the demands of a new energy facility, and additional opportunities to deliver recycled water to existing customers. Specifically, this section will present the results of the City's Recycled Water Facilities Plan, completed in September 2009.

### *Coordination of Recycled Water Planning*

The following entities either participated in developing a recycled plan for Hayward's service area, or provided resources that were used to develop the Recycled Water Facilities Plan.

***Table 4-1***
***Recycled Water Facility Plan - Participating Entities***

| Agency | Role |
|---|---|
| City of Hayward Water Pollution Control Facility (WPCF) | Provided information on treatment and disposal of wastewater, as well as projections regarding future wastewater flows |
| Calpine Corporation (potential anchor customer) | Provided information on water supply projections and treatment requirements |
| Other Potential Customers | Participated in survey to identify potential recycled water users, quantities, and water quality issues |

*Source: City of Hayward Recycled Water Facilities Plan*

### *Wastewater Collection and Treatment*

The City of Hayward owns and operates the wastewater collection and treatment system that serves almost all of the residential, commercial, and industrial users within the incorporated City limits. The City also serves a small number of properties in unincorporated areas of Alameda County. A very small number of customers within the City limits are served by Oro Loma Sanitary District.

The wastewater collection system is comprised of 350 miles of sewer mains, 9 sewage lift stations, and 2.5 miles of force mains. The Water Pollution Control Facility is permitted to provide primary through advanced secondary treatment for up to 18.5 mgd of wastewater utilizing:

- Primary clarification
- Two high-rate trickling filters
- Solids contact aeration basin
- Secondary clarification

Hayward recently completed a major upgrade of treatment plant facilities to improve the reliability and redundancy of treatment processes. New and upgraded facilities include a second trickling filter, two final clarifiers, a solids contact tank, and solids thickening facilities.

All wastewater is currently treated to secondary level, which meets California Department of Public Health Title 22 requirements for only limited recycled water use, such as golf course, freeway and cemetery irrigation. Table 4-2 documents the current and anticipated quantity of wastewater collected and treated.

***Table 4-2***
***Estimated Wastewater Collected and Treated 2010 – 2035 (in mgd)***

| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Quantity Collected/Treated | 12.1 | 13.5 | 15.0 | 16.5 | 17.5 | 18.5 |
| Quantity that Meets Title 22 Standards (Secondary Level) | 12.1 | 13.5 | 15.0 | 16.5 | 17.5 | 18.5 |

*Source: City of Hayward estimates, May 2011*

### *Wastewater Disposal*

Hayward is a founding member of the East Bay Dischargers Authority (EBDA), a joint powers agency which disposes of treated wastewater through a deepwater outfall to the San Francisco Bay. Effluent from the WPCF is disinfected with sodium hypochlorite and discharged into the East Bay Dischargers Authority (EBDA) system. The chlorine residual is removed prior to discharge to the San Francisco Bay.

## *Current Uses of Recycled Water by East Bay Dischargers Authority*

EBDA supplies the Skywest Golf Course, located in Hayward, with recycled water. In 2010, the Hayward Area Recreation and Park District (HARD) used an average of about 225,000 gpd (25- acre-feet per year) to irrigate the 100-acre golf course, which was previously irrigated from a 250-foot well. EBDA also provides recycled wastewater to the Hayward Marsh, which is operated jointly by EBDA, Union Sanitary District (USD), and the East Bay Regional Parks District. In 2010, the Marsh used approximately 2.8 mgd, comprised of effluent from USD.

Table 4-3 summarizes current recycled water use from the EBDA combined effluent, which includes some Hayward effluent.

***Table 4-3***
***Comparison of Projected and Actual 2010 Use of Recycled Water***

| Use | Treatment Level | Projected 2010 Use (in 2005 UWMP) (afy) | Actual 2010 Use (afy) |
|---|---|---|---|
| Landscape Irrigation | Secondary | 180 | 251 |
| Wetlands Enhancement | Secondary | 3,475 | 3,107 |
| Total | | 3,655 | 3,358 |

*Sources: 2005 UWMP and East Bay Dischargers Authority*

The 2010 recycled water use projected in the 2005 UWMP was estimated at 3,655 af. Actual recycled water deliveries in 2010 totaled 3,358 af, or about 9% less.

Based on information from EBDA staff, the current levels of recycled water use by this agency are expected to continue through the planning period. [2] The following section, which addresses potential future recycled water use, will focus solely on use of recycled water generated by Hayward and distributed within Hayward's service area, as will future UWMPs.

## *Potential Uses of Recycled Water*

In September 2009, Hayward completed a Recycled Water Facility Plan (RWFP) to assess potential recycled water demand, customer acceptance, water quality issues, and distribution system alternatives. A copy of the RWFP is included as Appendix F.

The Russell City Energy Center (RCEC), a 600 megawatt combined cycle energy generation facility, is currently under construction on a site adjacent to the City's Water Pollution Control Facility. Calpine anticipates using an average of 3.1 mgd of tertiary treated recycled water for cooling water purposes, with peak use of 4 mgd during summer months. Hayward expects to supply Calpine with secondary level treated wastewater, which Calpine will then treat to tertiary level at a new recycled water facility, and then further treat at a zero liquid discharge facility to acceptable levels for their cooling system use. The tertiary treatment facility may be sized such that additional recycled water could be distributed by Hayward to other customers. The RWFP was developed within this context.

[2] Communication from Michael Connor, EBDA General Manager, May 23, 2011

The RWFP identifies three potential distribution systems: 1) delivery to RCEC only; 2) delivery to RCEC and approximately 20 other small to medium size customers within a two-mile radius of the treatment facility; and 3) delivery to RCEC and two large customers at much higher elevations. Based on customer surveys and cost estimates, the second alternative appears to be a viable option. Based on a survey of potential customers, uses would be limited to industrial cooling and irrigation. Table 4-4 summarizes potential deliveries of recycled water over the next 25 years.

***Table 4-4***
***Potential Use of Recycled Water***

| Type of Use | Potential Annual Recycled Water Use (in AFY) | | | | |
|---|---|---|---|---|---|
| | **2015** | **2020** | **2025** | **2030** | **2035** |
| Calpine only (industrial) | 3,475 | 3,475 | 3,475 | 3,475 | 3,475 |
| Industrial | | 65 | 65 | 65 | 65 |
| Irrigation | | 220 | 220 | 220 | 220 |
| Total | 3,475 | 3,760 | 3,760 | 3,760 | 3,760 |

*Source: City of Hayward Recycled Water Facility Plan, 2009*

### *Technical and Economic Feasibility of Projected Recycled Water Use*

This discussion can be divided into two parts: 1) the technical and economic feasibility of recycled water use by Calpine; and 2) by other customers. Regarding Calpine, the California Energy Commission approved the licensing of the RCEC subject to the condition that recycled water be used for appropriate purposes. The cost of constructing recycled water treatment facilities of a sufficient size to meet Calpine's needs will be borne by Calpine, and technical issues related to receiving secondary level wastewater from Hayward and treating it to the standards needed for facility use will need to be resolved by the company prior to initiating operations. Costs for providing additional recycled water for distribution to other customers would be subject to negotiation between Calpine and the City.

Regarding the feasibility of delivering recycled water to other customers, the issues are more complex and can be assessed using the following criteria:

- Customer Acceptance. The RWFP includes a survey of potential customers to assess their interest and concerns about recycled water. While there was general interest in using recycled water, customers expressed concerns about water quality, health and safety (particularly in using recycled water for park and schoolyard irrigation), on-site plumbing retrofits, delivery pressure, and impacts on landscaping. Hayward would need to work closely with potential customers to address their concerns, provide sufficient documentation to ensure appropriate water quality standards, and assist with plumbing changes.

- Public Acceptance. Although recycled water is becoming more accepted as a water supply, there are still some health and safety concerns about the use in public areas

such as parks and schools. These concerns would need to be addressed through extensive public outreach and water quality monitoring.

- Water Quality. Industrial uses, mainly cooling towers and boiler feed, require that specific water quality standards be met. There is concern among some customers that alkalinity and total dissolved solids in particular may be too high. A monitoring program would need to be implemented to ensure ongoing and consistent maintenance of water quality standards.

- Distribution and Storage. Seasonal variation will need to be addressed to ensure sufficient quantities of recycled water during peak periods.

- Cost. The capital costs of constructing a distribution system, storage facilities and customer retrofits are significant. Further, once facilities are in place, pricing for recycled water would need to be attractive enough to customers to convince them to switch from potable to recycled water. The City would need to pursue funding resources, explore the possibility of providing financial assistance for retrofits, and price recycled water to incentivize customers to use the product.

### *Encouraging Recycled Water Use*

The RWFP includes strategies for encouraging the use of recycled water, including public outreach and education to increase public awareness and acceptance. A public education effort could include informational workshops for the public and elected officials and media releases. The City would also investigate the feasibility of financial assistance for retrofits and pricing strategies to encourage the use of recycled water. Another possible mechanism would be a recycled water ordinance that would require existing and/or new customers to connect to the recycled water system, unless doing so would present a proven hardship. While the City has not settled on which strategies, or combination of measures, would be implemented to encourage recycled water use, all of the above are viable alternatives.

### *Recycled Water Optimization Plan*

The RWFP also describes the potential for optimizing recycled water in Hayward's service area. In general, the Plan entails delivering an average of 300,000 gpd to customers within a two-mile radius of the WPCF, in addition to 3.1 mgd that will be utilized by the RCEC. The Facility Plan includes a preliminary distribution system, cost estimate, results of a customer survey, and discussion of issues and concerns that must be addressed.

## GROUNDWATER

Hayward does not currently nor does it plans to use groundwater to meet any portion of its day-to-day normal water demand. Five emergency wells located within the City, and using local groundwater, can theoretically provide up to a total of 13.6 mgd. These wells do not run concurrently with the SFPUC source and have been certified by the California Department of Health Services for short duration emergency use only. Hence further discussion regarding the management of groundwater resources is not included in this UWMP.

While the wells are not considered part of the City's drinking water supply portfolio, Table 4-5 is provided to demonstrate the theoretical capacity of the wells in the event that SFPUC transmission lines are not able to meet the City's demands for a limited time. It is important to note that the City has not operated the five wells simultaneously; therefore, the total production capacity of the wells, if operated simultaneously and on a sustained basis, is not known.

*Table 4-5*
*Emergency Well Capacity*

| Well Identification | Capacity |
|---|---|
| Well A | 1.7 mgd |
| Well B | 2.9 mgd |
| Well C | 4.6 mgd |
| Well D | 1.4 mgd |
| Well E | 3.0 mgd |

*Source: City of Hayward Water System Master Plan, 2002*

## WATER TRANSFERS AND EXCHANGES

Hayward has established agreements with two neighboring agencies, East Bay Municipal Utility District (EBMUD) and Alameda County Water District (ACWD), to receive or deliver water in the event of an emergency. The three interties have the capacity to deliver up to a total of about 14 mgd. Delivery would be of short duration only and would depend upon each agency's ability to provide water without negatively impacting supplies or their own customer and emergency requirements.

In addition to interties between Hayward and its neighboring agencies, SFPUC and EBMUD completed a regional intertie facility with a capacity of 30 mgd. This facility, which is located in Hayward and substantially relies on existing Hayward infrastructure for water delivery, may be used to exchange water between the two larger agencies in the event of an emergency or planned maintenance.

## DESALINATION

Hayward currently does not foresee opportunities for development of desalinated water supplies within the planning horizon of the 2010 UWMP. Constraints on developing desalinated water include the high cost of infrastructure and the large amount of energy required to operate a desalination facility.

## FUTURE WATER PROJECTS

Hayward receives potable water from SFPUC through two aqueducts, and delivers potable water through a pressurized distribution system, comprised of approximately 325 miles of pipeline, thirteen water storage reservoirs, seven pump stations delivering water to the upper pressure zones, transmission system pressure reducing valves, numerous zonal pressure reducing valves, and two booster pump stations. The facilities are monitored through a Supervisory Control and Data Acquisition (SCADA) system.

### *Water Supply Projects*

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 Program (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 Water Supply Master Plan (2000).

In approving the WSIP, the Commission adopted a Phased WSIP Variant for water supply that was analyzed in the Program Environmental Impact Report (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 up to 265 MGD until at least 2018 (see Chapter 5 for more discussion of the Interim Supply Limitation). 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.

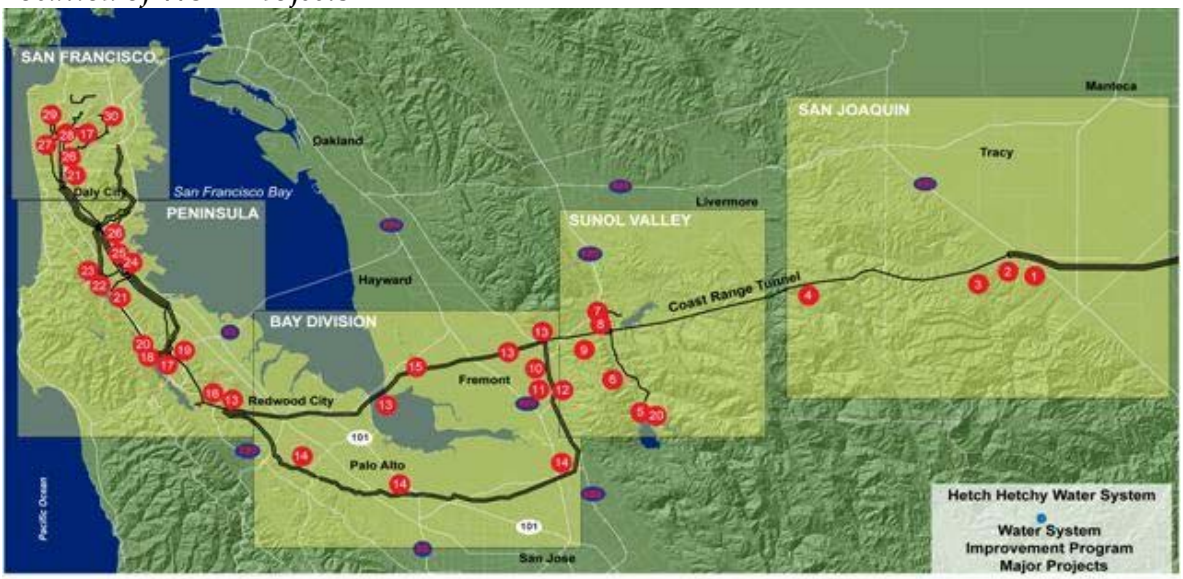
A Program Environmental Impact Report (PEIR) was prepared in accordance with the California Environmental Quality Act (CEQA) for the WSIP. A PEIR is a special kind of environmental impact report under CEQA that is prepared for an agency program or series of actions that can be characterized as one large project. The PEIR, 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.

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.

Figure 4-2 indicates the locations of the various capital improvement projects which comprise the WSIP.

***Figure 4-2***
***Location of WSIP Projects***




1. San Joaquin Pipeline System
2. Rehabilitation of Existing San Joaquin Pipelines
3. Tesla Treatment Facility
4. Lawrence Livermore Water Quality Improvement
5. Calaveras Dam Replacement
5. Calaveras Reservoir Upgrades
5. San Antonio Backup Pipeline
6. SVWTP Expansion & Treated Water Reservoir
7. Upper Alameda Creek Filter Gallery
8. Alameda Siphon #4
8. San Antonio Pump Station Upgrade
9. New Irvington Tunnel
10. BDPL No. 4 Condition Assessment PCCP Sections
11. Seismic Upgrade of BDPL Nos. 3 & 4
12. BDPL Nos. 3 & 4 Crossover/Isolation Valves
13. BDPL Reliability Upgrade - Tunnel
13. BDPL Reliability Upgrade - Pipeline
13. BDPL Reliability Upgrade - Relocation of BDPL Nos. 1 & 2
14. BDPL Nos. 3 & 4 Crossovers
15. SFPUC / EBMUD Intertie
16. Pulgas Balancing - Inlet/Outlet Work
16. Pulgas Balancing - Discharge Channel Modifications
16. Pulgas Balancing - Structural Rehabilitation & Roof Replacement
16. Pulgas Balancing - Modifications of the Existing Dechlorination Facility
17. Crystal Springs Pipeline No. 2 Replacement
18. Lower Crystal Springs Dam Improvements
19. New Crystal Springs Bypass Tunnel
20. Adit Leak Repair - Crystal Springs/Calaveras
21. Crystal Springs/San Andreas Transmission Upgrade
22. HTWTP Long-Term Improvements
23. HTWTP Short-Term Improvements - Demo Filters
23. HTWTP Short-Term Improvements - Coagulation & Flocculation/Remaining Filters
24. Capuchino Valve Lot Improvements
25. Peninsula Pipelines Seismic Upgrade
26. Baden and San Pedro Valve Lots Improvements
27. Regional Groundwater Storage and Recovery
28. San Andreas Pipeline No. 3 Installation
29. Sunset Reservoir - North Basin
30. University Mound Reservoir - North Basin

**WSIP Project in Various Locations**
- Standby Power Facilities - Various Locations
- Pipeline Repair & Readiness Improvements
- SCADA System - Phase II
- System Security Upgrades
- Cross Connection Controls
- Programmatic EIR
- Habitat Reserve Program
- Watershed Environment Improvement Program

## *Water Distribution System Projects*

In 2002, the City updated its Water System Master Plan to address major development plans and corresponding water demands and to account for improvements that had been constructed since the last Master Plan. An analysis was completed to assess future water demands, pumping capacity, water storage, distribution system hydraulics and water quality. The Master Plan update includes a number of recommended improvements, many of which the City has constructed.

The City prepares a ten-year Capital Improvement Program annually. In this current year, the Highland 1000 reservoir's reconstruction, which more than doubles the storage capacity, was completed and the reservoir put back into service. Also completed were major rehabilitations of High School and D Street Reservoirs. Major water system projects in the near term focus on the replacement and renovation of existing water storage reservoirs to increase storage capacity and improve structural reliability. For example, the Highland 250 and Maitland reservoirs are currently scheduled to undergo seismic upgrades over the next two to three years. In future years, projects to replace the existing 1 million gallon High School Reservoir with a 3 MG facility and to construct a new 2 MG reservoir on Hesperian Blvd are included to improve storage capacity. Various water main replacement and improvement projects are scheduled to ensure that system capacity requirements are achieved and that facilities are maintained for optimal operating efficiency.
The City has also made extensive efforts to seismically improve the water system, including seismic retrofits of several reservoirs and improvements to pipes at faultline crossings.

In order to keep pace with changing conditions and assess future needs, the CIP includes an update to the Water System Master Plan in FY 2012 to evaluate the system in view of current conditions and the improvements made in recent years, with additional funding proposed in subsequent years for projects that will be recommended in the update.

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# CHAPTER 5

# WATER SUPPLY RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING

This section provides a water supply reliability analysis and water shortage contingency plans to document the stages of action that have been and would be taken by the City of Hayward in response to water supply shortages.

## WATER SUPPLIES – CURRENT AND PROJECTED

Hayward's current and projected water use is described in Chapter 3. Hayward expects to meet its water supply needs almost exclusively through purchases from SFPUC. However, most of the water that the City will supply to the privately owned Russell City Energy Center (RCEC) would be recycled water produced at a new recycled water facility. A certain amount of recycled water will be produced and supplied to other businesses for industrial and irrigation uses. Table 5-1 summarizes the sources of supply that Hayward anticipates utilizing to meet its expected demand.

***Table 5-1***
***Current and Projected Water Supplies***

| **Water Supply Source** | **Water Supplies (in AFY)** | | | | | | |
|---|---|---|---|---|---|---|---|
| Water purchased from: | Wholesaler Supplied Volume? | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
| SFPUC | Yes | 19,537 | 24,200 | 26,200 | 28,450 | 31,000 | 34,160 |
| Recycled Water | | 0 | 3,475 | 3,760 | 3,760 | 3,760 | 3,760 |
| Total Current and Projected Supplies | | 19,537 | 27,675 | 29,460 | 31,680 | 34,270 | 37,390 |

*Sources: Table 3-13 and Communication from SFPUC dated March 11, 2011*

## WATER SUPPLY RELIABILITY AND SUPPLY INCONSISTENCIES

### *Potential Supply Inconsistencies*

Table 5-2 summarizes potential issues that may arise during the planning period, causing inconsistencies in supplies. The SFPUC water supplies in particular may be subject to legal issues regarding Tuolumne River allocations and climatic conditions, such as periods of drought.

*Table 5-2*
*Factors Resulting in Inconsistency of Supply*

| | Legal | Environmental | Water Quality | Climatic |
|---|---|---|---|---|
| SFPUC | Allocation of water from Tuolumne River | None expected | None expected | Lower-than-normal precipitation |
| Recycled Water | Regulatory and permitting issues | None expected | None expected | None |

Since the City considers recycled water to be a reliable and stable water supply source, the remainder of this chapter will focus on the reliability of the SFPUC water supplies and contingency plans for reductions in potable water supply only.

### *Reliability of the Regional Water System*

The SFPUC's Water System Improvement Program (WSIP) provides goals and objectives to improve the delivery reliability of the Regional Water System (RWS) including water supply reliability. The goals and objectives of the WSIP related to water supply are described in Table 5-3:

*Table 5-3*
*WSIP Water Supply Goals and Objectives*

| Program Goal | System Performance Objective |
|---|---|
| Water Supply – *meet customer water needs in non-drought and drought periods* | • Meet average annual water demand of 265 million gallons per day (mgd) from the SFPUC watersheds for retail and wholesale customers during non-drought years for system demands through 2018.<br>• Meet dry-year delivery needs through 2018 while limiting rationing to a maximum 20 percent system-wide reduction in water service during extended droughts.<br>• Diversify water supply options during non-drought and drought periods.<br>• Improve use of new water sources and drought management, including groundwater, recycled water, conservation, and transfers. |

*Source: Water System Improvement Program*

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.

***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
- 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.

***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
- Water Transfer with Modesto Irrigation District (MID) / Turlock Irrigation District (TID)

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. Table 5-4 summarizes SFPUC water supply options in both normal and dry years.

***Table 5-4***
***SFPUC Water Supply Options for 2015 through 2035***

| | **Water Supply Options (in AFY)** [(1)] | | | | |
|---|---|---|---|---|---|
| All Year Supplies | **2015** | **2020** | **2025** | **2030** | **2035** |
| Tuolumne River, Alameda Creek and San Mateo County Watersheds | 296,838 | 296,838 | 296,838 | 296,838 | 296,838 |
| Dry Year Supplies | **2015** | **2020** | **2025** | **2030** | **2035** |
| Crystal Spring Reservoir (20.28 billion gal) | 62,237 | 62,237 | 62,237 | 62,237 | 62,237 |
| Westside Basin Groundwater | 8,100 | 8,100 | 8,100 | 8,100 | 8,100 |
| Calaveras Reservoir Recovery ( 31.5 billion gal) | 96,670 | 96,670 | 96,670 | 96,670 | 96,670 |
| Districts' Transfer | 2,240 | 2,240 | 2,240 | 2,240 | 2,240 |

*Source: Paula Kehoe's (SFPUC) letter to Nicole Sandkulla (BAWSCA) dated March 31, 2011*

(1) Total supplies available for SFPUC retail and wholesale customers

***Projected SFPUC System Supply Reliability -*** The SFPUC has provided a table, *Projected System Supply Reliability Based on Historical Hydrologic Period* (included in Appendix E), presenting the projected RWS supply reliability. This table assumes that the wholesale customers purchase 184 mgd from the RWS through 2035 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 Water Shortage Allocation Plan. This table does not reflect any potential impact to RWS yield from the additional fishery flows required as part of Calaveras Dam Replacement Project and the Lower Crystal Springs Dam Improvements Project.

***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 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 Lower Crystal Springs Dam Improvements and the Calaveras Dam Replacement Project in approximately 2013 and 2015, 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.

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 below. 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 5-5***
***Water Deliveries in SFPUC Service Area***

| | FY2006 | FY 2007 | FY 2008 | FY 2009 | FY 2010 |
|---|---|---|---|---|---|
| Total Deliveries (mgd) | 247.5 | 257.0 | 254.1 | 243.4 | 225.2 |

*Source: SPFUC*

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.

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 MID and/or TID
- Increase in Tuolumne River supply
- Revising the Upper Alameda Creek Filter Gallery Project capacity [3]
- Development of a desalination project

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 Commission on October 15, 2010, the Commission 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 LOS 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.

[3] The adopted WSIP included the Alameda Creek Fishery Enhancement project, since renamed the Upper Alameda Creek Filter Gallery (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 UACFG 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 AF per year. The UACFG will undergo a separate CEQA process in which all impacts associated with the project will be analyzed fully.

SFPUC staff will report back to the Commission by August 31, 2011 to provide further information on actions to resolve the shortfall problem.

### *Interim Supply Allocations*

As part of its adoption of the Water System Improvement Program (WSIP) in October 2008, the Commission adopted a water supply element, the Interim Supply Limitation (ISL), to limit sales from the San Francisco Regional Water System (RWS) watersheds to an average annual of 265 mgd through 2018. The wholesale customer's collective allocation under the ISL is 184 mgd and San Francisco's allocation is 81 mgd. Although the wholesale customers did not agree to the ISL, the Water Supply Agreement provides a framework for administering the ISL. The Bay Area Water Supply Agency (BAWSCA) comprised of agencies that purchase SFPUC water, has developed a strategy to meet members' unmet needs for the duration of the ISL through a Water Conservation Implementation Plan and Long Term Reliable Water Supply Strategy.

The Interim Water Supply Allocations (ISAs) refer to each individual wholesale customer's share of the ISL. On December 14, 2010, the Commission established each agency's ISA through 2018. In general, the Commission based the allocations on the lesser of the projected fiscal year 2017-18 purchase projections or Individual Supply Guarantees. San Francisco's ISA is 81 mgd. The ISAs are effective only until December 2018.

The Commission established the Environmental Enhancement Surcharge concurrently with the budget-coordinated rate process. The surcharge will be unilaterally imposed by SFPUC on individual wholesale customers, and SFPUC retail customers, when each agency's use exceed their ISA and when sales of water to the wholesale customers and San Francisco's retail customers, collectively, exceeds the ISL of 265 mgd. The surcharge will become effective on July 1, 2011. As stated in the Water Supply Agreement, the wholesale customers do not concede the legality of the Commission's ISA's and the Environmental Surcharge, and expressly retain the right to challenge either or both, if and when imposed, in a court of competent jurisdiction.

Because Hayward's purchases are not limited by an Individual Supply Guarantee (see Chapter 3), its ISA was based on projected purchases in Fiscal Year 2017-18 and set at 22.9 mgd. Hayward does not expect to exceed its ISA in any year through 2018.

### *Long Term Reliable Water Supply Strategy*

The Bay Area Water Supply and Conservation Agency (BAWSCA) , of which Hayward is a member agency, was created in 2003 to represent the interests of the 26 cities, water districts, water company and university that purchase water on a wholesale basis from SFPUC. Among BAWSCA's water management objectives is to ensure that a reliable, high quality supply of water is available where and when people within the BAWSCA service area need it. Recognizing that 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 (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 BAWCSA 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.

## DROUGHT PLANNING

The SFPUC water supply is vulnerable to seasonal or climatic shortages given that the majority of water originates in the Sierra Nevada. Because of Hayward's dependency on the SFPUC supply, preparation for drought situation is a critical component of overall water supply planning.

### *Water Shortage Allocations*

SFPUC water supply allocations during periods of drought are governed by two agreements:

- Water Shortage Allocation Plan (Tier 1) – allocates water between SFPUC and wholesale customers
- Drought Implementation Plan (Tier 2) – allocates water among wholesale customers

Copies of both the Tier 1 and Tier 2 allocation plans are located in Appendix G.

### Tier One Drought Allocations

In July 2009, in connection with the WSA, the wholesale customers and San Francisco adopted a Water Shortage Allocation Plan (WSAP) to allocate water from the regional water system between SFPUC and wholesale customers during system-wide shortages of 20% or less (the "Tier One Plan"). The Tier One Plan replaced the prior Interim Water Shortage Allocation Plan, 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:

*Table 5-6*
*Allocation of Water Between SFPUC and Wholesale Customers*

| Level of System Wide Reduction in Water Use Required | Share of Available Water | |
|---|---|---|
| | SFPUC Share | Wholesale Customers Share |
| 5% or less | 35.5% | 64.5% |
| 6% through 10% | 36.0% | 64.0% |
| 11% through 15% | 37.0% | 63.0% |
| 16% through 20% | 37.5% | 62.5% |

*Source: Water Supply Agreement, July 2009*

The Tier One Plan will expire at the end of the term of the Water Supply Agreement, unless extended by San Francisco and the wholesale customers.

### 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 (mgd), 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.

### *Estimated Minimum Supply for Next Three Years*

The base years on which the following supply estimates are based are summarized in the following table.

***Table 5-7***
***Basis of Water Year Data***

| Water Year Type | Base Year(s) |
|---|---|
| Average Water Year | 2004 |
| Single Dry Water Year | 1987 |
| Multiple Dry Water Years | 1987 - 1989 |

Table 5-8 projects minimum water supplies available in the next immediate three-year period from SFPUC, as confirmed by SFPUC, based on 2010 purchases.

*Table 5-8*
*Estimated Minimum SFPUC Supply for Next Three Years*

| | Purchase Request Year 2010 (mgd) | One Critical Dry Year | Current Deliveries During Multiple Dry Years | | |
|---|---|---|---|---|---|
| | | | Year 1 | Year 2 | Year 3 |
| System-Wide Shortage (Percent) | 0 | 10% | 10% | 20% | 20% |
| Wholesale Allocation (mgd) | 184 | 152.6 | 152.6 | 132.5 | 132.5 |
| City of Hayward Allocation (mgd) (1) | 17.4 | 17.4 | 17.4 | 17.4 | 17.4 |

*Source: SFPUC Communication dated March 11, 2011*

(1) Wholesale water demands in 2010 were very low relative to available supply throughout the Hetch Hetchy System. Based on information provided by the SFPUC and application of the Tier 1 Water Shortage Allocation Plan and the Tier 2 Drought Implementation Plan, Hayward's projected drought allocations from SFPUC in 2010 and immediately thereafter are actually greater than 2010 purchases of 17.4 mgd (i.e., Hayward is projected to received up to 20 mgd under a 10% system-wide rationing, and 17.4 mgd under a 20% system-wide rationing).

### *SFPUC Supply and Demand Comparison – Normal Year*

Table 5-9 compares projected supply and demand during a year of normal precipitation.

*Table 5-9*
*SFPUC Supply and Demand Comparison – Normal Year (in mgd)*

| | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|
| Supply Totals | 21.6 | 23.4 | 25.4 | 27.7 | 30.5 |
| Demand Totals | 21.6 | 23.4 | 25.4 | 27.7 | 30.5 |
| Difference | 0 | 0 | 0 | 0 | 0 |
| Difference as a % of Supply | 0% | 0% | 0% | 0% | 0% |
| Difference as a % of Demand | 0% | 0% | 0% | 0% | 0% |

*Source: SFPUC Communication dated March 11, 2011*

### *SFPUC Supply and Demand Comparison – Single Dry Year*

Table 5-10 compares projected supply and demand during a single dry year.

*Table 5-10*
*SFPUC Supply and Demand Comparison – Single Dry Year (in mgd)*

| | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|
| Supply Totals (1) | 20.1 | 20.1 | 20.1 | 20.1 | 20.1 |
| Demand Totals | 21.6 | 23.4 | 25.4 | 27.7 | 30.5 |
| Difference | -1.5 | -3.3 | -5.3 | -7.6 | -10.4 |
| Difference as a % of Supply | 7% | 16% | 26% | 38% | 52% |
| Difference as a % of Demand | 7% | 14% | 21% | 27% | 34% |

*Source: Communication from SFPUC – March 11, 2011*

(1) Based on the current Drought Implementation Plan allocation methodology and on a Final Allocation Factor of 13.12% of available water for Hayward, calculated using recent consumption data. Under the terms of the existing Drought Implementation Plan, which expires in 2018, the actual Allocation Factor will depend on consumption by Hayward and other SFPUC wholesale customers in the years immediately preceding the drought. Beyond 2018, actual supply totals would be based on the drought implementation plan in effect at the time of the shortage and actual usage by Hayward and other SFPUC wholesale customers.

## *SFPUC Supply and Demand Comparison – Multiple Dry Years*

Table 5-11 compares projected supply and demands during period of multiple dry years.

*Table 5-11*
*SFPUC Supply and Demand Comparison – Multiple Dry Years (in mgd)*

| | | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| Multiple Dry Year First Year Supply | Supply Totals (1) | 20.1 | 20.1 | 20.1 | 20.1 | 20.1 |
| | Demand Totals | 21.6 | 23.4 | 25.4 | 27.7 | 30.5 |
| | Difference | -1.5 | -3.3 | -5.3 | -7.6 | -10.4 |
| | Difference as a % of Supply | 7% | 16% | 26% | 38% | 52% |
| | Difference as a % of Demand | 7% | 14% | 21% | 27% | 34% |
| Multiple Dry Year Second Year Supply | Supply Totals (1) | 17.4 | 17.4 | 17.4 | 17.4 | 17.4 |
| | Demand Totals | 22.0 | 23.8 | 25.9 | 28.3 | 30.5 |
| | Difference | -4.9 | -6.7 | -8.8 | -11.2 | -13.4 |
| | Difference as a % of Supply | 28% | 38% | 50% | 64% | 77% |
| | Difference as a % of Demand | 22% | 28% | 34% | 39% | 44% |
| Multiple Dry Year Third Year Supply | Supply Totals (1) | 17.4 | 17.4 | 17.4 | 17.4 | 17.4 |
| | Demand Totals | 22.3 | 24.2 | 26.4 | 28.8 | 30.5 |
| | Difference | -5.2 | -7.1 | -9.3 | -11.7 | -13.4 |
| | Difference as a % of Supply | 30% | 41% | 53% | 67% | 77% |
| | Difference as a % of Demand | 23% | 29% | 35% | 40% | 43% |

*Source: Communication from SFPUC – March 11, 2011*

(1) Based on the current Drought Implementation Plan allocation methodology and on a Final Allocation Factor of 13.12% of available water for Hayward, calculated using recent consumption data. Under the terms of the existing Drought Implementation Plan, which expires in 2018, the actual Allocation Factor will depend on consumption by Hayward and other SFPUC wholesale customers in the years immediately preceding the drought. Beyond 2018, actual supply totals would be based on the drought implementation plan in effect at the time of the shortage and actual usage by Hayward and other SFPUC wholesale customers.

Clearly the percentage cutbacks beyond 2015 shown in Tables 5-9 and 5-10 are unsustainable for Hayward, given Hayward's already low residential consumption. It is important to note that these are theoretical numbers only and based on assumptions that have not been reviewed and acted upon by the Hayward City Council. The Drought Implementation Plan, on which the allocation factor is based, will expire in 2018, and at that time, Hayward will have an opportunity to address increasing disparity between demand and available SFPUC supplies in dry years.

## WATER SHORTAGE CONTINGENCY PLAN

In response to a water shortage due to climate conditions, emergency event or other causes, the City would implement a Water Shortage Contingency Plan.

### *Stages of Action*

Hayward's past experience with water shortages, most notably in 1977 and from 1987-1992, has shaped its current plans for managing such an event in the future. The following stages have been developed to respond to increasingly severe drought conditions and are triggered by water supplies.

***Table 5-12***
***Water Shortage Stages of Action***

| Stage | Water Supply Conditions | % Shortage |
|---|---|---|
| I | • Single dry year<br>• Supply is 90 to 99% of normal | Up to 10% |
| II | • Critically dry year<br>• Supply is 80 to 90% of normal | 10 – 20% |
| III | • Second dry year or critically dry year<br>• Supply is 50 to 80% of normal<br>• Loss of 20 to 50% of supply due to emergency | 20 – 50% |
| IV | • Supply is less than 50% of normal<br>• Loss of 50% or more of supply due to emergency | Over 50% |

*Source: City of Hayward*

Hayward's most recent experience with severe water supply shortages was during the state-wide drought of the early 1990s, in which Hayward customers reduced water use by 27%. The rationing program implemented was modeled on the very successful effort launched in 1977, in which Hayward customers reduced water usage by about 32%. More recently, a Stage I rationing effort was implemented following SFPUC's requested voluntary reduction of 10%. Although no mandatory prohibitions were implemented, the voluntary actions taken by Hayward customers resulted in Hayward exceeding the reduction target. It is

expected that future rationing programs would follow prior models, although changes could be incorporated to fit current conditions.

### *Stage I - Voluntary Conservation Actions*

The following list identifies specific conservation actions that Hayward customers are asked to take during a Stage I rationing effort. Hayward would implement a public information campaign to specifically address the situation.

- Avoid washing sidewalks, driveways, parking lots, buildings and other outdoors areas and structures
- Utilize a water recirculating system in ornamental fountains
- Repair broken or defective plumbing and irrigation systems
- Avoid use of hoses without a hose bib in washing vehicles
- Irrigate landscaping carefully to avoid overwatering
- Limit irrigation to early morning and evening hours to reduce evaporation
- Install water-saving devices
- Ensure full loads in dishwashers and clothes washing machines

### *Stage II and III - Mandatory Prohibitions*

Table 5-12 lists mandatory prohibitions during water shortages and the rationing stage at which the prohibition would become mandatory.

*Table 5-13*
*Water Use Prohibitions*

| Prohibition | Stage When Prohibition Becomes Mandatory |
|---|---|
| Water use in excess of allocation (implement rate structure appropriate to the shortage) | Stage II (10% to 20% reduction) |
| Washing buildings, sidewalks, driveways, parking lots, and other outdoor areas | |
| Using defective plumbing and irrigation systems | |
| Filling or refilling swimming pools, spas or hot tubs | |
| Using water to fill or maintain water level in decorative fountain | |
| Serving water in restaurants (unless specifically asked by customer) | |
| Washing vehicles, except in commercial carwashes | |
| Using potable water in construction activities unless no other water is available | |

| Prohibition | Stage When Prohibition Becomes Mandatory |
|---|---|
| Continuation of all Stage II prohibitions | Stage III (20 to 50% reduction) |
| Using potable water for cooling purposes and commercial car washes, unless recycled | |
| Using potable water for golf course irrigation | |
| Use of potable water for street sweeping | |
| Use of potable water to irrigate landscaping in new developments | |

*Source: City of Hayward draft ordinances and resolutions*

### *Stage IV – Addition Reductions*

In a Stage IV rationing effort, the City would intensify all of the prohibitions as listed in Table 6-13. Additional measures, such as limited watering days, would be added to achieve savings. The majority of additional savings would come from further reduced customer allocations.

## PENALTIES FOR EXCESS USE

During the most recent period of mandatory rationing, in the early 1990s, excess use charges for Hayward customers were implemented based on excess use charges applied to the City by SFPUC for water used in excess of Hayward's overall monthly allocations. SFPUC's excess use charges are set on a "graduated" basis, and Hayward has followed this same system with its own customers. Specifically, in 1991, excess water up to 10% over the allotment was billed at a higher rate per unit (hundred cubic feet), and an additional higher tier was implemented for excess water from 10% to 20% over the allotment. This scale, which matched that of SFPUC, provided sufficient deterrent and assisted Hayward in reducing consumption by 27%. It is expected that a variation of this scale would be implemented during a future supply shortage. The exact amount would depend on SFPUC's excess use rate schedule and would be implemented during Stage II or III rationing.

## REVENUE IMPACTS OF REDUCED SALES

Hayward's rate structure is based on a cost-of-service method where the beneficiaries of a service pay for the cost of providing the service, and where one customer class does not unduly subsidize another. The City has implemented an increasing block rate structure, four tiers for residential customer and two tiers for non-residential and multi-family customers, to promote water conservation, and reviews water rates annually to ensure adequate revenues to meet operating and capital expenses. A key factor in this review is anticipated consumption, and a water shortage would be expected to result in lower consumption and reduced revenues.

Hayward would also anticipate expending funds on the implementation of a water rationing program, including:

- Computer programming modifications to implement excess water usage fees
- Computer programming needed to determine appropriate customer allocations
- Advertising and public education materials
- Possible additional customer service staff to support rationing program

The reduced revenues would be mitigated in part by lower costs for purchasing water. However, Hayward would develop a rate structure, including excess use charges, to mitigate some of the revenue impacts to the extent possible. In the event that revenue was lower than expenditures, Hayward would rely upon the short-term use of reserves to offset the deficit. Also, some types of maintenance would be deferred, if such deferment would not compromise water quality or service, and short-term cost efficiencies would be implemented to reduce the impact of reduced water sales.

### DRAFT WATER SHORTAGE RESOLUTIONS AND ORDINANCES

Appendix H contains samples of resolutions and ordinances that were adopted during the most recent drought in the early 1990s. It is anticipated that the City would use similar documents to implement future water shortage programs.

### USE MONITORING PROCEDURES

All water in Hayward is metered, including water used by the City government and other public agencies. All meters are read bi-monthly, and water bills are issued based on actual usage. Customer bills include usage data from the same time period the previous year, to enable customers to monitor their own water use. The utility billing system is capable of generating a variety of data for a given period of time, including consumption by customer type, meter size, and selected businesses. The City can also readily track water usage for large users such as the university, colleges, park district, City facilities, and certain large-use businesses. These reports would be used to determine customer use reductions.

The City also maintains a state-of-the-art Supervisory Control and Data Acquisition (SCADA) system to monitor the water distribution system. Water usage at various locations in the system can be tracked virtually hourly and reports can be generated to provide operating data and information. The SCADA can be used to determine reductions in water deliveries from SFPUC, consumption trends in various locations, and other useful monitoring data.

## WATER QUALITY IMPACTS ON SUPPLY RELIABILITY

Water supplies from SFPUC, delivered from the Tuolumne River and local reservoirs, are of very high quality. The majority of water supplied originates in the upper Tuolumne River watershed, high in the Sierra Nevada and removed from human development pollution. Known as Hetch Hetchy water, this supply is conveyed to the Bay Area through a system of pipes and tunnels. The U.S. Environmental Protection Agency and the California Department of Health Services currently approves the use of this drinking water source without requiring filtration. Local water from the Alameda watershed, which provides a small amount of Hayward's water, requires filtration to meet drinking water quality standards. The filtered and treated water from the local watershed is blended with Hetch Hetchy water. SPFUC chloraminates and fluoridates water prior to delivery to wholesale customers. Water quality is continuously monitored and tested, by both SFPUC and Hayward, to ensure that water delivered to customers meets or exceeds federal and state drinking water/public health standards.

One of the objectives of the SFPUC Water System Improvement Program is the continued ability to meet water quality standards. It is anticipated that there will be no degradation of water quality in the future and that water quality issues will not impact current water management strategies or supply reliability.

## CATASTROPHIC WATER SUPPLY INTERRUPTION PLAN

### *City of Hayward Emergency Water Supply Planning*

The City of Hayward has taken significant steps to plan for and to supplement potable water supplies in the event of a catastrophic interruption in regular water supplies, including interruptions caused by a regional power outage, earthquake, or other disaster, including interties with two neighboring water agencies and implementation of an emergency well system. One of the agencies with which Hayward shares interties (EBMUD) is fully independent of the SFPUC water supply; the other agency (ACWD) receives about 70% of its supply from sources other than SFPUC.

The following describes possible actions that could be taken in the event of a catastrophic interruption in water supplies. The actual actions would depend on the severity of the disruption and the number of customers impacted.

- Notify customers of the need to limit water consumption. This could be by means of media contact, written notices to be posted in public places or hand-delivered and/or use of an emergency notification telephone system
- Make contact with high-water-use businesses and other businesses through use of the "sensitive water users" list maintained by the City of Hayward

- Activate emergency interties, using emergency generators if necessary
- Activate emergency well system, using each well's emergency generator if necessary

Hayward developed and maintains a comprehensive Water System Emergency Response Plan (ERP) to incorporate all aspects of disaster planning into one document. The ERP utilizes the Standardized Emergency Management System (SEMS) to identify roles and responsibilities during an emergency. The ERP also includes instructions for communicating with SFPUC and other key agencies in the event of an emergency. In addition, Hayward is a member of the Water Agency Response Network, a mutual aid agreement with water agencies throughout the State of California. The signatories may be called upon during an emergency to provide resources if they are available.

### *SFPUC Emergency Water Supply 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, originally released in 1992, and has been updated on average every two years. The latest plan update will be 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 Emergency Operations Plan 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 sometime real world event response and evaluation. Also, the SFPUC has an emergency response training plan that is based on federal, state and local standards and exercise and incident improvement plans. SFPUC employees have emergency training requirements that are based on their emergency response role.

### *SFPUC 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.

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 (ERRP), 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. The ERRP complements the other SFPUC emergency operations plans at the Department, Division and Bureau levels for major system emergencies.

The SFPUC has also prepared in 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 of 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.

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. The following action pertains to Hayward's water supply.

- 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.

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.

### *Capital Projects for Seismic Reliability and Overall System Reliability*

As discussed previously, the SFPUC is undertaking a Water System Improvement Program (WSIP) in order to enhance the ability of the SFPUC water supply system to meet identified service goals for water quality, seismic reliability, delivery reliability, and water supply. The WSIP projects include several projects related to the SFPUC Regional Water System 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 intertie utilizes significant portions of the City of Hayward's transmission system.

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).

## 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, 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 (RWS) or the 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.

# CHAPTER 6

# DEMAND MANAGEMENT MEASURES

This section provides a description of Hayward's current and planned water conservation programs, including implementation of Best Management Practices (BMPs), known as Demand Management Measures (DMMs) in the Urban Water Management Planning Act.

## CALIFORNIA URBAN WATER CONSERVATION COUNCIL MEMORANDUM OF UNDERSTANDING

The City of Hayward has one of the lowest per capita water usage among agencies that purchase water from SFPUC. This may be partially due to the fact that, as one of the original signatories to the California Urban Water Conservation Council (CUWCC) Memorandum of Understanding Regarding Urban Water Conservation in California (MOU), Hayward has long been committed to effective water conservation. The CUWCC was created to increase water use efficiency through partnerships among urban water agencies, public interest organizations and private entities that provide services and equipment to promote water conservation. The MOU was originally crafted in 1991, and although it has been through several revisions, this document remains the cornerstone of Hayward's water conservation planning and implementation efforts. Table 6-1 provides a comprehensive summary of the current BMPs applicable to Hayward.

*Table 6-1*
*CUWCC Best Management Practices*

| BMP Category | BMP No. | BMP Name | Corresponding DMM No. in UWM Planning Act |
|---|---|---|---|
| Foundational | **1** | **Utility Operations** | |
| | **1.1** | **Operations Practices:** | |
| | 1.1.1 | Conservation Coordinator | L |
| | 1.1.2 | Water Waste Prevention | M |
| | 1.2 | Water Loss Control | C |
| | 1.3 | Metering with Commodity Rates | D |
| | 1.4 | Retail Conservation Pricing | K |
| | **2** | **Education:** | |
| | 2.1 | Public Information Programs | G |
| | 2.2 | School Education | H |
| Programmatic | **3** | **Residential:** | |
| | 3.1 | Residential Assistance Program | A,B |
| | 3.2 | Landscape Water Survey | A |
| | 3.2 | High Efficiency Clothes Washers | F |
| | 3.4 | Water Sense Specification Toilets | N |
| | 3.5 | Water Sense Specifications for Residential Development | New |
| | **4** | **Commercial, Industrial, Institutional (CII)** | I |
| | **5** | **Landscape** | E |

*Source: CUWCC MOU as amended December 2008*

As noted, Hayward remains committed to the BMPs developed in partnership with public policy organizations and other interested entities. In addition, Hayward will continue to pursue a wide range of water conservation opportunities that fall outside of the BMP structure, as opportunities arise and technologies become available.

## REGIONAL WATER CONSERVATION PROGRAMS

Hayward has and will continue to actively participate in regional demand management efforts, including development and implementation of the regional Water Conservation Implementation Plan. Hayward evaluates each regional conservation program individually to assess the benefits to Hayward customers. To date, Hayward has participated in the regional programs such as:

- High efficiency clothes washing machine rebates
- High efficiency toilet rebates
- Indoor water efficiency standards for new development
- Residential water efficient landscape classes
- School education programs (in-class and assembly)
- Distribution of pre-rinse spray valves
- Adoption of Bay Friendly landscape ordinances and standards

### *Regional Water Conservation Implementation Plan*

In September 2009, BAWSCA completed the Water Conservation Implementation Plan (WCIP). 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 Report (PEIR) for the Water System Improvement Program (WSIP) which is further described in Chapter 4. The WCIP'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 million gallons per day (MGD) Interim Supply Limitation, imposed 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, including Hayward, 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.

### *Regional Coordination On Demand Management*

BAWSCA and its member agencies look for opportunities to work with other water agencies, including the SFPUC. For example, in 2005, BAWSCA and the SFPUC entered into a Memorandum of Understanding (MOU) 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 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.

## IMPLEMENTATION OF SPECIFIC WATER CONSERVATION MEASURES

Recognizing the importance of a sustainable water supply, Hayward has been, and will remain, committed to an aggressive and effective water conservation effort. In 2010, Hayward's achievements in this field were recognized with the Silicon Valley Water Conservation Award. Through local and regional programs, the City has been able to offer its customers a diverse range of opportunities to learn about and practice good stewardship of water resources.

Tables 6-2 through 6-16 address the status of each water conservation measure that the City has or plans to implement in the near term, with descriptions of each of the parameters identified in the 2010 UWMP Guidebook, if applicable:

*Table 6-2*
*Water Conservation Coordinator*

| **Measure No. and Name:** | **1.1.1 Water Conservation Coordinator** |
|---|---|
| Steps Needed | Fully Implemented |
| Description | The City has designated a Water Conservation Coordinator (currently holding the more general title of Administrative Analyst III) who is responsible for evaluation, management, tracking, planning and reporting of water conservation programming. This position is assisted by others on staff as needed, including another Administrative Analyst and a Landscape Architect. |
| Schedule | N/A |
| Marketing/Advertisement | N/A |
| Evaluation Method(s) | N/A |
| Quantification | N/A |
| Estimated Water Savings | Not quantified |

*Table 6-3*
*Water Waste Prevention*

| **Measure No. and Name:** | **1.1.2 Water Waste Prevention** |
|---|---|
| Steps Needed | Fully Implemented |
| Description | The City of Hayward has had a water waste prohibition ordinance in place since 1993. In February 2010, an updated Ordinance was adopted by City Council to include prohibition of additional water wasting activities. The updated Ordinance specifically prohibits all activities identifies as wasteful in BMP 1.1.2.<br>In addition, the City Council adopted Indoor Water Use Efficiency Standards for new development that exceed the plumbing code, as well as a water efficient landscape ordinance that is more stringent than the State Model Water Efficient Landscape Ordinance. Copies of these ordinances are located in Appendix I. |
| Schedule | N/A |
| Marketing/Advertisement | City Building and Planning Divisions, City website |
| Evaluation Method(s) | N/A |
| Quantification Criteria | Number of fixtures/applicants subject to the ordinance(s) |
| Estimated Water Savings | Not yet quantified as ordinances are relatively new |

*Table 6-4*

*Water Loss Control*

| **Measure No. and Name:** | **1.2 Water Loss Control** |
|---|---|
| Steps Needed | Partially Implemented<br>• Evaluate recommendations from water loss audit<br>• Implement cost effective interventions |
| Description | Hayward prepared a pre-screening system audit and determined that, given the increasing percentage of unaccounted for water, a full scale audit was needed. Hayward contracted with WSO, a San Francisco based firm specializing in water loss evaluation and control, to prepare the audit, consistent with the procedures described in the AWWA *Water Audit and Leak Detection Guidebook*. The study was completed in March 2011, and the findings are currently under review. Preliminarily, it appears that losses are primarily the result of system leaks and some under-reading meters. The City will be assessing the most cost effective approach to resolving these issues and reducing the level of unaccounted for water, including evaluating the feasibility of converting to an Advanced Metering Infrastructure (AMI) metering system. |
| Schedule | • Leak detection and repair – FY 2012<br>• Evaluation of conversion to AMI meters – FY 2012<br>• Implement results of AMI meter evaluation (conversion or repair/replacement of existing units) – FY 2013 to FY 2015 |
| Marketing/Advertisement | N/A |
| Evaluation Method(s) | Comparison of pre- and post-intervention quantities of unaccounted-for-water. |
| Quantification | Quantity of unaccounted-for-water |
| Estimated Water Savings | Estimated theoretical recoverable real losses from leaks – 1 mgd<br>Estimated theoretical recoverable apparent losses from under functioning meters – 0.4 mgd<br>Note: Actual water savings will depend on the interventions selected and the rate of implementation. |

*Table 6-5*

*Metering with Commodity Rates*

| **Measure No. and Name:** | **1.3 Metering with Commodity Rates** |
|---|---|
| Steps Needed | Fully Implemented |
| Description | All water use in Hayward is metered, and all water sales are based on metered consumption. Customer meters are read and bills issued every two months (a minimum of six times per year). |
| Schedule | N/A |
| Marketing/Advertisement | Water bills, City website |
| Evaluation Method(s) | N/A |
| Quantification Criteria | N/A |
| Estimated Water Savings | Not quantified |

*Table 6-6*
*Retail Conservation Pricing*

| **Measure No. and Name:** | **1.4 Retail Conservation Pricing** |
|---|---|
| Steps Needed | Fully Implemented |
| Description | Hayward implemented tiered rates in the early 1990s, in which the volumetric rate increases as the quantity of water increases. The tier structure has been modified several times. In its current form, there are four tiers for single-family residential and two tiers for non-residential and multi-family customers. Also, the City's fixed service charge is among the lowest in the Bay Area. A copy of the City's FY 2011 water rates is included in Appendix J. |
| Schedule | N/A |
| Marketing/Advertisement | City website, water bills, schedule of fees |
| Evaluation Method(s) | Per the CUWCC MOU, conservation pricing is effective if the revenue from volumetric charges represents at least 70% of the water utility's total revenue. In FY 2010, Hayward's total revenue from volumetric charges and fixed services charges was just over $25 million. Of this amount, 88% was from volumetric charges. |
| Quantification Criteria | N/A |
| Estimated Water Savings | Not quantified |

*Table 6-7*
*Public Information Programs*

| **Measure No. and Name:** | **2.1 Public Information Programs** |
|---|---|
| Steps Needed | Fully Implemented |
| Description | Hayward has implemented an extensive and varied public information effort to inform and encourage customers regarding water use efficiency. Program components include:<br>• Billing inserts to promote ideas for indoor and outdoor water use efficiency and to announce upcoming classes and events<br>• Workshops and classes on water efficient landscaping<br>• Comparison of use from year to year on water bills<br>• Distribution of information at fairs and other events, including street fairs, earth day events and other community gatherings<br>• Extensive website information and links<br>• Notification to customers if water use is unusually high<br>• Point-of-purchase displays for rebates |
| Schedule | Ongoing |
| Marketing/Advertisement | Water bills, City website, billing inserts, direct mail |
| Evaluation Method(s) | Review of participation levels in classes, website traffic, number of events |
| Quantification Criteria (Annually) | • Number of billing inserts issued - 4<br>• Number of landscape classes/participants – 3/75<br>• Number of events - 9<br>• Number of point-of-purchase displays - 1 |
| Estimated Water Savings | Not quantified |

*Table 6-8*
*School Education*

| **Measure No. and Name:** | **2.2 School Education Programs** |
|---|---|
| Steps Needed | Fully Implemented |
| Description | Hayward has implemented a school education program that utilizes in-class curriculum and assembly programs to reach students.<br>The in-class curriculum is directed at 5th grade students and consists of:<br>• Lesson plans and teaching aids<br>• Student workbook<br>• Supplemental student activities<br>• WaterWise Kit for each student (home water use survey, water saving showerhead and faucet aerators, leak detection materials)<br>• Evaluation form<br>The assembly program is available to all elementary school age students and tailored to specific grade levels as needed. Professional presenters combine music, comedy and theatrics to teach students about water conservation.<br>In addition to the school programs, Hayward's water conservation website also includes activities and links for students at all grade levels. |
| Schedule | Ongoing |
| Marketing/Advertisement | Direct contact and scheduling with schools, City website |
| Evaluation Method(s) | Review of participation levels in classes, number of water saving devices installed, feedback from teachers |
| Quantification Criteria | • Number of students participating in-class program (about 600 annually)<br>• Number of students attending assembly programs (about 4,000 annually)<br>• Number of water saving devices distributed/installed (about 300 each of showerheads, kitchen faucet aerators and bathroom faucet aerators) |
| Estimated Water Savings | In-class Program – Approx 160 AFY<br>Assembly Program – Not quantified |

*Table 6-9*
*Residential Assistance Program*

| **Measure No. and Name:** | **3.1 Residential Assistance Program** |
|---|---|
| Steps Needed | Partially implemented<br>• Increase level of distribution of water saving devices<br>  • Improve and expand outreach efforts<br>• Increase number of residential surveys<br>  • Identify ways of expanding surveys to year-round program<br>  • Develop improved outreach program |
| Description | Distribution of Low Flow Devices – The City makes available at no charge low flow showerheads and faucet aerators (kitchen and bathroom). These items are available to residents in both single-family and multi-family dwellings.<br>Residential Surveys – The City works with Rising Sun Energy Services to provide residential water and energy efficiency surveys at no charge to customers during the summer. Surveyors check for leaks and water waste, offer suggestions as well as measure the volume of showerheads and faucets, and replace with low flow fixtures if warranted. |
| Schedule | Distribution of water saving devices – Develop and implement steps to increase visibility of and participation in program – FY 2012<br>Residential surveys – evaluate effectiveness of current program and either modify or replace with equivalent effort – FY 2012 and FY 2013 |
| Marketing/Advertisement | Website, billing inserts, direct contact with potential customers, outreach at fairs and other events |
| Evaluation Method(s) | Number of surveys conducted, number of water saving devices installed |
| Quantification Criteria | • Number of homes surveyed - 400<br>• Number of water saving devices distributed (since 2005)<br>  • Showerheads – 2,000<br>  • Faucet aerators – 5,000 |
| Estimated Water Savings | 40 AFY |

*Table 6-10*
*Residential Landscape Program*

| **Measure No. and Name:** | **3.2 Residential Landscape Program** |
|---|---|
| Steps Needed | Not yet implemented<br>• Evaluate benefits of program to Hayward residents<br>• If feasible, develop and implement program |
| Description | This program, which would offer site-specific landscape water surveys to single-family properties, has not been implemented in Hayward, mainly due to Hayward's relatively low outdoor residential use in comparison to other urban agencies. |
| Schedule | Evaluate cost effectiveness of program – FY 2013<br>If cost effective, develop and implement program - FY 2014 |
| Marketing/Advertisement | N/A pending evaluation of program |
| Evaluation Method(s) | N/A pending evaluation of program |
| Quantification Criteria | N/A pending evaluation of program |
| Estimated Water Savings | Not yet quantified |

*Table 6-11*
*High Efficiency Clothes Washers*

| **Measure No. and Name:** | **3.3 High Efficiency Clothes Washers** |
|---|---|
| Steps Needed | Fully implemented |
| Description | This program provides rebates of up to $100 (combined City and PG&E rebate) for the purchase of a Consortium for Energy Efficiency (CEE) Tier 3 clothes washer. This program has been in place since 2001. |
| Schedule | Fully implemented |
| Marketing/Advertisement | Website, outreach to retailers, billing inserts |
| Evaluation Method(s) | Number of rebates issued |
| Quantification Criteria | • Number rebates issued – 4,600 |
| Estimated Water Savings | 70 AFY |

*Table 6-12*
*Water Sense Specification Toilets*

| **Measure No. and Name:** | **3.4 Water Sense Specification Toilets** |
|---|---|
| Steps Needed | Partially implemented<br>• Increase participation in existing program |
| Description | This program provides rebates of up to $150 (to be reduced to $100 effective July 1, 2011) for the purchase of a Water Sense certified, 1.28 gallon per flush toilet. This program has been in place since 2008. Rebates are available to both residential and non-residential customers, up to three toilets per residential unit and up to ten toilets per non-residential units. Hayward's goal is to replace 900 toilets annually. Currently this goal is not being met, and efforts will be made to increase awareness and participation in this program. |
| Schedule | Evaluate and implement additional outreach opportunities to increase participation in program, including further direct contact with apartments and motels/hotels – currently underway and continuing to FY 2012 |
| Marketing/Advertisement | Website, outreach to retailers, direct contact, billing inserts |
| Evaluation Method(s) | Number of rebates issued and number of toilets replaced |
| Quantification Criteria | • Number rebates issued (since 2009) – 375<br>• Number of toilets replaced (since 2009) - 575 |
| Estimated Water Savings | 25 AFY |

*Table 6-13*
*Water Sense Specifications for Residential Development*

| **Measure No. and Name:** | **3.5 Water Sense Specifications for Residential Development** |
|---|---|
| Steps Needed | Fully implemented |
| Description | In February 2010, the Hayward City Council adopted Indoor Water Use Efficiency standards that are applicable to all new development and to remodels that affect a certain number of square feet. For residential properties, standards are specified for toilets, showerheads, faucets, clothes washers (if installed by applicant), and dishwashers. A copy of the Ordinance is attached in Appendix I. The standards meet or exceed those developed by Water Sense and the CA Green Building Code. |
| Schedule | N/A |
| Marketing/Advertisement | Building and Planning Divisions, website |
| Evaluation Method(s) | Number of fixtures installed/ replaced as a result of the ordinance |
| Quantification Criteria | Number of fixtures installed/replaced – not yet quantified |
| Estimated Water Savings | Not yet quantified |

*Table 6-14*

*Commercial, Industrial and Institutional*

| **Measure No. and Name:** | **4 Commercial, Industrial and Institutional (CII) Programs** |
|---|---|
| Steps Needed | Partially implemented<br>• Enhance and expand CII programs to reach a greater segment of this customer sector |
| Description | Hayward's current programs available to CII customers include:<br>• Rebates for Water Sense certified toilets<br>• Rebates for commercial high efficiency clothes washers<br>• Rebates for cooling tower controllers<br>• Distribution of water efficient pre-rinse spray valves to food-related businesses<br>With the exception of pre-rinse spray valves, Hayward has had limited success in achieving participation in its CII programs and will be looking at ways to expand water use efficiency measures in this customer sector, such as enhanced outreach for existing program, industrial process water use reduction, and other rebate programs that may be cost effective.<br>In addition to the incentive programs, Hayward has also implemented Indoor Water Use Efficiency standards for new and renovated CII properties, similar to the residential standards described in Table 6-14, with additional standards for refrigeration units, cooling systems, and ice making equipment. |
| Schedule | Evaluate enhancement opportunities for existing program and develop additional programs to increase CII water use efficiency – FY 2012 and FY 2013 |
| Marketing/Advertisement | City website, billing inserts, outreach to retailers and contractors, City Building and Planning Divisions |
| Evaluation Method(s) | Number of fixtures installed/ replaced |
| Quantification Criteria | Number of Water Sense certified toilets - 0<br>Number of commercial high efficiency clothes washers – 2<br>Number of cooling tower controllers - 0<br>Number of pre-rinse spray valves installed - 200 |
| Estimated Water Savings | 40 AFY |

*Table 6-15*
*Landscape*

| **Measure No. and Name:** | **5. Landscape** |
|---|---|
| Steps Needed | Partially implemented<br>• Evaluate results of Phase I landscape survey program and determine appropriate future program |
| Description | The Hayward City Council adopted the Bay Friendly Water Efficient Landscape Ordinance in February 2010. This Ordinance meets and exceeds all of the requirements of the State Model Water Efficient Landscape Ordinance and provides for a more holistic approach to environmentally sustainable landscaping. This Ordinance, which is included in Appendix I, is administered by a licensed landscape architect.<br>In 2009, the City initiated a focused Phase I large landscape survey program, in which 20 sites were selected to receive an irrigation water budget, extensive survey of the existing irrigation system by a certified irrigation auditor, and a full report of finding, recommendations, estimated costs, and rate of return analysis. The information was provided to the customers, and the City is currently monitoring the results.<br>Water savings have not yet been quantified because insufficient time has passed since the reports were distributed to make a meaningful evaluation. |
| Schedule | • Evaluate results of Phase I Landscape Survey to determine if significant water savings were achieved – FY 2012<br>• Plan next phase of landscape program, based on the results of Phase I. The next phase may be a continuation of Phase I, whereby a small group of customers is selected for intensive study, or may utilize the more traditional approach of including more customers and less site-specific analysis – FY 2013 |
| Marketing/Advertisement | Direct mail and telephone calls |
| Evaluation Method(s) | Comparison of pre- and post-survey water usage |
| Quantification Criteria | Pre- and post-survey water use |
| Estimated Water Savings | Not yet fully quantified; however, initial annual savings totaled 46 AFY. |

## FUTURE POTENTIAL WATER CONSERVATION PROGRAMS

Hayward's residential and gross per-capita is very low compared to both the state-wide average and to neighboring communities. Hayward's service area includes a large and growing industrial sector, a state university and community college, both of which are mainly "commuter" institutions, two major hospitals. Over the years, through a combination of factors, Hayward's demand has "hardened" such that achieving further reductions in per capita use will be a challenge.

However, the City will continue to implement existing programs, as long as they are cost effective. Further, the City will be assessing and implementing additional cost effective water conservation measures in order to achieve SB7 targets and to carry out the Hayward City Council's mission of efficient and sustainable use of resources. Potential future programs may include:

- Rebates for weather-based irrigation controllers and efficient irrigation systems
- Water use surveys for commercial/industrial sites, including hotels and motels
- Incentives to replace inefficient commercial and industrial equipment

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# APPENDICES

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# APPENDIX A

## URBAN WATER MANAGEMENT PLAN CHECKLIST

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**Table A-1 Urban Water Management Plan checklist, organized by subject [b]**

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| PLAN PREPARATION | | | | |
| 4 | Coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable. | 10620(d)(2) | | Chapter 1, Pg. 1-2<br>Appendix C |
| 6 | Notify, at least 60 days prior to the public hearing on the plan required by Section 10642, any city or county within which the supplier provides water that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. Any city or county receiving the notice may be consulted and provide comments. | 10621(b) | | Chapter 1, Pg. 1-2<br>Appendix C |
| 7 | Provide supporting documentation that the UWMP or any amendments to, or changes in, have been adopted as described in Section 10640 et seq. | 10621(c) | | Appendix C |
| 54 | Provide supporting documentation that the urban water management plan has been or will be provided to any city or county within which it provides water, no later than 60 days after the submission of this urban water management plan. | 10635(b) | | Chapter 1, Pg. 1-3 |
| 55 | Provide supporting documentation that the water supplier has encouraged active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. | 10642 | | Chapter 1, Pg. 1-1<br>Appendix C |
| 56 | Provide supporting documentation that the urban water supplier made the plan available for public inspection and held a public hearing about the plan. For public agencies, the hearing notice is to be provided pursuant to Section 6066 of the Government Code. The water supplier is to provide the time and place of the hearing to any city or county within which the supplier provides water. Privately-owned water suppliers shall provide an equivalent notice within its service area. | 10642 | | Chapter 1, Pg. 1-3<br>Appendix C |
| 57 | Provide supporting documentation that the plan has been adopted as prepared or modified. | 10642 | | Chapter 1, Pg. 1-3<br>Appendix C |
| 58 | Provide supporting documentation as to how the water supplier plans to implement its plan. | 10643 | | Chapter 1, Pg. 1-3 |

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| 59 | Provide supporting documentation that, in addition to submittal to DWR, the urban water supplier has submitted this UWMP to the California State Library and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. This also includes amendments or changes. | 10644(a) | | Chapter 1, Pg. 1-3 |
| 60 | Provide supporting documentation that, not later than 30 days after filing a copy of its plan with the department, the urban water supplier has or will make the plan available for public review during normal business hours | 10645 | | Chapter 1, Pg. 1-3 |
| SYSTEM DESCRIPTION | | | | |
| 8 | Describe the water supplier service area. | 10631(a) | | Chapter 2, Pg. 2-1 |
| 9 | Describe the climate and other demographic factors of the service area of the supplier | 10631(a) | | Chapter 2, Pg. 2-2 to Pg. 2-4 |
| 10 | Indicate the current population of the service area | 10631(a) | Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M. | Chapter 2, Pg. 2-3 |
| 11 | Provide population projections for 2015, 2020, 2025, and 2030, based on data from State, regional, or local service area population projections. | 10631(a) | 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents. | Chapter 2, Pg. 2-3 |
| 12 | Describe other demographic factors affecting the supplier's water management planning. | 10631(a) | | Chapter 2, Pg. 2-4 |
| SYSTEM DEMANDS | | | | |
| 1 | Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data. | 10608.20(e) | | Chapter 3, Pg. 3-5 to Pg. 3-8 |
| 2 | *Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009. | 10608.36<br>10608.26(a) | Retailers and wholesalers have slightly different requirements | Appendix C |

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| 3 | Report progress in meeting urban water use targets using the standardized form. | 10608.40 | Progress will be reported in 2015 UWMP. Water Use Reduction Plan appears in Chapter 3, Pg. 3-8. | Chapter 3, Pg. 3-8 to Pg. 3-10 |
| 25 | Quantify past, current, and projected water use, identifying the uses among water use sectors, for the following: (A) single-family residential, (B) multifamily, (C) commercial, (D) industrial, (E) institutional and governmental, (F) landscape, (G) sales to other agencies, (H) saline water intrusion barriers, groundwater recharge, conjunctive use, and (I) agriculture. | 10631(e)(1) | Consider 'past' to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years. | Chapter 3, pg. 3-11 to Pg. 3-16 |
| 33 | Provide documentation that either the retail agency provided the wholesale agency with water use projections for at least 20 years, if the UWMP agency is a retail agency, OR, if a wholesale agency, it provided its urban retail customers with future planned and existing water source available to it from the wholesale agency during the required water-year types | 10631(k) | Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030 | Chapter 3, Pg. 3-17; Appendix E |
| 34 | Include projected water use for single-family and multifamily residential housing needed for lower income households, as identified in the housing element of any city, county, or city and county in the service area of the supplier. | 10631.1(a) | | Chapter 3, Pg. 3-17 |
| SYSTEM SUPPLIES | | | | |
| 13 | Identify and quantify the existing and planned sources of water available for 2015, 2020, 2025, and 2030. | 10631(b) | The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided. | Chapter 5, Pg. 5-1 |
| 14 | Indicate whether groundwater is an existing or planned source of water available to the supplier. If yes, then complete 15 through 21 of the UWMP Checklist. If no, then indicate "not applicable" in lines 15 through 21 under the UWMP location column. | 10631(b) | Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other. | N/A, Chapter 4, Pg. 4-8 |
| 15 | Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization. | 10631(b)(1) | | N/A, Chapter 4, Pg. 4-8 |

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| 16 | Describe the groundwater basin. | 10631(b)(2) | | N/A, Chapter 4, Pg. 4-8 |
| 17 | Indicate whether the groundwater basin is adjudicated? Include a copy of the court order or decree. | 10631(b)(2) | | N/A, Chapter 4, Pg. 4-8 |
| 18 | Describe the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. If the basin is not adjudicated, indicate “not applicable” in the UWMP location column. | 10631(b)(2) | | N/A, Chapter 4, Pg. 4-8 |
| 19 | For groundwater basins that are not adjudicated, provide information as to whether DWR has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition. If the basin is adjudicated, indicate “not applicable” in the UWMP location column. | 10631(b)(2) | | N/A, Chapter 4, Pg. 4-8 |
| 20 | Provide a detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years | 10631(b)(3) | | N/A, Chapter 4, Pg. 4-8 |
| 21 | Provide a detailed description and analysis of the amount and location of groundwater that is projected to be pumped. | 10631(b)(4) | Provide projections for 2015, 2020, 2025, and 2030. | N/A, Chapter 4, Pg. 4-8 |
| 24 | Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis. | 10631(d) | | Chapter 4, Pg. 4-8 |
| 30 | Include a detailed description of all water supply projects and programs that may be undertaken by the water supplier to address water supply reliability in average, single-dry, and multiple-dry years, excluding demand management programs addressed in (f)(1). Include specific projects, describe water supply impacts, and provide a timeline for each project. | 10631(h) | | Chapter 4, Pg. 4-9 |
| 31 | Describe desalinated water project opportunities for long-term supply, including, but not limited to, ocean water, brackish water, and groundwater. | 10631(i) | | Chapter 4, Pg. 4-9 |
| 44 | Provide information on recycled water and its potential for use as a water source in the service area of the urban water supplier. Coordinate with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area. | 10633 | | Chapter 4, Pg. 4-3 to Pg. 4-5 |

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| 45 | Describe the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal. | 10633(a) | | Chapter 4, Pg. 4-3 |
| 46 | Describe the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project. | 10633(b) | | Chapter 4, Pg. 4-4 |
| 47 | Describe the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use. | 10633(c) | | Chapter 4, Pg. 4-4 |
| 48 | Describe and quantify the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses. | 10633(d) | | Chapter 4, Pg. 4-5 |
| 49 | The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected. | 10633(e) | | Chapter 4, Pg. 4-6 |
| 50 | Describe the actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year. | 10633(f) | | Chapter 4, Pg. 4-7 |
| 51 | Provide a plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use. | 10633(g) | | Chapter 4, Pg. 4-7 Appendix F |
| WATER SHORTAGE RELIABILITY AND WATER SHORTAGE CONTINGENCY PLANNING [b] | | | | |
| 5 | Describe water management tools and options to maximize resources and minimize the need to import water from other regions. | 10620(f) | | Chapter 5, Pg. 5-1 to Pg. 5-7 |
| 22 | Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage and provide data for (A) an average water year, (B) a single dry water year, and (C) multiple dry water years. | 10631(c)(1) | | Chapter 5, Pg. 5-7 to Pg. 5-11 |
| 23 | For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable. | 10631(c)(2) | Water Shortage Contingency Planning | Chapter 5, Pg. 5-12 |

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| 35 | Provide an urban water shortage contingency analysis that specifies stages of action, including up to a 50-percent water supply reduction, and an outline of specific water supply conditions at each stage | 10632(a) | | Chapter 5, Pg. 5-12 |
| 36 | Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply. | 10632(b) | | Chapter 5, Pg. 5-10 |
| 37 | Identify actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster. | 10632(c) | | Chapter 5, Pg. 5-16 |
| 38 | Identify additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning. | 10632(d) | | Chapter 5, Pg. 5-13 |
| 39 | Specify consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply. | 10632(e) | | Chapter 5, Pg. 5-12 to Pg. 5-14 |
| 40 | Indicated penalties or charges for excessive use, where applicable. | 10632(f) | | Chapter 5, Pg. 5-14 |
| 41 | Provide an analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments. | 10632(g) | | Chapter 5, Pg. 5-14 |
| 42 | Provide a draft water shortage contingency resolution or ordinance. | 10632(h) | | Appendix H |
| 43 | Indicate a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis. | 10632(i) | | Chapter 5, Pg. 5-15 |
| 52 | Provide information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments, and the manner in which water quality affects water management strategies and supply reliability | 10634 | For years 2010, 2015, 2020, 2025, and 2030 | Chapter 5, Pg. 5-16 |

| No. | UWMP requirement [a] | Calif. Water Code reference | Additional clarification | UWMP location |
|---|---|---|---|---|
| 53 | Assess the water supply reliability during normal, dry, and multiple dry water years by comparing the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. Base the assessment on the information compiled under Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier. | 10635(a) | | Chapter 5, Pg. 5-10 to Pg. 5-11 |
| DEMAND MANAGEMENT MEASURES | | | | |
| 26 | Describe how each water demand management measures is being implemented or scheduled for implementation. Use the list provided. | 10631(f)(1) | Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules. | Chapter 6, Pg. 6-4 to Pg. 6-12 |
| 27 | Describe the methods the supplier uses to evaluate the effectiveness of DMMs implemented or described in the UWMP. | 10631(f)(3) | | Chapter 6, Pg. 6-4 to Pg. 6-12 |
| 28 | Provide an estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the ability to further reduce demand. | 10631(f)(4) | | Chapter 6, Pg. 6-4 to Pg. 6-12 |
| 29 | Evaluate each water demand management measure that is not currently being implemented or scheduled for implementation. The evaluation should include economic and non-economic factors, cost-benefit analysis, available funding, and the water suppliers' legal authority to implement the work. | 10631(g) | See 10631(g) for additional wording. | Chapter 6, Pg. 6-9 Table 6-10 |
| 32 | Include the annual reports submitted to meet the Section 6.2 requirements, if a member of the CUWCC and signer of the December 10, 2008 MOU. | 10631(j) | Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29. | See descriptions of DMMs in Chapter 6, Pg. 6-4 to Pg. 6-12 |

a The UWMP Requirement descriptions are general summaries of what is provided in the legislation. Urban water suppliers should review the exact legislative wording prior to submitting its UWMP.

b The Subject classification is provided for clarification only. It is aligned with the organization presented in Part I of this guidebook. A water supplier is free to address the UWMP Requirement anywhere with its UWMP, but is urged to provide clarification to DWR to facilitate review.

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# APPENDIX B

## URBAN WATER MANAGEMENT PLANNING ACT

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# CALIFORNIA WATER CODE DIVISION 6
# PART 2.6. URBAN WATER MANAGEMENT PLANNING

All California Codes have been updated to include the 2010 Statutes.



## WATER CODE
## SECTION 10610-10610.4

**10610.** This part shall be known and may be cited as the "Urban Water Management Planning Act."

**10610.2.** (a) The Legislature finds and declares all of the following:

(1) The waters of the state are a limited and renewable resource subject to ever-increasing demands.

(2) The conservation and efficient use of urban water supplies are of statewide concern; however, the planning for that use and the implementation of those plans can best be accomplished at the local level.

(3) A long-term, reliable supply of water is essential to protect the productivity of California's businesses and economic climate.

(4) As part of its long-range planning activities, every urban water supplier should make every effort to ensure the appropriate level of reliability in its water service sufficient to meet the needs of its various categories of customers during normal, dry, and multiple dry water years.

(5) Public health issues have been raised over a number of contaminants that have been identified in certain local and imported water supplies.

(6) Implementing effective water management strategies, including groundwater storage projects and recycled water projects, may require specific water quality and salinity targets for meeting groundwater basins water quality objectives and promoting beneficial use of recycled water.

(7) Water quality regulations are becoming an increasingly important factor in water agencies' selection of raw water sources, treatment alternatives, and modifications to existing treatment facilities.

(8) Changes in drinking water quality standards may also impact the usefulness of water supplies and may ultimately impact supply reliability.

(9) The quality of source supplies can have a significant impact

on water management strategies and supply reliability.
(b) This part is intended to provide assistance to water agencies in carrying out their long-term resource planning responsibilities to ensure adequate water supplies to meet existing and future demands for water.

**10610.4.** The Legislature finds and declares that it is the policy of the state as follows:
(a) The management of urban water demands and efficient use of water shall be actively pursued to protect both the people of the state and their water resources.
(b) The management of urban water demands and efficient use of urban water supplies shall be a guiding criterion in public decisions.
(c) Urban water suppliers shall be required to develop water management plans to actively pursue the efficient use of available supplies.

## WATER CODE
## SECTION 10611-10617

**10611.** Unless the context otherwise requires, the definitions of this chapter govern the construction of this part.

**10611.5.** "Demand management" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

**10612.** "Customer" means a purchaser of water from a water supplier who uses the water for municipal purposes, including residential, commercial, governmental, and industrial uses.

**10613.** "Efficient use" means those management measures that result in the most effective use of water so as to prevent its waste or unreasonable use or unreasonable method of use.

**10614.** "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of such an entity.

**10615.** "Plan" means an urban water management plan prepared pursuant to this part. A plan shall describe and evaluate sources of supply, reasonable and practical efficient uses, reclamation and demand management activities. The components of the plan may vary according to an individual community or area's characteristics and its capabilities to efficiently use and conserve water. The plan shall address measures for residential, commercial, governmental, and industrial water demand management as set forth in Article 2 (commencing with Section 10630) of Chapter 3. In addition, a strategy and time schedule for implementation shall be included in the plan.

**10616.** "Public agency" means any board, commission, county, city

and county, city, regional agency, district, or other public entity.

**10616.5.** "Recycled water" means the reclamation and reuse of wastewater for beneficial use.

**10617.** "Urban water supplier" means a supplier, either publicly or privately owned, providing water for municipal purposes either directly or indirectly to more than 3,000 customers or supplying more than 3,000 acre-feet of water annually. An urban water supplier includes a supplier or contractor for water, regardless of the basis of right, which distributes or sells for ultimate resale to customers. This part applies only to water supplied from public water systems subject to Chapter 4 (commencing with Section 116275) of Part 12 of Division 104 of the Health and Safety Code.

## WATER CODE
## SECTION 10620-10621

**10620.** (a) Every urban water supplier shall prepare and adopt an urban water management plan in the manner set forth in Article 3 (commencing with Section 10640).

(b) Every person that becomes an urban water supplier shall adopt an urban water management plan within one year after it has become an urban water supplier.

(c) An urban water supplier indirectly providing water shall not include planning elements in its water management plan as provided in Article 2 (commencing with Section 10630) that would be applicable to urban water suppliers or public agencies directly providing water, or to their customers, without the consent of those suppliers or public agencies.

(d) (1) An urban water supplier may satisfy the requirements of this part by participation in areawide, regional, watershed, or basinwide urban water management planning where those plans will reduce preparation costs and contribute to the achievement of conservation and efficient water use.

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

(e) The urban water supplier may prepare the plan with its own staff, by contract, or in cooperation with other governmental agencies.

(f) An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.

**10621.** (a) Each urban water supplier shall update its plan at least once every five years on or before December 31, in years ending in five and zero.

(b) Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water

supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.

(c) The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).

# WATER CODE
# SECTION 10630-10634

**10630.** It is the intention of the Legislature, in enacting this part, to permit levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

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

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

(b) Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a). If groundwater is identified as an existing or planned source of water available to the supplier, all of the following information shall be included in the plan:

(1) A copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management.

(2) A description of any groundwater basin or basins from which the urban water supplier pumps groundwater. For those basins for which a court or the board has adjudicated the rights to pump groundwater, a copy of the order or decree adopted by the court or the board and a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree. For basins that have not been adjudicated, information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.

(3) A detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(4) A detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.

(c) (1) Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following:

(A) An average water year.

(B) A single dry water year.

(C) Multiple dry water years.

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

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

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

(A) Single-family residential.

(B) Multifamily.

(C) Commercial.

(D) Industrial.

(E) Institutional and governmental.

(F) Landscape.

(G) Sales to other agencies.

(H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof.

(I) Agricultural.

(2) The water use projections shall be in the same five-year increments described in subdivision (a).

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

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

(A) Water survey programs for single-family residential and multifamily residential customers.

(B) Residential plumbing retrofit.

(C) System water audits, leak detection, and repair.

(D) Metering with commodity rates for all new connections and retrofit of existing connections.

(E) Large landscape conservation programs and incentives.

(F) High-efficiency washing machine rebate programs.

(G) Public information programs.

(H) School education programs.

(I) Conservation programs for commercial, industrial, and institutional accounts.

(J) Wholesale agency programs.
(K) Conservation pricing.
(L) Water conservation coordinator.
(M) Water waste prohibition.
(N) Residential ultra-low-flush toilet replacement programs.
(2) A schedule of implementation for all water demand management measures proposed or described in the plan.
(3) A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.
(4) An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.
(g) An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following:
(1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors.
(2) Include a cost-benefit analysis, identifying total benefits and total costs.
(3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost.
(4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.
(h) Include a description of all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.
(i) Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.
(j) For purposes of this part, urban water suppliers that are members of the California Urban Water Conservation Council shall be deemed in compliance with the requirements of subdivisions (f) and (g) by complying with all the provisions of the "Memorandum of Understanding Regarding Urban Water Conservation in California,"

dated December 10, 2008, as it may be amended, and by submitting the annual reports required by Section 6.2 of that memorandum.

(k) Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).

**10631.1.** (a) The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.

(b) It is the intent of the Legislature that the identification of projected water use for single-family and multifamily residential housing for lower income households will assist a supplier in complying with the requirement under Section 65589.7 of the Government Code to grant a priority for the provision of service to housing units affordable to lower income households.

**10631.5.** (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall

determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of

the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

**10631.7.** The department, in consultation with the California Urban Water Conservation Council, shall convene an independent technical panel to provide information and recommendations to the department and the Legislature on new demand management measures, technologies, and approaches. The panel shall consist of no more than seven members, who shall be selected by the department to reflect a balanced representation of experts. The panel shall have at least one, but no more than two, representatives from each of the following: retail water suppliers, environmental organizations, the business community, wholesale water suppliers, and academia. The panel shall be convened by January 1, 2009, and shall report to the Legislature no later than January 1, 2010, and every five years thereafter. The department shall review the panel report and include in the final report to the Legislature the department's recommendations and comments regarding the panel process and the panel's recommendations.

**10632.** (a) The plan shall provide an urban water shortage contingency analysis that includes each of the following elements that are within the authority of the urban water supplier:

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

(2) An estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic

sequence for the agency's water supply.

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

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

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

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

(7) An analysis of the impacts of each of the actions and conditions described in paragraphs (1) to (6), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.

(8) A draft water shortage contingency resolution or ordinance.

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

(b) Commencing with the urban water management plan update due December 31, 2015, for purposes of developing the water shortage contingency analysis pursuant to subdivision (a), the urban water supplier shall analyze and define water features that are artificially supplied with water, including ponds, lakes, waterfalls, and fountains, separately from swimming pools and spas, as defined in subdivision (a) of Section 115921 of the Health and Safety Code.

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

(a) A description of the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.

(b) A description of the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.

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

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

(e) The projected use of recycled water within the supplier's

service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.

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

(g) A plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.

**10634.** The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.

## WATER CODE SECTION 10635

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

(b) The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.

(c) Nothing in this article is intended to create a right or entitlement to water service or any specific level of water service.

(d) Nothing in this article is intended to change existing law concerning an urban water supplier's obligation to provide water service to its existing customers or to any potential future customers.

# WATER CODE
# SECTION 10640-10645

**10640.** Every urban water supplier required to prepare a plan pursuant to this part shall prepare its plan pursuant to Article 2 (commencing with Section 10630).

The supplier shall likewise periodically review the plan as required by Section 10621, and any amendments or changes required as a result of that review shall be adopted pursuant to this article.

**10641.** An urban water supplier required to prepare a plan may consult with, and obtain comments from, any public agency or state agency or any person who has special expertise with respect to water demand management methods and techniques.

**10642.** Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan. Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area. After the hearing, the plan shall be adopted as prepared or as modified after the hearing.

**10643.** An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.

**10644.** (a) An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.

(b) The department shall prepare and submit to the Legislature, on or before December 31, in the years ending in six and one, a report summarizing the status of the plans adopted pursuant to this part. The report prepared by the department shall identify the exemplary elements of the individual plans. The department shall provide a copy of the report to each urban water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearings designed to consider the effectiveness of plans submitted pursuant to this part.

(c) (1) For the purpose of identifying the exemplary elements of the individual plans, the department shall identify in the report those water demand management measures adopted and implemented by specific urban water suppliers, and identified pursuant to Section

10631, that achieve water savings significantly above the levels established by the department to meet the requirements of Section 10631.5.

(2) The department shall distribute to the panel convened pursuant to Section 10631.7 the results achieved by the implementation of those water demand management measures described in paragraph (1).

(3) The department shall make available to the public the standard the department will use to identify exemplary water demand management measures.

**10645.** Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.

# WATER CODE
# SECTION 10650-10656

**10650.** Any actions or proceedings to attack, review, set aside, void, or annul the acts or decisions of an urban water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(a) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(b) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 90 days after filing of the plan or amendment thereto pursuant to Section 10644 or the taking of that action.

**10651.** In any action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an urban water supplier on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse of discretion is established if the supplier has not proceeded in a manner required by law or if the action by the water supplier is not supported by substantial evidence.

**10652.** The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part or to the implementation of actions taken pursuant to Section 10632. Nothing in this part shall be interpreted as exempting from the California Environmental Quality Act any project that would significantly affect water supplies for fish and wildlife, or any project for implementation of the plan, other than projects implementing Section 10632, or any project for expanded or additional water supplies.

**10653.** The adoption of a plan shall satisfy any requirements of state law, regulation, or order, including those of the State Water Resources Control Board and the Public Utilities Commission, for the preparation of water management plans or conservation plans; provided, that if the State Water Resources Control Board or the Public Utilities Commission requires additional information concerning water conservation to implement its existing authority, nothing in this part shall be deemed to limit the board or the commission in obtaining that information. The requirements of this part shall be satisfied by any urban water demand management plan prepared to meet federal laws or regulations after the effective date of this part, and which substantially meets the requirements of this part, or by any existing urban water management plan which includes the contents of a plan required under this part.

**10654.** An urban water supplier may recover in its rates the costs incurred in preparing its plan and implementing the reasonable water conservation measures included in the plan. Any best water management practice that is included in the plan that is identified in the

"Memorandum of Understanding Regarding Urban Water Conservation in California" is deemed to be reasonable for the purposes of this section.

**10655.** If any provision of this part or the application thereof to any person or circumstances is held invalid, that invalidity shall not affect other provisions or applications of this part which can be given effect without the invalid provision or application thereof, and to this end the provisions of this part are severable.

**10656.** An urban water supplier that does not prepare, adopt, and submit its urban water management plan to the department in accordance with this part, is ineligible to receive funding pursuant to Division 24 (commencing with Section 78500) or Division 26 (commencing with Section 79000), or receive drought assistance from the state until the urban water management plan is submitted pursuant to this article.

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# APPENDIX C

## RESOLUTION OF ADOPTION AND PUBLIC NOTICES

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CITY OF
HAYWARD
HEART OF THE BAY

January 6, 2011

<Agency>
<Attention>
<Address>
<City>, <State> <Zip>

Subject: Notice of Preparation of Urban Water Management Plan

Dear <Recipient>:

The Urban Water Management Plan Act requires the City of Hayward to update its Urban Water Management Plan by June 30, 2011. We are reviewing our current Plan, which was last updated in 2005, and will be considering revisions to it.

We will make proposed revisions to our Plan available for public review and will hold a public hearing later this year. In the meantime, if you have any questions about our Plan, or the process for updating it, please contact:

Marilyn Mosher
Administrative Analyst III
777 B Street
Hayward, CA 94541
Tel: 510-583-4723
Fax: 510- 583-3610
E-mail: marilyn.mosher@hayward-ca.gov

Sincerely,

Alex Ameri
Deputy Director of Public Works

The Notice of Preparation of UWMP was mailed to the following list of recipients:

Doug Chun, Water Quality Manager
Alameda County Water District
P. O. Box 5110
Fremont, CA 94537

Darin Duncan, Rate Manager
California Water Service Co.
3351 El Camino Real, Suite 190
Atherton, CA 94027

Randy Breault, Public Works Director
City of Brisbane
50 Park Lane
Brisbane, CA 94005

Syed Murtuza, Public Works Director
City of Burlingame
501 Primrose Road
Burlingame, CA 94010

Patrick Sweetland, Director of Water and Waste Water
City of Daly City
153 Lake Merced Blvd.
Daly City, CA 94015-1097

Kent Steffens, Director of Public Works
City of Menlo Park
701 Laurel Street
Menlo Park, CA 94025-3483

Ron Popp, Director of Public Works
City of Millbrae
621 Magnolia Avenue
Millbrae, CA 94030-1832

Kathleen Phalen, Utility Engineer
City of Milpitas
455 E. Calaveras Blvd.
Milpitas, CA 95034-5479

Gregg Hosfeldt, Asst. Director of Public Works
City of Mountain View
P.O. Box 7540
Mountain View, CA 94039-7540

Jane Ratchye, Asst. Director, Util. Dept.
City of Palo Alto
250 Hamilton Ave.
Palo Alto, CA 94301-2593

Justin Ezell, PW Superintendent
City of Redwood City, Public Works Services Dept.
1400 Broadway
Redwood City, CA 94063

Klara Fabry, Public Services Director
City of San Bruno
567 El Camino Real
San Bruno, CA 94066-4299

Alan Kurotori, Director of Water and Sewer Utilities
City of Santa Clara
1500 Warburton Avenue
Santa Clara, CA 95050-3792

James Craig, Superintendent of Field Services
City of Sunnyvale
P. O. Box 3707
Sunnyvale, CA 94088-3707

David Dickson, General Manager
Coastside County Water District
766 Main Street
Half Moon Bay, CA 94019

Anthony Docto, Director of Public Works
East Palo Alto Water District
2415 University Avenue
East Palo Alto, CA 94303

Ray Towne, Director of Public Works
Estero Mun. Improvement Dist.
610 Foster City Blvd.
Foster City, CA 94404-2299

Paul Regan, General Manager
Mid-Peninsula Water District
Three Dairy Lane
Belmont, CA 94002

Kevin O'Connell, General Manager
North Coast County Water Dist.
2400 Francisco Blvd.
Pacifica, CA 94044-6039

Patrick Walter, General Manager
Purissima Hills Water District
26375 W. Fremont Road
Los Altos Hills, CA 94022-2699

Mansour Nasser, Environmental Division Manager
San Jose Municipal Water System
3025 Tuers Road
San Jose, CA 95121

Marty Laporte, Associate Director, Environmental Quality
Stanford University
327 Bonair Siding
Stanford, CA 94305-7270

Martha DeBry, Director of Public Works
Town of Hillsborough
1600 Floribunda Avenue
Hillsborough, CA 94010-6498

Darryl Barrow, General Manager
Westborough Water District
2263 Westborough Blvd.
South San Francisco, CA 94080-5406

Art Jensen, General Manager
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 302
San Mateo, CA 94402

Michael S. Connor, General Manager
East Bay Dischargers Authority
2651 Grant Avenue
San Lorenzo, CA 94580-1841

Chris Bazar, Director
County of Alameda, Community Development Agency
224 W. Winton Avenue, Room 110
Hayward, CA 94544

Dennis Diemer, General Manager
East Bay Municipal Utilities District
P.O. Box 24055
Oakland, CA 94623

Ellen Levin, Deputy Manager,Water Enterprise
San Francisco PUC
1145 Market Street, Suite 401
San Francisco, CA 94103

**Daily Review**
c/o Bay Area News Group-East Bay
22533 Foothill Blvd.
Hayward, CA 94541
Legal Advertising
(800) 595-9595 opt. 4

Hayward, City of/City Clerk
Miriam Lens,777 B St.
Hayward CA 94541

# PROOF OF PUBLICATION

## FILE NO. 6/21 Hearing

In the matter of

Daily Review

The Daily Review

I am a citizen of the United States; I am over the age of eighteen years, and not a party to or interested in the above-entitled matter. I am the Legal Advertising Clerk of the printer and publisher of The Daily Review, a newspaper published in the English language in the City of Hayward, County of Alameda, State of California.

I declare that the Daily Review is a newspaper of general circulation as defined by the laws of the State of California as determined by this court's decree, dated March 2, 1950, in the action entitled In the Matter of the Ascertainment and Establishment of the Standing of The Daily Review as a Newspaper of General Circulation, case number 221938. Said decree states that "'The Daily Review' has been established, printed, and published daily in the City of Hayward, County of Alameda, State of California, for one year or more next preceding the date of the filing of said petition; that it is a newspaper published for the dissemination of local and telegraphic news and intelligence of a general character and has a bona fide subscription list of paying subscribers; ... [ ] [and] THEREFORE, ... 'The Daily Review' is hereby determined and declared to be a newspaper of general circulation [within the meaning of Government Code §§ 6000 et seq.]" Said decree has not been revoked, vacated or set aside.

I declare that the notice, of which the annexed is a printed copy, has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates, to wit:

**6/6/2011, 6/11/2011**

I certify (or declare) under the penalty of perjury that the foregoing is true and correct.

Public Notice Advertising Clerk

Legal No. **0004027920**

**NOTICE OF PUBLIC HEARING**
**CITY OF HAYWARD**
**CITY COUNCIL**

**Date:** **June 21, 2011**
**Time:** **7:00 p.m.**
**Place:** **City Hall, Council Chambers**
**777 B Street, Second Floor**
**Hayward, CA 94541**

On the above date, at or about the hour noted, the Hayward City Council will hold a public hearing to obtain citizen input and consider approval of the following:

2010 Urban Water Management Plan - The Urban Water Management Plan is updated every five years. The Plan assesses Hayward's water supply reliability, and describes the City's anticipated water demand, water shortage contingency plans, and water conservation strategies.

In conjunction with the Urban Water Management Plan, the City will be considering and adopting the method for determining water use targets for 2015 and 2020, as required by California State Law, as well as the economic impacts of achieving the water use targets.

The draft Urban Water Management Plan is available for review, beginning June 6, on weekdays from 8:00 a.m. to 5:00 p.m. in the Office of the City Clerk, 4th Floor of City Hall, 777 B Street, or at the Main City Library, 835 C Street, or the Weekes Branch, 27300 Patrick Avenue, Hayward. The Plan can also be accessed on the City's website, www.hayward-ca.gov.

The community is encouraged to participate in the review process by attending the meeting to speak or by offering written comments. Written comments may be directed to:

Alex Ameri, Deputy Director of Public Works
Department of Public Works
777 B Street, Hayward, CA 94541
(510) 583-4720
alex.ameri@hayward-ca.gov

A copy of the staff report may be reviewed in the office of the City Clerk, 777 B Street, or at the Main City Library, 835 C Street, Hayward, or on the City's website at www.hayward-ca.gov. Staff reports are available the Friday before the hearing.

**PLEASE TAKE NOTICE** that if you file a lawsuit challenging any final decision on the subject of this notice, the issues in the lawsuit may be limited to the issues which were raised at the City's public hearing or presented in writing to the City Clerk at or before the public hearing. By Resolution the City Council has imposed the 90-day time deadline set forth in C.C.P. Section 1094.6 for filing of any lawsuit challenging final action on an item that is subject to C.C.P. Section 1094.5.

**ASSISTANCE** will be provided to those requiring accommodations for disabilities in compliance with the Americans with Disabilities Act of 1990. Persons needing accommodation should contact the Hayward City Manager's Office, 48 hours in advance of the meeting, at (510) 583-4300, or by using the TDD line for those with speech and hearing disabilities at (510) 247-3340.

Dated: June 6 and June 11, 2011
Miriam Lens, City Clerk
City of Hayward

**DR #4027920; Jun. 6, 11, 2011**

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HAYWARD CITY COUNCIL

RESOLUTION NO. 11-091

Introduced by Council Member Quirk

RESOLUTION APPROVING THE USE OF METHOD 3, 95 PERCENT OF APPLICABLE STATE HYDROLOGIC REGION TARGET TO DETERMINE THE CITY OF HAYWARD'S 2015 AND 2020 URBAN WATER USE TARGET

WHEREAS, the City of Hayward recognizes the importance of water conservation and is committed to sustainable use of water resources; and

WHEREAS, the California Legislature enacted Senate Bill 7, the Water Conservation Act of 2009, which requires State-wide reduction of urban per-capita water use by 20 percent by 2020 and further requires urban water suppliers that supply at least 3,000 acre feet of water per year or have 3,000 connections to develop an interim urban water use target for 2015 and an urban water use target for 2020; and

WHEREAS, the City of Hayward must adopt one of the four methods described in the legislation for determining interim urban water use targets and urban water use targets; and

WHEREAS, the City of Hayward considered each of the four methods; and

WHEREAS, Method 3, 95 percent of the applicable State hydrologic region target is appropriate for the City of Hayward; and

WHEREAS, a public hearing was held on June 21, 2011, in the manner prescribed in the legislation.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Hayward that the City of Hayward adopts Method 3, 95 percent of the Applicable State Hydrologic Region Target, to determine the City's urban water use target.

IN COUNCIL, HAYWARD, CALIFORNIA June 21, 2011

ADOPTED BY THE FOLLOWING VOTE:

AYES: COUNCIL MEMBERS: Zermeño, Quirk, Halliday, Peixoto, Salinas, Henson
MAYOR: Mayor

NOES: COUNCIL MEMBERS: None

ABSTAIN: COUNCIL MEMBERS: None

ABSENT: COUNCIL MEMBERS: None

ATTEST: _____
City Clerk of the City of Hayward

APPROVED AS TO FORM:

_____
City Attorney of the City of Hayward

**I hereby certify that this is a correct copy of a document on file in this office**
**MIRIAM LENS**
**City Clerk, City of Hayward, California**

**By:** _____
City Clerk

**Date:** July 1, 2011

HAYWARD CITY COUNCIL

RESOLUTION NO. 11-090

Introduced by Council Member Quirk

RESOLUTION ADOPTING THE 2010 URBAN WATER MANAGEMENT PLAN FOR THE CITY OF HAYWARD

WHEREAS, the 1983 Urban Water Management Act, amended through 2010, requires all California urban water agencies that supply more than 3,000 acre feet of water per year or have more than 3,000 connection to prepare an Urban Water Management Plan every five years; and

WHEREAS, the next Urban Water Management Plan must be adopted by July 1, 2011; and

WHEREAS, preparation of this document involves comprehensive review and assessment of water usage data, projected water demand, water resources, water supply reliability, and water conservation; and

WHEREAS, the City of Hayward has prepared the 2010 Urban Water Management Plan in accordance with provisions of the Urban Water Management Planning Act in cooperation with the City's wholesale water supplier; and

WHEREAS, the Director of Public Works has submitted to the City Council for review a copy of the draft 2010 Urban Water Management Plan and staff report dated June 21, 2011, and has made available for public review the draft 2010 Urban Water Management Plan in its entirety; and

WHEREAS, a public hearing was held on June 21, 2011, in the manner prescribed by law.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Hayward that the plan entitled "2010 Urban Water Management Plan," a copy of which is on file in the office of the Department of Public Works and office of the City Clerk, is hereby adopted as the urban water management plan for the City of Hayward.

IN COUNCIL, HAYWARD, CALIFORNIA June 21, 2011

ADOPTED BY THE FOLLOWING VOTE:

AYES: COUNCIL MEMBERS: Zermeño, Quirk, Halliday, Peixoto, Salinas, Henson
MAYOR: Mayor

NOES: COUNCIL MEMBERS: Nóne

ABSTAIN: COUNCIL MEMBERS: None

ABSENT: COUNCIL MEMBERS: None

ATTEST: _____
City Clerk of the City of Hayward

APPROVED AS TO FORM:

_____
City Attorney of the City of Hayward

CITY OF HAYWARD CALIFORNIA

**I hereby certify that this is a correct copy of a document on file in this office**
**MIRIAM LENS**
**City Clerk, City of Hayward, California**

**By:** _____
City Clerk

**Date:** July 1, 2011

# APPENDIX D

## WATER CONSERVATION ACT OF 2009

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## Senate Bill No. 7

CHAPTER 4

An act to amend and repeal Section 10631.5 of, to add Part 2.55 (commencing with Section 10608) to Division 6 of, and to repeal and add Part 2.8 (commencing with Section 10800) of Division 6 of, the Water Code, relating to water.

[Approved by Governor November 10, 2009. Filed with Secretary of State November 10, 2009.]

LEGISLATIVE COUNSEL'S DIGEST

SB 7, Steinberg. Water conservation.

(1) Existing law requires the Department of Water Resources to convene an independent technical panel to provide information to the department and the Legislature on new demand management measures, technologies, and approaches. "Demand management measures" means those water conservation measures, programs, and incentives that prevent the waste of water and promote the reasonable and efficient use and reuse of available supplies.

This bill would require the state to achieve a 20% reduction in urban per capita water use in California by December 31, 2020. The state would be required to make incremental progress towards this goal by reducing per capita water use by at least 10% on or before December 31, 2015. The bill would require each urban retail water supplier to develop urban water use targets and an interim urban water use target, in accordance with specified requirements. The bill would require agricultural water suppliers to implement efficient water management practices. The bill would require the department, in consultation with other state agencies, to develop a single standardized water use reporting form. The bill, with certain exceptions, would provide that urban retail water suppliers, on and after July 1, 2016, and agricultural water suppliers, on and after July 1, 2013, are not eligible for state water grants or loans unless they comply with the water conservation requirements established by the bill. The bill would repeal, on July 1, 2016, an existing requirement that conditions eligibility for certain water management grants or loans to an urban water supplier on the implementation of certain water demand management measures.

(2) Existing law, until January 1, 1993, and thereafter only as specified, requires certain agricultural water suppliers to prepare and adopt water management plans.

This bill would revise existing law relating to agricultural water management planning to require agricultural water suppliers to prepare and adopt agricultural water management plans with specified components on or before December 31, 2012, and update those plans on or before December

31, 2015, and on or before December 31 every 5 years thereafter. An agricultural water supplier that becomes an agricultural water supplier after December 31, 2012, would be required to prepare and adopt an agricultural water management plan within one year after becoming an agricultural water supplier. The agricultural water supplier would be required to notify each city or county within which the supplier provides water supplies with regard to the preparation or review of the plan. The bill would require the agricultural water supplier to submit copies of the plan to the department and other specified entities. The bill would provide that an agricultural water supplier is not eligible for state water grants or loans unless the supplier complies with the water management planning requirements established by the bill.

(3) The bill would take effect only if SB 1 and SB 6 of the 2009–10 7th Extraordinary Session of the Legislature are enacted and become effective.

*The people of the State of California do enact as follows:*

SECTION 1. Part 2.55 (commencing with Section 10608) is added to Division 6 of the Water Code, to read:

## PART 2.55. SUSTAINABLE WATER USE AND DEMAND REDUCTION

### Chapter 1. General Declarations and Policy

10608. The Legislature finds and declares all of the following:

(a) Water is a public resource that the California Constitution protects against waste and unreasonable use.

(b) Growing population, climate change, and the need to protect and grow California's economy while protecting and restoring our fish and wildlife habitats make it essential that the state manage its water resources as efficiently as possible.

(c) Diverse regional water supply portfolios will increase water supply reliability and reduce dependence on the Delta.

(d) Reduced water use through conservation provides significant energy and environmental benefits, and can help protect water quality, improve streamflows, and reduce greenhouse gas emissions.

(e) The success of state and local water conservation programs to increase efficiency of water use is best determined on the basis of measurable outcomes related to water use or efficiency.

(f) Improvements in technology and management practices offer the potential for increasing water efficiency in California over time, providing an essential water management tool to meet the need for water for urban, agricultural, and environmental uses.

(g) The Governor has called for a 20 percent per capita reduction in urban water use statewide by 2020.

(h) The factors used to formulate water use efficiency targets can vary significantly from location to location based on factors including weather, patterns of urban and suburban development, and past efforts to enhance water use efficiency.

(i) Per capita water use is a valid measure of a water provider's efforts to reduce urban water use within its service area. However, per capita water use is less useful for measuring relative water use efficiency between different water providers. Differences in weather, historical patterns of urban and suburban development, and density of housing in a particular location need to be considered when assessing per capita water use as a measure of efficiency.

10608.4. It is the intent of the Legislature, by the enactment of this part, to do all of the following:

(a) Require all water suppliers to increase the efficiency of use of this essential resource.

(b) Establish a framework to meet the state targets for urban water conservation identified in this part and called for by the Governor.

(c) Measure increased efficiency of urban water use on a per capita basis.

(d) Establish a method or methods for urban retail water suppliers to determine targets for achieving increased water use efficiency by the year 2020, in accordance with the Governor's goal of a 20-percent reduction.

(e) Establish consistent water use efficiency planning and implementation standards for urban water suppliers and agricultural water suppliers.

(f) Promote urban water conservation standards that are consistent with the California Urban Water Conservation Council's adopted best management practices and the requirements for demand management in Section 10631.

(g) Establish standards that recognize and provide credit to water suppliers that made substantial capital investments in urban water conservation since the drought of the early 1990s.

(h) Recognize and account for the investment of urban retail water suppliers in providing recycled water for beneficial uses.

(i) Require implementation of specified efficient water management practices for agricultural water suppliers.

(j) Support the economic productivity of California's agricultural, commercial, and industrial sectors.

(k) Advance regional water resources management.

10608.8. (a) (1) Water use efficiency measures adopted and implemented pursuant to this part or Part 2.8 (commencing with Section 10800) are water conservation measures subject to the protections provided under Section 1011.

(2) Because an urban agency is not required to meet its urban water use target until 2020 pursuant to subdivision (b) of Section 10608.24, an urban retail water supplier's failure to meet those targets shall not establish a violation of law for purposes of any state administrative or judicial proceeding prior to January 1, 2021. Nothing in this paragraph limits the use of data reported to the department or the board in litigation or an

administrative proceeding. This paragraph shall become inoperative on January 1, 2021.

(3) To the extent feasible, the department and the board shall provide for the use of water conservation reports required under this part to meet the requirements of Section 1011 for water conservation reporting.

(b) This part does not limit or otherwise affect the application of Chapter 3.5 (commencing with Section 11340), Chapter 4 (commencing with Section 11370), Chapter 4.5 (commencing with Section 11400), and Chapter 5 (commencing with Section 11500) of Part 1 of Division 3 of Title 2 of the Government Code.

(c) This part does not require a reduction in the total water used in the agricultural or urban sectors, because other factors, including, but not limited to, changes in agricultural economics or population growth may have greater effects on water use. This part does not limit the economic productivity of California's agricultural, commercial, or industrial sectors.

(d) The requirements of this part do not apply to an agricultural water supplier that is a party to the Quantification Settlement Agreement, as defined in subdivision (a) of Section 1 of Chapter 617 of the Statutes of 2002, during the period within which the Quantification Settlement Agreement remains in effect. After the expiration of the Quantification Settlement Agreement, to the extent conservation water projects implemented as part of the Quantification Settlement Agreement remain in effect, the conserved water created as part of those projects shall be credited against the obligations of the agricultural water supplier pursuant to this part.

## Chapter 2. Definitions

10608.12. Unless the context otherwise requires, the following definitions govern the construction of this part:

(a) "Agricultural water supplier" means a water supplier, either publicly or privately owned, providing water to 10,000 or more irrigated acres, excluding recycled water. "Agricultural water supplier" includes a supplier or contractor for water, regardless of the basis of right, that distributes or sells water for ultimate resale to customers. "Agricultural water supplier" does not include the department.

(b) "Base daily per capita water use" means any of the following:

(1) The urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous 10-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) For an urban retail water supplier that meets at least 10 percent of its 2008 measured retail water demand through recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier, the urban retail water supplier may extend the calculation described in paragraph (1) up to an additional five years to a maximum of

a continuous 15-year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(3) For the purposes of Section 10608.22, the urban retail water supplier's estimate of its average gross water use, reported in gallons per capita per day and calculated over a continuous five-year period ending no earlier than December 31, 2007, and no later than December 31, 2010.

(c) "Baseline commercial, industrial, and institutional water use" means an urban retail water supplier's base daily per capita water use for commercial, industrial, and institutional users.

(d) "Commercial water user" means a water user that provides or distributes a product or service.

(e) "Compliance daily per capita water use" means the gross water use during the final year of the reporting period, reported in gallons per capita per day.

(f) "Disadvantaged community" means a community with an annual median household income that is less than 80 percent of the statewide annual median household income.

(g) "Gross water use" means the total volume of water, whether treated or untreated, entering the distribution system of an urban retail water supplier, excluding all of the following:

(1) Recycled water that is delivered within the service area of an urban retail water supplier or its urban wholesale water supplier.

(2) The net volume of water that the urban retail water supplier places into long-term storage.

(3) The volume of water the urban retail water supplier conveys for use by another urban water supplier.

(4) The volume of water delivered for agricultural use, except as otherwise provided in subdivision (f) of Section 10608.24.

(h) "Industrial water user" means a water user that is primarily a manufacturer or processor of materials as defined by the North American Industry Classification System code sectors 31 to 33, inclusive, or an entity that is a water user primarily engaged in research and development.

(i) "Institutional water user" means a water user dedicated to public service. This type of user includes, among other users, higher education institutions, schools, courts, churches, hospitals, government facilities, and nonprofit research institutions.

(j) "Interim urban water use target" means the midpoint between the urban retail water supplier's base daily per capita water use and the urban retail water supplier's urban water use target for 2020.

(k) "Locally cost effective" means that the present value of the local benefits of implementing an agricultural efficiency water management practice is greater than or equal to the present value of the local cost of implementing that measure.

(*l*) "Process water" means water used for producing a product or product content or water used for research and development, including, but not limited to, continuous manufacturing processes, water used for testing and maintaining equipment used in producing a product or product content, and

water used in combined heat and power facilities used in producing a product or product content. Process water does not mean incidental water uses not related to the production of a product or product content, including, but not limited to, water used for restrooms, landscaping, air conditioning, heating, kitchens, and laundry.

(m) "Recycled water" means recycled water, as defined in subdivision (n) of Section 13050, that is used to offset potable demand, including recycled water supplied for direct use and indirect potable reuse, that meets the following requirements, where applicable:

(1) For groundwater recharge, including recharge through spreading basins, water supplies that are all of the following:

(A) Metered.

(B) Developed through planned investment by the urban water supplier or a wastewater treatment agency.

(C) Treated to a minimum tertiary level.

(D) Delivered within the service area of an urban retail water supplier or its urban wholesale water supplier that helps an urban retail water supplier meet its urban water use target.

(2) For reservoir augmentation, water supplies that meet the criteria of paragraph (1) and are conveyed through a distribution system constructed specifically for recycled water.

(n) "Regional water resources management" means sources of supply resulting from watershed-based planning for sustainable local water reliability or any of the following alternative sources of water:

(1) The capture and reuse of stormwater or rainwater.

(2) The use of recycled water.

(3) The desalination of brackish groundwater.

(4) The conjunctive use of surface water and groundwater in a manner that is consistent with the safe yield of the groundwater basin.

(o) "Reporting period" means the years for which an urban retail water supplier reports compliance with the urban water use targets.

(p) "Urban retail water supplier" means a water supplier, either publicly or privately owned, that directly provides potable municipal water to more than 3,000 end users or that supplies more than 3,000 acre-feet of potable water annually at retail for municipal purposes.

(q) "Urban water use target" means the urban retail water supplier's targeted future daily per capita water use.

(r) "Urban wholesale water supplier," means a water supplier, either publicly or privately owned, that provides more than 3,000 acre-feet of water annually at wholesale for potable municipal purposes.

## Chapter 3. Urban Retail Water Suppliers

10608.16. (a) The state shall achieve a 20-percent reduction in urban per capita water use in California on or before December 31, 2020.

(b) The state shall make incremental progress towards the state target specified in subdivision (a) by reducing urban per capita water use by at least 10 percent on or before December 31, 2015.

10608.20. (a) (1) Each urban retail water supplier shall develop urban water use targets and an interim urban water use target by July 1, 2011. Urban retail water suppliers may elect to determine and report progress toward achieving these targets on an individual or regional basis, as provided in subdivision (a) of Section 10608.28, and may determine the targets on a fiscal year or calendar year basis.

(2) It is the intent of the Legislature that the urban water use targets described in subdivision (a) cumulatively result in a 20-percent reduction from the baseline daily per capita water use by December 31, 2020.

(b) An urban retail water supplier shall adopt one of the following methods for determining its urban water use target pursuant to subdivision (a):

(1) Eighty percent of the urban retail water supplier's baseline per capita daily water use.

(2) The per capita daily water use that is estimated using the sum of the following performance standards:

(A) For indoor residential water use, 55 gallons per capita daily water use as a provisional standard. Upon completion of the department's 2016 report to the Legislature pursuant to Section 10608.42, this standard may be adjusted by the Legislature by statute.

(B) For landscape irrigated through dedicated or residential meters or connections, water efficiency equivalent to the standards of the Model Water Efficient Landscape Ordinance set forth in Chapter 2.7 (commencing with Section 490) of Division 2 of Title 23 of the California Code of Regulations, as in effect the later of the year of the landscape's installation or 1992. An urban retail water supplier using the approach specified in this subparagraph shall use satellite imagery, site visits, or other best available technology to develop an accurate estimate of landscaped areas.

(C) For commercial, industrial, and institutional uses, a 10-percent reduction in water use from the baseline commercial, industrial, and institutional water use by 2020.

(3) Ninety-five percent of the applicable state hydrologic region target, as set forth in the state's draft 20x2020 Water Conservation Plan (dated April 30, 2009). If the service area of an urban water supplier includes more than one hydrologic region, the supplier shall apportion its service area to each region based on population or area.

(4) A method that shall be identified and developed by the department, through a public process, and reported to the Legislature no later than December 31, 2010. The method developed by the department shall identify per capita targets that cumulatively result in a statewide 20-percent reduction in urban daily per capita water use by December 31, 2020. In developing urban daily per capita water use targets, the department shall do all of the following:

(A) Consider climatic differences within the state.

(B) Consider population density differences within the state.

(C) Provide flexibility to communities and regions in meeting the targets.

(D) Consider different levels of per capita water use according to plant water needs in different regions.

(E) Consider different levels of commercial, industrial, and institutional water use in different regions of the state.

(F) Avoid placing an undue hardship on communities that have implemented conservation measures or taken actions to keep per capita water use low.

(c) If the department adopts a regulation pursuant to paragraph (4) of subdivision (b) that results in a requirement that an urban retail water supplier achieve a reduction in daily per capita water use that is greater than 20 percent by December 31, 2020, an urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may limit its urban water use target to a reduction of not more than 20 percent by December 31, 2020, by adopting the method described in paragraph (1) of subdivision (b).

(d) The department shall update the method described in paragraph (4) of subdivision (b) and report to the Legislature by December 31, 2014. An urban retail water supplier that adopted the method described in paragraph (4) of subdivision (b) may adopt a new urban daily per capita water use target pursuant to this updated method.

(e) An urban retail water supplier shall include in its urban water management plan required pursuant to Part 2.6 (commencing with Section 10610) due in 2010 the baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.

(f) When calculating per capita values for the purposes of this chapter, an urban retail water supplier shall determine population using federal, state, and local population reports and projections.

(g) An urban retail water supplier may update its 2020 urban water use target in its 2015 urban water management plan required pursuant to Part 2.6 (commencing with Section 10610).

(h) (1) The department, through a public process and in consultation with the California Urban Water Conservation Council, shall develop technical methodologies and criteria for the consistent implementation of this part, including, but not limited to, both of the following:

(A) Methodologies for calculating base daily per capita water use, baseline commercial, industrial, and institutional water use, compliance daily per capita water use, gross water use, service area population, indoor residential water use, and landscaped area water use.

(B) Criteria for adjustments pursuant to subdivisions (d) and (e) of Section 10608.24.

(2) The department shall post the methodologies and criteria developed pursuant to this subdivision on its Internet Web site, and make written copies

available, by October 1, 2010. An urban retail water supplier shall use the methods developed by the department in compliance with this part.

(i) (1) The department shall adopt regulations for implementation of the provisions relating to process water in accordance with subdivision (*l*) of Section 10608.12, subdivision (e) of Section 10608.24, and subdivision (d) of Section 10608.26.

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

(j) An urban retail water supplier shall be granted an extension to July 1, 2011, for adoption of an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) due in 2010 to allow use of technical methodologies developed by the department pursuant to paragraph (4) of subdivision (b) and subdivision (h). An urban retail water supplier that adopts an urban water management plan due in 2010 that does not use the methodologies developed by the department pursuant to subdivision (h) shall amend the plan by July 1, 2011, to comply with this part.

10608.22. Notwithstanding the method adopted by an urban retail water supplier pursuant to Section 10608.20, an urban retail water supplier's per capita daily water use reduction shall be no less than 5 percent of base daily per capita water use as defined in paragraph (3) of subdivision (b) of Section 10608.12. This section does not apply to an urban retail water supplier with a base daily per capita water use at or below 100 gallons per capita per day.

10608.24. (a) Each urban retail water supplier shall meet its interim urban water use target by December 31, 2015.

(b) Each urban retail water supplier shall meet its urban water use target by December 31, 2020.

(c) An urban retail water supplier's compliance daily per capita water use shall be the measure of progress toward achievement of its urban water use target.

(d) (1) When determining compliance daily per capita water use, an urban retail water supplier may consider the following factors:

(A) Differences in evapotranspiration and rainfall in the baseline period compared to the compliance reporting period.

(B) Substantial changes to commercial or industrial water use resulting from increased business output and economic development that have occurred during the reporting period.

(C) Substantial changes to institutional water use resulting from fire suppression services or other extraordinary events, or from new or expanded operations, that have occurred during the reporting period.

(2) If the urban retail water supplier elects to adjust its estimate of compliance daily per capita water use due to one or more of the factors described in paragraph (1), it shall provide the basis for, and data supporting, the adjustment in the report required by Section 10608.40.

(e) When developing the urban water use target pursuant to Section 10608.20, an urban retail water supplier that has a substantial percentage of industrial water use in its service area, may exclude process water from the calculation of gross water use to avoid a disproportionate burden on another customer sector.

(f) (1) An urban retail water supplier that includes agricultural water use in an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) may include the agricultural water use in determining gross water use. An urban retail water supplier that includes agricultural water use in determining gross water use and develops its urban water use target pursuant to paragraph (2) of subdivision (b) of Section 10608.20 shall use a water efficient standard for agricultural irrigation of 100 percent of reference evapotranspiration multiplied by the crop coefficient for irrigated acres.

(2) An urban retail water supplier, that is also an agricultural water supplier, is not subject to the requirements of Chapter 4 (commencing with Section 10608.48), if the agricultural water use is incorporated into its urban water use target pursuant to paragraph (1).

10608.26. (a) In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:

(1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.

(2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.

(3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

(b) In complying with this part, an urban retail water supplier may meet its urban water use target through efficiency improvements in any combination among its customer sectors. An urban retail water supplier shall avoid placing a disproportionate burden on any customer sector.

(c) For an urban retail water supplier that supplies water to a United States Department of Defense military installation, the urban retail water supplier's implementation plan for complying with this part shall consider the United States Department of Defense military installation's requirements under federal Executive Order 13423.

(d) (1) Any ordinance or resolution adopted by an urban retail water supplier after the effective date of this section shall not require existing customers as of the effective date of this section, to undertake changes in product formulation, operations, or equipment that would reduce process water use, but may provide technical assistance and financial incentives to those customers to implement efficiency measures for process water. This section shall not limit an ordinance or resolution adopted pursuant to a declaration of drought emergency by an urban retail water supplier.

(2) This part shall not be construed or enforced so as to interfere with the requirements of Chapter 4 (commencing with Section 113980) to Chapter 13 (commencing with Section 114380), inclusive, of Part 7 of Division 104 of the Health and Safety Code, or any requirement or standard for the protection of public health, public safety, or worker safety established by federal, state, or local government or recommended by recognized standard setting organizations or trade associations.

10608.28. (a) An urban retail water supplier may meet its urban water use target within its retail service area, or through mutual agreement, by any of the following:

(1) Through an urban wholesale water supplier.

(2) Through a regional agency authorized to plan and implement water conservation, including, but not limited to, an agency established under the Bay Area Water Supply and Conservation Agency Act (Division 31 (commencing with Section 81300)).

(3) Through a regional water management group as defined in Section 10537.

(4) By an integrated regional water management funding area.

(5) By hydrologic region.

(6) Through other appropriate geographic scales for which computation methods have been developed by the department.

(b) A regional water management group, with the written consent of its member agencies, may undertake any or all planning, reporting, and implementation functions under this chapter for the member agencies that consent to those activities. Any data or reports shall provide information both for the regional water management group and separately for each consenting urban retail water supplier and urban wholesale water supplier.

10608.32. All costs incurred pursuant to this part by a water utility regulated by the Public Utilities Commission may be recoverable in rates subject to review and approval by the Public Utilities Commission, and may be recorded in a memorandum account and reviewed for reasonableness by the Public Utilities Commission.

10608.36. Urban wholesale water suppliers shall include in the urban water management plans required pursuant to Part 2.6 (commencing with Section 10610) an assessment of their present and proposed future measures, programs, and policies to help achieve the water use reductions required by this part.

10608.40. Urban water retail suppliers shall report to the department on their progress in meeting their urban water use targets as part of their urban water management plans submitted pursuant to Section 10631. The data shall be reported using a standardized form developed pursuant to Section 10608.52.

10608.42. The department shall review the 2015 urban water management plans and report to the Legislature by December 31, 2016, on progress towards achieving a 20-percent reduction in urban water use by December 31, 2020. The report shall include recommendations on changes to water efficiency standards or urban water use targets in order to achieve

the 20-percent reduction and to reflect updated efficiency information and technology changes.

10608.43. The department, in conjunction with the California Urban Water Conservation Council, by April 1, 2010, shall convene a representative task force consisting of academic experts, urban retail water suppliers, environmental organizations, commercial water users, industrial water users, and institutional water users to develop alternative best management practices for commercial, industrial, and institutional users and an assessment of the potential statewide water use efficiency improvement in the commercial, industrial, and institutional sectors that would result from implementation of these best management practices. The taskforce, in conjunction with the department, shall submit a report to the Legislature by April 1, 2012, that shall include a review of multiple sectors within commercial, industrial, and institutional users and that shall recommend water use efficiency standards for commercial, industrial, and institutional users among various sectors of water use. The report shall include, but not be limited to, the following:

(a) Appropriate metrics for evaluating commercial, industrial, and institutional water use.

(b) Evaluation of water demands for manufacturing processes, goods, and cooling.

(c) Evaluation of public infrastructure necessary for delivery of recycled water to the commercial, industrial, and institutional sectors.

(d) Evaluation of institutional and economic barriers to increased recycled water use within the commercial, industrial, and institutional sectors.

(e) Identification of technical feasibility and cost of the best management practices to achieve more efficient water use statewide in the commercial, industrial, and institutional sectors that is consistent with the public interest and reflects past investments in water use efficiency.

10608.44. Each state agency shall reduce water use on facilities it operates to support urban retail water suppliers in meeting the target identified in Section 10608.16.

## Chapter 4. Agricultural Water Suppliers

10608.48. (a) On or before July 31, 2012, an agricultural water supplier shall implement efficient water management practices pursuant to subdivisions (b) and (c).

(b) Agricultural water suppliers shall implement all of the following critical efficient management practices:

(1) Measure the volume of water delivered to customers with sufficient accuracy to comply with subdivision (a) of Section 531.10 and to implement paragraph (2).

(2) Adopt a pricing structure for water customers based at least in part on quantity delivered.

(c) Agricultural water suppliers shall implement additional efficient management practices, including, but not limited to, practices to accomplish all of the following, if the measures are locally cost effective and technically feasible:

(1) Facilitate alternative land use for lands with exceptionally high water duties or whose irrigation contributes to significant problems, including drainage.

(2) Facilitate use of available recycled water that otherwise would not be used beneficially, meets all health and safety criteria, and does not harm crops or soils.

(3) Facilitate the financing of capital improvements for on-farm irrigation systems.

(4) Implement an incentive pricing structure that promotes one or more of the following goals:

(A) More efficient water use at the farm level.

(B) Conjunctive use of groundwater.

(C) Appropriate increase of groundwater recharge.

(D) Reduction in problem drainage.

(E) Improved management of environmental resources.

(F) Effective management of all water sources throughout the year by adjusting seasonal pricing structures based on current conditions.

(5) Expand line or pipe distribution systems, and construct regulatory reservoirs to increase distribution system flexibility and capacity, decrease maintenance, and reduce seepage.

(6) Increase flexibility in water ordering by, and delivery to, water customers within operational limits.

(7) Construct and operate supplier spill and tailwater recovery systems.

(8) Increase planned conjunctive use of surface water and groundwater within the supplier service area.

(9) Automate canal control structures.

(10) Facilitate or promote customer pump testing and evaluation.

(11) Designate a water conservation coordinator who will develop and implement the water management plan and prepare progress reports.

(12) Provide for the availability of water management services to water users. These services may include, but are not limited to, all of the following:

(A) On-farm irrigation and drainage system evaluations.

(B) Normal year and real-time irrigation scheduling and crop evapotranspiration information.

(C) Surface water, groundwater, and drainage water quantity and quality data.

(D) Agricultural water management educational programs and materials for farmers, staff, and the public.

(13) Evaluate the policies of agencies that provide the supplier with water to identify the potential for institutional changes to allow more flexible water deliveries and storage.

(14) Evaluate and improve the efficiencies of the supplier’s pumps.

(d) Agricultural water suppliers shall include in the agricultural water management plans required pursuant to Part 2.8 (commencing with Section 10800) a report on which efficient water management practices have been implemented and are planned to be implemented, an estimate of the water use efficiency improvements that have occurred since the last report, and an estimate of the water use efficiency improvements estimated to occur five and 10 years in the future. If an agricultural water supplier determines that an efficient water management practice is not locally cost effective or technically feasible, the supplier shall submit information documenting that determination.

(e) The data shall be reported using a standardized form developed pursuant to Section 10608.52.

(f) An agricultural water supplier may meet the requirements of subdivisions (d) and (e) by submitting to the department a water conservation plan submitted to the United States Bureau of Reclamation that meets the requirements described in Section 10828.

(g) On or before December 31, 2013, December 31, 2016, and December 31, 2021, the department, in consultation with the board, shall submit to the Legislature a report on the agricultural efficient water management practices that have been implemented and are planned to be implemented and an assessment of the manner in which the implementation of those efficient water management practices has affected and will affect agricultural operations, including estimated water use efficiency improvements, if any.

(h) The department may update the efficient water management practices required pursuant to subdivision (c), in consultation with the Agricultural Water Management Council, the United States Bureau of Reclamation, and the board. All efficient water management practices for agricultural water use pursuant to this chapter shall be adopted or revised by the department only after the department conducts public hearings to allow participation of the diverse geographical areas and interests of the state.

(i) (1) The department shall adopt regulations that provide for a range of options that agricultural water suppliers may use or implement to comply with the measurement requirement in paragraph (1) of subdivision (b).

(2) The initial adoption of a regulation authorized by this subdivision is deemed to address an emergency, for purposes of Sections 11346.1 and 11349.6 of the Government Code, and the department is hereby exempted for that purpose from the requirements of subdivision (b) of Section 11346.1 of the Government Code. After the initial adoption of an emergency regulation pursuant to this subdivision, the department shall not request approval from the Office of Administrative Law to readopt the regulation as an emergency regulation pursuant to Section 11346.1 of the Government Code.

## Chapter 5. Sustainable Water Management

10608.50. (a) The department, in consultation with the board, shall promote implementation of regional water resources management practices through increased incentives and removal of barriers consistent with state and federal law. Potential changes may include, but are not limited to, all of the following:

(1) Revisions to the requirements for urban and agricultural water management plans.

(2) Revisions to the requirements for integrated regional water management plans.

(3) Revisions to the eligibility for state water management grants and loans.

(4) Revisions to state or local permitting requirements that increase water supply opportunities, but do not weaken water quality protection under state and federal law.

(5) Increased funding for research, feasibility studies, and project construction.

(6) Expanding technical and educational support for local land use and water management agencies.

(b) No later than January 1, 2011, and updated as part of the California Water Plan, the department, in consultation with the board, and with public input, shall propose new statewide targets, or review and update existing statewide targets, for regional water resources management practices, including, but not limited to, recycled water, brackish groundwater desalination, and infiltration and direct use of urban stormwater runoff.

## Chapter 6. Standardized Data Collection

10608.52. (a) The department, in consultation with the board, the California Bay-Delta Authority or its successor agency, the State Department of Public Health, and the Public Utilities Commission, shall develop a single standardized water use reporting form to meet the water use information needs of each agency, including the needs of urban water suppliers that elect to determine and report progress toward achieving targets on a regional basis as provided in subdivision (a) of Section 10608.28.

(b) At a minimum, the form shall be developed to accommodate information sufficient to assess an urban water supplier's compliance with conservation targets pursuant to Section 10608.24 and an agricultural water supplier's compliance with implementation of efficient water management practices pursuant to subdivision (a) of Section 10608.48. The form shall accommodate reporting by urban water suppliers on an individual or regional basis as provided in subdivision (a) of Section 10608.28.

10608.56. (a) On and after July 1, 2016, an urban retail water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(b) On and after July 1, 2013, an agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

(c) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for achieving the per capita reductions. The supplier may request grant or loan funds to achieve the per capita reductions to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(d) Notwithstanding subdivision (b), the department shall determine that an agricultural water supplier is eligible for a water grant or loan even though the supplier is not implementing all of the efficient water management practices described in Section 10608.48, if the agricultural water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the efficient water management practices. The supplier may request grant or loan funds to implement the efficient water management practices to the extent the request is consistent with the eligibility requirements applicable to the water funds.

(e) Notwithstanding subdivision (a), the department shall determine that an urban retail water supplier is eligible for a water grant or loan even though the supplier has not met the per capita reductions required pursuant to Section 10608.24, if the urban retail water supplier has submitted to the department for approval documentation demonstrating that its entire service area qualifies as a disadvantaged community.

(f) The department shall not deny eligibility to an urban retail water supplier or agricultural water supplier in compliance with the requirements of this part and Part 2.8 (commencing with Section 10800), that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the requirements of this part or Part 2.8 (commencing with Section 10800).

10608.60. (a) It is the intent of the Legislature that funds made available by Section 75026 of the Public Resources Code should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for grants to implement this part. In the allocation of funding, it is the intent of the

Legislature that the department give consideration to disadvantaged communities to assist in implementing the requirements of this part.

(b) It is the intent of the Legislature that funds made available by Section 75041 of the Public Resources Code, should be expended, consistent with Division 43 (commencing with Section 75001) of the Public Resources Code and upon appropriation by the Legislature, for direct expenditures to implement this part.

### Chapter 8. Quantifying Agricultural Water Use Efficiency

10608.64. The department, in consultation with the Agricultural Water Management Council, academic experts, and other stakeholders, shall develop a methodology for quantifying the efficiency of agricultural water use. Alternatives to be assessed shall include, but not be limited to, determination of efficiency levels based on crop type or irrigation system distribution uniformity. On or before December 31, 2011, the department shall report to the Legislature on a proposed methodology and a plan for implementation. The plan shall include the estimated implementation costs and the types of data needed to support the methodology. Nothing in this section authorizes the department to implement a methodology established pursuant to this section.

SEC. 2. Section 10631.5 of the Water Code is amended to read:

10631.5. (a) (1) Beginning January 1, 2009, the terms of, and eligibility for, a water management grant or loan made to an urban water supplier and awarded or administered by the department, state board, or California Bay-Delta Authority or its successor agency shall be conditioned on the implementation of the water demand management measures described in Section 10631, as determined by the department pursuant to subdivision (b).

(2) For the purposes of this section, water management grants and loans include funding for programs and projects for surface water or groundwater storage, recycling, desalination, water conservation, water supply reliability, and water supply augmentation. This section does not apply to water management projects funded by the federal American Recovery and Reinvestment Act of 2009 (Public Law 111-5).

(3) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if the urban water supplier has submitted to the department for approval a schedule, financing plan, and budget, to be included in the grant or loan agreement, for implementation of the water demand management measures. The supplier may request grant or loan funds to implement the water demand management measures to the extent the request is consistent with the eligibility requirements applicable to the water management funds.

(4) (A) Notwithstanding paragraph (1), the department shall determine that an urban water supplier is eligible for a water management grant or loan even though the supplier is not implementing all of the water demand management measures described in Section 10631, if an urban water supplier submits to the department for approval documentation demonstrating that a water demand management measure is not locally cost effective. If the department determines that the documentation submitted by the urban water supplier fails to demonstrate that a water demand management measure is not locally cost effective, the department shall notify the urban water supplier and the agency administering the grant or loan program within 120 days that the documentation does not satisfy the requirements for an exemption, and include in that notification a detailed statement to support the determination.

(B) For purposes of this paragraph, "not locally cost effective" means that the present value of the local benefits of implementing a water demand management measure is less than the present value of the local costs of implementing that measure.

(b) (1) The department, in consultation with the state board and the California Bay-Delta Authority or its successor agency, and after soliciting public comment regarding eligibility requirements, shall develop eligibility requirements to implement the requirement of paragraph (1) of subdivision (a). In establishing these eligibility requirements, the department shall do both of the following:

(A) Consider the conservation measures described in the Memorandum of Understanding Regarding Urban Water Conservation in California, and alternative conservation approaches that provide equal or greater water savings.

(B) Recognize the different legal, technical, fiscal, and practical roles and responsibilities of wholesale water suppliers and retail water suppliers.

(2) (A) For the purposes of this section, the department shall determine whether an urban water supplier is implementing all of the water demand management measures described in Section 10631 based on either, or a combination, of the following:

(i) Compliance on an individual basis.

(ii) Compliance on a regional basis. Regional compliance shall require participation in a regional conservation program consisting of two or more urban water suppliers that achieves the level of conservation or water efficiency savings equivalent to the amount of conservation or savings achieved if each of the participating urban water suppliers implemented the water demand management measures. The urban water supplier administering the regional program shall provide participating urban water suppliers and the department with data to demonstrate that the regional program is consistent with this clause. The department shall review the data to determine whether the urban water suppliers in the regional program are meeting the eligibility requirements.

(B) The department may require additional information for any determination pursuant to this section.

(3) The department shall not deny eligibility to an urban water supplier in compliance with the requirements of this section that is participating in a multiagency water project, or an integrated regional water management plan, developed pursuant to Section 75026 of the Public Resources Code, solely on the basis that one or more of the agencies participating in the project or plan is not implementing all of the water demand management measures described in Section 10631.

(c) In establishing guidelines pursuant to the specific funding authorization for any water management grant or loan program subject to this section, the agency administering the grant or loan program shall include in the guidelines the eligibility requirements developed by the department pursuant to subdivision (b).

(d) Upon receipt of a water management grant or loan application by an agency administering a grant and loan program subject to this section, the agency shall request an eligibility determination from the department with respect to the requirements of this section. The department shall respond to the request within 60 days of the request.

(e) The urban water supplier may submit to the department copies of its annual reports and other relevant documents to assist the department in determining whether the urban water supplier is implementing or scheduling the implementation of water demand management activities. In addition, for urban water suppliers that are signatories to the Memorandum of Understanding Regarding Urban Water Conservation in California and submit biennial reports to the California Urban Water Conservation Council in accordance with the memorandum, the department may use these reports to assist in tracking the implementation of water demand management measures.

(f) This section shall remain in effect only until July 1, 2016, and as of that date is repealed, unless a later enacted statute, that is enacted before July 1, 2016, deletes or extends that date.

SEC. 3. Part 2.8 (commencing with Section 10800) of Division 6 of the Water Code is repealed.

SEC. 4. Part 2.8 (commencing with Section 10800) is added to Division 6 of the Water Code, to read:

## PART 2.8. AGRICULTURAL WATER MANAGEMENT PLANNING

### Chapter 1. General Declarations and Policy

10800. This part shall be known and may be cited as the Agricultural Water Management Planning Act.

10801. The Legislature finds and declares all of the following:

(a) The waters of the state are a limited and renewable resource.

(b) The California Constitution requires that water in the state be used in a reasonable and beneficial manner.

(c) Urban water districts are required to adopt water management plans.

(d) The conservation of agricultural water supplies is of great statewide concern.

(e) There is a great amount of reuse of delivered water, both inside and outside the water service areas.

(f) Significant noncrop beneficial uses are associated with agricultural water use, including streamflows and wildlife habitat.

(g) Significant opportunities exist in some areas, through improved irrigation water management, to conserve water or to reduce the quantity of highly saline or toxic drainage water.

(h) Changes in water management practices should be carefully planned and implemented to minimize adverse effects on other beneficial uses currently being served.

(i) Agricultural water suppliers that receive water from the federal Central Valley Project are required by federal law to prepare and implement water conservation plans.

(j) Agricultural water users applying for a permit to appropriate water from the board are required to prepare and implement water conservation plans.

10802. The Legislature finds and declares that all of the following are the policies of the state:

(a) The conservation of water shall be pursued actively to protect both the people of the state and the state's water resources.

(b) The conservation of agricultural water supplies shall be an important criterion in public decisions with regard to water.

(c) Agricultural water suppliers shall be required to prepare water management plans to achieve conservation of water.

## Chapter 2. Definitions

10810. Unless the context otherwise requires, the definitions set forth in this chapter govern the construction of this part.

10811. "Agricultural water management plan" or "plan" means an agricultural water management plan prepared pursuant to this part.

10812. "Agricultural water supplier" has the same meaning as defined in Section 10608.12.

10813. "Customer" means a purchaser of water from a water supplier who uses water for agricultural purposes.

10814. "Person" means any individual, firm, association, organization, partnership, business, trust, corporation, company, public agency, or any agency of that entity.

10815. "Public agency" means any city, county, city and county, special district, or other public entity.

10816. "Urban water supplier" has the same meaning as set forth in Section 10617.

10817. "Water conservation" means the efficient management of water resources for beneficial uses, preventing waste, or accomplishing additional benefits with the same amount of water.

## Chapter 3. Agricultural Water Management Plans

### Article 1. General Provisions

10820. (a) An agricultural water supplier shall prepare and adopt an agricultural water management plan in the manner set forth in this chapter on or before December 31, 2012, and shall update that plan on December 31, 2015, and on or before December 31 every five years thereafter.

(b) Every supplier that becomes an agricultural water supplier after December 31, 2012, shall prepare and adopt an agricultural water management plan within one year after the date it has become an agricultural water supplier.

(c) A water supplier that indirectly provides water to customers for agricultural purposes shall not prepare a plan pursuant to this part without the consent of each agricultural water supplier that directly provides that water to its customers.

10821. (a) An agricultural water supplier required to prepare a plan pursuant to this part shall notify each city or county within which the supplier provides water supplies that the agricultural water supplier will be preparing the plan or reviewing the plan and considering amendments or changes to the plan. The agricultural water supplier may consult with, and obtain comments from, each city or county that receives notice pursuant to this subdivision.

(b) The amendments to, or changes in, the plan shall be adopted and submitted in the manner set forth in Article 3 (commencing with Section 10840).

### Article 2. Contents of Plans

10825. (a) It is the intent of the Legislature in enacting this part to allow levels of water management planning commensurate with the numbers of customers served and the volume of water supplied.

(b) This part does not require the implementation of water conservation programs or practices that are not locally cost effective.

10826. An agricultural water management plan shall be adopted in accordance with this chapter. The plan shall do all of the following:

(a) Describe the agricultural water supplier and the service area, including all of the following:

(1) Size of the service area.

(2) Location of the service area and its water management facilities.

(3) Terrain and soils.

(4) Climate.

(5) Operating rules and regulations.
(6) Water delivery measurements or calculations.
(7) Water rate schedules and billing.
(8) Water shortage allocation policies.

(b) Describe the quantity and quality of water resources of the agricultural water supplier, including all of the following:
(1) Surface water supply.
(2) Groundwater supply.
(3) Other water supplies.
(4) Source water quality monitoring practices.
(5) Water uses within the agricultural water supplier's service area, including all of the following:
(A) Agricultural.
(B) Environmental.
(C) Recreational.
(D) Municipal and industrial.
(E) Groundwater recharge.
(F) Transfers and exchanges.
(G) Other water uses.
(6) Drainage from the water supplier's service area.
(7) Water accounting, including all of the following:
(A) Quantifying the water supplier's water supplies.
(B) Tabulating water uses.
(C) Overall water budget.
(8) Water supply reliability.

(c) Include an analysis, based on available information, of the effect of climate change on future water supplies.

(d) Describe previous water management activities.

(e) Include in the plan the water use efficiency information required pursuant to Section 10608.48.

10827. Agricultural water suppliers that are members of the Agricultural Water Management Council, and that submit water management plans to that council in accordance with the "Memorandum of Understanding Regarding Efficient Water Management Practices By Agricultural Water Suppliers In California," dated January 1, 1999, may submit the water management plans identifying water demand management measures currently being implemented, or scheduled for implementation, to satisfy the requirements of Section 10826.

10828. (a) Agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, may submit those water conservation plans to satisfy the requirements of Section 10826, if both of the following apply:

(1) The agricultural water supplier has adopted and submitted the water conservation plan to the United States Bureau of Reclamation within the previous four years.

(2) The United States Bureau of Reclamation has accepted the water conservation plan as adequate.

(b) This part does not require agricultural water suppliers that are required to submit water conservation plans to the United States Bureau of Reclamation pursuant to either the Central Valley Project Improvement Act (Public Law 102-575) or the Reclamation Reform Act of 1982, or both, to prepare and adopt water conservation plans according to a schedule that is different from that required by the United States Bureau of Reclamation.

10829. An agricultural water supplier may satisfy the requirements of this part by adopting an urban water management plan pursuant to Part 2.6 (commencing with Section 10610) or by participation in areawide, regional, watershed, or basinwide water management planning if those plans meet or exceed the requirements of this part.

## Article 3. Adoption and Implementation of Plans

10840. Every agricultural water supplier shall prepare its plan pursuant to Article 2 (commencing with Section 10825).

10841. Prior to adopting a plan, the agricultural water supplier shall make the proposed plan available for public inspection, and shall hold a public hearing on the plan. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned agricultural water supplier pursuant to Section 6066 of the Government Code. A privately owned agricultural water supplier shall provide an equivalent notice within its service area and shall provide a reasonably equivalent opportunity that would otherwise be afforded through a public hearing process for interested parties to provide input on the plan. After the hearing, the plan shall be adopted as prepared or as modified during or after the hearing.

10842. An agricultural water supplier shall implement the plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan, as determined by the governing body of the agricultural water supplier.

10843. (a) An agricultural water supplier shall submit to the entities identified in subdivision (b) a copy of its plan no later than 30 days after the adoption of the plan. Copies of amendments or changes to the plans shall be submitted to the entities identified in subdivision (b) within 30 days after the adoption of the amendments or changes.

(b) An agricultural water supplier shall submit a copy of its plan and amendments or changes to the plan to each of the following entities:

(1) The department.

(2) Any city, county, or city and county within which the agricultural water supplier provides water supplies.

(3) Any groundwater management entity within which jurisdiction the agricultural water supplier extracts or provides water supplies.

(4) Any urban water supplier within which jurisdiction the agricultural water supplier provides water supplies.

(5) Any city or county library within which jurisdiction the agricultural water supplier provides water supplies.

(6) The California State Library.

(7) Any local agency formation commission serving a county within which the agricultural water supplier provides water supplies.

10844. (a) Not later than 30 days after the date of adopting its plan, the agricultural water supplier shall make the plan available for public review on the agricultural water supplier's Internet Web site.

(b) An agricultural water supplier that does not have an Internet Web site shall submit to the department, not later than 30 days after the date of adopting its plan, a copy of the adopted plan in an electronic format. The department shall make the plan available for public review on the department's Internet Web site.

10845. (a) The department shall prepare and submit to the Legislature, on or before December 31, 2013, and thereafter in the years ending in six and years ending in one, a report summarizing the status of the plans adopted pursuant to this part.

(b) The report prepared by the department shall identify the outstanding elements of any plan adopted pursuant to this part. The report shall include an evaluation of the effectiveness of this part in promoting efficient agricultural water management practices and recommendations relating to proposed changes to this part, as appropriate.

(c) The department shall provide a copy of the report to each agricultural water supplier that has submitted its plan to the department. The department shall also prepare reports and provide data for any legislative hearing designed to consider the effectiveness of plans submitted pursuant to this part.

(d) This section does not authorize the department, in preparing the report, to approve, disapprove, or critique individual plans submitted pursuant to this part.

## Chapter 4. Miscellaneous Provisions

10850. (a) Any action or proceeding to attack, review, set aside, void, or annul the acts or decisions of an agricultural water supplier on the grounds of noncompliance with this part shall be commenced as follows:

(1) An action or proceeding alleging failure to adopt a plan shall be commenced within 18 months after that adoption is required by this part.

(2) Any action or proceeding alleging that a plan, or action taken pursuant to the plan, does not comply with this part shall be commenced within 120 days after submitting the plan or amendments to the plan to entities in accordance with Section 10844 or the taking of that action.

(b) In an action or proceeding to attack, review, set aside, void, or annul a plan, or an action taken pursuant to the plan by an agricultural water supplier, on the grounds of noncompliance with this part, the inquiry shall extend only to whether there was a prejudicial abuse of discretion. Abuse

of discretion is established if the agricultural water supplier has not proceeded in a manner required by law, or if the action by the agricultural water supplier is not supported by substantial evidence.

10851. The California Environmental Quality Act (Division 13 (commencing with Section 21000) of the Public Resources Code) does not apply to the preparation and adoption of plans pursuant to this part. This part does not exempt projects for implementation of the plan or for expanded or additional water supplies from the California Environmental Quality Act.

10852. An agricultural water supplier is not eligible for a water grant or loan awarded or administered by the state unless the supplier complies with this part.

10853. No agricultural water supplier that provides water to less than 25,000 irrigated acres, excluding recycled water, shall be required to implement the requirements of this part or Part 2.55 (commencing with Section 10608) unless sufficient funding has specifically been provided to that water supplier for these purposes.

SEC. 5. This act shall take effect only if Senate Bill 1 and Senate Bill 6 of the 2009–10 Seventh Extraordinary Session of the Legislature are enacted and become effective.

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# APPENDIX E

## WATER SUPPLY VERIFICATIONS

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Hayward
p. 181

**Nicole Sandkulla**

**From:** Marilyn Mosher [Marilyn.Mosher@hayward-ca.gov]
**Sent:** Wednesday, February 16, 2011 9:56 AM
**To:** Nicole Sandkulla
**Cc:** Alex Ameri
**Subject:** RE: Projected SFPUC Purchases for UWMP Preparation Needed by February 17, 2011

Nicole,

At this time, Hayward's projections remain those which resulted from the Water Conservation Implementation Plan (WCIP). These projections include the additional conservation from the WCIP. We recognize that water consumption has decreased throughout the region, including Hayward, since the WCIP was prepared; however, no definitive cause or combination of factors has been identified that explains the decrease, nor is there certainty about what, if any, portion of the decreased usage is permanent.

As you know, we are currently preparing our 2010 Urban Water Management Plan, and the purchase projections may be adjusted as we fully assess the potential water demand from future residential and non-residential development and receive the latest data and information available from the City's long-range planners, as well as evaluate the impact of SB7, if any. In that this work is not yet complete, we request that you forward the following projections to SFPUC, along with the italicized language below the table:

*City of Hayward*
*SFPUC Purchase Projections 2015 – 2035*
*In Million Gallons per Day*

| *2015* | *2020* | *2025* | *2030* | *2035* |
|---|---|---|---|---|
| *22.0* | *23.6* | *25.8* | *28.1* | *30.7* |

*These projections include the baseline conservation savings to which Hayward committed in 2004, as well as additional conservation savings identified in the 2009 Water Conservation Implementation Plan (WCIP). Hayward is currently preparing its 2010 Urban Water Management Plan, and these projections are subject to change to account for updated assessments of future potential residential and non-residential development, as well as the impacts of water conservation legislation.*

Lastly, in reference to your note about SFPUC purchase projections through 2018, due to SFPUC by June 30, Hayward's 2018 projection remains 22.9 mgd.

*Marilyn Mosher*
Administrative Analyst III

City of Hayward | Department of Public Works/Utilities Division | 777 B Street | Hayward CA 94541 |
Ph: 510.583.4723 | Fax: 510.583.3610 | Email: marilyn.mosher@hayward-ca.gov |

**From:** Nicole Sandkulla [mailto:NSandkulla@bawsca.org]
**Sent:** Friday, February 04, 2011 12:03 PM
**To:** Alan Kurotori (akurotori@santaclaraca.gov); Alex Ameri; Art Morimoto (amorimoto@burlingame.org); Carl Lemke; Carrasco, Anthony; cathya@midpeninsulawater.org; David Dickson (ddickson@coastsidewater.org); dbarrow@westboroughwater.com; eric.cartwright@acwd.com; Flegel, Elizabeth; Gregg Hosfeldt (gregg.hosfeldt@mountainview.gov); Henry Young (henryy@midpeninsulawater.org); James Craig; Jerry Flanagan; Justin

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SAN FRANCISCO PUBLIC UTILITIES COMMISSION

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WATER
WASTEWATER
POWER



March 31, 2011

Nicole Sandkulla
Senior Water Resources Engineer
Bay Area Water Supply and Conservation Agency
155 Bovet Road, Suite 302
San Mateo, CA 94402

Dear Nicole,

Attached please find additional information through 2035 on the Regional Water System's supply reliability for use in the Wholesale Customer's 2010 Urban Water Management Plan updates. The SFPUC has assessed the water supply reliability under the following planning scenarios:

- Projected Single dry-year supply for 2010
- Projected Multiple dry-year supply beginning 2010; and
- Projected supply reliability for years 2010-2035.

Table 1 summarizes deliveries to the Wholesale Customers for projected single dry-year supply for 2010 and projected multiple dry-year supply beginning 2010.

With regards to future demands, the SFPUC proposes to expand their water supply portfolio by increasing the types of water supply resources. Table 2 summarizes the water supply resources assumed to be available by 2035.

Concerning allocation of supply during dry years, the Water Shortage Allocation Plan ("Plan") was utilized to allocate shortages between the SFPUC and the Wholesale Customers collectively. The Plan implements a method for allocating water among the individual Wholesale Customers which has been adopted by the Wholesale Customers. The Plan was adopted pursuant to Section 7.03(a) of the 1984 Settlement Agreement and Master Water Sales Contract and has been updated to correspond to the terminology used in the June 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County.

Finally, the SFPUC estimated the frequency and severity of anticipated shortages for the period 2010 though 2035. For this analysis, we assumed that the historical hydrologic period is indicative of future events and evaluated the supply reliability assuming a repeat of the actual historic hydrologic period 1920 through 2002. The results of this analysis are summarized in Table 3.

It is our understanding that you will pass this information on to the Wholesale Customers. If you have any questions or need additional information, please do not hesitate to contact me at (415) 554-0792.

Sincerely,

Paula Kehoe

Paula Kehoe
Director of Water Resources

**Table 1**
**Projected Deliveries for Three Multiple Dry Years**

| | 2010 | One Critical Dry Year | Deliveries during Multiple Dry Years in mgd | | |
|---|---|---|---|---|---|
| | | | Year 1 | Year 2 | Year 3 |
| System-Wide Shortage in Percent | 0% | 10% | 10% | 20% | 20% |
| Wholesale Allocation (mgd) | 184.0 | 152.6 | 152.6 | 132.5 | 132.5 |

**Table 2**

| **UWMP Studies: Water Supply Reliability Water Supply Options for Years 2010 through 2030** | | | | | | |
|---|---|---|---|---|---|---|
| | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
| Crystal Springs Reservoir (20.28bg) | | x | x | x | x | x |
| Westside Basin Groundwater afa | | 8,100 | 8,100 | 8,100 | 8,100 | 8,100 |
| Calaveras Reservoir Recovery (31.5 bg) | | x | x | x | x | x |
| Districts' Transfer afa | | 2240 | 2240 | 2240 | 2240 | 2240 |

**Table 3: Projected System Supply Reliability Based on Historical Hydrologic Period**

| Allocation by Year | Wholesale Demand in mgd | | | | | |
|---|---|---|---|---|---|---|
| | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| | Projected Wholesale Allocation in mgd | | | | | |
| Delivery for Fiscal Year | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
| 1920 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1921 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1922 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1923 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1924 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1925 | 154.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1926 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1927 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1928 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1929 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1930 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1931 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1932 | 132.5 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1933 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1934 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1935 | 154.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1936 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1937 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1938 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1939 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1940 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1941 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1942 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1943 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1944 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1945 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1946 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1947 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1948 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1949 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1950 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1951 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1952 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1953 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1954 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1955 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1956 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1957 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1958 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1959 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |

| Delivery for Fiscal Year | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 |
|---|---|---|---|---|---|---|
| 1960 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1961 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1962 | 132.5 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1963 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1964 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1965 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1966 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1967 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1968 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1969 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1970 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1971 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1972 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1973 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1974 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1975 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1976 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1977 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1978 | 136.2 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1979 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1980 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1981 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1982 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1983 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1984 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1985 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1986 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1987 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1988 | 152.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1989 | 132.5 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1990 | 132.5 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1991 | 132.5 | 132.5 | 132.5 | 132.5 | 132.5 | 132.5 |
| 1992 | 132.5 | 152.6 | 152.6 | 152.6 | 152.6 | 152.6 |
| 1993 | 136.2 | 132.5 | 132.5 | 132.5 | 132.5 | 132.5 |
| 1994 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1995 | 154.6 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1996 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1997 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1998 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 1999 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2000 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2001 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |
| 2002 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 | 184.0 |

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# APPENDIX F

## RECYCLED WATER FACILITY PLAN

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CITY OF
HAYWARD
HEART OF THE BAY

# City of Hayward
# Recycled Water Facility Plan

State Water Resources Control Board Project # 07-465-550

**Prepared by:**

RMC
Water and Environment

**September 2009**

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## List of Abbreviations

| | |
|---|---|
| AFY | acre-feet per year |
| ccf | hundred cubic foot |
| CCR | California Code of Regulations |
| CEQA | California Environmental Quality Act |
| City | City of Hayward |
| DHS | Department of Health Services |
| EIR | Environmental Impact Report |
| GIS | Geographical Information System |
| gpd | gallons per day |
| gpm | gallons per minute |
| HARD | Hayward Area Recreation and Park District |
| HUSD | Hayward Unified School District |
| mg/L | milligrams per liter |
| mgd | million gallons per day |
| MND | mitigated negative declaration |
| MPN | most probable number |
| NPDES | National Pollutant Discharge Elimination System |
| Plan | Facilities Plan |
| Project | Hayward Recycled Water Project |
| psi | pounds per square inch |
| RMC | RMC Water and Environment |
| RWQCB | Regional Water Quality Control Board |
| SWRCB | State Water Resources Control Board |
| TDS | total dissolved solids |
| Title 22 | Title 22 California Code of Regulations |
| WPCF | Hayward Water Pollution Control Facility |

# Chapter 1 Introduction

This chapter includes background on the City of Hayward (City) and the Recycled Water Facility Plan (Plan), documentation of the goals and drivers for considering implementation of a Recycled Water Project (Project) in the City, discussion of the Plan objectives and approach, description of stakeholder involvement during the course of the Plan, and summary of the report organization.

## 1.1 Background

The City of Hayward is located in the San Francisco Bay Area in the southern portion of Alameda County. The City had approximately 146,000 residents in 2005. The City boundaries extend from the San Francisco Bay on the west to the East Bay hills on the east. **Figure 1-1** illustrates the project location.

**Figure 1-1: Project Location**

The City operates the City-owned utilities, including water and wastewater services, within the City boundaries.

In 1993, the City participated in the preparation of a Recycled Water Master Plan by East Bay Dischargers Authority (EBDA) to investigate potential recycled water projects.

In 2007, the City completed a Recycled Water Feasibility Study (RMC 2007), including preliminary market and recycled water supply assessment and evaluation of two conceptual alternatives to serve recycled water customers to assess overall feasibility of expanding the City's water supply portfolio to include recycled water.

As a result of the Feasibility Study, the City decided to prepare a Recycled Water Facility Plan (this Plan) for treatment and distribution facilities to assist the City in making informed decisions about the use of recycled water in Hayward.

## 1.2 Project Goals and Drivers

The primary objective of implementing a Recycled Water Project in the City would be to allow the City to maximize recycled water as a supplemental non-potable water source.

As further discussed in Chapter 2, there are several drivers for the need to develop a recycled water resource including:

- Expected growth in the City in both residential and industrial sectors
- Increases in SFPUC water charges and potential decreases in SFPUC water availability at current reliability levels
- Potential for increasingly stringent discharge requirements to the San Francisco Bay
- City's desire to evaluate more sustainable alternatives to using potable water for certain applications

In addition, Calpine is currently developing a power generation facility that would be located on the property adjacent to the City's Water Pollution Control Facility. Calpine is obligated to use tertiary treated recycled water at their power generation facility. Construction of the power generation facility is anticipated to start no later than September 2010 and the facility to be operational by June 2013. As of this writing, the City and Calpine are in the process of negotiating terms for the construction and operation of the treatment facilities necessary to produce tertiary recycled water sufficient for Calpine's needs. For the purposes of this Plan, it's assumed the City will be responsible for developing and operating tertiary treatment facilities at their existing Water Pollution Control Facility site. Calpine has indicated that if they are to construct and operate the tertiary facilities, they will agree to provide surplus tertiary treated recycled water back to the City for reuse.

## 1.3 Study Objectives and Approach

The objectives of this Plan are fourfold:

1. Refine the recycled water market assessment prepared as part of the Feasibility Study
2. Refine and evaluate the project alternatives identified in the Feasibility Study
3. Develop a Facility Plan for the recommended project, including target customers, planning-level facilities design criteria, and planning-level cost estimate.
4. Prepare an implementation plan for the recommended project, including implementation schedule, construction financing plan and preliminary environmental checklist.

Technical activities performed by RMC for this Plan include market analysis, survey of customers, alternative development and evaluation, environmental checklist, and construction financing plan. The details of these services, including specific approach, are presented and discussed in Chapter 2 through 5.

## 1.4 Stakeholder Involvement

During the preparation of this Plan, stakeholder involvement and outreach focused on potential customers through customer survey of industrial and commercial customers and individual meetings with the Hayward Unified School District (HUSD) and the Hayward Area Recreation and Park District (HARD). Further discussion on their involvement can be found in Chapter 3 - Market Assessment and in Appendix A -HARD and HUSD Meeting Notes. The City staff has also been keeping the City elected officials appraised of the Plan and regularly communicating with Calpine.

Outreach to the general public beyond the public forum provided by the City Council was not initiated as part of this Plan for two main reasons:

- Most of the potential use for recycled water considered in this Plan is for irrigation of public spaces and recycled water for irrigation of public spaces has become more common and broadly accepted in California; and
- The City has a successful history of recycled water use at the Skywest golf course.

Should the City decide to move forward with a recycled water project, it would initiate more extensive public involvement – at a minimum, through the environmental review process.

## 1.5 Report Content

- **Chapter 1 – Introduction (this section).**
- **Chapter 2 – Study Area Characteristics**. This section includes information on the service area, water supplies and wastewater treatment.
- **Chapter 3 – Market Assessment.** This section includes information on the market for recycled water in the City including estimates of customer demands, and water quality analysis.
- **Chapter 4 – Alternatives Assessment**. This section includes information on three recycled water project alternatives including customer base and cost estimates.
- **Chapter 5 – Recommended Project.** This section includes detailed information on the Recommended Project including benefits, implementation plan, and recycled water market assurances.

# Chapter 2 Study Area Characteristics

This chapter includes additional background information on the City including characteristics of the City's study area, a discussion of water supply and wastewater management issues facing the City, which prompted the need to evaluate recycled water use, and a description of existing recycled water uses in the City.

## 2.1 Study Area Setting

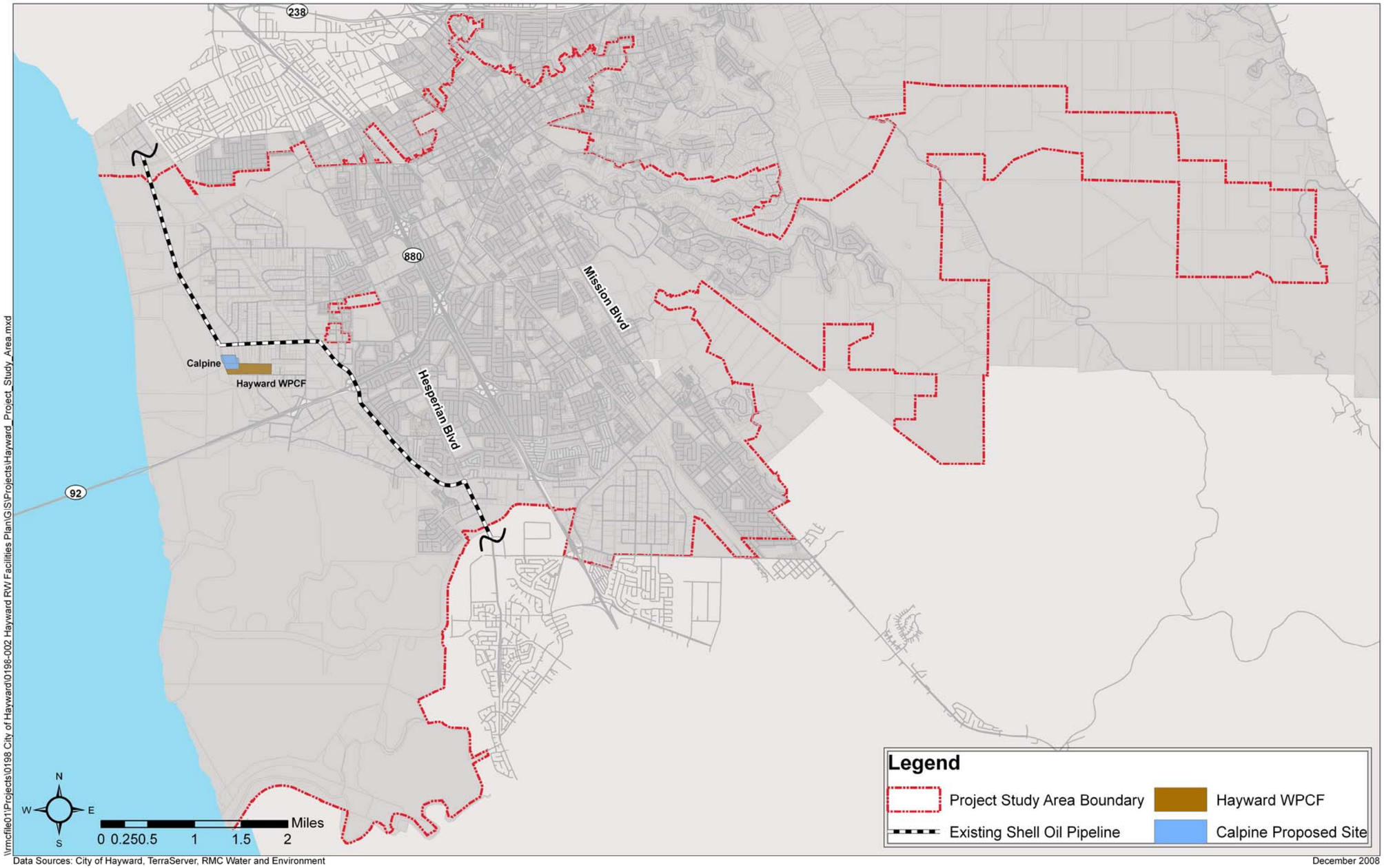
The study area for this Plan is defined as the City in its entirety. The City covers approximately 61 square miles including a large portion of tidal wetlands on the San Francisco Bay shoreline. **Figure 2-1** illustrates the project study area boundary.

The City has a Mediterranean coastal climate, with mild dry summers and cool winters. Temperatures vary from average highs September of 73.5 degrees Fahrenheit (deg F) to average lows in January of 42 deg F. Rainfall averages 18 inches annually with most rain occurring between October and April.

There is a mixture of industrial parks, office parks, commercial areas, golf courses, recreational parks, residential areas, an airport, schools and open space throughout the City. The City has a large and diverse industrial section including food and beverage processors and high-technology manufacturing. Additionally, the City is home to two regional public post-secondary educational institutions - California State University – East Bay and Chabot Community College.

The City operates the City-owned utilities, including water distribution and wastewater collection and treatment services, within the City boundaries.

**Figure 2-1: Project Study Area**



## 2.2 Water Supply Management Issues

With increasing water demands forecasted over the next 20 years, the City's exclusive dependence on the SFPUC for water supplies raises several water supply management issues that recycled water could help address.

### 2.2.1 Water Demand

Per ABAG Projections 2007, the population in Hayward is expected to increase by 15.7% between 2008 and 2010. In addition to residential growth, the City targeting industrial economic growth in both information-based and traditional industries, with the latter contributing increased water demands in the future. **Table 2-1** summarizes the current and projected water demands in the City between 2005 and 2030. Values are shown as acre-foot per year (AFY).

**Table 2-1: Current and Projected Water Demands**

| | 2005 | 2010 | 2015 | 2020 | 2025 | 2030 |
|---|---|---|---|---|---|---|
| Demand (AFY) | 22,009 | 24,923 | 26,135 | 27,96 | 30,022 | 32,062 |

Source: UWMP, 2005

### 2.2.2 Water Supply

Since 1962, the City's sole source of potable water has been the City and County of San Francisco's regional system, operated by the San Francisco Public Utilities Commission (SFPUC). The SFPUC system supply is predominantly snowmelt from the Sierra Nevada Mountains, delivered through the Hetch Hetchy aqueducts.

The City also has five emergency groundwater wells located within City boundaries that can supply up to 13.6 mgd during short duration emergency use (UWMP 2005).

The City's dependence on SFPUC for potable water supplies leads to several potential issues that may be addressed or reduced by the use of recycled water in the City:

- **Water Supply Availability during Average Year.** Per the City's contract with SFPUC, the City has no cap on water supply usage from SFPUC. However, mounting pressure and competition for water supplied by SFPUC may put strain on SFPUC's ability to meet the City's demand. On October 30, 2008, SFPUC approved the Phased Water System Improvement Program (WSIP) Goals and Objectives and adopted the associated California Environmental Quality Act (CEQA) Findings. Per the PEIR on SFPUC WSIP (ESA+Orion 2008), SFPUC is planning on limiting average annual water deliveries supplied from its watersheds to 265 million gallons per day (mgd) at least through 2018, whereas the demand on the SFPUC regional water system by 2018 is projected to be 285 mgd. To bridge the 20 mgd gap, the SFPUC proposes development of 10 mgd of local conservation, recycled water, and groundwater projects within San Francisco and an additional 10 mgd of local conservation, recycled water, and groundwater projects within the overall San Francisco Bay service area. Three approaches are proposed to develop the 10 mgd of local conservation, recycled water, and groundwater projects within the overall San Francisco Bay service area:
    - The SFPUC, wholesale customers, and Bay Area Water Supply and Conservation Agency (BAWSCA) partner to develop an additional 10 mgd; or
    - BAWSCA and the wholesale customers develop an additional 10 mgd, independent of SFPUC; or
    - Individual wholesale customers develop 10 mgd on their own within their individual services areas.

BAWSCA and the wholesale customers are currently determining the best approach to develop the additional 10 mgd of local supply/conservation needed. Supplying recycled water in the City could potentially help meet the 10 mgd gap.

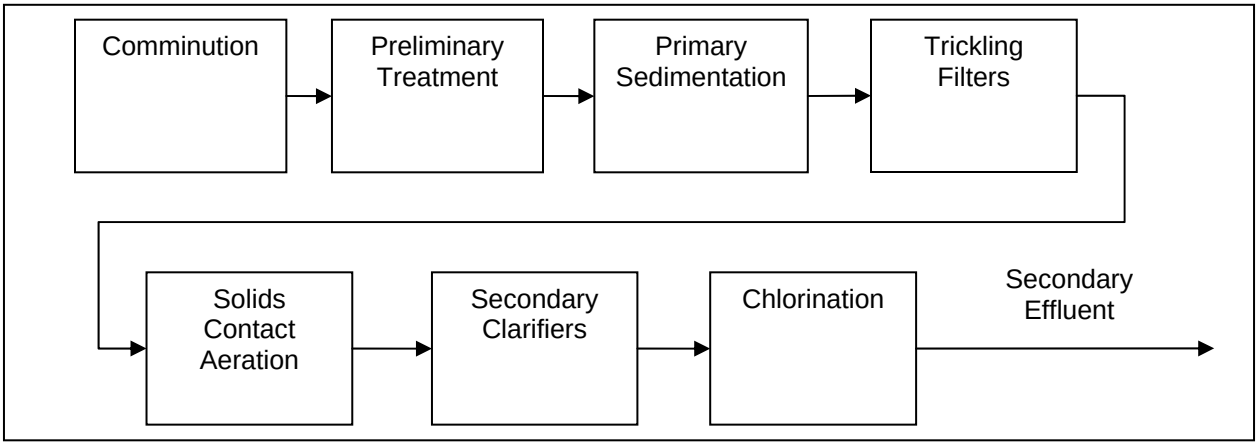
- **Water Supply Reliability during Periods of Drought.** The majority of SFPUC water supplies are surface water and susceptible to drought conditions. The City estimates that in the third year of a drought, the supplies from SFPUC could be reduced to 76% of normal. Supplying recycled water to non-potable demands would dampen drought impacts on potable water supply.
- **Water Supply Reliability during Service Disruptions.** The majority of SFPUC water supplies are piped in from outside the City's immediate area. The City's exclusive dependence on the SFPUC for potable water leaves the City in a vulnerable position to service disruptions and outages if an event (e.g. earthquake) damages the transmission system. To address this issue, SFPUC is in the midst of undertaking the WSIP to address reliability, and seismic protection in their system. In addition, recycled water would allow for the use of a local, reliable water supply for non-potable demands in the event of service disruptions.
- **Water Supply Cost.** SFPUC wholesale water currently costs an average of $1.43 per hundred cubic feet (ccf) or about $623 per acre-foot (AF). The City's potable water rates range between $2.15 and $3.12/ccf depending on water usage. The City anticipates increases in the cost of SFPUC water as the result of implementing the WSIP capital improvement projects. Reducing the need to purchase potable water for non-potable uses will lessen the impact to the City of the increasing SFPUC costs. Based on the most recent projections from SFPUC, the wholesale water cost will rise to $1,500/AF by 2016.

## 2.3 Wastewater Discharge Management Issues

The City owns and operates its own wastewater treatment facility, the Hayward Water Pollution Control Facility (WPCF), and is a member of EBDA. EBDA is a joint powers authority of five agencies that dispose of treated wastewater in the San Francisco Bay through a common deepwater outfall.

The Hayward WPCF is permitted to treat up to 16.5 mgd of wastewater with primary through advanced secondary treatment. This capacity will increase to 18.5 mgd after certain improvements to the WPCF, namely two new final clarifiers, have been constructed and placed in service. The WPCF utilizes primary clarification, a high-rate trickling filter, secondary clarification, and chlorination. The chlorine residual is removed within the EBDA system before disposal to San Francisco Bay. **Figure 2-2** illustrates the existing wastewater treatment process at the Hayward WPCF.

**Figure 2-2: Existing Wastewater Treatment Process at the Hayward WPCF**




Source: Adapted from NPDES Permit, 2000

The WPCF is regulated by an NPDES permit issued by the San Francisco Bay Regional Water Quality Control Board (RWQCB). The NPDES permit is issued to EBDA. The WPCF currently meets all the NPDES permit requirements, however, the RWQCB has begun to set lower discharge limits for pollutants during permit renewal.

As a San Francisco Bay discharger, the WPCF may in the future be required to meet increased water quality restrictions for effluent discharges.

Implementation of a recycled water project as envisioned in this plan could aid in achieving future NPDES permit limits in two ways:

- By decreasing mass loading of regulated constituents to the San Francisco Bay through reduction of effluent flows being discharged to the Bay; or
- By decreasing both mass loading and concentration of certain regulated constituents should all effluent flow be treated to a tertiary level.

Implementation of a recycled water project as envisioned in this plan is not anticipated to have any negative effects on the receiving waters (deepwater outfall in San Francisco Bay).

## 2.4 Existing Recycled Water Uses

There are two existing recycled water customers within Hayward's city limits – the Skywest Golf Course operated by the HARD, which uses combined secondary treated effluent from the EBDA pipeline; and the Hayward Marsh operated by EBDA, Union Sanitary District and the East Bay Regional Parks District, which uses secondary treated effluent from Union Sanitary District. The golf course and marsh utilize 180 AFY and 3,475 AFY of secondary treated water, respectively (UWMP 2005).

The WPCF also has a small on-site treatment facility to produce recycled water for use at the WPCF (No. 3 Water).

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# Chapter 3 Market Assessment

A preliminary recycled water market assessment was conducted as part of the Recycled Water Feasibility Study in 2007. The assessment consisted of three major tasks: preliminary demand assessment, preliminary water supply assessment, and preliminary water quality assessment.

For the purpose of this Plan, the preliminary recycled water market assessment needed to be refined as follows:

- **Confirm preliminary demand estimates and expand the potential user base to include other existing and future customers** – the Feasibility Study only considered the largest existing potable water customers. Other potential customers (existing and future) in the Study Area should be considered.
- **Confirm available quantities of recycled water** – the Feasibility Study made assumptions relative to availability of recycled water from Calpine and/or City-owned sources; these assumptions need to be confirmed based on latest discussions with Calpine.
- **Confirm the water quality assessment** – the Feasibility Study included a cursory water quality assessment based on typical water quality objectives for certain category of customers; this assessment should be refined based on direct input from potential customers, additional water quality data, and other considerations such as local soil types.
- **Identify any retrofit issues or other potential user concerns** – the Feasibility Study made assumptions about potential retrofit needs and potential user concerns (including water quality, retrofit costs) based on experience from other recycled water projects in the San Francisco Bay Area. This assessment should identify retrofit issues and potential concerns specific to this Project based on direct input from potential customers in the Study area.

This refined market assessment will form the basis for refining the recycled water project alternatives described in the Feasibility Study and updating the evaluation.

## 3.1 Potential User Base and Demand Assessment

### 3.1.1 Potential Uses & Customers

A list of potential uses for the City of Hayward was developed in the Feasibility Study based on recyclable water uses allowable under Title 22 of the California Code of Regulations. A preliminary database of potential recycled water customers based on the identified uses was developed in the Feasibility Study. The main potential uses and associated recycled water customers within the Study Area identified in the Feasibility Study are summarized in **Table 3-1**. The full database of customers is included in **Appendix B -Potential Recycled Water Customers.** No other uses other than those identified in the Feasibility Study were considered herein.

**Table 3-1: Main Potential Uses & Recycled Water Customers**

| Allowable Uses [a] | Minimum Treatment Level | Applicable Uses within the Study Area | Potential Recycled Water Customers |
|---|---|---|---|
| Irrigation | Tertiary | Parks and Playgrounds | Parks and playgrounds under the jurisdiction of the Hayward Area Recreation and Park District (HARD). |
| Irrigation | Tertiary | School Yards | School yards under the jurisdiction of the Hayward Unified School District (HUSD) or private schools (e.g. Moreau Catholic High School). |
| Irrigation | Tertiary | Any other irrigation uses not prohibited by other provisions of the California Code of Regulations | Landscaped areas at business parks, colleges and universities. |
| Irrigation | Disinfected Secondary | Restricted Access Golf Courses | Skywest Golf Course (managed by HARD) is already being served with recycled water from the EBDA pipeline. Additional golf courses within Hayward city limit (Mission Hills, managed by HARD, and Stonebrae, private). |
| Irrigation | Disinfected Secondary | Cemeteries | Cemeteries within Hayward city limit (e.g. Holy Sepulchre Cemetery). |
| Irrigation | Disinfected Secondary | Freeway Landscaping | Caltrans-owned landscaped parcels underneath freeway ramp. |
| Industrial/ Commercial | Tertiary | Industrial cooling or air conditioning involving a cooling tower, evaporative condenser, or mister | Industrial customers in the Top 90 Private Water Users. |
| Industrial/ Commercial | Tertiary | Commercial Laundries | Commercial laundry operators in the Top 90 Private Water Users. |
| Industrial/ Commercial | Tertiary | Automatic Commercial Car Washes | Commercial car washes in the Top 90 Private Water Users. |
| Industrial/ Commercial | Disinfected Secondary | Industrial cooling or air conditioning not involving a cooling tower, evaporative condenser, or mister | Industrial customers in the Top 90 Private Water Users. |
| Industrial/ Commercial | Disinfected Secondary | Industrial boiler feed | Industrial customers in the Top 90 Private Water Users. |

Notes:
a. Per California Code of Regulations Title 22, Division 4, Chapter 3, Article 3, Sections 60303-60307

It is not practical to serve tertiary and disinfected secondary water to two separate sets of customers (except for Skywest Golf Course, which is already supplied with disinfected secondary from the EBDA pipeline). It is therefore assumed that tertiary treated water will be provided to all potential customers to maximize the potential recycled water market within the City.

### 3.1.2 Refinement of Potential Customers

As part of this Plan, the preliminary database was reviewed with the City to determine if there were additional existing and future recycled water customers within the identified uses listed in Table 3-1. The review approaches and conclusions are summarized in **Table 3-2**. Based on Table 3-2 conclusions, the list of potential customers developed in the Feasibility Study and included in Appendix B -Potential Recycled Water Customers was not modified.

**Table 3-2: Other Potential Uses**

| Review Approach | Conclusions |
|---|---|
| Identification of additional existing commercial/industrial customers within a two-mile radius of the WPCF [a] | No additional significant commercial/industrial water customers were identified in consultation with the City of Hayward. However, it was noted in the review that there are small customers (e.g. businesses with greenscapes) along the pipe alignments that can be served without the need for changes to the Project definition. |
| Identification of potential customers associated with future redevelopment in the Study Area. | Although the 2005 Urban Water Management Plan identifies an increase in water demand associated with industry, no specific redevelopment projects were identified based on conversations with the City's Planning Department [b].<br><br>However, it was noted during Project development that the existing industrial area north of the Hayward WPCF along Whitesell Road could transition into an area for water-intensive industries that would be able to use recycled water in their operations. There was no basis for evaluating this potential recycled water demand but this information was used in the development of the pipeline alignment discussed in Chapter 4.<br><br>It is recommended that future updates of the Facility Plan include information from the upcoming 2010 Urban Water Management Plan. |

Notes:
a. Two-mile radius was selected to maximize the customer base closest to the WPCF while trying to avoid crossings of major roadways (e.g. Highway 880).
b. Conversations held by Marilyn Mosher with the Planning Department in May 2008.

### 3.1.3 Demand Estimate Methodologies

The methodologies listed below were used in the Feasibility Study to estimate recycled water demands based on available data and user type:

#### Method 1

- **Customers with Irrigation as primary potential recycled water use (with separate irrigation accounts)** – Demand for these customers was estimated based on the assumption that 100 percent of their 2006 water use as recorded on the separate irrigation meter could be converted to recycled water. As noted in the Feasibility Study, 2006 data were used – which was a relatively wet year. The demand might therefore be slightly underestimated but deemed appropriate for the Facility Plan.

#### Method 2

- **Customers without separate accounts to track indoor and outdoor water use** – Potential recycled water demand was derived from 2006 potable water usage by applying a conversion factor based on business code for each user. The list of business codes and corresponding

conversion factors is included in the Feasibility Study. Conducting a customer survey was recommended as part of the Feasibility Study to confirm the conversion factor and potential recycled water demand, particularly for large customers.

## Method 3

- **Stonebrae Golf Course** – Potential recycled water demand for the Stonebrae Golf Course was estimated based on peak month demand data for Stonebrae, provided by the City, as well as an average annual demand calculated based on the demand pattern for the another golf course in the City, Skywest Golf Course.

As part of this Facility Plan, the preliminary demand estimates associated with customers for which Method 2 was applied were refined as described below (Method 4). No refinements were made to the demand estimates associated with customers for which Method 1 and Method 3 were applied, as the estimates were considered fairly representative (Method 1), or because no new information was available (Method 3).

## Method 4

- **Telephone Survey for Specific Existing, Large Water Customers** - A telephone survey was conducted for specific existing water customers for which Method 2 above was originally used. The customers that were contacted are listed in **Table 3-3**. The survey list was developed in collaboration with the City and includes fifteen potential recycled water customers located approximately within a 2-mile radius of the Hayward WPCF, with significant water use and the potential for utilizing recycled water for one of the following applications: landscape irrigation, industrial cooling, industrial boiler feed, or commercial laundries purposes. A copy of the telephone survey questions and survey results is provided in Appendix C -Customer Survey Results Summary.

**Table 3-3: Customer Survey Contact List and Results Summary**

| ID | Customer Name | Business Type | Primary Use for Recycled Water | Prelim. Average Demand [a] (mgd) | Revised Planning Demand (mgd) | Revised Planning Demand (AFY) |
|---|---|---|---|---|---|---|
| 1 | Bottling Group LLC (Pepsi) | Beverage Manufacturing | Irrigation [d] | 0.008 | 0.027 | 31 |
| 2 | Berkeley Farms | Dairy Processing | Irrigation [d] | 0.002 | 0.014 | 16 |
| 3 | Kobe Precision | Wafer Products Reclamation | Industrial | - | 0.002 | 2 |
| 4 | Shasta Beverages | Beverage Manufacturing | Industrial | - | 0.007 | 8 |
| 5 | Rohm & Haas | Chemicals Water-based Paints Manufacturing | Industrial | 0.02 | 0.02 | 22 |
| 7 | Kaiser Medical Center | Hospital | Irrigation [d] | 0.001 | 0.005 | 6 |
| 10 | Cell Genesys | Biological Product Manufacturing | Industrial | 0.002 | 0 | 0 |
| 12 | St. Rose Hospital | Hospital | Irrigation [d] | 0.003 | 0.003 | 4 |
| 14 | Columbus Manufacturing | Food Manufacturing | Irrigation [d] | 0.002 | 0.003 | 4 |
| 19 | Henkel Adhesive Corp. | Adhesive Manufacturing | Industrial | 0.003 | 0.006 | 7 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 26 | Baxter Healthcare Corp. | Medical Equipment Manufacturing | Irrigation | 0.004 | 0.004 | 5 |
| 28 | Food Depot and United Catering | Food Product Manufacturing | Irrigation | - | 0.002 | 3 |
| 29 | Life Chiropractic College | Educational Institution | Industrial | 0.003 | 0.003 | 3 |
| 30 | SCA Packaging | Packaging Manufacturing | Industrial | 0.003 | 0.001 | 2 |
| 37 | Friendly Wash Coin Laundry [b] | Coin-Operated Laundromat | Industrial | 0.009 | 0.0 | 0 |
| 38 | Pentagon Industries | Semiconductor Manufacturing | Industrial | 0.001 | 0.0 | 0 |
| 63 | Gilllig Corp. | Bus Manufacturing | Industrial | 0.004 | 0.001 | 1 |
| 65 | Fairfield Inn and Suites | Hotel | Commercial | 0.001 | 0.001 | 1 |
| 74 | Novo Nordisk Delivery [c] | Medical Equipment Manufacturing | Industrial | 0.002 | 0.0 | 0 |
| | | | **TOTAL [e]** | **0.1** | 0.1 | 114 |

Notes:
a. Preliminary estimates reported in the Feasibility Study.
b. Removed from survey list after determining that the use of recycled water is unsuitable for publicly accessible coin-operated laundries.
c. Removed from survey list due to ceasing of operations in June 2008
d. Overall primary potable water use at this site is industrial, but industrial recycled water use is precluded based on product or service type (e.g. food processing, public exposure).
e. Rounded to nearest 1 AFY or 0.1 mgd.

### 3.1.4 Demand Estimate

**Table 3-4** summarizes the potential recycled water demand for three major categories of customers within the Study area. **Figure 3-1** shows the locations of potential recycled water customers in the City of Hayward and associated demand. The detailed list of potential customers, including user names, business code, recycled water use type, 2006 potable water use, potential recycled water demand (average and peak), and methodology used is attached in Appendix B -Potential Recycled Water Customers.

**Table 3-4: Recycled Water Demand Estimate**

| Type of Use | No. of Customers [a] | Average Annual Demand (mgd) | Average Annual Demand (AFY) | Peak Month Demand (mgd) |
|---|---|---|---|---|
| Calpine | 1 | 3.1 | 3,475 | 4.0 |
| Irrigation | 126 | 1.5 | 1,662 | 3.4 |
| Industrial/Commercial | 49 | 0.1 | 165 | 0.1 |
| Total | 176 | 4.7 | 5,302 | 7.6 |

Notes:
a. Customers with both irrigation and industrial uses were counted in each group.

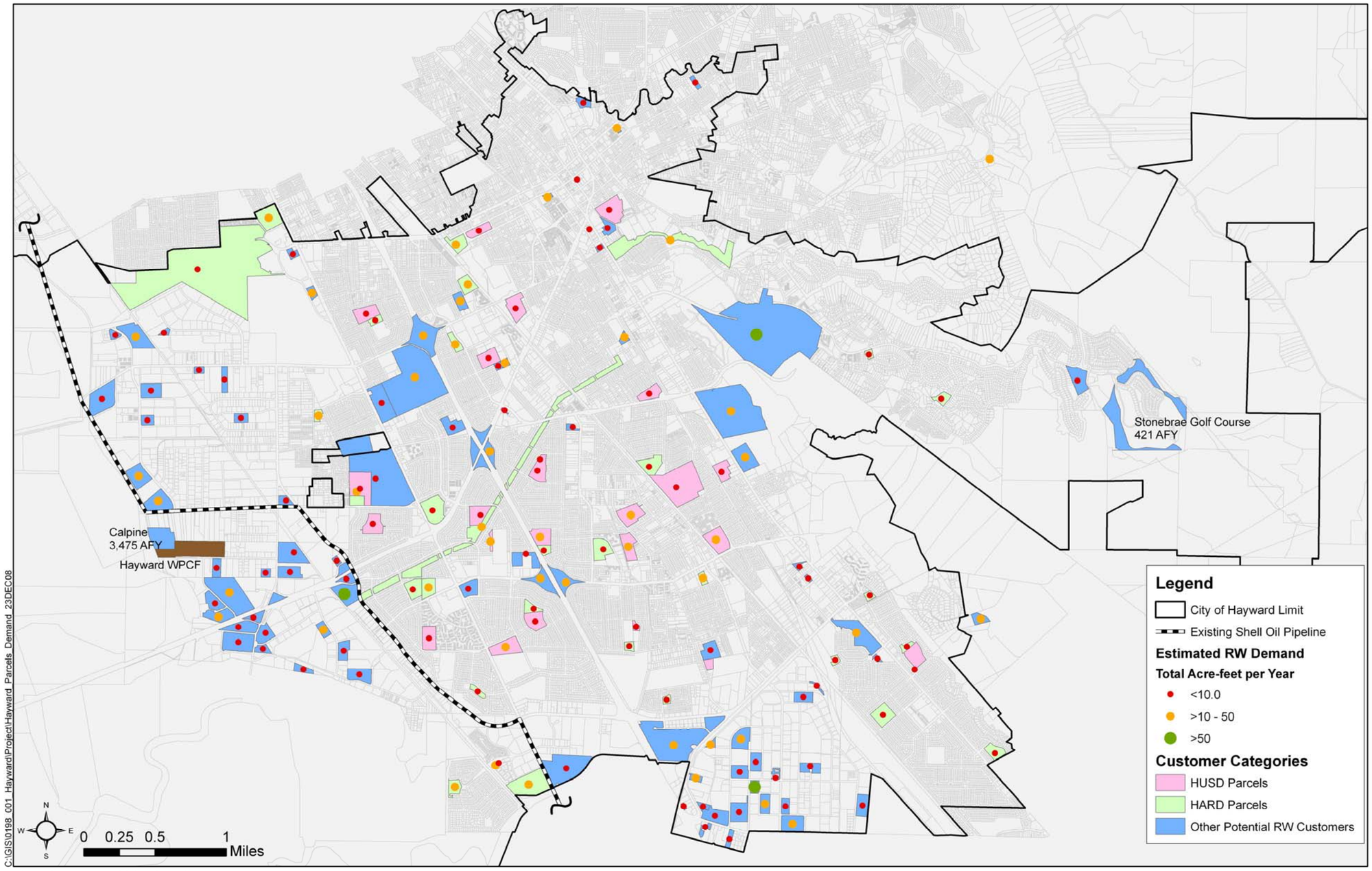
**Average Annual Demand**

- Average annual demand is the existing or potential average annual recycled water demand for each potential recycled water customer established based on methods 1, 3 or 4.

## Peak Demand

- Peak monthly demand - A monthly peaking factor was applied to the average monthly flow to obtain the average daily flow for a peak month. Using data from City of Hayward bi-monthly irrigation meter water records, a monthly peaking factor was estimated at 2.3.
- Peak hourly demand – An hourly peaking factor was applied to the maximum month, average day peak to obtain the maximum month, average day, peak hour flow. A peaking factor of 3.0 was used for irrigation demand assuming an 8-hour irrigation period from 10pm to 6am. See Appendix B -Potential Recycled Water Customers for peak hour demand by customer.

**Figure 3-1: Potential Recycled Water Customers and Demand Estimate**




Source: City of Hayward, RMC Water and Enviroment

## 3.2 Recycled Water Supply Assessment

The WPCF does not currently produce tertiary treated water. This section provides information on the secondary treated water flows at the WPCF that correspond to the available flows for tertiary treatment. The information in this section was used in Chapter 4 and Chapter 5 to define tertiary treatment and storage facilities planning-level design criteria.

The recycled water supply assessment was completed by utilizing projected wastewater flows prepared by the City for their 2005 UWMP and actual 2006 effluent flows from the City.

The current and projected secondary-treated average dry weather wastewater flows (ADWF), which correspond to the total amount of water available for tertiary treatment, are shown in **Table 3-5.**

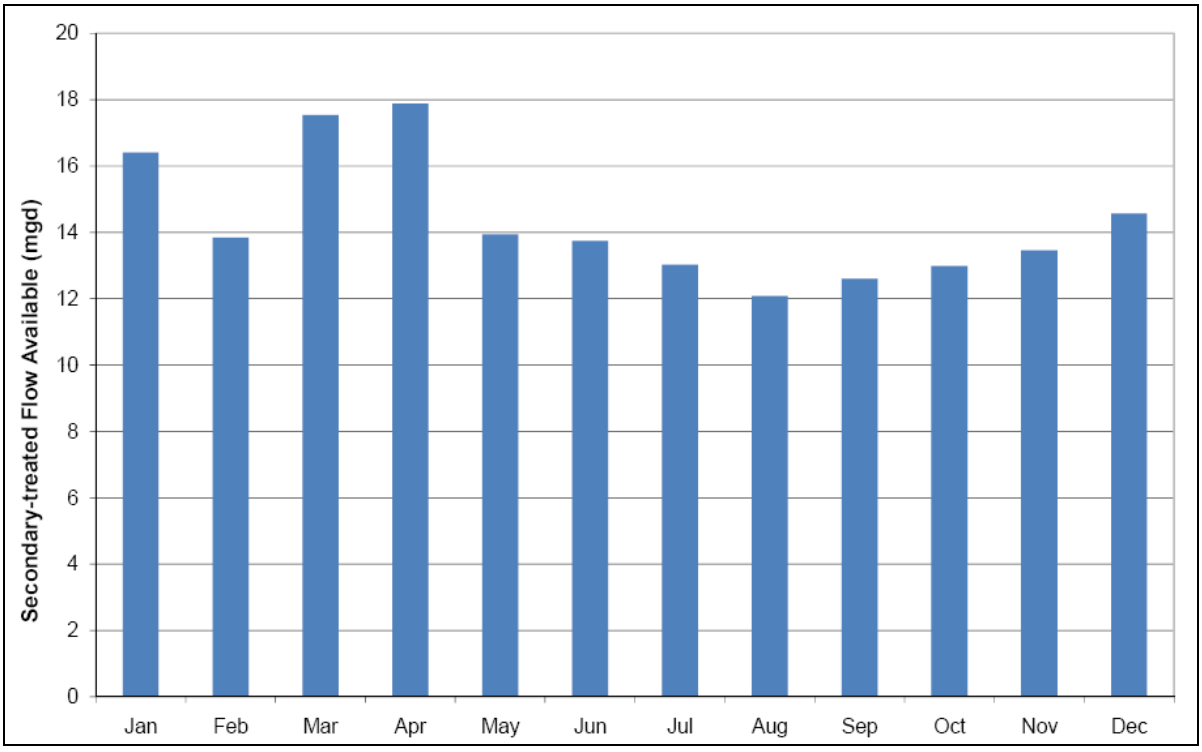
**Table 3-5: Secondary-Treated Wastewater Flows Available for Tertiary Treatment**

| | Actual | Projected | | | |
|---|---|---|---|---|---|
| | 2006 | 2010 | 2015 | 2020 | 2025 |
| Permitted Capacity, ADWF (mgd) | 16.5 | 16.5 | 18.5 [a] | 18.5 | 18.5 |
| Produced, ADWF (mgd) [b] | 13.2 | 12.5 | 15.2 | 16.3 | 18.5 |

Notes:
a. The City plans to upgrade the WPCF to raise the permitted plant capacity from 16.5 to 18.5 mgd
b. Sources: 2005 UWMP, with updates by City based on 2008 ADWF.

**Figure 3-2** shows the projected monthly availability of secondary-treated water supplies in Year 2010. The Year 2010 monthly variations in wastewater flows were apportioned from the Year 2006 monthly flows provided by the City.

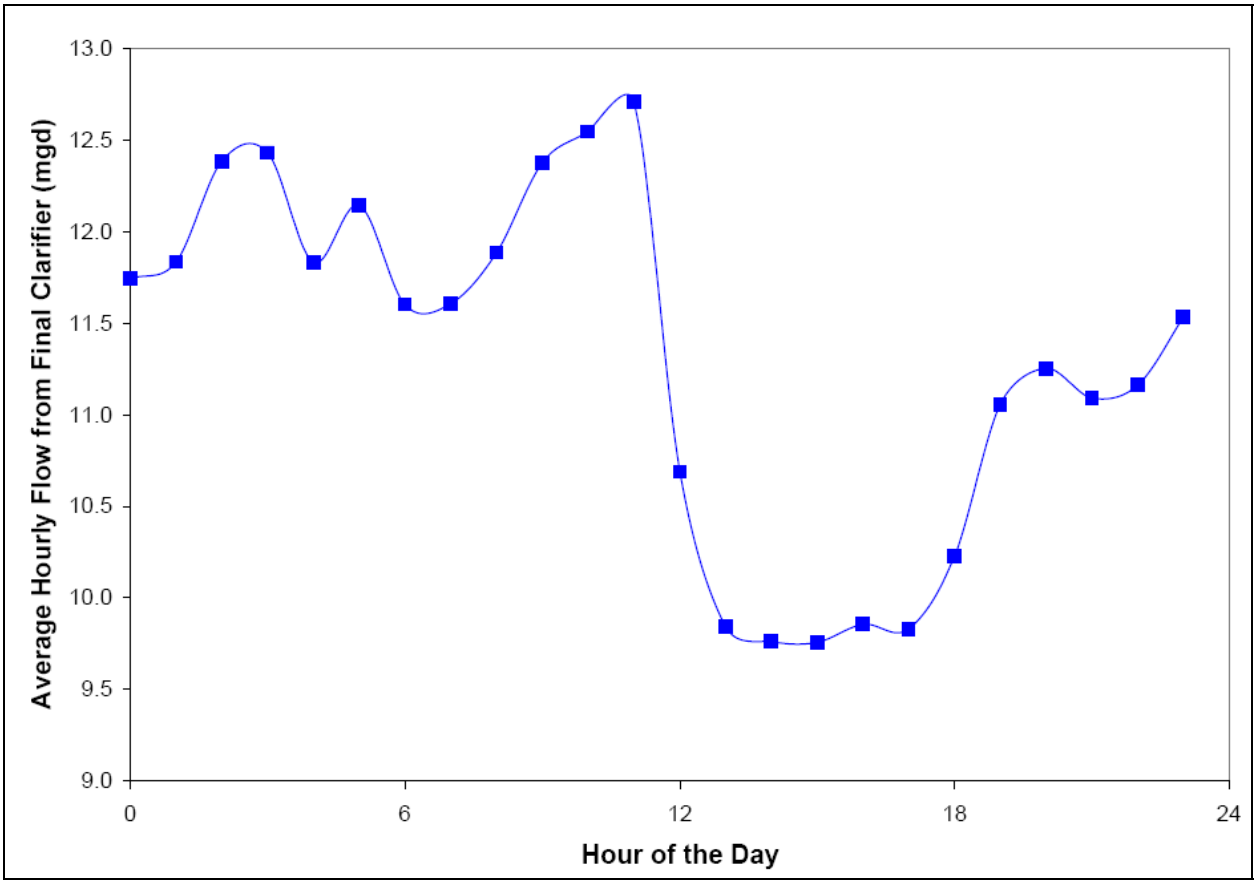
**Figure 3-2: Estimated Monthly Flows Available for Tertiary Treatment in Year 2010**




Source: 2010 average annual projected wastewater flows from 2005 UWMP; apportioned based on 2006 City monthly flow data.

Typical, summer time diurnal variations in secondary-treated flows from the WPCF are shown in **Figure 3-3**. The daily variations in wastewater flows were derived from 10-minute interval flow data from the final clarifier at the Hayward WPCF for the month of July 2008.

**Figure 3-3: Diurnal Variations in Secondary-Treated Wastewater Flows**




Source: July 2008 10-minute interval flow data from WPCF, 2008

## 3.3 Recycled Water Quality Assessment

The Feasibility Study included a cursory recycled water quality assessment based on typical water quality objectives for certain category of customers.

As part of this Plan, the preliminary water quality assessment performed in the Feasibility Study was refined through the following:

- Updating the list of representative constituents and associated water quality targets for various categories of customers based on information collected through the customer survey results (see Appendix C -Customer Survey Results Summary**). Table 3-6** lists the target concentrations for industrial and landscape irrigation applications within the Study area.
- Refining future recycled water quality estimates based on final clarifier effluent water quality data collected in April 2008, after upgrades to the City's secondary treatment processes were completed. The refined estimates are reflected in Table 3-6.
- Considering hydrogeological and soil characteristics, including soil drainage class and depth to water table. **Figure 3-4** shows the soil drainage characteristics in the vicinity of the project area. Soil drainage characteristics are important to consider in the use of recycled water for irrigation because the permeability of the soil will influence the potential accumulation of salts from the

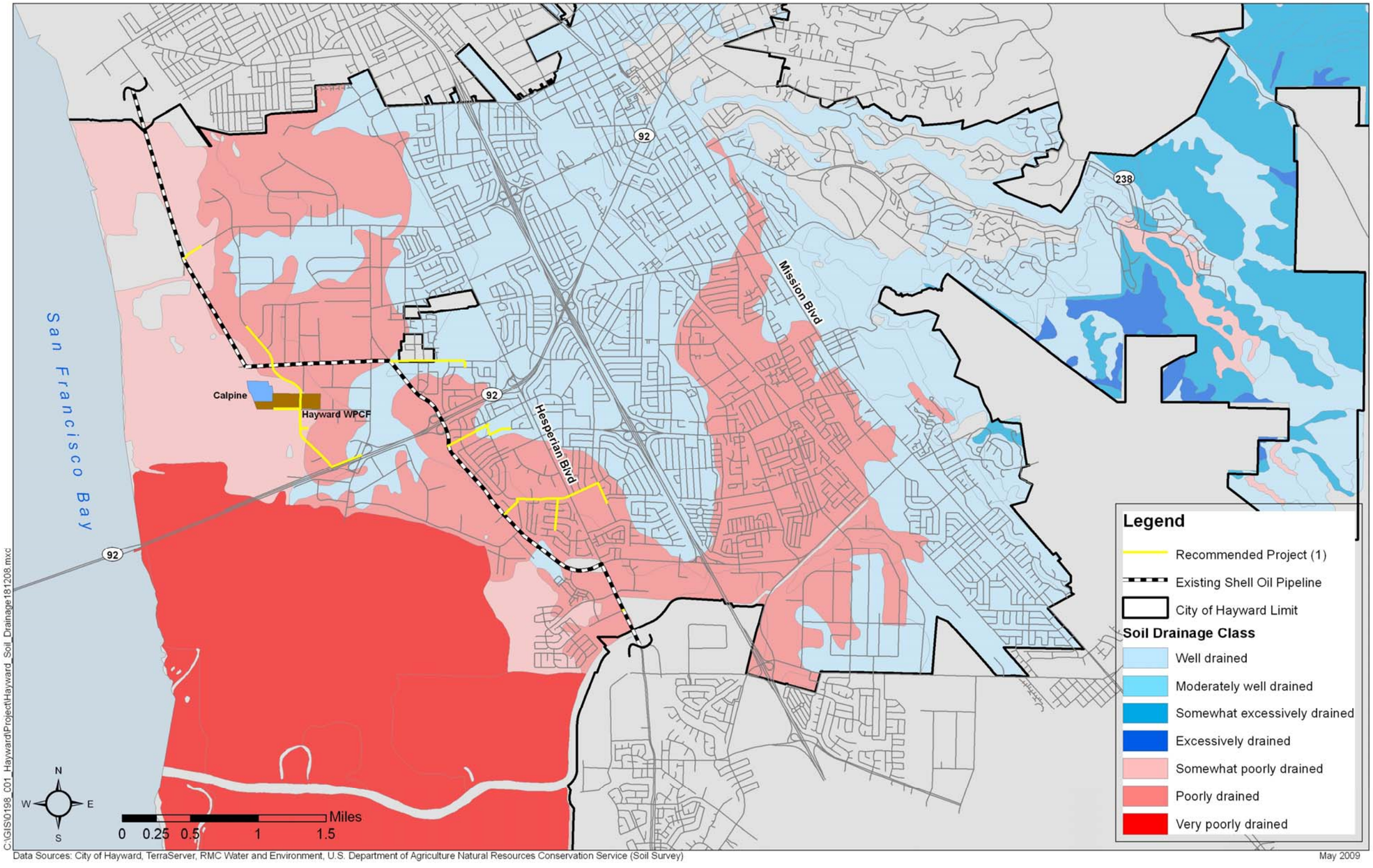
recycled water in the root zone. Soil drainage characteristics are also important in determining whether flushing should be implemented as a salinity management technique. **Figure 3-5 s**hows the average minimum depth to the water table. Minimum depth to the water table and other hydrogeological features such as presence of an aquitard are parameters to be considered when assessing the potential impact of recycled water on local groundwater quality. The soil drainage and depth to the water table information was obtained from the Soil Survey Geographic Database compiled by the United States Department of Agriculture, Natural Resources Conservation Service.

**Table 3-6: Recycled Water Quality Assessment**

| Representative Constituent | Projected RW Quality based on Current Hayward WPCF WQ and Title 22 Requirements [a] | Category of Customers | Maximum Target Concentration | Notes |
|---|---|---|---|---|
| Turbidity | <2 NTU [c] | All | 2 NTU[c] | No issue |
| Total Suspended Solids (TSS) | <3.0 mg/L | Industrial Boiler Feed Water | 10 mg/L (<150 psig Pressure Level) [d] | No issue |
| | | Industrial Cooling Water Processes | 100-300 mg/L [d, e] | No issue |
| Total Dissolved Solids (TDS) | 430 - 640 mg/L [b] | Irrigation | 500-700 mg/L [f] | Potential issue (refer to Section 3.3.1) |
| | | Industrial Boiler Feed Water | 700 mg/L (<150 psig Pressure Level) [d] | No issue except for Calpine [h] |
| | | Industrial Cooling Water Processes | 4,000 mg/L [d, e] | No issue |
| Sodium | 83 - 88 mg/L | Irrigation | 60-100 mg/L [f] | Potential issue (refer to Section 3.3.1) |
| Chloride | 81 - 88 mg/L | Irrigation | <100 mg/L | No issue |
| | | Industrial | 200 mg/L [d] | No issue |
| Adjusted Sodium Absorption Ratio (SAR) | 1.8 | Irrigation | <5.0 [g] | No issue |
| Silica | 13 -15 mg/L | Industrial Boiler Feed Water | 30 mg/L (<150 psig Pressure Level) [d] | No issue |
| | | Industrial Cooling Water Processes | 150 mg/L as $SiO_2$ [d, e] | No issue |
| Total Alkalinity | 250 - 268 mg/L as $CaCO_3$ | Industrial Cooling Water Processes | 30 mg/L as $CaCO_3$ (without scale inhibitor), 50 mg/L as $CaCO_3$ (with scale inhibitor) [d, e] | Potential issue (refer to Section 3.3.2) |
| | | Industrial Boiler Feed Water | 350 mg/L (<150 psig Pressure Level) [d] | No issue |

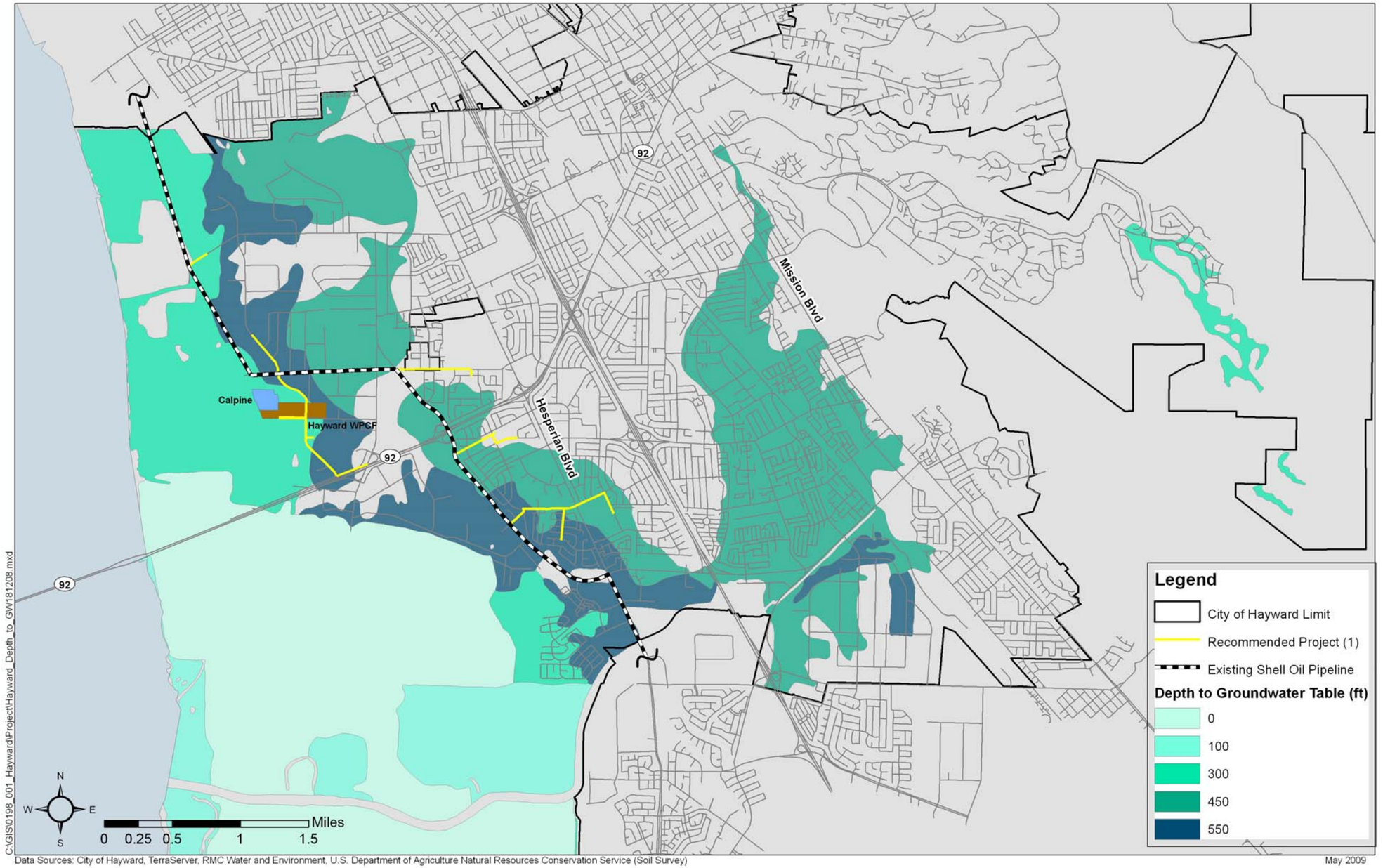
Notes:
a. Water quality data for all constituents except Turbidity were obtained from final clarifier effluent sampling over a normal week in April 2008. Turbidity data was obtained from final clarifier effluent sampling over a normal week in July 2008.
b. TDS data obtained from the treatment suggest seasonal variations in TDS concentrations in the source of wastewater entering the Hayward WPCF. At this point, these seasonal variations are not expected to impact the suitability of the recycled water for irrigation or industrial applications.
c. Title 22 requirement. Current WPCF WQ is 12.4 NTU.
d. Loretitsch, G. Puckorius & Associates. Table 2.01.
e. DiFillippo, M.N. (2006) Table 2-1.
f. Based on typical irrigation guidelines and experience with operating recycled water projects in the Bay Area. May vary by plant and soil type.
g. Maximum recommended concentration may vary with soil type.
h. Calpine plans to utilize a microfiltration/reverse osmosis unit, or equivalent, on-site to meet TDS requirements for industrial boiler feed water.

**Figure 3-4: Soil Drainage Characteristics**




Notes:
1. See Chapter 5 for discussion of Recommended Project

**Figure 3-5: Depth to Groundwater Table**




Notes:
1. See Chapter 5 for discussion of Recommended Project

**Table 3-7** summarizes the specific water quality-related elements to be incorporated in the Project alternative definition or Implementation Plan based on information presented in Table 3-6 and Figure 3-4 and Figure 3-5, and analysis provided in the paragraphs below for each water quality category.

**Table 3-7: Water Quality-Related Project Elements to Be Considered**

| Water-Quality Related Element | Recommendations | |
|---|---|---|
| Irrigation | Project Definition | ▪ No treatment needs anticipated above and beyond Title 22 requirements. |
| | Implementation Plan | ▪ Monitor water quality for constituents of concern to customers (above and beyond Title 22 requirements).<br>▪ Communicate with potential customers on potential constituents of concern for plant health and develop salinity management strategies (e.g. Best Management Practices) as needed. |
| Industrial Cooling | Project Definition | ▪ Reduce high alkalinity levels (which may lead to scaling problems) with onsite treatment methods such as lime softening and the addition of acid, if on-site treatment is not already provided.<br>▪ Reduce TDS for Calpine's needs with onsite treatment methods such as microfiltration/reverse osmosis (MF/RO) |
| | Implementation Plan | ▪ Monitor water quality for constituents of concern to customers (above and beyond Title 22 requirements).<br>▪ Additional treatment onsite at Calpine (MF/RO) |
| Boiler Feed | Project Definition | ▪ No treatment needs anticipated above and beyond Title 22 requirements. |
| | Implementation Plan | ▪ Monitor water quality for constituents of concern to customers (above and beyond Title 22 requirements). |
| Groundwater Impacts | Project Definition | ▪ No major issue was identified at this time.<br>▪ Further consideration of the potential impact to groundwater quality associated with the percolation of recycled water from landscape irrigation will occur during CEQA review. |

### 3.3.1 Irrigation Uses

- The suitability of recycled water for landscape irrigation is in part related to the concentration of salt in the water, the amount applied and the physical characteristics of the soil. Good permeability or drainage keeps the potential accumulation of salts in the root zone at manageable levels and allows the leaching of excess salts from the root zone when subjected to heavier irrigation or flushing.
- Based on the City's current effluent water quality monitoring data, salinity levels (measured by Total Dissolved Solids) are within the acceptable ranges for landscape irrigation uses. It should be noted that some species such as Redwood trees have shown sign of being more sensitive to salt than other species. Openly communicating with potential customers on recycled water quality in terms of constituents of potential concerns for plant health is therefore important.

- The area in the vicinity of the Hayward WPCF and Calpine and areas along the Shell Oil pipeline are generally characterized by poor soil drainage (Figure 3-4).
- Input obtained from HARD indicated that water quality and soil drainage is one of their major concerns for the use of recycled water (see Appendix A -HARD and HUSD Meeting Notes).
- Best Management Practices such as monitoring of soil salinity levels, occasional flushing of additional water through the soil, or annual flushing of the soil with potable water to decrease the concentration of salt, will likely need to be implemented to prevent or reduce salinity impacts. These Best Management Practices would be applied by individual customers. A more "regional" approach to managing recycled water quality, such as adding gypsum to the recycled water at the treatment plant, or blending recycled water with potable water to lower salt concentrations is not anticipated to be necessary in the short term.

### 3.3.2 Industrial Cooling Use

- Water quality sampling data collected after completion of the upgrades to the City's secondary treatment process indicate that total suspended solids (TSS), total dissolved solids (TDS), and silica concentrations in the treated effluent are within the recommended ranges for water-cooled industrial processes. Alkalinity and turbidity levels in the sampled effluent currently do not fulfill the criteria for industrial cooling water, but may be reduced through treatment methods listed below.
    - Alkalinity:
        - High alkalinity levels may cause scaling problems, but this can be treated through lime softening, which involves the use of lime to increase the pH of the water to approximately 11 to allow calcium and magnesium to precipitate out. The alkalinity of the water may then be decreased by the addition of acid.
    - Turbidity:
        - High turbidity levels may be indicative of water quality issues, but this can be addressed with treatment through a flocculating clarifier followed by filtration during the tertiary treatment process.
- Based on results of the water quality sampling, recycled water produced at the treatment plant should be suitable for water-cooled industrial processes, with proper alkalinity reduction measures and turbidity treatment in place.
- Surveyed customers have existing onsite treatment systems and will not need additional onsite treatment beyond Title 22 requirements.

### 3.3.3 Boiler Feed Use

- Total suspended solids (TSS), total dissolved solids (TDS), silica and alkalinity concentrations measured in the sampled effluent are within the recommended ranges for boiler feed water users. This indicates that recycled water produced at the treatment plant should be suitable for boiler feed uses.
- Some customers interviewed in the phone survey expressed concern over the potential for bacterial regrowth, which can be mitigated by maintaining a chlorine residual in recycled water (standard O&M practice).

### 3.3.4 Potential Impact to Groundwater Quality

- Potential impact to groundwater quality associated with percolation of recycled water from landscape irrigation is typically addressed during CEQA review and in the Regional Water Quality Control Board water recycling permit.

- A preliminary evaluation was performed as part of this water quality assessment to identify any potential fatal flaw or facilities to be incorporated in the project definition or implementation plan.
- The main aquifer in the Project area is the Niles Cone Subbasin of the Santa Clara Valley Groundwater Basin. The Niles Cone Subbasin west of the Hayward Fault is composed of a series of gently westward dipping aquifers separated by extensive clay aquitards: the Newark Aquifer, which is confined except at the forebay area, and deeper confined aquifers including Centerville and Fremont. The Newark aquifer is an extensive permeable gravel and sand layer between 40 to 140 feet below ground surface, except in the forebay area where it begins near the surface. The aquifer is overlain by a thick layer of Young Bay Mud, which may be considered a restrictive layer with very low permeability, extending to the east of I-880. The immediate underlying geology in the vicinity of the Project area consists mainly of Young Bay Mud (California Groundwater Bulletin 118).
- Based on the City's current treated effluent water quality and the underlying hydrogeological and soil characteristics of the area, no potential issues are anticipated with the use of recycled water for irrigation. Impact on groundwater quality would be further analyzed in the environmental impact report.

## 3.4 General Retrofit Issues or Other Potential Customer Concerns

The Feasibility Study made assumptions about potential retrofit needs and potential user concerns (including water quality, costs) based on experience from other recycled water projects in the San Francisco Bay Area.

This assessment gathered more specific information on retrofit issues and potential concerns specific to this Project based on direct input from potential customers in the Study area obtained through the customers' survey, and individual meetings with HARD and HUSD.

### 3.4.1 Issues and Concerns

**Table 3-8** summarizes the issues and concerns raised by potential customers during the customer survey (see Appendix C -Customer Survey Results Summary for details) and subsequent meetings with the School Board and Recreation and Park Department (see Appendix A -HARD and HUSD Meeting Notes for meeting minutes).

It was determined that these concerns should not eliminate any customers from consideration in this Plan.

**Table 3-8: Customer Issues and Concerns**

| Issue | HARD | HUSD | Industrial Customers | Calpine [d] |
|---|---|---|---|---|
| Onsite retrofits [b,c] | None. | Concerned with public perception of health and safety and will need bilingual (English and Spanish) signage on school sites. | Concerned with the cost and logistics of onsite re-plumbing of existing water systems to incorporate recycled water use. | None. |

| Issue | HARD | HUSD | Industrial Customers | Calpine [d] |
|---|---|---|---|---|
| Delivery pressure needs | Requires recycled water to be delivered at the same pressure as the existing potable supply. | Requires recycled water to be delivered at the same pressure as the existing potable supply. | Requires recycled water to be delivered at the same pressure as the existing potable supply. | Requires recycled water to be delivered at the same pressure as the existing potable supply. |
| Reliability | None. | None. | None. | Reliability of recycled water supply is a key factor. |
| Landscape sensitivities | Concerned with the cumulative water quality effects on the soil and drainage. | Concerned with (1) possible contact of students and recycled water if sprinklers automatically turn on mid-day when children are out on the fields and (2) Type of residue that would be left on the grass from the use of recycled water and the potential risk of body contact cross-contamination. | None. | None. |
| Willingness to use recycled water | Highly receptive to the use of recycled water in view of the potential cost savings, but will need to address public health concerns and queries from the public. | Somewhat receptive to the use of recycled water in view of the potential cost savings and conservation benefits, but will need extensive public education and outreach, and will require School Board approval for implementation. | Generally receptive to the use of recycled water in view of the potential cost savings but has limited applications in their industrial processes. Mostly suitable only for cooling tower and boiler feed water systems. | Advocate for the use of recycled water. |

Notes:
a. Sources: Meetings with HARD and HUSD, Customer Telephone Survey
b. All existing irrigation systems will be retrofitted to include an additional meter for recycled water and provided with an air gap for the potable system. Other onsite retrofits include purple sprinkler heads installation; recycled water valve boxes covers, prevention of cross-connection, and any irrigation pattern changes needed to isolate the recycled water system from water fountains, picnic areas, etc.
c. Existing industrial customers will have to ensure separation between their potable and non-potable water systems which may require replumbing and valving to isolate each supply stream. Industrial customers in the telephone survey generally understand the piping process at their facilities and did not anticipate extensive retrofits should they being using recycled water at their sites.
d. Calpine issues and concerns are assumed based on prior experience with other Calpine facilities.

### 3.4.2 Potential Solutions

**Table 3-9** identifies potential solutions associated with the issues and concerns identified in Table 3-8 that will need to be considered in the project definition or implementation plan in addition to those listed in Section 2.3.

**Table 3-9: Potential Solutions to Customer Issues**

| Potential Solution | HARD | HUSD | Industrial Users | Calpine |
|---|---|---|---|---|
| Public Outreach and Education | Conduct informational workshops on recycled water use. | Conduct informational workshops on recycled water use and invite representatives from other School Districts that have successfully implemented recycled water use to share their experiences. | Conduct onsite informational visits to industrial customers to address retrofit concerns. | None. |
| Reliability | Provide potable backup supply. | Provide potable backup supply. | Provide potable backup supply. | Provide recycled water storage and potable backup supply. |
| Salinity Management Strategies [a] | Develop tree and soil condition monitoring programs; Provide outreach materials regarding best management practices (BMPs) and training on water quality and appropriate irrigation techniques (e.g. irrigation flushing) | Develop tree and soil condition monitoring programs; Provide outreach materials regarding best management practices (BMPs) and training on water quality and appropriate irrigation techniques (e.g. irrigation flushing) | Irrigation: Provide outreach materials regarding best management practices (BMPs) and training on water quality and appropriate irrigation techniques if landscape irrigation is involved. Industrial: Onsite treatment at individual sites, as needed. | Onsite treatment at Calpine. |
| Monetary Incentives to Secure Recycled Water Market | | | Grants for onsite retrofits; discounts on utility bills | |

Notes:
a. Other salinity management strategies exist beyond those listed here (e.g. source control to reduce TDS in WPCF influent, advanced treatment processes) but are not currently warranted for this project.

# Chapter 4 Alternatives Assessment

This Chapter documents the Project recycled water production assumptions, development of Project alternatives and the process of determining the near-term Recommended Project.

## 4.1 Recycled Water Production

As noted in Chapter 3, new treatment facilities will be required at the Hayward WPCF to produce recycled water meeting Title 22 standards for disinfected, tertiary filtered recycled water to serve potential recycled water customers.

### 4.1.1 Treatment Process

#### Approved Processes

There are a number of available filtration and disinfection treatment processes that are approved by the Department of Public Health (DPH) to meet Title 22 Water Quality Standards for recycled water. For example, granular media filters, cloth media filters, microfiltration (membranes), are some available filtration options, and chlorination and ultraviolet (UV) disinfection are available disinfection options. For this Plan, the selection of the treatment train was limited to currently approved processes.

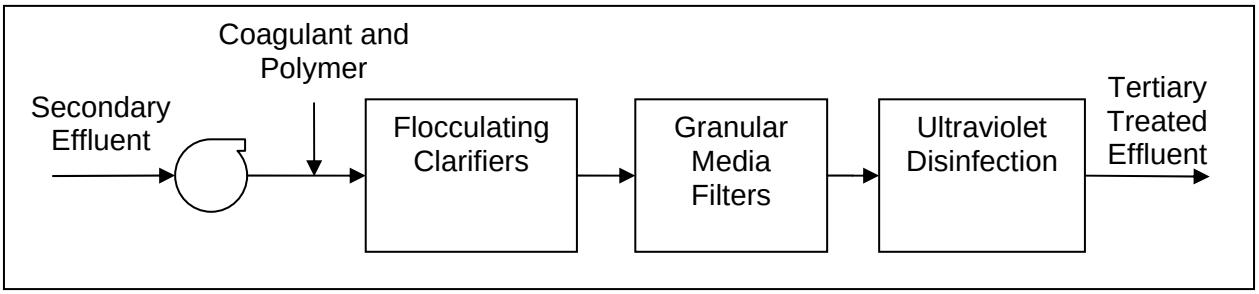
#### Assumed Process Train

The final selection for filtration and disinfection alternatives would be determined during the pre-design (e.g. cloth media filters could be preferred to granular media filters). The Facility Planning-level process train, to be finalized during pre-design, is:

- Filtration:
  - Pre-treatment using flocculating clarifier
  - Granular media filtration
- Disinfection:
  - Ultraviolet (UV) disinfection

The recommended tertiary treatment process train is shown in **Figure 4-1**.

**Figure 4-1: Tertiary Treatment Train Assumed for Facility Plan**




- **Filtration.** The treatment train selection considered both approved treatment processes and the existing secondary effluent characteristics (turbidity, total suspended solids, etc.). As noted in Chapter 2, the WPCF utilizes trickling filters and solids contact aeration in their secondary treatment processes. The City has recently upgraded the WPCF and would not likely modify the secondary treatment process train. Pilot testing at the City of Watsonville demonstrated that secondary effluent produced from trickling filters (with solids contact aeration) cannot meet Title 22 requirements without pre-treatment during filtration. Therefore, the recommended filtration processes include both a pre-treatment step through flocculating clarifiers and filtration through

granular media filters. This combination of filtration processes was assumed for this Plan and should be confirmed with on-site pilot testing at the WPCF during pre-design.

- **Disinfection.** Due to the site constraints at the WPCF and based on recent project experience with City of Watsonville and Delta Diablo Sanitary District, UV disinfection was assumed for the disinfection step of the tertiary treatment process. Based on comparisons developed for the City of Palo Alto, UV lamps have a similar life-cycle cost to chlorine contact basins and are less space intensive.

### 4.1.2 Treatment Facilities Planning-Level Design Criteria and Layout

#### Design Criteria

In determining planning-level the design criteria for the recommended treatment facilities, several sizing options were analyzed for the City.

**Table 4-1** summarizes the three options for treatment train sizing. The difference in cost between the basic option – Option 1 – and the other two options is shown as a percentage. These costs were preliminarily developed for the City's information; however detailed cost estimates were only developed for the recommended option as discussed in Chapter 5. To balance present needs and future costs, Option 2 was selected as the recommended treatment train sizing.

**Table 4-1: Options for Treatment Train Sizing**

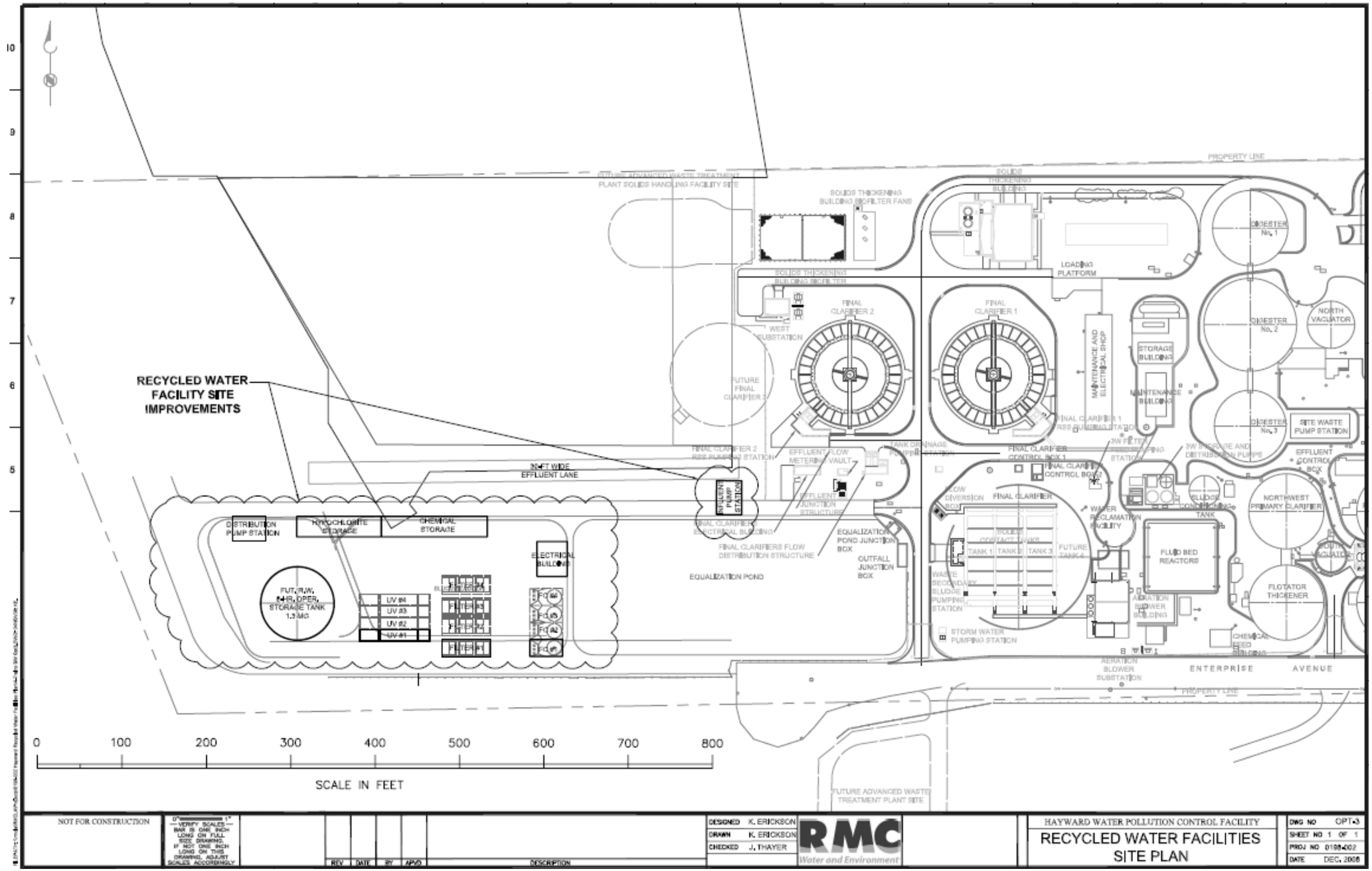
| | Option 1 | Option 2 | Option 3 |
|---|---|---|---|
| Description | Facilities sized to treat 4.65 mgd | Mechanical equipment (pumps, filter package units) sized to treat 4.65 mgd. Civil facilities (concrete, piping) sized for future expansion to 18.5 mgd. | Facilities sized to treat full future permitted capacity of 18.5 mgd. Tertiary water beyond RW customer demand would be discharged through the EBDA system. |
| Treatment Capacity (mgd) | 4.65 | 4.65 | 18.5 |
| # of Treatment Trains | 1 | 1 | 4 |
| Construction Cost (2008 $) [a] | $9.2 million | $14.3 million | $23.0 million |

Notes:
a. These construction costs were based on order of magnitude cost estimates (approximately ±40% variability) to allow the City to select a preferred option as an intermediate step in the development of this Plan. The refined detailed cost estimate for the Recommended Project is provided in Chapter 5.

#### Layout

Discussions were held with the WPCF plant manager on the potential site for the tertiary treatment facilities including storage and a distribution pump station. Based on the information from the plant manager and from analyzing the layout of existing facilities, the southwestern corner of the WPCF property was selected for the proposed layout of the tertiary treatment facilities. A conceptual layout for the tertiary treatment facilities at the WPCF is included in Figure 4-2 that shows the footprint for the four treatment trains (Option 3).

**Figure 4-2: Recommended Project Facility-Planning Level Tertiary Treatment Layout**



## 4.2 Recycled Water Project Alternatives

Based on the results from the market assessment and geographical proximity analysis, three Project Alternatives were developed and evaluated:

- **Project A, also referred to as Baseline Project,** which would serve the new Calpine power generation facility only whose demand was considered large enough to constitute a project on its own. This Project was developed based on information from the Feasibility Study, and through consultation with the City. In Project A, the City would install tertiary treatment facilities and storage at the WPCF to serve only the demand from Calpine.
- **Project B, also referred to as Baseline plus Local Urban Reuse Project,** which would serve the new Calpine power generation facility and local urban non-residential customers located approximately within a two-mile radius of the Hayward WPCF for local urban reuse. Customers include irrigation customers, industrial and combined customers in the Top 90 Private Water Users list. Industrial customers in this Project were surveyed as part of the market assessment to determine the proportion of their water demand that could be converted to recycled water.
- **Project C, also referred to as Baseline plus Expanded Local Urban Reuse Project,** which would serve the new Calpine power generation facility and non-residential customers in the eastern hills of Hayward such as the California State University (East Bay Campus), Stonebrae Golf Course, and other customers. Due to the upward sloping topography of the service area from the WPCF, Project C will involve pumping water from the WPCF to these customers. Additional Project C customers apart from CSU-East Bay and Stonebrae Golf Course are not specifically identified in the Facility Plan; but based on the Feasibility Study, these customers could include the Holy Sepulchre Cemetery, sections of the Eden Greenway, and schools on the eastern side of Hayward.

### 4.2.1 Project Alternatives Target Customers

**Table 4-2** summarizes the target customers associated with each alternative. Note that the Skywest Golf Course (existing recycled water use of 180 AFY) was not included as a target user in any of the alternatives since this customer is currently being served and will not benefit from the addition of tertiary treatment (no expected decrease in TDS from the tertiary treatment).

**Table 4-2: Project Alternatives Customers and Demand**

| Customer No. | Customer Name | Type of Use | Average Demand (AFY) [b] | Average Demand (mgd) [c] | Peak Month Demand (mgd) [c] |
|---|---|---|---|---|---|
| Project A (Baseline) | | | | | |
| 0 | Calpine | Industrial | 3,475 | 3.1 | 4.0 |
| | **Total (A)** | | **3,475** | **3.1** | **4.0** |
| Project B (Baseline + Local Urban Reuse) | | | | | |
| 1 | Bottling Group LLC (Pepsi) | Combined [a] | 31 | 0.03 | 0.04 |
| 4 | Shasta Beverages | Industrial | 8 | 0.01 | 0.01 |
| 5 | Rohm & Haas | Industrial | 22 | 0.02 | 0.02 |
| 8 | Chabot-Las Positas Community College | Irrigation | 6 | 0.005 | 0.01 |
| 29 | Life Chiropractic College | Combined [a] | 3 | 0.003 | 0.003 |
| 30 | SCA Packaging | Industrial | 2 | 0.001 | 0.001 |
| 40 | Bay Center II | Irrigation | 20 | 0.02 | 0.001 |
| 42 | BB&K Franklin Township | Irrigation | 13 | 0.01 | 0.03 |
| 72 | Robert Chang & Associates | Irrigation | 10 | 0.01 | 0.02 |
| 79 | Caltrans D-4 HDWS | Irrigation | 9 | 0.01 | 0.02 |
| 80 | Caltrans D-4 | Irrigation | 8 | 0.01 | 0.02 |
| 91 | Mt. Eden High School | Irrigation | 43 | 0.04 | 0.09 |
| 98 | Eden Garden School | Irrigation | 3 | 0.003 | 0.01 |
| 105 | Loren Eden High School | Irrigation | 8 | 0.01 | 0.02 |
| 114 | Oliver Sports Park | Irrigation | 35 | 0.03 | 0.07 |
| 116 | Mt. Eden Park | Irrigation | 21 | 0.02 | 0.04 |
| 119 | Eden Greenway – Part 1 | Irrigation | 10 | 0.01 | 0.02 |
| 129 | Brenkwitz School | Irrigation | 8 | 0.01 | 0.02 |
| 132 | Christian Penke Park | Irrigation | 7 | 0.01 | 0.01 |
| 135 | Rancho Arroyo Park | Irrigation | 7 | 0.01 | 0.01 |
| 160 | Bay Center II | Irrigation | 7 | 0.01 | 0.02 |
| 163 | Winton Industrial Center | Irrigation | 7 | 0.01 | 0.01 |
| | **Total (B) (includes A)** | | **3,760** | **3.4** | **4.5** |
| Project C (Baseline + Expanded Urban Reuse) | | | | | |
| 6 | California State University | Irrigation | 98.9 | 0.09 | 0.2 |
| 164 | Stonebrae Golf Course | Irrigation | 420.7 | 0.4 | 0.9 |
| Various | Other customers | Irrigation/Industrial | 138 | 0.1 | 0.2 |
| | **Total (C) (includes A)** | | **4,133** | **3.7** | **5.3** |

Notes:
a. Either has irrigation as a primary use and industrial as a secondary use, or vice-versa.
b. Rounded to the nearest 1 AFY.
c. Total rounded to the nearest 0.1 mgd.

### 4.2.2 Project Alternatives Facilities

**Table 4-3** lists the major facilities for Project A, B, and C respectively. **Figure 4-3** illustrates the location of major facilities for Project A, B and C.

Projects A and B assume that the existing 8-inch Shell Oil pipeline identified by the City is useable for recycled water conveyance with limited retrofits. Project C (which extends service to customers in the eastern part of Hayward) requires a recycled water transmission line larger than the existing 8-inch Shell Oil pipeline and therefore does not assume utilization of the Shell Oil pipeline. For the purposes of this plan, it is assumed that retrofit of the Shell Oil pipeline will not require lining; instead potential retrofit activities could include:

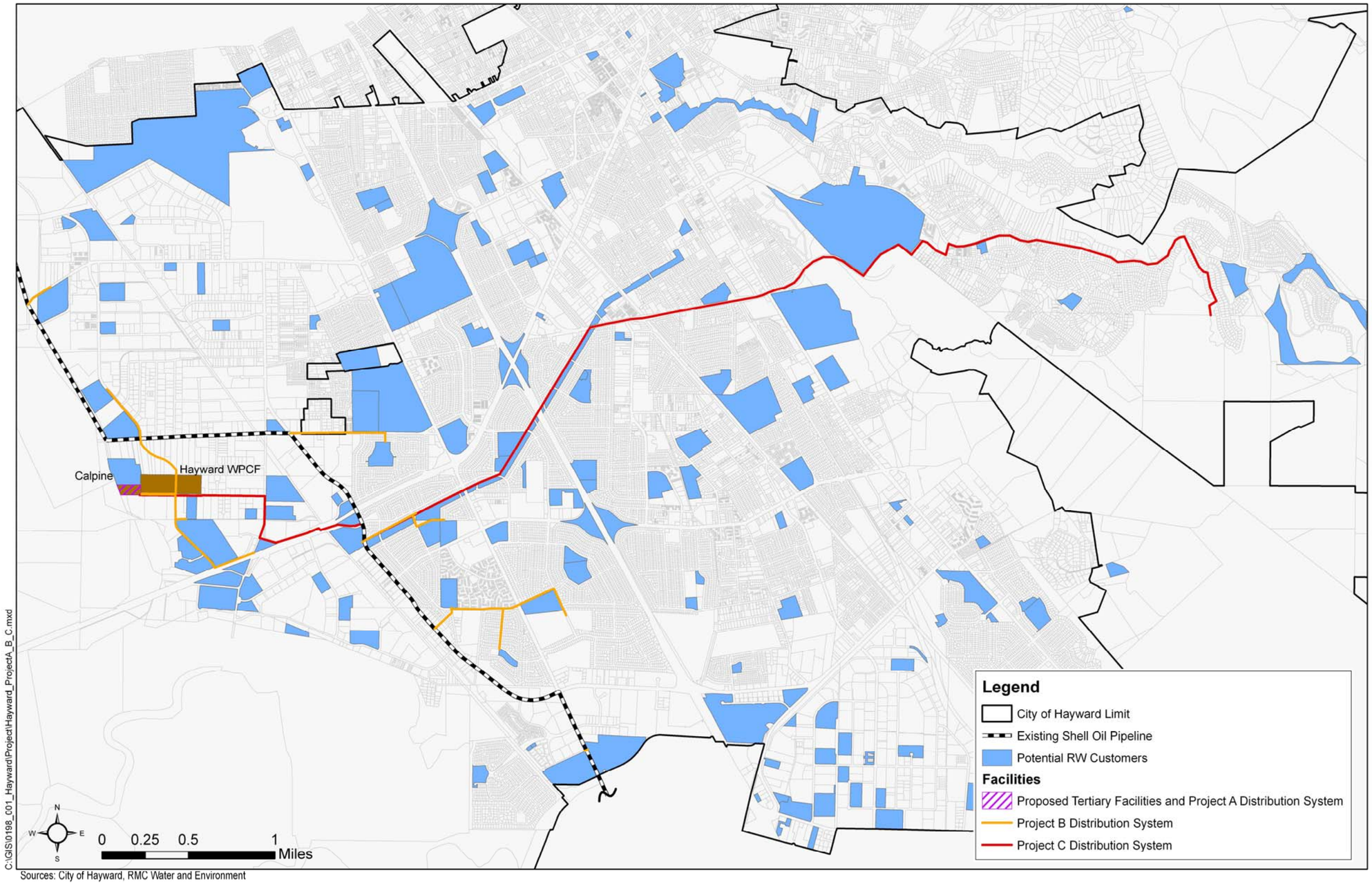
- Dewatering and cleaning of any petroleum residue;
- Television inspection (if possible);
- Pressure testing for leaks;
- Corrosion analysis (if possible);
- Determination of nearest existing isolation valves (if any);
- Right-of-way identification; and
- Installation of valves, flanges, meters, etc.

**Table 4-3: Project Alternatives Facilities**

| Description | Units | Project A | Project B | Project C |
|---|---|---|---|---|
| Customers | | | | |
| Number of Customers | # | 1 | 22 | 34 |
| Annual Average Demand | AFY | 3,475 | 3,760 | 4,133 |
| Peak Month Demand | mgd | 4.0 [f] | 4.51 | 5.2 |
| Peak Hour Demand | mgd | 4.0 | 4.51 | 11.5 |
| Treatment Facilities | | | | |
| Influent Pump Station | hp | 20 | 20 | 20 |
| Flocculating Clarifiers [a] | mgd | 4.85 | 4.85 | 5.35 [g] |
| Granular Media Filters [a] | mgd | 4.85 | 4.85 | 5.35 [g] |
| UV Disinfection | mgd | 4.65 | 4.65 | 5.2 [g] |
| Treated Recycled Water Storage | | | | |
| Storage Tank [b] | MG | 0.8 | 1.1 | 2.0 |
| Distribution Pump Station(s) | | | | |
| Calpine Pump Station [c] | hp | 200 | 200 | 200 |
| Other Customers Pump Station [c, d] | hp | NA | 165 | 275 |
| Distribution System | | | | |
| Total Pipeline Length [e] | LF | 600 | 23,900 | 46,000 |
| 14” Pipe | LF | 600 | 0 | 45,400 |
| 8” Pipe | LF | 0 | 7,100 | 0 |
| 6” Pipe | LF | 0 | 16,800 | 600 |
| Retrofit of Abandoned Shell Oil Pipeline for Conveyance | LF | N/A | 7,460 | N/A |
| Connections to Retrofitted Shell Oil Pipeline | # | 0 | 11 | 0 |

Notes:
a. Facilities are oversized to account for 3-4% water loss through treatment processes.
b. Storage tank was sized using the SWRCB Office of Water Recycling Storage Excel Workbook and maximum drawdown criteria of 2 feet. See Appendix D -Facility Technical Information.
c. Pumps were sized based on peak hour flow, pipeline headloss, and downstream required pressures
d. Summary of total distribution pumping needs for each alternative. One or more distribution pump stations may be utilized in each alternative.
e. Pipelines were sized based on peak hour flow, pipeline headloss, and existing pipeline sizes (Shell Oil pipeline)
f. Per December 8, 2008, conversation with Marilyn Mosher (City), Calpine requires approximately 3.9 mgd of disinfected tertiary water for their plant operations.
g. Size of treatment train would have to be increased above 4.65 mgd to accommodate Project C.

**Figure 4-3: Project A, B and C Major Facilities**



### 4.2.3 Project Alternatives Cost Estimates and Conclusions

#### Cost Estimates

**Table 4-4** summarizes the cost estimates for each alternative. Estimated costs are referenced to the October 2008 Engineering Construction Cost Index (ENR CCI) for San Francisco of 9853.42.

**Table 4-4: Project Alternatives Conceptual-Level Cost Estimates**

| Description | Project A | Project B | Project C |
|---|---|---|---|
| Treatment Facilities | $6,669,000 | $6,669,000 | $7,436,000 |
| Treated Recycled Water Storage | $800,000 | $1,100,000 | $2,000,000 |
| Potable Backup Water Supply | $100,000 | $100,000 | $100,000 |
| Distribution Pump Station | $1,088,000 | $1,616,000 | $1,968,000 |
| Main Pipelines | $168,000 | $1,347,000 | $12,880,000 |
| Lateral Pipelines | $0 | $2,520,000 | $90,000 |
| User Connections | $0 | $366,000 | $575,000 |
| **Subtotal Raw Construction Cost** | **$8,855,000** | **$13,748,000** | **$25,049,000** |
| Contractor Overhead and Profit (10%) | $886,000 | $1,375,000 | $2,505,000 |
| Change Order Allowance (5%) | $443,000 | $687,000 | $1,252,000 |
| Level of Estimate Contingency (30%) | $2,657,000 | $4,124,000 | $7,515,000 |
| **Total Construction Cost** | **$12,841,000** | **$19,934,000** | **$36,321,000** |
| Engineering and Construction Management/Environmental/ Administration/Legal (35%) | $4,494,000 | $6,977,000 | $12,712,000 |
| **Total Capital Cost** | **$17,335,000** | **$26,911,000** | **$49,033,000** |
| Annualized Capital Costs [a] | $1,177,000 | $1,828,000 | $3,329,000 |
| Annual O&M Costs | $1,103,000 | $1,233,000 | $2,000,000 |
| Total Annualized Cost | $2,280,000 | $3,061,000 | $5,329,000 |
| Estimated Recycled Water Yield | 3,475 | 3,760 | 4,133 |
| **Unit Cost, Annualized ($/AFY)** | **$700/AF** | **$810/AF** | **$1,290/AF** |

Notes:
a. Annualized at 30 years, 5.38%

#### Conclusions

Based on discussions with City, Project B was recommended:

- Incremental construction cost of approximately $7 million would bring an additional 285 AFY of recycled water use now and provide the ability to several additional recycled water customers along Whitesell Road in the future.
- Compared to Project B, Project C requires a significantly larger investment by the City in both capital costs for additional treatment and pipeline capacity and higher operations costs for pumping recycled water to the customers in the East Bay hills.

# Chapter 5 Recommended Project

This chapter develops the Recommended Recycled Water Project (Recommended Project) identified in Chapter 4 at the facility-plan level. It includes target customers, project facilities descriptions, cost estimates, project benefits, and an implementation plan (including construction financing plan).

## 5.1 Facilities Description

The Recommended Project involves the construction of tertiary treatment facilities designed to treat a peak flow of 4.65 mgd, 1.5 miles of distribution lines to the north and south of the WPCF, rehabilitation and connections to the existing Shell Oil pipeline, over three miles of customer laterals to 21 customers and the Calpine facility, and installation of customer connections and retrofits. The Project would deliver an estimated 3,760 AFY of recycled water, including 3,475 AFY to Calpine. The majority of other recycled water customers will utilize recycled water for irrigation. Some small industrial use for cooling towers and boilers is also included.

**Figure 5-1** illustrates the recommended recycled water target customers and major facilities.

**Table 5-1** provides the estimated average annual demand for each customer.

**Figure 5-2** illustrates the recommended, planning-level layout for the new recycled water treatment facilities at the WPCF. Additional information on the facilities sizing and technical details is available in Appendix D -Facility Technical Information.

The Project begins with connection to the WPCF's secondary effluent supply. Secondary effluent would be pumped through a Tertiary Influent Pump Station to a single flocculation clarifier package unit. The effluent will then flow by gravity to a granular media package filtration unit and then to UV disinfection channel. Disinfection tertiary effluent will be pumped to a steel storage tank. From storage, tertiary flow will be pumped to the distribution system to customers or to Calpine. All tertiary treatment process will be arranged and sized with adjoining space/capacity for future expansions up to full permitted treatment plant capacity (18.5 mgd).

Distribution from the WPCF will be through two parallel 8-inch main pipelines to serve the north and south branches of Whitesell Road. The south branch will serve a cluster of recycled water customers in the area between the WPCF and Highway 92. The north branch will connect to the existing Shell Oil pipeline (8-inch), which will be rehabilitated for water use. Flow through the Shell Oil pipeline will split to customers on the north and south ends of the pipeline. Connections will be made into the Shell Oil pipeline for 6-inch laterals to a single customer or customer grouping. These customer laterals vary from a few yards to three quarters of a mile.

**Figure 5-1: Recommended Project Recycled Water Customers and Facilities**

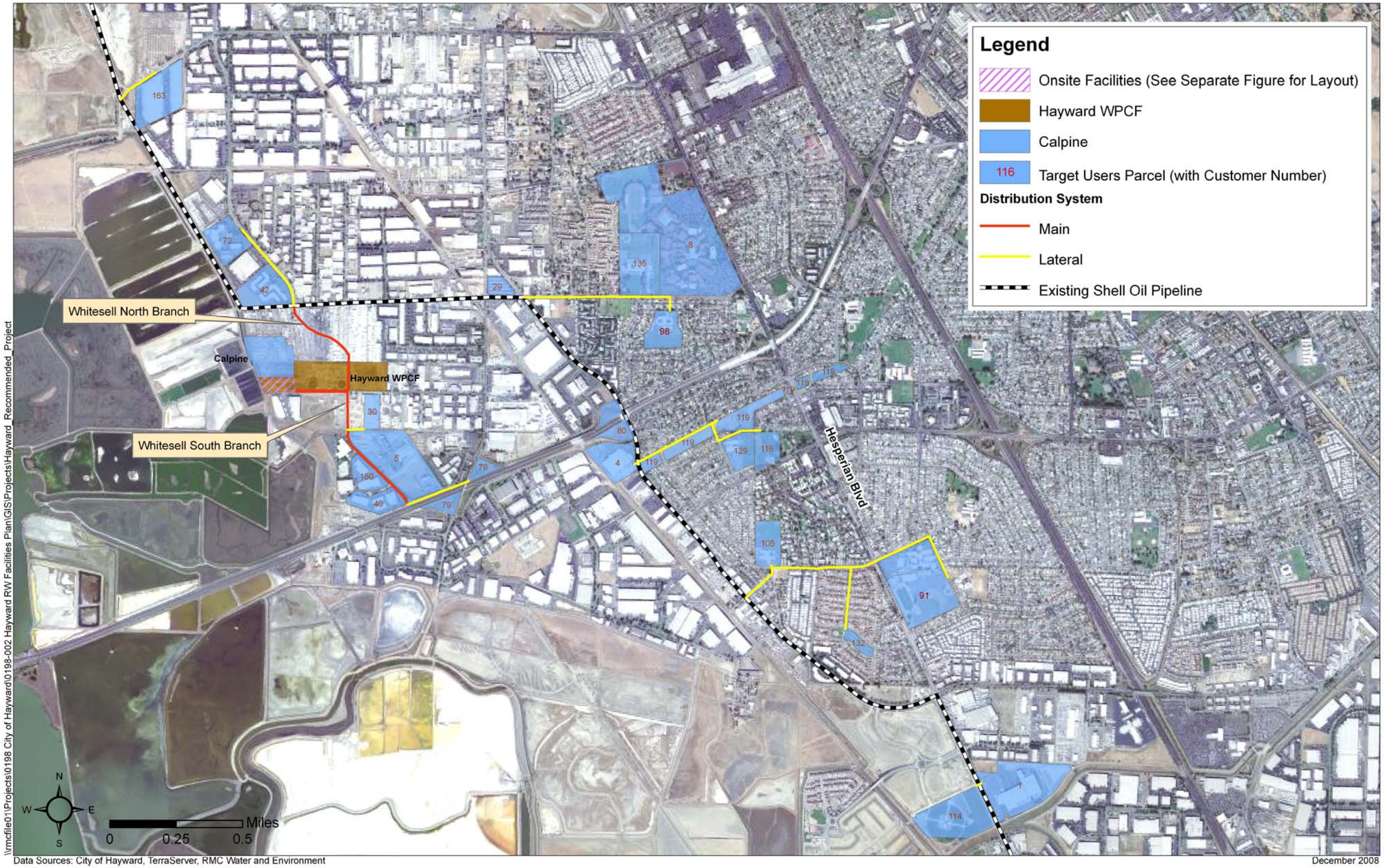


**Table 5-1: Recommended Project Recycled Water Customers**

| Customer No. | Customer Name | Primary Type of Use | Average Annual Demand (mgd) | Average Annual Demand (AFY) | Peak Month Demand (mgd) |
|---|---|---|---|---|---|
| 0 | Calpine | Industrial | 3.10 | 3,475 | 4.00 |
| 1 | Bottling Group LLC (Pepsi) | Combined [a] | 0.03 | 30.9 | 0.04 |
| 4 | Shasta Beverages | Industrial | 0.01 | 7.5 | 0.01 |
| 5 | Rohm & Haas | Industrial | 0.02 | 22.4 | 0.02 |
| 8 | Chabot-Las Positas Community College | Irrigation | 0.005 | 6.1 | 0.01 |
| 29 | Life Chiropractic College | Combined [a] | 0.003 | 3.0 | 0.003 |
| 30 | SCA Packaging | Industrial | 0.001 | 1.5 | 0.001 |
| 40 | Bay Center II | Irrigation | 0.02 | 20.1 | 0.001 |
| 42 | BB&K Franklin Township | Irrigation | 0.01 | 12.8 | 0.03 |
| 72 | Robert Chang & Associates | Irrigation | 0.01 | 10.3 | 0.02 |
| 79 | Caltrans D-4 HDWS | Irrigation | 0.01 | 8.7 | 0.02 |
| 80 | Caltrans D-4 | Irrigation | 0.01 | 7.7 | 0.02 |
| 91 | Mt. Eden High School | Irrigation | 0.04 | 43.1 | 0.09 |
| 98 | Eden Garden School | Irrigation | 0.003 | 2.9 | 0.01 |
| 105 | Loren Eden School | Irrigation | 0.01 | 7.8 | 0.02 |
| 114 | Oliver Sports Park | Irrigation | 0.03 | 35.0 | 0.07 |
| 116 | Mt. Eden Park | Irrigation | 0.02 | 20.5 | 0.04 |
| 119 | Eden Greenway – Part 1 | Irrigation | 0.01 | 10.0 | 0.02 |
| 129 | Brenkwitz School | Irrigation | 0.01 | 8.0 | 0.02 |
| 132 | Christian Penke Park | Irrigation | 0.01 | 7.2 | 0.01 |
| 135 | Rancho Arroyo Park | Irrigation | 0.01 | 6.5 | 0.01 |
| 160 | Bay Center II | Irrigation | 0.01 | 7.3 | 0.02 |
| 163 | Winton Industrial Center | Irrigation | 0.01 | 7.1 | 0.01 |
| | | **TOTAL** | **3.3** | **3760** | **4.52** |

Notes:
a. Either has irrigation as a primary use and industrial as a secondary use, or vice-versa.

**Figure 5-2: Recommended Project Facility-Planning Level Tertiary Treatment Layout**

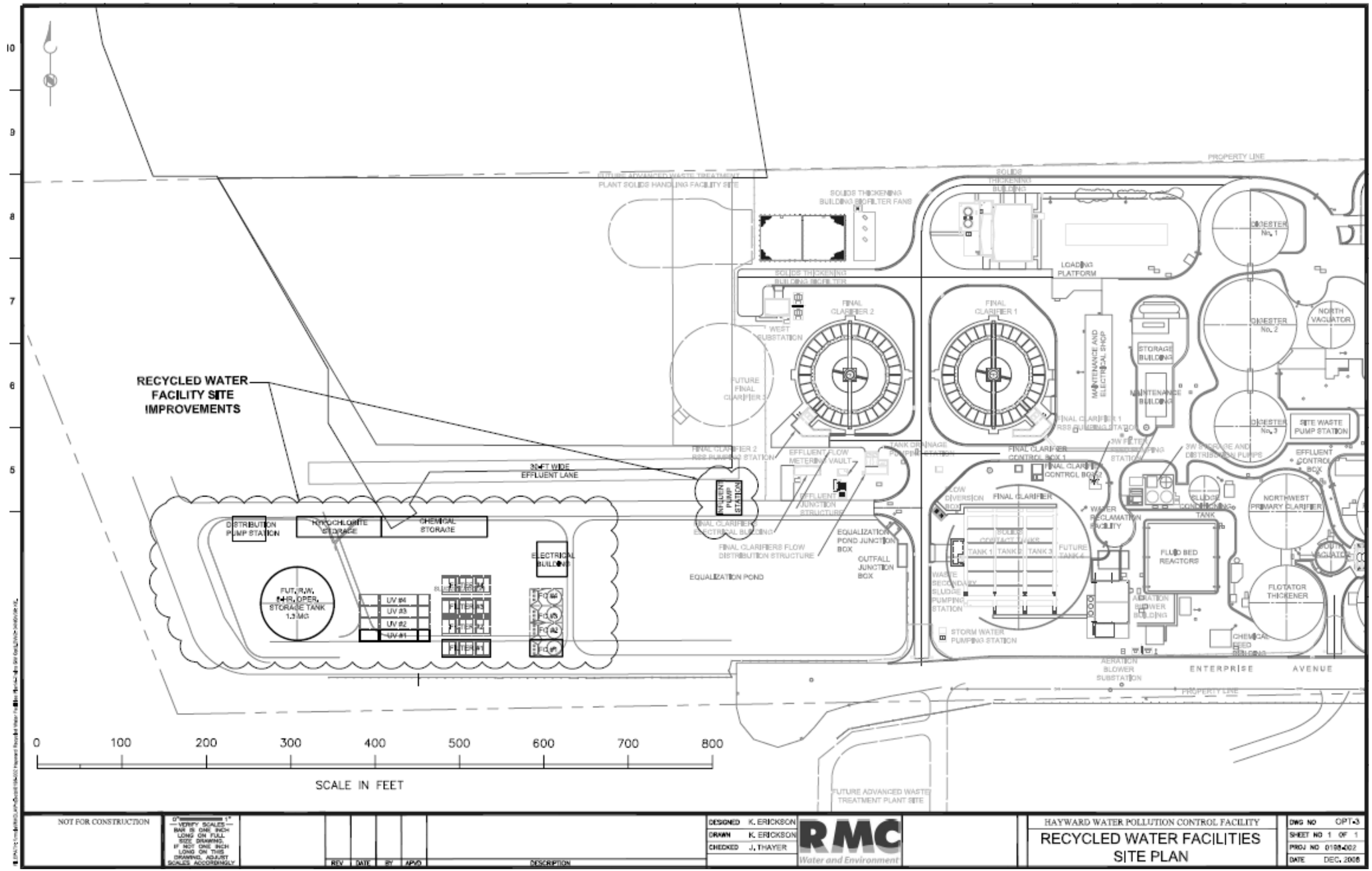


**Table 5-2** summarizes key planning-level design criteria for the recommended facilities. Additional information on the facilities sizing and technical details is available in Appendix D -Facility Technical Information.

**Table 5-2: Recommended Project Facilities**

| Description | Units | Quantity |
|---|---|---|
| **Customers** | | |
| Number of Project Customers | --- | 22 |
| Annual Average Demand | AFY | 3,760 |
| Peak Month Demand | mgd | 4.58 mgd |
| Peak Hour Demand | mgd<br>gpm | 5.50 mgd<br>3900 gpm |
| **Treatment Facilities** [a] | | |
| Flocculating Clarifiers | mgd | 4.65 |
| Granular Media Filters | mgd | 4.65 |
| UV Disinfection Facilities | mgd | 4.65 |
| **Distribution Pump Station to North Branch** | | |
| Peak Hour Flowrate | gpm | 845 |
| Peak Flow TDH Required | FT | 455 |
| Pump Capacity | HP | 150 |
| **Distribution Pump Station to South Branch** | | |
| Peak Hour Flowrate | gpm | 185 |
| Peak Flow TDH Required | FT | 190 |
| Pump Capacity | HP | 15 |
| **Distribution System** | | |
| Total New Pipeline Length | LF | 23,900 |
| 8" Pipe | LF | 7,100 |
| 6" Pipe | LF | 16,800 |
| Retrofit of Shell Oil Pipeline (8") | LF | 7,460 |
| Shell Oil Pipeline Connections | --- | 11 |

Notes:
a. Treatment facilities are sized to allow for up to 3 percent of influent flow being recycled and returned to the WPCF during treatment.

**Table 5-3** summarizes the total capacity of the project facilities and the capacity that is utilized to serve the customer group.

**Table 5-3: Total versus Utilized Capacity in Recommended Project**

| Facility | Total Capacity | Utilized Capacity |
|---|---|---|
| Shell Oil Pipeline (8 inch) | 1.58 mgd | 1.22 mgd (Peak Hour) |
| Whitesell South Branch (8 inch) | 1.58 mgd | 0.27 (Peak Hour) |
| Whitesell North Branch (8 inch) | 1.58 mgd | 1.22 mgd (Peak Hour) |
| Treatment Facilities (4.65 mgd) | 4.65 mgd (Peak Month) | 4.51 mgd (Peak Month) |

## 5.2 Cost Estimate

**Table 5-4** summarizes the cost information for the Recommended Project. Estimated costs are referenced to the October 2008 Engineering Construction Cost Index (ENR CCI) for San Francisco of 9853.42.

**Table 5-4: Cost Estimate Summary**

| Description | Cost [b,c] |
|---|---|
| Treatment Facilities | $6,669,000 |
| Treated Recycled Water Storage | $1,100,000 |
| Potable Backup Water Supply | $100,000 |
| Distribution Pump Station | $1,616,000 |
| Main Pipelines | $1,347,000 |
| Lateral Pipelines | $2,520,000 |
| User Connections | $366,000 |
| **Subtotal** | **$13,748,000** |
| Contractor Overhead and Profit (10%) | $1,375,000 |
| Change Order Allowance (5%) | $687,000 |
| Level of Estimate Contingency (30%) | $4,124,000 |
| **Total Construction Cost** | **$19,934,000** |
| Engineering and Construction Management/Environmental/Administration/Legal (35%) | $6,977,000 |
| **Total Capital Cost** | **$26,911,000** |
| Annualized Capital Costs [a] | $1,828,000 |
| Annual O&M Costs | $1,233,000 |
| Total Annualized Cost | $3,061,000 |
| Estimated Recycled Water Yield | 3,760 |
| **Unit Cost, Annualized ($/AFY)** | **$810/AF** |

Notes:
a. Annualized at 30 years, 5.38%
b. Costs are referenced to October 2008 ENR CCI for San Francisco of 9853.42.
c. See Appendix E -Cost Estimate for detailed cost information.

## 5.3 Benefits

Overall, the Recommended Project helps the City to address the project drivers listed in Chapter 1 while also leveraging the water needs of a single industrial customer to maximize the public benefit of recycled water use. The Recommended Project provides the City with the key benefits summarized in **Table 5-5** at an incremental construction cost of $7.1 million (see difference in Project A and Project B cost estimates in Table 4-4). **Table 5-6** identifies benefits to stakeholders other than the City.

**Table 5-5: Key Benefits to the City**

| Benefit Category | Description |
|---|---|
| Economic Growth and Development | ▪ Provides water to for non-potable industrial uses.<br>▪ Provide water to support redevelopment of industrial areas near WPCF. |
| Diversifying Water Sources | ▪ Provides 3,760 AFY of locally controlled, drought-proof water supply for non-potable uses.<br>▪ Reduces dependence on SFPUC imported water |
| Environmental Protection | ▪ Reduces mass loading of regulated constituents to the San Francisco Bay. |
| Sustainability | ▪ Conserves potable water for its highest uses.<br>▪ Beneficial reuse of an existing City-owned resource. |

**Table 5-6: Potential Benefits to Other Stakeholders**

| Stakeholder | Key Benefits |
|---|---|
| SFPUC/BAWSCA | ▪ Reduces demand on SFPUC imported water system. |
| SWRCB | ▪ Assists in meeting statewide recycled water use targets.<br>▪ Extends State water supply with 3,760 AFY of drought-proof, non-potable water. |

## 5.4 Construction Financing Plan

### 5.4.1 City/Calpine Partnership

As discussed in Chapter 1, Calpine's interest in utilizing tertiary treated recycled water at their proposed power generation facility is one of the drivers for the City's development of this Plan. Calpine and the City are still in negotiations on the partnership but it is assumed that Calpine will participate at some level in the financing of the tertiary treatment facilities. For the purpose of this Plan, Calpine was assumed to be the primary funding source for the tertiary facilities while the City is the primary funding source for the distribution system.

### 5.4.2 Outside Funding/Financing Sources

There are various sources of outside funding the City can choose to pursue to aid in funding/financing the Project. **Table 5-7** summarizes the recommended outside funding/financing sources including potential contribution.

**Table 5-7: Potential Outside Funding/Financing Sources**

| Partner / Method | Description / Project Benefits to Partner | Potential Contribution to Recommended Project |
|---|---|---|
| SWRCB Construction Grant | SWRCB operates a Recycled Water Construction Financing Grant program. The City obtained a SWRCB Facilities Planning Grant to complete this Plan for the project and is therefore expected to be a high priority for obtaining a construction grant. SWRCB grants can cover up to 25% of eligible project costs up to a $4 million cap. Funds are allocated through a competitive process when available. | $2.1 million [a] |
| Proposition 84 through the IRWMP | SWRCB and DWR operate an Integrated Regional Water Management Planning (IRWMP) Grants program. Current funding for the IRWMP Grant program comes from Proposition 84, passed by California voters in 2006. Through the Bay Area IRWMP, the City may have access to Proposition 84 grants. Funds are allocated through a competitive process. | --- [b] |
| Federal Grant | Federal Bureau of Reclamation (USBR) operates the Title XVI Grant Program and other programs. Through the Bay Area Regional Water Recycling Program (BARWRP), the City may have access to Federal grants.<br>National Environmental Policy Act (NEPA) coverage would be required for the project in addition to meeting CEQA requirements. City would need to enter into agreement with the USBR | --- [b] |
| SWRCB State Revolving Fund (SRF) and Water Recycled Fund Loans | There are two low-interest construction loan programs available from the State that the City could apply for: 1) SRF and 2) Water Recycling Fund. These loans are available to public agencies based on a prioritized list of projects. The City will need to apply to put the Project on the priority lists for both loan programs.<br>Both loan programs have a 20 year payback at low-interest rates. The City can consider using one or both low programs to help financing the Project. | Loan (no set amount); savings are on debt service |

Notes:
a. Only the portion of the Project paid for directly by the City (no reimbursement from or cost sharing with Calpine) is assumed not to be eligible for this grant. These costs total approximately $8.4 million, of which 25% is $2.1 million.
b. Access to these funding sources is highly competitive, requiring active engagement by the City in ongoing planning and advocacy, and was therefore not assumed as potential contributions at this time.

### 5.4.3 City Funds

To fund the remaining portion of the project, the City would add the Project to its Capital Improvement Plan (CIP) and finance the facilities' construction through rates. The City will need to determine whether all water utility customers should support financing the Project (recycled water surcharge applied to all water customers) or only the recycled water customers (recycled water unit cost charged to recycled water customers based on usage).

### 5.4.4 Cash Flow Analysis

Monthly cash flows during the design and construction of the Project were analyzed along with assumed payments from the City, Calpine, and outside funding sources based on costs at the midpoint of

construction. From this analysis, the City can expect to have average Project payments of $1.7 million per months during construction. A spreadsheet with the complete cash flow analysis is included in **Appendix G -Construction Financing Plan.**

## 5.5 Comparison to Freshwater Alternative

Demands being supply by recycled water in the Project will be present even if the Project is not implemented. Without the Project, these demands would continue or commence by being met using freshwater supplies from the SFPUC. **Table 5-8** shows a comparison between implementation of the Project or utilizing more freshwater supplies from SFPUC.

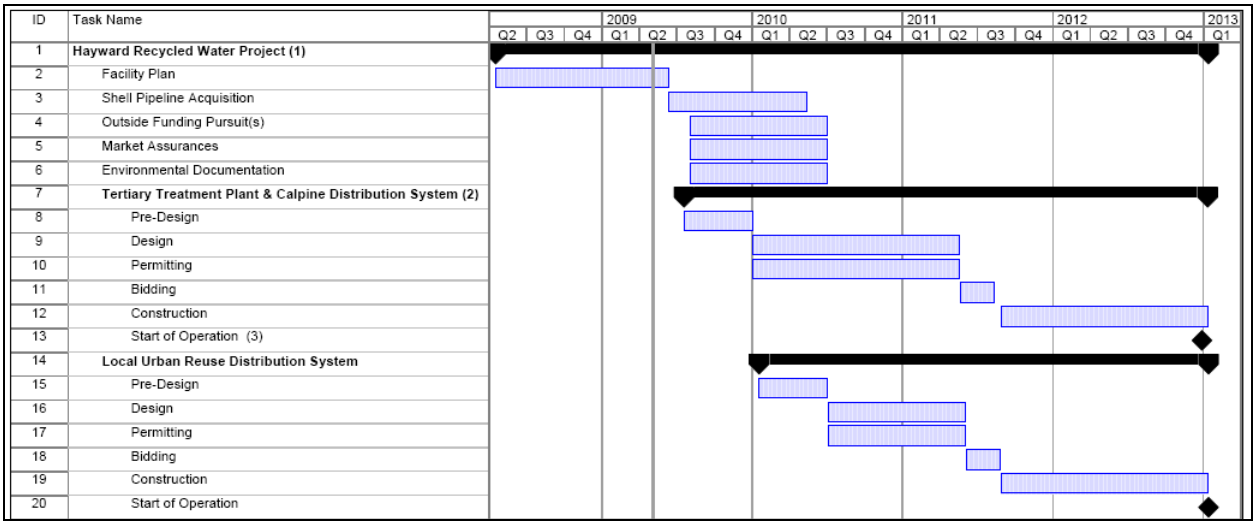
**Table 5-8: Recommended Project vs. Freshwater Alternative Comparison**

| Criteria | Hayward Recycled Water Project | Status Quo – Supply from SFPUC |
|---|---|---|
| **Summary** | | |
| Description | Development of treatment and distribution systems to provide recycled water for irrigation and industrial uses | Status quo. No additional facilities required. |
| Water Supply | Recycled water from the Hayward WPCF, treated to Title 22 standards for unrestricted reuse | Surface water from Tuolumne and Alameda watersheds |
| **Benefits** | | |
| Diversifying Water Sources | 3,670 AFY of drought-proof locally controlled water supply for non–potable uses | |
| Sustainability | Conserves potable water for its highest beneficial use | |
| Economic Development | Provides additional non-potable water source suitable for industrial uses | |
| **Costs** | | |
| Capital Cost | $26.9 million (Oct 2008 dollars) | None |
| Unit Cost ($/AF) | $810/AF (delivered) | $1,500/AF in 2016 (wholesale – see Chapter 2) |
| Other Potential Future Costs/Risks | ▪ Cost of salinity management program<br>▪ Cost of groundwater monitoring<br>▪ Cost of nitrogen management program | ▪ Risk of unavailable supplies during periods of drought<br>▪ Risk of supply interruption following a catastrophic event (e.g. earthquake)<br>▪ Risk of additional future cost increases |

## 5.6 Implementation Plan

**Figure 5-3** shows the proposed implementation schedule for the Recommended Project. The schedule includes implementation of the tertiary treatment facilities and the distribution system.

**Figure 5-3: Project Implementation Schedule**




1. Ongoing activities such as project management and stakeholder/public outreach are not represented. Schedule subject to changes based on negotiations with Calpine.
2. Tertiary treatment plant implementation from pre-design through construction could be compressed significantly should Calpine be the lead contracting agency. For example, all activities from pre-design through construction were complete in 24 months for the Calpine/DDSD project.
3. Start of construction no later than September 2010 and completion by June 2013 per discussion with City on November 4, 2008.

## Facility Plan

As of September 2009, the Facility Plan (this report) is in final form.

## Shell Oil Pipeline Acquisition

As of December 2008, the City is reinitiating discussions with the Shell Corporation to acquire the Shell Oil pipeline. These discussions had occurred previously with Shell but had not been finalized. Based on the transfer of abandoned pipelines to other public agencies in the area (e.g. Central Contra Costa Sanitary District), it is anticipated acquisition could occur in 12 months or less.

## Outside Funding Pursuits/Negotiations with Calpine

As discussed in the Construction Financing section, the City plans to pursue outside funding from the SWRCB for a portion of the Project costs. The City will likely apply for the 2010/2011 funding cycle as environmental documentation would need to be ready. Additionally, the City may receive financial support for the Project from Calpine.

## Market Assurances

To ensure the use of recycled water by the targeted market if the Recommended Project is built, the City is planning to issue a Recycled Water Ordinance. A copy of a sample ordinance similar to what the City plans to issue is provided in **Appendix H -Sample Recycled Water Ordinance.**

The City has already signed a Will Serve letter with Calpine. A copy of this letter is included in **Appendix I -Calpine Will Serve Letter (2001).** Recycled water flows identified in the Will Serve letter are being reevaluated and this Plan contains the latest available information.

## Environmental Documentation

An initial analysis of the environmental impacts that would be expected to occur from construction and operation of the Recommended Project has been conducted. The analysis shows that the majority of the impacts would be less than significant or less than significant with mitigation incorporated. Because no significant, unavoidable impacts were identified during this preliminary analysis, an Initial Study/Mitigated Negative Declaration (IS/MND) appears to be the appropriate level of environmental document for this project. The IS/MND will provide a more detailed description of the project as well as explain the thresholds used in the determination of environmental impacts. In addition, the IS/MND would elaborate on the mitigation measures that are proposed to avoid or reduce potential impacts to less-than-significant levels. Refer to **Appendix F -Environmental Checklist** for the detailed Environmental Checklist.

## Tertiary Treatment Plant Facilities and Local Urban Reuse Distribution System

- **Pre-Design**. Following completion and approval of this Plan, the City could commence on the pre-design of the tertiary treatment plant facilities to finalize the treatment processes, sizing and layout to be used in the final design. Additionally, following the completion of this Plan, the City will commence on the pre-design of the distribution system to finalize the pipeline alignments, materials, sizing, and customer connections to be used in the final design. The pre-design information would be needed to complete the IS/MND.
- **Permitting**. In conjunction with pre-design of the treatment and distribution facilities, the City would begin acquiring permits for the additional treatment facilities and the distribution system/recycled water use. **Table 5-9** summarizes the expected stakeholders and agencies that will be involved in permitting or review of the tertiary treatment facilities and the local urban reuse distribution system.

**Table 5-9: Jurisdictional and Stakeholder Agencies for Permitting or Review for the Tertiary Treatment Facilities and Recycled Water Use**

| Agency Name | Permits or Special Topics | |
|---|---|---|
| | **Tertiary Treatment Facilities** | **Distribution System** |
| California Regional Water Quality Control Board | Waste Discharge Requirements and/or Water Recycling Requirements [a,b,c] | |
| California Department of Public Health | Title 22 Engineers' Report for the Production, Distribution and Use of Recycled Water | |
| San Francisco Bay Air Quality Management District | Permit to Construct | |
| San Francisco Bay Conservation and Development Commission | Construction near the San Francisco Bay Shoreline | |
| City of Hayward Department of Public Works | Grading and clearing | ▪ Grading and clearing<br>▪ Encroachment Permit |
| California Department of Fish and Game | None | Stream Bed Alteration Agreement/Waiver, if necessary |
| Caltrans | None | Encroachment Permit |
| Pacific Gas and Electric, cable and telecommunications providers | None | Infrastructure review, as applicable |

Notes

a. The Waste Discharge Requirements and/or Water Recycling Requirements will cover the production, distribution, and use of recycled water.

b. Various permitting strategies (e.g. Master Permit, Project Specific Permit) can be employed for this project. The best strategy should be defined as the project moves forward.

c. In February 2009, SWRCB passed Resolution No. 2009-0011: Policy for Water Quality Control for Recycled Water Policy. This policy requires every basin and sub-basin in California to develop a Salt/Nutrient Management Plan to protect the region's water quality as part of the recycled water project permitting process by 2014. The degree of detail will depend on site specific factors such as basin size, basin complexity, hydrogeology, recycled water quality, aquifer water quality, etc.

- **Design and Construction**. Assuming negotiations with Calpine and adequate funding can be secured in 2009/2010, the City could commence design of the tertiary treatment facilities in 2010 and begin construction by mid-2011. Assuming acquisition of the Shell Oil pipeline and adequate funding can be secured in 2010/2011, the City could commence design of the local urban reuse distribution system in mid-2010 and begin construction in mid to late 2011 (timed to coincide with treatment facilities construction). **Appendix J -Customer Connection Schedule** includes the schedule for customer connections that will need to occur before startup of the distribution system.

# References

California's Groundwater Bulletin 118 (2006). Santa Clara Valley Groundwater Basin, Niles Cone Subbasin.

City of Hayward (2005). Urban Water Management Plan.

DiFillippo, M.N. Cooling Tower Water Quality Parameters for Degraded Water, Table 2-1. Prepared for the California Energy Commission, April 2006 (CEC-500-2005-170).

ESA+Orion (2008). Final Programmatic Environmental Impact Report for SFPUC Water System Improvement Program. Case No. 2005.0159E.

Loretitsch, G. Puckorius & Associates. Guidelines for Managing Water in Cooling Systems for Owners, Operators, and Environmental Managers, Table 2.01.

RMC Water and Environment. (2007). City of Hayward Recycled Water Feasibility Study.

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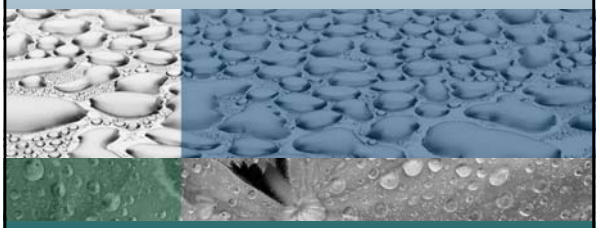
# Appendix A - HARD and HUSD Meeting Notes

*City of Hayward*
*Recycled Water Facilities Plan*
*Meeting with Potential Recycled Water Customer*



RMC *Innovative Solutions for Water and the Environment*

September 2, 2008

## *Meeting Agenda*

- Introduction and Background
- Project Overview
- Project Schedule and Next Steps
- Questions or Comments

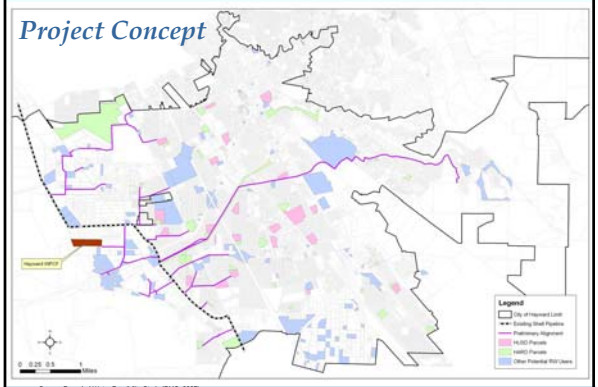
## *Driving Factors for Recycled Water Use*

- Expected growth
- Increases in SFPUC water charges
- Potential for increasingly stringent discharge requirements
- Provides sustainable alternative to using potable water for certain applications

## *Purpose of Facility Plan*

- Evaluate the recycled water potential within the City and confirm the quantity and quality of available recycled water supplies.
- Evaluate and improve conceptual alternatives for treatment, storage, and distribution of recycled water.
- Develop an implementation plan for the selected alternative, including construction financing.

## *Project Concept*



Source: Recycled Water Feasibility Study (RMC, 2007)

## *Primary Benefits to Potential Customers*

- Provides reliable, locally controlled supply
- Reduces water rationing in droughts
- Is in-line with green business practices
- Results in potential cost savings on your water bill

## Who is a Potential Customer?



- Anyone along the pipeline path with irrigation or other uses for non-potable water.
- The greater your usage of non-potable water, the more we are interested in your participation to make this project work.



RMC

## Project Schedule

- Facility Planning work is in progress, scheduled to be completed in February 2009.
- If the City decides to move forward with implementation
  - Design could start in late 2009/2010
  - Recycled water could be available in 2012

RMC

## Immediate Next Steps

- Refining Project Alternatives and Facilities
- Defining Project Phases
- Developing Construction Financing Plan; Pursuing Outside Sources of Funding
- Getting Potential Customer Input/Feedback

RMC

## Questions or Comments?

Marilyn Mosher
Marilyn.Mosher@hayward-ca.gov

Helene Kubler
hkubler@rmcwater.com

RMC

**From:** Helene Kubler
**Sent:** Tuesday, September 09, 2008 5:56 PM
**To:** Marilyn.Mosher@hayward-ca.gov
**Cc:** Joanne Siew
**Subject:** Recycled Water Facilities Plan - Summary Notes from HARD and HUSD Meetings and Progress Meeting #2

Marilyn,

Please find below a brief summary of discussion and action items from our September 2 meetings for your records.
Let us know if you have any additions or clarifications.

Helene
415-321-3423

_____

**HARD Meeting**
**Date: Tuesday, Sept 2, 2008**
**Time: 10 – 11 am**

Attendees: Larry Lepore (HARD, Park Superintendent), Karl Zabel (HARD), Alex Ameri, Marilyn Mosher (Hayward), Helene Kubler, Joanne Siew (RMC)

Agenda: Introductions/Meeting Objectives; Project Overview; Project Schedule and Next Steps; Questions or Comments

Main Discussion Items:

**Skywest Golf Course**
- Larry mentioned that HARD has been irrigating the golf course with disinfected secondary effluent from the EBDA pipeline for approximately 20 years.
- Disinfected secondary effluent is used to irrigate both greens and fairways.
- HARD does not water within 30 feet of the fence line of Skywest Town Homes, which is located next to the golf course.
- Larry noted that HARD had to redo 8 of the greens and noted the poor drainage (largely due to the tarmac layer that underlies the soil).

**HARD Parks**
- Larry noted that there were two new parks which were not indicated on the HARD parcels map: Lewis Park and Jalquin Vista Park.
- He also noted that Rancho Arroyo Park is considered part of the Ochoa School's property.

**Impact of Water Rationing on HARD**
- Alex indicated that Hayward may have to implement water rationing next year if drought conditions continue, and the impact on HARD could be a reduction of 10-30% in their water allocation.

**Potential Water Quality Issues/Concerns**
- Larry noted that the main concerns regarding the use of recycled water for irrigation (based on their experience with Skywest Golf Course) could be the cumulative water quality effects on the soil and drainage; however Larry noted that he would still support its use.

- Larry also noted the need to address potential questions from the public on water quality issues associated with recycled water as it relates to public health.
- Larry noted that there are groundwater wells located at the following parks in Hayward: Mission Hills (>500 ft); Kennedy Park (300 ft); Elridge Park. Well water is used for irrigation of Kennedy Park and Mission Hills Park. Some of the wells are not in used for cost reasons (e.g., San Lorenzo Park)

**Other Questions**

- Karl queried if the project could supply recycled water to irrigate parks in areas just outside Hayward's boundary (within EBMUD service area), such as San Lorenzo and San Felipe parks. Alex responded that the City would need to explore this possibility with EBMUD.
- Karl asked whether homeowners' associations were being targeted as well. Marilyn indicated that the target users at this point have been focused on public and commercial/industrial users. Helene added that demand associated with homeowners' associations is usually small, unless there is a major new development; this demand could therefore be served if the recycled water pipeline is aligned in a nearby street. This does not impact the Facility Plan and project definition, but could be considered in later phases of the project (design).
- Karl asked whether recycled water could be used at cemeteries.Yes - it can.
- Larry asked about the possibility of using emergency wells at nearby parks (for regular use). The City could explore this possibility as part of the upcoming Groundwater Management Plan.

**Follow-Up Tasks**

- Larry/Karl will review the HARD parks shown on the map and highlight any large parks that might not have been included to Marilyn by the end of next week.
- Larry/Karl will also provide Marilyn with a list of wells at parks, indicating if possible which ones are in used and what percentage of the demand they serve, by the end of next week.
- Marilyn will coordinate with HARD to obtain the address/parcel information for Lewis and Jalquin Vista Parks.

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**HUSD Meeting**
**Date: Tuesday, Sept 2, 2008**
**Time: 2 - 3 pm**

Attendees: Billy Martin (HUSD; Director Maintenance Operations & Transportation), Alex Ameri, Marilyn Mosher (Hayward), Helene Kubler, Joanne Siew (RMC)

Agenda: Introductions/Meeting Objectives; Project Overview; Project Schedule and Next Steps; Questions or Comments

Main Discussion Items:

**Potential Concerns Relative to Recycled Water Use for Schoolyard Irrigation**

- The irrigation sprinklers are timed to water in the evenings when students are not around; but in case of a power loss at night, they may come on mid-day when children are on the fields and contact with the water from the sprinklers.
- Type of residue that would be left on the grass from the use of recycled water in view of the potential risk of body contact cross-contamination.
- Posting up notices that recycled water is used on school premises may raise concerns among parents. Education would be needed and should account for language diversity.
- In conclusion, Billy said that outreach and education would likely be needed to get Board approval to use recycled water for school yard irrigation.

**Suggestions for Building School Board Support**

- Provide substantial evidence on the safety of using recycled water for irrigation from the CA Department of Public Health.
- Provide a list of schools (as recent as possible) using recycled water for irrigation in California and nearby counties.
- Give a presentation to the School Board providing project background, CA Department of Public Health perspective and examples of places where it has been done before, and clearly articulating the upside and downside of using recycled water.

**Other**

- Some schools are currently using well water for irrigation.
- The Board is currently looking into LEED Certification, solar program, and Green certification for its facilities.

**Follow-Up Tasks**

- Billy will review the HUSD parcel map to identify and potentially missing or mislabeled schools and will compile a list of schools that have wells and use the wells for irrigation. Billy will provide that information to Marilyn by the end of next week.
- The City will provide Billy example of schools using recycled water for irrigation.

# Appendix B - Potential Recycled Water Customers

| | | | | | | | | | | | | | | | Business Code Calcuations | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Potential Customer | Customer Type | Primary Type of RW Use | Secondary Type of RW Use | Method of Estimate | Irrigation - Average Annual RW Demand (AFY) | Irrigation - Annual RW Demand Estimate (mgd) | Irrigation - Peak Month RW Demand Estimate (mgd) | Revised Industrial - Average Annual RW Demand (AFY) | Industrial - Annual RW Demand Estimate (mgd) | Industrial - Peak Month RW Demand Estimate (mgd) | Total - Average Annual RW Demand (AFY) | Total - Annual RW Demand Estimate (mgd) | Total - Peak Month RW Demand Estimate (mgd) | Total Water Use (AFY) (2006) | Original Non-Irrigation Use Factor | Revised Non-Irrigation Use Factor | Revised Industrial Average Annual RW Demand (AFY) (loops back to K Column) | Irrigation - Peak Hour Demand (mgd) | Industrial - Peak Hour Demand (mgd) | Total - Peak Hour Demand (mgd) |
| 0 | Calpine | | Industrial | | | | | | 3475.0 | 3.100 | 4.000 | 3475.0 | 3.100 | 4.000 | | | | | 0 | 4.000 | 4 |
| 1 | Bottling Group LLC (Pepsi) | Beverage Manufacturer | Irrigation | Industrial | 4 | 9.1 | 0.008 | 0.018 | 21.8 | 0.019 | 0.019 | 30.9 | 0.027 | 0.037 | 435 | 0% | 5% | 21.8 | 0.054 | 0.038 | 0.092 |
| 2 | Berkeley Farms | Dairy Processor | Irrigation | Industrial | 4 | 2.4 | 0.002 | 0.005 | 13.6 | 0.012 | 0.012 | 16.0 | 0.014 | 0.017 | 272.6 | 0% | 5% | 13.6 | 0.015 | 0.024 | 0.039 |
| 3 | Kobe Precision | Coating, Engraving and Allied Services | Industrial | | 4 | 2.4 | 0.002 | 0.005 | 0.0 | 0.000 | 0.000 | 2.4 | 0.002 | 0.005 | 76.8 | 0% | 0% | 0.0 | 0.015 | 0 | 0.015 |
| 4 | Shasta Beverages | Beverage Manufacturer | Industrial | | 4 | | 0.000 | 0.000 | 7.5 | 0.007 | 0.007 | 7.5 | 0.007 | 0.007 | 149.5 | 0% | 5% | 7.5 | 0 | 0.014 | 0.014 |
| 5 | Rohm & Haas | Paints Manufacturer | Industrial | | 4 | | 0.000 | 0.000 | 22.4 | 0.020 | 0.020 | 22.4 | 0.020 | 0.020 | 112 | 20% | 20% | 22.4 | 0 | 0.04 | 0.04 |
| 6 | California State University | School | Irrigation | | 1 | 98.9 | 0.088 | 0.202 | | 0.000 | 0.000 | 98.9 | 0.088 | 0.202 | | | | | 0.606 | 0 | 0.606 |
| 7 | Kaiser Medical Center | Hospital | Irrigation | Industrial | 4 | 1.4 | 0.001 | 0.002 | 4.5 | 0.004 | 0.004 | 5.9 | 0.005 | 0.006 | 44.9 | 2% | 10% | 4.5 | 0.006 | 0.008 | 0.014 |
| 8 | Chabot-Las Positas Community College | School | Irrigation * | | 2 | 6.1 | 0.005 | 0.012 | | 0.000 | 0.000 | 6.1 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 9 | City Center Commercial | Operators of Non-Residential Bldgs | Irrigation | | 2 | 9.8 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.8 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 10 | Cell Genesys | Pharmaceutical/Medical Product Manufacturer | Industrial | | 4 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 26.1 | 10% | 0% | 0.0 | 0 | 0 | 0 |
| 11 | St. Michael Convalescent Hospital | Hospital | Commercial | | 2 | | 0.000 | 0.000 | 3.4 | 0.003 | 0.003 | 3.4 | 0.003 | 0.003 | | | | | 0 | 0.006 | 0.006 |
| 12 | St. Rose Hospital | Hospital | Irrigation | Industrial | 4 | 3.9 | 0.003 | 0.007 | 0.1 | 0.000 | 0.000 | 4.0 | 0.003 | 0.007 | 22 | 1% | 1% | 0.1 | 0.021 | 0 | 0.021 |
| 13 | Holy Sepulchre Cemetery | Cemetary | Irrigation * | | 2 | 23.5 | 0.021 | 0.048 | | 0.000 | 0.000 | 23.5 | 0.021 | 0.048 | | | | | 0.144 | 0 | 0.144 |
| 14 | Columbus Manufacturing | Food Manufacturer | Irrigation | Industrial | 4 | 2.7 | 0.002 | 0.005 | 1.0 | 0.001 | 0.001 | 3.7 | 0.003 | 0.006 | 20.4 | 0% | 5% | 1.0 | 0.015 | 0.002 | 0.017 |
| 15 | La Quinta Inn | Motel/Hotel | Commercial | | 2 | | 0.000 | 0.000 | 2.0 | 0.002 | 0.002 | 2.0 | 0.002 | 0.002 | | | | | 0 | 0.004 | 0.004 |
| 16 | BART Maintenance Yard | Maintenance Facility | Industrial | | 2 | | 0.000 | 0.000 | 5.2 | 0.005 | 0.005 | 5.2 | 0.005 | 0.005 | | | | | 0 | 0.01 | 0.01 |
| 17 | Tom's Laundromat | Laundromat | Commercial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 18 | Best Express Foods | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 19 | Henkel Adhesive Corp | Adhesive Manufacturer | Industrial | | 4 | | 0.000 | 0.000 | 6.9 | 0.006 | 0.006 | 6.9 | 0.006 | 0.006 | 17.2 | 20% | 40% | 6.9 | 0 | 0.012 | 0.012 |
| 20 | Caltrans D-4 | ROW | Irrigation | | 1 | 16.9 | 0.015 | 0.035 | | 0.000 | 0.000 | 16.9 | 0.015 | 0.035 | | | | | 0.105 | 0 | 0.105 |
| 21 | Azuma Foods | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 22 | Islander Motel | Motel/Hotel | Commercial | | 2 | | 0.000 | 0.000 | 1.6 | 0.001 | 0.001 | 1.6 | 0.001 | 0.001 | | | | | 0 | 0.002 | 0.002 |
| 23 | Caltrans | ROW | Irrigation | | 1 | 15.3 | 0.014 | 0.032 | | 0.000 | 0.000 | 15.3 | 0.014 | 0.032 | | | | | 0.096 | 0 | 0.096 |
| 24 | Caltrans | ROW | Irrigation | | 1 | 15.1 | 0.013 | 0.030 | | 0.000 | 0.000 | 15.1 | 0.013 | 0.030 | | | | | 0.09 | 0 | 0.09 |
| 25 | Legacy Partners (Gruma Foods) | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 26 | Baxter Healthcare Corp. | Pharmaceutical/Medical Product Manufacturer | Irrigation | Industrial | 4 | 4.5 | 0.004 | 0.009 | 0.0 | 0.000 | 0.000 | 4.5 | 0.004 | 0.009 | 14.9 | 0% | 0% | 0.0 | 0.027 | 0 | 0.027 |
| 27 | Discovery Foods (American Avenue facility) | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 28 | Food Depot and United Catering | Food-related Business | Industrial | Irrigation | 4 | 1.6 | 0.001 | 0.002 | 1.5 | 0.001 | 0.001 | 3.1 | 0.002 | 0.003 | 30.7 | 0% | 5% | 1.5 | 0.006 | 0.002 | 0.008 |
| 29 | Life Chiropractic College | School | Industrial | | 4 | | 0.000 | 0.000 | 3.0 | 0.003 | 0.003 | 3.0 | 0.003 | 0.003 | 14.9 | 20% | 20% | 3.0 | 0 | 0.006 | 0.006 |
| 30 | SCA Packaging | Food/Medical Packaging Manufacturer | Industrial | | 4 | | 0.000 | 0.000 | 1.5 | 0.001 | 0.001 | 1.5 | 0.001 | 0.001 | 14.9 | 20% | 10% | 1.5 | 0 | 0.002 | 0.002 |
| 31 | RREEF America REIT II | Business Park | Irrigation | | 1 | 14.5 | 0.013 | 0.030 | | 0.000 | 0.000 | 14.5 | 0.013 | 0.030 | | | | | 0.09 | 0 | 0.09 |
| 32 | Southland Mall | Retail Center | Irrigation | | 1 | 12.8 | 0.011 | 0.025 | | 0.000 | 0.000 | 12.8 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 33 | RREEF American REIT II | Business Park | Irrigation | | 1 | 12.9 | 0.012 | 0.028 | | 0.000 | 0.000 | 12.9 | 0.012 | 0.028 | | | | | 0.084 | 0 | 0.084 |
| 34 | Alameda County Corporation Yard | Maintenance Facility | Industrial | | 2 | | 0.000 | 0.000 | 5.6 | 0.005 | 0.005 | 5.6 | 0.005 | 0.005 | | | | | 0 | 0.01 | 0.01 |
| 35 | Morgan Advanced Ceramics | Construction Materials Manufacturer | Industrial | | 2 | | 0.000 | 0.000 | 5.6 | 0.005 | 0.005 | 5.6 | 0.005 | 0.005 | | | | | 0 | 0.01 | 0.01 |
| 36 | Hayward Point Eden | Business Park | Irrigation | | 1 | 31.6 | 0.028 | 0.064 | | 0.000 | 0.000 | 31.6 | 0.028 | 0.064 | | | | | 0.192 | 0 | 0.192 |
| 37 | Friendly Wash Coin Laundry | Laundromat | Commercial | | 4 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 13.3 | 80% | 0% | 0.0 | 0 | 0 | 0 |
| 38 | Pentagon Technologies | Semi-conductor Manufacturer | Industrial | | 4 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 14.4 | 10% | 0% | 0.0 | 0 | 0 | 0 |
| 39 | Prologis Trust | Operators of Non-Residential Bldgs | Irrigation | | 1 | 14.6 | 0.013 | 0.030 | | 0.000 | 0.000 | 14.6 | 0.013 | 0.030 | | | | | 0.09 | 0 | 0.09 |
| 40 | Bay Center II | Business Park | Irrigation | | 1 | 20.2 | 0.018 | 0.041 | | 0.000 | 0.000 | 20.2 | 0.018 | 0.041 | | | | | 0.123 | 0 | 0.123 |
| 41 | Central Concrete Supply | Construction Materials Manufacturer | Industrial | | 2 | | 0.000 | 0.000 | 9.7 | 0.009 | 0.009 | 9.7 | 0.009 | 0.009 | | | | | 0 | 0.018 | 0.018 |
| 42 | BB&K Franklin Township | Business Park | Irrigation | | 1 | 12.8 | 0.011 | 0.025 | 0.0 | 0.000 | 0.000 | 12.8 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 43 | American Food Distribution | Operators of Non-Residential Bldgs | Irrigation | | 2 | 2.5 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.5 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 44 | Clarmil Manufacturing | Food Manufacturer | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 45 | Moreau High School | School | Irrigation | | 1 | 12.4 | 0.011 | 0.025 | | 0.000 | 0.000 | 12.4 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 46 | Jackson-Winton Laundry | Laundromat | Commercial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 47 | Pacific Bell | Small Generator? | Irrigation | | 1 | 8.6 | 0.008 | 0.018 | 7.1 | 0.006 | 0.006 | 15.7 | 0.014 | 0.024 | | | | | 0.054 | 0.012 | 0.066 |
| 48 | Ho Yuan Chan | Automobile-related business | Irrigation | | 1 | 11.6 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.6 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 49 | Home Depot | Retail Center | Irrigation | | 1 | 11.6 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.6 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 50 | Hutch's Car Wash | Carwash | Industrial | | 2 | | 0.000 | 0.000 | 10.4 | 0.009 | 0.009 | 10.4 | 0.009 | 0.009 | | | | | 0 | 0.018 | 0.018 |
| 51 | Balch Business Center IV | Business Park | Irrigation | | 2 | 2.4 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.4 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 52 | Olive Garden | Food-related Business | Irrigation | | 1 | 1.3 | 0.001 | 0.002 | | 0.000 | 0.000 | 1.3 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 53 | Wing Nien | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 54 | 24-Hour Fitness | Fitness Facility | Irrigation | | 1 | 1.6 | 0.001 | 0.002 | | 0.000 | 0.000 | 1.6 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 55 | Caltrans D-4 | ROW | Irrigation | | 1 | 10.7 | 0.010 | 0.023 | | 0.000 | 0.000 | 10.7 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 56 | Calwest Industrial Properties | Business Park | Industrial | | 2 | | 0.000 | 0.000 | 2.1 | 0.002 | 0.002 | 2.1 | 0.002 | 0.002 | | | | | 0 | 0.004 | 0.004 |
| 57 | RREEF American REIT II | Business Park | Irrigation | | 1 | 7.5 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.5 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 58 | Garin Regional Park (EBRPD) | Park | Irrigation | | 1 | 10.5 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.5 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 59 | The Clean Machine | Laundromat | Commercial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 60 | Dobake Inc. | Unclassified | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 61 | Atalaya Properties | Retail Center | Irrigation | | 1 | 7.9 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.9 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 62 | Hayward Community Garden | Park | Irrigation | | 1 | 13.3 | 0.012 | 0.028 | | 0.000 | 0.000 | 13.3 | 0.012 | 0.028 | | | | | 0.084 | 0 | 0.084 |
| 63 | Gillig Corp | Automobile-related business | Industrial | | 4 | | 0.000 | 0.000 | 1.0 | 0.001 | 0.001 | 1.0 | 0.001 | 0.001 | 10.2 | 40% | 10% | 1.0 | 0 | 0.002 | 0.002 |
| 64 | Hayward 880 LLC | Business Park | Irrigation | | 1 | 9.8 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.8 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 65 | Fairfield Inn and Suites | Motel/Hotel | Commercial | | 4 | | 0.000 | 0.000 | 1.0 | 0.001 | 0.001 | 1.0 | 0.001 | 0.001 | 9.8 | 10% | 10% | 1.0 | 0 | 0.002 | 0.002 |
| 66 | Home Depot #635 | Retail Center | Irrigation | | 1 | 11.9 | 0.011 | 0.025 | 0.0 | 0.000 | 0.000 | 11.9 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 67 | Mi Pueblo Food Center | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 68 | Target Corporation | Retail Center | Irrigation | | 1 | 9.7 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.7 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 69 | Hayward Convalescent Hospital | Hospital | Commercial | | 2 | | 0.000 | 0.000 | 1.4 | 0.001 | 0.001 | 1.4 | 0.001 | 0.001 | | | | | 0 | 0.002 | 0.002 |

| # | Potential Customer | Customer Type | Primary Type of RW Use | Secondary Type of RW Use | Method of Estimate | Irrigation - Average Annual RW Demand (AFY) | Irrigation - Annual RW Demand Estimate (mgd) | Irrigation - Peak Month RW Demand Estimate (mgd) | Revised Industrial - Average Annual RW Demand (AFY) | Industrial - Annual RW Demand Estimate (mgd) | Industrial - Peak Month RW Demand Estimate (mgd) | Total - Average Annual RW Demand (AFY) | Total - Annual RW Demand Estimate (mgd) | Total - Peak Month RW Demand Estimate (mgd) | Total Water Use (AFY) (2006) | Original Non-Irrigation Use Factor | Revised Non-Irrigation Use Factor | Revised Industrial Average Annual RW Demand (AFY) (loops back to K Column) | Irrigation - Peak Hour Demand (mgd) | Industrial - Peak Hour Demand (mgd) | Total - Peak Hour Demand (mgd) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 70 | Pacific Cheese | Food Manufacturer | Irrigation | | 1 | 5.9 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.9 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 71 | Clean Xpress | Drycleaner | Commercial | | 2 | | 0.000 | 0.000 | 7.6 | 0.007 | 0.007 | 7.6 | 0.007 | 0.007 | | | | | 0 | 0.014 | 0.014 |
| 72 | Robert Chang & Associates | Business Park | Irrigation | | 1 | 10.3 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.3 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 73 | American Hotel/Green Shutter | Retail Center | Commercial | | 2 | | 0.000 | 0.000 | 0.9 | 0.001 | 0.001 | 0.9 | 0.001 | 0.001 | | | | | 0 | 0.002 | 0.002 |
| 74 | Novo Nordisk Delivery | Management Services | Industrial | | 4 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 9.1 | 20% | 0% | 0.0 | 0 | 0 | 0 |
| 75 | Linchen Inc. | Specialty Wine | Irrigation | | 1 | 0.9 | 0.001 | 0.002 | | 0.000 | 0.000 | 0.9 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 76 | International Window Corp | Construction Materials | Industrial | | 2 | | 0.000 | 0.000 | 7.8 | 0.007 | 0.007 | 7.8 | 0.007 | 0.007 | | | | | 0 | 0.014 | 0.014 |
| 77 | Hayward Whipple Association | Commercial Center | Irrigation | | 2 | 1.0 | 0.001 | 0.002 | | 0.000 | 0.000 | 1.0 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 78 | Motel 6 | Motel/Hotel | Commercial | | 2 | | 0.000 | 0.000 | 0.8 | 0.001 | 0.001 | 0.8 | 0.001 | 0.001 | | | | | 0 | 0.002 | 0.002 |
| 79 | Caltrans D-4 HDWS | ROW | Irrigation | | 1 | 8.7 | 0.008 | 0.018 | | 0.000 | 0.000 | 8.7 | 0.008 | 0.018 | | | | | 0.054 | 0 | 0.054 |
| 80 | Caltrans D-4 | ROW | Irrigation | | 1 | 7.7 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.7 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 81 | Mission Car Wash | Carwash | Commercial | | 2 | | 0.000 | 0.000 | 7.7 | 0.007 | 0.007 | 7.7 | 0.007 | 0.007 | | | | | 0 | 0.014 | 0.014 |
| 82 | Bay Cities Auto Auction | Automobile-related business | Irrigation | | 1 | 18.3 | 0.016 | 0.037 | | 0.000 | 0.000 | 18.3 | 0.016 | 0.037 | | | | | 0.111 | 0 | 0.111 |
| 83 | TIAA Realty | Business Park | Irrigation | | 1 | 8.9 | 0.008 | 0.018 | | 0.000 | 0.000 | 8.9 | 0.008 | 0.018 | | | | | 0.054 | 0 | 0.054 |
| 84 | Hampton Inn | Motel/Hotel | Irrigation | | 1 | 2.3 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.3 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 85 | Domino's Commissary | Food-related Business | Industrial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 86 | R&R Laundry | Laundromat | Commercial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 87 | Friendly Wash | Laundromat | Commercial | | 2 | | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | 0.0 | 0.000 | 0.000 | | | | | 0 | 0 | 0 |
| 88 | Honda of Hayward | Car Dealershiip | Irrigation | | 1 | 8.1 | 0.007 | 0.016 | | 0.000 | 0.000 | 8.1 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 89 | Arden Industrial Center | Business Park | Irrigation | | 1 | 7.8 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.8 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 90 | RREEF Management Company | Business Park | Irrigation | | 1 | 7.6 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.6 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 91 | Mt. Eden High School | School | Irrigation | | 1 | 43.1 | 0.038 | 0.087 | | 0.000 | 0.000 | 43.1 | 0.038 | 0.087 | | | | | 0.261 | 0 | 0.261 |
| 92 | Tennyson High School | School | Irrigation | | 2 | 5.38 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.4 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 93 | Ochoa Middle School | School | Irrigation | | 1 | 18.4 | 0.016 | 0.037 | | 0.000 | 0.000 | 18.4 | 0.016 | 0.037 | | | | | 0.111 | 0 | 0.111 |
| 94 | King Middle School | School | Irrigation | | 1 | 11.8 | 0.011 | 0.025 | | 0.000 | 0.000 | 11.8 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 95 | Cesar Chavez School | School | Irrigation | | 1 | 11.3 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.3 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 96 | Southgate School | School | Irrigation * | | 2 | 0.76 | 0.001 | 0.002 | | 0.000 | 0.000 | 0.8 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 97 | Bowman School | School | Irrigation | | 2 | 3.22 | 0.003 | 0.007 | | 0.000 | 0.000 | 3.2 | 0.003 | 0.007 | | | | | 0.021 | 0 | 0.021 |
| 98 | Eden Garden School | School | Irrigation * | | 2 | 2.88 | 0.003 | 0.007 | | 0.000 | 0.000 | 2.9 | 0.003 | 0.007 | | | | | 0.021 | 0 | 0.021 |
| 99 | Eldridge School | School | Irrigation | | 1 | 10.7 | 0.010 | 0.023 | | 0.000 | 0.000 | 10.7 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 100 | Shepherd School | School | Irrigation | | 1 | 10.4 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.4 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 101 | Ruus School | School | Irrigation | | 1 | 9.9 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.9 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 102 | Longwood School | School | Irrigation | | 1 | 9.7 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.7 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 103 | Tyrrell School | School | Irrigation | | 1 | 11 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.0 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 104 | Peixoto School | School | Irrigation | | 1 | 1.48 | 0.001 | 0.002 | | 0.000 | 0.000 | 1.5 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 105 | Loren Eden School | School | Irrigation | | 1 | 7.8 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.8 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 106 | Harder School | School | Irrigation | | 1 | 5.2 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.2 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 107 | Treeview School | School | Irrigation | | 1 | 6.7 | 0.006 | 0.014 | | 0.000 | 0.000 | 6.7 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 108 | Schafer Park School | School | Irrigation | | 2 | 1.16 | 0.001 | 0.002 | | 0.000 | 0.000 | 1.2 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 109 | Park School | School | Irrigation | | 1 | 5.8 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.8 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 110 | Bret Harte School | School | Irrigation | | 1 | 4.8 | 0.004 | 0.009 | | 0.000 | 0.000 | 4.8 | 0.004 | 0.009 | | | | | 0.027 | 0 | 0.027 |
| 111 | Burbank School | School | Irrigation | | 1 | 2.4 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.4 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 112 | Palma Ceia School | School | Irrigation * | | 2 | 1.36 | 0.001 | 0.002 | | 0.000 | 0.000 | 1.4 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 113 | Winton Jr. High | School | Irrigation | | 2 | 0.84 | 0.001 | 0.002 | | 0.000 | 0.000 | 0.8 | 0.001 | 0.002 | | | | | 0.006 | 0 | 0.006 |
| 114 | Oliver Sports Park | Park | Irrigation | | 1 | 35.0 | 0.031 | 0.071 | | 0.000 | 0.000 | 35.0 | 0.031 | 0.071 | | | | | 0.213 | 0 | 0.213 |
| 115 | Kennedy Park | Park | Irrigation | | 1 | 21.5 | 0.019 | 0.044 | | 0.000 | 0.000 | 21.5 | 0.019 | 0.044 | | | | | 0.132 | 0 | 0.132 |
| 116 | Mt. Eden Park | Park | Irrigation | | 1 | 20.5 | 0.018 | 0.041 | | 0.000 | 0.000 | 20.5 | 0.018 | 0.041 | | | | | 0.123 | 0 | 0.123 |
| 117 | Tennyson Park | Park | Irrigation | | 1 | 18.8 | 0.017 | 0.039 | | 0.000 | 0.000 | 18.8 | 0.017 | 0.039 | | | | | 0.117 | 0 | 0.117 |
| 118 | Centennial Park | Park | Irrigation | | 1 | 17.4 | 0.016 | 0.037 | | 0.000 | 0.000 | 17.4 | 0.016 | 0.037 | | | | | 0.111 | 0 | 0.111 |
| 119 | Eden Greenway - Part 1 | Park | Irrigation | | 1 | 10.0 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.0 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 120 | Skywest Golf Course | Golf Course | Irrigation | | 1 | 7.5 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.5 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 121 | Eden Shores Park | Park | Irrigation | | 1 | 12.7 | 0.011 | 0.025 | | 0.000 | 0.000 | 12.7 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 122 | Five Canyons Park | Park | Irrigation | | 1 | 12.1 | 0.011 | 0.025 | | 0.000 | 0.000 | 12.1 | 0.011 | 0.025 | | | | | 0.075 | 0 | 0.075 |
| 123 | Greenwood Park | Park | Irrigation | | 1 | 11.7 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.7 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 124 | Birchfield Park | Park | Irrigation | | 1 | 10.8 | 0.010 | 0.023 | | 0.000 | 0.000 | 10.8 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 125 | Cannery Park | Park | Irrigation | | 1 | 10.3 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.3 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 126 | Schafer Park | Park | Irrigation | | 1 | 9.9 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.9 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 127 | Palma Ceia Park | Park | Irrigation | | 1 | 9.7 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.7 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 128 | Gansburger Park | Park | Irrigation | | 1 | 8.2 | 0.007 | 0.016 | | 0.000 | 0.000 | 8.2 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 129 | Brenkwitz School | School | Irrigation | | 1 | 8.0 | 0.007 | 0.016 | | 0.000 | 0.000 | 8.0 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 130 | Longwood Park | Park | Irrigation | | 1 | 7.6 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.6 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 131 | Weekes Park | Park | Irrigation | | 1 | 8.4 | 0.007 | 0.016 | | 0.000 | 0.000 | 8.4 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 132 | Christian Penke Park | Park | Irrigation | | 1 | 7.2 | 0.006 | 0.014 | | 0.000 | 0.000 | 7.2 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 133 | Eldridge Park | Park | Irrigation | | 1 | 7.0 | 0.006 | 0.014 | | 0.000 | 0.000 | 7.0 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 134 | Stratford Village Park | Park | Irrigation | | 1 | 6.9 | 0.006 | 0.014 | | 0.000 | 0.000 | 6.9 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 135 | Rancho Arroyo Park | Park | Irrigation | | 1 | 6.5 | 0.006 | 0.014 | | 0.000 | 0.000 | 6.5 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 136 | Bidwell Park | Park | Irrigation | | 1 | 6.3 | 0.006 | 0.014 | | 0.000 | 0.000 | 6.3 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 137 | Twin Bridges Park | Park | Irrigation | | 1 | 6.0 | 0.005 | 0.012 | | 0.000 | 0.000 | 6.0 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 138 | Memorial Park/Plunge | Park | Irrigation | | 1 | 13.2 | 0.012 | 0.028 | | 0.000 | 0.000 | 13.2 | 0.012 | 0.028 | | | | | 0.084 | 0 | 0.084 |
| 139 | El Rancho Verde School | School | Irrigation | | 1 | 5.1 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.1 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 140 | Canyon View Park | Park | Irrigation | | 1 | 5.1 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.1 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 141 | Ruus Park | Park | Irrigation | | 1 | 7.5 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.5 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 142 | Sorensdale Park | Park | Irrigation | | 1 | 4.1 | 0.004 | 0.009 | | 0.000 | 0.000 | 4.1 | 0.004 | 0.009 | | | | | 0.027 | 0 | 0.027 |
| 143 | Stonybrook Park | Park | Irrigation | | 1 | 4.1 | 0.004 | 0.009 | | 0.000 | 0.000 | 4.1 | 0.004 | 0.009 | | | | | 0.027 | 0 | 0.027 |

| # | Potential Customer | Customer Type | Primary Type of RW Use | Secondary Type of RW Use | Method of Estimate | Irrigation - Average Annual RW Demand (AFY) | Irrigation - Annual RW Demand Estimate (mgd) | Irrigation - Peak Month RW Demand Estimate (mgd) | Revised Industrial - Average Annual RW Demand (AFY) | Industrial - Annual RW Demand Estimate (mgd) | Industrial - Peak Month RW Demand Estimate (mgd) | Total - Average Annual RW Demand (AFY) | Total - Annual RW Demand Estimate (mgd) | Total - Peak Month RW Demand Estimate (mgd) | Total Water Use (AFY) (2006) | Original Non-Irrigation Use Factor | Revised Non-Irrigation Use Factor | Revised Industrial Average Annual RW Demand (AFY) (loops back to K Column) | Irrigation - Peak Hour Demand (mgd) | Industrial - Peak Hour Demand (mgd) | Total - Peak Hour Demand (mgd) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 144 | College Heights Park | Park | Irrigation | | 1 | 2.8 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.8 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 145 | Fairway Greens Park | Park | Irrigation | | 1 | 3.0 | 0.003 | 0.007 | | 0.000 | 0.000 | 3.0 | 0.003 | 0.007 | | | | | 0.021 | 0 | 0.021 |
| 146 | CITY OF HAYWARD | Park | Irrigation | | 1 | 13.3 | 0.012 | 0.028 | | 0.000 | 0.000 | 13.3 | 0.012 | 0.028 | | | | | 0.084 | 0 | 0.084 |
| 147 | City of Hayward | Park | Irrigation | | 1 | 11.5 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.5 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 148 | City of Hayward | Park | Irrigation | | 1 | 9.9 | 0.009 | 0.021 | | 0.000 | 0.000 | 9.9 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 149 | CITY OF HAYWARD | Park | Irrigation | | 1 | 8.3 | 0.007 | 0.016 | | 0.000 | 0.000 | 8.3 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 150 | CITY OF HAYWARD | City Hall | Irrigation | | 1 | 10.3 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.3 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 151 | CITY OF HAYWARD | Wastewater Lift Station | Irrigation | | 1 | 5.4 | 0.005 | 0.012 | | 0.000 | 0.000 | 5.4 | 0.005 | 0.012 | | | | | 0.036 | 0 | 0.036 |
| 152 | Shaklee Corporation | R&D | Irrigation | | 1 | 2.7 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.7 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 153 | LBA Realty (formerly ETEC) | Business Park | Irrigation | | 1 | 11.7 | 0.010 | 0.023 | | 0.000 | 0.000 | 11.7 | 0.010 | 0.023 | | | | | 0.069 | 0 | 0.069 |
| 154 | David Himy | Business Park | Irrigation | | 1 | 7.7 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.7 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 155 | PNK, LLC | Business Park | Irrigation | | 1 | 7.8 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.8 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 156 | Prologis Trust | Business Park | Irrigation | | 1 | 7.4 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.4 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 157 | Hayward Point Eden I LP | Business Park | Irrigation | | 1 | 7.6 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.6 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 158 | Gahrahmat Properties | Business Park | Irrigation * | | 2 | 7.9 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.9 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 159 | Brittania Point Eden | Business Park | Irrigation | | 1 | 7.3 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.3 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 160 | Bay Center II | Business Park | Irrigation | | 1 | 7.3 | 0.007 | 0.016 | | 0.000 | 0.000 | 7.3 | 0.007 | 0.016 | | | | | 0.048 | 0 | 0.048 |
| 161 | Sprinkler Fitters | Business Park | Irrigation | | 1 | 7.1 | 0.006 | 0.014 | | 0.000 | 0.000 | 7.1 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 162 | Hayward FGHK | Business Park | Irrigation | | 1 | 7.1 | 0.006 | 0.014 | | 0.000 | 0.000 | 7.1 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 163 | Winton Industrial Center | Business Park | Irrigation | | 1 | 7.1 | 0.006 | 0.014 | | 0.000 | 0.000 | 7.1 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 164 | Stonebrae Golf Course | Golf Course | Irrigation | | 3 | 420.7 | 0.375 | 0.863 | | 0.000 | 0.000 | 420.7 | 0.375 | 0.863 | | | | | 2.589 | 0 | 2.589 |
| 165 | Stonebrae Elementary School | School | Irrigation | | 1 | 6.7 | 0.006 | 0.014 | | 0.000 | 0.000 | 6.7 | 0.006 | 0.014 | | | | | 0.042 | 0 | 0.042 |
| 166 | Jalquin Vista Park | Park | Irrigation | | 1 | 2.3 | 0.002 | 0.005 | | 0.000 | 0.000 | 2.3 | 0.002 | 0.005 | | | | | 0.015 | 0 | 0.015 |
| 167 | Eden Greenway - Part 2 | Park | Irrigation | | 1 | 10.0 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.0 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| 168 | Eden Greenway - Part 3 | Park | Irrigation | | 1 | 10.0 | 0.009 | 0.021 | | 0.000 | 0.000 | 10.0 | 0.009 | 0.021 | | | | | 0.063 | 0 | 0.063 |
| | | | **Total** | | | **1661.8** | **1.5** | **3.4** | **3639.7** | **3.2** | **4.1** | **5301.5** | **4.7** | **7.6** | | | | 85.8 | 10.239 | 4.294 | 14.533 |

# Appendix C - Customer Survey Results Summary

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Hayward Recycled Water Feasibility Study – Telephone Survey Results Summary
Water Demand

| Cust ID | Customer Name | Major Indoor Water-consuming Applications | Water Use Proportion | | | Water Use Variations | | Potential Indoor Applications for RW | Planning Level Demand | | | Specialized Onsite Water Treatment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | Product Manufacturing | Boiler | Cooling | Daily | Seasonal | | Total Non-Irrigation Water Demand (AFY) | Revised Factor of Usage (%) | Revised Industrial Recycled Water Demand (AFY) | (excluding anti-scaling chemical treatment) |
| 1 | Bottling Group LLC (Pepsi) | ▪ Beverage production<br>▪ Sanitation of production equipment (bottles), production lines and floors.<br>▪ Boiler (used for sanitizing bottling machines and filler – requires drinking water standards)<br>▪ Industrial cooling (evaporative condenser, AC)<br>▪ Wastewater pretreatment system | 90% | Less than cooling | 90,000-150,000 gal/mth | 16h/day, 8 h shifts (beginning at 4 am) | Peaks during Spring/Summer/Early Fall. | ▪ Evaporative condenser<br>▪ Cooling towers<br>▪ Boilers | 435 | 5 | 22 | ▪ RO minimal treatment system |
| 2 | Berkeley Farms | ▪ Cleaning of tanks, silos, fillers<br>▪ Cooling Towers<br>▪ Boilers (used for steam sterilization)<br>▪ Lube system (water used as lubricant for chains)<br>▪ Case washers | ▪10% (orange drink production)<br>▪ 90% (dairy processing – incl. cooling, boilers, cleaning) | No info provided | No info provided | 24/7, 6pm-6am (peak) | Relatively consistent year round. | ▪ Cooling towers<br>▪ Evaporative condensers (located next to cooling towers on the roof)<br>▪ Boilers<br>▪ Lube system | 273 | 5 | 14 | ▪ None |
| 3 | Kobe Precision | ▪ Semi-conductor operations (reclamation of wafer products – cleaning with R/O water) | ▪ 95% | No info provided | No info provided | 24/7, 5 days a week | Production fluctuates with demand. | ▪ Not identified – RO water is recycled through the entire production process for use in cooling applications. | 77 | 0 | 0 | ▪ RO treatment |
| 4 | Shasta Beverages | ▪ Beverage production | No info provided | No info provided | No info provided | No info provided | No info provided | ▪ Assumed similar operations to Pepsi. | 150 | 5 | 8 | ▪ Not identified |
| 5 | Rohm & Haas Chemicals | ▪ Production of water-based emulsions (using de-ionized water).<br>▪ Boiler feed use<br>▪ Cooling towers/blowers | 40% (de-ionized) | Less than cooling | 10-15% | 24/7 | Higher production from Apr-Sep. | ▪ General rinsing off of emulsion coating from production equipment.<br>▪ Boiler<br>▪ Cooling towers/blowers | 112 | 20 | 22 | ▪ Deionizers |
| 7 | Kaiser Medical Center | ▪ Restrooms (1 in every hospital room)<br>▪ Cooling tower<br>▪ Chillers (closed loop)<br>▪ Autoclaves – generates steam for equipment sterilization. | Autoclaves for sterilization:<br>20 gal/min | No info provided | In the order of hundreds of gallons per month | 24/7<br>Offices A/C: 6am-7pm | Higher patient load from Jan-Mar and on hot days (for cooling). | ▪ Cooling tower | 45 | 10 | 5 | ▪ None |
| 10 | Cell Genesys | ▪ Pharmaceuticals manufacturing<br>▪ Boiler<br>▪ AC cooling | >80% (manufacturing process) | <20% (General utility – incl. showers, sinks, industrial boilers, cooling) | No info provided | No info provided | No info provided | ▪ Not identified – piping is co-mingled, so other industrial processes receive the same water used in pharmaceutical production. | 26 | 0 | 0 | ▪ Deionizers<br>▪ UF<br>▪ Distillers |
| 12 | St. Rose Hospital | ▪ High-pressure steam boiler for sterilization<br>▪ Cooling tower | No info provided | 1200 gal/mth | 1200-1500 gal/mth | No info provided | Cooling – higher load in summer.<br>Boiler – relatively consistent with heavier use in winter. | ▪ Cooling tower | 22 | 1 | 0.1 | ▪ None |
| 14 | Columbus Manufacturing | ▪ Food Products Manufacturing<br>▪ Boilers (1 operational, 1 backup)<br>▪ Cooling tower<br>▪ Excess sanitation procedures (e.g. wash down) | ▪ 90% | No info provided | No info provided | 5-6 days/wk<br>Day (8h)shift: boiling & cooling<br>Night shift:: sanitation | No info provided | ▪ Cooling tower<br>▪ Boilers | 20 | 5 | 1 | ▪ None |
| 19 | Henkel Adhesive Corporation | ▪ Formula component of adhesive product<br>▪ Cleaning of tanks<br>▪ Steam generation<br>▪ Cooling (recirculation of water) | >50% | 10-15% | 25-30% | 5 days/wk, 5am-5pm | Relatively consistent year round. | ▪ Boiler<br>▪ Cooling<br>▪ Two labs | 17 | 40 | 7 | ▪ None |
| 26 | Baxter Healthcare Corporation | ▪ Pharmaceutical production<br>▪ Medical device production | 63% (Manufacturing process – incl. boilers/HVACs/3 chillers/cooling tower/restrooms/labs/cafeteria) | No info provided | No info provided | 9am-5pm | Production fluctuates according to demand. | ▪ No suitable applications within production process but is considering re-using water for irrigation after routing the wastewater through neutralization systems. | 15 | 0 | 0 | ▪ Filtration system<br>▪ Neutralization system |
| 28 | Food Depot/United Catering | ▪ Food products manufacturing | No info provided | No info provided | No info provided | No info provided | No info provided | ▪ Assumed similar operations to Columbus Manufacturing. | 31 | 5 | 2 | ▪ Not identified. |
| 29 | Life Chiropractic College | ▪ Restrooms<br>▪ Cooling towers | No info provided | No info provided | No info provided | 9 am – 5pm | Relatively consistent year round. | ▪ Assumed water use factor based on business code. | 15 | 20 | 3 | ▪ None |

Hayward Recycled Water Feasibility Study – Telephone Survey Results Summary
Water Demand

| Cust ID | Customer Name | Major Indoor Water-consuming Applications | Water Use Proportion | | | Water Use Variations | | Potential Indoor Applications for RW | Planning Level Demand | | | Specialized Onsite Water Treatment |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 30 | SCA Packaging | ▪ Injection molding<br>▪ Temperature-controlled packaging (used for vaccines, food – subject to strict regulations)<br>▪ Boiler (heating medium)<br>▪ Cooling tower (uses same water from the boiler that is recycled in a closed loop). | 80% (after going through boiler) | 80% (used in product after running through boiler) | 10% | 5 days/wk<br>16 h/day | 20-30% increase in last quarter of the year. | ▪ Not identified – piping is all linked sequentially. | 15 | 10 | 1.5 | ▪ Micro-metalllic treatment |
| 38 | Pentagon Technologies | ▪ High-purity DI water for use at the site<br>▪ Cleaning of parts for semi-conductor industry. | 80% DI (production process) | DI water from production processes is reused for scrubber (flushing) and cooling tower needs | | 5 days/wk, 16 h/day | Production fluctuates with demand. | ▪ Not identified – DI water is recycled through the entire production process for use in the scrubber and cooling tower. | 14 | 0 | 0 | ▪ RO<br>▪ Deionizers |
| 63 | Gillig Corporation | ▪ Rinsing of buses after assembly for painting.<br>▪ Restrooms for 500-600 employees | 5-10% (rinsing of buses for painting);<br>Remainder (restrooms) | No info provided | No info provided | 2 shifts, 5am-1.30pm (peak) | No. | ▪ Could be used for rinsing applications if water does not contain residues. | 10 | 10 | 1 | ▪ None |
| 65 | Fairfield Inn & Suites<br>**Customer did not return telephone calls** | ▪ Restrooms<br>▪ Laundry Washing<br>▪ Cooling towers | No info provided | No info provided | No info provided | No info provided | No info provided | ▪ In-house laundry | 10 | 10 | 1 | ▪ None |
| | | | | | | | | TOTAL | 1287 | | 87.6 | |

Hayward Recycled Water Feasibility Study – Telephone Survey Results Summary
Water Quality and Other Retrofit Issues

| Cust ID | Customer Name | Business Type | Major Water-consuming Applications | RW Potential Applications | Water Quality Issues | Onsite Treatment Facilities | Onsite Storage | Booster Pumps | Retrofit Issues | Improvement Plans | Additional Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | Bottling Group LLC (Pepsi) | Beverage Manufacturer | ▪ Beverage production<br>▪ Sanitation of production equipment (bottles), production lines and floors.<br>▪ Landscape irrigation<br>▪ Boiler feed use<br>▪ Industrial cooling (evaporative condenser, AC)<br>▪ Wastewater pretreatment system | ▪ Landscape irrigation<br>▪ Evaporative condenser | Pepsi HQ has water quality mandates for boiler feed water quality and evaporative cooling water quality.<br>▪ Hardness - boiler | ▪ R/O Treatment<br>▪ Minimal Treatment System<br>▪ WW Pretreatment System | 20,000 gal surge tank to store water that is processed for production purposes. | No. | Will take significant amount of effort since most piping is underground. | Dependent on national initiative implemented at HQ level. | ▪ Steam from the boiler does not come into contact with beverage.<br>▪ The feasibility of using RW at this facility is dependent upon an assessment by the Engineering Division at the HQ. |
| 2 | Berkeley Farms | Dairy Processor | ▪ Cleaning of tanks, silos, fillers<br>▪ Cooling Towers<br>▪ Boilers (used for steam sterilization)<br>▪ Lube system (water used as lubricant for chains)<br>▪ Case washers | ▪ Cooling towers<br>▪ Evaporative condensers (located next to cooling towers on the roof)<br>▪ Boilers<br>▪ Lube systems<br>▪ Case washing<br>▪ Landscaping | ▪ Water used for boilers need to be in line with steam sterilization requirements.<br>▪ City water is currently run through water softeners before going into boilers.<br>▪ City water is currently fed directly into cooling towers. | ▪ Water softeners | No. | No. | Currently one input source from the City. Will take significant amount of effort since most piping is underground. | No. | ▪ Berkeley Farms is considering using “cow water” (water that is evaporated from milk in the skim milk production process) for their case washers, lube systems and cooling towers. |
| 5 | Rohm & Haas Chemicals | Water-based Paint Manufacturer | ▪ Production of water-based emulsions (using de-ionized water)<br>▪ Boiler feed use<br>▪ Cooling towers/blowers | ▪ General rinsing off of emulsion coating from production equipment.<br>▪ Boilers<br>▪ Cooling towers/blowers | ▪ De-ionized water is used for the product.<br>▪ Water used for boiler feed and cooling towers are treated with anti-scaling chemicals.<br>▪ Conductivity must not be too high.<br>▪ City water is currently treated for high pH.<br>▪ Product is very susceptible to bacterial growth.<br>▪ Heavy metals conc. needs to be low as facility has a WW discharge limit of 1 ppm. | De-ionizers | Refrigerated water tank (0.24 mil gal) for cooling towers. | No. | Not identified – incoming city water goes into a single input source. | No. | ▪ Rohm & Haas is very interested to explore the potential for RW use on their facility.<br>▪ They were close to making an agreement with Calpine to receive treated discharge water from the proposed Calpine project a few years ago. |
| 7 | Kaiser Medical Center | Hospital | ▪ Restrooms (1 in every hospital room)<br>▪ Cooling tower<br>▪ Chillers (closed loop)<br>▪ Autoclaves – generates steam for equipment sterilization. | ▪ Cooling tower<br>▪ Restrooms | ▪ No critical water quality concerns for cooling tower feed, except typical treatments for anti-scaling, etc. | ▪ Charcoal filters for drinking water. | 10,000 gal drinking water tank for emergencies. | No. | No significant issues identified with retrofitting condensers to receive RW water since they are isolated systems. | No. | ▪ Condensers appear to be the only system available for RW applicable, and are subject to OSHA requirements. |
| 10 | Cell Genesys | Pharmaceutical Manufacturer | ▪ Pharmaceuticals manufacturing<br>▪ Industrial boiler<br>▪ AC cooling | Not identified – piping is co-mingled, so other industrial processes receive the same water used in pharmaceutical production. | ▪ Nature of product does not allow for use of RW – not supported by industry.<br>▪ Due to co-mingling of piping, other manufacturing and some industrial processes receive the same supplies as the product.<br>▪ Industrial boiler and AC systems have separate water feeds, and are not subject to the same WQ regulations. | ▪ De-ionizers<br>▪ UF<br>▪ Distiller<br>Use of each system varies acc. to level of purity needed for the process. | No info provided | No info provided | All piping is co-mingled and would be difficult to separate. | No info provided | ▪ There is a lab/office facility onsite that uses treated water from the main production process for AC cooling, but the amount of water used is very small. |
| 12 | St. Rose Hospital | Hospital | ▪ High-pressure steam boiler for sterilization<br>▪ Cooling tower<br>▪ Landscape irrigation | ▪ Cooling tower<br>▪ Landscape irrigation | ▪ Water for boiler is currently treated with softeners for hardness.<br>▪ Water for cooling towers is treated with for corrosion inhibition, sulfite injection, and TSS. | Boiler – softener | Three 1000 gal hot water tanks. | Bladder tanks | Not identified.<br>- All piping underground. | Facility retrofits ongoing, but would not impact plumbing. | ▪ Boiler and cooling towers could be easily adapted for RW application.<br>▪ The hospital previously looked at installing a storage tank but found it to be cost prohibitive. |
| 14 | Columbus Manufacturing | Food Manufacturer | ▪ Boilers (1 operational, 1 backup)<br>▪ Cooling Tower<br>▪ Excess sanitation procedures (e.g. wash down) | ▪ Cooling tower | ▪ Water is currently treated with anti-scaling chemicals. | No info provided | No. | No info provided | No info provided | No info provided | ▪ Columbus previously considered using RW for the cooling towers (multi-vac, water cooling, run once per year). |

Hayward Recycled Water Feasibility Study – Telephone Survey Results Summary
Water Quality and Other Retrofit Issues

| Cust ID | Customer Name | Business Type | Major Water-consuming Applications | RW Potential Applications | Water Quality Issues | Onsite Treatment Facilities | Onsite Storage | Booster Pumps | Retrofit Issues | Improvement Plans | Additional Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 19 | Henkel Adhesive Corporation | Adhesive Manufacturer | ▪ Formula component of adhesive product<br>▪ Cleaning of tanks<br>▪ Steam generation<br>▪ Cooling (recirculation of water) | ▪ Boiler<br>▪ Cooling<br>▪ Two labs<br>▪ Several restrooms | ▪ Product is highly susceptible to bacterial growth.<br>▪ Water used for boiler/steam generation needs to be of a certain quality so as not to decrease efficiency. | No. | No. | No. | Relatively simple piping and fairly segregated (e.g. cooling).<br>- Incoming city water goes into a single input source. | No info provided | ▪ Henkel has expressed a very positive interest in using RW for their cooling and possibly boiler system. |
| 26 | Baxter Healthcare Corporation | Pharmaceuticals and Medical Device Manufacturer | ▪ Pharmaceutical production<br>▪ Medical device production<br>▪ Boilers<br>▪ HVAC<br>▪ Chillers (3)<br>▪ Cooling tower | No suitable applications within production but is considering re-using water for irrigation after routing the wastewater through neutralization systems. | ▪ Water quality needs to comply with the manufacturing standards set forth by the FDA.<br>▪ Iron and Zinc levels cannot be too high. | ▪ pH neutralization system<br>▪ Filtration system (to filter input from City) | No. | No. | Not identified – incoming city water goes into a single input source. | Baxter is conducting a water audit in August 2008 and will evaluate the need for improvements. | ▪ Baxter has expressed interest if it is economically feasible, and would provide water that would meet FDA's manufacturing standards. |
| 29 | Life Chiropractic College **Customer did not return phone calls** | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided |
| 30 | SCA Packaging | Packaging Manufacturer | ▪ Injection molding<br>▪ Temperature-controlled packaging<br>▪ Boiler (heating medium)<br>▪ Cooling tower (uses same water from the boiler that is recycled in a closed loop) | Not identified – piping is all linked sequentially. | ▪ Product is subject to strict regulations since it is used for vaccines and food.<br>▪ Discharge requirements are source-controlled.<br>▪ Metals testing in discharge conducted monthly. | ▪ Water softeners<br>▪ Micro-metallic treatment to remove metals and balance pH.<br>▪ Anti-scaling treatment. | 2000 gal for raw storage (reserved for boiler) | Yes (20-30 pumps – series of pumps for cooling tower, boiler feed) | Piping is all interlinked sequentially. (Water runs through boilers then into product then into cooling towers)<br>- Would have to separate out cooling tower to serve RW separately. | No info provided | No info provided |
| 38 | Pentagon Technologies | Semi-conductor Manufacturer | ▪ High-purity DI water for use at the site<br>▪ Cleaning of semi-conductor parts | Not identified - DI water is recycled through the entire production process for use in the scrubber and cooling tower. | ▪ Extremely high purity water needed for semi-conductor parts cleaning.<br>▪ Water that is used for the cooling tower needs to be treated with anti-scaling chemicals. | R/O system for de-ionized water production. | 3000 gal (DI-reuse water tanks) | No. | There are potential sections that could be isolated for RW input to cooling and scrubber systems. | No. Because they are at permit discharge limit. | ▪ There is currently a significant amount of onsite recycling of DI water because of permit limits in discharge (e.g. scrubbing, cooling systems are all fed by water recycled from DI processes).<br>▪ Would be interested in the cost-benefit of using RW.<br>▪ Would need to consider discharge permit issues since they are already at the limit. |
| 63 | Gillig Corporation | Bus Manufacturer | ▪ Rinsing of buses after assembly for painting<br>▪ Restrooms for 500-600 employees | Could be used for rinsing applications if water does not contain residues. | ▪ Water that is used for rinsing buses cannot contain residues – unsuitable for painting.<br>▪ Salt and chlorine are potential constituents of concern. | Recycling facility for water from car wash station. | 300 gal in the recycling facility. | No. | All piping is underground. | No info provided | ▪ Requires water that does not contain residues for the cleaning of buses.<br>▪ No health issues are anticipated with the use of RW for bus cleaning as they are conducted in automated stations. |
| 65 | Fairfield Inn & Suites **Customer did not return telephone calls** | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided | No info provided |

# Appendix D - Facility Technical Information

**Assuming Calpine needs 700,000 gallons - CALPINE ONLY STORAGE**

| | | | |
|---|---|---|---|
| Volume Needed to Serve Demand | 764,341 | gallons | |

*Change height and diameter until Cells H20 and H27 are equal.*

| | | | |
|---|---|---|---|
| Tank Height | 24 | feet | 8-ft increments for steel tank |
| Tank Diameter | 74 | feet | |
| | | | |
| Tank Volume | 103,220 | cubic ft | |
| Tank Volume | 772,087 | gallons | |
| Tank Volume (rounded) | 780,000 | gallons | |
| | | | |
| Minimum Draw Down | 2 | feet | |
| Minimum Volume | 8,602 | cubic ft | |
| Minimum Volume | 64,341 | gallons | |

**Assuming Calpine needs 700,000 gallons**

| | | | |
|---|---|---|---|
| Volume Needed to Serve Demand | 1,094,068 | gallons | |

*Change height and diameter until Cells C20 and C27 are equal.*

| | | | |
|---|---|---|---|
| Tank Height | 24 | feet | 8-ft increments for steel tank |
| Tank Diameter | 89 | feet | |
| | | | |
| Tank Volume | 149,307 | cubic ft | |
| Tank Volume | 1,116,819 | gallons | |
| Tank Volume (rounded) | 1,120,000 | gallons | |
| | | | |
| Minimum Draw Down | 2 | feet | |
| Minimum Volume | 12,442 | cubic ft | |
| Minimum Volume | 93,068 | gallons | |

| | Item | | Units | Notes |
|---|---|---|---|---|
| Given | Pipe Diameter | 14 | inch | |
| Given | Pipe Diameter | 1.167 | feet | |
| | | | | |
| Calc | Pipe X-Sectional Area | 1.07 | sq ft | |
| | | | | |
| Given | Peak Hour Demand | 4.510 | MGD | |
| Calc | Peak Hour Demand | 4,510,000 | gal/day | |
| Calc | Peak Hour Demand | 3,132 | gal/min | |
| Calc | Peak Hour Demand | 602,941 | ft3/day | |
| Calc | Peak Hour Demand | 6.98 | ft3/sec | |
| | | | | |
| Calc | Flow Velocity | 6.5 | ft/sec | CHECK BTWN 5-7 ft/sec |
| | | | | |
| Given | Downstream Pressure Requirement | 11 | psi | to fill 24-foot tall tank |
| Given | Pipe Length to Storage PS | 20 | feet | From Disinfection to Storage |
| | | | | |
| Given | Hazen Williams C factor | 130 | | |
| Calc | Total Headloss | 0.1989091 | ft | |
| Calc | Total Headloss | 0 | psi | |
| | | | | |
| Calc | Required Upstream Pressure | 11 | psi | |
| Calc | Required Head at Pump | 25 | feet | |
| Calc | Distribution Pump Horsepower | 28.25 | hp | |
| | | 30 hp is next available standard size motor | | |

| | Item | | Units | Notes | |
|---|---|---|---|---|---|
| Given | Pipe Diameter | 14 | inch | | |
| Given | Pipe Diameter | 1.167 | feet | | |
| | | | | | |
| Calc | Pipe X-Sectional Area | 1.07 | sq ft | | |
| | | | | | |
| Given | Peak Hour Demand | 4.650 | MGD | | |
| Calc | Peak Hour Demand | 4,650,000 | gal/day | | |
| Calc | Peak Hour Demand | 3,229 | gal/min | | |
| Calc | Peak Hour Demand | 621,658 | ft3/day | | |
| Calc | Peak Hour Demand | 7.20 | ft3/sec | | |
| | | | | | |
| Calc | Flow Velocity | 6.7 | ft/sec | CHECK BTWN 5-7 ft/sec | |
| | | | | | |
| Given | Downstream Pressure Requirement | 4.5 | psi | | 10.395 |
| Given | Pipe Length to Floc Clarifiers | 350 | feet | Piping from Influent PS to FC | |
| | | | | | |
| Given | Hazen Williams C factor | 130 | | | |
| Calc | Total Headloss | 3.6834434 | ft | | |
| Calc | Total Headloss | 2 | psi | | |
| | | | | | |
| Calc | Required Upstream Pressure | 6.5 | psi | | |
| Calc | Required Head at Pump | 15 | feet | | |
| Calc | Distribution Pump Horsepower | 17.47 | hp | | |
| | | 20 hp is next available standard size motor | | | |

| | Item | | Units | Notes |
|---|---|---|---|---|
| Given | Pipe Diameter | 14 | inch | |
| Given | Pipe Diameter | 1.167 | feet | |
| | | | | |
| Calc | Pipe X-Sectional Area | 1.07 | sq ft | |
| | | | | |
| Given | Peak Hour Demand | 4.000 | MGD | |
| Calc | Peak Hour Demand | 4,000,000 | gal/day | |
| Calc | Peak Hour Demand | 2,778 | gal/min | |
| Calc | Peak Hour Demand | 534,759 | ft3/day | |
| Calc | Peak Hour Demand | 6.19 | ft3/sec | |
| | | | | |
| Calc | Flow Velocity | 5.8 | ft/sec | CHECK BTWN 5-7 ft/sec |
| | | | | |
| Given | Downstream Pressure Requirement | 80 | psi | |
| Given | Pipe Length to Calpine Facility | 600 | feet | This is assumed for the purpose of the hydraulic analysis. |
| | | | | |
| Given | Hazen Williams C factor | 130 | | |
| Calc | Total Headloss | 4.7792552 | ft | |
| Calc | Total Headloss | 2 | psi | |
| | | | | |
| Calc | Required Upstream Pressure | 82 | psi | |
| Calc | Required Head at Pump | 189 | feet | |
| Calc | Distribution Pump Horsepower | 189.39 | hp | |
| | | 200 hp is next available standard size motor | | |

| | Item | | Units | Notes |
|---|---|---|---|---|
| Given | Pipe Diameter | 8 | inch | |
| Given | Pipe Diameter | 0.667 | feet | |
| | | | | |
| Calc | Pipe X-Sectional Area | 0.349 | sq ft | |
| | | | | |
| Given | Peak Hour Demand | 0.267 | MGD | |
| Calc | Peak Hour Demand | 267,000 | gal/day | |
| Calc | Peak Hour Demand | 185 | gal/min | |
| Calc | Peak Hour Demand | 35,695 | ft3/day | |
| Calc | Peak Hour Demand | 0.41 | ft3/sec | |
| | | | | |
| Calc | Flow Velocity | 1.2 | ft/sec | CHECK BTWN 5-7 ft/sec |
| | | | | |
| Given | Downstream Pressure Requirement | 80 | psi | |
| Given | Pipe Length to Caltrans | 4,100 | feet | |
| | | | | |
| Given | Hazen Williams C factor | 130 | | |
| Calc | Total Headloss | 3.3389222 | ft | |
| Calc | Total Headloss | 1.4 | psi | |
| | | | | |
| Calc | Required Upstream Pressure | 81.4 | psi | |
| Calc | Required Head at Pump | 188 | feet | |
| Calc | Distribution Pump Horsepower | 12.58 | hp | |
| | | 15 hp is next available standard size motor | | |

| | Item | | Units | Notes |
|---|---|---|---|---|
| Given | Pipe Diameter | 8 | inch | |
| Given | Pipe Diameter | 0.667 | feet | |
| | | | | |
| Calc | Pipe X-Sectional Area | 0.349 | sq ft | |
| | | | | |
| Given | Peak Hour Demand | 1.216 | MGD | |
| Calc | Peak Hour Demand | 1,216,000 | gal/day | |
| Calc | Peak Hour Demand | 844 | gal/min | |
| Calc | Peak Hour Demand | 162,567 | ft3/day | |
| Calc | Peak Hour Demand | 1.88 | ft3/sec | |
| | | | | |
| Calc | Flow Velocity | 5.4 | ft/sec | CHECK BTWN 5-7 ft/sec |
| | | | | |
| Given | Downstream Pressure Requirement | 80 | psi | |
| Given | Pipe Length to Oliver/Pepsi | 19,985 | feet | |
| | | | | |
| Given | Hazen Williams C factor | 130 | | |
| Calc | Total Headloss | 268.91057 | ft | |
| Calc | Total Headloss | 116 | psi | |
| | | | | |
| Calc | Required Upstream Pressure | 196 | psi | |
| Calc | Required Head at Pump | 453 | feet | |
| Calc | Distribution Pump Horsepower | 138.00 | hp | |
| | | 150 hp is next available standard size motor | | |

Table J: Treatment plant operational supply and demand summa

| Operational Flow | | | |
|---|---|---|---|
| Hr | Supply | Demand | Storage |
| | GPM | GPM | Gallons |
| 1 | 2 | 3 | 4 |
| 1 | 451 | 1,008 | 301000 |
| 2 | 451 | 1,008 | 267604.2242 |
| 3 | 451 | 1,008 | 234208.4483 |
| 4 | 451 | 1,008 | 200812.6725 |
| 5 | 451 | 1,008 | 167416.8967 |
| 6 | 451 | 35 | 192386.3914 |
| 7 | 451 | 35 | 217355.8861 |
| 8 | 451 | 35 | 242325.3809 |
| 9 | 451 | 35 | 267294.8756 |
| 10 | 451 | 35 | 292264.3703 |
| 11 | 451 | 35 | 301000 |
| 12 | 451 | 35 | 301000 |
| 13 | 451 | 35 | 301000 |
| 14 | 451 | 35 | 301000 |
| 15 | 451 | 35 | 301000 |
| 16 | 451 | 35 | 301000 |
| 17 | 451 | 35 | 301000 |
| 18 | 451 | 35 | 301000 |
| 19 | 451 | 35 | 301000 |
| 20 | 451 | 35 | 301000 |
| 21 | 451 | 1,008 | 267,604 |
| 22 | 451 | 1,008 | 234,208 |
| 23 | 451 | 1,008 | 200,813 |
| 24 | 451 | 1,008 | 167,417 |
| 25 | 451 | 1,008 | 134,021 |
| 26 | 451 | 1,008 | 100,625 |
| 27 | 451 | 1,008 | 67,230 |
| 28 | 451 | 1,008 | 33,834 |
| 29 | 451 | 1,008 | 438 |
| 30 | 451 | 35 | 25,408 |
| 31 | 451 | 35 | 50,377 |
| 32 | 451 | 35 | 75,347 |
| 33 | 451 | 35 | 100,316 |
| 34 | 451 | 35 | 125,285 |
| 35 | 451 | 35 | 150,255 |
| 36 | 451 | 35 | 175,224 |
| 37 | 451 | 35 | 200,194 |
| 38 | 451 | 35 | 225,163 |
| 39 | 451 | 35 | 250,133 |
| 40 | 451 | 35 | 275,102 |
| 41 | 451 | 35 | 300,072 |
| 42 | 451 | 35 | 301,000 |
| 43 | 451 | 35 | 301,000 |
| 44 | 451 | 35 | 301,000 |
| 45 | 451 | 1,008 | 267,604 |
| 46 | 451 | 1,008 | 234,208 |
| 47 | 451 | 1,008 | 200,813 |

Figure J-1: Hourly Supply and Demand

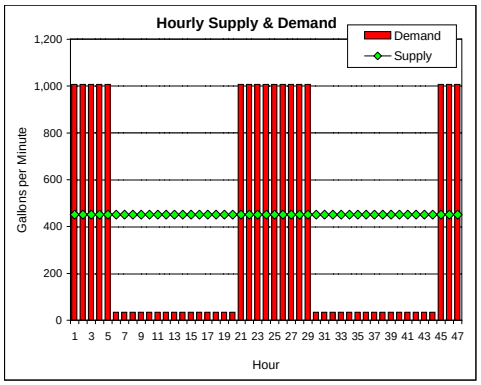


Figure J-2: Water Storage by hour (gallons)

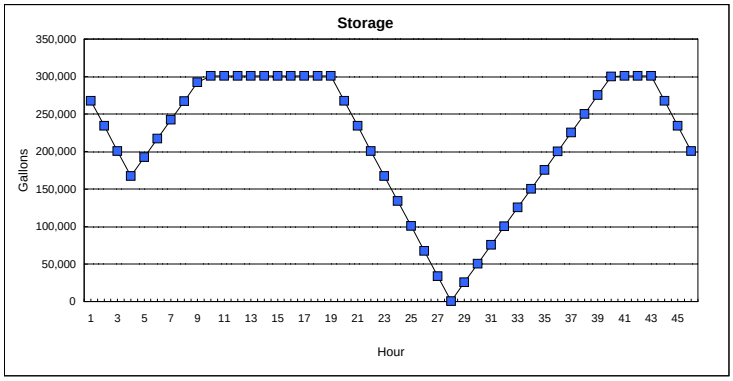


Table K: Project summary

| SUMMARY | | | |
|---|---|---|---|
| Amount of storage used: | | 300,562 | Gallons |
| Amount of potable used: | | 0 | Gallons |
| Based on- | | | |
| Treatment capacity of: | | 0.65 | MGD |
| Pumping capacity of: | | 451 | GPM |
| Supply/Demand Ratio of: | | 1.17 | GPM |

**Remarks:**

(a) Current secondary flow estimated at 11.3 MGD
(b) Same as current flow
(c) Max. amount to be pumped, limited by treatment capacity of 4.65 mgd
(d) Project irrigation demand
(e) N/A
(f) Maximum amount to be treated and pumped, limited by tertiary treatment capacity of 4.65 mgd
(g) Calculations based on starting with full storage at hour 1
(h) Secondary treatment plant flows are always above 4.65 mgd so no diurnal variation of secondary supply is needed.

NOTE: This analysis is only for Operational Storage needs related to City Recycled Water Demands. Calpine demands and storage are excluded from this analysis.

# Appendix E - Cost Estimate

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RMC
Water and Environment

**Project: Hayward Recycled Water Facilities Plan**

**Aspect: Project Alternatives**

Date: December 2008
Project Number: 0198-002

Prepared by: CDB
Checked by: MM/HK/MT

Estimate Type: Facilities Planning (10%)

| Item | | Unit Cost | Quantity - A | Unit | Total Cost - A | Quantity - B | Total Cost - B | Quantity - C | Total Cost - C | Notes |
|---|---|---|---|---|---|---|---|---|---|---|
| | | $ | | | $ | | $ | | $ | |
| **Treatment Facilities and Plant Upgrades** | | $ 6,699,000 | 1 | Allowance | $ 6,699,000 | 1 | $ 6,699,000 | 1 | $ 7,436,000 | 4.65 mgd treatment facility w/ expansion capacity to 18.5 mgd |
| **Pump Station to Serve Irrigation & Industrial Customers** | | | | | | | | | | |
| Base Cost | | $ 448,000 | 0 | Allowance | $ - | 1 | $ 448,000 | 1 | $ 448,000 | |
| Cost per horsepower | | $ 3,200 | 0 | hp | $ - | 165 | $ 528,000 | 275 | $ 880,000 | |
| **Calpine Pump Station** | | | | | | | | | | |
| Base Cost | | $ 448,000 | 1 | Allowance | $ 448,000 | 0 | $ - | 0 | $ - | Calpine pumps will be combined into a distribution pump station to other customers, if available |
| Cost per horsepower | | $ 3,200 | 200 | hp | $ 640,000 | 200 | $ 640,000 | 200 | $ 640,000 | |
| **Distribution Pipeline to Calpine** | | | | | | | | | | |
| Pipeline to Calpine Facility (14" PVC Pipe) | | $ 280 | 600 | LF | $ 168,000 | 600 | $ 168,000 | 600 | $ 168,000 | Includes installation, trenching, backfill, etc. |
| **Storage Tank** | | $ 1.00 | 800,000 | gal | $ 800,000 | 1,100,000 | $ 1,100,000 | 2,000,000 | $ 2,000,000 | |
| **Distribution Pipelines** | | | | | | | | | | |
| Whitesell South Branch (8" PVC Pipe) | | $ 144 | 0 | LF | $ - | 3,800 | $ 548,000 | 0 | $ - | Includes installation, trenching, backfill, etc. |
| Whitesell North Branch (8" PVC Pipe) | | $ 144 | 0 | LF | $ - | 3,300 | $ 476,000 | 0 | $ - | Includes installation, trenching, backfill, etc. |
| Retrofit of Shell Pipeline | | $ 100,000 | 0 | Allowance | $ - | 1 | $ 100,000 | 0 | $ - | Based on City description of pipe condition, a low retrofit cost is assumed. Retrofit requirements will be verified with the Dept of Public Health |
| Connections to Shell Pipeline | | $ 55,000 | 0 | Allowance | $ - | 1 | $ 55,000 | 0 | $ - | |
| Eastside Mainline (14" PVC Pipe) | | $ 280 | 0 | LF | $ - | 0 | $ - | 45400 | $ 12,712,000 | Includes installation, trenching, backfill, etc. |
| **Laterals to Customers** | | | | | | | | | | |
| 6" PVC Pipe | | $ 150 | 0 | LF | $ - | 16,800 | $ 2,520,000 | 600 | $ 90,000 | Includes installation, trenching, backfill, etc. |
| **Use Site Retrofits** | | | | | | | | | | |
| To Property Line | | $ 17,400 | 0 | Customers | $ - | 21 | $ 366,000 | 33 | $ 575,000 | Retrofits to the customer's property line will include piping from distribution system to property line, meter, isolation valve |
| Onsite Retrofits | | . | | | NA | | NA | | | |
| **Potable Backup line** | | $ 100,000 | 1 | Allowance | $ 100,000 | 1 | $ 100,000 | 1 | $ 100,000 | |
| | | | | Raw Construction Cost | $ 8,855,000 | | $ 13,748,000 | | $ 25,049,000 | |
| | Capital Costs | 10% | | Contractor Overhead and Profit | $ 886,000 | | $ 1,375,000 | | $ 2,505,000 | |
| | | 5% | | Change Order Allowance | $ 443,000 | | $ 687,000 | | $ 1,252,000 | |
| | | 30% | | Level of Estimate Contingency | $ 2,657,000 | | $ 4,124,000 | | $ 7,515,000 | |
| | | | | **Total Construction Cost** | **$ 12,841,000** | | **$ 19,934,000** | | **$ 36,321,000** | |
| | | 35% | | Env/Eng/CM/Admin/Legal | $ 4,494,000 | | $ 6,977,000 | | $ 12,712,000 | |
| | | | | **Total Capital Cost** | **$ 17,335,000** | | **$ 26,911,000** | | **$ 49,033,000** | |
| | | 13% | | Treatment Facilities Ops & Maintenance | $ 870,900 | | $ 871,000 | | $ 966,700 | |
| | | 0.50% | | Storage Tank Maintenance | $ 4,000 | | $ 5,500 | | $ 10,000 | |
| | | 0.50% | | Distribution System Maintenance | $ - | | $ 17,720 | | $ 64,010 | |
| | O&M | | | Calpine Pump Station Operation Cost | $ 64,800 | | $ 64,800 | | $ 64,800 | Assuming PS run 300 days, 12 hrs a day |
| | | | | City Pump Station Operation Cost | $ - | | $ 30,900 | | $ 599,000 | Assuming PS run 260 days, 8 hrs a day |
| | | 15% | | Pump Station Maintenance Cost | $ 163,200 | | $ 242,400 | | $ 295,200 | |
| | | | | **Total O&M Cost** | **$ 1,103,000** | | **$ 1,233,000** | | **$ 2,000,000** | |
| | | | | Annual Capital Cost | $ 1,177,000 | | $ 1,828,000 | | $ 3,329,000 | 30 years, 5.38% - Municipal Bond Rate retrieved 14Oct08 from Bloomberg.com |
| | | | | Total Annual Cost | $ 2,280,000 | | $ 3,061,000 | | $ 5,329,000 | |
| | | | | RW Yield (AFY) | 3,475 | | 3,759 | | 4,133 | |
| | | | | Unit Cost | $ 700 | | $ 810 | | $ 1,290 | |

**Project:** Hayward Recycled Water Facility Plan

**Aspect:** Tertiary Treatment Facilities

Date: December 2008
Project Number: 0198-002

Prepared by: C. Del Boccio

Estimate Type: Facilities Planning (10%)

**Process Cost Summary by Division**

| Spec. Division | Subtotal | Notes |
|---|---|---|
| 1 - General | $ - | None |
| 2 - Sitework | $ 1,023,000 | |
| 3 - Concrete | $ 718,000 | Does not include piles; geotechnical investigations may determine piles are needed at WPCF |
| 4 - Masonry | $ 528,000 | |
| 5 - Metals | $ 153,000 | |
| 6 - Wood and Plastic | $ - | None |
| 7 - Moisture and Thermal Protection | $ - | None |
| 8 - Doors and Windows | $ - | None |
| 9 - Finishes | $ 14,000 | |
| 10 - Specialties | $ - | None |
| 11 - Equipment | $ 3,030,000 | |
| 12 - Furnishings | $ - | None |
| 13 - Special Construction | $ 252,000 | |
| 14 - Conveying Systems | $ 81,000 | |
| 15 - Mechanical | $ 213,000 | |
| 16 - Electrical | $ 687,000 | |
| **Tax on Materials** **8.75%** | **$ 293,100** | Percentage of materials costs (materials cost estimated as 50% of construction cost) |
| **FACILITY RAW CONSTRUCTION COST** | **$ 6,699,000** | |

| Spec. Division | Item | Size | Units | Quantity | Unit | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|---|---|
| **1 - General** | | | | | | | **$ -** | |
| | None - Contractor Overhead and Profit Account for Separately | | | | | | | |
| **2 - Sitework and Yard Piping** | | | | | | | **$ 1,022,010** | |
| | Excavation | | | 1130 | CY | $ 20 | $ 22,800 | |
| | Drain Rock | | | 570 | CY | $ 46 | $ 26,400 | |
| | Road Paving | | | 28000 | SF | $ 5 | $ 138,900 | |
| | Yard Piping Trench Excavation | | | 1266 | CY | $ 13 | $ 16,500 | Includes piping for 18.5 mgd treatment plant |
| | Yard Piping Trench Backfill | | | 1190 | CY | $ 46 | $ 54,800 | Includes piping for 18.5 mgd treatment plant |
| | Yard Piping - 14" PVC | | | 2040 | LF | $ 96 | $ 195,100 | Includes piping for 18.5 mgd treatment plant |
| | Yard Piping - 2" PVC | | | 640 | LF | $ 31 | $ 20,100 | Includes piping for 18.5 mgd treatment plant |
| | Miscellaneous (curbs, drainage, shoring, dewatering, etc) | | | 1 | LS | $ 454,500 | $ 454,500 | 100% of total sitework |
| | Allowance for Shoring/Dewatering/Thrust Protection/Misc | | | | | 10% | $ 92,910 | |
| **3 - Concrete** | | | | | | | **$ 717,500** | |
| | Elevated Slabs | | | 40 | CY | $ 1,200 | $ 47,600 | 1.7' thick; for UV Disinfection Module |
| | Walls | | | 288 | CY | $ 1,200 | $ 345,200 | 1' thick |
| | Slabs on grade | | | 456 | CY | $ 450 | $ 205,100 | 1.5' thick; slab base (excavation and drain rock) included in Division 2 - Sitework |
| | Misc Concrete | | | 1 | LS | $ 59,790 | $ 59,800 | Approx 10% of total concrete |
| | Allowance for Embedded Items/Cutting/Touch-Ups/Etc | | | 1 | LS | $ 59,790 | $ 59,800 | Approx 10% of total concrete |
| **4 - Masonry** | | | | | | | **$ 528,000** | |
| | Electrical Building - CMU | | | 1600 | SF | $ 300 | $ 480,000 | |
| | Misc. | | | | | 10% | $ 48,000 | |
| **5 - Metals** | | | | | | | **$ 152,250** | |
| | Treadplate - UV Facility | | | 253 | SF | $ 64 | $ 16,200 | 3.33' x 45.8 channels, misc access hatches, +100 sf for launder area |
| | Handrail - UV Facility | | | 180 | LF | $ 85 | $ 15,300 | |
| | Stairs - UV Facility | 2 | SET | 18 | RISER | $ 442 | $ 16,000 | Two sets at the UV structure and one replacement set at the mixing box |
| | Allowance for Stairs/Platforms - Non-UV Process Areas | | | 1 | LS | $ 100,000 | $ 100,000 | Misc stairs, handrails, platforms at non-UV process areas |
| | Allowance for Nuts/Bolts/Connections/Etc | | | | | 10% | $ 4,750 | |
| **6 - Wood and Plastic** | | | | | | | **$ -** | |
| | None | | | | | | | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **7 - Moisture and Thermal Protection** | | | | | | | **$ -** | |
| | None | | | | | | | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **8 - Doors and Windows** | | | | | | | **$ -** | |
| | None - Included in Electrical Bldg Estimate in Division 4 | | | | | | | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **9 - Finishes** | | | | | | | **$ 13,400** | |
| | Allowance for Painting and Coating, % of the raw construction cost, excl taxes. | | | | | 0.2% | $ 13,400 | |
| **10 - Specialties** | | | | | | | **$ -** | |
| | None | | | | | | | |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | | 10% | $ - | |

**Project:** Hayward Recycled Water Facility Plan

**Aspect:** Tertiary Treatment Facilities

Date: December 2008
Project Number: 0198-002

Prepared by: C. Del Boccio

Estimate Type: Facilities Planning (10%)

**Process Cost Summary by Division**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **11 - Equipment** | | | | | | | **$** | **3,029,620** | |
| | Influent Pumps | 20 | HP | 1 | LS | $ 344,000 | $ | 344,000 | 20 hp, 3200 gpm |
| | Flocculating Clarifiers | | | 1 | LS | $ 666,345 | $ | 666,400 | |
| | Granular Media Filters | | | 1 | LS | $ 633,795 | $ | 633,800 | |
| | Chemical Feed Equipment | | | 1 | LS | $ 106,000 | $ | 106,000 | Includes metering pumps, storage tanks, equipment testing, etc. |
| | Pumps to Storage | 30 | HP | 1 | LS | $ 344,000 | $ | 344,000 | 30 hp, 3100 gpm |
| | UV Equipment and Appurtenances | | | 1 | LS | $ 500,000 | $ | 500,000 | UV System (Banks, PDC, SCC, HSC), baffles, cleaning tank, level sensors, Transmittance Analyzer |
| | UV Equipment Installation | | | 1 | LS | $ 150,000 | $ | 150,000 | 30% of Equipment Cost |
| | Equipment testing | | | 1 | LS | $ 10,000 | $ | 10,000 | Most testing in vendor quote |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | ALLOW | 10% | $ | 275,420 | |
| **12 - Furnishings** | | | | | | | **$** | **-** | |
| | None | | | | | | | | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ | - | |
| **13 - Special** | | | | | | | **$** | **251,560** | |
| | Bridge Crane Structure | | | 1162 | SF | $ 90 | $ | 104,600 | 83' x 14' - covers UV channels for 4.65 mgd treatment plant |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | | 10% | $ | 10,460 | |
| | Sun Shade - UV Facility | | | 1162 | SF | $ 15 | $ | 17,500 | 83' x 14' - covers UV channels for 4.65 mgd treatment plant |
| | Instruments Installation - UV Facility | | | 1 | LS | $ 25,000 | $ | 25,000 | Includes installation |
| | PLC and SCADA Hardware and Software - UV Facility | | | 1 | LS | $ 12,000 | $ | 12,000 | |
| | Unlisted Items - UV Facility | | | | ALLOW | 10% | $ | 4,000 | |
| | I&C Conductor Installation (Site) - UV Facility | | | | ALLOW | 5% | $ | 2,000 | |
| | I&C Conductor Installation (Process) - UV Facility | | | | ALLOW | 7% | $ | 3,000 | |
| | Electrical Subcontractor's Markup on I&C Contractor | | | | ALLOW | 5% | $ | 2,000 | |
| | Allowance for Non-UV Process Areas Instrumentation & Controls | | | | ALLOW | 5% | $ | 71,000 | |
| **14 - Conveying Systems** | | | | | | | **$** | **81,000** | |
| | Bridge Crane and Hoist - UV Facility | | | 1 | LS | $ 60,000 | $ | 60,000 | |
| | Allowance for Misc Attachment Materials & Items Etc | | | | | 10% | $ | 6,000 | |
| | Misc Installation Allowance | | | | | 25% | $ | 15,000 | |
| **15 - Mechanical** | | | | | | | **$** | **212,520** | |
| | HVAC Electrical Building | | | 1 | LS | $ 10,000 | $ | 10,000 | |
| | Isolation Valves | | | 1 | LS | $ 40,000 | $ | 40,000 | |
| | 48" Slide Gate - UV Facility | | | 2 | EA | $ 8,400 | $ | 16,800 | |
| | Gate Actuators - UV Facility | | | 2 | EA | $ 8,500 | $ | 17,000 | |
| | Mud Valves - UV Facility | | | 1 | EA | $ 980 | $ | 1,000 | |
| | Misc Mechanical | | | 1 | LS | $ 100,000 | $ | 100,000 | Misc piping, valves, fittings, etc. |
| | Allowance for Hangers, Supports, Etc. | | | | ALLOW | 15% | $ | 27,720 | |
| **16 - Electrical** | | | | | | | **$** | **687,000** | |
| | UV Electrical (See Separate Tab) | | | 1 | LS | $ 405,000 | $ | 405,000 | |
| | Allowance for Other Electrical | | | | ALLOW | 20% | $ | 282,000 | |

**Project:** Hayward Recycled Water Facility Plan

**Aspect:** Tertiary Treatment Facilities

Date: December 9, 2008
Project Number: 0198-002

Prepared by: C. Del Boccio

Estimate Type: Facilities Planning (10%)

| Area | Aspect | Width (ft) | Length (ft) | Depth (ft) | Area (SF) | Area (acres) | Volume (CF) | Vol (CY) |
|---|---|---|---|---|---|---|---|---|
| Influent Pump Station | | 31 | 42 | 0 | 1302 | 0.03 | | |
| Influent Pump Station | Drain Rock | 31 | 42 | 1.5 | | | 1953 | 72 |
| Influent Pump Station | Excavation | 31 | 42 | 3 | | | 3906 | 145 |
| | | | | | | | | |
| Chemical Storage | | 24 | 125 | 0 | 3000 | 0.07 | | |
| Chemical Storage | Drain Rock | 24 | 125 | 1.5 | | | 4500 | 167 |
| Chemical Storage | Excavation | 24 | 125 | 3 | | | 9000 | 333 |
| | | | | | | | | |
| Hypochlorite Storage | | 24 | 100 | 0 | 2400 | 0.06 | | |
| Hypochlorite Storage | Drain Rock | 24 | 100 | 1.5 | | | 3600 | 133 |
| Hypochlorite Storage | Excavation | 24 | 100 | 3 | | | 7200 | 267 |
| | | | | | | | | |
| Flocculation Clarifiers | | 40 | 20 | 0 | 800 | 0.02 | | |
| Flocculation Clarifiers | Drain Rock | 40 | 20 | 1.5 | | | 1200 | 44 |
| Flocculation Clarifiers | Excavation | 40 | 20 | 3 | | | 2400 | 89 |
| | | | | | | | | |
| Filters | | 58 | 25 | | 1450 | 0.03 | | |
| Filters | Drain Rock | 58 | 25 | 1.5 | | | 2175 | 81 |
| Filters | Excavation | 58 | 25 | 3 | | | 4350 | 161 |
| | | | | | | | | |
| UV Facilities | | | | | 0 | 0 | | |
| UV Facilities | Drain Rock | 14 | 83 | 1.5 | | | 1743 | 65 |
| UV Facilities | Excavation | 14 | 83 | 3 | | | 3486 | 129 |
| | | | | | | | | |
| Yard Piping | 14in Pipe | | 2040 | | | | | |
| Yard Piping | 2in Pipe | | 640 | | | | | |
| Yard Piping | Trench | 3.2 | 1100 | 4.6 | | | 34176 | 1266 |
| Yard Piping | Backfill | 3.2 | 1100 | 4.6 | 13.65 | | 31981 | 1184 |
| | | | | | | | | |
| Overall | Road Paving | | | | 28000 | | | |

**Project:** Hayward Recycled Water Facility Plan

**Aspect:** Tertiary Treatment Facilities

Date: December 9, 2008
Project Number: 0198-002

Prepared by: C. Del Boccio

Estimate Type: Facilities Planning (10%)

| Area | Aspect | Subaspect | Width (ft) | Depth (ft) | Length (ft) | Volume (CF) | Vol (CY) | Area (SF) |
|---|---|---|---|---|---|---|---|---|
| Chemical Storage and Feed | Slab on grade | | 125 | 1.5 | 24 | 4500 | 167 | 3000 |
| Chemical Storage and Feed | Wall | N | 1 | 5 | 125 | 625 | 23 | |
| Chemical Storage and Feed | Wall | S | 1 | 5 | 125 | 625 | 23 | |
| Chemical Storage and Feed | Wall | W | 1 | 5 | 24 | 120 | 4 | |
| Chemical/Hypo Storage | Wall | Shared | 1 | 5 | 24 | 120 | 4 | |
| Hypochlorite Storage and Feed | Slab on grade | | 100 | 1.5 | 24 | 3600 | 133 | 2400 |
| Hypochlorite Storage and Feed | Wall | N | 1 | 5 | 100 | 500 | 19 | |
| Hypochlorite Storage and Feed | Wall | S | 1 | 5 | 100 | 500 | 19 | |
| Hypochlorite Storage and Feed | Wall | E | 1 | 5 | 24 | 120 | 4 | |
| UV Disinfection Influent Channel | Slab on grade | | 14 | 1.5 | 14 | 294 | 11 | 196 |
| UV Disinfection Influent Channel | Wall | N | 1 | 15 | 14 | 210 | 8 | |
| UV Disinfection Influent Channel | Wall | S | 1 | 15 | 14 | 210 | 8 | |
| UV Disinfection Influent Channel | Wall | E | 14 | 15 | 1 | 210 | 8 | |
| UV Disinfection Influent Channel | Wall | W | 14 | 15 | 1 | 210 | 8 | |
| UV Disinfection Effluent Channel | Slab on grade | | 23 | 1.5 | 15 | 518 | 19 | 345 |
| UV Disinfection Effluent Channel | Wall | N | 1 | 15 | 14 | 210 | 8 | |
| UV Disinfection Effluent Channel | Wall | S | 1 | 15 | 14 | 210 | 8 | |
| UV Disinfection Effluent Channel | Wall | E | 23 | 15 | 1 | 345 | 13 | |
| UV Disinfection Effluent Channel | Wall | W | 23 | 15 | 1 | 345 | 13 | |
| UV Disinfection Module Channel | Elevated Slab | | 14 | 1.667 | 45.8 | 1069 | 40 | |
| UV Disinfection Module Channel | Wall | N | 2.5 | 14 | 45.8 | 1603 | 59 | |
| UV Disinfection Module Channel | Wall | S | 2.5 | 14 | 45.8 | 1603 | 59 | |
| UV Bridge Crane Footings | Slab on grade | | 2 | 4 | 2 | 16 | 0.6 | |
| Flocculating Clarifiers | Slab on grade | | 40 | 1.5 | 20 | 1200 | 44 | 800 |
| Filters | Slab on grade | | 58 | 1.5 | 25 | 2175 | 81 | 1450 |

**Project:** Hayward Recycled Water Facility Plan

**Aspect:** UV Electrical

Date: November 1, 2008
Project Number: 0198-002

Prepared by: MN

Estimate Type: Concept UV Cost Estimate

**Process Cost Summary by Division**

| Spec. Division | Subtotal | Notes |
|---|---|---|
| 1 - General | $ - | |
| 2 - Sitework | $ - | |
| 3 - Concrete | $ - | |
| 4 - Masonry | $ - | |
| 5 - Metals | $ - | |
| 6 - Wood and Plastic | $ - | |
| 7 - Moisture and Thermal Protection | $ - | |
| 8 - Doors and Windows | $ - | |
| 9 - Finishes | $ 1,000 | |
| 10 - Specialties | $ - | |
| 11 - Equipment | $ 138,000 | |
| 12 - Furnishings | $ - | |
| 13 - Special Construction | $ - | |
| 14 - Conveying Systems | $ - | |
| 15 - Mechanical | $ 97,000 | |
| 16 - Electrical | $ 169,000 | |
| **FACILITY RAW CONSTRUCTION COST** | **$ 405,000** | |

| Spec. Division | Item | Size | Units | Quantity | Unit | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|---|---|
| **1 - General** | | | | | | | **$ -** | |
| **2 - Sitework** | | | | | | | **$ -** | |
| | Allowance for Shoring/Dewatering/Thrust Protection/Misc | | | | | 10% | $ - | Not applicable |
| **3 - Concrete** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Embedded Items/Cutting/Touch-Ups/Etc | | | | | 10% | $ - | |
| **4 - Masonry** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Misc. | | | | | 10% | $ - | |
| **5 - Metals** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Nuts/Bolts/Connections/Etc | | | | | 10% | $ - | |
| **6 - Wood and Plastic** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **7 - Moisture and Thermal Protection** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **8 - Doors and Windows** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **9 - Finishes** | | | | | | | **$ 808** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Painting and Coating, % of the raw construction cost, excluding taxes. | | | | | 0.2% | $ 808 | |
| **10 - Specialties** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | | 10% | $ - | |
| **11 - Equipment** | | | | | | | **$ 137,500** | |
| | | | | | | | $ - | |
| | Standby Generator | | | 1 | LS | $ 125,000 | $ 125,000 | Includes accessories and weather proof housing |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | | 10% | $ 12,500 | |
| **12 - Furnishings** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | Allowance for Misc. Materials & Items, Etc. | | | | | 10% | $ - | |
| **13 - Special** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | | 10% | $ - | |
| **14 - Conveying Systems** | | | | | | | **$ -** | |
| | | | | | | | $ - | |
| | | | | | | | $ - | |
| | Allowance for Misc Attachment Materials & Items Etc. | | | | | 10% | $ - | |
| **15 - Mechanical** | | | | | | | **$ 96,140** | |
| | | | | | | | $ - | |
| | Conduit | | | | | | $ - | |
| | Ductbank PVC 2-4"C | | | 54 | LF | $ 21.40 | $ 1,200 | |
| | Ductbank PVC 4-4"C | | | 43 | LF | $ 43.00 | $ 1,900 | |
| | Ductbank PVC 4-1"C | | | 43 | LF | $ 25.70 | $ 1,200 | |
| | Ductbank PVC | | | 70 | LF | $ 43.00 | $ 3,000 | |
| | 4" Conduit - PVC | | | 411 | LF | $ 24.50 | $ 10,100 | |
| | 4" Conduit - RGS | | | 196 | LF | $ 54.50 | $ 10,700 | |
| | 2" Conduit - RGS | | | 40 | LF | $ 20.50 | $ 900 | |
| | 1 1/2" Conduit - RGS | | | 502 | LF | $ 16.45 | $ 8,300 | |
| | 1" Conduit - RGS | | | 538 | LF | $ 12.40 | $ 6,700 | |
| | 3/4" Conduit - RGS | | | 2 | LF | $ 9.60 | $ 100 | |
| | Wiring and Cable | | | | | | | |

**Project:** Hayward Recycled Water Facility Plan

**Aspect:** UV Electrical

Date: November 1, 2008
Project Number: 0198-002

Prepared by: MN

Estimate Type: Concept UV Cost Estimate

**Process Cost Summary by Division**

| Spec. Division | Subtotal | Notes |
|---|---|---|
| 1 - General | $ - | |
| 2 - Sitework | $ - | |
| 3 - Concrete | $ - | |
| 4 - Masonry | $ - | |
| 5 - Metals | $ - | |
| 6 - Wood and Plastic | $ - | |
| 7 - Moisture and Thermal Protection | $ - | |
| 8 - Doors and Windows | $ - | |
| 9 - Finishes | $ 1,000 | |
| 10 - Specialties | $ - | |
| 11 - Equipment | $ 138,000 | |
| 12 - Furnishings | $ - | |
| 13 - Special Construction | $ - | |
| 14 - Conveying Systems | $ - | |
| 15 - Mechanical | $ 97,000 | |
| 16 - Electrical | $ 169,000 | |
| **FACILITY RAW CONSTRUCTION COST** | **$ 405,000** | |

| Spec. Division | Item | Size | Units | Quantity | Unit | Unit Cost | Total Cost | Notes |
|---|---|---|---|---|---|---|---|---|
| | 500Kcmil - 600V THWN-THHN | | | 663 | LF | $ 15.50 | $ 10,300 | |
| | 350Kcmil - (15kV) | | | 992 | LF | $ 14.00 | $ 13,900 | |
| | #4/0 - (15kV) | | | 331 | LF | $ 10.25 | $ 3,400 | |
| | #4/0 - 600V THWN-THHN | | | 166 | LF | $ 7.55 | $ 1,300 | |
| | #8 - 600V THWN-THHN | | | 933 | LF | $ 1.13 | $ 1,100 | |
| | #10 - 600V THWN-THHN | | | 1981 | LF | $ 0.81 | $ 1,700 | |
| | #12 - 600V THWN-THHN | | | 2100 | LF | $ 0.67 | $ 1,500 | |
| | #14 - 600V THWN-THHN | | | 3553 | LF | $ 0.53 | $ 1,900 | |
| | #18 Pair | | | 1277 | LF | $ 1.61 | $ 2,100 | |
| | Fiberoptic cable and conduit | | | 31 | LF | $ 15.50 | $ 500 | |
| | CAT6e cable and conduit | | | 71 | LF | $ 24.90 | $ 1,800 | |
| | | | | | | | $ - | |
| | Allowance for Hangers, Supports, Etc. | | | | | 15% | $ 12,540 | |
| **16 - Electrical** | | | | | | | **$ 168,015** | |
| | | | | | | | $ - | |
| | Electrical Installation/connections of Trojan UV system | | | 1 | LS | $ 25,000 | $ 25,000 | |
| | | | | | | | | |
| | Lighting UV Facility | | | | | | $ - | |
| | 250W HID ceiling mounted | | | 2 | EA | $ 450 | $ 900 | |
| | 100W HID external wall mounted | | | 1 | EA | $ 500 | $ 500 | |
| | 100W HID external wall mounted | | | 1 | EA | $ 1,500 | $ 1,500 | |
| | 3-way lighting switch | | | 2 | EA | $ 100 | $ 200 | |
| | Lighting switch | | | 2 | EA | $ 100 | $ 200 | |
| | Dedicated phone line for remote monitoring UV system | | | 1 | LS | $ 8,500 | $ 8,500 | |
| | | | | | | | | |
| | UV Control Panel - CP-1 (Connections) | | | 1 | LS | $ 10,000 | $ 10,000 | |
| | Main Power Distribution Panel - MPD | | | 1 | LS | $ 10,000 | $ 10,000 | |
| | MV Pullbox (4x4x4) with excavation & backfill | | | 1 | EA | $ 10,000 | $ 10,000 | |
| | Instrumentation Pullbox (2x3x4) | | | 1 | LS | $ 5,000 | $ 5,000 | |
| | 30A Disconnect Switches | | | 4 | EA | $ 510 | $ 2,100 | |
| | 60A Disconnect swtiches | | | 4 | EA | $ 1,025 | $ 4,100 | |
| | Welding Recptacles - 480V 50A 3P (UV Facility | | | 4 | EA | $ 1,500 | $ 6,000 | |
| | Weather-Proof Receptacles (UV Facility | | | 9 | EA | $ 225 | $ 2,100 | |
| | | | | | | | | |
| | Control System - PLC (MCP-1) | | | 1 | LS | $ 15,000 | $ 15,000 | |
| | Interface to exist SCADA (software) | | | 1 | LS | $ 15,000 | $ 15,000 | |
| | | | | | | | $ - | |
| | Staging, functional testing, training | | | 1 | LS | $ 15,000 | $ 15,000 | |
| | Final acceptance tests | | | 1 | LS | $ 15,000 | $ 15,000 | |
| | | | | | | | $ - | |
| | Allowance for Hangers, Supports, Etc. | | | | | 15% | $ 21,915 | |

RMC
Water and Environment

**Project: Hayward Recycled Water Facilities Plan**

**Aspect: Unit Costs**

Date: Oct-08
Project Number: 0198-002

Prepared by: CDB

Estimate Type: Facilities Planning (10%)

ENR Construction Cost Index - San Francisco October 2008 9,853.42

| Cost Criteria | | |
|---|---|---|
| Division Cost Estimates Allowances and Contingencies | | |
| 2 - Sitework | 10% | Allowance for Shoring/Dewatering/Thrust Protection/Misc |
| 3 - Concrete | 10% | Allowance for Embedded Items/Cutting/Touch-Ups/Etc |
| 4 - Masonry | 10% | Misc. |
| 5 - Metals | 10% | Allowance for Nuts/Bolts/Connections/Etc |
| 6 - Wood and Plastics | 10% | Allowance for Misc. Materials & Items, Etc. |
| 7 - Moisture and Thermal Protection | 10% | Allowance for Misc. Materials & Items, Etc. |
| 8 - Doors and Windows | 10% | Allowance for Misc. Materials & Items, Etc. |
| 9 - Finishes | 0.2% | Allowance for Painting and Coating, % of the raw construction cost, excluding taxes. |
| 10 - Specialties | 10% | Allowance for Misc Attachment Materials & Items Etc. |
| 11 - Equipment | 10% | Allowance for Misc Attachment Materials & Items Etc. |
| 12 - Furnishings | 10% | Allowance for Misc. Materials & Items, Etc. |
| 13 - Special Construction | 10% | Allowance for Misc Attachment Materials & Items Etc. |
| 14 - Conveying Systems | 10% | Allowance for Misc Attachment Materials & Items Etc. |
| 15 - Mechanical | 15% | Allowance for Hangers, Supports, Etc. |
| 16 - Electrical | 15% | Allowance for Hangers, Supports, Etc. |
| Misc Installation Allowance | 25% | |
| Tax on materials | 8.75% | |

| Item | Size | Unit | Non Adjusted Cost | ENR Month-Year | ENR Base Value (SF, CCI) | Adjusted Cost | Reference | Notes |
|---|---|---|---|---|---|---|---|---|
| **Division 2 - Site Work** | | | | | | | | |
| Structural Excavation | | $/CY | $18.64 | Dec-07 | 9,131.81 | $20.12 | Palo Alto UV, Dec 2007 | |
| Structural Backfill | | $/CY | $7.84 | Dec-07 | 9,131.81 | $8.46 | Palo Alto UV, Dec 2007 | |
| Drain Rock | | $/CY | $42.81 | Dec-07 | 9,131.81 | $46.20 | Palo Alto UV, Dec 2007 | |
| Trench Excavation (6-10 ft deep) | | $/CY | $12.00 | Mar-07 | 9,102.68 | $12.99 | Novato Sanitary District WWTP Bid Results, March 2007 | |
| Trench Backfill | | $/CY | $45.97 | Oct-08 | 9,853.42 | $45.97 | Palo Alto UV 100% Estimate | |
| Yard Piping - PVC 2" | | $/LF | $31.26 | Oct-08 | 9,853.42 | $31.26 | Palo Alto UV 100% Estimate | |
| Yard Piping - PVC, 12-16" | | $/LF/inch diameter | $5.70 | Jan-05 | 8,229.62 | $6.83 | Novato Sanitary District WWTP 95% Cost Esimate; January 2005 | |
| Road Paving | | $/SF | $3.30 | Mar-97 | 6,566.00 | $4.96 | Santa Rosa UV 100% Estimate | |
| Retrofit to Shell Line | | LS | $100,000 | | | | | ASSUMED |
| Connections to Shell Line | | LS | $50,000 | | | | | ASSUMED |
| Use Site Retrofits | | $/use site | $16,000 | Apr-07 | 9,102.72 | $17,400 | Palo Alto-Mountain View Moffett Area Reclaimed Water Pipeline Project Bid Results, April 2007 | |
| Potable Backup Line | | LS | $100,000 | | | | | ASSUMED; needs to be sized once connection point to potable water system is identified |
| Distribution Pipe - PVC | 6 in | $134 | $22 | Apr-07 | 9,102.72 | $25 | Palo Alto-Mountain View Moffett Area RW Pipeline Project Bid Results, April 2007 | |
| Distribution Pipe - PVC | 8 in | $130 | $16 | Apr-07 | 9,102.72 | $18 | Palo Alto-Mountain View Moffett Area RW Pipeline Project Bid Results, April 2007 | |
| Distribution Pipe - PVC | 12 in | $207 | $17 | Apr-07 | 9,102.72 | $19 | Palo Alto-Mountain View Moffett Area RW Pipeline Project Bid Results, April 2007 | |
| Distribution Pipe - PVC | 16 in | $240 | $15 | Apr-07 | 9,102.72 | $17 | Palo Alto-Mountain View Moffett Area RW Pipeline Project Bid Results, April 2007 | |
| | | | | | | | Average of bids results for 6-16 inch PVC from Palo Alto-Mountain View Moffett Area Reclaimed Water Pipeline | |
| Distribution Pipe - PVC | 6-16 inch | $/LF/inch diameter | $18 | Apr-07 | 9,102.72 | $20 | Project, Bid April 2007 | |
| **Division 3 - Concrete** | | | | | | | | |
| Concrete - walls | | $/CY | $950 | Aug-06 | 8,464.23 | $1,200 | Average of Watsonville RWF, Bid August 2006 | Includes formwork, rebar, finishing |
| Concrete - slab on grade | | $/CY | $450 | Aug-06 | 9,853.42 | $450 | Average of Watsonville RWF, Bid August 2006 | Includes formwork, rebar, finishing |
| Concrete - piles | | $/LF | $40 | Aug-06 | 8,464.23 | $100 | Average of Watsonville RWF, Bid August 2006 | Precast, prestressed, 40' long, 14" thick, square |
| Pile cap | | $/EA | $1,000 | Oct-08 | 9,853.42 | $1,000 | Palo Alto UV 100% Estimate | |
| Elevated Slab | | $/CY | $1,200 | Oct-08 | 9,853.42 | $1,200 | Palo Alto UV 100% Estimate | |
| **Division 4 - Masonry** | | | | | | | | |
| Electrical Building | | $/SF | $250 | Jan-05 | 8,229.62 | $300 | From City of Lancaster Recycled Water Master Plan (RMC, 2006) | |
| **Division 5 - Metals** | | | | | | | | |
| Storage | | $/gallon | $0.80 | Jun-05 | 8,440.73 | $1.00 | From City of Lancaster Recycled Water Master Plan (RMC, 2006) | Above ground, steel storage. |
| Handrail | | LF | $84.95 | Oct-08 | 9,853.42 | $84.95 | Palo Alto UV 100% Estimate | |
| Checker plate | | SF | $64.09 | Oct-08 | 9,853.42 | $64.09 | Palo Alto UV 100% Estimate | |
| Stairs | | RISER | $441.76 | Oct-08 | 9,853.42 | $441.76 | Palo Alto UV 100% Estimate | |
| **Division 11 - Equipment** | | | | | | | | |
| Full Pump Station - Base Cost | | LS for base cost | $260,000 | Jun-88 | 5,730.00 | $448,000 | Extrapolated from *Pumping Station Design*, Figure 29-6, (Sanks, 1998) | Service Water Pumping Station |
| Full Pump Station - Size Cost | | $/hp | $1,860 | Jun-88 | 5,730.00 | $3,200 | Extrapolated from *Pumping Station Design*, Figure 29-6, (Sanks, 1998) | |
| Influent Pump Station | 3229 gpm | LS | $200,000 | Jun-88 | 5,730.00 | $344,000 | From *Pumping Station Design*, Figure 29-9, (Sanks, 1998) | |
| To Storage Pump Station | 3132 gpm | LS | $200,000 | Jun-88 | 5,730.00 | $344,000 | From *Pumping Station Design*, Figure 29-9, (Sanks, 1998) | |
| Inflico Densadeg - Clarifier/Thickener | 8 mgd | $ 800,000 | $100,000 | Aug-07 | 9,071.91 | $108,700 | Quote for Sausilito-Marin City Sanitation District Project, August 2007 | |
| Inflico Densadeg - Clarifier/Thickener | 7.2 mgd | $ 1,100,000 $/mgd | $152,778 | Aug-06 | 8,464.23 | $177,900 $143,300 | Watsonville RWF, Bid August 2006 | |
| Kruger Actiflo - Granular Media Filters | 7 mgd | $ 878,200 | $125,457 | Aug-07 | 9,071.91 | $136,300 | Quote for Sausilito-Marin City Sanitation District Project, August 2007 | |
| Kruger Actiflo - Granular Media Filters | | $/mgd | | | | $136,300 | | |
| Chemical Feed Equipment | | | $ 97,600 | Mar-07 | 9,102.68 | $105,649.53 | Novato Sanitary District WWTP Bid Results, March 2007 | |
| **Division 15 - Mechanical** | | | | | | | | |
| 48 inch Slide Gates | | $/EA | $ 7,763 | Dec-07 | 9,131.81 | $8,400 | RS Means 2008 | |
| Mud Valves | | $/EA | $900 | Dec-07 | 9,131.81 | $980 | Palo Alto UV 100% Estimate | |

# Appendix F - Environmental Checklist

## Introduction

The purpose of this preliminary evaluation is to identify expected environmental impacts from implementation (construction and operation) of the Hayward Recycled Water Recommended Project. In addition, this analysis is intended to help the City determine the level of environmental documentation that will be needed at the next stage of CEQA environmental review. The environmental topics discussed in this document are based on Appendix G of the CEQA Guidelines. The anticipated environmental impacts are identified for each resource area. The level of significance for each resource area uses CEQA terminology as specified below:

- No Impact:
- Less than Significant:
- Less than Significant Impact with Mitigation Incorporation:
- Potentially Significant Impact:

Project Description

Chapter 5 of the Hayward Recycled Water Facility Plan provides a discussion of the Hayward Recycled Water Recommended Project[1]. The figures in that section identify the locations of the proposed above-ground facilities within the WPCF and the proposed pipeline alignments within the City's boundaries. For the purposes of this preliminary analysis, it is assumed that construction activities would involve grading, excavation, erection of facilities, installation of pipelines using open-trench construction, retrofitting of the existing Shell Oil pipeline, and backfilling. Typical construction equipment would be used, including but not limited bulldozers, backhoes, water trucks, dump trucks, excavators, and concrete trucks. Construction activities would likely last a total of 2 years overall but would be less for each component (e.g., above-ground facilities at the WPCF and the proposed pipeline segments). Details of the construction scenarios will be developed as the project progresses into design, and will be evaluated in more depth in the upcoming environmental analysis. The following preliminary analysis is based on the current understand of the project construction and operation as described Chapter 5 of the Hayward Recycled Water Facility Plan. This analysis shows that the majority of the impacts would be less than significant. Where potential significant impacts are anticipated, they would be reduced to less than significant with implementation of mitigation measures that will be further developed during the CEQA process. No significant, unavoidable impacts have been identified.

[1] It should be noted that this preliminary analysis does not cover proposed Calpine facilities. Calpine will conduct its own CEQA analysis.

| Environmental Topics | Expected Impact | Discussion of Major, Potential Environmental Effects |
|---|---|---|
| **Aesthetics** | | |
| Adverse effect on a scenic vista | NI | • There are no scenic vistas, ridgeline, or roads within the City of Hayward as identified by the City of Hayward General Plan and Caltrans Scenic Highway Program. Construction of all proposed facilities would temporarily alter the visual quality of the affected area due to the presence of construction equipment, but would not result in any permanent visual changes.<br>• Above-ground facilities (e.g., tertiary treatment facilities, tank, and pump) proposed within the WPCF would be expected to integrate in appearance with existing, surrounding industrial facilities. Therefore, visual impacts are not anticipated at the site.<br>• Proposed pipelines would ultimately be buried underground and out of sight. No visual impacts would occur. |
| Substantial degradation of the existing visual character or quality of the site and its surroundings | LTS | |
| Creation of a new source of substantial light or glare which would adversely affect day or nighttime views in the area | LTS | |
| **Agricultural Resources** | | |
| Conversion oft Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) or conflict with existing zoning for agricultural use or a Williamson Act contract | NI | • The proposed Project is located within an urban area consisting of residential, commercial, and industrial uses. No agricultural lands are located within the project area. |
| **Air Quality** | | |
| Conflict with or obstruction of implementation of the applicable air quality plan or cumulative considerable net increase of any criteria pollutant for which the project region is non-attainment | LTS | • Construction activities would generate dust and criteria pollutant emissions that could exceed Bay Area Air Quality Management District (BAAQMD) standards. These emissions have not yet been quantified. However, it is expected that project construction activities would not exceed BAAQMD standards due to the minimal size of the project. Construction emissions would be quantified and confirmed as part of the environmental analysis for the project. In addition, inclusion of dust abatement measures as mitigation would reduce dust emissions.<br>• Sensitive receptors are located more than 1 mile from proposed facilities at the WPCF and within 50 feet of the proposed pipeline alignments. See above regarding emissions resulting from construction of the project. Due to the distance of sensitive receptors from the WPCF, and the continually moving, short-term nature of construction activities along the pipeline route, proposed project construction is not expected to |
| Violation of any air quality standard or substantial contribution to an existing or projected air quality violation | LTSM | |

| | | |
|---|---|---|
| Exposure of sensitive receptors to substantial pollutant concentrations | LTSM | expose sensitive receptors to substantial pollutant concentrations. See above regarding dust abatement measures.<br>• Operation of the facilities would generate minimal emissions associated with maintenance vehicle trips; such emissions would be expected to be less than significant.<br>• Constructions activities may generate odors associated with use of diesel. However, such odors would be short-term and are not expected to significantly affect the public. Operation of the proposed Project is not expected to generate substantial odors due to the high level of treatment of the wastewater to recycled water. |
| Creation of objectionable odors affecting a substantial number of people | LTS | |
| **Biological Resources** | | |
| Effects on candidate, sensitive, or special status species or sensitive habitat, | LTSM | • A California Natural Diversity Database (CNDDB) search for sensitive resources was conducted for information regarding the locations of known observations of Federal and State-listed sensitive species and habitats in the vicinity of the Project area. Information on wetlands, creeks, and/or other water bodies was derived from the U.S. Fish and Wildlife Service's Wetland Digital Database. Biological resources surveys have not been completed for this preliminary analysis.<br>• Due to the developed nature of the WPCF, no sensitive biological resources are expected at the site. Therefore, impacts to sensitive habitats or special status species from development of the proposed facilities at the WPCF are expected to be less than significant.<br>• Construction and retrofit of the proposed pipeline segments may occur in areas containing sensitive biological resources (e.g., creeks, low-lying areas, etc.). Any direct or indirect effects on sensitive habitats have the potential to also affect associated plant and wildlife species. This would be a potentially significant impact and would require implementation of mitigation measures that avoid or reduce such effects.<br>• Construction and retrofit of the proposed pipeline segments may require the removal of trees, including protected trees designated by the City of Hayward Tree Preservation Ordinance. Such removal would require appropriate mitigation to offset the loss of such sensitive resources. |
| Substantial interference with the movement of fish or wildlife species, their or native wildlife nursery sites | LTSM | |
| Conflicts with any local plans, policies or ordinances protecting biological resources | LTSM | |
| **Cultural Resources** | | |
| Alteration of or damage to cultural resources (i.e., historical and archaeological resources, including human remains, and paleontological resources | LTSM | • A record search through the Northwest Information Center of the California Historical Research Information System, and cultural resources surveys have not been conducted as part of this preliminary analysis.<br>• Excavation activities could disturb known or unrecorded cultural resources. Any damage or alteration to these resources would be considered significant. However, mitigation measures are available to reduce potential impacts to less than significant levels. |
| **Geology, Soils, and Seismicity** | | |
| Exposure of people or | LTS | • Proposed facilities are not habitable structures. |

| | | |
|---|---|---|
| structures to potential substantial adverse effects, including the risk of loss, injury, or death involving seismic risks or landslides | | • The project sites would not be located within an Alquist-Priolo "Earthquake Fault Zone" for fault rupture hazard; Thus, harm to people or damage to proposed facilities from fault rupture are not expected to occur. Proposed facilities would be located within a seismically active region of Northern California and are subject to groundshaking. Design and construction of the facilities would comply with 2001 California Building Code (based on 1997 Uniform Building Code). Secondary seismic effects are not expected in the project area as liquefaction potential is anticipated to be low to moderately low (ABAG 2008) and the project area is located on flat terrain (not subject to landslide hazards). Therefore, the project is not expected to result in significant impacts associated with the exposure of people or structures to harm or damage.<br>• The project area is subject to soil erosion during construction activities. However, implementation of typical Best Management Practices (BMPs) and the required Stormwater Pollution Prevention Plan (SWPPP) would ensure that effects would be minimal.<br>• The proposed project would be located on expansive soil. Potential impacts of building on such soils are considered potentially significant. Implementation of mitigation measures would be required to reduce such effects to less than significant. |
| Substantial soil erosion or the loss of topsoil | LTS | |
| Exposure of people or structures to unstable soils | LTSM | |
| **Hazards and Hazardous Materials** | | |
| Creation of a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials; or accident involving the release of hazardous materials into the environment | LTSM | • Operation of the proposed tertiary facilities at the WPCF and the pipelines would not require the routine transport, use or disposal of hazardous materials, and therefore, is not expected to create a significant hazard to the public or the environment through normal operations. However, UV lamps used for treatment of the wastewater would contain mercury that may be a hazard if accidentally broken or disposed of improperly; the City would be required to properly dispose of broken or spent lamps in compliance with lamp recycling regulations.<br>• Construction activities would involve the use of certain potentially hazardous materials such as fuels, oils and solvents. Accidental releases of these materials into the environment could occur during construction activities and constitute a significant impact on public health and the environment.. Mitigation measures would be implemented to reduce potential impacts to less than significant levels.<br>• Retrofit of the existing Shell Oil Pipeline may result in the release of residual hazardous materials that may pose a threat to public health. It is expected that mitigation measures would be available to reduce impacts to a less than significant level.<br>• A Department of Toxic Substances Control list of hazardous materials sites search was conducted to determine the proximity of proposed Project Area to Federal Superfund Sites, State Response Site, Voluntary Cleanup Sites, and School Cleanup Sites. The Project area is located near a number of voluntary cleanup sites, one State Response site, a Hazardous Waste Permit site, and a Hazardous Waste Correction Action Site. The project may encounter these and unknown or unrecorded hazardous material sites (e.g., potentially in the vicinity of the existing Shell Oil pipeline). Encountering contaminated soils and/or |
| Emission or handling of hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school. | LTSM | |
| Located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 | LTS | |

| | | |
|---|---|---|
| Located within two miles of a public airport or private airstrip and result in a safety hazard for people residing or working in the project area. | NI | groundwater may result in a public health hazard. Mitigation measures would be available to address this issue and reduce potential impacts to less than significant.<br>• There are no existing or proposed schools located within one-quarter mile of the proposed tertiary facilities at the WPCF. Five educational institutions (Mt. Eden High School, Loren Eden High School, Brenkwitz School, Chabot Las-Positas Community College and Life Chiropractic College) are located within one-quarter mile of the proposed pipeline alignments. In addition, other facilities used by children, including Christian Penke Park, Oliver Sports Fields, Mt. Eden Park and Eden Greenway are located nearby. Operation of the pipelines would not result in emissions of hazardous waste. Please see above for a discussion of construction activities.<br>• Proposed project facilities would not be located within any sites included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 (Cortese List). The only site identified on the list within the City of Hayward is located within the Hayward Executive Airport, which is located approximately two miles away from the nearest project facilities<br>• The proposed tertiary facilities are located within two miles of the Hayward Executive Airport. New above-ground structures are not expected to interfere with any airport operations or result in a safety hazard for people working in the WPCF site.<br>• Construction is not anticipated to interfere with an emergency response plan or emergency evacuation plan.<br>• The proposed Project is located within an urban setting and would not expose people to wildfire risks; therefore, no impacts are anticipated. |
| Exposure of people or structures to significant risk of loss, injury or death involving wildland fires | NI | |
| **Hydrology and Water Quality** | | |
| Violation of water quality standards or waste discharge requirements or degrade water quality | LTS | • The proposed Project would involve the treatment of wastewater to recycled water quality standards (Title 22) for use as non-potable supply (e.g. outdoor irrigation and industrial uses such as cooling and/or boiler feed systems). Compliance with Title 22 standards would ensure protection of public health.<br>• The proposed tertiary treatment facilities at the WPCF would improve effluent water quality from the WPCF by eliminating common by-products of chlorine disinfection.<br>• Water quality effects from construction would be reduced with standard erosion control techniques, implementation of BMPs and the SWPPP,<br>• The proposed Project would not require the withdrawal of groundwater resources. Dewatering associated with construction activities may occur but is not expected to result in substantial depletion of groundwater supplies or interference with groundwater recharge.<br>• The tertiary treatment facilities would be located on an existing disturbed dirt site within the WPCF property that was used as a construction staging area for the recent treatment plant upgrades. The proposed pipeline alignments would be located primarily within disturbed, paved road rights-of-way. Therefore, impacts associated with substantial alteration of the existing drainage pattern of the site or area are |
| Substantial depletion of groundwater supplies or interference with groundwater recharge | LTS | |
| Substantial alteration of the existing drainage pattern of the site or area | LTS | |
| Creation of contribution of runoff water which would exceed the capacity of | LTS | |

| | | |
|---|---|---|
| existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff | | expected to be less than significant.<br>• The locations of the proposed facilities are designated as C flood zone, defined by FEMA as Areas of Minimal Flooding. Therefore flood impacts are expected to be less than significant.<br>• The Project area is not subject to tsunamis or mudflows. However, due to the location of the WPCF adjacent to the Bay shore, seiches could occur although they would be unlikely. |
| Placement of housing within a 100-year flood hazard area, or structures within a 100-year flood hazard area which would impede or redirect flood flows | NI | |
| Exposure of people or structures to a significant risk or loss, injury or death involving flooding. | LTS | |
| Inundation by seiche, tsunami or mudflow | LTS | |
| **Land Use and Planning** | | |
| Physically divide an established community or conflict with applicable land use plan, or regulation | NI | • The proposed Project is located within Hayward city limits in Alameda County. Above-ground facilities would be located on City-owned WPCF property and would be consistent with the City's General Plan land use designation for the area (Industrial). The proposed pipeline alignments would be placed underground along existing roadways and/or utility corridors within commercial, industrial, and residential land use designations and would not conflict with land use designations.<br>• Proposed Project facilities would not conflict with existing uses and thus would not divide established communities. |
| **Mineral Resources** | | |
| Loss of availability of a known mineral resource | NI | • Proposed Project facilities would be located in an urbanized area that does not contain significant mineral resources. Therefore, no impacts are anticipated. |
| **Noise** | | |
| Exposure of persons to or generation of noise levels in | LTSM | • Construction of the proposed Project would require the use of the equipment that has potential to generate noise in excess of relevant local noise regulations and groundbourne vibration. Exposure of sensitive |

| | | |
|---|---|---|
| excess of standards or excessive groundbourne vibration | | receptors to noise may occur where sensitive receptors are located near construction sites, such as along the proposed pipeline alignments. Implementation of appropriate mitigation measures would reduce potential adverse effects on sensitive receptors. |
| Substantial permanent or periodic increase in ambient noise levels in the project vicinity | LTSM | • Once constructed, the pipelines would not create any new sources of operational noise. The proposed pump station, located within the WPCF property, would generate operational noise. However, since it would be located away from sensitive receptors (more than one mile away), such noise levels would not be expected to result in a significant permanent noise impact. Appropriate mitigation measures would be required to ensure that the facility is designed and constructed to meet the City's noise standards. |
| **Population and Housing** | | |
| Induction of substantial population growth in an area either directly or indirectly | LTS | • The primary objective of implementing a recycled water project in the City would be to allow the City to maximize recycled water as a supplemental non-potable water source. The proposed Project would accommodate population growth because the Project would provide recycled water, making potable supplies more available, thus increasing the overall supply of water indirectly. However, as growth in the City of Hayward is controlled by the General Plan, the new water supply as a result of the proposed Project is not expected to result in increase development. Therefore, the Project is not anticipated to substantially change existing water demands and induce population growth in the area.<br>• Construction, operation and maintenance of the proposed Project would not displace people or housing, or increase the numbers of permanent workers. |
| Displacement of substantial numbers of existing people or housing | NI | |
| **Public Services** | | |
| Substantial adverse physical impacts to public services including but not limited to fire and police protection, schools and parks | NI | • The proposed Project would involve the provision of recycled water treatment and distribution facilities and would not increase the use of or demand for public services, (e.g. schools, parks, fire, police or other public facilities) such that new facilities necessitating physical construction would be required. |
| **Recreation** | | |
| Substantial physical deterioration of park facilities | NI | • The proposed Project would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of these facilities would occur, or be accelerated. |
| **Transportation/Traffic** | | |
| Increase in traffic which is | LTSM | • Construction of above-ground facilities would occur within the existing WPCF property, away from public |

| | | |
|---|---|---|
| substantial in relation to the existing traffic load and capacity of the street system | | streets. Pipeline installation activities (primarily involving open-trench construction along public rights-of-way) would temporarily disrupt traffic patterns in the vicinity of the construction zones through the potential reduction of roadway width or blockage of roads/intersections. Potential conflicts between construction traffic, bicyclists, pedestrians and emergency vehicles could also occur in the vicinity of construction zones. Appropriate traffic control mitigation measures would be required to reduce potential traffic-related effects.<br>• In addition, construction-related traffic associated with the import and export of equipment, soils, and material would increase truck traffic on city streets and potentially result in a significant impact on traffic flow of they were to occur during peak traffic periods. Implementation of available traffic control mitigation measures would be expected to reduce potential traffic effects to a less than significant level.<br>• The Hayward Executive Airport is located within two miles of the proposed above-ground project facilities near the WPCF. The proposed Project would not involve any changes to the air traffic patterns, and no significant impact on air traffic patterns is anticipated.<br>• The proposed Project would create temporary parking demand for construction workers and construction vehicles at the WPCF and along pipeline installation roadways. Implementation of mitigation measures would be required to reduce potential impacts on parking capacity to a less than significant level. |
| Changes in air traffic patterns, resulting in substantial safety risks | NI | |
| Substantially increase hazards due to a design feature (e.g. sharp curves or dangerous intersections) or incompatible uses | LTS | |
| Inadequate emergency access or parking capacity | LTSM | |
| **Utilities and Service Systems** | | |
| Exceedence of wastewater requirements of the applicable Regional Water Quality Control Board | LTS | • The proposed Project would treat secondary effluent to the Department of Public Health's Title 22 standards and use the tertiary-treated recycled water for various non-potable purposes, including irrigation. The use of recycled water would not involve discharging wastewater into the environment except to irrigate the lands of specific customers. Irrigation would be expected to occur at agronomic rates such than additional run-off would not occur. In addition, tertiary-treated recycled water would not exceed the requirements of typical secondary-treated wastewater.<br>• Recycled water has the potential to result in salt accumulation in the root zones of irrigated parcels. This may be a concern for plants sensitive to salt. BMPs would be implemented to address this issue.<br>• For industrial users, including Calpine, additional on-site treatment of the recycled water would be necessary to achieve the water quality standards for the industrial uses. Additional treatment beyond Title 22 standards for individual customers is not evaluated as part of this analysis.<br>• Solid waste generated from the proposed project is expected to be accommodated by existing landfills. No long-term solid waste generation would be associated with the proposed Project.<br>• The proposed Project is limited tertiary treatment facilities at the WPCF and distribution facilities, and would not add significant use to a public facility. Therefore, it would not result in a substantial physical deterioration of a public facility due to increased use. |
| Expansions of, or construction of new water, wastewater, or stormwater facilities cause significant environmental effects or physical deterioration of a public facility due to increased use as a result of the project | NI | |
| Sufficient water supplies or capacity to serve the project | NI | |
| Have sufficient capacity at a landfill to accommodate the project's solid waste disposal needs and compliance with | LTS | |

| | | |
|---|---|---|
| statues and regulations related to solid waste | | |
| **Mandatory Findings of Significance** | | |
| Substantial environmental degradation (e.g., reduction of sensitive habitat, endangered plant or animal species, or cultural resources, | LTSM | • Please refer to environmental topics above regarding potential impacts to biological resources. Mitigation measures are available to reduce potential impacts to a less than significant level.<br>• Construction impacts of the proposed Project would be temporary, although it may contribute to cumulatively considerable impacts when considered in combination with other past, present and probable futures projects that would be constructed. In particular, air quality emissions from construction activities may contribute to global climate change. Currently, thresholds for determining global climate change impacts have not yet been established. Further evaluation in the follow-up CEQA environmental would be needed to disclose the project's incremental effects.<br>• Please refer to the environmental topics above for noise and air quality for a discussion of potential to adversely affect human beings. Mitigation measures would be available to reduce potential impacts to a less than significant level. |
| Contribution to cumulative impacts | LTSM | |
| Substantial adverse effects on human beings. | LTSM | |

Note: PS = Potentially significant; LTSM = Less than Significant with Mitigation Incorporation; LTS = Less than Significant; NI = No Impact

# Appendix G - Construction Financing Plan

City of Hayward Recycled Water Project
SWRCB WRFP Project # 07-465-550

**Design and Construction Cash Flow Analysis[1]**

| | | | Design | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | TOTALS | Jan-10 | Feb-10 | Mar-10 | Apr-10 | May-10 | Jun-10 | Jul-10 | Aug-10 | Sep-10 | Oct-10 |
| **DESIGN/CONSTRUCTION COSTS[2]** | | | | | | | | | | | |
| Eligible Design/Construction Costs | $ 30,000,000 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 |
| Engineering/Construction Management Costs by Consultant | $ 7,800,000 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 |
| Project Construction Costs | $ 22,200,000 | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **TOTAL** | **$ 30,000,000** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** |
| **PAYMENTS FROM PROJECT ACCOUNT** | | | | | | | | | | | |
| Design/Construction Payment | $ 30,000,000 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 |
| **TOTAL** | **$ 30,000,000** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** |
| **PAYMENTS TO PROJECT ACCOUNT** | | | | | | | | | | | |
| City of Hayward | $ 8,899,000 | $ 1,570,000 | | | | | | | | | |
| Calpine | $ 19,000,000 | $ 3,250,000 | | | | | | | | | |
| SWRCB Construction Grant | $ 2,101,000 | $ 315,000 | | | | | | | | | |
| **TOTAL** | **$ 30,000,000** | **$ 5,135,000** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| **PROJECT ACCOUNT END OF MONTH BALANCE** | | **$ 4,859,706** | **$ 4,584,412** | **$ 4,309,118** | **$ 4,033,824** | **$ 3,758,529** | **$ 3,483,235** | **$ 3,207,941** | **$ 2,932,647** | **$ 2,657,353** | **$ 2,382,059** |

| | Design | | | | | | | Advertise, Bidding & Award | | | Construction |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Nov-10 | Dec-10 | Jan-11 | Feb-11 | Mar-11 | Apr-11 | May-11 | Jun-11 | Jul-11 | Aug-11 | Sep-11 |
| **DESIGN/CONSTRUCTION COSTS** | | | | | | | | | | | |
| Eligible Design/Construction Costs | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 130,000 | $ 130,000 | $ 130,000 | $ 1,558,125 |
| Engineering/Construction Management Costs by Consultant | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 130,000 | $ 130,000 | $ 130,000 | $ 170,625 |
| Project Construction Costs | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ - | $ 1,387,500 |
| **TOTAL** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 130,000** | **$ 130,000** | **$ 130,000** | **$ 1,558,125** |
| **PAYMENTS FROM PROJECT ACCOUNT** | | | | | | | | | | | |
| Design/Construction Payment | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 275,294 | $ 130,000 | $ 130,000 | $ 130,000 | $ 1,558,125 |
| **TOTAL** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 275,294** | **$ 130,000** | **$ 130,000** | **$ 130,000** | **$ 1,558,125** |
| **PAYMENTS TO PROJECT ACCOUNT** | | | | | | | | | | | |
| City of Hayward | | | | | | | | | | | $ 7,329,000 |
| Calpine | | | | | | | | | | | $ 15,750,000 |
| SWRCB Construction Grant | | | | | | | | | | | $ 893,000 |
| **TOTAL** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ 23,972,000** |
| **PROJECT ACCOUNT END OF MONTH BALANCE** | **$ 2,106,765** | **$ 1,831,471** | **$ 1,556,176** | **$ 1,280,882** | **$ 1,005,588** | **$ 730,294** | **$ 455,000** | **$ 325,000** | **$ 195,000** | **$ 65,000** | **$ 22,478,875** |

| | Construction | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Oct-11 | Nov-11 | Dec-11 | Jan-12 | Feb-12 | Mar-12 | Apr-12 | May-12 | Jun-12 | Jul-12 | Aug-12 |
| **EXPENSES (Payments from Project Account)** | | | | | | | | | | | |
| Eligible Design/Construction Costs | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 |
| Engineering/Construction Management Costs by Consultant | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 |
| Project Construction Costs | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 |
| **TOTAL** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** |
| **PAYMENTS FROM PROJECT ACCOUNT** | | | | | | | | | | | |
| Design/Construction Payment | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 |
| **TOTAL** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** |
| **PAYMENTS TO PROJECT ACCOUNT** | | | | | | | | | | | |
| City of Hayward | | | | | | | | | | | |
| Calpine | | | | | | | | | | | |
| SWRCB Construction Grant | | | | | | | | | | | |
| **TOTAL** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| **PROJECT ACCOUNT END OF MONTH BALANCE** | **$ 20,920,750** | **$ 19,362,625** | **$ 17,804,500** | **$ 16,246,375** | **$ 14,688,250** | **$ 13,130,125** | **$ 11,572,000** | **$ 10,013,875** | **$ 8,455,750** | **$ 6,897,625** | **$ 5,339,500** |

| | Construction | | | | Initiation of Operations/Operations | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | Sep-12 | Oct-12 | Nov-12 | Dec-12 | Jan-13 | Feb-13 | Mar-13 | Apr-13 | May-13 | Jun-13 | Jul-13 |
| **EXPENSES (Payments from Project Account)** | | | | | | | | | | | |
| Eligible Design/Construction Costs | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| Engineering/Construction Management Costs by Consultant | $ 170,625 | $ 170,625 | $ 170,625 | $ 170,625 | | | | | | | |
| Project Construction Costs | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | $ 1,387,500 | | | | | | | |
| **TOTAL** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| **PAYMENTS FROM PROJECT ACCOUNT** | | | | | | | | | | | |
| Design/Construction Payment | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ 1,558,125 | $ - | $ - | $ - | $ - | $ - | $ - | $ - |
| **TOTAL** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ 1,558,125** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** | **$ -** |
| **PAYMENTS TO PROJECT ACCOUNT** | | | | | | | | | | | |
| City of Hayward | | | | | | | | | | | |
| Calpine | | | | | | | | | | | |
| SWRCB Construction Grant | | | | $ 893,000 | | | | | | | |
| **TOTAL** | **$ -** | **$ -** | **$ -** | **$ 893,000** | **$ -** | **$ -** | | | | | |
| **PROJECT ACCOUNT END OF MONTH BALANCE** | **$ 3,781,375** | **$ 2,223,250** | **$ 665,125** | **$ -** | **$ -** | **$ -** | | | | | |

Notes:
1. Cash flow analysis does not consider the financing costs, which would be paid back over a period longer than project implementaion, so the financing mechanism (e.g. bonds, SRF, etc.) is not considered here.
2. Capital costs were escalated from Plan estimate in October 2008 dollars to estimated mid-point of construction in May 2012. An annual inflation rate of 3% was applied.

**City of Hayward Recycled Water Project**
**SWRCB WRFP Project # 07-465-550**

**Capital Cost Estimate for Recommended Project**

| Item | Present Cost (Oct 2008) [a] | | Cost Escalated to Construction Mid-Point (May 2012) [a,b,c] |
|---|---|---|---|
| Treatment Facilities | $ 6,699,000 | | |
| Distribution Pump Station | $ 976,000 | | |
| Potable Backup Line | $ 100,000 | | |
| Calpine Pump Station | $ 640,000 | | |
| Storage Tank | $ 1,100,000 | | |
| Distribution Pipeline | $ 1,347,000 | | |
| User Retrofits and Connections | $ 366,000 | | |
| Laterals to Customers | $ 2,520,000 | | |
| **Raw Construction Costs** | **$ 13,748,000** | | |
| Contractor Overhead and Profit (10% of Raw Construction Cost) | $ 1,374,800 | | |
| Change Order Allowance (5% of Raw Construction Cost) | $ 687,400 | | |
| Project Contingency (30% of Raw Construction Costs) | $ 4,124,400 | | |
| **Total Construction Cost** | **$ 19,934,600** | | **$ 22,200,000** |
| Engineering and Construction Management (35%) | $ 6,977,000 | | $ 7,800,000 |
| | | | $ - |
| **Total Capital Costs** | **$ 26,911,600** | | **$ 30,000,000** |
| | | | |
| Annualized Capital Costs | $1,827,000 | | $2,000,000 |
| Annual O&M Costs | $ 1,233,000 | | $ 1,400,000 |
| **Total Annualized Costs** | **$ 3,060,000** | | **$ 3,400,000** |
| | | | |
| | | | |
| Estimated Recycled Water Yield (AFY) | 3,760 | | 3,760 |
| **Total Annualized Costs** | **$ 810** | | **$ 900** |

a. Numbers might not exactly add up due to rounding
b. Used for Cash Flow Analysis
c. Assumes 3% inflation rate

# Appendix H - Sample Recycled Water Ordinances

*October 10, 2001*

*MODEL WATER RECYCLING ORDINANCE*

*Ordinance No.*
*An Ordinance of the*
*Establishing A Water Recycling Master Plan*
*And Implementing Procedures*

*WHEREAS, the people of the state of California have a primary interest in the development of facilities to recycle water containing waste to supplement existing surface and underground water supplies and to assist in meeting the future water requirements of the state (California Water Code, Section 13510); and*

*WHEREAS, conservation of all available water resources requires the maximum reuse of wastewater for beneficial uses of water (Water Code Section 461); and*

*WHEREAS, continued use of potable water for irrigation of greenbelt areas and other non-potable uses may be an unreasonable use of such water where recycled water is available;*

*NOW, THEREFORE, the (District)(City)(County)*
*Does hereby ordain:*

*SECTION 1. FINDINGS*

*The state policies described above are in the best interest of the_____. This ordinance is necessary to protect the common water supply of the region which is vital to public health and safety, and to prevent endangerment of public and private property. _____ is highly dependent on limited imported water for domestic, agricultural and industrial uses. The reliability of the supply of imported water is uncertain. By developing and utilizing recycled water, the need for additional imported water can be reduced. In light of these circumstances, certain uses of potable water may be considered unreasonable where recycled water is available. Recycled water should be more readily available in seasons of drought when the supply of potable water for nonessential uses may be uncertain.*

*SECTION 2: WATER RECYCLING POLICY*

*It is the policy of _____that recycled water determined to be available pursuant to Section 13550 of the Water Code shall be used for nonpotable uses within the designated Recycled Water Use Areas set forth by within the jurisdiction wherever there is not an alternative higher or better use for the recycled water, its use is economically justified, financially and technically feasible, and consistent with legal requirements, preservation of public health, safety and welfare, and the environment.*

*SECTION 3: DEFINITIONS The following terms are defined for purposes of this ordinance:*

*3.1 AGRICULTURAL PURPOSES: Agricultural purposes include the growing of field and nursery crops, row crops, trees, and vines and the feeding of fowl and livestock.*

*3.2 ARTIFICIAL LAKE: A human-made lake, pond, lagoon, or other body of water that is used wholly or partly for landscape, scenic or noncontact recreational purposes.*

*3.3 COMMERCIAL OFFICE BUILDING:Any building for office or commercial uses with water requirements which include, but are not limited to, landscape irrigation, toilets, urinals and decorative fountains.*

*3.4 RECYCLED WATER DISTRIBUTION SYSTEM: A piping system intended for the delivery of recycled water only and which is separate from any potable water distribution system.*

*3.5 GREENBELT AREAS: A greenbelt area includes, but is not limited to, golf courses, cemeteries, parks and landscaping.*

*3.6 INDUSTRIAL PROCESS WATER: Water used by any industrial facility with process water requirements which include, but are not limited to, rinsing, washing, cooling and circulation, or construction, including any facility regulated by the industrial waste discharge ordinance of _____.*

*3.7 OFF-SITE FACILITIES: Water facilities from the source of supply to the point of connection with the on-site facilities, including the water meter.*

*3.8 ON-SITE FACILITIES: Water facilities under the control of the owner, downstream from the water meter.*

*3.9 POTABLE WATER: Water which conforms to the federal, state and local standards for human consumption.*

*3.10 RECYCLED WATER:*
*Recycled water means water which, as a result of treatment of wastewater, is suitable for a direct beneficial use or controlled use that would not otherwise occur. (See Water Code Section 13050(n).)*

*SECTION 4: WATER RECYCLING MASTER PLAN*

*4.1 GENERAL: Upon adoption of this ordinance, the _____ shall prepare and adopt a Water Recycling Master Plan to define, encourage, and develop the use of recycled water within its boundaries. The Master Plan shall be updated not less often than every five years.*

*5.4 CONTENTS OF THE WATER RECYCLING MASTER PLAN: The Master Plan shall include, but not be limited to, the following:*

*4.2.1 PLANTS AND FACILITIES. Evaluation of the location and size of present and future reclamation treatment plants, distribution pipelines, pump stations, reservoirs, and other related facilities, including cost estimates and potential financing methods.*

*4.2.2 RECYCLED WATER SERVICE AREAS. A designation, based on the criteria set forth in Section 2 and the information derived from Section 4.2.1 and 4.2.2, of the areas within the boundaries of _____that can or may in the future use recycled water in lieu of potable water. Recycled water uses may include, but are not limited to, the irrigation of greenbelt and*

*agricultural areas, filling of artificial lakes, and appropriate industrial and commercial uses.*

*4.2.3 MANDATORY RECYCLED WATER USE. For each recycled water service area, evaluate whether greenbelt irrigation, agricultural irrigation, commercial office buildings, filling of artificial lakes, or industrial processes shall be limited to the use of recycled water. As appropriate, mandate construction of recycled water distribution systems or other facilities in new and existing developments for current or future recycled water use as a condition of any development approval or continued water service if future water recycling facilities are proposed in the Master Plan that could adequately serve the development, in accordance with the procedures described in Section 5. Identify resources and adopt measures to assist water users in the financing of necessary conversions.*

*4.2.4 RULES AND REGULATIONS. Establish general rules and regulations governing the use and distribution of recycled water.*

*SECTION 5. PROCEDURES*

*5.1 EXISTING POTABLE WATER SERVICE:*

*5.1.1 PRELIMINARY DETERMINATION. Based upon the Master Plan, upon the designation of each recycled water service area or the commencement of the design of new recycled water facilities, the shall make preliminary determinations as to which existing potable water customers shall be converted to the use of recycled water. Each water customer shall be notified of the basis for a determination that conversion to recycled water service will be required, as well as the proposed conditions and schedule for conversion.*

*5.1.2 NOTICE. The notice of the preliminary determination, including the proposed conditions and time schedule for compliance, and a recycled water permit application shall be sent to the water customer by certified mail.*

*5.1.3 OBJECTIONS; APPEALS. The water customer may file a notice of objection with the within (30) days after any notice of determination to comply is delivered or mailed to the customer, and may request reconsideration of the determination or modification of the proposed conditions or schedule for conversion. The objection must be in writing and specify the reasons for the objection. The preliminary determination shall be final if the customer does not file a timely objection. Staff (to be specified) shall review the objection and shall confirm, modify or abandon the preliminary determination. Upon issuance of a final*

*determination by staff, customer may appeal the determination as follows: (The desired appeal process should here be described.)*

*5.2 DEVELOPMENT AND WATER SERVICE APPROVALS:*

*5.2.1 CONDITIONS. Upon application by a developer, owner or water customer (herein referred to as "applicant") for a new industrial, commercial, or residential subdivisions located within the designated Recycled Water Use Areas for which a tentative map or parcel map is required pursuant to Government Code Section 66426 [ or for new or altered water service ~Note: Applicable to water districts only ], the staff shall review the Master Plan and make a preliminary determination whether the current or proposed use of the subject property is required to be served with recycled water or to include facilities designed to accommodate the use of recycled water in the future. Based upon such determination, use of recycled water and provision of recycled water distribution systems or other facilities for the use of recycled water, and application for a permit for such use may be required as a condition of approval of any such application, in addition to any other conditions of approval [or service.(Note: Applicable in water districts only; such Conditions should normally be placed upon projects at the earliest possible stage, e.g. subdivision map approval.)]*

*5.2.2 ALTERATIONS AND REMODELING. On a case by case basis, upon application for a permit for the alteration or remodeling of multi-family, commercial or industrial structures (including, for example, commercial office buildings), the staff shall review the Master Plan and make a preliminary determination whether the subject property shall be required to be served with recycled water or to include facilities designed to accommodate the use of recycled water in the future. Based upon such determination, use of recycled water and provision of recycled water distribution systems or other facilities for the use of recycled water, and application for a permit for such use, may be required as a condition of approval of the application.*

*5.2.3 NOTICE OF DETERMINATION. A notice of the basis for the preliminary determination, proposed conditions of approval and schedule for compliance shall be provided to the applicant prior to approval of the development application [or application for water service ( Water districts only.)]. (Note: Since in most cases, development conditions can be negotiated or appealed through established procedures, no new process is provided here.)*

*5.2.4 REQUESTED SERVICE. On a case by case basis, upon application for a permit to use recycled water on a property not covered by Sections 5.1.1, 5.2.1, or 5.2.2 above, the shall review*

*the Master Plan and make a determination whether the subject property shall be served with recycled water. Based upon such determination, the application for the permit shall be accepted and processed subject to Section 5.3.*

*5.3 RECYCLED WATER PERMIT PROCESS: Upon a final determination by the_____that a property shall be served with recycled water, or adoption of a condition of development approval [or water service (Water districts only)] requiring use or accommodation of the use of recycled water, the water customer, owner or applicant shall obtain a recycled water permit.*

*5.3.1 PERMIT CONDITIONS. The permit shall specify the design and operational requirements for the applicant's water distribution facilities and schedule for compliance, based on the rules and regulations adopted pursuant to Section 4.2 and shall require compliance with both the California Department of Health Services Wastewater Recycling Criteria (see California Code of Administrative Regulations, Title 22), and requirements of the Regional Water Quality Control Board.*

*5.3.2 PLAN APPROVAL. Plans for the recycled and non recycled water distribution systems for the parcel shall be reviewed by the_____and a field inspection conducted before the permit is granted.*

*5.3.3 PERMIT ISSUANCE. Upon approval of plans the permit shall be issued. Recycled water shall not be supplied to a property until inspection by the _____determines that the applicant is in compliance with the permit conditions. Recycled water service shall not commence within the designated Recycled Water Use Area in any service area of a private utility, as defined in Section 1502 of the Public Utilities Code, or to any service area of a public agency retail water supplier that is not a city, county or city and county, except in accordance with a written agreement between the recycled water producer and the private utility or public agency retail water supplier.*

*5.4 TEMPORARY USE OF POTABLE WATER:*
*At the discretion of the _____, potable water may be made available on a temporary basis, until recycled water is available. Before the applicant receives temporary potable water, a water recycling permit, as described in Section 5.3, must be obtained for new on-site distribution facilities. Prior to commencement of recycled water service, an inspection of the on-site facilities will be conducted to verify that the facilities have been maintained and are in compliance with the recycled water permit and current requirements for service. Upon verification of*

*compliance, recycled water shall be served to the parcel for the intended use. If the facilities are not in compliance, the applicant shall be notified of the corrective actions necessary and shall have at least thirty (30) days to take such actions prior to initiation of enforcement proceedings.*

*5.5 RECYCLED WATER RATE: The rate charged for recycled water shall be established by resolution of the _____.*

*SECTION 6. SANCTIONS*

*6.1 PUBLIC NUISANCE:Discharge of wastes or the use of recycled water in any manner in violation of this ordinance or of any permit issued hereunder is hereby declared a public nuisance and shall be corrected or abated as directed by _____. Any person creating such a public nuisance is guilty of a misdemeanor.*

*6.2 INJUNCTION: Whenever a discharge of wastes or use of recycled water is in violation of this ordinance or otherwise causes or threatens to cause a condition of nuisance, the _____may seek injunctive relief as may be appropriate to enjoin such discharge or use.*

*6.3 PERMIT REVOCATION: In addition to any other statute or rule authorizing termination of water service, the _____may revoke a permit issued hereunder if a violation of any provision of this ordinance is found to exist or if a discharge of wastes or use of recycled water causes or threatens to cause a nuisance.*

*6.4 PENALTY: Any owner andlor operator who violates this ordinance shall, for each day of violation, or portion thereof, be subject to a fine not exceeding $1,000. In addition, water service to the property may be discontinued.*

*SECTION 7. VALIDITY*

*If any provision of this ordinance or the application thereof to any person or circumstance is held invalid, the remainder of the ordinance and the application of such provisions to other persons or circumstances shall not be affected thereby.*

# Appendix I - Calpine Will Serve Letter (2001)

CITY OF
HAYWARD
HEART OF THE BAY

May 4, 2001

Mr. William I. Toman
Development Manager
Calpine/Bechtel Joint Development
6700 Koll Center Parkway, Suite 320
Pleasanton, California 94566

Subject: Water Service to the Proposed Russell City Energy Center

Dear Mr. Toman:

The purpose of this letter is to indicate the City of Hayward's ("City") willingness to serve and to describe the general terms upon which the City would provide water service to the proposed 600 Megawatt Russell City Energy Center (RCEC).

Potable water

- The City will provide potable water for use at the site for domestic needs and as required to meet fire service needs for the RCEC. This service is to be provided on the same terms as service is provided for similar uses throughout the City. We anticipate providing a two-inch service connection and meter to provide domestic service to the site and a ten-inch unmetered connection with leak detector to provide fire flow capabilities.

Process and Cooling Water

- The City is prepared to serve the RCEC with recycled water derived from the effluent of the City's Water Pollution Control Facility (WPCF) in accordance with the following terms and conditions:

    - Calpine will construct and transfer to the City an advanced wastewater treatment (AWT) plant to provide high-quality recycled water for use at the RCEC. The AWT will be designed to mutually acceptable standards to provide approximately 4,000 acre-feet per year of desalinated tertiary effluent to the RCEC at peak flows of up to 4.17 million gallons per day (MGD).

OFFICE OF THE CITY MANAGER
777 B STREET, HAYWARD, CA 94541-5007
TEL: 510/583-4300 • FAX: 510/583-3601 • TDD: 510/247-3340

Mr. William Toman
Calpine/Bechtel Joint Development
May 4, 2001

- The treatment process used to produce the recycled water for the RCEC will produce waste streams that will be further treated prior to discharge from the WPCF. Therefore, the total flow of secondary effluent that will be utilized to produce the recycled peak flow of 4.17 MGD would be approximately 5.73 MGD. The City has sufficient effluent available to ensure the availability of adequate supplies to meet these requirements.

- The City will require Calpine/Bechtel to pay all costs for the AWT, including but not limited to construction, operation and maintenance.

- The City will take necessary steps to secure rights and construct facilities to obtain secondary effluent from the East Bay Dischargers Authority discharge system as a back-up supply of secondary effluent to supply the AWT during periods when maintenance or other outages of the WPCF make the source of supply unavailable. Calpine/Bechtel will pay all costs for this backup connection, including but not limited to construction, operation and maintenance.

The City's willingness to provide this service is dependant upon compliance with the provisions of the California Environmental Quality Act. The detailed commercial terms for operation and maintenance of the AWT plant will be established by a detailed service contract, to be negotiated in the future, which will be subject to approval of the Hayward City Council.

If you have questions or require further information please call me at 510-583-4305.

Sincerely,

Jesús Armas
City Manager

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# Appendix J - Customer Connection Schedule

**Hayward Recycled Water Facilities Plan**

***Customer Connection Schedule***

| | | | | | | | | | Connection Information | | | | Recycled Water Demands (mgd) | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| # | Potential Customer | Location | Primary Type of RW Use | Secondary Type of RW Use | Irrigation - Average Annual RW Demand (AFY) | Revised Industrial - Average Annual RW Demand (AFY) | Total - Average Annual RW Demand (AFY) | Status [a] | Projected Connection Date [b] | Assurance Type [c] | Retrofit Required (Y/N) [d] | Current Fresh Water Supplier [e] | Annual Demand (mgd) | Peak Month Demand (mgd) | Peak Hour Demand (mgd) |
| 0 | Calpine | | Industrial | | | 3475.0 | 3475.0 | D | Jan-2013 | C | N/A | N/A | 3.100 | 4.000 | 4 |
| 1 | Bottling Group LLC (Pepsi) | 29000 HESPERIAN BLVD | Irrigation | Industrial | 9.1 | 21.8 | 30.9 | E | Jan-2013 | M | N | City | 0.027 | 0.037 | 0.092 |
| 4 | Shasta Beverages | 26901 INDUSTRIAL BLVD | Industrial | | | 7.5 | 7.5 | E | Jan-2013 | M | N | City | 0.007 | 0.007 | 0.014 |
| 5 | Rohm & Haas | 25500 WHITESELL ST | Industrial | | | 22.4 | 22.4 | E | Jan-2013 | M | N | City | 0.020 | 0.020 | 0.04 |
| 8 | Chabot-Las Positas Community College | 25555 HESPERIAN BLVD | Irrigation * | | 6.1 | | 6.1 | E | Jan-2013 | M | Y | City | 0.005 | 0.012 | 0.036 |
| 29 | Life Chiropractic College | 24801 INDUSTRIAL BLVD | Industrial | | | 3.0 | 3.0 | E | Jan-2013 | M | N | City | 0.003 | 0.003 | 0.006 |
| 30 | SCA Packaging | 3466 ENTERPRISE AVE | Industrial | | | 1.5 | 1.5 | E | Jan-2013 | M | N | City | 0.001 | 0.001 | 0.002 |
| 40 | Bay Center II | 3832 BAY CENTER PL | Irrigation | | 20.2 | | 20.2 | E | Jan-2013 | M | N | City | 0.018 | 0.041 | 0.123 |
| 42 | BB&K Franklin Township | 23575 CABOT BLVD | Irrigation | | 12.8 | 0.0 | 12.8 | E | Jan-2013 | M | N | City | 0.011 | 0.025 | 0.075 |
| 72 | Robert Chang & Associates | 21325 CABOT BLVD | Irrigation | | 10.3 | | 10.3 | E | Jan-2013 | M | N | City | 0.009 | 0.021 | 0.063 |
| 79 | Caltrans D-4 HDWS | SAN MATEO BRIDGE | Irrigation | | 8.7 | | 8.7 | E | Jan-2013 | M | N | City | 0.008 | 0.018 | 0.054 |
| 80 | Caltrans D-4 | JACKSON @ INDUSTRIAL PKWY | Irrigation | | 7.7 | | 7.7 | E | Jan-2013 | M | N | City | 0.007 | 0.016 | 0.048 |
| 91 | Mt. Eden High School | 2300 PANAMA | Irrigation | | 43.1 | | 43.1 | E | Jan-2013 | M | N | City | 0.038 | 0.087 | 0.261 |
| 98 | Eden Garden School | 2184 THAYER AVE | Irrigation * | | 2.88 | | 2.9 | E | Jan-2013 | M | Y | City | 0.003 | 0.007 | 0.021 |
| 105 | Loren Eden School | 27790 PORTSMOUTH AVE | Irrigation | | 7.8 | | 7.8 | E | Jan-2013 | M | N | City | 0.007 | 0.016 | 0.048 |
| 114 | Oliver Sports Park | 2580 EDEN PARK PL | Irrigation | | 35.0 | | 35.0 | E | Jan-2013 | M | N | City | 0.031 | 0.071 | 0.213 |
| 116 | Mt. Eden Park | 2451 W. TENNYSON | Irrigation | | 20.5 | | 20.5 | E | Jan-2013 | M | N | City | 0.018 | 0.041 | 0.123 |
| 119 | Eden Greenway - Part 1 | VARIOUS | Irrigation | | 10.0 | | 10.0 | E | Jan-2013 | M | N | City | 0.009 | 0.021 | 0.063 |
| 129 | Brenkwitz School | 2560 DARWIN ST | Irrigation | | 8.0 | | 8.0 | E | Jan-2013 | M | N | City | 0.007 | 0.016 | 0.048 |
| 132 | Christian Penke Park | TAHOE & MORNINGSIDE | Irrigation | | 7.2 | | 7.2 | E | Jan-2013 | M | N | City | 0.006 | 0.014 | 0.042 |
| 135 | Rancho Arroyo Park | 2121 DEPOT RD | Irrigation | | 6.5 | | 6.5 | E | Jan-2013 | M | N | City | 0.006 | 0.014 | 0.042 |
| 160 | Bay Center II | 3825 BAY CENTER PL | Irrigation | | 7.3 | | 7.3 | E | Jan-2013 | M | N | City | 0.007 | 0.016 | 0.048 |
| 163 | Winton Industrial Center | 2660 W WINTON | Irrigation | | 7.1 | | 7.1 | E | Jan-2013 | M | N | City | 0.006 | 0.014 | 0.042 |
| | | | **Total** | | **230.2** | **3531.1** | **3761.3** | | | | | | **3.4** | **4.5** | **5.504** |

a. E = Use site exists and currently uses freshwater
   D = Use site under development and will be ready to take recycled water upon completion of RW project construction
b. Connection dates for customer sites are estimates. Actual connection are pending CDPH approval to operated irrigation/industrial systems.
c. M = Mandatory Use Ordinance
   C = User Contract
d. Assumed based on preliminary customer information.
e. Either the City of Hayward, groundwater, or a combination of both.

# APPENDIX G

## TIER 1 AND TIER 2 DROUGHT ALLOCATION PLANS

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# ATTACHMENT H

# WATER SHORTAGE ALLOCATION PLAN

This Interim Water Shortage Allocation Plan ("Plan") describes the method for allocating water between the San Francisco Public Utilities Commission ("SFPUC") and the Wholesale Customers collectively during shortages caused by drought. The Plan implements a method for allocating water among the individual Wholesale Customers which has been adopted by the Wholesale Customers. The Plan includes provisions for transfers, banking, and excess use charges. The Plan applies only when the SFPUC determines that a system-wide water shortage due to drought exists, and all references to "shortages" and "water shortages" are to be so understood. This Plan was adopted pursuant to Section 7.03(a) of the 1984 Settlement Agreement and Master Water Sales Contract and has been updated to correspond to the terminology used in the June 2009 Water Supply Agreement between the City and County of San Francisco and Wholesale Customers in Alameda County, San Mateo County and Santa Clara County ("Agreement").

## SECTION 1. SHORTAGE CONDITIONS

**1.1. Projected Available SFPUC Water Supply.** The SFPUC shall make an annual determination as to whether or not a shortage condition exists. The determination of projected available water supply shall consider, among other things, stored water, projected runoff, water acquired by the SFPUC from non-SFPUC sources, inactive storage, reservoir losses, allowance for carryover storage, and water bank balances, if any, described in Section 3.

**1.2 Projected SFPUC Purchases.** The SFPUC will utilize purchase data, including volumes of water purchased by the Wholesale Customers and by Retail Customers (as those terms are used in the Agreement) in the year immediately prior to the drought, along with other available relevant information, as a basis for determining projected system-wide water purchases from the SFPUC for the upcoming year.

**1.3. Shortage Conditions.** The SFPUC will compare the available water supply (Section 1.1) with projected system-wide water purchases (Section 1.2). A shortage condition exists if the SFPUC determines that the projected available water supply is less than projected system-wide water purchases in the upcoming Supply Year (defined as the period from July 1 through June 30). When a shortage condition exists, SFPUC will determine whether voluntary or mandatory actions will be required to reduce purchases of SFPUC water to required levels.

**1.3.1 Voluntary Response.** If the SFPUC determines that voluntary actions will be sufficient to accomplish the necessary reduction in water use throughout its service area, the SFPUC and the Wholesale Customers will make good faith efforts to reduce their water purchases to stay within their annual shortage allocations and associated monthly water use budgets. The SFPUC will not impose excess use charges during periods of voluntary rationing, but may suspend the prospective accumulation of water bank credits, or impose a ceiling on further accumulation of bank credits, consistent with Section 3.2.1 of this Plan.

1.3.2 Mandatory Response. If the SFPUC determines that mandatory actions will be required to accomplish the necessary reduction in water use in the SFPUC service area, the SFPUC may implement excess use charges as set forth in Section 4 of this Plan.

1.4. Period of Shortage. A shortage period commences when the SFPUC determines that a water shortage exists, as set forth in a declaration of water shortage emergency issued by the SFPUC pursuant to California Water Code Sections 350 et seq. Termination of the water shortage emergency will be declared by resolution of the SFPUC.

## SECTION 2. SHORTAGE ALLOCATIONS

2.1. Annual Allocations between the SFPUC and the Wholesale Customers. The annual water supply available during shortages will be allocated between the SFPUC and the collective Wholesale Customers as follows:

| Level of System Wide Reduction in Water Use Required | Share of Available Water | |
|---|---|---|
| | SFPUC Share | Wholesale Customers Share |
| 5% or less | 35.5% | 64.5% |
| 6% through 10% | 36.0% | 64.0% |
| 11% through 15% | 37.0% | 63.0% |
| 16% through 20% | 37.5% | 62.5% |

The water allocated to the SFPUC shall correspond to the total allocation for all Retail Customers.

2.2 Annual Allocations among the Wholesale Customers. The annual water supply allocated to the Wholesale Customers collectively during system wide shortages of 20 percent or less will be apportioned among them based on a methodology adopted by all of the Wholesale Customers, as described in Section 3.11(C) of the Agreement. In any year for which the methodology must be applied, the Bay Area Water Supply and Conservation Agency ("BAWSCA") will calculate each Wholesale Customer's individual percentage share of the amount of water allocated to the Wholesale Customers collectively pursuant to Section 2.1. Following the declaration or reconfirmation of a water shortage emergency by the SFPUC, BAWSCA will deliver to the SFPUC General Manager a list, signed by the President of BAWSCA's Board of Directors and its General Manager, showing each Wholesale Customer together with its percentage share and stating that the list has been prepared in accordance with the methodology adopted by the Wholesale Customers. The SFPUC shall allocate water to each Wholesale Customer, as specified in the list. The shortage allocations so established may be transferred as provided in Section 2.5 of this Plan. If BAWSCA or all Wholesale Customers do not provide the SFPUC with individual allocations, the SFPUC may make a final allocation decision after first meeting and discussing allocations with BAWSCA and the Wholesale Customers.

The methodology adopted by the Wholesale Customers utilizes the rolling average of each individual Wholesale Customer's purchases from the SFPUC during the three immediately

preceding Supply Years. The SFPUC agrees to provide BAWSCA by November 1 of each year a list showing the amount of water purchased by each Wholesale Customer during the immediately preceding Supply Year. The list will be prepared using Customer Service Bureau report MGT440 (or comparable official record in use at the time), adjusted as required for any reporting errors or omissions, and will be transmitted by the SFPUC General Manager or his designee.

**2.3. Limited Applicability of Plan to System Wide Shortages Greater Than Twenty Percent.** The allocations of water between the SFPUC and the Wholesale Customers collectively, provided for in Section 2.1, apply only to shortages of 20 percent or less. The SFPUC and Wholesale Customers recognize the possibility of a drought occurring which could create system-wide shortages greater than 20 percent despite actions taken by the SFPUC aimed at reducing the probability and severity of water shortages in the SFPUC service area. If the SFPUC determines that a system wide water shortage greater than 20 percent exists, the SFPUC and the Wholesale Customers agree to meet within 10 days and discuss whether a change is required to the allocation set forth in Section 2.1 in order to mitigate undue hardships that might otherwise be experienced by individual Wholesale Customers or Retail Customers. Following these discussions, the Tier 1 water allocations set forth in Section 2.1 of this Plan, or a modified version thereof, may be adopted by mutual written consent of the SFPUC and the Wholesale Customers. If the SFPUC and Wholesale Customers meet and cannot agree on an appropriate Tier 1 allocation within 30 days of the SFPUC's determination of water shortage greater than 20 percent, then (1) the provisions of Section 3.11(C) of the Agreement will apply, unless (2) all of the Wholesale Customers direct in writing that a Tier 2 allocation methodology agreed to by them be used to apportion the water to be made available to the Wholesale Customers collectively, in lieu of the provisions of Section 3.11(C).

The provisions of this Plan relating to transfers (in Section 2.5), banking (in Section 3), and excess use charges (in Section 4) shall continue to apply during system-wide shortages greater than 20 percent.

**2.4. Monthly Water Budgets.** Within 10 days after adopting a declaration of water shortage emergency, the SFPUC will determine the amount of Tier 1 water allocated to the Wholesale Customers collectively pursuant to Section 2.1. The SFPUC General Manager, using the Tier 2 allocation percentages shown on the list delivered by BAWSCA pursuant to Section 2.2, will calculate each Wholesale Customer's individual annual allocation. The SFPUC General Manager, or his designee, will then provide each Wholesale Customer with a proposed schedule of monthly water budgets based on the pattern of monthly water purchases during the Supply Year immediately preceding the declaration of shortage (the "Default Schedule"). Each Wholesale Customer may, within two weeks of receiving its Default Schedule, provide the SFPUC with an alternative monthly water budget that reschedules its annual Tier 2 shortage allocation over the course of the succeeding Supply Year. If a Wholesale Customer does not deliver an alternative monthly water budget to the SFPUC within two weeks of its receipt of the Default Schedule, then its monthly budget for the ensuing Supply Year shall be the Default Schedule proposed by the SFPUC.

Monthly Wholesale Customer water budgets will be derived from annual Tier 2 allocations for purposes of accounting for excess use. Monthly Wholesale Customer water budgets shall be adjusted during the year to account for transfers of shortage allocation under Section 2.5 and

transfers of banked water under Section 3.4.

**2.5. Transfers of Shortage Allocations.** Voluntary transfers of shortage allocations between the SFPUC and any Wholesale Customers, and between any Wholesale Customers, will be permitted using the same procedure as that for transfers of banked water set forth in Section 3.4. The SFPUC and BAWSCA shall be notified of each transfer. Transfers of shortage allocations shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC. Transfers of shortage allocations shall be in compliance with Section 3.05 of the Agreement. The transferring parties will meet with the SFPUC, if requested, to discuss any effect the transfer may have on its operations.

## SECTION 3. SHORTAGE WATER BANKING

**3.1. Water Bank Accounts.** The SFPUC shall create a water bank account for itself and each Wholesale Customer during shortages in conjunction with its resale customer billing process. Bank accounts will account for amounts of water that are either saved or used in excess of the shortage allocation for each agency; the accounts are not used for tracking billings and payments. When a shortage period is in effect (as defined in Section 1.4), the following provisions for bank credits, debits, and transfers shall be in force. A statement of bank balance for each Wholesale Customer will be included with the SFPUC's monthly water bills.

**3.2. Bank Account Credits.** Each month, monthly purchases will be compared to the monthly budget for that month. Any unused shortage allocation by an agency will be credited to that agency's water bank account. Credits will accumulate during the entire shortage period, subject to potential restrictions imposed pursuant to Section 3.2.1. Credits remaining at the end of the shortage period will be zeroed out; no financial or other credit shall be granted for banked water.

**3.2.1. Maximum Balances.** The SFPUC may suspend the prospective accumulation of credits in all accounts. Alternatively, the SFPUC may impose a ceiling on further accumulation of credits in water bank balances based on a uniform ratio of the bank balance to the annual water allocation. In making a decision to suspend the prospective accumulation of water bank credits, the SFPUC shall consider the available water supply as set forth in Section 1.1 of this Plan and other reasonable, relevant factors.

**3.3. Account Debits.** Each month, monthly purchases will be compared to the budget for that month. Purchases in excess of monthly budgets will be debited against an agency's water bank account. Bank debits remaining at the end of the fiscal year will be subject to excess use charges (see Section 4).

**3.4. Transfers of Banked Water.** In addition to the transfers of shortage allocations provided for in Section 2.5, voluntary transfers of banked water will also be permitted between the SFPUC and any Wholesale Customer, and among the Wholesale Customers. The volume of transferred water will be credited to the transferee's water bank account and debited against the transferor's water bank account. The transferring parties must notify the SFPUC and BAWSCA of each transfer in writing (so that adjustments can be made to bank accounts), and will meet with the SFPUC, if requested, to discuss any affect the transfer may have on SFPUC operations. Transfers of banked water shall be deemed to be an emergency transfer and shall become effective on the third business day after notice of the transfer has been delivered to the SFPUC.

If the SFPUC incurs extraordinary costs in implementing transfers, it will give written notice to the transferring parties within ten (10) business days after receipt of notice of the transfer. Extraordinary costs means additional costs directly attributable to accommodating transfers and which are not incurred in non-drought years nor simply as a result of the shortage condition itself. Extraordinary costs shall be calculated in accordance with the procedures in the Agreement and shall be subject to the disclosure and auditing requirements in the Agreement. In the case of transfers between Wholesale Customers, such extraordinary costs shall be considered to be expenses chargeable solely to individual Wholesale Customers and shall be borne equally by the parties to the transfer. In the case of transfers between the SFPUC and a Wholesale Customer, the SFPUC's share of any extraordinary transfer costs shall not be added to the Wholesale Revenue Requirement.

**3.4.1. Transfer Limitations.** The agency transferring banked water will be allowed to transfer no more than the accumulated balance in its bank. Transfers of estimated prospective banked credits and the "overdrafting" of accounts shall not be permitted. The price of transfer water originally derived from the SFPUC system is to be determined by the transferring parties and is not specified herein. Transfers of banked water shall be in compliance with Section 3.05 of the Agreement.

## SECTION 4. WHOLESALE EXCESS USE CHARGES

**4.1. Amount of Excess Use Charges.** Monthly excess use charges shall be determined by the SFPUC at the time of the declared water shortage consistent with the calendar in Section 6 and in accordance with Section 6.03 of the Agreement. The excess use charges will be in the form of multipliers applied to the rate in effect at the time the excess use occurs. The same excess use charge multipliers shall apply to the Wholesale Customers and all Retail Customers. The excess use charge multipliers apply only to the charges for water delivered at the rate in effect at the time the excess use occurred.

**4.2 Monitoring Suburban Water Use.** During periods of voluntary rationing, water usage greater than a customer's allocation (as determined in Section 2) will be indicated on each SFPUC monthly water bill. During periods of mandatory rationing, monthly and cumulative water usage greater than a Wholesale Customer's shortage allocation and the associated excess use charges will be indicated on each SFPUC monthly water bill.

**4.3. Suburban Excess Use Charge Payments.** An annual reconciliation will be made of monthly excess use charges according to the calendar in Section 6. Annual excess use charges will be calculated by comparing total annual purchases for each Wholesale Customer with its annual shortage allocation (as adjusted for transfers of shortage allocations and banked water, if any). Excess use charge payments by those Wholesale Customers with net excess use will be paid according to the calendar in Section 6. The SFPUC may dedicate excess use charges paid by Wholesale Customers toward the purchase of water from the State Drought Water Bank or other willing sellers in order to provide additional water to the Wholesale Customers. Excess use charges paid by the Wholesale Customers constitute Wholesale Customer revenue and shall be included within the SFPUC's annual Wholesale Revenue Requirement calculation.

## SECTION 5. GENERAL PROVISIONS GOVERNING WATER SHORTAGE ALLOCATION PLAN

**5.1. Construction of Terms.** This Plan is for the sole benefit of the parties and shall not be construed as granting rights to any person other than the parties or imposing obligations on a party to any person other than another party.

**5.2. Governing Law.** This Plan is made under and shall be governed by the laws of the State of California.

**5.3. Effect on Agreement.** This Plan describes the method for allocating water between the SFPUC and the collective Wholesale Customers during system-wide water shortages of 20 percent or less. This Plan also provides for the SFPUC to allocate water among the Wholesale Customers in accordance with directions provided by the Wholesale Customers through BAWSCA under Section 2.2, and to implement a program by which such allocations may be voluntarily transferred among the Wholesale Customers. The provisions of this Plan are intended to implement Section 3.11(C) of the Agreement and do not affect, change or modify any other section, term or condition of the Agreement.

**5.4. Inapplicability of Plan to Allocation of SFPUC System Water During Non-Shortage Periods.** The SFPUC's agreement in this Plan to a respective share of SFPUC system water during years of shortage shall not be construed to provide a basis for the allocation of water between the SFPUC and the Wholesale Customers when no water shortage emergency exists.

**5.5. Termination.** This Plan shall expire at the end of the Term of the Agreement.. The SFPUC and the Wholesale Customers can mutually agree to revise or terminate this Plan prior to that date due to changes in the water delivery capability of the SFPUC system, the acquisition of new water supplies, and other factors affecting the availability of water from the SFPUC system during times of shortage.

## SECTION 6. ALLOCATION CALENDAR

**6.1. Annual Schedule.** The annual schedule for the shortage allocation process is shown below. This schedule may be changed by the SFPUC to facilitate implementation.

6.1.1

| In All Years | Target Dates |
|---|---|
| 1. SFPUC delivers list of annual purchases by each Wholesale Customer during the immediately preceding Supply Year | November 1 |
| 2. SFPUC meets with the Wholesale Customers and presents water supply forecast for the following Supply Year | February |
| 3. SFPUC issues initial estimate of available water supply | February 1 |
| 4. SFPUC announces potential first year of drought (if applicable) | February 1 |
| 5. SFPUC and Wholesale Customers meet upon request to exchange information concerning water availability and projected system-wide purchases | February 1-May 31 |
| 6. SFPUC issues revised estimate of available water supply, and confirms continued potential shortage conditions, if applicable | March 1 |
| 7. SFPUC issues final estimate of available water supply | April 15th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year. |
| 8. SFPUC determines amount of water available to Wholesale Customers collectively | April 15th or sooner if adequate snow course measurement data is available to form a robust estimate on available water supply for the coming year. |

| In Drought Years | Target Dates |
|---|---|
| 9. SFPUC formally declares the existence of water shortage emergency (or end of water shortage emergency, if applicable) under Water Code Sections 350 et. seq. | April 15-31 |
| 10. SFPUC declares the need for a voluntary or mandatory response | April 15-31 |
| 11. BAWSCA submits calculation to SFPUC of individual Wholesale Customers' percentage shares of water allocated to Wholesale Customers collectively | April 15- 31 |
| 12. SFPUC determines individual shortage allocations, based on BAWSCA's submittal of individual agency percentage shares to SFPUC, and monthly water budgets (Default Schedule) | April 25—May 10 |
| 13. Wholesale Customers submit alternative monthly water budgets (optional) | May 8-May 24 |
| 14. Final drought shortage allocations are issued for the Supply Year beginning July 1 through June 30 | June 1 |
| 15. Monthly water budgets become effective | July 1 |
| 16. Excess use charges indicated on monthly Suburban bills | August 1 (of the beginning year) through June 30 (of the succeeding year) |
| 17. Excess use charges paid by Wholesale Customers for prior year | August of the succeeding year |

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**EXHIBIT A**

**TIER 2 DROUGHT IMPLEMENTATION PLAN**
**AMONG WHOLESALE CUSTOMERS**

This Tier 2 Drought Implementation (Plan) describes the method for allocating the water made available by the San Francisco Public Utilities Commission (SFPUC) among the Wholesale Customers during shortages caused by drought. This Plan is adopted pursuant to Section 3.11.C of the July 2009 Water Supply Agreement between the City and County of San Francisco and the Wholesale Customers (Agreement).

## SECTION 1. APPLICABILITY AND INTEGRATION

**Section 1.1** **Applicability**. This Plan applies when, and only when, the SFPUC determines that a system-wide water shortage of 20 percent or less exists, as set forth in a declaration of water shortage emergency adopted by the SFPUC pursuant to California Water Code Sections 350 *et seq.* This Plan applies only to water acquired and distributed by the SFPUC to the Wholesale Customers and has no effect on water obtained by a Wholesale Customer from any source other than the SFPUC.

**Section 1.2** **Integration with Tier 1 Water Shortage Allocation Plan**. The Agreement contains, in Attachment H, a Water Shortage Allocation Plan which, among other things, (a) provides for the allocation by the SFPUC of water between Direct City Water Users (e.g., retail water customers within the City and County of San Francisco) and the Wholesale Customers collectively during system-wide water shortages of 20 percent or less, (b) contemplates the adoption by the Wholesale Customers of this Plan for allocation of the water made available to Wholesale Customers collectively among the 26 individual Wholesale Customers, (c) commits the SFPUC to implement this Plan, and (d) provides for the transfer of both banked water and shortage allocations between and among the Wholesale Customers and commits the SFPUC to implement such transfers. That plan is referred to as the Tier 1 Plan.

The Tier 1 Plan also provides the methodology for determining the Overall Average Wholesale Customer Reduction, expressed as a percentage cutback from prior year's normal SFPUC purchases, and Overall Wholesale Customer Allocation, in million gallons per day, both of which are used in determining the Final Allocation Factor for each Wholesale Customer. The Overall Average Wholesale Customer Reduction is determined by dividing the volume of water available to the Wholesale Customers (the Overall Wholesale Customer Allocation), shown as a share of available water in Section 2 of the Tier 1 Plan, by the prior year's normal total Wholesale Customers SFPUC purchases and subtracting that value from one.

This Plan is referred to in the Agreement as the Tier 2 Plan. It is intended to be integrated with the Tier 1 Plan described in the preceding paragraph. Terms used in this Plan are intended to have the same meaning as such terms have in the Tier 1 Plan.

## SECTION 2. ALLOCATION OF WATER AMONG WHOLESALE CUSTOMERS

**Section 2.1 Annual Allocations Among the Wholesale Customers**. The annual water supply allocated by the SFPUC to the Wholesale Customers collectively during system-wide shortages of 20 percent or less shall be apportioned among them based on the methodology described in this Section.

**Section 2.2 Methodology for Allocating Water Among Wholesale Customers**. The water made available to the Wholesale Customers collectively will be allocated among them in proportion to each Wholesale Customer's Allocation Factor, adjusted as described in the following subsections below. The Wholesale Customer Allocation Factors will only be calculated at the onset of a drought and will remain the same until such time as the SFPUC declares the shortage condition over. The Wholesale Customer Allocation Factors will be recalculated during subsequent shortage periods for use during those specific periods.

**Section 2.2.1 Step One: Determination of Base/Seasonal Purchase Cutback For Each Wholesale Customer**. The first step requires calculating the Wholesale Customer's Base/Seasonal Purchase Cutback. This calculation has seven parts. An example of Steps 1b-1f is presented in Table 2. Step 1g is shown in columns 3-6 in Table 3. For steps 1b-1g, the calculation uses average monthly production values for the three years preceding the drought for all potable supply sources, expressed as a monthly value in hundred cubic feet:

- Step 1a: Each agency's total annual purchases from the SFPUC will be compared to its Individual Supply Guarantee (ISG), with any annual purchases above its ISG subtracted from that agency's total annual SFPUC purchases by subtracting the amount on a monthly basis in proportion to the agency's monthly SFPUC purchase pattern,

- Step 1b: Calculate Average Monthly and Total Production for the three fiscal years immediately preceding the drought, excluding years during which shortage allocations were in effect, based on monthly production data from the SFPUC and Wholesale Customers,

- Step 1c: Calculate Base Component which is equal to the Average Monthly Production during the base months of December, January, February and March, multiplied by 12,

- Step 1d: Calculate Seasonal Component as the difference between Total Production and Base Component,

- Step 1e: Calculate an agency's Base/Seasonal Allocation , expressed in hundred cubic feet, by multiplying the Base Component by one minus the Base Reduction Percentage, or 90%, and the Seasonal Component by the percentage needed (Seasonal Reduction Percentage) to achieve the required Overall Average Wholesale Customer Reduction, which is expressed as a percentage,

- Step 1f: Calculate the Base/Seasonal Allocation Cutback Percentage for each agency by dividing its Base/Seasonal Allocation by the agency's Total Production, and

- Step 1g: Calculate the Base/Seasonal Purchase Cutback Percentage by multiplying the Base/Seasonal Allocation Cutback percentage times the lesser of: (a) the immediately preceding SFPUC purchases or (b) ISG, adjusting the Seasonal percentage above until the total reduction equals the Overall Average Wholesale Customer Reduction.

Additionally, adjustments to the Base Component for Stanford University will be made to remove that two week time period that the University is completely closed during the winter break per policy set by the University President as long as that policy remains in place. This adjustment will be removed at such time as the seasonal closure policy is terminated by Stanford University.

**Section 2.2.2 Step Two: First Adjustment for San Jose and Santa Clara.** The resulting Base/Seasonal Purchase Cutback Percentage in Section 2.2.1 for San Jose and Santa Clara will be compared to the highest Base/Seasonal Purchase Cutback percentage of the other Wholesale Customers. If both San Jose's and Santa Clara's percentage reductions are larger than the highest percentage reduction among any other Wholesale Customers, the Base/Seasonal Purchase Cutback percentage established under Section 2.2.1 will remain unchanged. If either San Jose's percentage cutback or Santa Clara's percentage cutback, or both, is smaller than the highest Base/Seasonal Purchase Cutback percentage of other Wholesale Customers, the Base/Seasonal Allocation (in mgd) of San Jose or Santa Clara, or both, will be reduced so that the percentage cutback of each is no smaller than that of the Wholesale Customers' otherwise highest percentage cutback. The amount of shortage allocation (in mgd) removed from San Jose and/or Santa Clara will be reallocated among the remaining Wholesale Customers in proportion to the Base/Seasonal Allocation of each.

**Section 2.2.3 Step Three: Determination of Weighted Purchase Cutback For Each Wholesale Customer.** Each agency's weighted allocation is calculated by multiplying its Adjusted Base/Seasonal Allocation in Section 2.2.2 by 66.66% and its Fixed Component by 33.33%. The Fixed Component is (i) the Wholesale Customer's ISG provided for in the Agreement, or (ii) in the case of Hayward, 25.11 mgd, or (iii) in the case of San Jose and Santa Clara, consistent with the limit on purchases from SFPUC set forth in Section 4.05 of the Agreement, e. g., 4.5 mgd each. The amount of the Fixed Component for each Wholesale Customer is shown on Table 1.

**Section 2.2.4 Step Four: Second Adjustment for San Jose and Santa Clara.** The resulting Weighted Allocations for San Jose and Santa Clara will be compared to the highest Weighted Purchase Cutback, shown as a percentage, of the other Wholesale Customers. If both San Jose's and Santa Clara's percentage cutback is larger than the highest percentage cutback among other Wholesale Customers, the Weighted Purchase Cutbacks established under Section 2.2.3 will remain unchanged. If either San Jose's

percentage cutback or Santa Clara's percentage cutback, or both, is smaller than the highest percentage cutback of any other Wholesale Customers, the Weighted Shortage Allocation (in mgd) of San Jose or Santa Clara, or both, will be reduced so that the percentage reduction of each is no smaller than that of the Wholesale Customers' otherwise highest Weighted Percentage Cutback. The amount of allocation (in mgd) removed from San Jose and/or Santa Clara will be reallocated among the remaining Wholesale Customers in proportion to the Weighted Shortage Allocation of each.

**Section 2.2.5 Step Five: Adjustment for Minimum and Maximum Cutbacks**. Using the Adjusted Weighted Purchase Cutbacks, either a 10% minimum cutback or maximum cutback, as defined below, is applied to any agency whose Adjusted Weighted Purchase Cutback falls outside this range:

- A minimum 10% cutback is applied to the individual agency Adjusted Weighted Allocation, with the reapportioned water being placed in the hardship bank for allocation to East Palo Alto.

- A maximum cutback of the average cutback plus 20% (e.g. 15% average cutback results in a maximum cutback of 15% + 20% = 35%) is applied to the individual agency Adjusted Weighted Allocation, with the water necessary to meet that level being subtracted in proportion to each Wholesale Customer's Adjusted Weighted Allocation from all remaining agencies, except those at agencies subject to the minimum cutback above.

The result is the Adjusted Minimum/Maximum Purchase Cutback, expressed as a percentage.

**Section 2.2.6 Step Six: Adjustment to Provide Sufficient Supply for East Palo Alto**. In order to provide for sufficient water supply for water customers served by the City of East Palo Alto (EPA), the maximum Final Purchase Cutback applied at any given time to EPA will be equal to 50% of the Overall Average Wholesale Customer Reduction. The water needed to accommodate the guaranteed maximum cutback to EPA will be provided in two ways:

- First, water from the hardship bank provided by the 10% minimum cutback will be first added to the EPA Adjusted Weighted Purchase Allocation, and

- Second, the balance of water needed for EPA will be deducted on a prorated basis from those agencies with a pre-drought residential per capita water use greater than 55 gallons per capita per day (as documented in the most recent BAWSCA Annual Survey) in proportion to each agency's Min./Max. Adjusted Allocation and who are not subject to the minimum and maximum reductions already applied per Section 2.2.5

The result is the Allocation with EPA Adjustment, expressed as an mgd.

**Section 2.2.7 Step Seven: Determination of Final Allocation Factor.** Each Wholesale Customer's Final Allocation Factor is the fraction expressed as a percentage, the numerator of which is the particular Wholesale Customer's "Final Allocation with EPA Adjustment" (in mgd) as calculated in Steps One through Six and the denominator of which is the Overall Wholesale Customer Allocation (in mgd), a number provided by the SFPUC during the drought period as determined by the SFPUC in the Tier 1 Plan.

**Section 2.2.8 Example Calculation**. Table 2 presents a sample of the calculations involved in Steps 1b-1f. Table 3 presents a sample of the calculations involved in Step 1g and Steps Two through Seven, using the values from Tables 1 and 2 and recent water use data for the other values. Tables 2 and 3 are presented for illustrative purposes only and do not supersede the foregoing provisions of this Section 2.2. In the event of any inconsistency between this Section 2.2 and Tables 2 and 3, the text of this section will govern.

**Section 2.3 Calculation of Individual Wholesale Customer Allocation Factors; Directions to SFPUC**. The Tier 1 Plan contemplates that in any year in which the methodology described above must be applied, the Bay Area Water Supply and Conversation Agency (BAWSCA) will calculate each Wholesale Customer's individual percentage share of the amount of water made available to the Wholesale Customers collectively, following the methodology described above and defined above as Wholesale Customer Allocation Factors. The Tier 1 Plan requires SFPUC to allocate water to each Wholesale Customer in accordance with calculations delivered to it by BAWSCA.

Each Wholesale Customer authorizes BAWSCA to perform the calculations required, using water sales data furnished to it by the SFPUC, and to deliver to SFPUC a list of individual Wholesale Customer Allocation Factors so calculated as contemplated by the Tier 1 Plan. Neither BAWSCA nor any officer or employee of BAWSCA shall be liable to any Wholesale Customer for any such calculations made in good faith, even if incorrect.

## SECTION 3. GENERAL PROVISIONS

**Section 3.1 No Third-Party Beneficiaries**. This Plan is for the sole benefit of the Wholesale Customers and shall not be construed as granting rights to any person other than another Wholesale Customer.

**Section 3.2 Governing Law**. This Plan is made under and shall be governed by the laws of the State of California.

**Section 3.3 Effect on Water Supply Agreement.** This Plan describes the method for allocating water from the SFPUC among the Wholesale Customers during system-wide water shortages of 20 percent or less declared by the SFPUC. The provisions of this Plan, and the Tier 1 Plan contained in Attachment H to the Agreement with which it is integrated, are intended to implement Section 3.11 of the Agreement. The Plans do not

affect, change or modify any other section, term or condition of the Agreement or of the individual Water Sales Contracts between each Wholesale Customer and San Francisco.

**Section 3.4** **Amendment**. This Plan may be amended only by the written agreement of all Wholesale Customers.

**Section 3.5** **Termination**. This Plan shall expire on December 31, 2018. It may be terminated prior to that date only by the written agreement of all Wholesale Customers.

# APPENDIX H

## SAMPLE WATER SHORTAGE ORDINANCES AND RESOLUTIONS

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ORDINANCE NO. _____ C.S.

AN ORDINANCE ENACTED AS AN EMERGENCY MEASURE ESTABLISHING RULES AND REGULATIONS FOR RATIONING WATER DURING A WATER SHORTAGE EMERGENCY AND ESTABLISHING PENALTIES FOR VIOLATIONS THEREOF

THE CITY COUNCIL OF THE CITY OF HAYWARD DOES ORDAIN AS FOLLOWS:

Section 1. FINDINGS AND DETERMINATIONS.

(a) A water shortage emergency condition prevails within the area served by the Hayward Water System.

(b) The San Francisco Water Department, at the direction of the San Francisco Public Utilities Commission, has requested that all resale customers, including the Hayward Water System, immediately institute a water conservation program designed to effect a [TBD] percent reduction in water usage.

(c) The rules, regulations and restrictions set forth in this ordinance are intended to conserve the water supply of the Hayward Water System for the greatest public benefit with particular regard to domestic use, sanitation and fire protection.

(d) The specific uses prohibited or restricted by this ordinance are nonessential, if allowed, would constitute wastage of Hayward Water System water, and should be prohibited pursuant to the City of Hayward's general authority under its charter as well as the authority granted by State Water Code Section 350 et seq. and the common law.

(e) The actions taken hereinafter are exempt from the provisions of Sections 21000 et seq. of the Public Resources Code as a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Title 14, California Code of Regulations Section 15269 (State CEQA Guidelines).

(f) The following measures are therefore found to be necessary as an emergency measure for preserving the public peace, health or safety.

SECTION 2. DEFINITIONS.

(a) The "Hayward Water System" is the Hayward Municipal Water System operated under Divisions of the City of Hayward Public Works Department.

(b) "Director" is Director of Public Works of the City of Hayward.

(c) "Person" means any person, firm, partnership association, corporation, company, organization or governmental entity.

(d) "Customer" means any person, whether within or without the geographic boundaries of the City of Hayward, who uses water supplied by the Hayward Water System.

(e) "Process Water" means water used to manufacture, alter, convert, clean, heat or cool a product, including water used in laundries and recycled car wash facilities.

(f) "Unit of Water" is 100 cubic feet of water.

(g) "Water" is water from the Hayward Water System.

Section 3. PROHIBITION OF NONESSENTIAL WATER USE. It shall be unlawful for any person to use water obtained from the Hayward Water System for nonessential uses as hereinafter defined.

Section 4. NONESSENTIAL USES DEFINED. The following uses of water are hereby determined to be nonessential, except as further provided herein:

(a) Use of water in excess of those certain allotments set forth in Schedule A entitled "Allotment System For Water Use During Water Shortage Emergency" attached hereto and hereby made a part hereof.

Allotments as established herein shall be based on [Year TBD] use with adjustments for unusual conditions. New services or services without [Year TBD] history shall be allotted on comparable customer usage.

The City Council is hereby authorized from time to time to establish by resolution allotments different from the allotments set forth in said Schedule A due to changes in circumstances.

(b) Use of water through any meter when the customer has been given 10 days written notice to repair broken or defective plumbing, sprinkler, watering or irrigation systems and has failed to effect such repairs.

(c) Use of water which results in flooding or runoff in gutters or streets.

(d) Use of water through a hand-held hose for washing cars, buses, boats, trailers or other vehicles, unless the hose is equipped with a positive shut-off nozzle.

(e) Use of water through a hand-held hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas.

(f) Use of water for filling any existing or new swimming pool or hot tub.

(g) Use of water to clean, fill or maintain levels in decorative fountains.

(h) Use of water for construction purposes such as consolidation of backfill unless no other source of water or other method can be used.

(i) Service of water by restaurants except upon the request of a customer.

Section 5. EXCEPTIONS. Written application for an exception or adjustment may be made to:

Hayward Water System
777 B Street
Hayward, California 94541-5007

The Director may (a) grant permits for the uses of water otherwise prohibited or (b) adjust the established allotments if it is found that:

(1) To fail to do so would cause an emergency condition adversely affecting the health, sanitation, fire protection, or safety of the customer or the public, or adverse impacts such as loss of production or jobs; or

(2) The customer has demonstrated to the Director's satisfaction that circumstances have changed warranting a change in the customer's allotment.

No permit shall be granted or allotment adjusted unless the customer has adopted all practicable water conservation measures and has demonstrated to the Director's satisfaction that there are no alternatives to the use of water from the Hayward Water System and that Hayward's water will be used efficiently and without waste.

The Director's denial of application for an exception or adjustments is final.

Section 6. EXCESS WATER USE CHARGE.

(a) In addition to regular metered service charges under Section 11-2.38 of the Hayward Municipal Code, every consumer shall pay for each billing period an excess use charge for water delivered in excess of established allotments. This

excess use charge shall be based upon a rate schedule as specified from time to time by resolution of the City Council.

(b) The excess use charge shall not apply to any residential customer whose consumption is 1000 cubic feet or less per bi-monthly billing period.

Section 7. ENFORCEMENT.

(a) Installation of Flow-Restricting Devices: In lieu of or in addition to the penalties provided for in Section 356 of the Water Code, the Hayward Water System may, after one written warning, install a flow-restricting device on the service line of any customer violating any of the provisions of this ordinance, including use of water in excess of the established allotments.

(b) Charges for Installation and Removal of Flow-Restricting Devices: Charges for installation and removal of flow-restricting devices shall be based upon a rate schedule as specified from time to time by resolution of the City Council.

(c) Discontinuance of Water Service: Continued water consumption in violation of the provisions of this ordinance may result in the discontinuance of water service by the Hayward Water System.

A charge shall be paid prior to reactivating a service which has been discontinued as provided herein. The charge shall be specified from time to time by resolution of the City Council.

Section 8. EFFECTIVE DATE. The findings and determinations set forth in Section 1. hereof constitute the statement of reasons for adopting this ordinance as an emergency measure in the manner provided by Section 617 of the Charger. This ordinance shall be effective immediately.

Section 9. OPERATIVE DATE. The requirements of this ordinance shall be operative as of [Date TBD].

INTRODUCED at a regular meeting of the City Council of the City of Hayward, held the [Date TBD], by Councilmember _____.

ORDINANCE NO. _____

AN ORDINANCE ENACTED TO ESTABLISH RULES AND REGULATIONS FOR INCREASED WATER RATIONING DURING A WATER SHORTAGE EMERGENCY AND ESTABLISHING PENALTIES FOR VIOLATIONS THEREOF

THE CITY COUNCIL OF THE CITY OF HAYWARD DOES ORDAIN AS FOLLOWS:

Section 1. Findings and Determinations.

(a) A water shortage emergency condition prevails within the area served by the Hayward Water System.

(b) On [Date TBD), the San Francisco Water Department, at the direction of the San Francisco Public Utilities Commission, requested that all resale customers, including the Hayward Water System, immediately institute a water conservation program designed to effect a [TBD] percent reduction in water usage.

(c) Such action was taken by the City of Hayward's adoption of Ordinance No. [TBD] C.S.

(d) On [Date TBD], the San Francisco Water Department, at the direction of the San Francisco Public Utilities Commission, recommended that all resale customers, including the Hayward Water System adopt additional water use restrictions to enhance their water conservation programs.

(e) The rules, regulations and restrictions set forth in this ordinance are intended to conserve the water supply of the Hayward Water System for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.

(f) The specific uses prohibited or restricted by this ordinance are nonessential, if allowed, would constitute wastage of Hayward Water System water, and should be prohibited pursuant to the City of Hayward's general authority under its Charter as well as the authority granted by State Water Code sections 350 et seq. and the common law.

(g) The actions taken hereinafter are exempt from the provisions of sections 21000 et seq. of the Public Resources Code as a project undertaken as immediate action necessary to prevent or mitigate an emergency pursuant to Title 14, California Administrative Code section 15071 (State of California Environmental Impact Report Guidelines).

(h) The following measures are therefore found to be necessary as an emergency measure for preserving the public peace, health, and safety.

Section 1.5 Amended Program. This ordinance supersedes Ordinance No. [TBD] C.S.

Section 2. Definitions.

(a) The "Hayward Water System" as operated under divisions of the City of Hayward Public Works Department.

(b) "Director" is Director of Public Works of the City of Hayward.

(c) "Person" means any person, firm, partnership, association, corporation, company, organization, or governmental entity.

(d) "Customer" means any person, whether within or without the geographic boundaries of the City of Hayward, who uses water supplied by the Hayward Water System.

(e) "Process Water" means water used to manufacture, alter, convert, clean, heat, or cool a product, including water used in laundries and recycled car wash facilities.

(f) "Unit of water" is 100 cubic feet of water.

(g) "Water" is water from the Hayward Water System.

Section 3. Prohibition of Nonessential Water Use. It shall be unlawful for any person to use water obtained from the Hayward Water System for nonessential uses as hereinafter defined.

Section 4. Nonessential Uses Defined. The following uses of water are hereby determined to be nonessential, except as further provided herein:

(a) Use of water in excess of those certain allotments set forth in Schedule A entitled "Allotment System For Water Use During Water Shortage Emergency" attached hereto and hereby made a part hereof.

Allotments as established herein shall be based on [Year TBD] use with adjustments for unusual conditions. New services or services without [Year TBD] history shall be allotted on comparable customer usage.

The City Council is hereby authorized from time to time to establish by resolution allotments different from the allotments set forth in said Schedule A due to changes in circumstances.

(b) Use of water through any meter when the person billed for the water service has been given 10 days written notice to repair broken or defective plumbing, sprinkler, watering, or irrigation systems and has failed to affect such repairs.

(a) Use of water which results in flooding or runoff in gutter or streets.

(d) Use of water through a hand-held hose for washing buildings, structures, mobile homes, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas.

(e) Use of water for filling or refilling after draining of any existing or new swimming pool, spa, or hot tub; topping off will be allowed to the extent the designated allocation is not exceeded. Because it is necessary to fill a swimming pool as part of its construction process, building permits for new pools will not be issued during the current water shortage emergency.

(f) Use of water to clean, fill, or maintain levels in decorative fountains.

(g) Use of water for construction purposes such as consolidation of backfill unless no other source of water or other method can be used.

(h) Service of water by restaurants except upon the request of a customer.

(i) The washing of all vehicles, including but not limited to automobiles, motorcycles, RV's, trucks, transit vehicles, trailers, boats, trains, and airplanes, is prohibited outside of a commercial washing facility. Use of water through a hand-held hose in connection with the exceptions to this use restriction is prohibited unless the hose is equipped with a positive shut-off nozzle.

(j) Verified water waste as determined by the Director will serve as prima facie evidence that the allocation assigned to the water account is excessive; therefore the allocation will be subject to review and possible reduction, including termination of service.

(k) The use of recycled water and for all commercial car washes is strongly recommended.

(l) The use of groundwater and/or reclaimed water for the irrigation of golf courses and similar turf areas is encouraged when approved by the Department of Public Health.

(m) The enforcement of any contractual provision that requires the installation of landscaping requiring irrigation.

Nothing in this Section 4 restricts the use of groundwater and/or reclaimed water when otherwise lawful.

Section 5. Exceptions.

(a) Written application for an exception or adjustment may be made to:

Hayward Water System
777 B Street
Hayward, California 94541-5007

(b) After written application, the Director may grant permits for the uses of water otherwise prohibited or adjust the established allotments if the Director finds that:

(1) The person billed for the water service has demonstrated that to do otherwise would cause an emergency condition adversely affecting the health, sanitation, fire protection, or safety of the person served or the public, or would result in loss of production or jobs; or

(2) The person billed for the water service has demonstrated to the Director's satisfaction that circumstances have changed, warranting a change in the allotment.

No permit shall be granted or allotment adjusted unless the person billed for the service has adopted all practicable water conservation measures and has demonstrated to the Director's satisfaction that there are no alternatives to the use of water from the Hayward Water System and that Hayward's water will be used efficiently and without waste.

(c) Upon the filing of a written request for an exception, the owner of a multiple residential development or a single-family household shall include a certification that the following water conservation efforts, at a minimum, have been implemented in every toilet and shower in the multiple residential development or single-family household:

(1) All toilet tanks have been tested for leaks with leak detection dye dye tablets;

(2) A two-quart plastic bag filled with water has been installed in all toilet tanks; and

(3) An approved flow restrictor has been installed in every shower head.

In multiple residential unit developments served by a master meter where the owner does not own the units within the development, the owner shall provide certification under penalty of perjury that a kit containing the equipment for the above described water conservation efforts was delivered to every unit and each unit owner or occupant was urged to install the kits.

(d) The Director's denial of an application for an exception or adjustments is final.

(e) The following service charges or other charges approved from time to time by City Council resolution shall be applied to allotment changes:

(1) Temporary residents – a fee of [Fee TBD] for changing existing allotments;

(2) Adjustments to prior billings – a minimum fee of [Fee TBD] to adjust prior billings.

Section 6. Excess Water Use Charge.

(a) In addition to regular metered service charges under Section 11-2.38 of the Hayward Municipal Code, every person billed for water service shall pay for each billing period an excess use charge for water delivered in excess of established allotments. This excess use charge shall be based upon a rate schedule as specified from time to time by resolution of the City Council.

(b) The excess use charge shall not apply to any residential customer whose consumption is 1000 cubic feet or less per bi-monthly billing period.

(c) In addition to the exception set forth in subsection (b) and notwithstanding any other provision of law, the Director of Public Works is authorized to adopt rules and regulations providing for waiver of excess use or other charges where their imposition would give rise to a civil right of action against the City by the person billed or would constitute a manifest and gross miscarriage of fairness and equity.

Section 7. Banking of Water Allocation. An unused portion of a customer's water allocation during a given billing period may be used in the next billing period to offset excess water usage in that period as provided in rules and regulations promulgated by the Director of Public Works in compliance with direction from the City Council.

Section 8. Enforcement and Penalties.

(a) Installation of Flow-Restricting Devices: In lieu of or in addition to the penalties provided for in Section 356 of the Water Code, the Hayward Water System may, after one written warning, install a flow-restricting device on the service line of any customer violating any of the provisions of this ordinance, including use of water in excess of the established allotments.

(b) Charges for Installation and Removal of Flow-Restricting Devices: Charges for installation and removal of flow-restricting devices shall be based upon a rate schedule as specified from time to time by resolution of the City Council.

(c) Reduction or Discontinuance of Water Service: Verified water waste consisting of continued water consumption in violation of the provisions of this ordinance will serve as prima facie evidence that the allotment to the water account is excessive and may result in the reduction or discontinuance of water service by the Hayward Water System.

A charge shall be paid prior to reactivating a service which has been discontinued as provided herein. The charge shall be specified from time to time by resolution of the City Council.

(d) Any person or customer violating or failing to comply with the provisions of this ordinance or any code or regulation adopted by reference shall constitute an infraction. Upon conviction of an infraction, a violator shall be subject to payment of a fine, not to exceed the limits set forth in California Government Code section 36900. After a third conviction for a violation of the same provision, subsequent violations within a twelve-month period may be charges as a misdemeanor. Upon conviction of a misdemeanor, a violator shall be subject to payment of a fine or imprisonment, or both, not to exceed the limits set forth in California Government Code section 36901.

(e) Each violator shall be guilty of a separate offense for each and every day during any portion of which any violation of any provision of this ordinance or of any code or regulation adopted by reference is committed, continued, or permitted by such person, and such person shall be punished accordingly.

(f) Whenever this ordinance or any code or regulation adopted by reference makes any act or omission unlawful, it shall include causing, permitted, aiding, abetting, suffering, or concealing the fact of such act or omission.

(g) Any violation of this ordinance or of any code or regulation adopted by reference shall constitute a public nuisance. In addition to any other remedies provided in this ordinance, the City may summarily abate such nuisance and may bring a civil suit to enjoin or abate the violation.

(h) The remedies provided for herein shall be cumulative and not exclusive.

(i) In addition to the punishment provided by law, a violator convicted of a misdemeanor or an infraction shall be liable for such costs, expenses, or disbursements paid or incurred by the City or any of its contractors in connection with the abatement or prosecution of the violation.

Section 9. Severability. If any provision of this ordinance is held by any court or by any federal, state, or local agency of competent jurisdiction to be invalid, then said provision shall be considered a separate, distinct, and independent part of this ordinance, and such holding shall not affect the validity and enforceability of all other provisions hereof.

Section 10. Operative Date. The requirements of this ordinance shall be operative as of _____, 2005.

INTRODUCED at a regular meeting of the City Council of the City of Hayward, held the [Date TBD], by Councilmember _____.

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ORDINANCE NO. _____

AN ORDINANCE ENACTED AS AN EMERGENCY MEASURE TO ESTABLISH RULES AND REGULATIONS FOR INCREASED WATER RATIONING DURING A WATER SHORTAGE EMERGENCY AND ESTABLISHING PENALTIES FOR VIOLATIONS THEREOF

THE CITY COUNCIL OF THE CITY OF HAYWARD DOES ORDAIN AS FOLLOWS:

Section 1. Findings and Determinations.

(a) A water shortage emergency condition prevails within the area served by the Hayward Water System.

(b) On [Date TBD], the San Francisco Water Department, at the direction of the San Francisco Public Utilities Commission, requested that all resale customers, including the Hayward Water System, immediately institute a water conservation program designed to effect a [TBD] percent reduction in water usage.

(c) Such action was taken by the City of Hayward's adoption of Ordinance No. [TBD] C.S.

(d) The severity of the water shortage has prompted the Governor of the State of California to call upon all communities to adopt water rationing plans to effect a 50 percent reduction in water usage.

(e) On [Date TBD], the San Francisco Water Department, at the direction of the San Francisco Public Utilities Commission, requested that all resale customers, including the Hayward Water System, immediately increase water conservation programs to effect a 50 percent reduction in water usage.

(f) The rules, regulations and restrictions set forth in this ordinance are intended to conserve the water supply of the Hayward Water System for the greatest public benefit with particular regard to domestic use, sanitation, and fire protection.

(g) The specific uses prohibited or restricted by this ordinance are nonessential, if allowed, would constitute wastage of Hayward Water system water, and should be prohibited pursuant to the City of Hayward's general authority under its Charter as well as the authority granted by State Water Code sections 350 et seq. and the common law.

(h) The actions taken hereinafter are exempt from the provisions of sections 21000 et seq. of the Public Resources Code as a project undertaken as immediate action

necessary to prevent or mitigate an emergency pursuant to Title 14, California Administrative Code section 15071 (State of California Environmental Impact Report Guidelines).

(i) The following measures are therefore found to be necessary as an emergency measure for preserving the public peace, health, and safety.

Section 1.5 Amended Program. This ordinance supersedes Ordinance No. [TBD] C.S.

Section 2. Definitions.

(a) The "Hayward Water System" as operated under divisions of the City of Hayward Public Works Department.

(b) "Director" is Director of Public Works of the City of Hayward.

(c) "Person" means any person, firm, partnership, association, corporation, company, organization, or governmental entity.

(d) "Customer" means any person, whether within or without the geographic boundaries of the City of Hayward, who uses water supplied by the Hayward Water System.

(e) "Process Water" means water used to manufacture, alter, convert, clean, heat, or cool a product, including water used in laundries and recycled car wash facilities.

(f) "Unit of Water" is 100 cubic feet of water.

(g) "Water" is water from the Hayward Water System.

Section 3. Prohibition of Nonessential Water Use. It shall be unlawful for any person to use water obtained from the Hayward Water System for nonessential uses as hereinafter defined.

Section 4. Nonessential Uses Defined. The following uses of water are hereby determined to be nonessential, except as further provided herein:

(a) Use of water in excess of those certain allotments set forth in Schedule A entitled "Allotment System for Water Use During Water Shortage Emergency" attached hereto and hereby made a part hereof.

Allotments as established herein shall be based on [Year TBD] use with adjustments for unusual conditions. New services or services without [Year TBD] history shall be allotted on comparable customer usage.

The City Council is hereby authorized from time to time to establish by resolution allotments different from the allotments set forth in said Schedule A due to changes in circumstances.

(b) Use of water through any meter when the person billed for the water service has been given 10 days written notice to repair broken or defective plumbing, sprinkler, watering, or irrigation systems and has failed to affect such repairs.

(c) Use of water which results in flooding or runoff in gutters or streets.

(d) Use of water through a hand-held hose for washing buildings, structures, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surfaced areas.

(e) Use of water for filling or refilling after draining or any existing or new swimming pool, spa, or hot tub; topping off will be allowed to the extent the designated allocation is not exceeded. Because it is necessary to fill a swimming pool as part of its construction process, building permits for new pools will not be issued during the current water shortage emergency.

(f) Use of water to clean, fill, or maintain levels in decorative fountains.

(g) Use of water for construction purposes such as consolidation of backfill unless no other source of water or other method can be used.

(h) Service of water by restaurants except upon the request of a customer.

(i) The washing of all vehicles, including but not limited to automobiles, motorcycles, RV's, trucks, transit vehicles, trailers, boats, trains, and airplanes, is prohibited outside of a commercial washing facility. Notwithstanding the foregoing, the following exceptions apply to this use restriction: washing windows on all vehicles and the use of water to clean commercial or safety vehicles requiring cleaning for health or safety reasons (e.g. garbage trucks, food delivery vehicles, ambulances, etc.). Use of water through a hand-held hose in connection with the exceptions to this use restriction is prohibited unless the hose is equipped with a positive shut-off nozzle.

(j) Water used for all cooling purposes and for commercial car washes unless it is recycled.

(k) The use of potable water on golf courses except for the irrigation of putting greens.

(l) The use of potable water for street sweepers/washers is prohibited.

(m) Notwithstanding contractual or statutory language to the contrary, the use of potable water to irrigate any landscaped areas in developments approved after the effective date of this ordinance. Water meters serving landscaped areas requiring irrigation will not be installed during the current water shortage.

(n) The enforcement of any contractual or statutory provision that requires the installation of landscaping requiring irrigation.

Nothing in this Section 4 restricts the use of groundwater and/or reclaimed water when otherwise lawful.

Section 5. Exceptions. Written application for an exception or adjustment may be made to:

Hayward Water System
777 B Street
Hayward, California 94541-5007

After written application, the Director may grant permits for the uses of water otherwise prohibited or adjust the established allotments if the Director finds that:

(a) The person billed for the water service has demonstrated that to do otherwise would cause an emergency condition adversely affecting the health, sanitation, fire protection or safety of the person served or the public, or would result in loss of production or jobs; or

(b) The person billed for the water service has demonstrated to the Director's satisfaction that circumstances have changed, warranting a change in the allotment; or

(c) The person billed for the water service has demonstrated to the Director's satisfaction that an adjustment in the allotment based upon 60 gallons per day per person in a single-family household or 150 gallons per day in a multifamily living unit is warranted.

No permit shall be granted or allotment adjusted unless the person billed for the service has adopted all practicable water conservation measures and has demonstrated to the Director's satisfaction that there are no alternatives to the use of water from the Hayward Water System and that Hayward's water will be used efficiently and without waste.

Upon the filing of a written request for an exception, the owner of a multiple residential development or a single-family household shall include a certification that the following water conservation efforts, at a minimum, have been implemented in every toilet and shower in the multiple residential development or single-family household:

(a) All toilet tanks have been tested for leaks with leak detection dye tablets;

(b) A two-quart plastic bag filled with water has been installed in all toilet tanks; and

(c) An approved flow restrictor has been installed in every shower head.

In multiple residential unit developments served by a master meter where the owner does not own the units within the development, the owner shall provide certification under penalty of perjury that a kit containing the equipment for the above described water conservation efforts was delivered to every unit and each unit owner or occupant was urged to install the kits.

The Director's denial of an application for an exception or adjustments is final.

The following service charges or other charges approved from time to time by City Council resolution shall be applied to allotment changes:

(b) Temporary residents – a fee of [Fee TBD] for changing existing allotments;

(c) Adjustments to prior billings – a minimum fee of [Fee TBD] to adjust prior billings.

Section 6. Excess Water Use Charge.

(a) In addition to regular metered service charges under Section 11-2.38 of the Hayward Municipal Code, every person billed for water service shall pay for each billing period an excess use charge for water delivered in excess of established allotments. This excess use charge shall be based upon a rate schedule as specified from time to time by resolution of the City Council.

(b) The excess use charge shall not apply to any residential customer whose consumption is 1000 cubic feet or less per bi-monthly billing period.

Section 7. Enforcement

(a) Installation of Flow-Restricting Devices: In lieu of or in addition to the penalties provided for in Section 356 of the Water Code, the Hayward Water System may, after one written warning, install a flow-restricting device on the service line of any customer violating any of the provisions of this ordinance, including use of water in excess of the established allotments.

(b) Charges for Installation and Removal of Flow-Restricting Devices: Charges for installation and removal of flow-restricting devices shall be based upon a rate schedule as specified from time to time by resolution of the City Council.

(c) Reduction or Discontinuance of Water Service: Verified water waste consisting of continued water consumption in violation of the provisions of this ordinance will serve as prima facie evidence that the allotment to the water account is excessive and may result in the reduction or discontinuance of water service by the Hayward Water System.

A charge shall be paid prior to reactivating a service which has been discontinued as provided herein. The charge shall be specified from time to time by resolution of the City Council.

Section 8. Effective Date. The findings and determinations set forth in Section 1 hereof constitute the statement of reasons for adopting this ordinance as an emergency measure in the manner provided by section 617 of the Charter. This ordinance shall be effective immediately.

Section 9. Operative Date. The requirements of this ordinance shall be operative as of [Date TBD].

INTRODUCED at a regular meeting of the City Council of the City of Hayward, held the [Date TBD], by Councilmember _____.

HAYWARD CITY COUNCIL

RESOLUTION NO. _____

Introduced by Councilmember _____

---

RESOLUTION ESTABLISHING EXCESS WATER USE CHARGES AND ENFORCEMENT CHARGES FOR RATIONING WATER DURING A WATER SHORTAGE EMERGENCY

WHEREAS, by Ordinance No. [TBD] C.S. the City Council adopted an emergency ordinance establishing rules and regulations operative [Date TBD], for water rationing during the current water emergency; and

WHEREAS, excess water use charges and enforcement charges shall be based upon rate schedules specified from time to time by resolution of the City Council.

NOW, THEREFORE, be it resolved by the City Council of the City of Hayward that said Council does hereby adopt the following charges:

Section 1. In addition to regular meter service charges, charges based upon the amount of water supplied and surcharges under Section 11-2.38 of the Hayward Municipal Code, the following amounts will be charged for water delivered in excess of established allotments.

EXCESS USE CHARGES IN ADDITION TO ALL OTHER WATER CHARGES FOR ALL HAYWARD WATER CUSTOMERS

| Excess Use Range | Percent of Water Used In Excess of Allotment | Excess Use Charge per 100 Cubic Feet for all Water Used in Excess of Allotment |
|---|---|---|
| A | 0% to 10% over allotment | |
| B | 10.01% to 20% over allotment | Charges TBD |
| C | Over 20.01% over allotment | |

Section 2. In accordance with Section 7 of Ordinance No. [TBD] C.S. the following charges shall be established for enforcement purposes:

(a) Charges for installation and removal of flow-restricting devices shall be as follows:

| Meter Size | Installation Charge | Removal Charge |
|---|---|---|
| 5/8" to 1" | Charges TBD | |
| 1-1/2" and 2" | | |

(b) A charge of [Charge TBD] shall be paid prior to reactivating a service which has been discontinued as provided in Ordinance No. [TBD] C.S.

IN COUNCIL HAYWARD, CALIF. _____, _____

ADOPTED BY THE FOLLOWING VOTE:

AYES: COUNCILMEMBERS:
MAYOR:
NOES: COUNCILMEMBERS:

ABSENT: COUNCILMEMBERS:

ATTEST: _____
City Clerk of the City of Hayward

SCHEDULE A

ALLOTMENT SYSTEM FOR WATER USE DURING
WATER SHORTAGE EMERGENCY

SINGLE FAMILY RESIDENTIAL UNITS:

Allotments to provide for a minimum overall decrease of 50% of [Year TBD] use. (Table 1.)

| BI-MONTHLY BILLING-in CCF | % REDUCTION |
|---|---|
| 0 to 10 | None. |
| 11 to 40 | Sliding scale from 5% to 50%. |
| All use over 40 | 90% all over 40 |

MULTIPLE RESIDENTIAL UNITS:

| DESCRIPTION | REDUCTION |
|---|---|
| Domestic with irrigation water | 50% |
| Domestic without irrigation water | 20% |
| Irrigation Only Services | 90% |

COMMERCIAL AND INDUSTRIAL:

| DESCRIPTION | REDUCTION |
|---|---|
| Process Water | 20% |
| Domestic Water | 50% |
| Irrigation Only Services | 90% |

GOVERNMENTAL:

| | |
|---|---|
| Domestic Water | 50% |
| Irrigation Services | 90% |

CONSTRUCTION SERVICES:

| | |
|---|---|
| Allowed by permit only. | --- |
| Water from other sources will be used where available. | |

TABLE 1
WATER RATIONING ORDINANCE
RESIDENTIAL SLIDING SCALE

| Use in Base Year | | | Allotment | | | |
|---|---|---|---|---|---|---|
| Billing Cubic Ft. | Gallons | GPD (60 days) | Billing Cubic Feet | Gallons | GPD (60 days) | Percent Reduction |
| 100 | 748 | 12 | 100 | 748 | 12 | 0% |
| 200 | 1496 | 25 | 200 | 1496 | 25 | 0% |
| 300 | 2244 | 37 | 300 | 2244 | 37 | 0% |
| 400 | 2992 | 50 | 400 | 2992 | 50 | 0% |
| 500 | 3740 | 62 | 500 | 3740 | 62 | 0% |
| 600 | 4488 | 75 | 600 | 4488 | 75 | 0% |
| 700 | 5236 | 87 | 700 | 5236 | 87 | 0% |
| 800 | 5984 | 100 | 800 | 5984 | 100 | 0% |
| 900 | 6732 | 112 | 900 | 6732 | 112 | 0% |
| 1000 | 7480 | 125 | 1000 | 7480 | 125 | 0% |
| 1100 | 8228 | 137 | 1033 | 7727 | 129 | 6% |
| 1200 | 8976 | 150 | 1066 | 7974 | 133 | 11% |
| 1300 | 9724 | 162 | 1099 | 8221 | 137 | 15% |
| 1400 | 10472 | 175 | 1132 | 8467 | 141 | 19% |
| 1500 | 11220 | 187 | 1165 | 8714 | 145 | 22% |
| 1600 | 11968 | 199 | 1198 | 8961 | 149 | 25% |
| 1700 | 12716 | 212 | 1231 | 9208 | 153 | 28% |
| 1800 | 13464 | 224 | 1264 | 9455 | 158 | 30% |
| 1900 | 14212 | 237 | 1297 | 9702 | 162 | 32% |
| 2000 | 14960 | 249 | 1330 | 9948 | 166 | 34% |
| 2100 | 15708 | 262 | 1363 | 10195 | 170 | 5% |
| 2200 | 16456 | 274 | 1396 | 10442 | 174 | 37% |
| 2300 | 17204 | 287 | 1429 | 10689 | 178 | 38% |
| 2400 | 17952 | 299 | 1462 | 10936 | 182 | 39% |
| 2500 | 18700 | 312 | 1495 | 11183 | 186 | 40% |
| 2600 | 19448 | 324 | 1528 | 11429 | 190 | 41% |
| 2700 | 20196 | 337 | 1561 | 11676 | 195 | 42% |
| 2800 | 20944 | 349 | 1594 | 11923 | 199 | 43% |
| 2900 | 21692 | 362 | 1627 | 12170 | 203 | 44% |
| 3000 | 22440 | 374 | 1660 | 12417 | 207 | 45% |
| 3100 | 23188 | 386 | 1693 | 12664 | 211 | 45% |
| 3200 | 23936 | 399 | 1726 | 12910 | 215 | 46% |
| 3300 | 24684 | 411 | 1759 | 13157 | 219 | 47% |
| 3400 | 25432 | 424 | 1792 | 13404 | 223 | 47% |
| 3500 | 26180 | 436 | 1825 | 13651 | 228 | 48% |
| 3600 | 26928 | 449 | 1858 | 13898 | 232 | 48% |
| 3700 | 27676 | 461 | 1891 | 14145 | 236 | 49% |
| 3800 | 28424 | 474 | 1924 | 14392 | 240 | 49% |
| 3900 | 29172 | 486 | 1957 | 14638 | 244 | 50% |
| 4000 | 29920 | 499 | 1990 | 14885 | 248 | 50% |

All water use over 40 units will be reduced by 90 percent

1 cubic foot + 7.48 gallons
100 cubic foot (CCF) = 748 gallons

# APPENDIX I

## WATER CONSERVATION ORDINANCES

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ARTICLE 2

HAYWARD MUNICIPAL WATER SYSTEM

ARTICLE 2

HAYWARD MUNICIPAL WATER SYSTEM

SEC. 11-2.00 DEFINITIONS. For the purposes of this Article, certain words and phrases are defined and certain provisions shall be construed as herein set out, unless it shall be apparent from the context that a different meaning is intended.

a. Applicant. Any person, business, organization, or agency that applies for water service.

b. Backflow Prevention. Prevention of a condition, caused by a differential in pressure, that causes the flow of water or other liquids, gases, mixtures or substances into the distributing pipes of a potable water supply from any source or sources other than an approved water supply source.

c. Cross-Connection. Any unprotected actual or potential connection between a potable water system and any source or system containing water or substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or other assemblies through which backflow could occur, shall be considered to be cross-connections.

d. Customer. Any person, business, organization, or other agency that obtains water from the Hayward Water System.

e. Fire Service Connection. A service connection to furnish water solely for extinguishing fires or testing of fire fighting systems.

f. Hayward Municipal Water System. All of the property, heretofore or hereafter constructed and/or owned by the City of Hayward, for the treatment, storage and distribution of water. It includes land, reservoirs, pipes and appurtenances, pumping stations, wells, and all other general property. Also known as Water System.

g. Irrigation Meter. A water meter used exclusively to measure the volume of water used for landscape irrigation purposes.

h. Meter. A device used to measure the quantity of water delivered to a customer.

i. Premises. Any lot, piece or parcel of land, any building or other structure or any part of any building or structure used or useful for human habitation or gathering or for carrying on a business or occupation. Any other unit that can be separately owned, such as a condominium unit, shall also be considered one premise.

j. Service Charge. A fixed bi-monthly charge for customer service, meter reading, billing, and meter maintenance.

k. Water Usage Charges. A charge based on the volume of water delivered to a customer during a bi-monthly billing period.

l. Water Distribution Main. All pipelines owned by the City and used to distribute water to individual customers.

m. Water Facilities Fee. A fee that is paid to: (a) buy into existing public water system facilities; and (b) fund the future construction of facilities needed for development. The Facilities Fee paid therefore represents the proportion of the existing system that will be used by the new customer and the proportion of costs of future projects that will be needed to serve the new customer.

n. Water Service Connection. The physical connection of the customer's pipe with the City's pipe, meter, or other facility owned by the City.

SEC. 11-2.01 WATER SERVICE. APPLICATION. All persons desiring water service from the Hayward Municipal Water System shall make application therefore at the City.

Said application shall be made in the manner prescribed by the Director of Public Works and shall be subject to approval of the Director of Public Works or authorized representative.

SEC. 11-2.02 APPLICATION DEPOSIT - PERMANENT SERVICE. Applicants are required to establish and maintain credit to the satisfaction of the Director of Public Works or authorized representative. A deposit is required from all customers who have not established credit with the water system. The deposit for a single-family residential customer shall be in an amount approximately two times the estimated bi-monthly billing. The deposit for a multi-family residential customer shall be in an amount approximately two times the estimated bi-monthly billing. The deposit for a commercial or industrial customer shall be in an amount equal to an estimated bi-monthly billing period.

When service has been commenced to a customer with the understanding that the deposit shall be paid and such deposit is not made within five days, service may be discontinued until such deposit and any connection charges are paid.

The deposit shall be retained for two years from the date of deposit and is then subject to refund to the customer if the service has been continuous and bills have been paid within 35 days from date of billing. If service is discontinued during this period, the deposit less the final bill will be refunded. No interest shall be paid on customers' deposits.

Deposits which remain unclaimed at the expiration of four years from the date of service termination will become the property of the Water System.

SEC. 11-2.03 STANDARD SERVICE CONNECTIONS. Standard service connections shall consist of 3/4 inch service pipe and 5/8 x 3/4 inch meter.

Applicants may have a larger connection if they desire, provided that the Director of Public Works determines that sufficient water supply is available and that a larger connection will cause no adverse impact on water service, including fire protection. Larger connections shall also be approved if required by the Fire Department. Applicant shall pay for the difference in cost between the standard service and a larger connection.

The Director of Public Works or authorized representative reserves the right to determine the location of each meter and service connection.

No person other than an authorized City of Hayward employee may connect water service to, or disconnect water service from, a Water System facility.

SEC. 11-2.04 WATER SERVICE CONNECTIONS. INSTALLATION COSTS. Where a service connection is already in existence, a meter activation charge shall be paid by the applicant to cover the cost of reinstating such service.

The applicant shall pay all costs of installing a new water service connection if a water service connection is not already installed on the premises or if the existing water service connection does not meet Water System standards.

Service connection (installation) fees for services and meters that are two inches or smaller shall be in accordance with fixed rates set by resolution of the City Council, unless otherwise determined. Service connection (installation) costs for meters that are larger than two inches will be calculated by the City based on time and materials and will include: costs of all materials, including, but not limited to, fittings, valves, pipe, meter, meter box, plus 5 percent of the total cost of materials for storage and handling; labor and equipment costs, including, but not limited to, necessary sawcutting, concrete, asphalt patching, and spoils disposal; other costs incurred due to any peculiarities of the installation; and 3 percent of the total of the preceding items for administrative costs.

In the event that an applicant decides not to complete the installation of the water connection, the costs of any work already performed related to the water connection will be deducted from the fees and the remaining fees will be returned to the applicant.

SEC. 11-2.05 ESTIMATE FOR SERVICE CONNECTION CHARGES. The Director of Public Works is hereby empowered to cause estimates to be made and to fix the charges for service connections based on the assumption that the water distribution main is located on the center line of a public street, alley or way and that there will be used 24 lineal feet of service pipe, notwithstanding that said water distribution main is actually located other than on said center line.

Services larger than two inches, and unusually long or difficult service connections of any size, may be charged on an actual cost basis.

SEC. 11-2.06 CHARGES PAYABLE IN ADVANCE. All service connection charges shall be due and actually paid before any work is commenced.

SEC. 11-2.07 TITLE TO METERS AND MATERIALS. Title to all meters and materials used in making a water service connection shall be with the Hayward Municipal Water System.

SEC. 11-2.08 WATER SERVICE METERS. INSTALLATION. Water service meters shall be installed only in public streets, alleys or ways, or in areas designated by the Director of Public Works. It shall be unlawful for any customer to enclose by a fence or wall or otherwise obstruct access to water service meters unless prior approval is obtained from the Director of Public Works and arrangements acceptable to the Director of Public Works have been made for convenient access.

SEC. 11-2.09 WATER SERVICE CONNECTIONS. BACKFLOW PREVENTION AND CROSS CONNECTION CONTROL. Appendix A, entitled 'Control of Backflow and Cross Connection Control Regulations,' attached hereto and by such reference incorporated herein and made part of as though set forth in full, is hereby adopted.

SEC. 11-2.10 SERVICE CONNECTION TO SERVE ONE PREMISES. No one service connection shall service more than one premises.

SEC. 11-2.11 SERVICE CONNECTION TO EACH CUSTOMER DISCRETIONARY. Where more than one customer is supplied through one service connection and one meter, the City shall hold the owner of the property (or other person, if agreed upon by all parties including the City) responsible for payment of all water furnished through said one service connection and one meter.

Where practicable to serve each customer through a separate service connection, the City, at its sole discretion, may install separate service connections and meters for each customer at the property owner's or customer's expense, and collect at the established meter rates for water supplied through each meter.

SEC. 11-2.12 HYDRO-PNEUMATIC WATER SYSTEMS PROHIBITED. It shall be unlawful to construct any hydro-pneumatic water system in the City of Hayward with the exception of any such system meeting all of the following criteria:

a. The system is located on private property on the service side of the meter;

b. The system serves only one single family residence; and

c. Provisions of Section 11-2.09, Backflow Prevention and Cross-Connection Control, are met.

Notwithstanding the foregoing, it shall not be unlawful to repair or maintain a hydro-pneumatic water system constructed before the effective date of this section or lawfully installed hereafter.

SEC. 11-2.13 METER MAINTENANCE. All water meters shall be maintained, repaired, and replaced by the City.

Where replacements or adjustments for any meter or service are necessary by the act, neglect or carelessness of the owner or occupant of any premises, any expense thereby caused to the City shall be charged against and collected from the owner or occupant of the premises.

SEC. 11-2.14 METER TESTING. Any customer desiring a test to be made on the accuracy of his water meter may deposit with the City an amount determined by the Director of Public Works or authorized representative to be the estimated cost of conducting the test, and the test will be made accordingly. The customer shall be notified at least 24 hours in advance and must be represented at such test.

If the meter is found to over-register more than 3 percent to 5 percent, depending upon the type of meter and in accordance with Suggested Accuracy Test Flow Rates issued by the American Water Works Association, an accurate meter shall be installed, the deposit shall be repaid to depositor, and the water bill adjusted to correct the error discovered and to refund the overcharge

to the customer subject to the time limitations of this section.

If the meter is found to be correct or to register less than the actual quantity of water passing through it, the City shall retain the deposit.

If the meter is found to register more than 10 percent less than the actual quantity of water passing through it, the City shall bill the customer for the amount of undercharge.

In no case shall adjustment for overcharge or undercharge exceed the period in which the meter was in use by the customer requesting the test, or for more than six months, whichever is less.

SEC. 11-2.15 ERRONEOUS METER. Whenever a meter fails to register correctly, the customer's water service charge shall be based on an estimated amount of water used, utilizing the customer's consumption during the same season of the previous year, if conditions were unchanged. If prior consumption is not available, or if conditions are not the same, charges shall be based upon a reasonable comparison with the use of other customers during the same period receiving the same class of service under similar circumstances.

SEC. 11-2.16 CONNECTION TO METER. Whenever any person connecting service pipes to the property side of the meter uses the water for testing pipes, said person shall shut the water off from unoccupied premises before leaving same, and in all cases leave the meter box properly installed to full depth in the ground or sidewalk, with the cover securely fastened in place.

SEC. 11-2.17 WATER SERVICE INSPECTION. Duly authorized employees of the City shall have the right of access for the purpose of inspection at all reasonable times to any premises where water is used.

If employees are refused admittance to any premises or are otherwise prevented from making an inspection, the City may cause the water to be shut off from said premises after giving at least 24 hours' notice to the owner or occupant of said premises. If, in the opinion of the City, a clear and immediate hazard to the potable water supply exists, water shall be shut off from said premises immediately and water service shall not be reinstated until such time as the hazardous condition is eliminated, at the customer's expense, to the satisfaction of the Director of Public Works.

SEC. 11-2.18 DISCONTINUANCE OF SERVICE. Application to discontinue water service shall be made at the City not less than two days before the date on which discontinuance is desired.

Water Service application deposits, less any outstanding monies owed for water service charges or sewer service charges, shall be refunded to the customer.

SEC. 11-2.19 WATER LINES, AUTHORIZED PERSONS TO TAP. No person except an employee of the City's Water System or a person acting with written permission of the Director of Public Works or authorized representative shall tap any of the water pipes of the main line or distribution system, or insert tees, stop-clocks or ferrules therein.

Where service pipes are found disconnected at the corporation cock they shall be reconnected only by an employee of the Water System or a person acting with written permission of the Director of Public Works or authorized representative.

SEC. 11-2.20 FIRE SERVICE CONNECTIONS. When an application is made for commercial or industrial/multi-family residential fire service connections, such fire service installation shall be not less than four inches in size (diameter). When an application is made for residential fire service connections, such fire service installation shall not be less than one inch in size (diameter). The City of Hayward Fire Prevention Bureau and/or City of Hayward Public Works Department shall approve commercial and industrial fire service connections before such service is turned on. The City of Hayward Fire Prevention Bureau and/or City of Hayward Building Inspection personnel shall approve residential fire service connections before such service is turned on.

Each fire service shall have installed therein a detector check valve of such pattern and design in accordance with City of Hayward Standard Details. The installation shall be approved by the Fire Marshall or authorized representative and/or the Director of Public Works or authorized representative.

A "detector check valve" is defined as a spring-loaded or weight-loaded swing check valve equipped with a metered by-pass.

Water furnished through any approved fire services (i.e., fire hydrants, underground fire service lines for automatic fire sprinkler systems) shall be used only for extinguishing fires or for authorized testing of the fire protection system(s). Whenever a customer wishes to test the fire service, the customer shall notify the City of Hayward Fire Prevention Bureau, City of Hayward Fire and Police Dispatch Communication Operator, and the Hayward Water System at least 24 hours before making such test.

SEC. 11-2.21 EXISTING FIRE SERVICE CONNECTIONS. All existing fire service connections must be equipped with a detector check valve. When an existing fire service connection is not equipped with a detector check valve, a detector check valve, approved by the Fire Department, shall be installed within 30 days' notice from the City of Hayward.

If it is found that an unauthorized connection has been made or that an unauthorized use has been made of the fire service connection, the customer shall be notified to discontinue such unauthorized connection or use; and if said customer fails or refuses to do so, the water to said service shall be shut off, and not turned on again until an appropriate meter has been installed. The City of Hayward Fire Prevention Bureau shall be immediately notified and said customer shall be responsible for obtaining a 24-hour fire watch while the service is shut off. A detector check valve shall be installed within 30 days of reinstatement of water service.

SEC. 11-2.22 TEMPORARY WATER SERVICE. CONSTRUCTION WORK. All water furnished for construction or related work shall be measured through a water hydrant meter provided by the City and shall be paid for by the customer at the same rates as metered consumption.

The size of the meters and other materials provided will be determined by the Director of Public Works or authorized representative. A deposit to cover the full cost of replacement of the meter and backflow assembly and the estimated cost of water consumption for two months will be retained by the City at the time application is made to insure the safe return of all materials and supplies and the payment of water usage charges. In the event that meter is not returned or is returned damaged, the City shall retain the deposit and the Customer shall pay for any additional costs incurred as a result of the unreturned meter.

The service charge and a minimum monthly consumption amount on all hydrant meters shall be based on a rate schedule as specified from time to time by resolution of the City Council.

It shall be the responsibility of the customer to return all hydrant meters to the Water Distribution System Office within the first five working days of each month to be read, inspected, and reissued if necessary. If not brought in by the fifth working day of the month, the Utilities Superintendent may cause the meter to be located in the field and read, inspected, and reissued if necessary. An additional service charge shall be applied to the bill for this service. Customers who fail to bring in a hydrant meter to be read and inspected for three consecutive months will no longer be permitted to use Hayward water and meter(s) shall be removed from the field.

Customers who fail to return hydrant meters to the Water Distribution System Office shall pay for the cost of replacement.

SEC. 11-2.23 CONSTRUCTION WORK. WATER SERVICE PERMIT REQUIRED. All persons desiring to use water in construction work, where connections must be made to a City hydrant or standpipe, shall obtain a written permit from the City before making such connection, and such permit shall be exhibited upon the work for which issued.

SEC. 11-2.24 FIRE HYDRANTS. Fire hydrants are provided for the sole purpose of extinguishing fires and are to be opened and used only by the City of Hayward Water System and City of Hayward Fire Department or such persons as may be officially authorized to do so. Persons responsible for unauthorized use of a fire hydrant will be assessed a penalty, established by City Council.

Any person authorized to open fire hydrants shall use only an approved spanner wrench and shall replace the caps on the outlets when not in use.

SEC. 11-2.25 STREET WORK. REMOVAL OF WATER SYSTEM FACILITIES. All persons engaged in street work shall give at least ten days' written notice to the City for the removal or displacement of Water System facilities that may interfere with such street work, and any damage resulting to said facilities from failure to give such notice shall be charged against the person engaged in such street work. Longer notice may be required, at the sole discretion of the Director of Public Works or authorized representative, for removal or displacement of large water mains or mains that are located on heavily traveled streets.

All costs involved in the removal or displacement of such facilities, and necessary work to backfill, repair and repave the street, shall be paid by the person engaged in such street work, except where provisions of County or State encroachment permits state otherwise.

SEC. 11-2.26 PLANS AND SPECIFICATIONS. FIRE SERVICE LINES AND FIRE HYDRANTS. Plans shall be submitted to the City of Hayward Fire Prevention Bureau for review and approval of any installation of fire service lines and fire hydrants. Fire hydrant locations shall be approved by the Fire Marshal or authorized representative. The applicant will pay costs for such hydrants.

A permit is required for the installation of any fire service line, fire hydrant, and use or operation of fire hydrants or valves intended for fire suppression services, which are installed on water systems. The applicant shall pay the cost of such permits.

SEC. 11-2.27 MINIMUM SIZE OF WATER MAINS. The inside diameter of every water main to be installed shall be not less than eight inches, except as may be determined by the Director of Public Works or authorized representative.

SEC. 11-2.28 PARCEL FRONTAGE EXTENSION OF WATER MAIN. In every case where a main is to be extended to serve a parcel, said main shall extend the full frontage of said parcel.

SEC. 11-2.29 ESTIMATE OF INSTALLATION COSTS. Upon receipt of the plans and specifications, if the Director of Public Works or authorized representative determines that the City can install the water system using City employees, the Director of Public Works shall cause an estimate of installation costs to be prepared, including (1) material costs, plus 5 percent thereof for storage and handling; (2) labor costs; (3) engineering costs; and (4) administrative costs.

Such plans, specifications and cost estimates shall be furnished to applicant who may elect to proceed with the installation or abandon the same. In the case applicant abandons, all deposits made by applicant less engineering costs shall be refunded to the applicant.

SEC. 11-2.30 INSTALLATION BY CITY OF HAYWARD. COSTS TO BE ADVANCED BY APPLICANT. In the case applicant elects to proceed with the water main installation, and the Director of Public Works or authorized representative determines that the City can install the water system using City employees, the City shall install the same. City shall not be required to order the materials required until the applicant has deposited an amount equal to the estimated cost of such materials, nor shall the City install said facilities until the applicant has deposited an additional amount which, when added to any previous deposits on the same application, is equal to the estimate of materials, labor, engineering and administration.

SEC. 11-2.31 APPLICANT MAY INSTALL WATER MAIN EXTENSION FACILITIES. As an alternative to Section 11-2.30 hereof, if the Director of Public Works or authorized representative determines that it is infeasible for City employees to install water main extension facilities within a reasonable time, or that it is not economical for said employees to do so, Director of Public Works may permit applicant to install said facilities in accordance with the plans and specifications, at the applicant's cost and expense. After water pressure and water quality testing is complete, the final connection to the City's water system will be completed by City employees.

In such event, applicant shall deposit an amount which, when added to any previous deposits on the same application, is equal to all estimated inspection costs, engineering costs, plus an administrative charge equal to 3 percent of the total cost of installation, before applicant begins such work.

SEC. 11-2.32 APPLICANT TO FILE SURETY BOND. In the event applicant installs water main extension facilities, the applicant shall furnish the City a surety company bond in an amount equal to at least the estimate of the installation costs, including materials and labor, to guarantee faithful performance by the applicant, and a surety company bond in an equal amount to guarantee claims of persons employed by applicant and claims of persons who furnish materials, supplies, and implements used by applicant on such work.

SEC. 11-2.33 WATER MAIN EXTENSION FACILITIES. BILL OF SALE. When water main extension facilities are installed and upon the execution and delivery by applicant of a good and sufficient bill of sale, in a form acceptable to the City, of said facilities to the City, water shall be furnished to applicant's property.

SEC. 11-2.34 BENEFIT DISTRICT PROCEDURES. WATER MAIN EXTENSIONS. When the City Engineer determines that a water main extension may benefit not only the property being served initially but also other properties, the City Council may adopt a resolution to initiate proceedings to form a "local improvement benefit district." Such proceedings shall be implemented in strict accordance with Chapter 8, Article 16 of the Hayward Municipal Code.

SEC. 11-2.35 WATER SYSTEM FACILITIES FEE. A Water System Facilities Fee is hereby imposed upon every applicant for a new water service. The Facilities Fee shall be paid in addition to installation fees authorized in Section 11-2.04.

Said Facilities Fee shall be based on a rate schedule as specified from time to time by resolution of the City Council.

Where a larger meter replaces an existing meter, the applicant shall pay a Facilities Fee in the amount of the difference between the Facilities Fee for the existing meter and the new meter.

Said fee shall be due and payable at the time the water service permit is to be issued for the new service applied for. All revenues derived from Facilities Fees shall be deposited in the "Water System Capital Improvement Fund" and used only for water system purposes authorized in that Fund. Facilities Fees are non-refundable.

SEC. 11-2.36 PAYMENT OF WATER BILLS. All water bills shall be paid at the City of Hayward Revenue Office, or other place or places designated by the Director of Public Works. All bills become delinquent 15 days after the billing date, and if not paid within five days after the delinquent date, the water may be shut off without further notice. Such action will be taken in accordance with noticing requirements of the State of California Public Utilities Commission.

When water has been restricted or shut off because of delinquency in payment of the water bill, the same may not be restored until all regular charges, together with any special costs incurred through attempts on the part of the City to collect payment or restore service, have been paid in full, or payment arrangements have been approved by the Revenue Manager. Such special charges may cover the costs of, but are not necessarily limited to, orifice installations, complete shutoffs, meter removals, replacement of damaged materials, and ultimate service restorations.

SEC. 11-2.37 BILLING PERIOD. METERED SERVICE. A billing period shall be two months, more or less, for each regular metered service. If a billing period contains less than 55 days or more than 65 days, a pro rata correction of the billing shall be made.

SEC. 11-2.38 METERED SERVICE CHARGES INSIDE CITY. For water supplied through a meter and used or consumed inside the city, every customer shall pay for each billing period a service charge and a usage charge based on the amount of water supplied. These charges shall be based on a rate schedule as specified from time to time by resolution of the City Council.

SEC. 11-2.39 FIRE SERVICE CONNECTIONS INSIDE CITY. For each fire service connection inside the city, whether or not any water is used for fire fighting, customer shall pay for each billing period a service charge based on a rate schedule as specified from time to time by resolution of the City Council. When property is vacant, the property owner shall be responsible for fire service charges.

SEC. 11-2.40 METERED SERVICE CHARGES OUTSIDE CITY. For water supplied through a meter and used or consumed outside the city, every customer shall pay for each billing the following charges:

a. A service charge based on the size of meter.

b. An amount based on the number of cubic feet of water supplied during each billing period.

c. A surcharge equal to 50 percent of the sum of the service charge and the usage charge based on the cubic feet of water supplied as set forth in subparagraphs a. and b. above.

SEC. 11-2.41 FIRE SERVICE CONNECTIONS OUTSIDE CITY. For each fire service connection outside the city, whether or not any water is used for fire fighting, customer shall pay for each billing period a charge based on a rate schedule as specified from time to time by resolution of the City Council. When property is vacant, the property owner shall be responsible for fire service charges.

SEC. 11-2.42 PERSONS RESPONSIBLE FOR PAYMENT. The person responsible for payment of service and water usage charges shall be that person who requested connection to the Hayward Water System or the successor in interest, or any person, persons or legal entity requesting that such bill be charged to them.

SEC. 11-2.43 EMERGENCY SHUT-OFF OF WATER. In case of fire, or alarm of fire, or in making repairs, or in constructing new work, the City shall have the right to shut off water from any customer or number of customers without notice and to keep it shut off as long as it may be necessary.

In case of fire, or alarm of fire, the use of fountains or yard sprinklers is prohibited should circumstances warrant.

The City shall have the right to limit the amount of water furnished to any customer, should circumstances warrant such action, although no limit is stated in the applications or permit.

SEC. 11-2.44 WATER SHUT-OFF. NOTICE TO FIRE DEPARTMENT. It shall be the responsibility of the Director of Public Works or authorized representative to notify the Fire and Police Dispatch Communication Center when water mains and/or hydrants are to be shut off. Such notice shall include the location of said mains and the estimate of time the water will be shut off. When the water is turned on, the Fire and Police Dispatch Communication Center shall be so notified.

SEC. 11-2.45 FIRE CHIEF. EMERGENCY AUTHORITY. The Fire Chief, in consultation with the Director of Public Works, shall have full authority in case of fire to direct the setting of gates and valves to water mains in order to secure the greatest possible pressure at the points required.

It shall be the responsibility of the Fire Chief to see that after each fire, all hydrants and gates are restored to their original condition, and report said fact to the Director of Public Works.

SEC. 11-2.46 SEPARATE IRRIGATION METER. Certain new water services shall include the installation of a separate irrigation meter to measure the volume of water used for landscape irrigation. This requirement shall apply to water connections that will serve properties with 5,000 or more square feet of irrigated landscape. The requirement shall not apply to single-family residential properties, including single-family homes, duplexes, triplexes and fourplexes.

For the purposes of this Section, "new water service" means the installation of a new water meter where water service has not been previously provided

This Section shall apply to any water service installed on or after January 1, 2008. It shall not apply to applications for new water services submitted to the City prior to January 1, 2007.

SEC. 11-2.47 PROHIBITION OF NONESSENTIAL WATER USE. No person shall use water obtained from the Water System for nonessential uses as herein defined.

a. Nonessential Uses Defined. The following uses of water are hereby determined to be nonessential, except as further provided herein:

(1) Excessive use, loss or escape of water due to broken or defective plumbing, sprinkler, watering, or irrigation systems, for any period of time after such use of water should have reasonably been discovered and corrected, and in no event more than seventy-two hours after the customer has received written notice from the City.

(2) Use of water that results in flooding or runoff in gutters or streets.

(3) Use of water for irrigation of any lawn, landscaping or other vegetated area in a manner that causes or allows excessive water flow, overspray or runoff onto an adjoining sidewalk, driveway, street, alley, gutter or ditch.

(4) Use of water through a hose for washing buildings, structures, mobile homes, sidewalks, walkways, driveways, patios, parking lots, tennis courts, or other hard-surface areas, unless the hose is equipped with a positive shut-off nozzle.

(5) The washing of all vehicles through a hose, including but not limited to automobiles, motorcycles, recreational vehicles, trucks, transit vehicles, trailers, boats, trains and airplanes, unless the hose is equipped with a positive shut-off nozzle.

b. Other Water Use Prohibitions. The following devices shall not be installed in new applicable facilities unless the City specifically approves a waiver:

(1) Water fountains or other decorative water features that do not use re-circulated water.

(2) Single-pass cooling systems in new buildings.

(3) Non-recirculating water systems in new commercial car washes.

(4) Non-recirculating water systems in new industrial laundries.

c. Application. The provisions of this section shall apply to any person in the use of potable water provided by the Water System, except for uses of water necessary to protect public health or safety or for essential government services such as police and fire service and water system maintenance services.

d. Enforcement. The Director of Public Works is authorized to enforce all provisions of this section. The provisions of this section may be enforced by one or more of the following measures:

(1) Correction Notice. When the City becomes aware of a violation of the provisions of this section, a correction notice shall be delivered to the property and to the customer of record (if mailing address is different) for the property. Said notice shall: 1) describe the date, approximate time, address or description of the location of the violation; 2) describe the violation and the subsection violated; 3) order that the violation be corrected and abated immediately, or within a specified time as the Director of Public Works determines is reasonable; and 4) explain the consequences of failure to correct the violation, including a monetary fine.

(2) Administrative Citation. In addition to other remedies available to the City, violations of this section may be subject to an administrative citation. The amount of the fine shall be set forth by Resolution of the City Council. Citations shall be issued and administered in accordance with Chapter 1, Article 7 of the Hayward Municipal Code. Administrative citations may be issued to the property owner, customer of record for the property, or to any other person causing wasteful use of water as described in this section.

(3) Installation of Flow Restricting Measures. The City may, after one written notice, install a flow-restricting device on the service line of any customer violating any of the provisions of this section.

(4) Reduction or Discontinuance of Water Service. Water waste consisting of continued water consumption in violation of the provisions of this section may result in the reduction or discontinuance of water service by the City. The City may reduce or discontinue water service after two correction notices, as described in Section 11-2.47.d.i, have been delivered to the property and to the customer of record (if mailing address is different) and if the corrective actions required are not taken within the time frame specified.

(5) Injunctive Relief.

Costs incurred by the City for the reduction or discontinuance of water service and for the resumption of water service will be the responsibility of the customer. Water service shall not be resumed until the Director of Public Works is satisfied that the violation has been fully corrected.

e. Penalties. Violation of this section shall not constitute a crime and may be enforced only through civil measures as stated herein.

HAYWARD MUNICIPAL WATER SYSTEM
(Chapter 11, Section 11-2.09)

# A P P E N D I X 'A'

## BACKFLOW AND CROSS-CONNECTION CONTROL REGULATIONS

(a) PURPOSE. To protect the public water supply system from pollution or contamination due to the potential and or actual cross-connections within the customer's internal or private water system(s). To eliminate or control potential or actual cross-connections within the customer's private potable water system(s) and other sources of water that are not approved as safe for human consumption. This shall be accomplished by the establishment of a Cross-Connection Control Program as required by state regulations. This ordinance is adopted pursuant to Title 17, Sections 7583 – 7605, inclusive, of the California Code of Regulations, entitled "Regulations Relating to Cross-Connections.'

(b) DEFINITIONS. For purposes of this section, certain words and phrases are defined and certain provisions shall be construed as herein set out, unless it shall be apparent from the context that a different meaning is intended.

1. AIR-GAP SEPARATION. A physical break between a supply pipe and a receiving vessel. The air-gap shall be at least double the diameter of the supply pipe measured vertically above the top rim of the vessel, and in no case less than one inch.

2. APPROVED BACKFLOW PREVENTION ASSEMBLY. An assembly which has passed laboratory and field evaluation tests performed by a recognized testing organization which has demonstrated its competency to perform such tests to the California Department of Health Services.

3. AUXILIARY WATER SUPPLY. Any water supply on or available to the premises other than the approved water supply.

4. BACKFLOW. A flow condition, caused by a differential in pressure, that causes the flow of water or other liquids, gases, mixtures or substances into the distributing pipes of a potable water supply from any source or sources other than an approved water supply source.

5. BACKPRESSURE. Any elevation of pressure in the downstream piping system (by pump, elevation of piping, or steam and/or air pressure at the point of consideration which would cause, or tend to cause, a reversal of the normal direction of flow.

6. BACKSIPHONAGE. A form of backflow due to a reduction in system pressure which causes a subatmospheric pressure to exist at a site in the water system.

7. CONTAMINATION. Degradation of the quality of the potable water by any foreign substance which creates a hazard to the public health, or which may impair the usefulness or quality of the water.

8. CROSS-CONNECTION. Any unprotected actual or potential connection between a potable water system and any source or system containing unapproved water or a substance that is not or cannot be approved as safe, wholesome, and potable. By-pass arrangements, jumper connections, removable sections, swivel or changeover assemblies, or other assemblies through which backflow could occur, shall be considered to be cross-connections.

9. DOUBLE CHECK VALVE ASSEMBLY. An assembly of two internally loaded, independently acting check valves, including resilient seated shut-off valves on each end of the assembly and test cocks for testing the water tightness of each check valve.

10. DOUBLE CHECK DETECTOR ASSEMBLY. A specially designed assembly composed of a line-size approved double check valve assembly with a bypass containing a specific water meter and an approved double check valve assembly. The meter shall register accurately for only very low rates of flow up to 3 gpm and shall show a registration for all rates of flow. This assembly shall only be used to protect against a non-health hazard. This assembly is used primarily on fire sprinkler systems.

11. POLLUTION. An impairment of the quality of the water to a degree which does not create a hazard to the public health but which adversely and unreasonably affects the aesthetic qualities of such waters for domestic use.

12. PREMISES. Any and all areas on a customer's property which are served or have the potential to be served by the public water system.

13. PUBLIC WATER SYSTEM. A system for the provision of piped water to the public for human consumption that has five or more water service connections or regularly serves an average of 25 individuals daily at least 60 days out of the year.

14. REDUCED PRESSURE PRINCIPLE ASSEMBLY. An assembly incorporating two internally loaded, independently operating check valves and an automatically operating differential relief valve located between the two checks, including resilient seated shut-off valves on each end of the assembly, and equipped with necessary test cocks for testing the assembly.

15. REDUCED PRESSURE PRINCIPLE DETECTOR ASSEMBLY. A specially designed assembly composed of a line size approved reduced

pressure principle assembly with a bypass containing a specific water meter and an approved reduced pressure principle assembly. The meter shall register accurately for only very low rates of flow up to 3 gpm and shall show a registration for all rates of flow. This assembly shall be used to protect against a non-health hazard or a health hazard. This assembly is primarily used on fire sprinkler systems.

16. WATER – POTABLE. The term "potable water" shall mean water from any source which has been investigated by the California Department of Health Services, and which has been approved for human consumption.

17. WATER - NON POTABLE. The term "non potable water" shall mean a water supply which has not been approved for human consumption by the California Department of Health Services.

(c) RESPONSIBILITY. The City of Hayward shall be responsible for implementing and enforcing the Cross-Connection Control Program. If, in the judgment of the Director of Public Works or authorized representative, an approved Backflow Prevention Assembly is required (at the customer's water service connection or within the private water system) the City of Hayward shall give notice in writing to said customer. The appropriate Backflow Prevention Assembly shall be immediately installed by and at the expense of the customer at each connection where required to prevent backflow from the customer's premises to the public potable water system. It shall be the customer's responsibility to comply with the City of Hayward's requirements and failure to do so shall constitute grounds for the termination of water service until such requirements have been met.

(d) PROTECTION REQUIREMENTS.

1. General Provisions

i. Unprotected cross-connections with the public water supply are prohibited.

ii. Whenever backflow protection has been found necessary on a water supply line entering a customer's premises, any and all water supply lines from the City of Hayward's mains entering such premises, buildings, or structures shall be protected by an approved backflow assembly. (Exception: Class 1 and Class 2 Fire Sprinkler Systems.)

iii. The customer's system should be open for inspection at all reasonable times to authorized representatives of the City of Hayward to determine whether unprotected cross-connections or other structural or sanitary hazards, including violations of the regulations, exist. When such a condition becomes known, the City of Hayward shall

deny or immediately discontinue service to the premises. Service will not be restored until such condition(s) of defect are corrected.

2. Where Protection is Required

   i. Each water service connection from the City of Hayward's water system for supplying water to a premises having an auxiliary water supply shall be protected against backflow of water from the premises into the public water system unless the auxiliary water supply is accepted as an additional source by the City of Hayward, and is approved by the California Department of Health Services.

   ii. Each water service connection from the City of Hayward's water system for supplying water to any premises on which any substance is handled in such manner as may allow its entry into the water system shall be protected against backflow of the water from the premises into the public system. This shall include the handling of process waters and waters originating from the City of Hayward's water system which have been subjected to deterioration in sanitary quality.

   iii. Backflow prevention assemblies shall be installed on the water service connection to any premises having (a) internal cross-connection that cannot be permanently corrected and controlled to the satisfaction of the City of Hayward, or (b) intricate plumbing and piping arrangements or where entry to all portions of the premises are not readily accessible for inspection purposes, making it impracticable or impossible to ascertain whether or not cross-connections exist.

3. Type of Protection Required

   i. The type of protection that shall be provided to prevent backflow into the approved water supply shall be commensurate with the degree of hazard that exists on the consumer's premises. The type of protective assembly that may be required includes: Air-gap separation, Reduced Pressure Principle Assembly, Reduced Pressure Principle Detector Assembly, and Double Check Valve Detector Assembly. The water consumer may choose a higher level of protection than required by the City of Hayward. Premises shall be evaluated on a case by case basis and the appropriate backflow protection shall be determined by the City of Hayward.

(e) ADMINISTRATIVE PROCEDURES.

1. General Provisions. The cross-connection control program shall be administered by the City of Hayward and the Cross-Connection Control Specialist. The following are the procedures for achieving a more meaningful involvement and participation of all administrative authorities and customers in the field of cross-connection control.

2. Water System Survey

   i. The City of Hayward shall review all requests for new services to determine if backflow protection is needed. Plans and specifications must be submitted to the City of Hayward upon request for review of possible cross-connection hazards as a condition of service for new water service connections. If it is determined that a backflow prevention assembly is necessary to protect the public water system, the required the required assembly must be installed before water will be supplied to the premises.

   ii. The City of Hayward may require an on-premises inspection to evaluate cross-connection hazards. The cross-connection control specialist may request an inspection appointment to each affected customer. An inspection of the premises by the cross-connection control specialist will evaluate the hazards existing. Any customer who cannot or will not allow an on-premise inspection of his piping system shall be required to install the backflow prevention assembly the cross-connection control specialist considers necessary.

   iii. The City of Hayward may, at its discretion, require another inspection for cross-connection hazards of any premise to which it provides water service. The Cross-Connection Control Specialist may request an inspection appointment to each affected customer. Any customer who cannot or will not allow an on-premise inspection shall be required to install the backflow prevention assembly the cross-connection specialist considers necessary.

   iv. The City of Hayward will notify the customer of the survey findings, listing the corrective actions to be taken if any are required. A reasonable period of time will be given to complete all corrective actions required, including installation of backflow prevention assemblies. Failure to comply with any the required corrective actions within the time given may result in discontinuation of water service.

3. Water Service Termination

i. When the City of Hayward's representative encounters water use(s) that, in the representative's opinion, represent a clear and immediate hazard to the potable water supply, the City of Hayward shall immediately discontinue water service until such time as the condition(s) for reinstatement outlined by the City of Hayward are satisfied.

ii. Conditions or water uses that create a basis for water service termination shall include, but are not limited to, the following items:

1. A situation which presents an immediate health hazard to the public water system.

2. Direct or indirect connections between the public water system and a sewer line.

3. Unprotected direct or indirect connections between the public water system and any system or equipment containing contaminants.

4. Unprotected direct or indirect connections between the public water system and an unapproved auxiliary water system.

5. Refusal to install a required backflow prevention assembly.

6. Refusal to repair or replace a faulty backflow prevention assembly.

4. Water Service Termination Procedures

i. For conditions 1, 2, or 3, or 4, the City of Hayward shall make a reasonable effort to advise the customer of intent to terminate water service. The water supply shall be terminated and the service locked until correction of violation has been approved by the City of Hayward.

ii. For conditions 5 or 6, the City of Hayward will terminate service to a customer's premises after two written notices have been sent specifying the corrective action needed and the time period in which it must be done. The first notice shall give a time period of 30 days to complete all corrective actions required. The second notice shall give a time period of 14 days to complete all corrective actions

required. If no corrective action has been taken within the 14-day time period, the City of Hayward may terminate water service to the affected customer until the required actions are taken.

(f) BACKFLOW PREVENTION ASSEMBLIES

1. Approved Backflow Prevention Assemblies. Only Backflow Prevention Assemblies which are a make, model, and size approved by Department of Health Services and the City of Hayward shall be acceptable for installation by a customer connected to the City of Hayward's potable water system. The City of Hayward shall provide to any customer, upon request, a list of approved Backflow Prevention Assemblies.

2. Backflow Prevention Assembly Installation. All Backflow Prevention Assemblies shall be installed above grade and as close as practical to the user's connection. The City of Hayward shall have the final authority in determining the required location of a Backflow Prevention Assembly. This assembly shall be installed so that it is readily accessible for testing and maintenance.

3. Backflow Prevention Assembly Testing and Maintenance. All Backflow Prevention Assemblies shall be tested annually and immediately after installation, relocation or repair. In those instances where the City of Hayward deems the hazard to be great enough, the City of Hayward may require tests at more frequent intervals.

4. Backflow Prevention Assembly Removal

   i. Approval must be obtained from the City of Hayward before a Backflow Prevention Assembly can be removed, relocated or replaced. In addition a Plumbing Permit must be obtained from the City of Hayward before any work can be started.

   iii. Removal: The use of a assembly may be discontinued and removed from service upon presentation of sufficient evidence to the City of Hayward to verify that a hazard no longer exists or is not likely to be created in the future.

   iii. Relocation: An assembly may be relocated following confirmation by the City of Hayward that the relocation will continue to provide the required protection and satisfy installation requirements. A retest will be required following the relocation of the assembly.

   iv. Repair: An assembly may be removed for repair, provided the water use is either discontinued until repair is

completed and the assembly is returned to service, or the water service connection is equipped with other backflow protection approved by the City of Hayward. A retest will be required following the repair of the assembly.

v. Replacement: An assembly may be removed and replaced provided the water use is discontinued until the replacement assembly is installed. All replacement assemblies must be approved by the City of Hayward and must be commensurate with the degree of hazard involved.

# ARTICLE 23

# INDOOR WATER USE EFFICIENCY ORDINANCE

ARTICLE 23

INDOOR WATER USE EFFICIENCY ORDINANCE

SEC. 10-23.01 TITLE. This Ordinance shall be known as the City of Hayward Indoor Water Use Efficiency Ordinance.

SEC. 10-23.02 DEFINITIONS.

(a) "Applicable standard" means the water use standard as set forth in the Indoor Water Use Efficiency Table in Section 10-23.05 of the Hayward Municipal Code.

(b) "Certified professional" means a licensed contractor, licensed architect or licensed professional engineer.

(c) "City" shall mean the City of Hayward, a charter city.

(d) "Energy Star Qualified" means that a given fixture meets the United States Environmental Protection Agency standard for an energy efficient product.

(e) "gal/cycle" means gallons per cycle.

(f) "gal/100 lbs ice" means gallons per hundred pounds of ice.

(g) "gpf" means gallons per flush.

(h) "gpm" means gallons per minute.

(i) "Hayward Water System" means the system owned and operated by the City for the storage and distribution of potable water.

(j) "LSI" means Langlier Saturation Index providing an indication of the degree of saturation of water with respect to calcium carbonate related to cooling tower efficiency.

(k) "Permit" means the document issued by City in connection with new construction, remodels or renovations and which authorizes the lawful initiation of construction, improvements or repairs to a building or structure.

(l) "Project applicant" means the individual or entity submitting a Indoor Water Use Efficiency Checklist as required under Section 10-23.06, and requesting a permit, plan check, design review, or new or expanded water service application from City. A project applicant may be the property owner or his or her designee.

(m) "RMF" means residential multi-family.

(n) "sq. ft." means square feet.

(o) "Water Factor" means the number of gallons per cycle per cubic foot used by a clothes washer.

SEC. 10-23.03 COORDINATION WITH PLUMBING CODE. To the extent the provisions of this Ordinance conflict with any provisions in the existing Plumbing Code, as amended, or the California Building Standards Code, as amended, the provisions of this Ordinance shall supersede and control with regard to the indoor fixture requirements described herein.

SEC. 10-23.04 APPLICABILITY.

(a) The provisions of this Ordinance shall apply to the following projects:

(1) All new construction, regardless of building classification, requiring a building permit, plan check or design review, or requiring new or expanded water service. For new construction, all fixtures and appliances that are being installed by the Project applicant shall comply with the applicable water use efficiency standards.

(2) All kitchen and bathroom remodels requiring a building permit, plan check, or design review, or requiring new or expanded water service, except that the provisions of this Ordinance will only apply to the fixtures normally included in the kitchen or bathroom, as the case may be, to be remodeled, as follows:

(A) Residential Projects.

i. Kitchens. Faucets shall comply with the applicable standard. Project applicants are not required to upgrade existing dishwashers as part of the project; however, if replacement dishwashers are installed as part of the project, they shall comply with the applicable standard.

ii. Bathrooms. Faucets and showerheads shall comply with the applicable standards. Existing toilets that use more than 1.6 gpf shall be replaced with toilets that meet the applicable standard.

(B) Non-Residential Projects.

i. Kitchen and Food Processing Facilities. Faucets, food steamers, ice machines, and pre-rinse spray valves shall comply with applicable standards. Commercial refrigeration shall comply with applicable standards. Project applicants are not required to upgrade existing dishwashers as part of the project; however, if replacement dishwashers are installed as part of the project, they shall comply with the applicable standard.

ii. Bathrooms. Faucets and showerheads shall comply with the applicable standards. Existing toilets that use more than 1.6 gpf shall be replaced with toilets that meet the applicable standard. Existing urinals that use more than 0.5 gpf shall be replaced with urinals that meet the applicable standard.

(3) Any remodel:

(A) the cost of which exceeds $50,000; or

(B) the size of which exceeds 500 square feet, as determined by the City, in its sole discretion; or

(C) that requires new or expanded water service.

(b) The provisions of this Ordinance shall not apply to:

(1) Existing buildings not seeking a building permit, plan check or design review;

(2) Registered local, state or federal historical sites;

(3) Remodels where, in the discretion of the City Building Official, the unique configuration of the building, its drainage system or portions of the public sewer, or both, are incompatible with efficiency standards listed in the Indoor Water Use Efficiency Table and require a greater quantity of water to flush the system in a manner that is consistent with public health.

(4) Projects that are not served potable water from the Hayward Water System.

SEC. 10-23.05 MINIMUM INDOOR FIXTURE REQUIREMENTS. All new construction and applicable remodels will have, at a minimum, fixtures that comply with the efficiency standards listed below (the "Indoor Water Use Efficiency Table"):

**INDOOR WATER USE EFFICIENCY TABLE**

| Fixture | Residential | Non-Residential |
|---|---|---|
| Toilets | ≤ 1.28 gpf | ≤ 1.28 gpf |
| Urinals | ≤ 0.5 gpf | ≤ 0.5 gpf |
| Showerheads | ≤ 2.0 gpm | ≤ 2.0 gpm |
| Bathroom faucets | ≤ 1.5 gpm | ≤ 0.5 gpm |
| Kitchen faucets | ≤ 2.2 gpm | ≤ 2.2 gpm |
| Clothes washers | ≤ 6.0 Water Factor | ≤ 6.0 Water Factor |
| Dishwashers | ≤ 6.5 gal/cycle, or Energy Star Qualified | Energy Star Qualified |
| Cooling towers | ≥ 5 - 10 cycles, or ≥ 2.5 LSI | ≥ 5 - 10 cycles, or ≥ 2.5 LSI |
| Food steamers | -- | Boilerless, or Self-contained |
| Ice machines | -- | ≤ 25 gal/100 lbs ice, or Air-cooled |
| Pre-rinse spray valves | -- | ≤ 1.15 gpm |
| Automatic vehicle wash facilities | -- | ≥ 50% of water that is recycled on site |
| Commercial refrigeration | -- | Closed loop, or Air-cooled |
| Meters | Submeters for RMF [(1)], and Separate meter for outdoor if landscape >5000 sq. ft. | Submeters [(1)], and Separate meter for outdoor if landscape >5000 sq. ft. |

[(1)] Submeters shall only be required for new multi-family residential and non-residential projects.

SEC. 10-23.06 COMPLIANCE WITH ORDINANCE.

(a) The Project applicant shall:

(1) Meet the minimum water use efficiency standards for indoor fixtures and appliances provided for in the Indoor Water Use Efficiency Table and Checklist; and

(2) Prior to construction, complete and submit all portions of the Indoor Water Use Efficiency Checklist, on a form approved by the City, to the Building Division for verification.

(b) The Building Division shall:

(1) Review the Indoor Water Use Efficiency Checklist submitted by the Project applicant;

(2) Approve or deny the Project applicant's Indoor Water Use Efficiency Checklist submittal;

(3) Only upon approval of the Indoor Water Use Efficiency Checklist, issue a permit or approve the plan check, design review or new or expanded water service application for the Project applicant; and

(4) At its discretion, inspect the installation of the water efficient fixtures and appliances to verify that they have been installed and are performing at the required use levels.

SEC 10-23.07 COMPONENTS OF THE INDOOR WATER USE EFFICIENCY CHECKLIST. The Indoor Water Use Efficiency Checklist shall require, at a minimum, the following:

(a) Project Information, including applicant name and phone number, project type, site address and project size;

(b) Quantity and unit water use factors of all indoor fixtures and appliances relative to the standards listed in the Indoor Water Use Efficiency Table and Checklist;

(c) The following statement to be completed by the Project applicant: "I certify that the subject project meets the specified requirements of the Indoor Water Use Efficiency Ordinance"; and

(d) Signature of the Project applicant, or that of a certified professional.

SEC. 10-23.08 PENALTIES AND ENFORCEMENT. The City Building Official is authorized to enforce all provisions of this Ordinance. It is unlawful for any person, firm, partnership, association, or corporation subject to the requirements of this Ordinance to fail to comply with the water use efficiency requirements or to alter or replace the fixtures and appliances required by this Ordinance with other noncompliant fixtures or appliances after the completion of construction or remodel. The provisions of this Ordinance may be enforced by one or more of the following measures:

(a) Violation and Notice of Correction. Whenever the City Building Official determines that a violation of this Ordinance has occurred, the City Building Official may serve a notice of correction on the owner(s) of the property on which the violation is situated. The owner(s) of record shall have ninety (90) days to take corrective action.

(b) Administrative Citation. In addition to other remedies available to the City, violations of this Ordinance may be subject to an administrative citation. The amount of the fine shall be set forth by Resolution of the City Council. Citations shall be issued and administered in accordance with Chapter 1, Article 7 of the Hayward Municipal Code.

SEC. 10-23.09 Public Education. The City shall provide information to all Project applicants regarding the installation of water efficient fixtures and appliances.

ARTICLE 12

BAY-FRIENDLY WATER EFFICIENT LANDSCAPE ORDINANCE

ARTICLE 12

BAY-FRIENDLY WATER-EFFICIENT LANDSCAPE ORDINANCE

SEC. 10-12.01 AUTHORITY. This Article is enacted pursuant to California Government Code section 65591 et seq. and is a "water-efficient landscape ordinance" adopted by a local agency under the provisions of said section.

SEC. 10-12.02 PURPOSE. The City Council finds and declares that it is in the public interest to promote the conservation and efficient use of water and to prevent the waste of this valuable resource while recognizing the values and benefits of landscapes as essential to the quality of life in California. Landscapes provide areas for active and passive recreation and enhance the environment by cleaning air and water, preventing erosion, offering fire protection, and replacing ecosystems lost to development. The purpose of the regulations set forth in this Article is to establish a structure for planning, designing, installing, maintaining and managing water efficient landscapes in new construction and rehabilitated projects; establish provisions for water management practices and water waste prevention for existing landscapes; utilize Bay-Friendly Landscaping a whole systems approach to the design, construction and maintenance of the landscape, to conserve water; and adopt the Bay-Friendly Landscape Guidelines, Bay-Friendly Landscape Scorecards and Bay-Friendly Gardening Guide, as they may be amended from time to time, City reference documents.

This Article shall be applied in a manner that achieves the maximum consistency with the landscaping performance standards contained in the Hayward Zoning ordinance, Article 1 of Chapter 10 of the Hayward Municipal Code. To the extent that a conflict exists between this Article and the Zoning Ordinance, the requirements of this Article shall control.

SEC. 10-12.03 APPLICABILITY.

(a) After January 1, 2010, this Article shall apply to all of the following landscape projects:

(1) New construction and rehabilitated landscapes for public agency projects and private development projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, plan check or planning permit. Other projects requiring a planning permit may be subject to provision of this Article at the discretion of Director of Development Services; and

(2) New construction and rehabilitated landscapes which are developer-installed in single-family and multi-family projects with a landscape area equal to or greater than 2,500 square feet requiring a building or landscape permit, or planning approval. Other projects requiring planning approval may be subject to provision of this Article at the discretion of Director of Development Services; and

(3) New construction and rehabilitated landscapes which are homeowner-provided and/or homeowner-hired in single-family and multi-family

residential projects with a total project landscape area equal to or greater than 5,000 square feet requiring a building or landscape permit, plan check or planning approval. Other projects requiring planning approval may be subject to provision of this Article at the discretion of Director of Development Services; and

(4) Existing landscapes as limited by Section 10-12.18; and

(5) Cemeteries: Recognizing the special landscape management needs of cemeteries, new and rehabilitated cemeteries are governed by to Sections 10-12.07, 10-12.14 and 10-12.15; and existing cemeteries are governed by to Section 10-12.18.

(b) This Article does not apply to:

(1) Registered local, state or federal historical sites;

(2) Ecological restoration projects that do not require a permanent irrigation system;

(3) Mined-land reclamation projects that do not require a permanent irrigation system; or

(4) Plant collections, as part of botanical gardens and arboretums open to the public.

SEC. 10-12.04 DEFINITIONS. The following words and phrases whenever used in this Article shall be construed as defined below.

(a) "Applied Water" means the portion of water supplied by the irrigation system to the landscape.

(b) "Automatic Irrigation Controller" means an automatic timing device used to remotely control valves that operate an irrigation system. Automatic irrigation controllers schedule irrigation events using either evapotranspiration (weather-based) or soil moisture data.

(c) "Backflow Prevention Device" means a safety device used to prevent pollution or contamination of the water supply due to the reverse flow of water from the irrigation system.

(d) "Bay-Friendly Landscape Guidelines" means the most recent version of the guidelines developed by StopWaste.Org for use in the professional design, construction and maintenance of landscapes. City staff shall maintain the most recent version of the "Bay-Friendly Landscape Guidelines" at all times.

(e) "Bay-Friendly Landscaping Scorecard" means the most recent version of the Bay-Friendly Landscaping points system developed by StopWaste.Org. City staff shall maintain the most recent version of the Bay-Friendly Landscaping Scorecard at all times.

(f) "Certificate of Completion" means the document required by Section 10-12.12, in the form set forth in Appendix C.

(g) "Certified Irrigation Designer" means a person certified to design irrigation systems by an accredited academic institution a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation designer certification program and Irrigation Association's Certified Irrigation Designer program.

(h) "Certified Landscape Irrigation Auditor" means a person certified to perform landscape irrigation audits by an accredited academic institution, a professional trade organization or other program such as the US Environmental Protection Agency's WaterSense irrigation auditor certification program and Irrigation Association's Certified Landscape Irrigation Auditor program.

(i) "Check Valve" or "Anti-Drain Valve" means a valve located under a sprinkler head, or other location in the irrigation system, to hold water in the system to prevent drainage from sprinkler heads when the sprinkler is off.

(j) "Common Interest Developments" means community apartment projects, condominium projects, planned developments, and stock cooperatives pursuant to Civil Code Section 1351.

(k) "Compost" shall mean the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste. It is an organic matter resource that has the unique ability to improve the chemical, physical and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer. (Excerpted from US Compost Council, Field Guide to Compost Use.)

(l) "Conversion Factor (0.62)" means the product of controlled biological decomposition of organic materials, often including urban plant debris and food waste. It is an organic matter resource that has the unique ability to improve the chemical, physical and biological characteristics of soils or growing media. It contains plant nutrients but is typically not characterized as a fertilizer. (Excerpted from US Compost Council, Field Guide to Compost Use.)

(m) "Drip Irrigation" means any non-spray low volume irrigation system utilizing emission devices with a flow rate measured in gallons per hour. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

(n) "Drought Resistant Soil" means soil that has been managed by amending with compost and covering with mulch, for example, to maximize rainfall infiltration, increase the soil's capacity to hold water, and allow for plant roots to penetrate and proliferate such that the landscape can survive with less than optimal water (i.e., less than Maximum Applied Water Allowance (MAWA)).

(o) "Ecological Restoration Project" means a project where the site is intentionally altered to establish a defined, indigenous, historic ecosystem.

(p) "Effective Precipitation" or "Usable Rainfall" (Eppt) means the portion of total precipitation which becomes available for plant growth.

(q) "Emitter" means a drip irrigation emission device that delivers water slowly from the system to the soil.

(r) "Established Landscape" means the point at which plants in the landscape have developed significant root growth into the soil. Typically, most plants are established after one or two years of growth.

(s) "Establishment Period of the Plants" means the first year after installing the plant in the landscape or the first two years if irrigation will be terminated after establishment. Typically, most plants are established after one or two years of growth.

(t) "Estimated Total Water Use" (ETWU) means the total water used for the landscape as described in Section 10-12.07.

(u) "ET Adjustment Factor" (ETAF) means a factor of 0.7, that, when applied to reference evapotranspiration, adjusts for plant factors and irrigation efficiency, two major influences upon the amount of water that needs to be applied to the landscape. A combined plant mix with a site-wide average of 0.5 is the basis of the plant factor portion of this calculation. For purposes of the ETAF, the average irrigation efficiency is 0.71. Therefore, the ET Adjustment Factor is (0.7)=(0.5/0.71). ETAF for a Special Landscape Area shall not exceed 1.0. ETAF for existing non-rehabilitated landscapes is 0.8.

(v) "Evapotranspiration Rate" means the quantity of water evaporated from adjacent soil and other surfaces and transpired by plants during a specified time.

(w) "Flow Rate" means the rate at which water flows through pipes, valves and emission devices, measured in gallons per minute, gallons per hour, or cubic feet per second.

(x) "Hardscapes" means any durable material (pervious and non-pervious).

(y) "High-Flow Sensors" or "Flow Meters" detect and report high flow conditions created by system damage or malfunction.

(z) "Hydrozone" means a portion of the landscaped area having plants with similar water needs. A hydrozone may be irrigated or non-irrigated.

(aa) "Infiltration Rate" means the rate of water entry into the soil expressed as a depth of water per unit of time (e.g., inches per hour).

(bb) "Invasive Plant Species" means species of plants not historically found in California that spread outside cultivated areas and can damage environmental or economic resources. Invasive species may be regulated by county agricultural agencies as noxious species. "Noxious weeds" means any weed designated by the Weed Control

Regulations in the Weed Control Act and identified on a Regional District noxious weed control list. Lists of invasive plants are maintained at the California Invasive Plant Inventory and USDA invasive and noxious weeds database.

(cc) "Irrigation Audit" means an in-depth evaluation of the performance of an irrigation system conducted by a Certified Landscape Irrigation Auditor. An irrigation audit includes, but is not limited to: inspection, system tune-up, system test with distribution uniformity or emission uniformity, reporting overspray or runoff that causes overland flow, and preparation of an irrigation schedule.

(dd) "Irrigation Efficiency" (IE) means the measurement of the amount of water beneficially used divided by the amount of water applied. Irrigation efficiency is derived from measurements and estimates of irrigation system characteristics and management practices. The minimum average irrigation efficiency for purposes of this Article is 0.71. Greater irrigation efficiency can be expected from well designed and maintained systems.

(ee) "Irrigation Survey" means an evaluation of an irrigation system that is less detailed than an irrigation audit. An irrigation survey includes, but is not limited to, inspection, system test, and written recommendations to improve performance of the irrigation system.

(ff) "Irrigation Water Use Analysis" means an analysis of water use data based on meter readings and billing data.

(gg) "Landscape Architect" means a person who holds a license to practice landscape architecture in the State of California Business and Professions Code Section 5615.

(hh) "Landscape Area" means all the planting areas, turf areas, and water features in a landscape design plan subject to the Maximum Applied Water Allowance calculation. The landscape area does not include footprints of buildings or structures, sidewalks, driveways, parking lots, decks, patios, gravel or stone walks, other pervious or non-pervious hardscapes, and other non-irrigated areas designated for non-development (e.g., open spaces and existing native vegetation).

(ii) "Landscape Contractor" means a person licensed by the State of California to construct, maintain, repair, install, or subcontract the development of landscape systems.

(jj) "Landscape Documentation Package" means the documents required under Section 10-12.06.

(kk) "Landscape Project" means total area of landscape in a project as defined in "landscape area" for the purposes of this Article.

(ll) "Lateral Line" means the water delivery pipeline that supplies water to the emitters or sprinklers from the valve.

(mm) "Local Agency" means a city or county, including a charter city or charter county, that is responsible for adopting and implementing the Article. The local agency is

also responsible for the enforcement of this Article, including but not limited to, approval of a permit and plan check or design review of a project.

(nn) "Local Water Purveyor" means any entity, including a public agency, city, county, or private water company that provides retail water service.

(oo) "Low Volume Irrigation" means the application of irrigation water at low pressure through a system of tubing or lateral lines and low-volume emitters such as drip, drip lines, and bubblers. Low volume irrigation systems are specifically designed to apply small volumes of water slowly at or near the root zone of plants.

(pp) "Main Line" means the pressurized pipeline that delivers water from the water source to the valve or outlet.

(qq) "Maximum Applied Water Allowance" (MAWA) means the upper limit of annual applied water for the established landscaped area as specified in Section 10-12.07. It is based upon the area's reference evapotranspiration, the ET Adjustment Factor, and the size of the landscape area. The Estimated Total Water Use shall not exceed the Maximum Applied Water Allowance. Special Landscape Areas, including recreation areas, areas permanently and solely dedicated to edible plants such as orchards and vegetable gardens, and areas irrigated with recycled water are subject to the MAWA with an ETAF not to exceed 1.0.

(rr) "Microclimate" means the climate of a small, specific area that may contrast with the climate of the overall landscape area due to factors such as wind, sun exposure, plant density, or proximity to reflective surfaces.

(ss) "Mined-Land Reclamation Projects" means any surface mining operation with a reclamation plan approved in accordance with the Surface Mining and Reclamation Act of 1975.

(tt) "Mulch" means any organic material such as leaves, arbor or wood chips, recycled wood waste, straw, compost, or inorganic mineral materials such as rocks, gravel, and decomposed granite left loose and applied to the soil surface for the beneficial purposes of reducing evaporation, suppressing weeds, moderating soil temperature, and preventing soil erosion.

(uu) "New Construction" means, for the purposes of this Article, a new building with a landscape or other new landscape, such as a park, playground, or greenbelt without an associated building.

(vv) "Operating Pressure" means the pressure at which the parts of an irrigation system are designed by the manufacturer to operate.

(ww) "Overhead Sprinkler Irrigation Systems" means systems that deliver water through the air (e.g., spray heads and rotors).

(xx) "Overspray" means the irrigation water which is delivered beyond the target area.

(yy) "Permit" means an authorizing document issued by local agencies for new construction or rehabilitated landscapes.

(zz) "Pervious" means any surface or material that allows the passage of water through the material and into the underlying soil.

(aaa) "Plant Factor" or "Plant Water Use Factor" is a factor, when multiplied by ETo, estimates the amount of water needed by plants. For purposes of this Article, the plant factor range for low water use plants is 0 to 0.3, the plant factor range for moderate water use plants is 0.4 to 0.6, and the plant factor range for high water use plants is 0.7 to 1.0. Plant factors cited in this Article are derived from the Department of Water Resources 2000 publication "Water Use Classification of Landscape Species".

(bbb) "Precipitation Rate" means the rate of application of water measured in inches per hour.

(ccc) "Project Applicant" means the individual or entity submitting a Landscape Documentation Package to request a permit, plan check, or design review from the local agency. A project applicant may be the property owner or his or her designee.

(ddd) "Rain Sensor" or "Rain Sensing Shutoff Device" means a component which automatically suspends an irrigation event when it rains.

(eee) "Record Drawing" or "as-builts" means a set of reproducible drawings which show significant changes in the work made during construction and which are usually based on drawings marked up in the field and other data furnished by the contractor.

(fff) "Recreational Area" means areas dedicated to active play such as parks, sports fields, and golf courses where turf provides a playing surface.

(ggg) "Recycled Water", "Reclaimed Water", or "Treated Sewage Effluent Water" means treated or recycled waste water of a quality suitable for non-potable uses such as landscape irrigation and water features. This water is not intended for human consumption.

(hhh) "Reference Evapotranspiration" or "ETo" means a standard measurement of environmental parameters which affect the water use of plants. ETo is expressed in inches per day, month, or year as represented in Appendix A, and is an estimate of the evapotranspiration of a large field of four- to seven-inch tall, cool-season grass that is well watered. Reference evapotranspiration is used as the basis of determining the Maximum Applied Water Allowance so that regional differences in climate can be accommodated.

(iii) "Rehabilitated Landscape" means any re-landscaping project that requires a permit , plan check, or design review, meets the requirements of Section 10-12.03, and the modified landscape area is equal to or greater than 2,500 square feet, is 50% of the total landscape area, and the modifications are completed within one year.

(jjj) "Runoff" means water which is not absorbed by the soil or landscape to which it is applied and flows from the landscape area. For example, runoff may result from water that is applied at too great a rate (application rate exceeds infiltration rate) or when there is a slope.

(kkk) "Soil Moisture Sensing Device" or "Soil Moisture Sensor" means a device that measures the amount of water in the soil. The device may also suspend or initiate an irrigation event.

(lll) "Soil Texture" means the classification of soil based on its percentage of sand, silt, and clay.

(mmm) "Special Landscape Area" (SLA) means an area of the landscape dedicated solely to edible plants, areas irrigated with recycled water, water features using recycled water and areas dedicated to active play such as parks, sports fields, golf courses, and where turf provides a playing surface.

(nnn) "Sprinkler Head" means a device which delivers water through a nozzle.

(ooo) "Static Water Pressure" means the pipeline or municipal water supply pressure when water is not flowing.

(ppp) "Station" means an area served by one valve or by a set of valves that operate simultaneously.

(qqq) "Swing Joint" means an irrigation component that provides a flexible, leak-free connection between the emission device and lateral pipeline to allow movement in any direction and to prevent equipment damage.

(rrr) "Turf" means a ground cover surface of mowed grass. Annual bluegrass, Kentucky bluegrass, Perennial ryegrass, Red fescue, and Tall fescue are cool-season grasses. Bermudagrass, Kikuyugrass, Seashore Paspalum, St. Augustinegrass, Zoysiagrass, and Buffalo grass are warm-season grasses.

(sss) "Valve" means a device used to control the flow of water in the irrigation system.

(ttt) "Water Conserving Plant Species" means a plant species identified as having a low plant factor.

(uuu) "Water Feature" means a design element where open water performs an aesthetic or recreational function. Water features include ponds, lakes, waterfalls, fountains, artificial streams, spas, and swimming pools (where water is artificially supplied). The surface area of water features is included in the high water use hydrozone of the landscape area. Constructed wetlands used for on-site wastewater treatment or stormwater best management practices that are not irrigated and used solely for water treatment or stormwater retention are not water features and, therefore, are not subject to the water budget calculation.

(vvv) "Watering Window" means the time of day irrigation is allowed.

(www) "WUCOLS" means the Water Use Classification of Landscape Species published by the University of California Cooperative Extension, the Department of Water Resources and the Bureau of Reclamation, 2000.

SEC. 10-12.05 COMPLIANCE WITH LANDSCAPE DOCUMENTATION PACKAGE.

(a) Prior to construction, the City shall:

(1) Provide the project applicant with the Article and procedures for permits, plan checks, or design reviews;
(2) Review the Landscape Documentation Package submitted by the project applicant;
(3) Approve or deny the Landscape Documentation Package; and
(4) Issue a permit or approve the plan check or design review for the project applicant.

(b) Prior to construction, the project applicant shall:

(1) Submit a Landscape Documentation Package to the City.

(c) Upon approval of the Landscape Documentation Package by the City, the project applicant shall:

(1) Receive a permit or approval of the plan check or design review and record the date of the permit in the Certificate of Completion; and
(2) Submit a copy of the approved Landscape Documentation Package along with the record drawings, and any other information to the property owner or his/her designee.

SEC. 10-12.06 LANDSCAPE DOCUMENTATION PACKAGE.

(a) The Landscape Documentation Package shall include the following six (6) elements:

(1) Project information;

(A) Date.

(B) Project applicant.

(C) Project address (if available, parcel and/or lot number(s).

(D) Total landscape area (square feet).

(E) Project type (e.g., new, rehabilitated, public, private, cemetery, homeowner-installed).

(F) Water supply type (e.g., potable, recycled, well).

(G) Checklist of all documents in Landscape Documentation Package.

(H) Project contacts to include contact information for the project applicant and property owner.

(I) Applicant signature and date with statement, "I agree to comply with the requirements of the water efficient landscape ordinance and submit a complete Landscape Documentation Package."

(2) Water Efficient Landscape Worksheet:

(A) Hydrozone information table

(B) Water budget calculations

(1) Maximum Applied Water Allowance (MAWA)

(2) Estimated Total Water Use (ETWU).

(3) Soil Management Report.

(4) Landscape design plan.

(5) Irrigation Design Plan.

(6) Grading Design Plans.

SEC. 10-12.07 WATER EFFICIENT LANDSCAPE WORKSHEET.

(a) A project applicant shall complete the Water Efficient Landscape Worksheet which contains two sections (see Appendix B):

(1) A hydrozone information table (see Appendix B, Section A) for the landscape project; and

(2) A water budget calculation (see Appendix B, Section B) for the landscape project. For the calculation of the Maximum Applied Water Allowance and Estimated Total Water Use, a project applicant shall use the ETo values of 44.2 of Union City for City of Hayward from the Reference Evapotranspiration Table in Appendix A. For geographic areas not covered in Appendix A, use data from other cities located nearby in the same reference evapotranspiration zone, as found in the CIMIS Reference Evapotranspiration Zones Map, Department of Water Resources, 1999.

(b) Water budget calculations shall adhere to the following requirements:

(1) The plant factor used shall be from WUCOLS. The plant factor ranges from 0 to 0.3 for low water use plants, from 0.4 to 0.6 for moderate water use plants, from 0.7 to 1.0 for high water use plants, 0.8 for cool season turf, and 0.6 for warm season turf.

(2) All water features shall be included in the high water use hydrozone and temporarily irrigated areas shall be included in the low water use hydrozone.

(3) All Special Landscape Areas shall be identified and their water use calculated as described below.

(4) ETAF (ET adjustment factor) for Special Landscape Areas shall not exceed 1.0.

(c) Maximum Applied Water Allowance (MAWA) shall be calculated using the equation:

MAWA = (ETo) (0.62) [(0.7 x LA) + (0.3 x SLA)]

| | |
|---|---|
| MAWA | Maximum Applied Water Allowance (gallons per year) |
| ETo | Reference Evapotranspiration (inches per year) |
| 0.62 | Conversion Factor (to gallons) |
| 0.7 | ET Adjustment Factor (ETAF) |
| LA | Landscape Area including SLA (square feet) |
| 0.3 | Additional Water Allowance for SLA |
| SLA | Special Landscape Area (square feet) |

To convert from gallons per year to hundred-cubic-feet per year:
= MAWA/748 = hundred-cubic-feet per year (100 cubic feet = 748 gallons)

(d) Estimated Total Water Use. The Estimated Total Water Use shall be calculated using the equation below. The sum of the Estimated Total Water Use calculated for all hydrozones shall not exceed MAWA.

$$ETWU = (ETo)(0.62)\left(\frac{PF \times HA}{IE} + SLA\right)$$

*Where:*

| | |
|---|---|
| ETWU | Estimated Total Water Use per year (gallons) |
| ETo | Reference Evapotranspiration (inches): Use 44.2 |
| PF | Plant Factor from WUCOLS (see Section 491) |
| HA | Hydrozone Area [high, medium, and low water use areas] (square feet) |
| SLA | Special Landscape Area (square feet) |
| 0.62 | Conversion Factor |
| IE | Irrigation Efficiency (minimum 0.71) |

SEC. 10-12.08 SOIL MANAGEMENT REPORT.

(a) In order to create drought resistant soil, reduce runoff and encourage healthy plant growth, a soil management report addressing soil attributes of the project site shall be completed by the project applicant or his/her designee.

(b) The soil management report shall address the soil attributes of the project site and shall include:

(1) Identification of areas of quality topsoil to be protected during construction and/or critical soil limitations such as compaction; water logged soils or wetlands; thin, eroded or erosion prone soils.

(2) A laboratory soil analysis of the soil(s) into which plantings are to be made:

(A) Soil sampling shall be conducted in accordance with laboratory protocol, including protocols regarding adequate sampling depth for the intended plants.

(B) At a minimum the soil analysis shall include:

(1) Soil texture;

(2) Infiltration rate determined by laboratory test or soil texture infiltration rate table;

(3) pH;

(4) Total soluble salts;

(5) Sodium;

(6) Essential nutrients;

(7) Percent organic matter; and

(8) Recommendations for soil amendments or nutrient applications to ameliorate the soil limitations identified by the analysis and the amount of compost required to bring the soil organic matter content to a minimum 3 inches. The required practice of adding compost is waived if the plant palette primarily includes California native species that are adapted to soils with little or no organic matter as documented by a published plant reference.

(C) It is required that:

(1) The lab report recommendations are based on an "organic" approach to soil and landscape management that specifies natural and non-synthetic fertilizers to rectify any soil deficiencies.

(2) If the soils are to be irrigated with recycled water the lab report recommendations are tailored to recycled water.

(3) The types of plantings intended such as turf, perennial bed, annual bed, swale etc are provided to the soil laboratory.

(4) Management actions are identified to remediate limiting soil

characteristics such as ripping the soil to alleviate soil compaction.

(3) Specifications for protecting topsoil, ameliorating soil limitations, such as ripping the soil to alleviate soil compaction, and incorporating compost and/or amendments as per recommendations in the soil analysis report.

(c) The project applicant, or his/her designee, shall submit the soil management report as part of the Landscape Documentation Package.

(d) The soil management report shall be made available, in a timely manner, to the professionals preparing the landscape design plans and irrigation design plans to make any necessary adjustments to the design plans.

(e) The project applicant, or his/her designee, shall submit documentation verifying implementation of soil management report recommendations to the City with Certificate of Completion.

SEC. 10-12.09 LANDSCAPE DESIGN PLAN.

(a) A landscape design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

(1) Plant Material.

(A) The estimated total water use of the plant material selected shall not exceed the Maximum Applied Water Allowance.

(B) Each hydrozone shall have plant materials with similar water use.

(C) At least 75% of the total number of plants in non-turf areas shall require occasional, little or no summer water. All species should be adapted to the climate in which they will be planted, as documented by a published plant reference. If plants are given a range of water needs from "occasional to moderate" for example, the landscape designer must determine if the plant will require either occasional or moderate watering based on site, soil, and climate conditions and categorize the plant appropriately. Sources used to determine climate adaptation and watering requirements may include:

(1) Bornstein, Carol, David Fross and Bart O'Brien, California Native Plants for the Garden.
Qualifying irrigation designation: "occasional", "infrequent", or "drought tolerant".

(2) East Bay Municipal Utility District's publication Plants and Landscapes for Summer Dry Climates.
Qualifying irrigation designation: "occasional", "infrequent" or "no summer water".

(3) Sunset Publishing Corporation Sunset Western Garden Book. Qualifying irrigation designation: "little or no water".

(4) University of California Cooperative Extension's Guide to Estimating Irrigation Water Needs of Landscape Plantings in CA.
Qualifying irrigation designation: "Low" or "Very Low".

(D) Turf shall not be allowed on slopes greater than 25% where the toe of the slope is adjacent to an impermeable hardscape.

(E) Total irrigated areas specified as turf shall be limited to a maximum of 25% with recreational areas exempted.

(F) A landscape design plan for projects in fire-prone areas shall address fire safety and prevention. A defensible space or zone around a building or structure is required per Public Resources Code Section 4291(a) and (b). Avoid fire-prone plant materials and highly flammable mulches.

(G) Those species identified by CAL-IPC as invasive in the San Francisco Bay Area shall not be specified.

(H) The architectural guidelines of a common interest development, which include community apartment projects, condominiums, planned developments, and stock cooperatives, shall not prohibit or include conditions that have the effect of prohibiting the use of low-water use plants as a group.

(I) Plants shall be selected and planted appropriately based upon their adaptability to the climatic, geologic, and topographical conditions of the project site:

(1) Protection and preservation of native species and natural vegetation.

(2) Selection of plants based on disease and pest resistance.

(3) Selection of trees based on applicable local tree ordinances or tree shading guidelines.

(4) Selection of California native plants from local and regional landscape program plant lists using local natural plant communities as models.

(5) Use of the Sunset Western Climate Zone System which takes into account temperature, humidity, elevation, terrain, latitude, and varying degrees of continental and marine influence on local climate.

(6) Recognize the horticultural attributes of plants (i.e., mature plant size, invasive surface roots) to minimize damage to property or infrastructure [e.g., buildings, sidewalks, power lines]; to allow them to grow to their mature size within the space allotted them to avoid shearing and topping.

(7) Consider the solar orientation for plant placement to maximize summer shade and winter solar gain.

(8) Avoid specifying turf in street medians, traffic islands or bulbouts of any size unless irrigated with subsurface or low volume irrigation.

(2) Water Features.

(A) Recirculating water systems shall be used for water features.

(B) Where available, recycled water shall be used as a source for decorative water features unless a written exemption has been granted by the City stating that recycled water meeting all public health codes and standard is not available and will not be available for the foreseeable future.

(C) Surface area of a water feature shall be included in the high water use hydrozone area of the water budget calculation.

(D) Covers are required for pool and spa.

(3) Mulch and Amendments.

(A) A minimum three inch (3") layer of recycled chipped wood mulch in Dark Brown color, or organic green waste shall be applied on all exposed soil surfaces of planting areas except in turf areas, or direct seeding applications where mulch is contraindicated.

(B) Stabilizing mulching products shall be used on slopes. It is required that bio based products are used, and petroleum based products are not allowed.

(C) The mulching portion of the seed/mulch slurry in hydro-seeded applications shall meet the mulching requirement.

(D) Compost and soil amendments shall be incorporated according to recommendations of the soil report into minimum first 9 inches of soil in the entire planting areas unless otherwise directed in the soil report (see Section 10-12.08).

(E) Compost is purchased from processors who participate in the US Composting Council's Standard Testing Assurance Program.

(F) Ongoing maintenance shall maintain a minimum of (3") mulch.

(b) The landscape design plan, at a minimum, shall identify:

(1) Each hydrozone by number, letter, or other method;

(2) Each hydrozone as low, moderate, high water, or mixed water use. Temporarily irrigated areas of the landscape shall be included in the low water use hydrozone for the water budget calculation;

(3) Recreational areas;

(4) Areas permanently and solely dedicated to edible plants;

(5) Areas irrigated with recycled water that meet all applicable City and State laws;

(6) Type of mulch and application depth;

(7) Soil amendments, type, and quantity;

(8) Type and surface area of water features;

(9) Hardscapes (pervious and non-pervious);

(10) Location and installation details of any applicable stormwater best management practices, but are not limited to:

(A) rain gardens, infiltration beds, swales, and basins that allow water to collect and soak into the ground;

(B) constructed wetlands and retention ponds that retain water, handle excess flow, and filter pollutants; and

(C) pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

(11) Any applicable rain harvesting or catchment technologies (e.g., cisterns, etc.);

(12) Contain the following statement: "I have complied with the criteria of the City of Hayward Bay-Friendly Water Efficient Landscape Ordinance, Hayward Municipal Code, Chapter 10, Article 12, and applied them for the efficient use of water in the landscape design plan"; and

(13) The signature of a licensed landscape architect, or any other person authorized to design a landscape. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title16 of the California Code of Regulations, and Section 6721 of the Food and Agriculture Code.)

SEC. 10-12.10 IRRIGATION DESIGN PLAN.

(a) For the efficient use of water, an irrigation system shall meet all the requirements listed in this section and the manufacturers' recommendations. The irrigation system and its related components shall be planned and designed to allow for proper installation, management, and maintenance. An irrigation design plan meeting the following design criteria shall be submitted as part of the Landscape Documentation Package.

(1) System.

(A) Dedicated landscape water meters are highly recommended on landscape areas smaller than 5,000 square feet to facilitate water management.

(B) Automatic irrigation controllers utilizing either evapotranspiration or soil moisture sensor data shall be required for irrigation scheduling in all irrigation systems.

(C) The irrigation system shall be designed to ensure that the dynamic pressure at each emission device is within the manufacturer's recommended pressure range for optimal performance.

(1) If the static pressure is above or below the required dynamic pressure of the irrigation system, pressure-regulating devices such as inline pressure regulators, booster pumps, or other devices shall be installed to meet the required dynamic pressure of the irrigation system.

(2) Static water pressure, dynamic or operating pressure, and flow reading of the water supply shall be measured at the point of connection. These pressure and flow measurements shall be conducted at the design stage. If the measurements are not available at the design stage, the measurements shall be conducted at installation.

(D) Sensors (rain, freeze, wind, etc.), either integral or auxiliary, that suspend or alter irrigation operation during unfavorable weather conditions shall be required on all irrigation systems, as appropriate for local climatic conditions.

(E) Manual shut-off valves (such as a gate valve, ball valve, or butterfly valve) shall be required, as close as possible to the point of connection of the water supply, to minimize water loss in case of an emergency (such as a main line break) or routine repair.

(F) Backflow prevention devices shall be required to protect the water supply from contamination by the irrigation system.

(G) High flow sensors (flow meters) that detect and report high flow conditions created by system damage or malfunction shall be required.

(H) The irrigation system shall be designed to prevent runoff, low head drainage, overspray, or other similar conditions where irrigation water flows onto non-targeted areas, such as adjacent property, non-irrigated areas, hardscapes, roadways, or structures.

(I) Relevant information from the soil management plan, such as soil type and infiltration rate, shall be utilized when designing irrigation systems.

(J) The design of the irrigation system shall conform to the hydrozones of the landscape design plan.

(K) The irrigation system must be designed and installed to meet the Maximum Applied Water Allowance.

(L) In mulched planting areas, the use of low volume irrigation is required to maximize water infiltration into the root zone.

(M) Sprinkler heads and other emission devices shall have matched precipitation rates, unless otherwise directed by the manufacturer's recommendations.

(N) Sprinkler spacing shall be designed to achieve head to head coverage and the highest possible distribution uniformity using the manufacturer's recommendations.

(O) Swing joints or other riser-protection components are required on all risers subject to damage that are adjacent to high traffic areas.

(P) Check valves or anti-drain valves are required for all irrigation systems.

(Q) Narrow or irregularly shaped areas, including turf, less than eight (8) feet in width in any direction shall be irrigated with subsurface irrigation or low volume irrigation system.

(R) Overhead irrigation shall not be permitted within 24 inches of any non-permeable surface. Allowable irrigation within the setback from non-permeable surfaces may include drip, drip line, or other low flow non-spray technology. These restrictions may be modified if:

(1) the landscape area is adjacent to permeable surfacing and no runoff occurs; or

(2) the adjacent non-permeable surfaces are designed and constructed to drain entirely to landscaping; or

(3) the irrigation designer specifies an alternative design or technology, as part of the Landscape Documentation Package). Prevention of overspray and runoff must be confirmed during the irrigation audit.

(S) Slopes greater than 25% shall not be irrigated with an irrigation system with a precipitation rate exceeding 0.65 inches per hour. The irrigation controller shall be programmed to "cycle and soaking" in a manner that the precipitation rate applied matches the infiltration rate. This restriction may be modified if the landscape designer specifies an alternative design or technology, as part of the Landscape Documentation Package, and clearly demonstrates no runoff or erosion will occur. Prevention of runoff and erosion must be confirmed during the irrigation audit.

(2) Hydrozone.

(A) Each valve shall irrigate a hydrozone with similar site, slope, sun exposure, soil conditions, and plant materials with similar water use.

(B) Sprinkler heads and other emission devices shall be selected based on what is appropriate for the plant type within that hydrozone.

(C) Trees shall be placed on separate valves from shrubs, groundcovers, and turf.

(D) Individual hydrozones that mix plants of moderate and low water use, or moderate and high water use, may be allowed if the plant factor of the higher water using plant is used for calculations.

(E) Individual hydrozones that mix high and low water use plants shall not be permitted.

(F) On the landscape design plan and irrigation design plan, hydrozone areas shall be designated by number, letter, or other designation. On the irrigation design plan, designate the areas irrigated by each valve, and assign a number to each valve. Use this valve number in the Hydrozone Information Table (see Appendix B Section A). This table can also assist with the irrigation audit and programming the controller.

(b) The irrigation design plan, at a minimum, shall contain:

(1) Location and size of separate water meters for landscape;

(2) Location, type and size of all components of the irrigation system, including controllers, main and lateral lines, valves, sprinkler heads, moisture sensing devices, rain switches, quick couplers, pressure regulators, high flow sensor and backflow prevention devices;

(3) Static water pressure at the point of connection to the City's water supply;

(4) Flow rate (gallons per minute), application rate (inches per hour), and design operating pressure (pressure per square inch) for each station;

(5) Recycled water irrigation systems: landscapes using recycled water are considered Special Landscape Areas. The ET Adjustment Factor for Special Landscape Areas shall not exceed 1.0;

(6) The following statement: "I have complied with the criteria of the City of Hayward Bay-Friendly Water Efficient Landscape Ordinance, Hayward Municipal Code, Chapter 10, Article 12, and applied them accordingly for the efficient use of water in the irrigation design plan"; and

(7) The signature of a licensed landscape architect, certified irrigation designer, or any other person authorized to design an irrigation system. (See Sections 5500.1, 5615, 5641, 5641.1, 5641.2, 5641.3, 5641.4, 5641.5, 5641.6, 6701, 7027.5 of the Business and Professions Code, Section 832.27 of Title 16 of the California Code of Regulations, and Section 6721 of the Food and Agricultural Code.)

SEC. 10-12.11 GRADING DESIGN PLAN.

(a) For the efficient use of water, grading of a project site shall be designed to minimize soil erosion, runoff, and water waste. A grading plan shall be submitted as part of the Landscape Documentation Package. A comprehensive grading plan prepared by a civil engineer for permits satisfies this requirement.

(1) The project applicant shall submit a landscape grading plan that indicates finished configurations and elevations of the landscape area including:

(A) Height of graded slopes;

(B) Drainage patterns;

(C) Pad elevations;

(D) Finish grade; and

(E) Stormwater retention improvements, if applicable.

(2) To prevent excessive erosion and runoff, it is highly recommended that project applicants:

(A) Grade so that all irrigation and normal rainfall remains within property lines and does not drain on to non-permeable hardscapes;

(B) Avoid disruption of natural drainage patterns and undisturbed soil; and

(C) Avoid soil compaction in landscape areas.

(3) The grading design plan shall contain the following statement: "I have complied with the criteria of the City of Hayward Bay-Friendly Water Efficient Landscape Ordinance, Hayward Municipal Code, Chapter 10, Article 12, and applied them accordingly for the efficient use of water in the grading design plan" and shall bear the signature of a licensed professional as authorized by law.

SEC. 10-12.12 CERTIFICATE OF COMPLETION.

(a) The Certificate of Completion (see Appendix C for a sample certificate) shall include the following six (6) elements:

(1) Project information sheet that contains:

(A) Date;

(B) Project name;

(C) Project applicant name, telephone, and mailing address;

(D) Project address and location; and

(E) Property owner name, telephone, and mailing address;

(2) Certification by either the signer of the landscape design plan, or the signer of the irrigation design plan, or the licensed landscape contractor when permitted by the City that the landscape project has been installed per the approved Landscape Documentation Package;

(A) Where there have been significant changes made in the field during construction, these "as-built" or record drawings shall be included with the certification;

(3) Irrigation scheduling parameters used to set the controller:

(4) Landscape and irrigation maintenance schedule;

(5) Irrigation audit report; and

(6) Soil management report, if not submitted with Landscape Documentation Package, and documentation verifying implementation of soil report recommendations.

(b) The project applicant shall submit the signed Certificate of Completion to the City prior to requesting a landscape inspection;

(c) The City staff shall perform a final inspection upon receipt of Certificate of Completion. Building permit final approval shall not be completed until the landscape inspection is approved as follows:

(1) Receive the signed Certificate of Completion from the project applicant;

(2) Perform a landscape field inspection verifying implementation of the approved landscape and irrigation plans and soil report recommendations; and

(3) Sign the permit card upon the field verification.

SEC. 10-12.13 IRRIGATION SCHEDULING.

(a) For the efficient use of water, all irrigation schedules shall be developed, managed, and evaluated to utilize the minimum amount of water required to maintain plant health. Irrigation schedules shall meet the following criteria:

(1) Irrigation scheduling shall be regulated by automatic irrigation controllers.

(2) Overhead irrigation shall be scheduled between 9:00 p.m. and 8:00 a.m. unless weather conditions prevent it. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

(3) For implementation of the irrigation schedule, particular attention must be paid to irrigation run times, emission device, flow rate, and current reference evapotranspiration, so that applied water meets the Estimated Total Water Use. Total annual applied water shall be less than or equal to Maximum Applied Water Allowance (MAWA). Actual irrigation schedules shall be regulated by automatic irrigation controllers using current reference evapotranspiration data (e.g., CIMIS) or soil moisture sensor data.

(4) Parameters used to set the automatic controller shall be developed and submitted for each of the following:

(A) The plant establishment period;

(B) The established landscape; and

(C) Temporarily irrigated areas.

(5) Each irrigation schedule shall consider for each station all of the following that apply:

(A) Irrigation interval (days between irrigation);

(B) Irrigation run times (hours or minutes per irrigation event to avoid runoff);

(C) Number of cycle starts required for each irrigation event to avoid runoff;

(D) Amount of applied water scheduled to be applied on a monthly basis;

(E) Application rate setting;

(F) Root depth setting;

(G) Plant type setting;

(H) Soil type and mulch depth;

(I) Slope factor setting;

(J) Shade factor setting; and

(K) Irrigation uniformity or efficiency setting.

SEC. 10-12.14 LANDSCAPE AND IRRIGATION MAINTENANCE SCHEDULE.

(a) Landscapes shall be maintained to ensure water use efficiency. A regular maintenance schedule shall be submitted with the Certificate of Completion.

(b) A regular maintenance schedule shall include, but not be limited to, routine inspection; adjustment and repair of the irrigation system and its components; aerating and dethatching turf areas; replenishing mulch; fertilizing; pruning; weeding in all landscape areas, and removing and obstruction to emission devices. Operation of the irrigation system outside the normal watering window is allowed for auditing and system maintenance.

(c) Repair of all irrigation equipment shall be done with the originally installed components or their equivalents.

(d) A project applicant is encouraged to implement sustainable or environmentally-friendly practices for overall landscape maintenance. The following are highly recommended:

(1) Use the "Bay-Friendly Landscape Model Maintenance Specifications" and the "Bay-Friendly Landscape Guidelines" as an official reference documents in the landscape maintenance contract and/or with on-site landscape staff.

(2) At least one landscaping staff member or contractor should be trained in the use of IPM or is a "Bay-Friendly Qualified Landscape Professional."

SEC. 10-12.15 IRRIGATION AUDIT, SURVEY, AND WATER USE ANALYSIS.

(a) All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

(b) For new construction and rehabilitated landscape projects installed after January 1, 2010:

(1) The project applicant shall submit an irrigation audit report with the Certificate of Completion to the City that may include, but is not limited to: inspection, system tune-up, system test with distribution uniformity, reporting overspray or run off that causes overland flow, and preparation of an irrigation schedule;

(2) The City shall administer programs that may include, but not be limited to, irrigation water use analysis, irrigation audits, and irrigation surveys for compliance with the Maximum Applied Water Allowance.

SEC. 10-12.16 STORMWATER MANAGEMENT.

(a) Stormwater management practices minimize runoff and increase infiltration which recharges groundwater and improves water quality. Implementing stormwater best management practices into the landscape and grading design plans to minimize runoff and to increase on-site retention and infiltration are encouraged. Examples include:

(1) Rain gardens, infiltration beds, swales and basins that allow water to collect and soak into the ground;

(2) Constructed wetlands and retention ponds that retain water, handle excess flow and filter pollutants; and

(3) Pervious or porous surfaces (e.g., permeable pavers or blocks, pervious or porous concrete, etc.) that minimize runoff.

(b) Rain harvesting or catchment technologies such as cisterns are recommended for storage and use of rainwater to satisfy a percentage of the landscape irrigation requirements.

(c) Project applicants shall refer to Regional Water Quality Control Board for information on any applicable stormwater ordinances and stormwater management plans.

SEC. 10-12.17 PUBLIC EDUCATION.

(a) Model Homes. All model homes that are landscaped shall use signs and written information to demonstrate the principles of water efficient landscapes described in this Article.

(1) Signs shall be used to identify the model as an example of a water efficient landscape featuring elements such as hydrozones, irrigation equipment, and others that contribute to the overall water efficient theme.

(2) Information shall be provided about designing, installing, managing, and maintaining water efficient landscapes.

SEC. 10-12.18 IRRIGATION AUDIT, SURVEY, AND WATER USE ANALYSIS FOR EXISTING LANDSCAPES.

(a) This section shall apply to all existing landscapes that were installed before January 1, 2010, are over one acre in size, and exceed the applicable Maximum Applied Water Allowance.

(1) For all landscapes that have a water meter, the City shall administer programs that may include, but not be limited to, irrigation water use analyses, irrigation surveys, and irrigation audits to evaluate water use and provide recommendations as necessary to reduce landscape water use to a level that does not exceed the Maximum Applied Water Allowance for existing landscapes. The Maximum Applied Water Allowance for existing landscapes shall be calculated as: MAWA = (0.8) (ETo)(LA)(0.62).

(2) For all landscapes that do not have a separate irrigation water meter, the City shall administer programs that may include, but not be limited to, irrigation surveys and irrigation audits to evaluate water use and provide recommendations as necessary in order to prevent water waste.

(b) All landscape irrigation audits shall be conducted by a certified landscape irrigation auditor.

SEC. 10-12.19 EFFECTIVE PRECIPITATION.

(a) A local agency may consider Effective Precipitation (25% of annual precipitation) in tracking water use and may use the following equation to calculate Maximum Applied Water Allowance:
MAWA= (ETo - Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)].

## Appendix A. REFERENCE EVAPOTRANSPIRATION (ETO) TABLE*

| County and City | Jan | Feb | Mar | Apr | May | Jun | Jul | Aug | Sep | Oct | Nov | Dec | Annual ETo |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **ALAMEDA** | | | | | | | | | | | | | |
| Fremont | 1.5 | 1.9 | 3.4 | 4.7 | 5.4 | 6.3 | 6.7 | 6.0 | 4.5 | 3.4 | 1.8 | 1.5 | 47.0 |
| Livermore | 1.2 | 1.5 | 2.9 | 4.4 | 5.9 | 6.6 | 7.4 | 6.4 | 5.3 | 3.2 | 1.5 | 0.9 | 47.2 |
| Oakland | 1.5 | 1.5 | 2.8 | 3.9 | 5.1 | 5.3 | 6.0 | 5.5 | 4.8 | 3.1 | 1.4 | 0.9 | 41.8 |
| Oakland Foothills | 1.1 | 1.4 | 2.7 | 3.7 | 5.1 | 6.4 | 5.8 | 4.9 | 3.6 | 2.6 | 1.4 | 1.0 | 39.6 |
| Pleasanton | 0.8 | 1.5 | 2.9 | 4.4 | 5.6 | 6.7 | 7.4 | 6.4 | 4.7 | 3.3 | 1.5 | 1.0 | 46.2 |
| Union City | 1.4 | 1.8 | 3.1 | 4.2 | 5.4 | 5.9 | 6.4 | 5.7 | 4.4 | 3.1 | 1.5 | 1.2 | 44.2 |

* The values in this table were derived from:

1) California Irrigation Management Information System (CIMIS);
2) Reference Evapo Transpiration Zones Map, UC Dept. of Land, Air & Water Resources and California Dept. of Water Resources 1999;
3) Reference Evapotranspiration for California, University of Californian, Department of Agriculture and Natural Resources (1987) Bulletin 1922; and
4) Determining Daily Reference Evapotranspiration, Coorperative Extension UC Division of Agriculture and Natural Resources (1987), Publication Leaflet 21426.

**Appendix B. WATER EFFICIENT LANDSCAPE WORKSHEET**

This worksheet is filled out by the project applicant and it is a required element of the Landscape Documentation Package. Please complete all sections (A and B) of the worksheet.

**SECTION A. HYDROZONE INFORMATION TABLE**

Please complete the hydrozone table(s) for each hydrozone. Use as many tables as necessary to provide the square footage of landscape area per hydrozone.

| Hydrozone* | Zone or Valve | Irrigation Method** | Area (Sq. Ft.) | % of Landscape Area |
|---|---|---|---|---|
| | | | | |
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| | | | | |
| | | | | |
| | **Total** | | | **100%** |

** **Hydrozone***

*HW = High Water Use Plants*

*MW = Moderate Water Use Plants*

*LW = Low Water Use Plants*

*** **Irrigation Method***

*MS = Micro-spray*

*S = Spray*

*R = Rotor*

*B = Bubbler*

*D = Drip*

*O = Other*

## SECTION B. WATER BUDGET CALCULATIONS

### Section B1. Maximum Applied Water Allowance (MAWA)

The project's Maximum Applied Water Allowance shall be calculated using this equation:

MAWA = (44.2) (0.62) [(0.7 x LA) + (0.3 x SLA)]

*Where:*

| | |
|---|---|
| MAWA | Maximum Applied Water Allowance (gallons per year) |
| ETo | 44.2: ETo of Union City in Reference Evapotranspiration from Appendix A (inches per year) |
| 0.7 | ET Adjustment Factor (ETAF) |
| LA | Landscaped Area includes Special Landscape Area (square feet) |
| 0.62 | Conversion factor (to gallons per square foot) |
| SLA | Portion of the landscape area identified as Special Landscape Area (square feet) |
| 0.3 | The additional ET Adjustment Factor for Special Landscape Area (1.0 - 0.7 = 0.3) |

**Maximum Applied Water Allowance** = _____**gallons per year**

Show calculations.

| |
|---|
| |

### Effective Precipitation (Eppt)

If considering Effective Precipitation, use 25% of annual precipitation. Use the following equation to calculate Maximum Applied Water Allowance:

MAWA (44.2 – Eppt) (0.62) [(0.7 x LA) + (0.3 x SLA)]

**Maximum Applied Water Allowance** = _____**gallons per year**

Show calculations.

| |
|---|
| |

The project's Estimated Total Water Use is calculated using the following formula:

$$ETWU = (ETo)(0.62)\left(\frac{PF\,x\,HA}{IE} + SLA\right)$$

*Where*:

| | |
|---|---|
| ETWU | Estimated total water use per year (gallons per year) |
| ETo | 44.2 ETo of Union City in Reference Evapotranspiration (inches per year) |
| PF | Plant Factor from WUCOLS (see Definitions) |
| HA | Hydrozone Area [high, medium, and low water use areas] (square feet) |
| SLA | Special Landscape Area (square feet) |
| 0.62 | Conversion Factor (to gallons per square foot) |
| IE | Irrigation Efficiency (minimum 0.71) |

**Hydrozone Table for Calculating ETWU**

Please complete the hydrozone table(s). Use as many tables as necessary.

| Hydrozone | Plant Water Use Type(s) | Plant Factor (PF) | Area (HA) (square feet) | PF x HA (square feet) |
|---|---|---|---|---|
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | Sum | |
| | SLA | | | |

**Estimated Total Water Use = _____gallons**

| **TABLE A - Plant Factors (PF) Based on WUCOLS** | | | **TABLE B - Irrigation Efficiency (IE)** | |
|---|---|---|---|---|
| Cool Season Turf | 0.8 | | Bubblers | 0.85 |
| Warm Season Turf | 0.6 | | Drip Emitters | 0.85 |
| High Water Use Plants | 0.7 – 1.0 | | Stream Sprinklers (in planter strips 8 feet or wider) | 0.75 |
| Moderate Water Use Plants | 0.4 – 0.6 | | Spray Sprinklers (in planter strips 8 feet or wider) | 0.625 |
| Low Water Use Plants | 0.1 – 0.3 | | Subsurface | 0.85 |

**Appendix C. CERTIFICATE OF COMPLETION**
This certificate is filled out by the project applicant upon completion of the landscape project.

**PART 1. PROJECT INFORMATION SHEET**

| | | |
|---|---|---|
| Date | Permit No. | |
| Project Name | Project Address | |
| Name of Project Applicant | Telephone No. | |
| | Fax No. | |
| Title | Email Address | |
| Company | Street Address | |
| City | State | Zip Code |

**Property Owner or his/her designee:**

| | | |
|---|---|---|
| Name | Telephone No. | |
| | Fax No. | |
| Title | Email Address | |
| Company | Street Address | |
| City | State | Zip Code |

"I/we certify that I/we have received copies of all the documents within the Landscape Documentation Package and the Certificate of Completion and that it is our responsibility to see that the project is maintained in accordance with the Landscape and Irrigation Maintenance Schedule."

Property Owner Signature Date

**PART 2. CERTIFICATION OF INSTALLATION ACCORDING TO THE LANDSCAPE DOCUMENTATION PACKAGE**

"I/we certify that based upon periodic site observations, the work has been substantially completed in accordance with the ordinance and that the landscape planting and irrigation installation conform with the criteria and specifications of the approved Landscape Documentation Package."

| | | |
|---|---|---|
| Signature* | Date | |
| Name (print) | Telephone No. | |
| Title | Email Address | |
| License No. or Certification No. | | |
| Company | Street Address | |
| City | State | Zip Code |

*Signer of the landscape design plan, signer of the irrigation plan, or a licensed landscape contractor when permitted by the City.

PART 3. IRRIGATION SCHEDULING
Attach parameters for setting the irrigation schedule on controller.

PART 4. SCHEDULE OF LANDSCAPE AND IRRIGATION MAINTENANCE
Attach schedule of Landscape and Irrigation Maintenance.

PART 5. LANDSCAPE IRRIGATION AUDIT REPORT
Attach Landscape Irrigation Audit Report.

PART 6. SOIL MANAGEMENT REPORT
Attach soil management report, if not previously submitted with the Landscape Documentation Package.

Attach documentation verifying implementation of recommendations from soil analysis report.

# APPENDIX J

## WATER SERVICE RATES

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CITY OF HAYWARD
HEART OF THE BAY

# WATER SERVICE RATES AND CHARGES
# (EFFECTIVE OCTOBER 1, 2010)

## WATER RATES

### Single Family Residential (including duplex, triplex and fourplex accounts)

| **Inside City of Hayward** | **Cost Per CCF of Metered Water Consumption** |
|---|---|
| 1 to 8 ccf (hundred cubic feet) | $2.90 |
| 9 to 25 ccf | $3.40 |
| 26 - 60 ccf | $4.25 |
| Over 60 ccf | $4.65 |

**Outside City of Hayward**

| | |
|---|---|
| 1 to 8 ccf | $4.35 |
| 9 to 25 ccf | $5.10 |
| 26 to 60 ccf | $6.38 |
| Over 60 ccf | $6.98 |

### Multi-Family and Non-Residential

| **Inside City of Hayward** | **Cost Per CCF of Metered Water Consumption** |
|---|---|
| 1 to 200 ccf | $3.65 |
| Over 200 ccf | $4.20 |

**Outside City of Hayward**

| | |
|---|---|
| 1 to 200 ccf | $5.48 |
| Over 200 ccf | $6.30 |

Note: hundred cubic feet = approximately 748 gallons of water

## SERVICE CHARGES (Two-Month Billing Period)

| Meter Size | Charge Inside City | Charge Outside City |
|---|---|---|
| 5/8" (Standard) | $9.00 | $13.50 |
| 3/4" | $12.20 | $18.30 |
| 1" | $18.50 | $27.75 |
| 1 1/2" | $40.60 | $60.90 |
| 2" | $71.40 | $107.10 |
| 3" | $180.20 | $270.30 |
| 4" | $357.00 | $535.50 |
| 6" | $629.80 | $944.70 |
| 8" | $871.80 | $1,307.70 |
| 10" | $1,050.40 | $1,575.60 |

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