



Redwood City Recycled Water Project 2007 Progress Report

Redwood City Recycled Water
Task Force Recommendations

Final Report

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Prepared for

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Preface

When the Redwood City Recycled Water Task Force delivered their recommendations to the City Council in March of 2004, it was determined that progress reports should be prepared for the Council and the community each year. As a result, the project team has been hosting annual meetings with the Task Force, for the purpose of going over a draft of the report before it is finalized and published.

This year tremendous progress has occurred in many areas, including the completion of a four-million gallon storage and pumping facility and the delivery of recycled water beginning in May 2007. The treatment and storage facilities and distribution pipelines have been designed to provide high quality recycled water to Redwood City. The project focus is first to reach the goal of 900 acre feet of recycled water to existing customers by 2010, after which the City may focus on expanding the system west of Highway 101 and / or becoming a “wholesaler” of recycled water to adjacent communities. To that end, 22 commercial and City-owned landscape irrigation sites in Redwood Shores have been retrofitted, and all of which are now using recycled water. Thirty-four additional commercial and industrial customers in the Redwood Shores and Seaport area have submitted applications for recycled water service. All of these sites are expected to begin using recycled water by the end of 2009 when the pipelines are projected to be complete.

The City was awarded two grants totaling nearly \$4 million from state-sponsored programs that promote recycled water. The grant monies will be applied directly to the project costs. Staff continues to stay abreast of grant opportunities and pursue outside funding when feasible.

The Project was honored with two awards at the National WaterReuse Symposium. Redwood City was awarded the *Large Project of the Year Award* and Hotel Sofitel was awarded the *Customer of the Year Award*. These two prestigious awards are a testament to the success of the project. WaterReuse is the premier national non-profit organization devoted to water recycling.

In addition, there are many new developments related to specific Task Force “Other Potential Measures” (OPMs) to report:

1. The City drilled an exploratory groundwater well in Red Morton Park and is investigating the results to determine the feasibility of using the groundwater for irrigation.
2. The commercial toilet replacement program replaced 219 toilets in 2007, bringing the total to 509 toilets replaced since the beginning of the program. The City has also been conducting a pilot program using low-flow urinals and is considering a urinal replacement program for 2008. This is in addition to over 7,800 residential toilets that have been installed as a portion of the City’s Direct Install Toilet Replacement Program and the 1,350 toilets that were given to residents in return for their old, water wasting toilet.
3. The City Council adopted new international plumbing codes January 14, 2008. In 2008, City Council will see recommendations for additional “green building” requirements.
4. A California Irrigation Management Information System (CIMIS) was installed in Redwood City in partnership with the California Department of Water Resources to collect local weather data that can be used to develop irrigation requirements for Redwood City customers.

5. A promising emerging technology for staff right now is sub-surface irrigation for large grass areas/play fields. During 2008, staff will be reviewing test results, performance, water efficiency, and maintenance costs of this technology.

After reviewing the draft report and answering questions with the Recycled Water Task Force on January 9, 2008, the Recycled Water Project Team is pleased to submit this 2007 Progress Report. We hope that all readers will find the report useful and informative.

Respectfully submitted for the Project Team,

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Glossary of Abbreviations

af/yr	acre-feet per year
BACWA	Bay Area Clean Water Agencies
BAWSCA	Bay Area Water Conservation and Supply Agency
BMP	Best Management Practice
CIMIS	California Irrigation Management Information System
CUWCC	California Urban Water Conservation Council
DHS	Department of Health Services (replaced by DPH in 2007)
DPH	Department of Public Health (replaced DHS in 2007)
DMF Mods	Dual Media Filtration Modifications
DSP	Disinfection Storage and Pumping
EBMUD	East Bay Municipal Utility District
EPA	Environmental Protection Agency
ET	Evapotranspiration
FY	Fiscal Year
GPF	Gallon Per Flush
OPM	Other Potential Measure
SBSA	South Bayside Systems Authority
SFPUC	San Francisco Public Utilities Commission
UWMP	Urban Water Management Plan

Section 1: Introduction

1.1 Background

Redwood City (the City) is 100% reliant on one source of potable (drinking) water supply, the San Francisco regional water system (regional system). Since 2001, the City has been studying the feasibility of using disinfected tertiary recycled water for landscape irrigation, industrial applications, and other uses that are allowed by Title 22 of the California Code of Regulations. Studies showed that implementing a recycled water program, in conjunction with an aggressive conservation program, would enable the City to eliminate its potable water supply deficit by 2010. In August 2003, Redwood City Council approved a broadly-defined and flexible recycled water project to help the City achieve its goal of reducing demands on the Regional system.

Also in August 2003, City Council created the Community Task Force on Recycled Water (Task Force). The objective of the Task Force, in summary, was to identify ways to reduce drinking water demand by 2,000 (af/yr) in a financially feasible manner; and in a way that would give the City alternatives to using recycled water at schools and playgrounds. The Task Force focused on solving the City's water supply and demand imbalance by the year 2010. The Task Force presented its recommendations to City Council via the Recycled Water Task Force Report, dated March 3, 2004 and City Council accepted the Task Force recommendations on March 22, 2004.

1.2 Purpose

The Task Force Report requested that City staff prepare annual reports on the City's progress toward implementing the recommendations presented in the Task Force Report and that these annual reports are made available for City Council and public review. This is the third Annual Status Report on Task Force Recommendations.

1.3 Potable (Drinking) Water Deficit Summary

The City continues to track its overall progress in eliminating its potable water deficit by the year 2010. Table 1 provides a summary of the potable water demand and deficit history over the past 9 years. The variations in potable water demand from year to year reflect many variables such as weather, implementation of increasingly 'active' conservation measures, and commercial building occupancy. The deficit increase from 2002/2003 to 2003/2004 was due to a two-week period of extremely hot weather in the Spring of 2004, which triggered irrigation demand almost a month earlier than normal. It is reasonable to assume that in addition, irrigation schedules were not reduced once the hot weather passed. The deficit decrease from 2003/2004 to 2005/2006 was due to conservation efforts along with precipitation totals. The deficit increase from 2005/2006 to 2006/2007 is possibly due to low precipitation totals and is currently being analyzed. Rises in Redwood City population are shown in Table 2. Although population does affect total potable water consumption, it is not the primary factor that dictates variation in use from year to year.

Table 1: Redwood City Potable Water Deficit History

Fiscal Year	Potable Water Supply Deficit (af/yr) ^(a)	Irrigation Demand ^(c)
1998/1999	549	No data
1999/2000	1,029	Average
2000/2001	950	High
2001/2002	794	Average
2002/2003	525	High
2003/2004	1,410	Very high
2004/2005	209	Very low
2005/2006	-55	Low
2006/2007	829	Average
9-Yr. Ave.	693	

Table 1 Notes:

- (a) Deficit is based on Redwood City's contractual "supply assurance" of 12,243 af/yr from the San Francisco regional water system.
- (b) Irrigation demand data is based on CIMIS data from Oakland Hills.

Table 2: Rise in Redwood City Population

Population by place from 1970 to 2005					
Places	1970 ¹	1980 ¹	1990 ¹	2000 ¹	2005 ²
Redwood City	55,360	55,400	66,100	75,400	76,000
San Mateo County	555,000	587,000	650,000	707,000	723,000
California	19,853,000	23,588,000	29,759,000	33,872,000	36,810,000
United States	201,607,000	224,811,000	248,710,000	281,422,000	296,503,000
¹ Source: US Census					
² Source: California Department of Finance E-5; 2005 (US estimate is from the Census)					
Numbers have been rounded					

1.4 Recycled Water Project Costs

When the Task Force began their work in the fall of 2003, the planning-level estimated cost of the recycled water project was \$43.6 million. This estimate was initially produced in 2002, using 2001 cost data. During the City Council meeting of January 24, 2005, City staff presented the Water Financing Plan Update (2004) for the purpose of financing Alternative TF. The presentation included a substantially refined and updated recycled water project cost estimate of \$72 million (for Phase One, east of Hwy. 101) to \$84 million (Complete Alt. TF project).

Public comments during the January 2005 Council meeting indicated concern and apprehension about the increasing costs of the recycled water project. The cause for the cost increase includes many different factors involving project design changes, revised methods for estimating costs, cost escalation over time, and pricing volatility in the construction industry. Recycled

water project design changes and escalation costs were not included in the Alternative TF cost estimate to allow an equitable comparison of the Alternative TF project costs to the project alternatives delineated in the 2002 Water Recycling Feasibility Studies.

Table 2 provides actual bid prices compared to 2005 estimates and pre-bid engineer's estimates for projects that have been bid as of December 14, 2007. For the most part, project bids have been very close to or below engineer's estimates and the City does not anticipate a significant change in the costs for pipeline projects that will be out for bid in 2008.

Table 3: Recycled Water Project 2005 Cost Estimates vs. Actual Costs
(completed / committed projects as of December 21, 2007)

Bid Package	2005 Cost Estimate	Pre-Bid Engineer's Estimate	Actual Bid Price as of 12/14/2007	Comparison to 2005 Cost Estimate ^(a)
SBSA Site Preparation	\$72,000	\$64,000	\$64,000	-11%
SBSA Disinfection Storage and Pumping	\$15,600,000	\$15,600,000	\$14,911,000	-4%
SBSA Sheet Piles (includes salvage bid) ^(b)	\$799,000	\$799,000	\$599,000	-25%
SBSA Connecting Pipelines & Utilities	\$376,000	\$376,000	\$601,000	+60%
SBSA Dual Media Filter Modifications	\$1,714,000	\$1,465,000	\$2,138,000	+25%
SBSA – Change Order Contingency	\$888,000	-	-	-30%
• SBSA Change Orders Paid	-	-	\$254,000	-
• SBSA Potential Additional Change Orders	-	-	\$369,000	-
Highway 101 Bike Path Pipeline	\$1,493,000	\$1,855,000	\$1,638,000	+10%
Redwood Shores Recycled Water Pipelines (BP 1 & 2)	\$10,685,000	-	-	-31%
• Bid Package 1	-	\$4,428,000	\$4,211,000	-
• Bid Package 2	-	\$3,540,000	\$3,124,000	-
Redwood Shores Recycled Water Pipeline Bid Package 3	\$3,188,000	\$5,382,000	\$4,124,000	+29%
Skyway Recycled Water Pipeline Bid Package 4	\$2,963,000	\$2,993,000	\$2,663,000	-10%
Seaport Recycled Water Pipelines (BP 5 & 6)	\$4,129,000			-27%
• Bid Package 5	-	\$2,762,000	\$2,105,000	-
• Bid Package 6	-	\$1,297,000	\$908,000 ^(c)	-
Site Retrofits – Group Bid 1	\$665,000	\$300,000	\$329,000	-50%
Totals^(d)	\$42,572,000	\$40,861,000	\$38,038,000	-11%

Table 3 Notes:

- (a) This column represents the actual bid price compared to the 2005 cost estimate in terms of percentage above (+) or below (-) the 2005 cost estimate.
- (b) After sheet piles had served their purpose during construction, the City sold the piles for \$200,000 to the highest bidder for reuse
- (c) Contractor bid has been received, but is not yet confirmed.
- (d) This table only provides cost data on those items that have been bid as of December 21, 2007. The total costs should not be compared to the full \$72 million Phase 1 project because several components of the Phase 1 project have not yet been bid.

1.5 Project Financing

The Recycled Water Project is financed by the City's Water Enterprise Fund. The 2007 Water Financing Plan provides updated financial projections and rate recommendations for maintaining the long-term financial health of the City's water enterprise. Key findings of the Water Financing Plan - June 2007 Update include:

- Construction of the recycled water project has been moving forward on schedule and on budget. Overall, project expenditures have been consistent with planning estimates.
- In May 2007, the City issued its third and final bond issue for funding the first phase of the project, which provides recycled water to areas east of Highway 101.
- Recycled water treatment and backbone transmission lines have been oversized to provide capacity for expansion, such as for providing recycled water to areas west of Highway 101 and / or other communities and regional agencies.
- The approved water rate increase for Fiscal Year 2007/08 remains at 10%, in line with prior financial plan projections since December 2004.
- The main drivers of expense and rate increases include:
 - SFPUC wholesale water rate increases – SFPUC rates are projected to more than triple within the next decade from \$1.22 per hundred cubic feet in 2006/07 to over \$3.60. Even accounting for reduced potable water demand due to conservation and recycled water use, the cost of potable water supply from the SFPUC is projected to increase from about \$7 million in 2006/07 to over \$18 million by 2013/14.
 - Recycled water project financing – Annual debt service for the three bond issues used to fund the project totals approximately \$4.7 million.
 - Operating cost inflation – The City's annual operating and maintenance costs – excluding costs of water supply, debt service, and capital – are projected to escalate at the annual rate of 4.0%. This results in a projected cost increase of roughly \$5 million over the next 10 years.

The Recycled Water Project has two sources of funding: City-issued water revenue bonds and state- or federally sponsored grants.

1.5.1 Revenue Bonds

The City Council has issued three series of Water Revenue Bonds to date for the purpose of financing the construction of the project:

- Series 2005 Based on the approved 2004 Water Financing Plan
Net funds for construction and associated costs: \$32.8M
- Series 2006 Based on the approved Water Financing Plan - 2006 Update
Net funds for construction and associated costs: \$23.8M
- Series 2007 Based on the approved Water Financing Plan – 2007 Update
Net funds for construction and associated costs: \$13.9M

1.5.2 Grants

City staff continues to monitor grant opportunities and pursue outside funding when feasible. The project is currently pursuing three separate grants administered by the State Water Resources Control Board (SWRCB), the California Department of Water Resources (DWR), and the US Bureau of Reclamation.

SWRCB Proposition 13 Grant: In June 2007 Redwood City was awarded a \$2.9M grant from the SWRCB Proposition 13. This reimbursement grant will be used to fund 25 percent of the construction costs of distribution pipeline Bid Packages 5 through 9. The contract between the SWRCB and the City was executed in October 2007 and the City expects to be receiving funds in early 2008.

DWR Proposition 50 Grant: Redwood City is one of 13 Bay-area sponsors that organized to pursue a Proposition 50 grant from DWR under the Integrated Regional Water Management program. A letter of Conditional Award was issued in March 2007 and Redwood City has been allocated approximately \$1M, which is estimated to be about 34 percent of the estimated construction cost of Bid Package 7. The Bay Area Clean Water Agencies (BACWA) will be the grant's contracting agency. A contract between DWR and BACWA is anticipated to be completed by mid-2008 and staff expects to receive funds in the second half of 2008.

Federal Title XVI Funding: The City is seeking \$1.1M in federal grants from the US Bureau of Reclamation, which would fund 25 percent of Bid Packages 5 and 6. Redwood City is one of 12 local agencies that are working together as the Bay Area Recycled Water Coalition to obtain Federal authorization and appropriations for water recycling projects. In July 2007 the House of Representatives passed HR 1526 authorizing seven water recycling projects. A companion bill,

S 1475, was introduced to the Senate in May and is awaiting action. The earliest the City would receive funds is anticipated to be 2010.

1.6 Report Organization

This report is organized to allow the reader to track the progression of the project over time. For each Task Force recommendation, the previous years' status is provided in a text box to allow the reader to review how each recommendation has evolved to the current condition.

Section 2: Task Force Recommendations

The Task Force Report recommended that the City implement Project “Alternative TF,” which is made up of several components:

- a recycled water system that will provide 1,710 af/yr of disinfected tertiary recycled water for landscape irrigation and other non-potable uses (industrial and indoor uses)
- potable demand reduction by replacing natural grass playing fields with synthetic turf
- continuing to use existing groundwater for landscape irrigation
- additional water conservation measures
 - water efficient pre-rinse spray nozzles in dishwashing facilities
 - evapotranspiration controllers for landscape irrigation systems
 - hot water recirculation pumps on residential water systems

The Task Force Report also recommended that the City investigate or implement ten “Other Potential Measures” (OPMs) which may further reduce potable demand. The OPMs are not included in Alternative TF because the potential potable demand reductions were difficult to quantify, additional research was required to determine their viability, and/or technology improvements are needed before the OPM can be implemented.

This section provides a discussion of each Task Force recommendation and its status.

2.1 Project Alternative TF

Implementation of Project Alternative TF, as it is now envisioned by the City, is anticipated to reduce potable water demand by 2,000 af/yr, by the year 2020. The 2010 interim goal for use of recycled water is 900 af/yr. Additionally, the City Council’s ‘active’ conservation measures target a cumulative potable water savings of 815 af/yr by 2010. Any additional water savings achieved as a result of implementation of the conservation measures and OPMs recommended by the Task Force will be accruing on top of these goals. The City’s Urban Water Management Plan (UWMP) was updated in the second half of 2005. It reflects and expands on the content of this report and the potential, additional conservation that may be achieved via full implementation of Alternative TF and Task Force OPMs. The City’s UWMP is available online at:

www.redwoodcity.org/publicworks/water/urban_water_management_plan.htm.

Table 3 summarizes the estimated potable demand reduction for each of the 2004 Task Force recommendations and provides re-projected potable demand reductions for 2005, 2006 and 2007 based on updated data as the project progresses.

Table 4 summarizes the progress of each of the Task Force recommendations. It should be noted that while the outcome of potable water demand reduction in the second year of the project is negligible, there has been substantial progress in completing the array of activities that precede delivery of recycled water.

Table 4: Projected Potable Demand Reduction Due to Task Force Recommendations

Task Force Recommendation	Status	2004 Estimated Potable Demand Reduction ^(a) (af/yr)	2005 Re-Projected Total Demand Reduction ^(b) (af/yr)	2006 Re-Projected Total Demand Reduction ^(b) (af/yr)	2007 Re-Projected Total Demand Reduction ^(b) (af/yr)
Recycled Water System					
Alternative TF Alignment ^(e)	In Design/ Construction	1,687	1,681	1,686 – 1,762	1,349 – 1,436 ^(f)
Downtown Cinema Dual Plumbing	Closed (2004)	23	0	0	0
<i>Subtotal</i>		<i>1,710</i>	<i>1,681</i>	<i>1,686 – 1,762</i>	<i>1,349 – 1,436</i>
Synthetic Turf Playing Fields					
Red Morton Park (3 fields)	Complete (2007)	51	51	51	51
Sandpiper Park	Construction	23	23	23	23
Marlin Park	Construction	12	12	12	12
Hawes Park	2008	9	9	9	9
Hoover Park	Complete (2005)	25 ^(c)	9 ^(c)	9	9
Sequoia High School	Complete (2005)	14 ^(c)	6 ^(c)	6	6
Cañada College	Complete (2005)	16	33 ^(g)	33	33
<i>Subtotal</i>		<i>150</i>	<i>143</i>	<i>143</i>	<i>143</i>
Existing Groundwater Use					
Sequoia High School ^(h)	Complete (2005)	57	35	35	35
<i>Subtotal</i>		<i>57</i>	<i>35</i>	<i>35</i>	<i>35</i>
Additional Conservation					
Pre-Rinse Spray Nozzles	Complete (2006)	33	40	42	42
ET Controllers	Pilot in Progress	46	46	46	46
Hot Water Recirc. Pumps	Ongoing	6	6	6	6
<i>Subtotal</i>		<i>85</i>	<i>92</i>	<i>94</i>	<i>94</i>
TOTAL – Alternative TF		2,002	1,951	1,958 – 2,034	1,621 – 1,708

Task Force Recommendation	Status	2004 Estimated Potable Demand Reduction ^(a) (af/yr)	2005 Re-Projected Total Demand Reduction ^(b) (af/yr)	2006 Re-Projected Total Demand Reduction ^(b) (af/yr)	2007 Re-Projected Total Demand Reduction ^(b) (af/yr)
Other Potential Measures					
#1: Additional Groundwater Use	Complete	0	0	0	0
#2: Commercial Toilet Replacement	Ongoing	0	5 – 10 ^(d)	5 – 10	5 – 10
#3: Promote Conservation	Ongoing	0	0	0	0
#4: Conservation Ordinance	Under Evaluation	0	0	0	0
#5: Low-Flow Urinal Ordinance	Under Evaluation	0	0	0	0
#6: New Construction Ordinance	Under Evaluation	0	0	0	0
#7: Electronic Eye Faucet Program	Under Evaluation	0	0	0	0
#8: Water Swaps	Ongoing	0	0	0	0
#9: Automated Irrigation Technology	Ongoing	0	0	0	0
#10: Treatment Technology	Ongoing	0	0	0	0
TOTAL – Other Potential Measures		0	5 - 10	5 – 10	5 – 10

Table 3 Notes:

- (a) The values for the estimated recycled water demands are taken from the Market Assessment that was used as the basis for the Technical Memorandum by Kennedy/Jenks "Recycled Water Alternatives for the Community Task Force on Recycled Water – FINAL (Rev 1)" dated 15 March, 2004. The assumptions for other potable water demand reductions are taken from the Recycled Water Task Force Report, dated March 3, 2004.
- (b) The estimated potable water demand reductions have been updated, where applicable, based on new information made available due to ongoing recycled water market assessment refinement and collection of additional water use data.
- (c) The potable demand reduction estimated in Alternative TF for turf replacement at Hoover Park and Sequoia High School was based on theoretical water demands. The updated potable demand reductions provided in 2005 are based on a 14-year average of water meter records provided by City staff.
- (d) Assumes a potable water demand reduction of 25 gallons per day per toilet and 5 days per week occupancy for commercial buildings.
- (e) Recycled water demands include First Step Project customers.
- (f) The 2007 re-projected recycled demands are lower than in previous years primarily due to recently modified planning information provided by an industrial customer in the Seaport Area. During the 2002 market assessment, RMC (now Cemex) was planning to expand their operations to include a large-scale dredge material washing facility that would use a large volume of recycled water (326 to 337 af/yr). Cemex is no longer pursuing the expansion, which results in a lowered recycled water demand, but does not result in increased potable demands.
- (g) The estimated savings at Canada College are based on theoretical irrigation demands of the playing fields replaced by turf. The 2004 Task Force Report assumed 2.5 acres of fields would be replaced. However, in 2005, the college doubled the area of fields replaced by turf, thereby increasing the estimated water savings.
- (h) To maintain continuity with the 2002 Market Assessment and the 2004 Task Force Report, the estimated savings for groundwater use at Sequoia High School is based on a theoretical irrigation demand of 71 af/yr for the entire site. The Task Force assumed that replacement of playing fields with artificial turf would reduce potable consumption by 14 af/yr and that the rest of the site was irrigated with groundwater, providing a 57 af/yr potable reduction. Subsequently, the City determined that a reduction of 6 af/yr could be realized by artificial turf replacement and that an average of 30 af/yr of potable water is used for irrigation. Therefore, the estimated savings is reduced to 35 af/yr.

Table 5: Status of Task Force Recommendations

Task Force Recommendation	Status	2005 Demand Reduction Achieved ^(a) (af/yr)	2006 Demand Reduction Achieved ^(e) (af/yr)	2007 Demand Reduction Achieved ^(g) (af/yr)	2008 Projected Demand Reduction (af/yr)
Recycled Water System					
Alternative TF Alignment ^(f)	Design/ Construction	26	33	93	492
Downtown Cinema Dual Plumbing	Closed (2004)	0	0	0	0
<i>Subtotal</i>		26	33	93	492
Synthetic Turf Playing Fields					
Red Morton Park (3 fields)	Complete (2007)	0	0	0	51
Sandpiper Park	Construction	0	0	0	23
Marlin Park	Construction	0	0	0	12
Hawes Park	2008	0	0	0	0
Hoover Park	Complete (2005)	9 ^(b)	9	9	9
Sequoia High School	Complete (2005)	6 ^(b)	6	6	6
Cañada College	Complete (2005)	0	33	33	33
<i>Subtotal</i>		15	48	48	134
Existing Groundwater Use					
Sequoia High School	Complete (2005)	35	35	35	35
<i>Subtotal</i>		35	35	35	35
Additional Conservation					
Pre-Rinse Spray Nozzles	Complete (2006)	14	42	42	42
ET Controllers	Pilot in Progress	0	0	0	0
Hot Water Recirc. Pumps	Ongoing	0	0	0	0
<i>Subtotal</i>		14	42	42	42
TOTAL – Alternative TF		90^(c)	158	218	703

Task Force Recommendation	Status	2005 Demand Reduction Achieved ^(a) (af/yr)	2006 Demand Reduction Achieved ^(e) (af/yr)	2007 Demand Reduction Achieved ^(g) (af/yr)	2008 Projected Demand Reduction (af/yr)
Other Potential Measures					
#1: Additional Groundwater Use	Complete	0	0	0	0
#2: Commercial Toilet Replacement	Ongoing	0	3 ^(d)	8 ^(d)	10 ^(d)
#3: Promote Conservation	Ongoing	0	0	0	0
#4: Conservation Ordinance	Under Evaluation	0	0	0	0
#5: Low-Flow Urinal Ordinance	Under Evaluation	0	0	0	0
#6: New Construction Ordinance	Under Evaluation	0	0	0	0
#7: Electronic Eye Faucet Program	Under Evaluation	0	0	0	0
#8: Water Swaps	Ongoing	0	0	0	0
#9: Automated Irrigation Technology	Ongoing	0	0	0	0
#10: Treatment Technology	Ongoing	0	0	0	0
TOTAL – Other Potential Measures		0	3	8	10

Table 4 Notes:

- (a) Data as of May 2005.
- (b) The potable demand reduction estimated in Alternative TF for turf replacement at Hoover Park and Sequoia High School was based on theoretical water demands. The updated potable demand reductions provided in 2005 are based on a 14-year average of water meter records provided by City staff.
- (c) In addition, cumulative water savings due to incremental implementation of the City's 'active' conservation measures is estimated to be 198 af/yr as of Feb. 2005 (see Appendix B)
- (d) Assumes a potable water demand reduction of 25 gallons per day per toilet and 5 days per week occupancy for commercial buildings.
- (e) Data as of July 2006.
- (f) Recycled water demands include First Step Project customers
- (g) Data as of December 2007.

2.1.1 Recycled Water System

This section describes the status of the Alternative TF recycled water system, which the Task Force estimated would reduce potable water demand by 1,710 af/yr. The recycled water will be used to irrigate Task Force-eligible landscapes (commercial, City medians and parkways, Caltrans, and Homeowner's Associations) as well as for industrial applications and for indoor uses, e.g., toilet flushing in new commercial buildings. The Alternative TF recycled water system includes pipelines and customers in Redwood Shores, the Greater Bayfront Area, and portions of Central Redwood City.

2.1.1.1 Alternative TF Recycled Water System

Recommendation: Deliver recycled water to 108 customers for an estimated potable water demand reduction of 1,710 af/yr. Ninety-three of the prospective customers are existing City water customers and 15 customers are future developments. Refer to Figure 1 for an illustration of the Alternative TF recycled water project.

2.1.1.1.1 Recycled Water Pipelines

Discussion & Status from Previous Year's Progress Report

2005 Status:

The first phase of recycled water pipeline design includes all distribution pipelines east of Bayshore Highway 101 and has been divided into five discrete project areas:

- Redwood Shores
- Skyway
- Bike Path
- Bayfront
- Seaport

Design and construction of the recycled water pipeline has been phased into discrete project areas to expedite the delivery of recycled water to those customers who are most likely to connect to the recycled water distribution system. For example, construction on the Redwood Shores project area can begin as design is underway for the Skyway project areas, which will enable commercial customers in Redwood Shores to receive recycled water as construction is underway in the Skyway area. This phasing sequence is coordinated with the customer retrofit effort and will enable the City to connect the customer's site to the recycled water distribution pipeline as customer retrofits are complete, which will reduce disruption due to construction.

It should be noted that the project team remains vigilant about opportunities to accelerate the project should grant funding be secured, and the phasing strategy is able to flex toward opportunities to connect customers earlier than

may have been envisioned.

Design of the Redwood Shores project area pipeline began in 2004 and is approximately 30 percent complete. The current design effort includes pipelines for Radio Road, Redwood Shores Parkway, Marine Parkway, Twin Dolphin Drive, and Shoreline Drive, all within the Redwood Shores project area. The Redwood Shores pipelines have been broken down into three bid packages. The existing recycled water pipelines in Radio Road and Shearwater Parkway that were installed as part of the First Step project will remain in service and will be connected to the new pipelines during construction.

The Bike Path project area pipeline was constructed as part of the recent Bayshore Highway 101 expansion construction was completed in 2004. Design has not yet begun for the Skyway, Bayfront, or Seaport project areas.

2005 Work Plan Next Steps:

The pipeline design for the Redwood Shores project area is scheduled for completion in September 2005. The first two construction packages of the Redwood Shores pipeline are scheduled to bid in January 2006, with construction beginning in March 2006 and lasting for seven to nine months. The third Redwood Shores bid package is scheduled to bid in January 2007. The City anticipates beginning pipeline design for the Skyway and Seaport project areas in 2006. Construction of the Skyway project is scheduled for completion in November 2007. Construction of the Seaport project is set for 2008, with the Bayfront project in 2009.

2006 Status:

The five discrete project areas of the first phase of recycled water pipeline design includes all distribution pipelines east of Bayshore Highway 101 and have been divided into eight bid packages. Plates A and B illustrate the geographic locations of each bid package.

- Redwood Shores
 - ◆ Bid Package 1: Radio Road, Redwood Shores Parkway, Marine Parkway
 - ◆ Bid Package 2: Marine Parkway, Oracle Parkway, Twin Dolphin Drive, Shoreline Drive
 - ◆ Bid Package 3: Redwood Shores Parkway, Bridge Parkway, Shell Parkway, Davit Lane
- Skyway
 - ◆ Bid Package 4: Redwood Shores Parkway, Airport Way, Sky Way
- Bike Path (part of a Caltrans bid package)
- Bayfront
 - ◆ Bid Package 7: Bayfront Road, Blomquist Road

- Seaport
 - ◆ Bid Package 5: Seaport Boulevard East
 - ◆ Bid Package 6: Seaport Boulevard West, Blomquist Road

The Redwood Shores pipelines have been broken down into three bid packages. Bid Packages 1 and 2, which include pipelines along Radio Road, Redwood Shores Parkway, Marine Parkway, Oracle Parkway, Twin Dolphin Drive, and Shoreline Drive were bid in early spring 2006 and are currently under construction. The current design effort is for Bid Package 3 and includes pipelines for Redwood Shores Parkway, Bridge Parkway, Shell Parkway, and Davit Lane, all within the Redwood Shores project area. Design of Bid Package 3 began in 2005 and is approximately 85 percent complete. The existing recycled water pipelines in Radio Road and Shearwater Parkway that were installed as part of the First Step project will remain in service and will be connected to the new pipelines during construction.

The design of a pipeline to serve potential commercial sites in the Westport Development is approximately 50 percent complete. Completion of pipeline design and construction depends on receiving an Application of Service from the customer.

Design for Bid Packages 4 and 5 began in early 2006. Bid package 4 includes Redwood Shores Parkway, Air Way, and Sky Way and Bid Package 5 includes Seaport Boulevard. The designs for these two bid packages are scheduled for completion in late 2006. Design for Bid Packages 6 and 7 has not begun.

2006 Work Plan Next Steps:

The pipeline construction for Bid Package 1 is scheduled for completion in December 2006 and pipeline construction for Bid Package 2 is scheduled for completion in January 2007. Slurry seal of roads in the areas disturbed by Bid Package 1 and 2 construction is scheduled for summer 2007.

Construction of Westport Loop may start as early as fall of 2007

Design for Bid Package 3 is scheduled for completion in September 2006, and designs for Bid Packages 4 and 5 are scheduled for completion in December 2006. Bid Package 3 is scheduled to bid in October 2006, with construction beginning in January 2007 and lasting for seven to nine months. Bid Packages 4 and 5 are scheduled to bid in January 2007, with construction beginning in March 2007 and lasting for seven to nine months.

The City anticipates beginning pipeline design for Bid Packages 6 and 7 in 2007, with construction estimated to commence in 2008.

2007 Status: Recycled water began flowing into pipelines in Redwood Shores in May 2007. The Project team continues to make progress on design and construction of pipelines in Phase 1 of the Project, which will distribute recycled water to customers in Redwood Shores and the Greater Bayfront Area.

The status of design and construction for each pipeline bid package is as follows:

- Bid Packages 1, 2 and 3 (Redwood Shores pipelines) are complete.
- Bid Package 4 (Skyway Road pipeline) is under construction and is expected to be complete by the end of 2007.
- Bid Package 5 (Seaport Boulevard East) began construction in October 2007 and is expected to be complete by April 2008.
- Bid Package 6 (Seaport Boulevard West) design is complete and construction is expected to begin in January 2008.
- Bayfront pipelines (previously Bid Package 7) have been broken down into two bid packages. Bid Package 7 now includes Blomquist Street, Maple Street and Bayshore Road. Bid Package 8 includes the Highway 101 Bridge crossing of Redwood Creek.
 - Bid Package 7 (Blomquist Street and Bayshore Road) design is approximately 50% complete and construction is expected to begin in March 2008.
 - Bid Package 8 (Blomquist Bridge) is currently in preliminary design. A request has been submitted to Caltrans to allow attachment of the recycled water pipeline to the Highway 101 Bridge.
- Bid Package 9 includes pipelines in the Westport Office complex in Redwood Shores that extend along Island Drive and Bridge Parkway. Design is approximately 90% complete and construction is expected to begin in March 2008.

2008 Work Plan Next Steps:

Construction on Bid Packages 5 is anticipated to be complete by April 2008. Construction on Bid Package 6 is expected to be complete by October 2008. Design for Bid Package 7 is scheduled to be complete by February 2008 with construction beginning in March 2008 and completing in December 2008. Design for Bid Package 8 is expected to be completed in early 2008 with construction beginning in March 2008 and completing in December 2008. Design for Bid Package 9 is expected to be complete in early 2008 with design beginning in March 2008 and completing in September 2008. Refer to Plates 8 and 9 for the locations of the Bid Packages and estimated construction schedules for each.

City Council has approved Phase 1 of the project (pipelines east of Highway 101). The section of pipeline that extends into Central Redwood City is considered to be in Phase 2 of the Project. If non-Project related construction provides an opportunity for the City to install pipelines in streets along the Phase 2 alignment, City staff will evaluate the situation on a case-by-case basis and will consult with City Council. Refer to Plate 1 for the Alternative TF pipeline alignment.

2.1.1.1.2 Recycled Water Customers and Site Retrofits

Discussion & Status from Previous Year's Progress Report

2005 Status:

The City continues to update its recycled water Market Assessment as information about potential customers is refined through site visits and site data collection. To date, the City has identified two new eligible recycled water customers that were not included in the Task Force report: Marlin Subdivision in Redwood Shores (Units #2 and #2a); and the Villas at Bair Island. City staff and consultants are studying the estimated demands for these potential customers and continuing to evaluate additional eligible sites as potential recycled water customers. The City has determined it is not feasible to retrofit the Kaiser campus on Veterans Boulevard in the near-term, due to its pending multi-year development plans. Instead, as plans are submitted to the City for the various phases of work, the City will ensure that the project design fully maximizes opportunities for separate meters and dual plumbing. The current landscape irrigation demand at the Kaiser campus is estimated to be 22 af/yr. The future landscape irrigation demand for the redeveloped campus is estimated to be 6 af/yr. Therefore, if the redeveloped campus is served with recycled water, the estimated potable water demand reduction of 22 af/yr will still be realized. If the City determines it is not feasible to serve the redeveloped campus with recycled water due to its small demands, the City will realize a potable demand reduction of 18 af/yr.

In 2004, the City began contacting potential commercial and industrial customers to gauge their interest in receiving recycled water and to determine the feasibility of serving specific customer sites. City staff and consultants have held discussions with Redwood Shores business owners, Redwood Shores and Redwood City residents, HOA Board Members, Elected Officials, and representatives of the Port of Redwood City and the Seaport Industrial Association. Comments and feedback from these discussions have helped the City develop a project implementation plan.

To date, 31 preliminary site retrofit designs have been created for commercial customers and parkway landscaping in Redwood Shores. Initial data collection has been gathered for 15 industrial sites in the Seaport area.

The City is currently developing a Recycled Water Use Application, User Terms & Conditions, and supporting informational materials for commercial and industrial users. In conjunction with the City's terms of use, the City Council's Utilities Committee will forward a recycled water pricing policy for Council consideration in late May, 2005.

2005 Work Plan Next Steps:

It is anticipated that, within the next year, site retrofit designs for 28 commercial sites and seven parkways in Redwood Shores will be completed and fully approved for recycled water use. These sites include City-owned

landscaping on Marine Parkway, Shell Parkway, Bridge Parkway, Davit Lane, and Redwood Shores Parkway, and commercial sites adjacent to Marine Parkway and Twin Dolphin Drive. Retrofit construction on these 35 sites is expected to begin in the next year, with an estimated 10 sites completed and ready to accept recycled water by summer 2006.

Preliminary site retrofit designs will be developed for the 15 industrial customers from whom initial data was collected in 2004/2005. The City will continue to target potential commercial and industrial customers for initial data collection and site retrofit design.

Customer site retrofit site design is scheduled to be complete in February 2008. Construction of customer site retrofits is scheduled to be complete in October 2008.

2006 Status:

The City has received 25 signed Recycled Water Service Applications from customers within Redwood Shores. Consultants are collaborating with City staff and DHS to develop final retrofit plans for these 25 sites. Standard notes and details for retrofits and Project advisory signage were approved by DHS in January 2006.

Draft Project Specifications and Bid Package documents for Group Bid 1 have been developed for review and approval by the City.

The City has been approached by a commercial customer in Redwood Shores with a request to utilize recycled water for five non-irrigation uses in addition to supplying the irrigation system. The City has submitted the customer request to DHS for preliminary approval.

Preliminary retrofit designs continue on 4 irrigation sites located in the Seaport Area.

The City continues to update its recycled water Market Assessment as information about potential customers is refined through site visits and site data collection. In November 2005, City consultants completed a Non-Irrigation Market Assessment. The Non-Irrigation Market Assessment included a detailed analysis of recycled water demands for non-irrigation uses in the Redwood Shores and Greater Bayfront Area and provided a refinement of irrigation demands based on updated site information from the retrofit team.

The Non-Irrigation Market Assessment included estimating demands for commercial cooling, a market that had not previously been assessed for Redwood City. Cooling towers are frequently used in cooling systems for large office buildings, and a significant amount of water is used to provide evaporative cooling within the system. Disinfected tertiary recycled water is safe for use in cooling towers and its use is allowed by Title 22 of the California Code of Regulations. Converting commercial cooling towers in

Redwood City to use recycled water would reduce the amount of potable used at those sites.

Table 5 [see 2007 Progress Report for table] provides a summary of the findings of the market assessment refinement. The differences in demands found in Table 5 are due to the following causes:

- New Customers: New industrial and irrigation customers have been added as a result of the Non-Irrigation Market Assessment and the irrigation market assessment update. A summary of potential new customers is provided in Table 6 [see 2007 Progress Report for table].
- Commercial Cooling: Estimated demands have been added for commercial cooling, which had not been evaluated in previous market analyses.
- Modified Irrigation Demands: During field reconnaissance, the project team has discovered additional information about meters. Specifically:
 - ◆ Meters that were not included in the City-wide Feasibility Study have been found.
 - ◆ Meters that were originally allocated to one site have been found to supply water to a different site.
 - ◆ During site reconnaissance and while reviewing City water meter data, a number of irrigation meters were discovered in the Seaport and Bayfront Areas that had not been included in the Greater Bayfront Area Market Assessment in the City-wide Feasibility Study.
- Combination Meters: The City-wide Feasibility Study assumed that, for each commercial combination-type meter, a portion of the demand was being used for irrigation purposes. However, the project team has found that none of the combination meters surveyed in Redwood Shores thus far supply water to landscape irrigation systems. Therefore, combination meter data has been eliminated from the irrigation demand projections.
- Future Demands: Many “future” demands have been reduced or eliminated due to updated and refined information from developers. Specifically, the large decreases in future recycled water use shown in Table 5 for the Greater Bayfront Area and Central Redwood City are due to:
 - ◆ The Highway 101/Redwood Shores Parkway Interchange was moved from the Greater Bayfront market into the Redwood Shores market
 - ◆ Plans for the Marina Shores Village development have been significantly modified and reduced in size.
 - ◆ Plans for redevelopment of the SYUFY Theater site have been significantly modified and reduced in size.
 - ◆ Recycled water demands for the Downtown Area Plan have been omitted from the market assessment because the

- outcome of planning is unpredictable.
- ◆ Recycled water demands for the Kaiser campus are now limited to outdoor irrigation and no longer include indoor uses.
 - Caltrans Hwy 101 Landscape Improvements: As two Caltrans interchanges undergo reconstruction, their current potable water use will cease, which will result in a reduction in demand on the regional system. This reduction in potable demand has not yet been accounted for in the potable demand reduction estimates

Since completion of the November study, the City has identified two additional eligible recycled water customers that were not included in the Task Force report: TowneSuites at the Marriott Hotel and the Shores Plaza. City staff and consultants are studying the estimated demands for these potential customers and continuing to evaluate additional eligible sites as potential recycled water customers.

2006/2007 Work Plan Next Steps:

Twenty-one commercial sites and streetscape landscaping located along Marine Parkway, Twin Dolphin Drive, Oracle Parkway, Lagoon Drive and Shoreline Drive will be included in Group Bid 1, as illustrated in Figure 2. Group Bid 1 is expected to be advertised for bid in the fourth quarter of 2006 with an estimated construction start date in the first quarter of 2007. The landscape irrigation for these sites is anticipated to be fully converted to recycled water use by April 2007 with a total estimated demand of approximately 360 af/yr (including First Step customers).

Final retrofit designs for the 7 remaining commercial customers and streetscapes along Redwood Shores Parkway, Bridge Parkway and Shell Parkway are under development and will be submitted to the City and DHS in 2007. The sites will be included in Group Bid 2 for conversion to recycled water when the main pipeline is completed on Redwood Shores Parkway in 2007/2008.

2007 Status:

Forty-six meters at 17 commercial and City-owned street landscaping sites in Redwood Shores were designed by consultants and approved by the City and the Department of Public Health (DPH). These retrofits were constructed in one bid package (Group Bid 1) and placed into service in the summer of 2007. The average recycled water demand associated with these customers is projected to be about 300 AF/yr. Two commercial sites in the Redwood Shores area that had initially requested recycled water service were removed from the retrofit bid package due to technical difficulties in landscape system operations.

The City has received 34 signed Recycled Water Service Applications from additional irrigation and industrial customers in Redwood Shores and the Seaport area. City staff is working with consultants and DPH to complete the design of remaining landscape irrigation sites in Redwood Shores (Group Bids 2 and 3) and the Seaport area (Group Bid 4).

Consultants are providing technical, financial planning and regulatory support to industrial and other non-irrigation customers to assist in their conversion to recycled water.

The City continues to update its Market Assessment as additional information about potential customers and landscape irrigation system configuration is discovered through site visits and data collection.

2008 Work Plan Next Steps:

Landscape irrigation retrofit efforts will continue as described below:

- Group 2 Site Retrofits: Retrofit plans for an additional 31 meters at 11 commercial and City-owned streetscape sites are being designed and coordinated through the DPH regulatory approval process, and will be bid and constructed before June of 2008. These sites are expected to yield an additional 150 AF/yr of recycled water demand.
- First Step Modifications: As part of the Group 2 Retrofit package, design modifications to First Step customers will bring 11 meters up to the same level of permanent installation as Group 1 and Group 2 sites (removal of backflows, thoroughly tagging and labeling all irrigation accessories, etc.).
- Group 3 Site Retrofits: Retrofit services are being provided for irrigation in the Westport Loop area, similar to services provided for Group 2. Seventeen new meters are included for conversion to recycled water for an additional 65 AF/yr demand.
- Group 4 Site Retrofits: Retrofit services are being provided for 32 meters at 15 irrigation sites in the Seaport area, similar to services provided for Group 2 and 3, for an additional 220 AF/yr.

Consultants will continue to provide support to industrial and other non-irrigation customers in the Seaport and Redwood Shores areas to assist in their conversion to recycled water.

2.1.1.1.3 Recycled Water Treatment Facilities

Discussion & Status from Previous Year's Progress Report

2005 Status:

The Disinfection, Storage and Pumping (DSP) facility was designed as a single contiguous structure located north of SBSA's main structure. The design package was completed in November 2004 and the construction contract awarded in February 2005. Pile driving began in early June 2005.

Design of two additional project components was completed in early May 2005 and put out for public bidding by the SBSA Commission:

- Dual Media Filters Modifications Project, which modifies SBSA's existing filtration system to enable production of recycled water
- Connecting Pipelines and Utilities Project, which includes pipelines, power, and communication utilities between the DSP Facility and the City's water and recycled water distribution systems, power grid, and communication network

2005 Work Plan Next Steps:

Connecting Pipelines and Utilities bid award is scheduled for June 2005. Construction is scheduled for July to December 2005.

Dual Media Filter Modifications project bid award is scheduled for June 2005. Construction is scheduled for July 2005 to May 2006.

Startup and testing of the DSP project is scheduled for May to July 2006. Construction of these facilities is scheduled to be completed in July 2006. Upon completion of the Disinfection, Storage, and Pumping Facilities, recycled water will be available for delivery to Redwood City's recycled water distribution system.

SBSA site landscaping is scheduled for July to December 2006.

2006 Status:

One of the three construction projects at SBSA, the Connecting Pipeline and Utilities Project, is complete. The other two projects, the Dual Media Filter Modifications (DMF Mods) Project and the DSP Project are nearing completion.

An overview of the SBSA projects' status:

- Connecting Pipelines and Utilities project bid was awarded in August 2005. Construction was completed in June 2006. *(The 2005 Task Force Progress Report reported that this project was scheduled to be awarded in June 2005. The project was re-bid in August 2005 due to a design change).*
- Dual Media Filter Modifications project bid was awarded in August 2005. Construction is underway and scheduled to be complete in August 2006. *(The 2005 Task Force Update reported that this project was scheduled to be awarded in June 2005. The initial bids received were higher than estimated. The design was modified and re-bid in August 2005).*
- DSP project is scheduled to be completed in November 2006. *(The 2005 Task Force Report Update reported that these facilities would be completed in July 2006. Due to a complicated construction sequence and weather related delays, the construction period is being extended.)*

2006 Work Plan Next Steps:

Following construction completion and contractor testing of the DMF Mods and DSP Projects, SBSA staff will conduct operational testing of the modified filters and the new disinfection facility. City staff will conduct operational testing of the storage tank and distribution pump station as these are City-

owned and -operated facilities.

Final SBSA site landscape design is underway. Site landscaping will begin following completion of the DSP project.

2007 Status: The design modifications at SBSA were completed and turned over to SBSA in spring 2007. Recycled water production began in April 2007 and delivery of recycled water began in May 2007.

2008 Work Plan Next Steps: Recycled water treatment facilities have been completed and are in operation. Therefore, this item is considered complete.

2.1.1.2 Downtown Cinema Dual Plumbing & Dual Plumbing Ordinance

Recommendation: Dual plumbing should be installed during construction of the new downtown cinema so that recycled water can be used for appropriate indoor and outdoor uses. This installation would be at the City's expense.

Discussion & Status from Previous Year's Progress Report

2005 Status: After the conclusion of the Task Force work, City staff continued to pursue the Task Force's recommendation to require installation of dual plumbing in the new downtown cinema. City staff reported back to the City Council on April 12, 2004 and provided the following factors that led to the conclusion that installing dual plumbing in the cinema was not feasible: the City did not have an ordinance in place to require such action by the developer; the City could not pay for the dual plumbing in the cinema without having a program available to other similar new construction projects; the developer's plans were already at 95% completion at the time of inquiry; and the dual plumbing plans would have required State Health Department review and approval, which would delay progress of the cinema. This recommendation is considered closed and no further action will be taken.

2005 Work Plan Next Steps: None for this property. Staff intends to develop a "dual plumbing" ordinance for Council adoption by the end of 2005.

2006 Status: Ordinance has been drafted for project team review and comment in August 2006

2006 Work Plan Next Steps: Staff anticipates submitting the final draft ordinance to the City Council Utilities Committee in the fall of 2006 for input, then to City Council for adoption by February 2007.

2007 Status: As City staff began the process of developing a "dual plumbing" ordinance, it became clear that dual plumbing is just one of many aspects of water recycling that should be incorporated into City code. Rather than implementing a narrowly-focused "dual plumbing" ordinance, the City has determined that a broader "recycled water" ordinance would be of

greater benefit to the community. The City has drafted a “recycled water” ordinance that, among many things, addresses the requirement to install dual plumbing in new construction within the recycled water service area. The draft ordinance has been reviewed with the City Council Utilities Committee.

2008 Work Plan Next Steps: City staff anticipates the ordinance will be released for public comment in spring or early summer of 2008 and adopted thereafter. The “recycled water project area” was defined as part of the environmental (CEQA) process (refer to Plate 1). The recycled water ordinance will define the “recycled water service area” to identify the scope of the ordinance.

2.1.2 Synthetic Turf Playing Fields

Recommendation: Reduce potable water demand by converting natural grass playing fields to synthetic turf at the following parks and schools:

- Red Morton Park (7.1 acres)
- Sandpiper Park (2.1 acres)
- Marlin Park (2.5 acres)
- Hawes Park (entire park)
- Hoover Park (4 acres)
- Sequoia High School (2.2 acres)
- Cañada College (2.5 acres)

The Task Force estimated that turf conversion of natural grass playing fields to synthetic turf would reduce potable demand by a total of 150 af/yr.

Discussion & Status from Previous Year’s Progress Report

2005 Status: The playing field at Sequoia High School was converted to synthetic turf in the summer of 2002, reducing potable demand by an estimated 6 af/yr. The Hoover Park playing field was converted to synthetic turf in October 2002. Based on water use data from the park’s water meter, the City has conserved about 9 af/yr of potable water. Two playing fields at Cañada College are currently being converted to synthetic turf, with estimated completion in summer 2005. At the time of the Task Force report, Cañada College was planning to install synthetic turf on the soccer field only. Subsequently, the College added a baseball field to the turf conversion contract. The total area of conversion is approximately 5.2 acres, an increase of 2.7 acres over the estimate included in the Task Force report. This increases the total estimated potable demand reduction at Cañada College to approximately 33 af/yr. At this time, no other fields at the College are scheduled for conversion to turf.

2005 Work Plan Next Steps: In July 2005, the City plans to begin design of three synthetic turf fields in the Red Morton park complex, with bidding and contract award scheduled for January to March, 2006. Construction of the

three fields will require approximately one year. Turf replacement at Sandpiper Park, Marlin Park and Hawes Park is scheduled for bidding and construction in the spring of 2007.

2006 Status: City Council will award a bid for converting the three Red Morton Park sports fields to synthetic turf during the August 7, 2006 council meeting. Construction is anticipated to be complete by May 2007. Artificial turf replacement has been completed at Canada College. No other fields at the college are scheduled for replacement with artificial turf.

2006 Work Plan Next Steps: The City is completing plans and specifications for the conversion of fields at Sandpiper Park and Marlin Park. The conversion is expected to be bid in late in 2006 and construction of these fields is scheduled to be complete in 2007. The City anticipates that the conversion of Hawes Field will be bid in 2008

2007 Status: City Council accepted synthetic turf conversion projects at three sports fields (7.8 acres) at Red Morton Park in September 2007. City Council also awarded a bid for converting the Sandpiper and Marlin Park sports fields to synthetic turf in July 2007. Construction is anticipated to be complete in spring 2008. Potable water usage on these two fields has stopped since construction began in August.

2008 Work Plan Next Steps: The City anticipates that the design of the Hawes Field sports field synthetic turf conversion will occur in 2008. This design and conversion effort will be coordinated with the installation of a new Hetch Hetchy 60" water main being proposed by the SF PUC. The new pipe will run adjacent to the field. The conversion will also be coordinated with other stadium improvements that are part of the City's Capital Improvements Program.

2.1.3 Existing Groundwater Use

Recommendation: Maintain existing potable water demand reduction by continuing to use groundwater to irrigate Sequoia High School landscaping. This recommendation is estimated to reduce potable water demand by 57 af/yr after the playing field is converted to artificial turf.

Discussion & Status from Previous Year's Progress Report

2005 Status: Sequoia High School is continuing to irrigate with the existing groundwater system. The Task Force Report had assumed that the high school was using groundwater to irrigate the entire site. However, the City subsequently determined that the consumption of potable water for outdoor irrigation averages 13,000 units (or 30 af) per year. Additionally, the site realizes a savings of 6af/yr due to conversion of playing fields to artificial turf. Therefore, the total potable water savings by irrigating with groundwater is now estimated to be 35 af/yr.

2005 Work Plan Next Steps: The school will continue to irrigate with groundwater, provided the well continues to produce sufficient quantity and

quality of water. Within the next year, the City will initiate further discussions with district operations staff to ensure the site is maximizing the use of groundwater for landscape irrigation and to evaluate the entire irrigation system for efficiency and optimization of water use in accordance with Large Landscape Irrigation Efficiency Program (know as Best Management Practice No. 5 within the California Urban Water Conservation Council's recognized conservation practices).

2006 Status: The school's demand has not changed significantly, and the school has not pursued participation in the City's BMP 5 program.

2006 Work Plan Next Steps: The City will initiate a site evaluation to clearly understand the water use practices and determine if the use of groundwater is being maximize.

2007 Status: Sequoia High School continues to use groundwater to meet a portion of its irrigation and the remainder is met using potable water.

2008 Work Plan Next Steps: The City will continue to promote and monitor the use of groundwater for irrigation at this site.

2.1.4 Additional Conservation Measures

2.1.4.1 Pre-Rinse Spray Nozzles

Recommendation: Install water-efficient pre-rinse spray nozzles in dishwashing facilities of restaurants, cafeterias, and other food service providers. The Task Force estimated 50% market penetration, resulting in a potable water reduction of 33 af/yr.

Discussion & Status from Previous Year's Progress Report

2005 Status: Redwood City began participation in the state-wide Pre-Rinse Spray Valve Installation Program, coordinated and administered by the California Urban Water Conservation Council. A total of 77 spray valves have been installed in Redwood City eateries, providing an estimated potable demand reduction of 14 af/yr.

2005 Work Plan Next Steps: Redwood City will renew its participation in the state program for Fiscal Year 2005/06, with the goal of installing an additional 150 pre-rinse spray valves with an estimated potable water demand reduction of an additional 26 af/yr.

2006 Status: Redwood City renewed its participation in the state program for Fiscal Year 2005/06. In the past year, 160 pre-rinse spray valves were installed, providing an estimated potable water demand reduction of 28 af/yr, bringing the program total to 237 valves installed with an estimated potable

demand reduction of 42 af/yr.

2006 Work Plan Next Steps:

The replacement of pre-rinse spray nozzles in Redwood City is considered complete because the City has provided water-efficient pre-rinse spray nozzles for all potential customers, reaching market saturation.

2007 Status: Complete.

2008 Work Plan Next Steps: None.

2.1.4.2 Evapotranspiration Controllers

Recommendation: Install evapotranspiration (ET) controllers on landscape irrigation systems for irrigation-only water customers. The Task Force estimated that this program would reduce potable water demand by 46 af/yr.

Discussion & Status from Previous Year's Progress Report

2005 Status: This recommendation has not yet been implemented. Staff's approach to implementing BMP 5 is to first focus site owners and managers on seasonally adjusted irrigation scheduling, based on a monthly water budget unique to the site and its conditions. Equal emphasis is placed on basic system inspection and repair; so that water is not being wasted due to broken spray heads and/or leaking pipes.

2005 Work Plan Next Steps: The City will implement a pilot program for residential sites in FY 2005/06. ET controllers will be installed on five large residential landscape systems with a total estimated potable water demand reduction of 5 af/yr. User evaluations and performance results will be tracked for future decision-making.

2006 Status: The City continues to evaluate different types of controllers available in the market. The City is waiting for the results of California regional and State-wide ET controller pilot projects to incorporate lessons learned into a City-sponsored pilot project. The City anticipates that the pilot will begin in 2006 and reduce potable consumption by approximately 15 af/yr in Fiscal Year 2006/2007.

2006 Work Plan Next Steps: The City plans to design its pilot project program using the program model and experience of other agencies. The City anticipates install ET controllers on large residential landscapes in the spring of 2007.

2007 Status: Two ET controllers were installed at the City's large landscape irrigation model site in Redwood Shores. The controllers pilot the "Smart Controllers" technology in a commercial setting to find out how commercial landscape contractors accept, understand and use this new

technology and if additional water savings are achieved. The initial results have shown that maintenance contractors have not yet embraced the technology and it has taken time for them to understand the full controller features. The water savings for this year are below last year's savings when contractors had more control over the schedules.

2008 Work Plan Next Steps: City will continue to work with the model site and will gather information from other agencies that have been implementing ET controllers to determine if the water savings justify the investment necessary for a rebate program.

2.1.4.3 Hot Water Recirculation Pumps

Recommendation: Promote installation of hot water recirculation pumps on residential water systems. The Task Force estimated that installation of 1,000 units would result in a potable demand reduction of 6 af/yr.

Discussion & Status from Previous Year's Progress Report

2005 Status: This recommendation has not yet been implemented.

2005 Work Plan Next Steps: The City is currently studying this program and anticipates implementation of a pilot effort in Fiscal Year 2005/06.

2006 Status: Hot water recirculation systems are included as a potential BMP of the California Urban Water Conservation Council (CUWCC) and the City's consideration of this program continues. Some of the findings are that the "demand controlled" pumping systems are the most energy-efficient and water conserving type among the six types of available recirculation systems. The Federal Environmental Protection Agency (EPA) is in the process of conducting a study on hot water recirculation systems and is expected to complete the study this winter.

2006 Work Plan Next Steps: The City will continue to work with the CUWCC on the evaluation of recirculation systems to clearly identify the potential water savings and how best implement a rebate program.

2007 Status: The City has continued to monitor recent CUWCC information regarding hot water recirculation systems. The California Urban Water Conservation Council (CUWCC) reports that the water savings does not justify an incentive program that funds the full cost of a residential installation. This conclusion is based upon the potential savings per household and the costs for retrofit installations.

2008 Work Plan Next Steps: The City will follow the CUWCC's recommendation to encourage installation of such systems during new construction. The City will consider implementing an ordinance to require recirculation systems in new construction.

2.2 Other Potential Measures

In addition to implementing Alternative TF, the Task Force recommended that the City investigate and/or implement ten OPMs which may further reduce demands on the City's potable water supply. The OPMs either were expected to generate savings that were difficult to quantify, required additional research beyond the Task Force's time frame to determine their viability, and/or depended on improvements in technology to implement. The status for each recommendation is discussed below.

2.2.1 OPM #1: Further Investigate Potential Use of Groundwater

Recommendation: Initiate exploratory well work to determine the feasibility and costs for using groundwater to irrigate large sites (e.g., Red Morton Park) and to supplement the potable water system.

Discussion & Status from Previous Year's Progress Report

2005 Status:

The City is currently studying constraints at Red Morton Park for use in determining possible well head, pump house, and supply piping locations. Considerations include the locations of buildings, right-of-ways, easements, underground utilities, future synthetic turf field replacement, box culverts, playgrounds, and the "Jefferson Branch" of Redwood Creek. The City's evaluation will also determine which areas of the park are feasible for irrigation with well water and establish site retrofit and isolation requirements that are needed to implement a private well water supply for the park's existing irrigation system.

As reflected in the Capital Improvement Projects Five Year Program Water Improvement Fund of the Recycled Water System Development Budget, \$360,000 (FY 05-06) and \$200,000 (FY 06-07) has been allocated for study, design, and construction of an irrigation well, as well as the necessary site retrofit.

2005 Work Plan Next Steps: Construction of an irrigation well at Red Morton Park is scheduled to begin in the fall of 2005, pending confirmation of a reliable groundwater source. Site retrofit is scheduled to begin in 2006.

2006 Status: The City has hired a groundwater engineering firm to perform a groundwater exploration survey throughout Red Morton Park. Eight (8) soundings were conducted at various locations. The survey findings indicate one sounding location as the most feasible site to drill a pilot well. The approximate location of the pilot well is in the grass area southeast of Veterans Memorial Building parking lot and west of Skateboard Park. Figure 3 illustrates the location of the pilot well (ETS-3 is the site for the pilot well).

2006 Work Plan Next Steps: The City is in the process of preparing bid

documents to hire a well contractor to drill a pilot well at the selected site. The pilot well will be used to measure potential water production and test water quality. If feasible, a production well will be constructed and equipped. The Red Morton Park irrigation system will be retrofit to allow using groundwater for irrigation purposes. Provisions for cross connection protection will be taken to ensure the integrity of the existing potable water system is not compromised.

2007 Status: The City prepared plans and specifications to drill and construct the proposed water well and the project was bid to a qualified contractor. The pilot well was drilled with the following results:

- Originally, the proposed depth for the well was 250 feet. The drilling work and the encountered materials were good from 0 to 180 feet deep. At this depth, a formation of hard black shale was encountered, slowing the drilling work.
- At a depth of 230 feet, the drilling fluids started becoming oily due to small amounts of naturally occurring oil present in the shale formation. In an effort of preventing oil to float to the surface, drilling was stopped and the bottom portion of the test hole was plugged with cement.
- A geophysical sounding device was lowered into the pilot well to explore the presence of groundwater. Logs from the geophysical exploration indicated the presence of a thirty five (35) feet thick water bearing stratum and a good stratum of fractured rock was found at a depth of 115'-150'. Based in these findings, the well was constructed: a larger bit was used to expand the 165 feet deep hole, screens, casing, gravel pack, sanitary seal and cap were installed. Standard well development procedures were followed and a test pump was then lowered into the well to measure its production capacity. During the first pumping test the well was not able to maintain a constant yield. The City and its consultants analyzed the problem and determined additional well development actions to optimize yield.
- In December 2007 and January 2008, additional development work was performed: special well developing chemicals were pumped into the well in an attempt to dissolve any calcium bicarbonates or magnesium bicarbonates that would inhibit well production and to ensure that well screens and stratum waterways are clean.
- A submersible well pump was installed in the well and another pumping test was performed. Unfortunately, the measured production of the well was as low as 0.06-0.07 gallons per minute. Therefore, the City's Engineering and Construction Department has determined that groundwater is not exploitable at this site and the pilot well shall be abandoned according to California Department of Public Health requirements.

2008 Work Plan Next Steps: The City has determined that groundwater pumping at this site is not feasible. Therefore, this item is considered closed.

2.2.2 OPM #2: Consider a Commercial Toilet Replacement Program

Recommendation: Consider providing financial incentives to replace toilets in commercial buildings with ultra low-flow toilets.

Discussion & Status from Previous Year's Progress Report

2005 Status: This recommendation has not yet been implemented.

2005 Work Plan Next Steps: In May 2005 the City Council awarded a \$2.2 million, full-service direct install contract for replacement of 10,050 residential and commercial toilets between June 2005 and June 2008. The City anticipates replacing 250 commercial toilets in the first year of the contract, with the potential to replace up to a total of 500 toilets over the life of the program. The estimated water savings for each toilet is 25 gallons per day, resulting in a potential potable water reduction of 5 to 10 af/yr (assuming 5 days per week occupancy of commercial buildings).

2006 Status: The City replaced 290 toilets in commercial sites through its toilet replacement program.

2006 Work Plan Next Steps:

The City will continue to market the program to commercial customers to increase market saturation.

The City will be participating in a regional direct-install Urinal Replacement Program coordinated by the Bay Area Water Conservation and Supply Agency (BAWSCA) to replace urinals using more than 2.0 gallons per flush (GPF) with new high efficiency urinals using 0.5 GPF.

2007 Status:

An additional 219 commercial toilets were replaced in 2007 with a total of 509 toilets replaced to date. The City has recently received some concerns about the performance of the residential ultra low flow toilet models.

A urinal that only uses 1 pint (1/8 gallon) per flush was installed for testing at Red Morton Recreation Center. City staff is pleased with the performance of the unit and is planning to replace the other two urinals in the facility.

2008 Work Plan Next Steps:

The City will continue offering free toilets to commercial customers until the goal of replacing 10,000 toilets citywide is reached.

The City is preparing to implement a urinal replacement program and to recommend requiring 1 pint urinals in new construction.

The City will consider performing a follow-up survey of recipients of the ultra low flow residential toilets.

2.2.3 OPM #3: Promote Conservation

Recommendation: The Task Force recommended several specific conservation promotion activities:

- Create a new section on the City website that focuses on conservation activities.
- Consider implementing a hotline that would provide conservation information.
- Consider water use efficiency as criteria for home beautification or business renovation awards.
- Encourage participants in rebate programs to consider additional conservation opportunities.

Discussion & Status from Previous Year's Progress Report

2005 Status:

The City's website has been improved to provide clear information on all City-sponsored conservation programs. The link to the conservation site has been promoted in the Utility Newsletter regularly.

The City has implemented a water conservation hotline and created four new, full-time positions dedicated 100% to conservation. The hotline phone number is (650) 780-7436.

The City's Mayor Beautification Award Program has created a category for the Best Drought Tolerant Landscaping as a way to recognize water conservation efforts by individuals and businesses.

The City promotes all conservation programs in the periodic Utility Newsletter. Participants in particular conservation programs are made aware of all the programs the City offers.

The City implemented a High-Efficiency Toilet Give-Away in October 2004; 1,350 high performance toilets were distributed free of charge to residents. The program kick-off included a media event, where the Mayor smashed a water-wasting toilet and unveiled the new High-Efficiency Toilet.

2005 Work Plan Next Steps:

The City will sustain existing conservation program promotional activities.

The City will investigate ways to provide information about conservation programs to Homeowner's Association members who don't receive water bills.

The City will consider requesting nurseries in Redwood City to post a list of drought-tolerant plants and/or install a drought-tolerant garden display.

2006 Status:

Redwood City presented five Water Wise Gardening Workshops in May 2006, including the topics of Irrigation Basics, Smart Gardening, ET Controller Concepts and Irrigation Scheduling & Maintenance.

The City's Large Landscape Conservation Program (BMP5) continues to provide ET-based water budgets and an analysis of water use efficiency every billing period to owners of all large landscapes with a dedicated irrigation meter.

- *Model Site Program:* The City has selected a Model Site in Redwood Shores as a way to demonstrate how to maintain an attractive landscape within the provided water budget. By working together with a dedicated property manager, Board of Directors and maintenance contractor, the site has achieved significant water savings.
- *Recognition Program:* At the end of this year's irrigation season each site will be graded according to its level of efficiency. Sites that stayed within their water budget or exceeded it by only 10%, (grades A and B respectively) will be recognized for their efforts and will also qualify for financial incentives the City will offer to improve their irrigation system, such as ET controllers.

2006 Work Plan Next Steps:

The spring Water Wise workshops will be presented annually, covering new topics that will help Redwood City residents learn about creating beautiful gardens and how to conserve water in their garden.

A Water Wise Gardening CD-Rom that will provide a low water-use encyclopedia and examples of successful gardens will be distributed to Redwood City residents this Fall.

The City will be studying and evaluating the implementation of budget-based rates for all large landscape irrigation sites in the next 6 months, as a way to provide incentives for water conservation and plans to get a recommendation to the City Council in Spring 2007.

2007 Status:

The Waterwise Gardening CD-Rom was completed and is available to customers for free. The CD-Rom is advertised on the City's website, in the utility bill newsletter, at City Hall and at the Department of Public Works.

Five spring gardening workshops were offered to residential customers in different topics ranging from drought-tolerant plants to irrigation scheduling and maintenance to garden design.

The water bill newsletter insert continues to be published on a bi-monthly cycle to all customers for the purpose of education and promoting conservation programs.

2008 Work Plan Next Steps: In addition to the ongoing public education programs, a new School Assembly Theater Program will be initiated in spring 2008 to promote water conservation in Redwood City schools. City staff is pursuing expanding this program to include Redwood Shores schools in the Belmont – Redwood Shores School district.

2.2.4 OPM #4: Adopt an Ordinance to Implement Conservation Measures

Recommendation: Consider adopting an ordinance to require conservation measures, including dual plumbing in new commercial construction and possibly OPMs #5, #6, and #7.

Discussion & Status from Previous Year's Progress Report

2005 Status: The City is researching and collecting sample ordinances.

2005 Work Plan Next Steps: City staff anticipated developing an ordinance and presenting it to City Council for adoption in Fiscal Year 2005/06.

2006 Status: City staff has collected samples of other water agencies' "Water Waste Prohibitions" and the California Urban Water Conservation Council is in the process of developing standards and guidelines for water efficiency in new construction under the concept of "Smart from the Start"

2006 Work Plan Next Steps: City staff anticipates developing an ordinance to present to City Council for adoption in Fiscal Year 2006/2007.

2007 Status: Staff presented new international plumbing codes to Redwood City Council on December 17, 2007. These new codes will be adopted by Council in 2008, followed by recommendations for some additional "green building" requirements by summer 2008.

2008 Work Plan Next Steps: City Council is adopting new international plumbing codes in January 2008. This will be followed with recommendations for some additional "green building" requirements by summer 2008.

2.2.5 OPM #5: Consider Requiring Low-Flow Urinals in New Construction

Recommendation: Consider requiring urinals in new construction buildings to use 0.5 gallons (or less) per flush.

Discussion & Status from Previous Year's Progress Report

2005 Status: The City is currently evaluating this recommendation.

2005 Work Plan Next Steps: The results of the City's evaluation will be complete in FY 2005/06.

2006 Status: There are now three low-flow urinal models that use 0.5 gallons per flush, two of them include a sensor-operated flush valve and the other uses a flush-o-meter valve. Other manufacturers are in the process of developing urinals that use only a quart or less per flush.

2006 Work Plan Next Steps: City staff will develop conservation requirements for new residential and commercial development. The City anticipates developing an ordinance to address these requirements in Fiscal Year 2006/2007.

2007 Status: A urinal that only uses 1 pint (1/8 gallon) was installed for testing at Red Morton Recreation Center. Based on its success, the City is preparing to implement a urinal replacement program and to recommend requiring 1 pint urinals in new construction.

2008 Work Plan Next Steps: City Council is adopting new international plumbing codes in January 2008. This will be followed with recommendations for some additional "green building" requirements by summer 2008.

2.2.6 OPM #6: Consider Requiring Conservation Devices in New Construction

Recommendation: Consider requiring installation of water-efficient spray nozzles in newly constructed or renovated food service facilities, ET controllers in newly constructed commercial landscape, and hot water recirculation systems in new construction buildings.

Discussion & Status from Previous Year's Progress Report

2005 Status: The City is studying this recommendation by researching existing programs at other agencies.

2005 Work Plan Next Steps: The results of the City's evaluation will be complete in FY 2005/06.

2006 Status: The California Urban Water Conservation Council is in the process of developing standards and guidelines for water efficiency in new construction under the concept of "Smart from the Start."

2006 Work Plan Next Steps: Once the CUWCC "Smart from the Start" standards are complete, the City will evaluate the feasibility of implementing the CUWCC recommendations into new commercial development

requirements.

2007 Status: Two ET controllers were installed at the City's large landscape irrigation model site in Redwood Shores to pilot the "Smart Controllers" technology in a commercial setting to find out how commercial landscape contractors accept, understand and use this new technology and if additional water savings are achieved. The initial results have shown that maintenance contractors have not embrace the technology and it has taken time for them to understand the full controller features. The water savings for this year are below last years when contractors had more control over the schedules.

2008 Work Plan Next Steps: City will continue to work with the model site and will wait to learn from other agencies that have been implementing ET controllers and whether or not the water savings justify the investment necessary for a rebate program.

2.2.7 OPM #7: Evaluate Incentives for Electronic Eye Faucets

Recommendation: Investigate and determine feasibility of incentive programs for installing electronic eye faucets in commercial buildings, considering both retrofit and new construction facilities.

Discussion & Status from Previous Year's Progress Report

2005 Status: The City is currently evaluating this recommendation.

2005 Work Plan Next Steps: The results of the City's evaluation will be complete in FY 2005/06.

2006 Status: The East Bay Municipal Utility District (EBMUD) has begun a study on the different types of sensor faucets in their Oakland headquarters building. Post-installation water use will be compared to the pre-existing spring-actuated faucets.

2006 Work Plan Next Steps: The results of the EBMUD study will be used to determine the level of conservation that can be achieved with sensor faucets.

2007 Status: The EBMUD study of sensor faucets is ongoing and its completion date is unknown. The City recently learned of two studies that compare infrared sensor-operated faucets with "push top" (cycling) faucets and conventional swivel top faucets that were performed in 2002. One study is the Millennium Dome Report on Water Efficiency-"Water cycle" and the other is by the American Society of Heating, Refrigerating and Air-Conditioning Engineers, Inc. Both studies confirm that faucets with infrared sensors use more water when compared to conventional fixtures.

2008 Work Plan Next Steps: The based on the 2002 studies, the City has determined that current electronic eye technology will not reduce water use in faucets. The City will continue to

stay apprised of new technologies and may reconsider this item if new technology provides additional conservation potential.

2.2.8 OPM #8: Investigate Potential Water Swaps with Other Potable Water Retailers

Recommendation: Investigate and determine feasibility of trading recycled water for potable water with neighboring water retailers.

Discussion & Status from Previous Year's Progress Report

2005 Status: The critical milestones of an approved, financed and under-construction project with flexibility to deliver large amounts of recycled water to other agencies were achieved in January 2005. As the project team completes its refined roadmap for meeting Redwood City 2010 water supply goals, additional resources are being allocated to development of a strategy for pursuing water transfers and/or trades. City staff and consultants have participated in a range of discussions with sister agencies in the BAWSCA. Additionally, the City's recycled water project has been re-submitted for several state and federal grants, including an "integrated resources planning" grant via a collaboration of BAWSCA, the San Francisco Public Utilities Commission (SFPUC), EBMUD and the Santa Clara Valley Water District.

2005 Work Plan Next Steps: City staff plans to complete a working strategy by the end of 2005 and develop a list of first priority agencies and establish initial contacts by June 2006.

2006 Status: The project team has focused much effort on the Prop 50 grant application and the concurrent alternative water supply study conducted by the SFPUC for the Water System Improvement Program. Both submittals describe three recycled water projects in Redwood City:

1. The "First Step" pilot project in eastern Redwood Shores, in operation since 1999. The nine customer sites in the First Step will be incorporated into #2 below.
2. The "Redwood City Recycled Water Project" – Alternative TF, being constructed now, for Redwood City customers within the Redwood City water service area. The annual yield of the project has been shown as "up to 2,000 af/yr", based on the Task Force recommendations adopted by the City Council, and including additional hydraulic capacity of production and distribution facilities.
3. The "Redwood City Sub-Regional System". This project would be driven by other communities and water service providers approaching Redwood City and expressing interest in negotiating partnerships for the purpose of buying recycled water at the wholesale level from

Redwood City. Staff has indicated that the potential yield of such a project could be 2,500 to 5,000 af/yr above and beyond the 2,000 af/yr already reserved for Redwood City users. Before such an undertaking can progress, staff needs the City Council to set their policies / guiding principles for becoming a wholesale agency in a yet-to-be-defined regional market. Such policies would provide the basis for negotiations with other agencies, should they pursue a discussion with Redwood City.

The project team has drafted a set of “guiding principles for pricing recycled water to potential wholesale customers” and has begun discussions with the City Council Utilities Committee. The draft document includes as a proposed Council policy, the provision to sell and/or trade recycled water.

2006 Work Plan Next Steps: City staff anticipate completing the policies / guiding principles and securing Council adoption by the end of 2006. The City plans to be prepared to respond to inquiries from adjacent communities in 2007.

2007 Status:

The recycled water pipelines designed and constructed in 2007 are sized to provide flexibility for water swapping with adjacent communities.

Redwood City investigated the possibility of swapping water supplies for regional housing allocations now being set via a “Sub-regional” process by the Association of Bay Area Governments and City/County Association of Governments. However, the City concluded that any swaps will be difficult to achieve before renegotiation of the BAWSCA/SFPUC master sales agreement, as the current contractual “supply assurance” is not a tangible water right.

2008 Work Plan Next Steps: The City will continue to focus on serving existing water customers within its service area but will maintain an open dialogue with neighboring communities that express an interest in Redwood City’s recycled water. The City will evaluate the potential for either selling recycled water to other agencies or trading recycled water for potable water with other agencies in the future

2.2.9 OPM #9: Evaluate Emerging Automated Landscape Irrigation Technology

Recommendation: Continue to stay abreast of new automated landscape irrigation technology and promote promising technologies to water customers.

Discussion & Status from Previous Year’s Progress Report

2005 Status: City staff continues to attend workshops and stay abreast of emerging technology that uses weather-based irrigation controllers. The California Urban Water Conservation Council is administering a State-wide

weather-based irrigation controller study program to evaluate emerging technologies and their potential water savings; the Council's report is projected to be completed in 2007.

2005 Work Plan Next Steps: City staff and consultants will monitor studies and new information.

2006 Status: City staff is working closely with the California Urban Water Conservation Council and the California Department of Water Resources on emerging technologies projects and as a result of this work, Redwood City will be installing a California Irrigation Management Information System (CIMIS) station to collect local weather data and to produce ET readings for use in irrigation scheduling and ET controller programs.

2006 Work Plan Next Steps: The City anticipates completing an agreement with the Department of Water Resources for the siting of the CIMIS station, purchasing the equipment and installing the station by the end of 2006.

2007 Status: A California Irrigation Management Information System (CIMIS) was installed in Redwood City in coordination with the California Department of Water Resources. This station is collecting local weather data that will be used to develop watering requirements for Redwood City customers.

2008 Work Plan Next Steps: Redwood City is one of seven water agencies participating in a Statewide ET Data Protocol project in cooperation with the State Department of Water Resources and ET controller manufacturers for the purpose of producing a standardized ET data protocol that will provide ET data Statewide by zip code through the web.

2.2.10 OPM #10: Evaluate Emerging Treatment Technology

Recommendation: Continue to evaluate advances in wastewater treatment technologies for the potential to address residents' safety concerns. If a suitable new technology emerges, initiate public discussions to gauge public acceptance of recycled water treated with this technology.

Discussion & Status from Previous Year's Progress Report

2005 Status: The facilities under construction at SBSA will enable SBSA to produce and deliver to the City disinfected tertiary recycled water suitable for unrestricted use as defined by Title 22 of the California Code of Regulations. The City will continue to keep abreast of advances in treatment technology in the event that a feasible system emerges that could enhance water quality and further address the community's safety concerns with regards to using recycled water where children play.

2005 Work Plan Next Steps: SBSA and City staff will complete work on a Cryptosporidium monitoring protocol and return to the City Council with recommendations within the next few months, well ahead of the completion of

construction of treatment facilities at SBSA. City staff will also monitor progress on several new research projects funded by the WateReuse Foundation and continue monitoring related industry literature. And finally, opportunities for future pilot project partnerships with private-sector vendors and/or manufacturers of emerging technologies will be pursued by the City.

2006 Status: The City has kept abreast of advances in treatment technology that could potentially enhance water quality and alleviate concerns regarding use of recycled water where children play. It should be noted, that there are no reported cases of any harmful impact to humans or animals regarding the use of disinfected tertiary recycled water as defined by Title 22 of the California Code of Regulations. Regardless, SBSA and City staff have evaluated and studied various approaches toward monitoring for pathogens of concern. Currently, there are no official testing standards or established guidelines for recycled water. However, it was discovered that there are proven approaches for reducing incidences of cross connection and enhanced operational efficiencies that can effectively minimize exposure to potential pathogens.

2006 Work Plan Next Steps:

After reviewing safe and successful recycled water projects around the country City staff plans to adopt a “best of breed” approach toward implementing and maintaining its recycled water system. This will include a comprehensive cross connection program, a rigorous inspection regime, and a continuous monitoring program; all part of an overall operating management program that will be reported to the City Council this fall along with the Task Force Update. Public information and educational awareness programs will also continue to be a part of this effort.

Additionally, City staff will continue to monitor industry related literature and progress of research projects funded by the WateReuse Foundation, and will continue to explore opportunities for possible pilot project partnerships with private-sector vendors and/or manufacturers of emerging technologies.

2007 Status: The most promising emerging technology for staff right now is sub-surface irrigation for large grass areas/play fields..

2008 Work Plan Next Steps: City staff will continue its investigation into this new technology and will be reviewing test results, performance, water efficiency, and maintenance costs. Possible effects on plant health, potential for breaks or leaks in the system, and system maintenance requirements are among the City’s concerns.

2.3 Additional Comments and Suggestions from Task Force Annual Status Report Review

During review of this Status Report in draft format, Task Force member provide suggestions and comments pertaining to the City's recycled water and conservation programs. This valuable Task Force input will be maintained within this section for City staff reference.

2006 Comments and Suggestions:

1. Amend plumbing code to require the installation of water-efficient pre-rinse spray nozzles during new construction. *[2007 Update: The plumbing code is a State code and the City cannot amend it. However, the City has the option of implementing an ordinance for new construction]*
2. Provide wide distribution of the Water-Wise gardening CD-Rom:
 - ◆ Distribute through garden centers and nurseries in and near the City.
 - ◆ Provide to landscapers.
 - ◆ Post on City web site
 - ◆ Provide a poster for garden centers and nurseries.

[2007 Update: See OPM#3]

3. Use customer water bills as a means to promote conservation with respect to landscape irrigation. When seasonal fluctuations result in high temperatures for a period of time, customers often increase the frequency of irrigation and may forget to restore the normal irrigation schedule when temperatures return to normal. This often results in higher water use throughout the irrigation season. The Task Force suggested the City provide a reminder in the water bill to maintain irrigation schedule in accordance with weather conditions. The reminder could consist of an insert or a statement on the bill itself. Another possible approach includes implementing summer and winter water rates and maintaining communication with landscape manager or property manager about conservation through pricing.
4. Provide written marketing materials to illustrate how ET controllers can be used to reduce water used for irrigation.
5. Provide landscape appraisals to the City's conservation program to help landscape managers and property owners understand which types of plants could be replaced with salt-tolerant landscape.
6. Install a CIMIS station in Redwood Shores due to the high variability of climate between Redwood Shores and central Redwood City. *[2007 Update: Finding a site in the Shores has been challenging.]*
7. Use the "weather underground" system to determine if residents in Redwood Shores would be willing to install a backyard weather station.

2007 Comments and Suggestions:

1. City should consider replacing its urinals with low-flow or waterless models at City facilities.
2. Consider a program to replace traditional urinals with waterless urinals in commercial buildings.
3. Develop a City-sponsored program to support installation of synthetic turf at residential houses. This might include cooperative purchase of artificial turf to decrease the costs to individual homeowners.

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- Urban Water Management Plan 2005*, City of Redwood City Public Works Services Department, December 19, 2005.
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