

City of San Diego Water Department  
Recycled Water Pricing Study  
Draft Report

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## 1.0 EXECUTIVE SUMMARY

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The City of San Diego (City) commissioned Raftelis Financial Consultants (RFC) to conduct the Recycled Water Pricing Study (Pricing Study). The purpose of the study was to review all financial aspects of the recycled water operations and capital program to:

- Calculate the true cost of producing and distributing recycled water
- Recommend a pricing structure that recovers all costs associated with producing and distributing recycled water
- Review alternative rate structures to encourage recycled water demand
- Determine appropriateness and amount of revenue and expenses that should be shared among potable water, wastewater and recycled water programs and the resultant impacts on customers
- Develop a user-friendly computer Pricing Model that could be used to model rates in future years and train City staff to use it

The Pricing Study included extensive review of the current and projected recycled water demands, operating and capital expenses, and policy issues related to allocation of costs among recycled water, water and wastewater enterprises.

The following sections document the background, cost of service review, analysis and findings and the recommendations which are the product of the study.

### 1.1. Background

This section describes the regulatory background, the state of the current recycled system and current rates for recycled water.

#### *1.1.1. Regulatory*

Since 1963, the City has treated its wastewater at the Point Loma Wastewater Treatment Plant (PLWTP). Wastewater is currently being treated to advanced primary standards. In 1972, the federal Clean Water Act (CWA) was adopted and it required wastewater treatment plants provide a minimum of secondary treatment. However, Section 301(h) of the CWA allowed facilities that discharge to certain marine waters to apply for a waiver from secondary treatment standards by 1982. The City originally applied for the waiver but withdrew it, and in 1987 the US Environmental Protection Agency (EPA) along environmental groups sued the City for not meeting the provisions of the CWA. The Ocean Pollution Reduction Act (OPRA) was passed in 1994 to allow the City to reapply for a Section 301(h) waiver. The City reapplied and received a waiver to treat wastewater to secondary standards as required by the Clean Water Act. One of the conditions of the waiver required the City to implement a water reclamation program that would create a system capacity to treat 45 million gallons per day (MGD) by 2010. The City has fulfilled the treatment capacity requirement with the completion of the 30 MGD North City Water Reclamation Plant (NCWRP) in 1997 and the 15 MGD South Bay Water Reclamation Plant (SBWRP) in 2002. A 1995 federal court order further required

the City to construct an optimized recycled water distribution system in conjunction with building the NCWRP. The distribution facilities that comprise the Optimized System were installed between 1995 and 1998 with Water Department funds to enable delivery of recycled water upon completion of the reclamation plant. The Optimized System, also known as the “backbone system”, is composed of recycled water facilities built to store and distribute recycled water produced at the NCWRP to the area north of Highway 52, south of Mira Mesa Boulevard, west of Interstate 15, and an area east of Interstate 15 in the Miramar Ranch North community.

Since 2001, the Water Department has expanded the Optimized System by connecting additional recycled water customers to the backbone system. The total cost of the Optimized System is approximately \$69.8 million and it consists of the following facilities:

- 66 miles of pipeline ranging from 4” – 18” in diameter
- 9 MG Reservoir
- 2 pump stations

The City also received approximately \$69.5 million in construction grants from the United States Environmental Protection Agency (EPA) for the construction of the NCWRP. Conditions of that grant included the following goals:

- A minimum of 75 percent of the plants design capacity (at least 22.5 MGD) must be treated at NCWRP. Of these flows the City will beneficially reuse 10 percent upon certification
- The City will attempt to reuse 25 percent of the flows (5.6 MGD) into the plant by December 31, 2003
- The City will attempt to reuse 50 percent of the flows (11.25 MGD) into the plant by December 31, 2010

As long as the City is making attempts at maximizing beneficial reuse of recycled water, the EPA does not include penalties for failing to meet the 50 percent reuse goal. In FY 2008, an average of 6.25 MGD of recycled water was used from the NCWRP, including in-plant usage.

### ***1.1.2. Current Recycled Water System***

To increase use of recycled water, the City continues to expand the distribution system to connect other retail customers. Recycled water distribution facilities are currently in place or are planned to serve the northern service area extending from the coast to the City of Poway (Poway). Additionally, through the Recycled Water Retrofit Program, the City has invested approximately \$14.9 million over 10 years to retrofit customers enabling them to use recycled water. When the program expired in 2001, recycled water commodity rates were reduced from 90 percent of the potable rate to \$0.80 per HCF to encourage retail customers to convert to recycled water use. The City currently sells recycled water produced at NCWRP to the City of Poway, Olivenhain Municipal Water District and to 44 retail customers. Additionally, the City started recycled water sales from SBWRP to the International Boundary Water Commission (IBWC) in 2006 and to

Otay Water District in 2007. In 2008 two new retail connections were made to serve U.S. Border Patrol, for construction use and irrigation as well as Caltrans for freeway landscaping. In the coming years Caltrans plans to expand their recycled water irrigation system along the interstates 5 and 905 corridors.

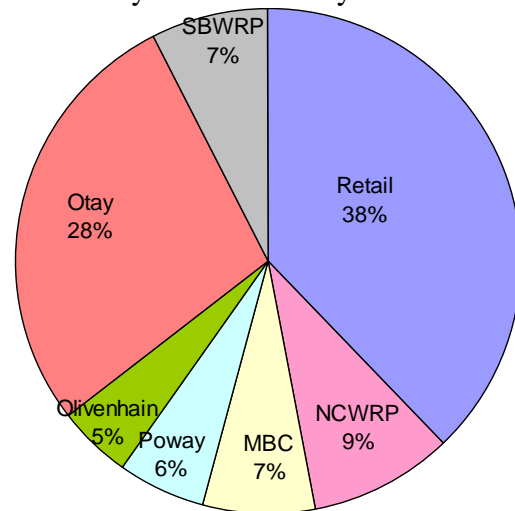
In addition to the volumetric rate, the City collects base fees based on the size of the meter serving each customer. At the current volumetric rate of \$0.80 per HCF, the recycled system is operating in deficit. In FY 2008, total revenue requirements including operation and maintenance (O&M) expenses (excluding tertiary treatment costs), rate funded capital costs and debt service costs are approximately \$8.8 million. If the past capital investments of the Water Department are amortized over 14 years and recovered from recycled water, the annual revenue requirements increase to \$16.4 million. Rate revenues and credits from Metropolitan Water District of Southern California (MWD) and the San Diego County Water Authority (SDCWA) are approximately \$5.8 million, resulting in a net deficit of \$10.6 million. This level of deficit, subsidized by potable water users, would continue unless rates are adjusted.

## 1.2. Projections

To determine rates, it is necessary to review the user and usage characteristics, revenue requirements, and miscellaneous revenue offsets.

### 1.2.1. Customers

The entire recycled water system comprised of North City and South Bay service areas currently has about 447 customers with meters ranging in size from 1-inch to 10-inch. Most are retail customers; however, the City sells recycled water to a few agencies including Otay Water District, Olivenhain Municipal Water District, and the City of Poway. A significant quantity of recycled water is used at the NCWRP and SBWRP, and at the Metropolitan Biosolids Center (MBC). Although most of the customers are retail customers, the majority of the usage is from wholesale customers.

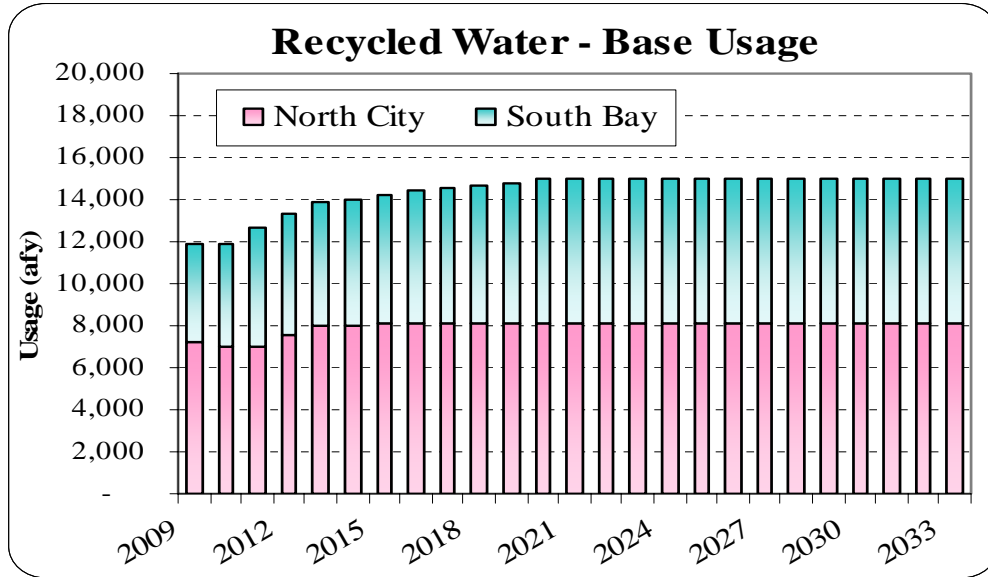


### 1.2.2. Usage

Recycled water commodity rates are very sensitive to usage and this emphasizes the importance of accurately estimating future sales. Future sales are dependent upon several factors including the expansion of the distribution system, seasonal and weather conditions as most of the recycled water is used for landscape irrigation. Based on current planning, recycled water sales are projected to grow at a stable rate for the next few years as the distribution system is expanded by the City and wholesale agencies, and level off in the long-term. The current projected base usage of recycled water from

NCWRP and SBWRP is shown in Figure ES-1 and includes recycled water usage within the reclamation plants.

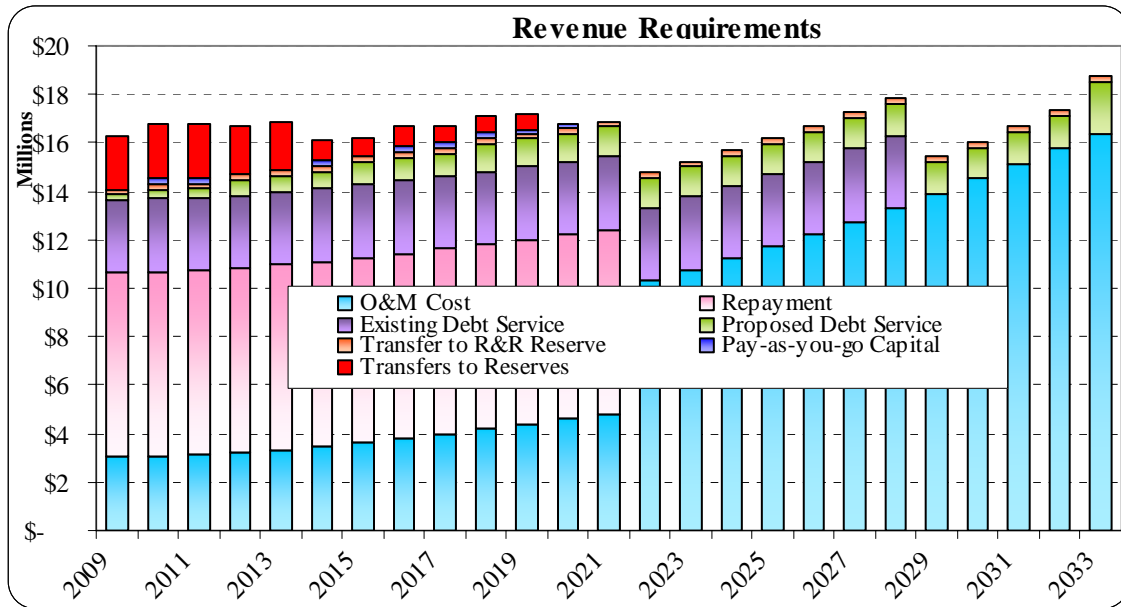
Figure ES-1



**1.2.3. Gross Revenue Requirements**

Revenue requirements include all expenses of the recycled water system. Gross revenue requirements include recovery of operating and maintenance (O&M), pay-as-you-go capital (PAYGO), replacement and refurbishment (R&R), operating reserve requirements, and debt service costs. As the City endeavors to meet its goal of beneficially reusing at least 50 percent of the wastewater flow at NCWRP, it will need to undertake significant capital expenses to extend the distribution system so that more users can be connected to the recycled water system. The capital expenses will be partially funded by PAYGO funds recovered through rates. The City’s policy is to fund 80 percent of the capital costs through debt funding and the balance through PAYGO and other sources. Figure ES-2 shows the gross revenue requirements for the recycled water system.

Figure ES-2



Net revenue requirements are revenues to be derived from commodity rates for recycled water and are gross revenue requirements less offsets. The offsets are discussed below.

**1.2.4. Revenue Offsets**

Commodity rates are determined from net revenue requirements and take into account offsets from several sources including:

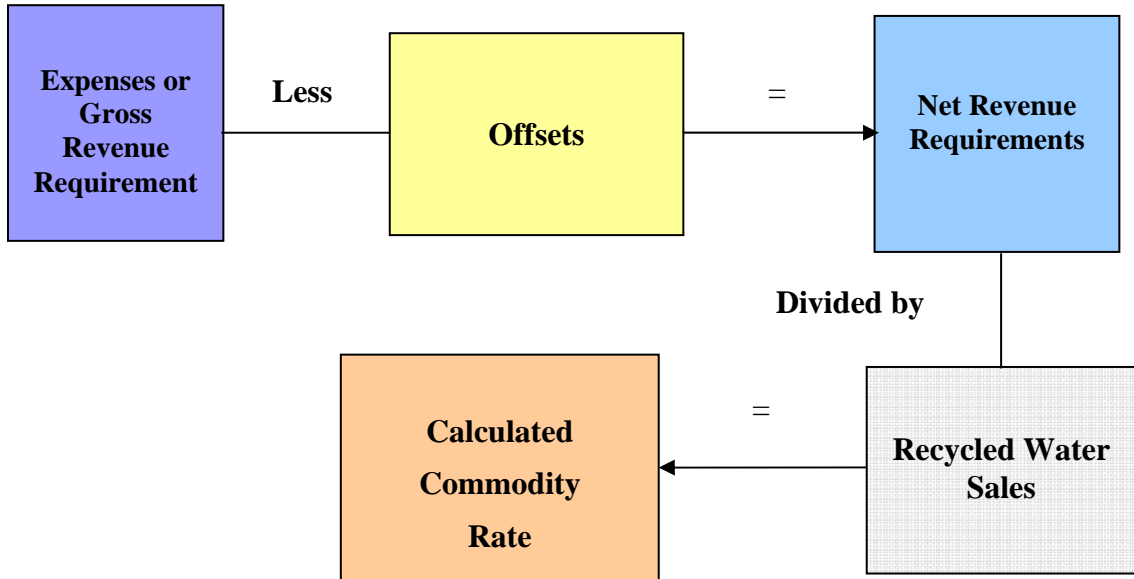
- Base charges collected on recycled water meters; base charges are the same as those for potable water;
- Incentives from MWD and SDCWA in the amount of \$250 and \$200 per acre feet (AF) of recycled water sales, respectively, for all sales at NCWRP. Retail sales from SBWRP only qualify for incentives from CWA ; and
- Fees of \$25 per AF from Olivenhain Municipal Water District for sales in its service area because it is not a member of Metropolitan Joint Powers Authority.

**1.2.5. Cost of Service Rates**

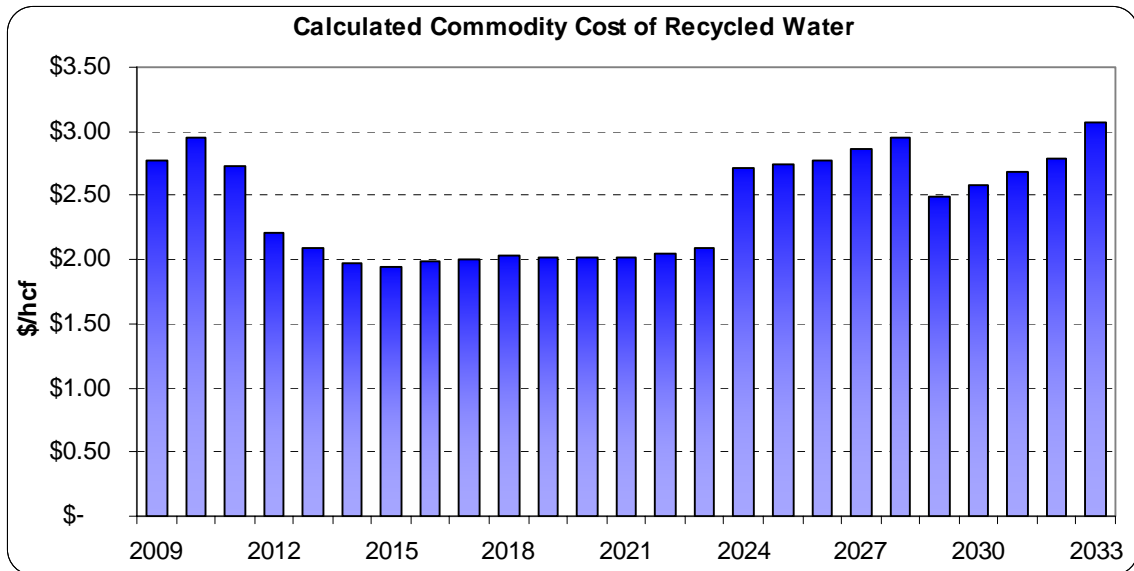
The net revenue requirement (the difference between the gross revenue requirements and the revenue offsets) for each year is divided by the projected recycled water sales in that year to derive the unit commodity cost of recycled water as shown in Figure ES-3. The calculated cost is shown in Figure ES-4. Since the new recycled water supply is initially more expensive than mature potable water supply, it is necessary to set the rates based on other considerations. These are further discussed in the Observations and Recommendations sections below.

Figure ES-3

**Calculation of Rates**



**Figure ES-4**



### 1.3. Observations

This section of the Executive Summary outlines some observations that will enhance the viability of the recycled water program.

1. The current rate for recycled water is \$0.80 per HCF. The Water Department began selling recycled water in October 1997 at \$1.34 per HCF and reduced the rate to its current level to encourage recycled water use.
2. Recycled water rates are very sensitive to the quantity of recycled water sold. Most of the costs of the recycled water system are fixed, including debt service and most of the O&M costs; spreading these costs over a larger usage base would result in lower rates.
3. To make recycled water available to more users, the City is planning capital investments in the distribution system. Capital costs will be funded on a PAYGO basis from rates, new debt, system development fees, and federal and state grants.
4. There are some cost savings at the PLWTP from producing recycled water at NCWRP. These savings result primarily from reducing power and chemical costs and are estimated to be about \$46 per AF in 2006. The Metropolitan Wastewater Department (MWWD) receives the full benefit from the cost savings.
5. By substituting recycled water for potable water, the City is, in effect, creating capacity in its potable system that can become available for new users. The effect is two fold:
  - a. Since the recycled water system is a **sunk cost**—a cost that has been incurred and cannot be reversed—for the most part, using it to its full potential provides the City with an alternate water supply that is relatively inexpensive. It frees up capacity in the potable system that becomes available to new users. Recycled water customers can benefit from lower rates (if rates are set based on market considerations) and also from a relatively reliable (more drought proof) supply when the system is used at maximum capacity.
  - b. Since the potable water system loses customers, there is a reduction in operating revenue to the potable water system. The loss of revenue is small when compared to the potable water revenues. In the long-term, the recycled water capacity allows the City greater flexibility to add customers.
6. The City receives financial credit for recycled water sales from SDCWA, for both the NCWRP and SBWRP. Additionally, NCWRP receives a financial credit from MWD. MWD and SDCWA provide incentives of \$250 and \$200 per AF, respectively, to encourage agencies to develop alternate sources of water because it releases demand on the imported water. These incentive agreements will expire in FY 2023 for NCWRP and FY 2032 for SBWRP.
7. Tertiary treatment costs at NCWRP and SBWRP were included in MWWD's rate case approved by City Council in February 2007 and cover FY 2008 to 2011. In

- the Pricing Model, it is assumed that MWWD will continue to bear those costs until all past investments to the potable water system is paid off.
8. The Pricing Model assumes that recycled water used at the treatment plants and at the MBC will not be billed as it is considered a raw material used to produce an end product at these facilities.
  9. As demand increases, NCWRP will need to expand demineralization capacity to ensure that product water total dissolved solids (TDS) is under 1,000 mg/l. The plant's current Electro Dialysis Reversal demineralization capacity is approximately 12 MGD depending on water and wastewater sources. TDS reduction at the SBWRP, if necessary, will be achieved by blending.
  10. Excluding the costs of the treatment plants, the City has invested about \$69.8 million in the optimized system and about \$14.9 million in retrofits so that customers could use recycled water. In addition, the City has invested about \$52.8 million in expanding the recycled water system. Out of the total costs of about \$137.5 million, \$25.6 million was grant funded, \$37 million was debt financed and the remaining cash financed. The recycled water rate alternatives provide a mechanism to recover all of these costs over time.

## 1.4. Recommendations

This section of the Executive Summary outlines recommendations to enhance the viability of the recycled water program.

1. We recommend that the City set system development fees for retail recycled water connections equal to the potable rate, currently \$3,047 per equivalent dwelling unit (EDU). This is consistent with the 2007 water rate case recommendations. The revenues will accrue to the recycled water system and will be used to offset capital costs for the recycled system.
2. The Metropolitan Wastewater system is treated as a unitary system, and all wastewater users proportionately share in the costs of this system. Similarly, the recycled water system should be considered a unitary system and all the costs of the system should be proportionately shared by both retail and wholesale customers receiving recycled water from the NCWRP and SBWRP. This means that all users should be charged the same commodity rate for simplicity, provided that these users are within the wastewater service area. Rates outside of the wastewater service area, such as Olivenhain MWD, could include an incremental fee since these outside users do not share in the costs of the wastewater system. Also, users such as Poway, that did not pay a capacity charge, could be charged a higher rate.
3. To ensure that the recycled water is marketable, we recommend that the commodity rate for recycled water be tied to the potable irrigation rate due to the fact that recycled water is used mainly for irrigation purposes. Most agencies in California charge a recycled water rate between 75 to 90 percent of the potable water rate. The recycled water commodity rate is currently 26 percent of the January 2009 irrigation rate of \$3.107. We recommend the recycled water rate

target set at 75 percent of the irrigation rate as this percentage provides a good balance among rates, reserves and cost of service. The target rate can be achieved by implementing increases over a period of three years to minimize impacts and continue encouraging customers to switch to recycled water use. It should be noted that the recommended rate is not the cost of service rate. The cost of service rate is much higher than the recommended rate in the early years or until 2012. In later years the recommended rate is higher than the cost of service rate so that revenues lost in the earlier years can be recovered. The rate model does not include any potential costs that the City may incur if the recycled water facilities are down and unable to provide recycled water. In that case the City may have to provide potable or raw water to its customers. The costs associated with serving potable water are not considered and the higher rate in later years may help offset any such costs. The recommended rate is designed to be a steadily increasing rate without the spikes to provide greater stability of charge to customers and of revenues to the recycled water system. As costs and sales can be projected with reasonable certainty for only a few years, the City should consider reviewing the rate policy after five years with available updated information.

4. The recycled water base fees or meter charges have not been revised for several years. Base fees include costs of customer service, billing, meter maintenance and a portion of the costs to provide capacity. These costs for potable and recycled water should be comparable; for simplicity, we recommend that the base fees for recycled water be set at the same level as the potable base or meter charges and continue to be revised when potable water rates are revised.
5. We recommend that the following rates be implemented in FY 2010. The meter charges are the same as the projected potable water meter charges in FY 2010. Projected rates for subsequent years are shown for planning purposes. The commodity rate is projected to increase to 75 percent of the irrigation rate by FY 2012.

**Table ES -1**  
**Recommended Recycled Water Rates**

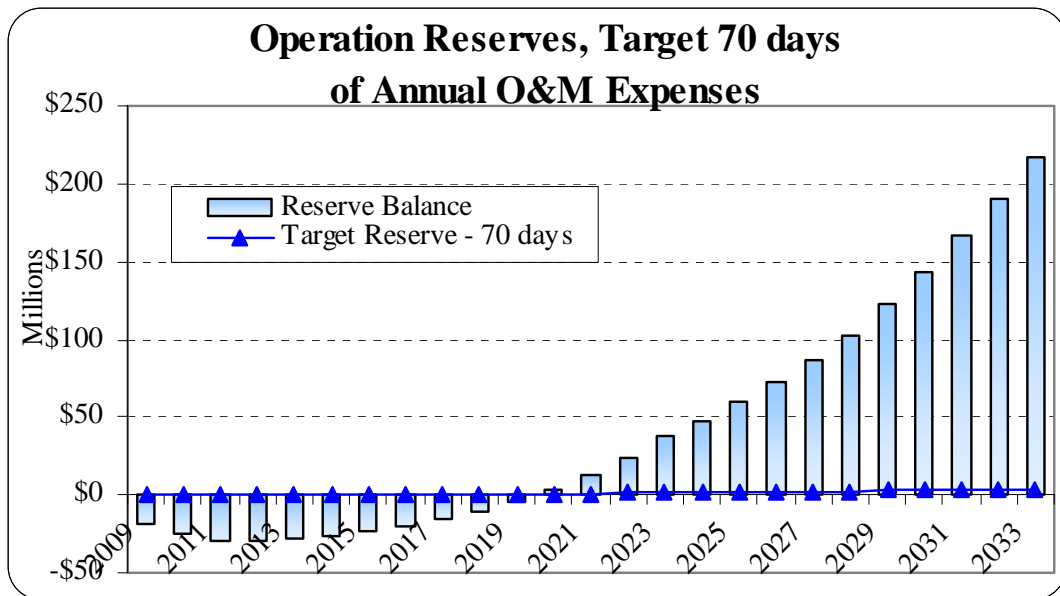
	Existing	Projected	Projected	Projected
	2009	2010	2011	2012
Monthly Base Fee				
<u>Meter Size</u>				
5/8"	\$ 8.63	\$ 17.22	\$ 18.34	\$ 19.07
3/4"	\$ 8.63	\$ 17.22	\$ 18.34	\$ 19.07
1"	\$ 8.63	\$ 25.15	\$ 26.78	\$ 27.85
1-1/2"	\$ 43.27	\$ 43.25	\$ 46.06	\$ 47.90
2"	\$ 65.96	\$ 65.89	\$ 70.17	\$ 72.98
3"	\$ 246.93	\$ 119.07	\$ 126.81	\$ 131.88
4"	\$ 411.53	\$ 194.89	\$ 207.56	\$ 215.86
6"	\$ 925.93	\$ 382.76	\$ 407.63	\$ 423.94
8"	\$ 1,234.59	\$ 609.09	\$ 648.68	\$ 674.63
10"	\$ 1,646.12	\$ 873.91	\$ 930.71	\$ 967.94
12"	\$ 2,263.42	\$ 1,627.61	\$ 1,733.41	\$ 1,802.75
16"	\$ 3,703.75	\$ 2,835.13	\$ 3,019.42	\$ 3,140.20
Commodity Rate (per HCF)	\$ 0.80	\$ 1.46	\$ 2.03	\$ 2.66
Commercial/Industrial	\$ 2.606	\$ 3.097	\$ 3.196	
Irrigation	\$ 2.784	\$ 3.309	\$ 3.415	

6. The City may consider alternate rate structures that encourage use during winter by establishing a lower winter rate. We recommend that such a rate be developed when the commodity rate reaches its target level.
7. Consistent with permit requirements, MWWD has borne the cost of constructing the capital facilities required to produce recycled water, including the demineralization facilities at NCWRP. We recommend that MWWD continue to be responsible for the R&R of the NCWRP and SBWRP facilities.
8. Currently the MWWD is bearing the full cost of O&M for producing recycled water. Consistent with conditions of the EPA grant used to fund the cost of NCWRP construction and the Participating Agencies (PA) Agreement, MWWD will be responsible for the costs of the tertiary system through the end of the current rate case, Fiscal Year 2012. The Pricing Model assumes that recycled water system will pay the tertiary treatment costs after all past investments are repaid to the potable water system in 2021.
9. The financial plan developed in the Pricing Model provides an allowance for R&R of the distribution system assets assuming that 80 percent of the costs will be debt financed. The revenues derived from including these costs in the revenue requirements should be set aside in the R&R reserve to be used to fund replacement of the system in the future.
10. Since the recycled water system will experience some growth over the next several years the estimates of O&M, R&R, and capital costs may need to be

revised. We recommend that the City review these figures on an annual basis for the next several years to ensure that they are consistent with the actual costs.

11. We recommend that the recycled water system establish reserve funds consistent with the water and wastewater enterprise funds. These reserves would include operating, capital, and rate stabilization reserves. The target for the operating reserve is set at 70 days or about 19 percent of the annual operating costs as shown in Figure ES-5 below. The capital reserve may be used to fund the R&R of the recycled water distribution system. The rate stabilization target is set at 10 percent of the commodity revenue.

**Figure ES-5**



12. The recycled water operation will continue to operate in the red for several years and begin to recoup the losses beginning in 2012. The cumulative losses shown in the operating reserves will be recovered in 2020 and will exceed the target of 70 days of O&M expenses in the same year. The City should revisit its recycled water rates policy before this happens.
13. The City should continue efforts to increase customers and usage. Investments in the distribution system to increase sales, however, should be analyzed by performing an economic analysis to ensure cost effectiveness.

## 2.0 INTRODUCTION

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The City of San Diego (City) engaged Raftelis Financial Consultants (RFC) to conduct a recycled water cost of service rate study to identify the cost of providing recycled water service and develop a financial plan considering alternatives of recovering various capital costs the City has incurred in establishing recycled water service.

This study evaluates the cost of providing recycled water, how costs are shared between the Water and Wastewater Departments, which are both impacted by the production, use and sale of recycled water, and the impacts on customers.

### 2.1. Background

The City of San Diego (City) is the eighth largest city in the United States and the second largest city in the State of California. The City's population is approximately 1.3 million. The City is located on the southernmost coast of California and covers a geographical area of about 330 square miles.

The Recycled Water Distribution System is currently managed and operated by the Water Department. However, the production and some of the costs are shared with the Wastewater Department. It is, therefore, important to gain some background and perspective on both the Water System and the Wastewater System.

### 2.2. Water System History

The Water System is owned and operated by the City and managed by the Water Department. The Water System consists of three treatment plants, nine surface raw water storage reservoirs, and about 3,200 miles of transmission and distribution lines. The Water System services the City and some surrounding areas through over 275,000 retail service connections. Approximately 92 percent of the connections serve residential customers and the balance serve commercial, industrial, and other customers. In addition to retail customers, the City sells potable or raw water on a wholesale basis to the California-American Water Company, the City of Del Mar, and the Santa Fe and San Dieguito Irrigation Districts.

#### 2.2.1. *Water Supply*

The Water System currently receives its water supply from two sources: local runoff and water imported by the SDCWA. An average of 10 to 15 percent of the water supply for the Water System comes from local runoff. This source is seasonal and variable in nature. The balance of the Water System water supply is purchased from SDCWA. In turn, SDCWA currently imports approximately 90 percent of its water supply from MWD.

The City has conducted several major studies addressing its water supply needs. The City's projected water demands and recommended future supplies are developed through the Strategic Plan for Water Supply which was adopted by the City Council in August

1997. The 2000 Strategic Plan estimated water demand through 2015 and identified infrastructure requirements necessary to ensure that facilities were in place to store, treat, and distribute water in an effective and efficient manner. In 2000, the City initiated an update of the Strategic Plan, known as the Long-Range Water Resources Plan (LRWRP) adopted by Council in December 2002. The LRWRP extended water demand projections through 2030 and developed a decision-making framework for evaluating water supply options. The LRWRP identified several options, including water reclamation to meet the mid- to long-term demands.

### 2.3. Wastewater System

The City’s MWWD operates a regional wastewater system that provides wastewater collection, conveyance and treatment services to the City and a number of Participating Agencies (PAs) outside the City. The PAs are:

<p><b>1. City of Coronado</b></p> <p><b>2. City of Del Mar</b></p> <p><b>3. East Otay Mesa Sewer Maintenance District</b></p> <p><b>4. City of El Cajon</b></p> <p><b>5. City of Imperial Beach</b></p>	<p><b>6. City of La Mesa</b></p> <p><b>7. Lakeside/Alpine Sanitation Districts</b></p> <p><b>8. Lemon Grove Sanitation District</b></p> <p><b>9. City of National City</b></p> <p><b>10. Padre Dam Municipal Water District</b></p>	<p><b>11. City of Poway</b></p> <p><b>12. Wintergardens Sewer Maintenance District</b></p> <p><b>13. City of Chula Vista</b></p> <p><b>14. Spring Valley Sanitation District</b></p> <p><b>15. Otay Water District</b></p>
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The regional wastewater system infrastructure currently includes three wastewater treatment plants, Point Loma Wastewater Treatment Plant (PLWTP), North City Water Reclamation Plant (NCWRP) and South Bay Water Reclamation Plant (SBWRP); two ocean outfalls, Point Loma Ocean Outfall and South Bay Ocean Outfall; a biosolids processing center, Metropolitan Wastewater’s Metro Biosolids Center (MBC); three major pump stations; and several miles of force mains and gravity flow interceptors. The City operates the regional wastewater system under two National Pollutant Discharge Elimination System (NPDES) permits that stipulate standards of discharge for the PLWTP and the SBWRP. To comply with the discharge standards and to meet other requirements of the federal Clean Water Act, the City had to undertake various capital project initiatives including the enhancement of existing wastewater treatment facilities and the construction of North City and South Bay water reclamation plants. The City operates the wastewater system as a self-supporting enterprise and costs are accounted for separately under the wastewater enterprise fund.

Some elements of the recycled water program are required elements in the wastewater program. It is important to understand these elements that are required for the wastewater system so that the cost sharing between the recycled and wastewater system is clearly defined.

### **2.3.1. Legal and Regulatory Background**

Since 1963, the City has treated its wastewater at the PLWTP, which provides advanced primary treatment before disposal in an ocean outfall. In 1972, the federal Clean Water Act (CWA) was adopted which requires that wastewater plants provide a minimum of secondary treatment. Section 301(h) of the CWA allowed facilities that discharge to certain marine waters to apply for a waiver from secondary treatment standards by 1982. The City originally applied for the waiver, but then withdrew it. In 1987, the U.S. Environmental Protection Agency (EPA) and environmental groups sued the City for not meeting the provisions of the CWA. The Ocean Pollution Reduction Act (OPRA) was passed by the U.S. Congress in 1994 to allow San Diego to reapply for the Section 301(h) waiver.

As part of the Section 301(h) application, the City committed to implementing a water reclamation program that would create a system capacity to treat 45 MGD by 2010. The City has fulfilled the treatment capacity requirement with the completion of the 30 MGD NCWRP in 1997 and the 15 MGD SBWRP in 2002. A 1995 federal court order further required the City to construct an optimized recycled water distribution system in conjunction with building the NCWRP. The majority of the distribution facilities that comprise the optimized system were installed between 1995 and 1998 to enable delivery of recycled water upon completion of the NCWRP.

The EPA provided a grant that helped fund the construction of the NCWRP. Conditions of the grant award are quoted as follows:

*“Upon certification of the NCWRP, flows into the plant will constitute a minimum of 75 percent of the plant’s design capacity (i.e. at least 22.5 MGD). Of these flows the City will beneficially reuse at least 10 percent upon certification and shall attempt to meet the following goals:*

- a. Beneficial reuse of 25 percent of the flows treated at the NCWRP by December 31, 2003.*
- b. Beneficial reuse of 50 percent of the flows treated at the NCWRP by December 31, 2010. “*

Presently, NCWRP treats 22.5 MGD (75 percent of capacity) of wastewater to secondary standards. The requirement to reuse 10 percent of the treated flows was achieved in 1998, when about 2.4 MGD of recycled water was distributed. Currently, about 6.25 MGD of recycled water is beneficially reused at the NCWRP, about 28 percent of treated flows. There is no penalty for failing to meet the EPA goals as long as the City is trying to maximize recycled water reuse.

## **2.4. Recycled Water Program History**

The City first produced recycled water in 1981. The 25,000-gallon per day (GPD) Aqua I pilot aquaculture plant began operation in Mission Valley. The plant’s production water was used to irrigate a sod farm adjacent to Jack Murphy Stadium (now Qualcomm Stadium). In 1984, the Aqua II Water Reclamation Facility, a second, larger pilot research installation, began treating 180,000 GPD of wastewater. This water was sold to Caltrans for use in irrigating freeway landscaping beginning in 1987. In 1991, the Aqua

III Water Reclamation Facility and Aqua 2000 Research Center were relocated in the San Pasqual Valley, north of Rancho Bernardo, where the City continued to use aquaculture treatment to reclaim wastewater. This facility had the capacity to treat 1 MGD for agricultural use and irrigation until 2001 when the facility was closed.

#### **2.4.1. Current Recycled Water System**

The current recycled water system consists of two plants, NCWRP and SBWRP, both owned and operated by MWWD. However, the distribution system that distributes recycled water to customers is owned and operated by the Water Department. Due to this separation of ownership, there exist several issues related to the cost sharing between MWWD and the Water Department, which are further explained in section 2.4.2.

The City has been delivering recycled water since September 1997 when construction on the NCWRP and distribution system was completed. The NCWRP provides recycled water to retail customers in the northern area of the City, to MBC, and wholesale service to the City of Poway and Olivenhain MWD for irrigation, industrial, and other non-potable uses. In FY 2008, an average of 6.25 MGD of recycled water was beneficially reused in the Northern Service area including the use at the NCWRP. The total capacity at the NCWRP is 30 MGD and the existing sustainable capacity of the demineralization process, called Electro Dialysis Reversal, is 12 MGD. The demineralization process is used to reduce the total dissolved solids (TDS) in the recycled water when it exceeds 1,000 milligrams per liter (mg/l). The City has committed to recycled water customers that the TDS of recycled water will not exceed 1,000 mg/l.

To encourage use of recycled water so that EPA goals could be reasonably achieved, the City funded approximately \$14.9 million in retrofits for existing users to convert to recycled water use. Retrofits are required to modify plumbing systems that are set up to use potable water so that there is no intertie between potable and recycled water. The program was discontinued in 2001. The City invested approximately \$69.8 million in the optimized recycled water distribution system, of which about \$14.3 million was grant funded.

In addition to the 30 MGD of recycled water design capacity provided at the NCWRP, the City has completed the SBWRP with a production capacity of 15 MGD. Sales of recycled water from SBWRP started in FY 2007. On average, recycled water usage from the SBWRP was approximately 4.6 MGD in FY 2008. The plant provides wholesale service to Otay and the International Boundary Water Commission (IBWC) in the South Bay area. There is no demineralization process at the SBWRP; thus, if the TDS level of the recycled water exceeds 1,000mg/l, the SBWRP would have to blend recycled water with potable water to meet the TDS requirement.

In FY 2008, the City had over 400 recycled water meters in operation with a total annual beneficially reuse of 12,165 acre-feet. Excluding use of the recycled water at the NCWRP and SBWRP, recycled water sales for FY 2008 are estimated to be about 6,000 AF from NCWRP and 3,600 AF from SBWRP. Recycled water distribution system (Recycled System) extensions are projected to modestly increase sales in the coming years. Projections of sales and a more detailed discussion of Recycled System growth assumptions are provided in Section 5.2 – System Growth Projections.

On July 1, 2001, coinciding with the conclusion of the retrofit program, the City Council reduced the commodity rate for recycled water from \$1.34 to \$0.80 per hundred cubic feet (HCF) to encourage more customer connections to the recycled water system. The rate has remained at that level except for a couple of months starting January 2002 when it was set at \$0.812 per HCF. The rate for recycled water is currently 29 percent of the City's current irrigation rate of \$2.784 per HCF. The meter charges for recycled water service have not changed since January 2002 when they were reduced slightly. The recycled water rate history is presented in Table 2-1 along with the current irrigation water rate for comparison purposes.

#### **2.4.2. Institutional**

Recycled water spans both water and wastewater systems because it is produced as a byproduct of the wastewater treatment and used to offset potable water demand. As a result there are institutional issues related to cost sharing by wastewater.

Since the reclamation plants were built as a condition of the waiver for secondary treatment at the PLWTP, MWWD has borne all the capital costs associated with producing recycled water including the operating costs of tertiary treatment. The capital and operating costs of demineralization at NCWRP are also borne by MWWD because grant conditions required sale of recycled water and the City has committed to the recycled water customers that the TDS content will not exceed 1000 mg/l.

MWWD uses recycled water in the NCWRP, SBWRP and MBC. This use "inside the fence" is not billed to MWWD.

**Table 2-1**  
**Recycled Water Rate History**

Meter Size	Recycled Water Rate History				Potable Water	
	Monthly Rate				Monthly Rate	
	Effective				Effective	
	1-Mar-00	1-Jul-01	20-Jan-02	28-Mar-02	1-Jan-08	1-Jul-08
5/8"	\$ 9.63	\$ 9.63	\$ 8.63	\$ 8.63	\$ 15.32	\$ 16.32
3/4"	\$ 9.63	\$ 9.63	\$ 8.63	\$ 8.63	\$ 15.32	\$ 16.32
1"	\$ 10.23	\$ 10.23	\$ 8.63	\$ 8.63	\$ 22.41	\$ 23.86
1-1/2"	\$ 46.27	\$ 46.27	\$ 43.27	\$ 43.27	\$ 38.59	\$ 41.10
2"	\$ 71.16	\$ 71.16	\$ 65.96	\$ 65.96	\$ 58.83	\$ 62.66
3"	\$ 256.53	\$ 256.53	\$ 246.93	\$ 246.93	\$ 106.38	\$ 113.29
4"	\$ 427.93	\$ 427.93	\$ 411.53	\$ 411.53	\$ 174.17	\$ 185.49
6"	\$ 655.93	\$ 655.93	\$ 925.93	\$ 925.93	\$ 342.12	\$ 364.36
8"	\$ 1,286.59	\$ 1,286.59	\$ 1,234.59	\$ 1,234.59	\$ 544.47	\$ 579.86
10"	\$ 1,724.12	\$ 1,724.12	\$ 1,646.12	\$ 1,646.12	\$ 781.23	\$ 832.01
12"	\$ 2,395.42	\$ 2,395.42	\$ 2,263.42	\$ 2,263.42	\$ 1,455.06	\$ 1,549.64
16"	\$ 3,989.75	\$ 3,989.75	\$ 3,703.75	\$ 3,703.75	\$ 2,534.62	\$ 2,699.37
Commodity Rate (per HCF)						
Commercial	\$ 1.34	\$ 0.80	\$ 0.80	\$ 0.80	\$ 2.45	\$ 2.606
Multi-Family	\$ 1.34	\$ 0.80	\$ 0.80	\$ 0.80	\$ 2.55	\$ 2.717
Cal-Trans	\$ 1.19	\$ 0.80	\$ 0.80	\$ 0.80	\$ -	
Irrigation					\$ 2.61	\$ 2.784

## 2.5.Pricing Objectives

The first step in developing a recycled water pricing structure is to identify and prioritize pricing objectives. The Pricing Study has five major pricing objectives. These pricing objectives may conflict with each other; for example, marketability requires a lower rate to sell as much recycled water as possible. However, that would conflict with financial sufficiency which requires rates to be set at a level which recovers the costs of service. As a result, the pricing objectives have to be balanced to meet the City’s requirements.

### 2.5.1. Financial Sufficiency

A major objective of the Pricing Study is to put the recycled water program on a self-sufficient financial footing. The Study must demonstrate that recycled water will be able to supply its own cash needs through revenue collected from its own fees and charges. Further, recycled water must be able to pay the debt service on the \$37 million in loans used to fund construction of the original distribution system.

### 2.5.2. Simplicity

Another objective of the Pricing Study is simplicity. Most customers of the recycled water system are irrigation customers with similar characteristics. Therefore there is no need to develop separate rates for different classes. This simplifies the rate structure, and it can be readily communicated to users and implemented easily.

### 2.5.3. *Legality and Adherence to Interagency Agreements*

The production, distribution, and sale of recycled water were, in part, dictated by several inter-governmental agreements. Production and sales goals were established in grant agreements with the EPA. The City has negotiated wholesale agreements that cover rates and capacity for recycled water services. Agreements are in place with MWD and SDCWA for incentive credits for recycled water usage to expand local supplies and relieve demand from the strained potable water supply. All of these agreements have been incorporated into the development of the recycled water pricing structure.

Proposition 218 passed in 1996, and validated by the California Supreme Court in 2006 as applicable to water and wastewater service, requires the following:

- Revenues derived from fees may not exceed the funds required to provide the service;
- The amount of the fee may not exceed the proportional cost of the service attributable to the parcel upon which the fee is imposed; and
- The fee may not be imposed unless the service is actually used by, or immediately available to, the owner of the property.

Article X, Section 2 of the State Constitution requires water resources to be put to the maximum beneficial use. This article states the following:

*“It is hereby declared that because of the conditions prevailing in this State the general welfare requires that the water resources of the State be put to beneficial use to the fullest extent of which they are capable, and that the waste or unreasonable use or unreasonable method of use of water be prevented, and that the conservation of such waters is to be exercised with a view to the reasonable and beneficial use thereof in the interest of the people and for the public welfare. ...”*

Combining Proposition 218 and Article X allows some flexibility in designing a system of rates that encourages the use of recycled water so that it is beneficially used especially in view of the current water supply situation in the State as long as the rates are reasonable. Given that the market based approach is widely practiced in California and across the US, it would not be unreasonable to implement such an approach in the City so that potable water rates support the recycled water system in the short run and recover costs in the long run.

### 2.5.4. *Marketability*

The goal of a financially sufficient enterprise fund is to recover annual cash needs through revenue generated by rates and charges. Current sales are relatively small and keeping rates relatively low compared to potable water would incentivize more customers to switch to recycled water. Recycled water has to compete with raw and potable water and its use is currently limited to irrigation and industrial uses. Recycled water cannot command premium pricing and expect to grow or even maintain its customer base even though recycled water has a nutrient value for irrigation and offers advantages of greater reliability than potable water during times of drought when non-essential usage such as irrigation is subject to mandatory conservation. Instead, recycled water needs to be at a

lower price. In addition, customers typically have to bear costs related to retrofitting their plumbing for recycled water. To recover these costs recycled water rates have to be lower than potable water rates. Many agencies set recycled water rates between 75 and 90 percent of the potable water rate.

**2.5.5. Customer Impact**

Finally, recycled water pricing must be cognizant of impacts higher rates would have on customer bills. The City is aware that recycled water rates would have to increase to meet the objective of financial sufficiency; however, the rates must be carefully structured to continue to incentivize customers. An alternative is to phase in the increases over a few years to minimize customer dissatisfaction. A period of three years may be reasonable.

### 3.0 DEVELOPMENT OF REVENUE REQUIREMENTS

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Every water utility must receive sufficient total revenue to ensure proper operation and maintenance (O&M), development and perpetuation of the system, and preservation of the utility's financial integrity<sup>1</sup> to provide adequate water service to its customers.

Revenue requirements may be established either by the utility approach or the cash-needs approach. The utility approach to determine revenue requirements is followed by most investor owned utilities and government utilities that are regulated by a state public utilities commission. The utility approach allows the utility to recover operating requirements, depreciation, and a return on capital as determined by generally accepted accounting principles. In the cash-needs approach, followed by most unregulated governmental utilities, user charges are structured to recover specific operations and capital cash requirements. The Pricing Study utilizes the cash-needs approach for development of revenue requirements. Therefore, revenue requirements for the recycled water program may be defined as the gross cash needs of the Enterprise Fund for operations and capital expenditures.

#### 3.1. Operating Costs

The O&M expense component is usually developed based on actual expenditures and adjusted to reflect anticipated changes in expenditures during the projection period. Adjustments to historical O&M expenses are determined by incorporating known and measurable changes to recorded expenses, and by using well-considered estimates of future expenses.

O&M expenses include salaries and wages, fringe benefits, energy, rent, chemicals, materials, small equipment, other supplies and services, and general overhead. For a government-owned utility, other elements of O&M expenses might also include the costs of support services rendered by the municipality, such as the use of computer facilities, assistance in billing and customer service, or office rental. The Study has grouped operating expenses into five major categories:

- Tertiary treatment costs
- Demineralization costs
- Recycled water distribution system energy costs
- Recycled water program costs
- Recycled water meter shop costs

Operating costs are itemized in the Pricing Model in Appendix B, Table 3.

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<sup>1</sup> AWWA M-1 Manual, p.3

### **3.1.1. Tertiary Treatment Costs**

Tertiary treatment, the final step in Title 22 recycled water treatment, removes very small particles including bacteria and viruses, and certain toxins that are not affected by conventional treatment. While the primary, secondary, and tertiary treatment processes are all ultimately required to produce recycled water, for the purposes of this Study, it was determined that only tertiary costs would be included in recycled water pricing. The costs of secondary treatment at the NCWRP and SBWRP will remain the responsibility of MWWD. Currently, MWWD is paying for the costs of tertiary treatment at the NCWRP and SBWRP. The Pricing Model assumes that the recycled water system will pay for tertiary treatment after all past investments are repaid to the potable water system in 2021. The current agreement with the PAs requires revenues from the sale of recycled water from the NCWRP to be used first for recovery of the optimized distribution system costs, followed by O&M costs of tertiary treatment at the NCWRP.

MWWD, NCWRP, and SBWRP plant operators provided costs for tertiary treatment broken down into a process format. For instance, chemical and electricity costs for each process were estimated and itemized. These costs are variable costs, meaning they vary with the level of plant production. The cost of personnel and maintenance contracts are fixed in that they remain constant at the level of plant production projected over the planning horizon. The Pricing Model utilizes a matrix of these fixed and variable prices applied to projected levels of production at the plants to estimate current year tertiary treatment costs for a range of annual production amounts. Once an escalator of four percent per year is applied to these costs to estimate inflation, they are ready for use in the Pricing Model.

### **3.1.2. Demineralization Costs**

Electro Dialysis Reversal is included as part of the treatment at NCWRP to ensure that TDS does not exceed 1,000 mg/l. Lowering TDS is considered an additional treatment step beyond Title 22 requirements for tertiary treatment. However, this demineralization step does not meet potable water standards. Currently, SBWRP does not have demineralization facilities and TDS may be temporarily controlled through blending recycled water and potable water. However, since the plant came on-line in FY 2007, there has not been a problem with TDS at the SBWRP so blending has not been necessary. In the event that the SBWRP experiences TDS problems, the Pricing Model has the flexibility of adjusting the blending percentage and the resultant costs of producing recycled water at SBWRP. Ultimately, SBWRP may seek a capital solution to TDS control by employing a demineralization process. Per the agreements with the PAs, MWWD will cover these demineralization costs in the same manner that it covers tertiary treatment costs as long as it is not potable water quality.

### **3.1.3. Recycled Water Distribution System Energy Costs**

Energy costs related to pumping recycled water through the distribution system are included here. Since energy costs have been increasing at a faster pace than general inflation, these costs are tracked separately and can be estimated more accurately by inflating at the appropriate rate.

### **3.1.4. Recycled Water Program Costs**

These costs include customer service, marketing and developing the customer base for the use of recycled water, coordinating public information efforts, administering the cross connection program, and enforcement of recycled water rules and regulations to ensure public health is not compromised.

### **3.1.5. Recycled Water Meter Shop Costs**

The Recycled Water Distribution System delivers recycled water from the NCWRP and SBWRP to customers. The distribution system consists of piping, pumping, and storage. Operating costs for the distribution system generally include labor and material costs for performance of routine O&M tasks. These tasks include exercising system valves, monitoring system performance, meter maintenance, and scheduled and minor maintenance of system assets.

## **3.2. Capital Costs**

Under the cash-needs approach, it is important to identify the cash that is needed from user charges to support the Capital Improvement Program (CIP) and related capital expenditures. Capital expenses are different from O&M expenses in that they relate to tangible assets that will be utilized over an extended useful life. For the purposes of this Study, capital costs may relate to prior capital investments in the recycled water system or prospective investment included in the CIP.

Capital expenditures include design, and construction of pumps, pipelines, and storage. Expenditures for engineering and financing the capital program may also be included.

Capital expenditures and capital funding sources are itemized in the Pricing Model found in Appendix B, Table 4 and Table 5.

### **3.2.1. Tertiary Treatment**

As defined under Section 3.1.1, tertiary treatment provides secondary treated wastewater to Title 22 water quality standard set by the State of California. Tertiary treatment capital costs include the investment made in tertiary treatment at both the NCWRP and SBWRP as well as an allowance for future capitalized maintenance, or repair and replacement, required for the NCWRP and SBWRP tertiary treatment processes. MWWD documentation shows that capital spending on NCWRP and SBWRP tertiary treatment, net of grant funding, was approximately \$40 million and \$18 million, respectively.

The advanced primary, secondary, and tertiary treatment processes are all required to produce recycled water. However, since MWWD was required to construct the NCWRP and SBWRP as a condition of the full secondary treatment waiver, none of the initial capital costs of construction or any future repair and replacement costs of these assets is used to develop rates.

### **3.2.2. Recycled Water Distribution**

As discussed in Section 3.1.2, the Recycled Water Distribution System consists of piping, pumping, and storage infrastructure. Distribution system capital costs captured in the

Pricing Model include assets already placed in service as well as prospective projects for service extensions in the CIP. Distribution system capital costs are developed from two sources. Historical costs net of grant funding for assets already in service are found in fixed asset records, bond issue official statements, and grant applications. Prospective capital costs come from the CIP. For purposes of this Study, the total past capital investment of \$137.5 million less grants of \$25.6 million is included in the rate calculation. Of this net amount of \$111.9 million, \$37 million was debt funded and the remaining \$74.9 million, representing investments in the recycled water distribution system made by the Water Department potable customers, is assumed to be paid off over 14 years at 5.1 percent or \$7.6 million per year. Additionally, an estimate of the present worth of the future R&R cost of the distribution system is included in the rate calculation assuming that 20 percent of the R&R costs will be cash financed and the remainder 80 percent debt financed. The revenue generated for the R&R component is set aside in an R&R reserve.

### **3.2.3. Capital Funding Sources**

Funding for the capital plan may come from many sources. Funding may come directly from rates in the form of pay-as-you-go capital, some from development or capacity fees, some from fund balance contributions, and some from financing costs over time as debt service. A balanced capital portfolio usually contains funding from many sources. Water Department guidelines suggest that 20 percent of the CIP be funded through rates as pay-as-you-go capital. The Pricing Model assumes capacity fees accrue to recycled water for new retail recycled water customers and existing potable customers converting to recycled water and this revenue is used as a capital funding source. Capacity charges from all new customers are computed at the rate of \$3,047 per EDU (0.56 AF per year) based on the 2007 water rate case. As mentioned earlier, the Water Department and MWWF funds were utilized for initial capitalization of the distribution and tertiary treatment, respectively. Finally, the pricing model assumes the remaining capital costs will be financed through new debt issues at a rate of six percent over 30 years.

### **3.2.4. Retrofitting Existing Customers**

Many potential customers of recycled water are existing potable water customers. Such customers already have the plumbing facilities, including irrigation systems, for potable water use on their properties. To convert these customers to recycled water use requires them to segregate current plumbing into potable water and recycled water systems. The primary reason for this is that there cannot be direct contact between recycled and potable water systems. As a result existing potable water customers wanting to use recycled water are also required to install backflow prevention devices on their potable service to ensure if there was an accidental cross connection on site that water could not flow back into the City's potable distribution system. Depending on the configuration, more extensive modifications may be required to their plumbing systems to separate the potable and the recycled water pipelines. A change required to an existing customer's plumbing system is referred to as retrofitting.

When NCWRP came on line in 1998, the City initiated a Retrofit Program that provided approximately \$14.8 million to fund the costs of retrofitting existing customers so that

they could be converted to recycled water. To meet the conditions of its EPA grant, the City needed to encourage and promote use of recycled water for the overall public good. The City discontinued executing new retrofit program agreements in 2001 and does not anticipate renewing this program.

### **3.3. Extraordinary Items**

One item of interest that is not widely considered is the nutrient value resulting from nitrates in recycled water used for irrigation purposes. In the eighties, the California State Water Resources Control Board (SWRCB) determined that recycled water provides nutrient value that reduced the need for fertilizers. This value was determined to be \$40 per AF of recycled water. The SWRCB continues to use this value currently in determining the economics of recycled water projects. This benefit is not factored into the calculation of recycled water rates which are based on the cost of service and not benefits.

## 4.0 DEVELOPMENT OF REVENUE OFFSETS

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Revenue offsets refer to cash the utility derives from sources other than commodity rate revenue. This additional cash offsets revenue requirements and thus reduces the amount of revenue that must be recovered through rates. This study has categorized revenue offsets into:

- Base charges
- Credits
- Avoided costs
- Other offsets

### 4.1. Base Charges

Base charges are typically designed to recover fixed costs that may be allocated to customers on a per account basis. At a minimum, the base charge may recover the costs of meter reading, billing, collections, and customer service. These services are provided for each account regardless of usage. The base charge may be extended to cover some portion of fixed capital or fixed O&M costs.

The Water Department employs a base charge component in its potable water rate structure to pay for meter reading, billing, collection, customer service, etc. It was determined that recycled water accounts should pay the same base charge as potable accounts. This decision reflects the fact that the same types of services provided to potable customers under the base charge are also provided to recycled customers.

### 4.2. Credits

Generally speaking, credits are revenues collected outside the standard rate structure that are used to offset costs. Credits against capital costs are structured payments from wholesale customers to buy into the capacity of the recycled water system. These are known as capacity fees. Credits against general costs are ongoing revenues that may be used to offset either capital or operating costs. These include MWD and SDCWA incentives.

#### 4.2.1. *Credits against Capital Costs*

In order for wholesale customers to receive recycled water service, they must pay capacity charges. Capacity fees compensate the Water Department for capital investments made in constructing system production and distribution capacity. By contract, the Water Department has received capacity fees from Olivenhain, IBWC, and Otay, and is expecting to receive capacity fees from new users connecting to the NCWRP system. Existing potable water retail customers who connect to the recycled water system will not pay capacity fees if they are acquiring the same or lower capacity in the recycled water system than they had in the potable system. However, the recycled water

system should get credit for these retail customers connecting to the recycled water system since they are releasing capacity in the potable water system that would then become available to new potable customers. Since these fees are collected to compensate for investment in capital infrastructure, they are used as offsets to capital costs.

#### **4.2.2. Credits against General Costs**

Olivenhain is a contract wholesale customer of the recycled water system. Since Olivenhain is not a member of the regional wastewater system, their wholesale price, by agreement, includes a premium of \$25 per AF. This premium payment is used in the Pricing Model as an offset to revenue requirements

As mentioned earlier, the City has agreements with SDCWA and MWD that recycled water sales will receive a credit because these sales relieve pressure on the potable water supply. As such, these agencies are willing to pay incentives for the development of recycled water use by providing credits to the Water Department. The maximum MWD and SDCWA credits are \$250 per AF and \$200 per AF, respectively. The agreements with SDCWA and MWD for credits on recycled water sales will expire either in 25 years after the starting date of operations, which is in 2023 for the NCWRP. The SDCWA incentives agreement for SBWRP expires in 2032. The agreement terms for both plants will expire early if the cost of producing recycled water becomes lower than the cost of purchasing water from MWD. Since potable water rates are projected to increase significantly in the near term, the City should monitor the continued receipt of these credits. The Pricing Model assumes that the City will continue to receive the \$250 per AF MWD and \$200 per AF CWA credits for the NCWRP for the entire term of the agreement. The City receives only SDCWA credits for SBWRP water to retail customers. According to the Otay Agreement, only Otay receives MWD and SDCWA credits for recycled water sold to Otay. There are no credits for recycled water used at the NCWRP, SBWRP and sales to Otay. The credits are used in the Pricing Model as an offset to revenue requirements.

**Table 4-1** shows a summary of net revenue requirements, gross revenue requirements less revenue offsets, from the Pricing Model. For more details see Appendix B.

**Table 4-1**  
**Revenue Requirements**

Line No.		Estimated	Projected	Projected	Projected	Projected
		2008	2009	2010	2011	2012
	<b>Gross Revenue Requirements</b>					
1	O&M Cost	\$ 3,009,049	\$ 3,046,169	\$ 3,078,053	\$ 3,129,142	\$ 3,184,417
2	Existing Debt Service	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649
3	Proposed Debt Service	\$ -	\$ 184,598	\$ 369,195	\$ 369,195	\$ 670,485
4	Repayment to Water	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076
5	Transfer to R&R Reserve	\$ -	\$ 220,451	\$ 220,451	\$ 220,451	\$ 220,451
6	Pay-as-you-go Capital	\$ 2,746,409	\$ -	\$ 263,424	\$ 224,975	\$ -
7	<b>Total Gross Revenue Requirements</b>	\$ 16,370,183	\$ 14,065,944	\$ 14,545,848	\$ 14,558,488	\$ 14,690,079
	<b>Revenue Offsets</b>					
8	Credits from MWD and CWA	\$ 2,284,000	\$ 2,934,000	\$ 2,866,500	\$ 2,872,500	\$ 3,120,000
9	Base Charge Revenue	\$ 610,982	\$ 678,739	\$ 516,144	\$ 592,852	\$ 643,209
10	Fees from Olivenhein	\$ 12,500	\$ 12,500	\$ 10,000	\$ 10,000	\$ 10,000
11	<b>Total Revenue Offsets</b>	\$ 2,907,482	\$ 3,625,239	\$ 3,392,644	\$ 3,475,352	\$ 3,773,209
	Net Revenue Requirements	\$ 13,462,701	\$ 10,440,704	\$ 11,153,204	\$ 11,083,136	\$ 10,916,870

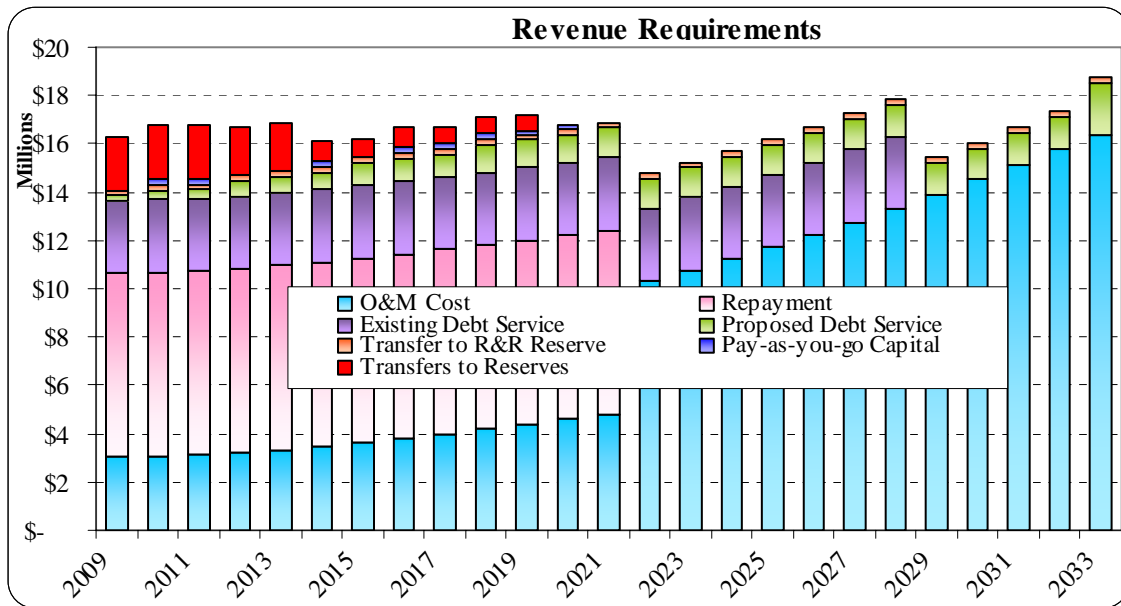
## 5.0 FINANCIAL PLAN

The financial plan presents projected financial statements for the utility and the economic impact on customers as a result of achieving the goals and objectives identified in the planning process. The intent of the financial plan is to demonstrate how changes in demand, costs, and pricing structure impact the financial position of the utility over a specific time horizon.<sup>2</sup> Taking a long-term approach to financial planning allows utilities to address problems before they become critical and smooth short-term fluctuations in rates. The keys to developing a solid financial plan are reliable projections of future costs and system growth.

### 5.1. Cost Projections

Figure 5-1 shows a projection of gross revenue requirements for the recycled water system from 2009 through 2033. Projections of operating and capital costs, the major components of the gross revenue requirements, are described below.

Figure 5-1



#### 5.1.1. Operating Costs

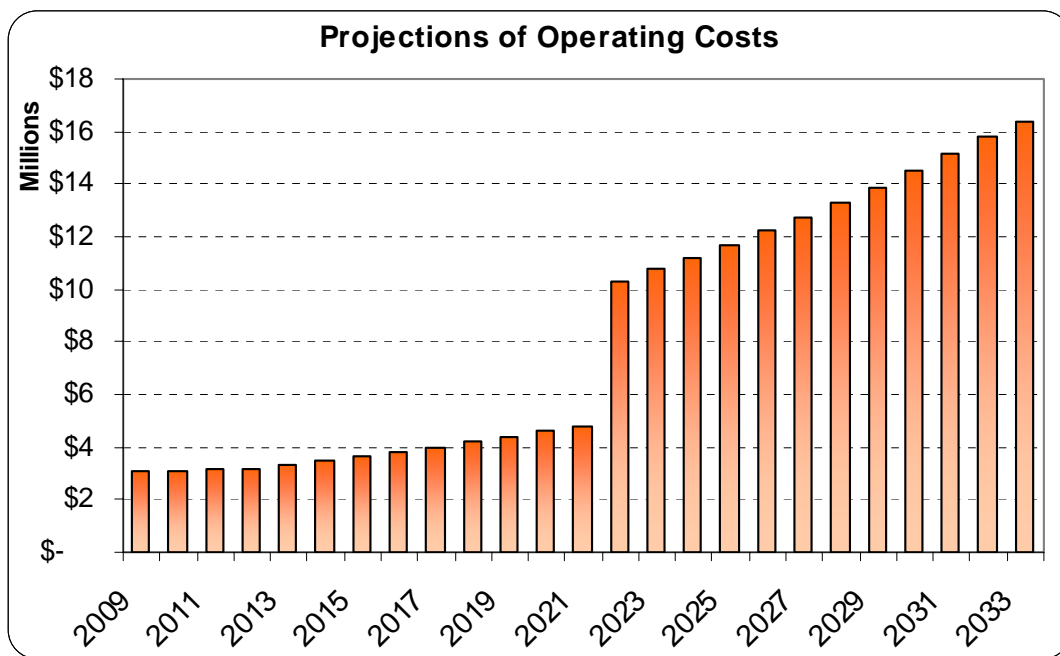
As discussed in Section 3.1, operating costs for the recycled water system were categorized by function into several different components. Cost escalation factors were estimated for these components to project future costs.

<sup>2</sup> Water and Wastewater Finance and Pricing – A Comprehensive Guide, Third Edition.

- Energy costs are projected to increase at eight percent per year for inflation. Additionally, energy costs are projected to change proportionally to the sales of water.
- Tertiary treatment operating costs, when included in the projections, were escalated using a standard approximation for price inflation of four percent annually. This factor is consistent with the potable water and wastewater rate cases.
- All other operating costs are projected to increase at a standard inflation rate of four percent per year.

Figure 5-2 shows operating cost projections for the recycled water program through FY 2033. Operating costs include distribution system energy costs, recycled water program costs, meter shop costs, and tertiary treatment costs starting in FY 2022.

**Figure 5-2**

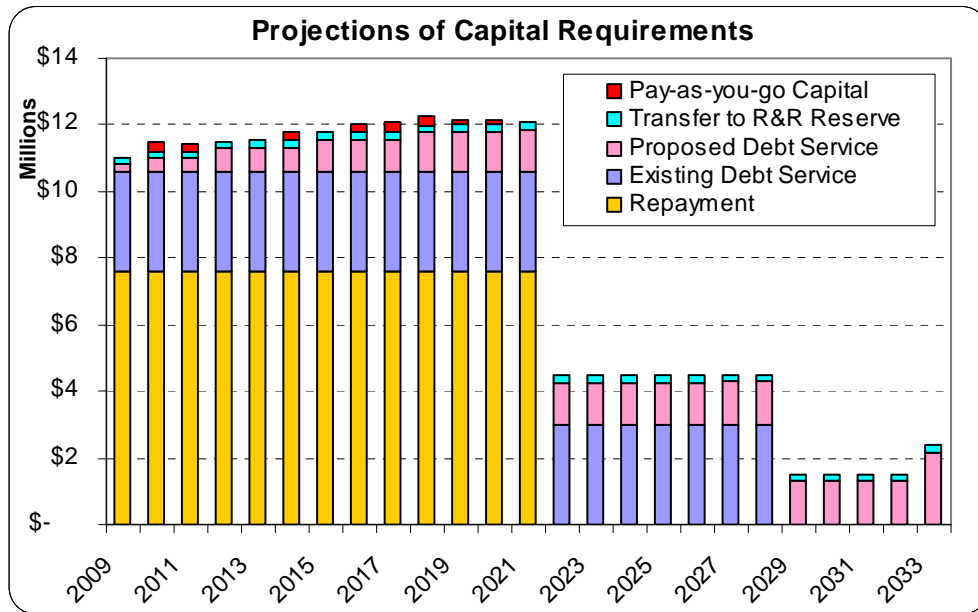


**5.1.2. Capital Costs**

The CIP for the recycled water system includes a forecast of capital projects and their associated cost outlays in current year dollars. The actual requirements, therefore, must be escalated for price inflation. These escalated projections from the CIP represent the capital component of future revenue requirements.

Figure 5-3 shows capital cost projections for the recycled water program through FY 2033. Capital costs are broken down into repayment for debt funded historical investment (existing debt service) in the system and prospective investment (proposed debt service) in system growth identified in the CIP.

Figure 5-3



## 5.2. System Growth Projections

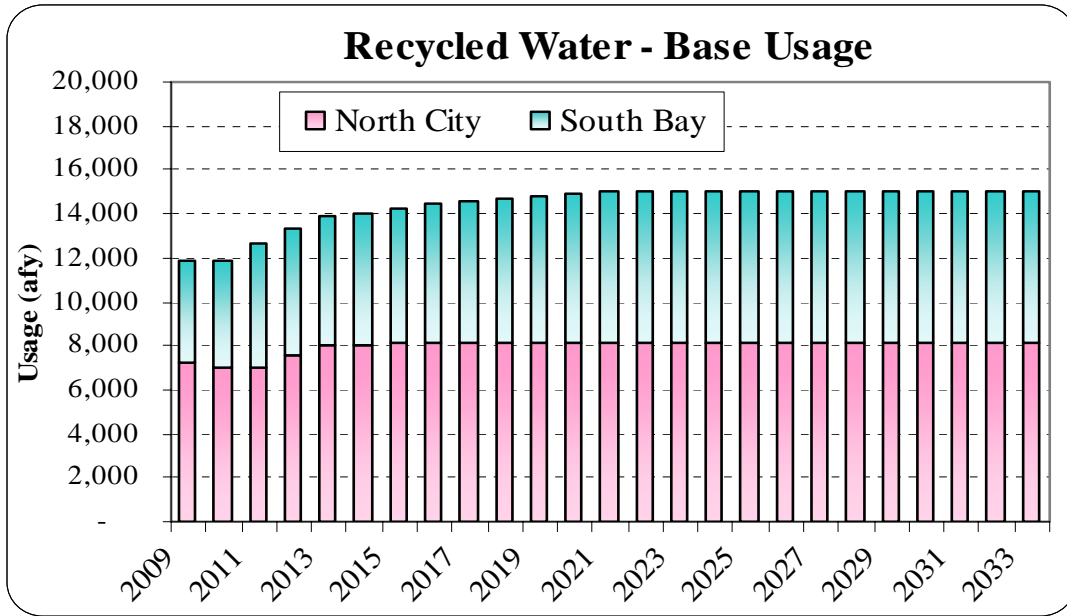
System growth projections are another key element in the financial planning process. System growth, measured in usage increases for recycled water, drives many of the cost increases discussed above. The expectation is that increases in usage outpace costs and yields a lower unit rate over time.

Usage projections are dependant on many variables. Distribution line extensions must be completed to allow customers to utilize recycled water service. Marketing and public information efforts must be in place to introduce prospective customers to recycled water benefits. Finally, the recycled water rate must be cost-effective as compared to available alternatives.

The Pricing Study recognizes the variability in these components of recycled water usage. The Pricing Model is designed with the flexibility to model different usage scenarios. The total usage scenario provided by the Water Department shows increases from 11,912 AF per year in FY 2009 to about 15,049 AF per year in FY 2021. This growth is characterized by an increase in retail sales coupled with bulk contracts with regional wholesale customers.

Figure 5-4 shows recycled water usage projections from the NCWRP and SBWRP plants.

Figure 5-4



## 6.0 RATE DEVELOPMENT

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Rate development for the Pricing Study considered two major objectives:

- Pricing should be set to ensure financial sufficiency to reflect the cost of providing service over a reasonable time frame
- The rates should be relatively easy to implement and simple to explain to customers

The first objective recognizes the City's desire to make recycled water a financially self-sufficient operation and new rates should be phased in over time allowing the customers to adjust. Generally accepted cost-of-service based rates may not fit relatively new service like the City's recycled water program. Cost-of-service based rates are developed by dividing net revenue requirements in a given year by the projected usage over that same year, thus ensuring financial sufficiency on an annual basis. This approach works well in a mature system that experiences incremental growth in costs and usage on an annual basis. Start-up utilities, such as the recycled water system, have special circumstances that make this approach difficult. New service typically experiences high start-up costs and low sales. Initial capital investments are required for production and distribution. Initial operating costs are required for administration and customer service. High costs spread over low initial consumption yields a high unit cost-of-service. As the fixed costs are spread over more and more consumption, the unit cost eventually decreases and stabilizes. In order to stabilize rate impacts, the Pricing Study uses a market-driven alternative during the phase-in period instead of the cost-of-service approach.

The second objective recognizes the advantages of developing a simple, equitable rate that applies to all customers. Most of the customers of recycled water are irrigation customers with similar usage characteristics. Applying the same rate structure to all customers simplifies the process of administration and customer service. This is consistent with industry practice.

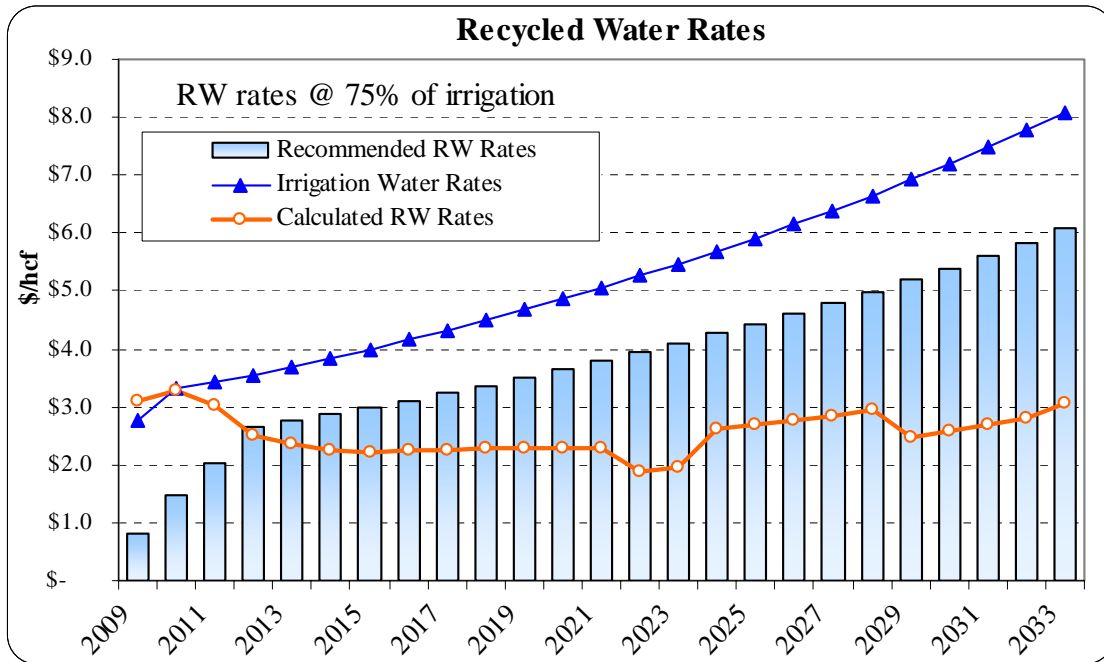
### 6.1. Cost-of-Service Rate Development

As mentioned, cost-of-service based rates are developed by dividing net annual revenue requirements by the projected annual usage. The result of this calculation is a unit cost rate that exactly recovers projected net revenue requirements each year. Since revenue from the cost-of-service rate fully recovers all cash needs every year, annual revenue sufficiency is assured, assuming rate assumptions hold. Cost of service rate calculations are shown in Figure 6-1 by the orange line.

Recycled water customers have enjoyed significantly lower rates for the last several years as the City decreased the rates to encourage more users to convert to recycled water. As potable water supplies have become scarcer and long term drought predictions become more real, the City recognizes the real value of the recycled water and setting rates

consistent with cost of service, even though it would result in significant impacts, is practical and would meet the regulatory requirements of Proposition 218.

Figure 6-1



## 6.2. Market-Driven Alternative Rate Development

Marketability and customer impacts were among the pricing objectives cited at the onset of our study. The City has a valuable resource in recycled water. Encouraging more users to switch to recycled water by providing a competitive pricing plan is in the interests of the City and the users, and helps meet regional goals. Recognizing that recycled water users incur costs in retrofitting and therefore need incentives to convert to recycled water, it is only reasonable to provide them a lower rate than potable water. If rates increase to cost-of-service levels too fast, there would be less incentive for new customers to convert to recycled water use. Market-driven rate alternatives may be designed to address the problems of a cost-of-service rate structure. Since such alternative rates are not constrained by the requirement to meet cash needs every year, they can be more competitive with potable irrigation water pricing. Alternative rates also have more flexibility to be phased in over time to mitigate adverse impacts on existing customers. Since recycled water is used mainly for irrigation purposes, it is more appropriate to peg the recycled water rate to the irrigation rate rather than the commercial potable water rate. The recommended recycled water rate is indicated by the blue bars in Figure 6-1. The target rate for recycled water is set at 75 percent of the irrigation water rates and phased in over three years so that the target rate is achieved in FY 2012. This target rate tracks the cost of service rate closely. The three-year phase-in period and 75 percent target rate provide a lower rate in the earlier years and recoup the revenues lost in later years. The proposed rates are shown in Table 6-1. For comparison purposes, Figure 6-1 shows the calculated and recommended recycled water rates and the potable

irrigation water rates. The difference between potable irrigation rates and recycled water rates grows with time providing a significant economic incentive to recycled water users.

**Table 6-1**  
**Projected Recycled Water Rates**

	Existing	Projected	Projected	Projected
	2009	2010	2011	2012
Monthly Base Fee				
<u>Meter Size</u>				
5/8"	\$ 8.63	\$ 17.22	\$ 18.34	\$ 19.07
3/4"	\$ 8.63	\$ 17.22	\$ 18.34	\$ 19.07
1"	\$ 8.63	\$ 25.15	\$ 26.78	\$ 27.85
1-1/2"	\$ 43.27	\$ 43.25	\$ 46.06	\$ 47.90
2"	\$ 65.96	\$ 65.89	\$ 70.17	\$ 72.98
3"	\$ 246.93	\$ 119.07	\$ 126.81	\$ 131.88
4"	\$ 411.53	\$ 194.89	\$ 207.56	\$ 215.86
6"	\$ 925.93	\$ 382.76	\$ 407.63	\$ 423.94
8"	\$ 1,234.59	\$ 609.09	\$ 648.68	\$ 674.63
10"	\$ 1,646.12	\$ 873.91	\$ 930.71	\$ 967.94
12"	\$ 2,263.42	\$ 1,627.61	\$ 1,733.41	\$ 1,802.75
16"	\$ 3,703.75	\$ 2,835.13	\$ 3,019.42	\$ 3,140.20
Commodity Rate (per HCF)	\$ 0.80	\$ 1.46	\$ 2.03	\$ 2.66
Commercial/Industrial	\$ 2.606	\$ 3.097	\$ 3.196	
Irrigation	\$ 2.784	\$ 3.309	\$ 3.415	

The drawback of alternative rates is their ability to meet the objective of financial sufficiency in the short term. This problem may be addressed in the long-term view employed by a financial planning model. The selected alternative rate structure may allow the recycled water program to run annual deficits initially as long as annual surpluses in subsequent years are sufficient to repay those shortfalls. In other words, the net present value of all annual surpluses and deficits over the planning horizon should be positive. The deficits in the earlier years would need to be funded by potable water and repaid with interest to the potable water enterprise in future years when surpluses are available.

The Pricing Model was developed to look at alternative rates pegged to either the irrigation water rate or the raw water rate. Irrigation water is the competitor of recycled water in that the recycled water rate must be lower than the irrigation rate to promote use. Therefore, pegging the recycled rate to a percentage of the irrigation rate should address the objective of promoting marketability. Raw water is also a competitor of recycled water. However, since only Olivenhain MWD has access to raw water through MWD and SDCWA, pegging recycled water pricing to raw water is not considered.

## 7.0 RATE IMPACTS

Depending on the rates implemented there are impacts on the water enterprise, the recycled water operation and on customers. This section briefly discusses these impacts.

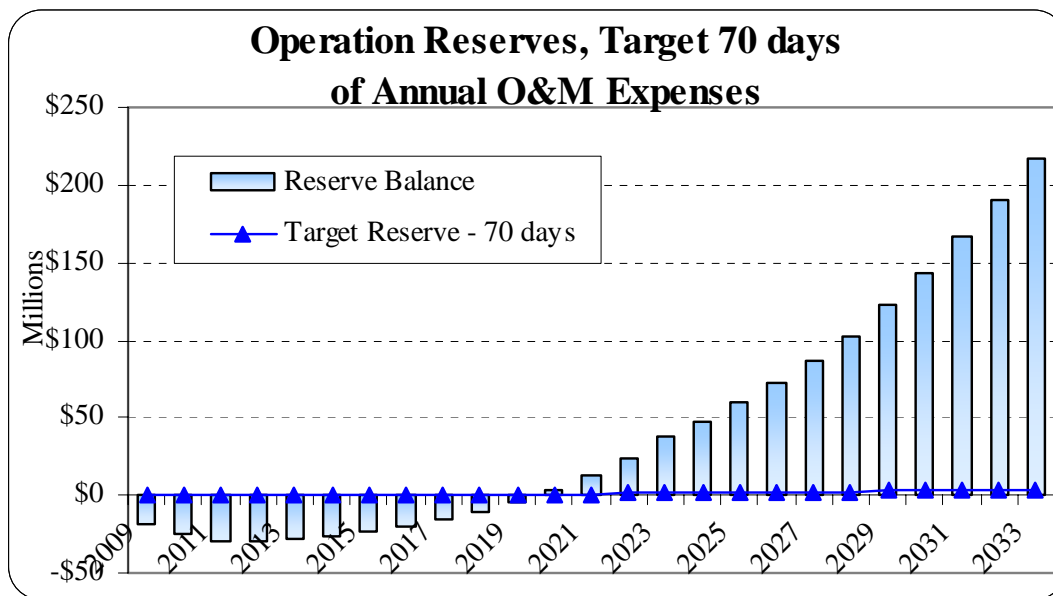
### 7.1. Recycled Water Reserves

As part of the revenue requirements included in the financial plan, the following reserves were set up for recycled water.

#### 7.1.1. Operations Reserve

The operating reserve is used to meet ongoing cash flow requirements as well as emergency requirements. Consistent with City policy and with potable water reserves, the target level for this reserve is set at 70 days of annual operating expenses. The reserve is shown below in Figure 7-1 starting in 2010 when there is a significant negative cash flow leading to a negative balance. The negative cash flow or shortfall in revenue in the recycled water system is made up by the potable water system. Because recycled water rates are phased in, the recycled water operating reserve will continue to show a negative balance for several years before it turns positive.

Figure 7-1

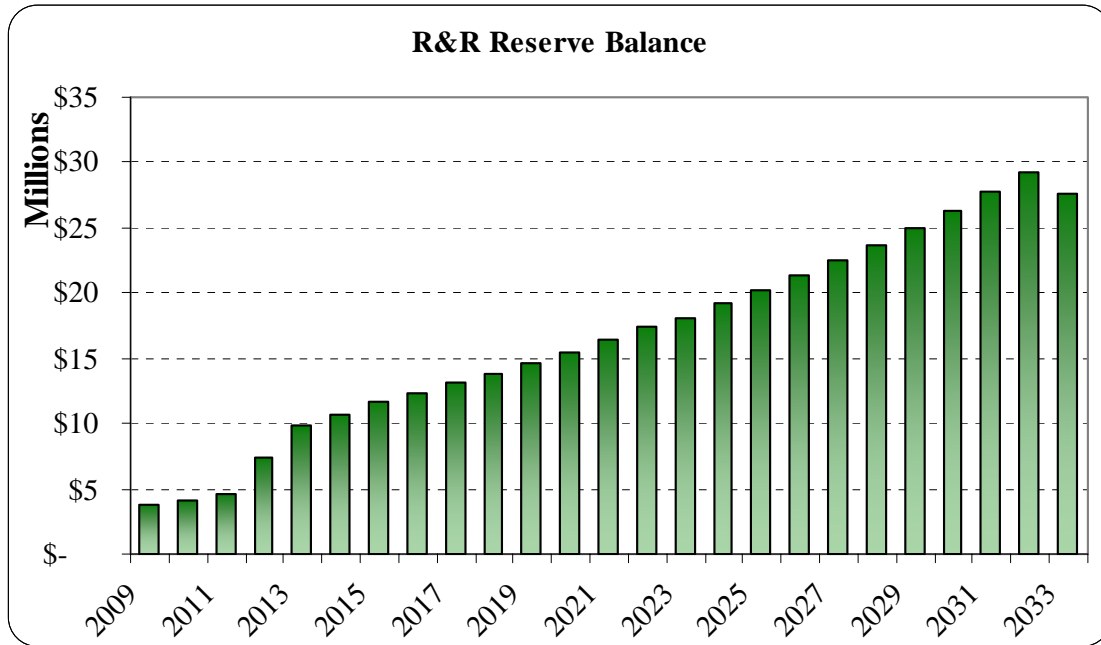


The City may be able to moderate rates in the later years to keep the operating reserve closer to target. Since this is not projected until about 2020, the City should have ample time to plan future rates.

**7.1.2. Replacement and Refurbishment Reserve**

As discussed in Section 3.2, the City needs to start building an R&R reserve to replace and repair the distribution system as it wears out. Per City policy, 20 percent of the estimated cost requirements are set aside in the reserve. Since the recycled water system is relatively new, these expenditures are not expected to be significant for many years to come. As a result the reserve will continue to grow and will not see substantial outflows until 2033. The balance in this reserve is projected in Figure 7-2 below.

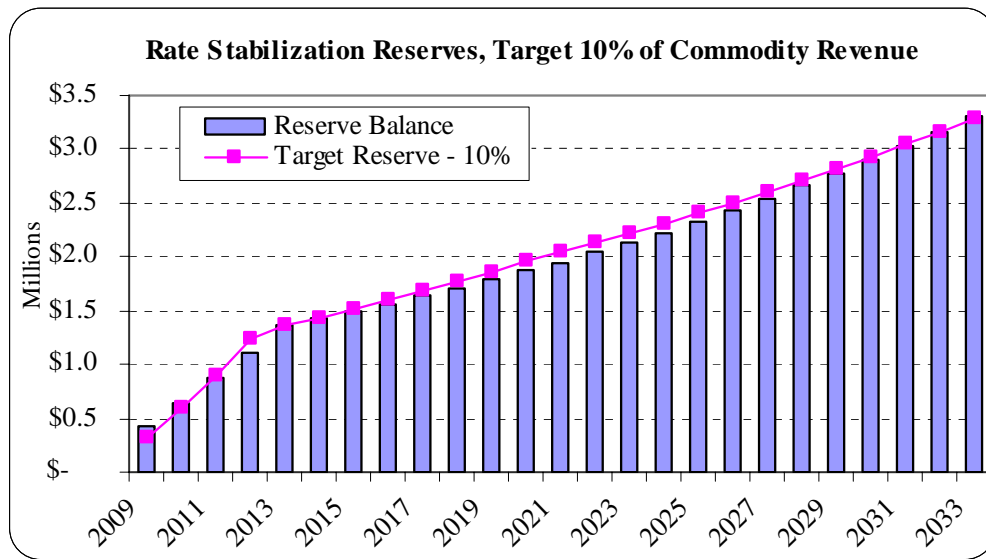
**Figure 7-2**



**7.1.3. Rate Stabilization Reserve**

In addition to the operations and R&R reserve, a rate stabilization reserve is recommended. While the costs of the recycled water system should be fairly stable from year to year, because usage and correspondingly the rate revenue could vary with the weather, it is reasonable to set up a rate stabilization reserve. A potential use of this reserve may be to purchase potable water when the recycled water system is down or for blending to meet TDS requirements. The target for this reserve is set at 10 percent of the commodity rate revenues consistent with the potable water system. The balance in this reserve is shown in Figure 7-3 below.

Figure 7-3



## 7.2. Impacts on Potable Water

The potable water system has been supporting the recycled water system for several years because the recycled water rates have not been increased or set to recover the costs of service. If rates are phased in over several years, the potable water system will continue to support the recycled water system; however, over a period of years the potable water system will recover all of its contributions to the recycled water system.

The impacts on the potable water system will result from the following:

- Payments of capacity charges to the recycled water system will be paid from the potable water system for retail recycled water customers that may be converting to recycled water from potable water. As discussed before, capacity becomes available as potable water users convert to recycled water and the potable water system should be able to recover these capacity charges from new potable water customers
- The potable water system has invested about \$74.9 million in the recycled water system. This investment will be recovered over the next 14 years by amortizing this amount at 5.1 percent resulting in payments of over \$7.6 million per year to the potable water system.
- As potable water users convert to recycled water, the potable water sales and revenues will tend to decrease. These amounts are relatively small and should be made up as new potable water users come on line.

On the whole implementing the recommended recycled water rates should help the potable water system.

### **7.3. Impacts on Recycled Water Customers**

Recycled water customers have enjoyed low rates for a number of years as potable customers have subsidized them. The recycled water rates have not been revised since July 2001. During that time potable water rates have increased from \$1.34 per HCF to \$3.107 (January 2009) for irrigation water, an increase of 132 percent. The recommended rate of \$1.46 per HCF represents an increase of 83 percent from the current rate of \$0.80 per HCF. The base charges for most of the meters, those larger than 1-in will actually be lower than under current rates.

## **APPENDICES**

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## APPENDIX A – RATE MODEL ASSUMPTIONS

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### *Inflation and Costs Assumptions*

1. O&M (includes non-personnel and tertiary O&M) Inflation: 4% per year. Personnel inflation is 4% per year after FY 2012.
2. Energy Inflation: 8% per year
3. Capital Inflation: 4% per year
4. Reserve Interest Rate: 4% per year in 2008 and 4.5% per year afterward
5. Debt Issue Interest Rate: 6% per year
6. New Debt Term: 30 years
7. Debt Issuance Cost: 3%
8. Potable Rate Escalation: 6.5% per year from 2009-2011 and 4% per year afterward – this is used in the revenue projections for recycled water when recycled rates are a percentage of potable rates.
9. Capacity Fees Escalation: 0% per year, capacity fees are equal to the potable water capacity fees.
10. Personnel and non-personnel costs for RW Program Cost and RW Meter Shop Costs are distributed between North City and South Bay based on the percentage of distribution system infrastructure in the respective service areas.
11. Distribution System costs are distributed between North City and South Bay based on the percentage of distribution system infrastructure in the respective service areas.
12. MWD/SDCWA reimbursements are assumed to be available each year through the term of the agreements with MWD and/or SDCWA. No MWD reimbursement at South Bay, nor SDCWA reimbursement for sales to Otay.
13. No billing for MBC usage.

### *Model Settings/Scenarios*

1. Two usage/demand scenarios: Base Usage and High Usage, same except for Otay usage: contracted vs. projected delivery.
2. Recycled Water (RW) is not paying for tertiary treatment costs.
3. RW is paying the \$37 million debt to Water. Loan terms are 5.1% for 21 years and 3% issuance cost.
4. RW is also paying back about \$75 million to Water Department for past investments. Loan terms are 5.1% for 14 years.
5. Capital projects (not including R&R) funding: 80% debt, 20% cash.
6. Calculated RW rates are not used, but instead RW rates are pegged to the potable water irrigation rates.
7. RW rates are targeted to 75% of potable water irrigation rates,
8. The phase-in period to bring recycled rates to the target is 3 years.
9. Target operations reserve is 19% or 70 days of annual O&M expenses.

10. Target capital reserve is 50% of average CIP.
11. Target rate stabilization reserve is 10% of commodity revenue.
12. R&R projects are kept separate from regular CIP. Each year, money is set aside in the R&R reserve to pay for actual R&R expenses as they occur. The model assumes R&R is 20% cash funded. However, there are options to allow changes to this assumption.

## **APPENDIX B – RECYCLED WATER PRICING MODEL**

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### Model Tables

Table 1	Recycled Water Rates History
Table 2	Calculated Recycled Water Revenue
Table 3	O&M Expenses
Table 4	Capital Improvement Program
Table 5	Capital Financing Plan
Table 6	MWD & CWA Credits
Table 7	Revenue Requirements
Table 8	Operating Cash Flow
Table 9	Reserve Funds

**Table 1**  
**Recycled Water Rate History**

Meter Size	Recycled Water Rate History				Potable Water	
	Monthly Rate				Monthly Rate	
	Effective				Effective	
	1-Mar-00	1-Jul-01	20-Jan-02	28-Mar-02	1-Jan-08	1-Jul-08
5/8"	\$ 9.63	\$ 9.63	\$ 8.63	\$ 8.63	\$ 15.32	\$ 16.32
3/4"	\$ 9.63	\$ 9.63	\$ 8.63	\$ 8.63	\$ 15.32	\$ 16.32
1"	\$ 10.23	\$ 10.23	\$ 8.63	\$ 8.63	\$ 22.41	\$ 23.86
1-1/2"	\$ 46.27	\$ 46.27	\$ 43.27	\$ 43.27	\$ 38.59	\$ 41.10
2"	\$ 71.16	\$ 71.16	\$ 65.96	\$ 65.96	\$ 58.83	\$ 62.66
3"	\$ 256.53	\$ 256.53	\$ 246.93	\$ 246.93	\$ 106.38	\$ 113.29
4"	\$ 427.93	\$ 427.93	\$ 411.53	\$ 411.53	\$ 174.17	\$ 185.49
6"	\$ 655.93	\$ 655.93	\$ 925.93	\$ 925.93	\$ 342.12	\$ 364.36
8"	\$ 1,286.59	\$ 1,286.59	\$ 1,234.59	\$ 1,234.59	\$ 544.47	\$ 579.86
10"	\$ 1,724.12	\$ 1,724.12	\$ 1,646.12	\$ 1,646.12	\$ 781.23	\$ 832.01
12"	\$ 2,395.42	\$ 2,395.42	\$ 2,263.42	\$ 2,263.42	\$ 1,455.06	\$ 1,549.64
16"	\$ 3,989.75	\$ 3,989.75	\$ 3,703.75	\$ 3,703.75	\$ 2,534.62	\$ 2,699.37
Commodity Rate (per HCF)						
Commercial	\$ 1.34	\$ 0.80	\$ 0.80	\$ 0.80	\$ 2.45	\$ 2.606
Multi-Family	\$ 1.34	\$ 0.80	\$ 0.80	\$ 0.80	\$ 2.55	\$ 2.717
Cal-Trans	\$ 1.19	\$ 0.80	\$ 0.80	\$ 0.80	\$ -	
Irrigation					\$ 2.61	\$ 2.784

**Table 2**  
**Calculated Recycled Water Revenue - Base Usage**

Line No.	Estimated	Projected	Projected	Projected	Projected	Projected
	2008	2009	2010	2011	2012	2013
<b>Operating Revenue</b>						
	Usage Revenue					
1	\$ 1,615,205	\$ 1,881,792	\$ 1,829,520	\$ 1,829,520	\$ 2,021,184	\$ 2,160,576
2	\$ 1,260,104	\$ 1,363,254	\$ 1,414,132	\$ 1,670,613	\$ 1,725,324	\$ 1,768,188
3	\$ 2,875,308	\$ 3,245,046	\$ 3,243,652	\$ 3,500,133	\$ 3,746,508	\$ 3,928,764
4	\$ 610,982	\$ 678,739	\$ 516,144	\$ 592,852	\$ 643,209	\$ 706,973
5	<b>\$ 3,486,290</b>	<b>\$ 3,923,785</b>	<b>\$ 3,759,796</b>	<b>\$ 4,092,986</b>	<b>\$ 4,389,718</b>	<b>\$ 4,635,737</b>
<b>Non-Operating Revenue</b>						
6	\$ -	\$ 3,618,313	\$ -	\$ -	\$ 2,992,589	\$ 2,176,429
7	\$ -	\$ 3,618,313	\$ -	\$ -	\$ 2,992,589	\$ 2,176,429
8	<b>\$ 3,486,290</b>	<b>\$ 7,542,097</b>	<b>\$ 3,759,796</b>	<b>\$ 4,092,986</b>	<b>\$ 7,382,307</b>	<b>\$ 6,812,165</b>

**Table 3**  
**O&M Expenses**

Line No.	Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013
<b><u>North City WRP Expenses</u></b>						
1	\$ 118,607	\$ 143,323	\$ 151,564	\$ 163,689	\$ 190,576	\$ 216,655
Recycled Water Distribution System Energy Cost						
Recycled Water Program Cost						
2	\$ 1,189,571	\$ 1,189,571	\$ 1,189,571	\$ 1,189,571	\$ 1,189,571	\$ 1,237,153
Personnel Cost						
3	\$ 135,000	\$ 135,000	\$ 140,400	\$ 146,016	\$ 151,857	\$ 157,931
Non-Personnel Cost						
4	\$ 1,324,571	\$ 1,324,571	\$ 1,329,971	\$ 1,335,587	\$ 1,341,427	\$ 1,395,084
Subtotal Recycled Water Program Cost						
Recycled Water Meter Shop Cost						
5	\$ 1,046,074	\$ 1,046,074	\$ 1,046,074	\$ 1,046,074	\$ 1,046,074	\$ 1,087,917
Personnel Cost						
6	\$ 157,500	\$ 157,500	\$ 163,800	\$ 170,352	\$ 177,166	\$ 184,253
Non-Personnel Cost						
7	\$ 1,203,574	\$ 1,203,574	\$ 1,209,874	\$ 1,216,426	\$ 1,223,240	\$ 1,272,169
Subtotal Recycled Water Meter Shop Cost						
Treatment Costs						
21	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
North City Treatment Costs (escalated)						
22	\$ 2,646,751	\$ 2,671,467	\$ 2,691,408	\$ 2,715,702	\$ 2,755,243	\$ 2,883,909
<b>Total North City WRP Expenses</b>						
<b><u>South Bay WRP Expenses</u></b>						
23	\$ 81,393	\$ 93,797	\$ 104,440	\$ 129,883	\$ 144,211	\$ 159,079
Recycled Water Distribution System Energy Cost						
Recycled Water Program Cost						
24	\$ 132,175	\$ 132,175	\$ 132,175	\$ 132,175	\$ 132,175	\$ 137,461
Personnel Cost						
25	\$ 15,000	\$ 15,000	\$ 15,600	\$ 16,224	\$ 16,873	\$ 17,548
Non-Personnel Cost						
26	\$ 147,175	\$ 147,175	\$ 147,775	\$ 148,399	\$ 149,047	\$ 155,009
Subtotal Recycled Water Program Cost						
Recycled Water Meter Shop Cost						
27	\$ 116,230	\$ 116,230	\$ 116,230	\$ 116,230	\$ 116,230	\$ 120,880
Personnel Cost						
28	\$ 17,500	\$ 17,500	\$ 18,200	\$ 18,928	\$ 19,685	\$ 20,473
Non-Personnel Cost						
29	\$ 133,730	\$ 133,730	\$ 134,430	\$ 135,158	\$ 135,916	\$ 141,352
Subtotal Recycled Water Meter Shop Cost						
Treatment Costs						
43	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
South Bay Treatment Costs (escalated)						
44	\$ 362,298	\$ 374,702	\$ 386,645	\$ 413,440	\$ 429,174	\$ 455,441
<b>Total South Bay WRP Expenses</b>						
45	\$ 3,009,049	\$ 3,046,169	\$ 3,078,053	\$ 3,129,142	\$ 3,184,417	\$ 3,339,349
<b>TOTAL O&amp;M EXPENSES</b>						

**Table 4**  
**CIP - inflated**

Line No.		Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013
<b>North City WRP CIP</b>							
1	709420 AA - Pooled Contingencies - RWDS	\$ 590,723	\$ 520,004	\$ 540,804	\$ 562,436	\$ 584,934	\$ 608,326
2	709490 AA - Reclaimed Water Extension	\$ 599,476	\$ 520,004	\$ 540,804	\$ 562,436	\$ 584,934	\$ 608,326
3	709541 Black Mountain Rd. Pipeline (RW Segment)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
4	709543 Black Mountain Ranch RW Storage Tank	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
5	709545 Carmel Valley Reclaimed Water Pipeline	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
6	709548 Los Penasquitos Canyon RW Project	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
7	709553 Pacific Highlands RWP - PA	\$ 247,405	\$ 1,067,941	\$ 4,442	\$ -	\$ -	\$ -
8	709555 Camino Del Sur RWP - E&CP	\$ 618,971	\$ 829,821	\$ 180,182	\$ -	\$ -	\$ -
9	709556 Los Penasquitos Canyon RWP Part Agmt	\$ 689,834	\$ 787,600	\$ 50,886	\$ -	\$ -	\$ -
10	709557 Black Mountain North Villages	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
11	709559 Santaluz, LLC Participation Agreement	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
12	Regulatory Requirements Compliance	\$ -	\$ -	\$ -	\$ -	\$ 1,654,180	\$ -
13	Distribution System Repair & Replacements (R&R)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 9,064
<b>14</b>	<b>Total North City WRP CIP</b>	<b>\$ 2,746,409</b>	<b>\$ 3,725,370</b>	<b>\$ 1,317,118</b>	<b>\$ 1,124,873</b>	<b>\$ 2,824,048</b>	<b>\$ 1,225,717</b>
<b>South Bay WRP CIP</b>							
15	Regulatory Requirements Compliance	\$ -	\$ -	\$ -	\$ -	\$ 175,479	\$ -
16	Distribution System Repair & Replacements (R&R)	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<b>17</b>	<b>Total South Bay WRP CIP</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 175,479</b>	<b>\$ -</b>
<b>18</b>	<b>Total CIP - inflated</b>	<b>\$ 2,746,409</b>	<b>\$ 3,725,370</b>	<b>\$ 1,317,118</b>	<b>\$ 1,124,873</b>	<b>\$ 2,999,527</b>	<b>\$ 1,225,717</b>
<b>R&amp;R Reserve Requirements</b>							
19	North City WRP	\$ -	\$ 199,944	\$ 199,944	\$ 199,944	\$ 199,944	\$ 199,944
20	South Bay WRP	\$ -	\$ 20,508	\$ 20,508	\$ 20,508	\$ 20,508	\$ 20,508
<b>21</b>	<b>Total R&amp;R Reserve Requirements</b>	<b>\$ -</b>	<b>\$ 220,451</b>	<b>\$ 220,451</b>	<b>\$ 220,451</b>	<b>\$ 220,451</b>	<b>\$ 220,451</b>
	Total CIP less R&R	\$ 2,746,409	\$ 3,725,370	\$ 1,317,118	\$ 1,124,873	\$ 2,999,527	\$ 1,216,653
	<b>Total North City WRP CIP</b>	<b>\$ 2,746,409</b>	<b>\$ 3,725,370</b>	<b>\$ 1,317,118</b>	<b>\$ 1,124,873</b>	<b>\$ 2,824,048</b>	<b>\$ 1,225,717</b>
	<b>Total South Bay WRP CIP</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ -</b>	<b>\$ 175,479</b>	<b>\$ -</b>

**Table 5**  
**Capital Financing Plan**

Line No.		Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013
<b>Sources of Funds</b>							
1	Transfers from Capital Reserve Fund	\$ -	\$ -	\$ -	\$ -	\$ -	\$ 1,813
2	Water Development Fees	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
3	Capacity Charges	\$ -	\$ 3,618,313	\$ -	\$ -	\$ 2,992,589	\$ 2,176,429
6	Pay-as-you-go Capital	\$ 2,746,409	\$ -	\$ 263,424	\$ 224,975	\$ -	\$ -
7	Proposed Debt Funding	80%	\$ 2,980,296	\$ 1,053,695	\$ 899,898	\$ 2,399,621	\$ 980,574
8	<b>Total Sources of Funds</b>	<b>\$ 2,746,409</b>	<b>\$ 6,598,609</b>	<b>\$ 1,317,118</b>	<b>\$ 1,124,873</b>	<b>\$ 5,392,211</b>	<b>\$ 3,158,815</b>
<b>Uses of Funds</b>							
9	Capital Improvement Projects	\$ 2,746,409	\$ 3,725,370	\$ 1,317,118	\$ 1,124,873	\$ 2,999,527	\$ 1,225,717
10	Transfers to Capital Reserve Fund	\$ -	\$ 2,873,238	\$ -	\$ -	\$ 2,392,684	\$ 1,933,098
11	<b>Total Uses of Funds</b>	<b>\$ 2,746,409</b>	<b>\$ 6,598,609</b>	<b>\$ 1,317,118</b>	<b>\$ 1,124,873</b>	<b>\$ 5,392,211</b>	<b>\$ 3,158,815</b>

**Table 6**  
**MWD and CWA Credits**

Line No.	Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013
<b>Credits for North City WRP (1)</b>						
1	\$ 200	\$ 250	\$ 250	\$ 250	\$ 250	\$ 250
2	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200
3	\$ 400	\$ 450	\$ 450	\$ 450	\$ 450	\$ 450
4	\$ 2,174,000	\$ 2,790,000	\$ 2,722,500	\$ 2,722,500	\$ 2,970,000	\$ 3,150,000
<b>Credits for South Bay WRP</b>						
5						
6	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200
7	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200	\$ 200
8	\$ 110,000	\$ 144,000	\$ 144,000	\$ 150,000	\$ 150,000	\$ 150,000
9	<b>\$ 2,284,000</b>	<b>\$ 2,934,000</b>	<b>\$ 2,866,500</b>	<b>\$ 2,872,500</b>	<b>\$ 3,120,000</b>	<b>\$ 3,300,000</b>

(1) Credits for North City WRP expired in FY 2023.

(2) Credits for South Bay WRP expired in FY 2032.

Table 7  
Revenue Requirements

Line No.		Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013
<b>North City WRP</b>							
<u>Revenue Requirements</u>							
1	O&M Costs	\$ 2,646,751	\$ 2,671,467	\$ 2,691,408	\$ 2,715,702	\$ 2,755,243	\$ 2,883,909
2	Capital Costs						
3	Existing Debt Service	\$ 10,614,726	\$ 10,614,727	\$ 10,614,728	\$ 10,614,729	\$ 10,614,730	\$ 10,614,731
4	Proposed Debt Service	\$ -	\$ 162,206	\$ 319,414	\$ 317,369	\$ 572,944	\$ 589,833
5	R&R Reserve	\$ -	\$ 199,944	\$ 199,944	\$ 199,944	\$ 199,944	\$ 199,944
6	Pay-as-you-go Capital	\$ 2,436,223	\$ -	\$ 227,904	\$ 193,394	\$ -	\$ -
7	Subtotal: Capital Costs	\$ 13,050,949	\$ 10,976,877	\$ 11,361,990	\$ 11,325,435	\$ 11,387,618	\$ 11,404,508
8							
9	Transfer to Operating Reserve	\$ 100,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 300,000	\$ 300,000
10	Transfer to Rate Stabilization Reserve	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
11	<b>Total Revenue Requirements</b>	<b>\$ 15,897,700</b>	<b>\$ 14,748,344</b>	<b>\$ 15,153,398</b>	<b>\$ 15,141,137</b>	<b>\$ 14,542,861</b>	<b>\$ 14,688,417</b>
<u>Less: Revenue Offsets</u>							
12	Credits from MWD and CWA	\$ 2,174,000	\$ 2,790,000	\$ 2,722,500	\$ 2,722,500	\$ 2,970,000	\$ 3,150,000
13	Base Charge Revenue	\$ 610,982	\$ 678,739	\$ 516,144	\$ 592,852	\$ 643,209	\$ 706,973
14	Fees from Olivenhein (1)	\$ 12,500	\$ 12,500	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
15	Subtotal Revenue Offsets	\$ 2,797,482	\$ 3,481,239	\$ 3,248,644	\$ 3,325,352	\$ 3,623,209	\$ 3,866,973
16	<b>North City WRP Net Revenue Requirements</b>	<b>\$ 13,100,218</b>	<b>\$ 11,267,105</b>	<b>\$ 11,904,754</b>	<b>\$ 11,815,784</b>	<b>\$ 10,919,652</b>	<b>\$ 10,821,443</b>
<b>South Bay WRP</b>							
<u>Revenue Requirements</u>							
17	O&M Costs	\$ 362,298	\$ 374,702	\$ 386,645	\$ 413,440	\$ 429,174	\$ 455,441
18	Capital Costs						
19	Existing Debt Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
20	Proposed Debt Service	\$ -	\$ 22,392	\$ 49,781	\$ 51,826	\$ 97,542	\$ 108,043
21	R&R Reserve	\$ -	\$ 20,508	\$ 20,508	\$ 20,508	\$ 20,508	\$ 20,508
22	Pay-as-you-go Capital	\$ 310,186	\$ -	\$ 35,519	\$ 31,581	\$ -	\$ -
23	Subtotal: Capital Costs	\$ 310,186	\$ 42,900	\$ 105,809	\$ 103,915	\$ 118,050	\$ 128,550
24	Transfer to Operating Reserve	\$ 100,000	\$ 1,000,000	\$ 1,000,000	\$ 1,000,000	\$ 300,000	\$ 300,000
25	Transfer to Rate Stabilization Reserve	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000	\$ 100,000
26	<b>Total Revenue Requirements</b>	<b>\$ 872,484</b>	<b>\$ 1,517,602</b>	<b>\$ 1,592,453</b>	<b>\$ 1,617,355</b>	<b>\$ 947,224</b>	<b>\$ 983,991</b>
<u>Less: Revenue Offsets</u>							
27							
28	Credits from MWD and CWA	\$ 110,000	\$ 144,000	\$ 144,000	\$ 150,000	\$ 150,000	\$ 150,000
29	Subtotal Revenue Offsets	\$ 110,000	\$ 144,000	\$ 144,000	\$ 150,000	\$ 150,000	\$ 150,000
30	<b>South Bay WRP Net Revenue Requirements</b>	<b>\$ 762,484</b>	<b>\$ 1,373,602</b>	<b>\$ 1,448,453</b>	<b>\$ 1,467,355</b>	<b>\$ 797,224</b>	<b>\$ 833,991</b>
31	<b>TOTAL NET REVENUE REQUIREMENTS</b>	<b>\$ 13,862,702</b>	<b>\$ 12,640,706</b>	<b>\$ 13,353,207</b>	<b>\$ 13,283,140</b>	<b>\$ 11,716,875</b>	<b>\$ 11,655,434</b>

(1) Fees from Olivenhein are a premium of \$25/ac-ft for not being a member agency of MWWD.

**Table 8**  
**Operating Cash Flow**

Line No.	Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013	
<b>Revenue</b>							
1	Commodity Rate - @ 75% of irrigation rates	\$ 2,875,308	\$ 3,245,046	\$ 5,924,443	\$ 8,901,792	\$ 12,474,468	\$ 13,604,562
2	Base Charge	\$ 610,982	\$ 678,739	\$ 516,144	\$ 592,852	\$ 643,209	\$ 706,973
3	CWA and MWD Credits	\$ 2,284,000	\$ 2,934,000	\$ 2,866,500	\$ 2,872,500	\$ 3,120,000	\$ 3,300,000
4	Other Revenue (Olivehain)	\$ 12,500	\$ 12,500	\$ 10,000	\$ 10,000	\$ 10,000	\$ 10,000
5	<b>Total Revenue</b>	<b>\$ 5,782,790</b>	<b>\$ 6,870,285</b>	<b>\$ 9,317,087</b>	<b>\$ 12,377,144</b>	<b>\$ 16,247,677</b>	<b>\$ 17,621,535</b>
<b>Revenue Requirements</b>							
6	O&M Cost	\$ 3,009,049	\$ 3,046,169	\$ 3,078,053	\$ 3,129,142	\$ 3,184,417	\$ 3,339,349
7	Existing Debt Service	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649	\$ 2,998,649
8	Proposed Debt Service	\$ -	\$ 184,598	\$ 369,195	\$ 369,195	\$ 670,485	\$ 697,876
9	Repayment to Water	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076	\$ 7,616,076
10	Transfer to R&R Reserve	\$ -	\$ 220,451	\$ 220,451	\$ 220,451	\$ 220,451	\$ 220,451
11	Pay-as-you-go Capital	\$ 2,746,409	\$ -	\$ 263,424	\$ 224,975	\$ -	\$ -
12	<b>Total Revenue Requirements</b>	<b>\$ 16,370,183</b>	<b>\$ 14,065,944</b>	<b>\$ 14,545,848</b>	<b>\$ 14,558,488</b>	<b>\$ 14,690,079</b>	<b>\$ 14,872,401</b>
13	<b>Net Annual Cash Flow</b>	<b>\$ (10,587,393)</b>	<b>\$ (7,195,659)</b>	<b>\$ (5,228,761)</b>	<b>\$ (2,181,344)</b>	<b>\$ 1,557,598</b>	<b>\$ 2,749,134</b>
14	Debt Service Coverage	86%	102%	161%	244%	328%	363%
15	Required Debt Service Coverage	125%	125%	125%	125%	125%	125%

**Table 9**  
**Reserve Funds**

Line No.		Estimated 2008	Projected 2009	Projected 2010	Projected 2011	Projected 2012	Projected 2013
<b>Operating Reserve Fund</b>							
1	Beginning Balance	\$ -	\$ (10,999,380)	\$ (19,062,430)	\$ (25,484,497)	\$ (29,084,647)	\$ (29,025,527)
2	Net Annual Cash Flow	\$ (10,587,393)	\$ (7,195,659)	\$ (5,228,761)	\$ (2,181,344)	\$ 1,557,598	\$ 2,749,134
3	Transfer to Rate Stabilization Fund	\$ (200,000)	\$ (200,000)	\$ (200,000)	\$ (200,000)	\$ (200,000)	\$ (200,000)
4	<b>Ending Balance Before Interest Revenue</b>	<b>\$ (10,787,393)</b>	<b>\$ (18,395,039)</b>	<b>\$ (24,491,191)</b>	<b>\$ (27,865,841)</b>	<b>\$ (27,727,049)</b>	<b>\$ (26,476,394)</b>
5	<i>Interest Revenue</i>	\$ (211,988)	\$ (667,391)	\$ (993,306)	\$ (1,218,806)	\$ (1,298,479)	\$ (1,268,331)
6	<b>Ending Balance After Interest Revenue</b>	<b>\$ (10,999,380)</b>	<b>\$ (19,062,430)</b>	<b>\$ (25,484,497)</b>	<b>\$ (29,084,647)</b>	<b>\$ (29,025,527)</b>	<b>\$ (27,744,725)</b>
7	Target Reserve	19% \$ 576,683	\$ 583,797	\$ 589,907	\$ 599,699	\$ 610,292	\$ 639,985
<b>R&amp;R Capital Reserve Fund</b>							
8	Beginning Balance	\$ -	\$ -	\$ 3,163,298	\$ 3,531,058	\$ 3,915,367	\$ 6,763,489
9	Transfers in	\$ -	\$ 3,093,690	\$ 220,451	\$ 220,451	\$ 2,613,135	\$ 2,153,549
10	<i>Transfer out - R&amp;R Projects</i>	\$ -	\$ -	\$ -	\$ -	\$ -	\$ (1,813)
11	<b>Ending Balance Before Interest Revenue</b>	<b>\$ -</b>	<b>\$ 3,093,690</b>	<b>\$ 3,383,749</b>	<b>\$ 3,751,509</b>	<b>\$ 6,528,502</b>	<b>\$ 8,915,225</b>
12	<i>Interest Revenue</i>	\$ -	\$ 69,608	\$ 147,309	\$ 163,858	\$ 234,987	\$ 352,771
13	<b>Ending Balance After Interest Revenue</b>	<b>\$ -</b>	<b>\$ 3,163,298</b>	<b>\$ 3,531,058</b>	<b>\$ 3,915,367</b>	<b>\$ 6,763,489</b>	<b>\$ 9,267,996</b>
14	Target Reserve	50% \$ 766,444	\$ 766,444	\$ 766,444	\$ 766,444	\$ 766,444	\$ 766,444
<b>Rate Stabilization Fund</b>							
15	Beginning Balance	\$ -	\$ 204,000	\$ 417,680	\$ 640,976	\$ 874,320	\$ 1,118,164
16	Transfer from Operating Fund	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000	\$ 200,000
17	Transfer out						
18	<b>Ending Balance Before Interest Revenue</b>	<b>\$ 200,000</b>	<b>\$ 404,000</b>	<b>\$ 617,680</b>	<b>\$ 840,976</b>	<b>\$ 1,074,320</b>	<b>\$ 1,318,164</b>
19	<i>Interest Revenue</i>	\$ 4,000	\$ 13,680	\$ 23,296	\$ 33,344	\$ 43,844	\$ 54,817
20	<b>Ending Balance After Interest Revenue</b>	<b>\$ 204,000</b>	<b>\$ 417,680</b>	<b>\$ 640,976</b>	<b>\$ 874,320</b>	<b>\$ 1,118,164</b>	<b>\$ 1,372,981</b>
21	Target Reserve	10% \$ 287,531	\$ 324,505	\$ 592,444	\$ 890,179	\$ 1,247,447	\$ 1,360,456

## APPENDIX C – LIST OF ABBREVIATIONS

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AF	acre-feet
CWA	Clean Water Act
EDU	Equivalent Dwelling Unit
EPA	United States Environmental Protection Agency
GPD	Gallons per day
HCF	Hundred Cubic Feet
IBWC	International Boundary Water Commission
LRWRP	Long Range Water Resources Plan
MBC	Metro Biosolids Center
Mg/l	milligrams per liter
MGD	million gallons per day
MJPA	Metropolitan Joint Powers Authority
MWD	Metropolitan Water District of Southern California
MWWD	Metropolitan Wastewater Department
NCWRP	North City Water Reclamation Plant
NPDES	National Pollutant Discharge Elimination System
O&M	Operations & Maintenance
OPRA	Ocean Pollution Reduction Act
PLWTP	Point Loma Wastewater Treatment Plant
PA	Participating Agency
PAYGO	Pay-as-you-go
R&R	Replacement and Refurbishment
SBWRP	South Bay Water Reclamation Plant
SDCWA	San Diego County Water Authority
SWRCB	State Water Resources Control Board
TDS	Total Dissolved Solids
WRP	Water Resources Plan