

CITY OF



Wastewater Cost of Service Rate Study



FINAL REPORT

RFC
RAFTELIS FINANCIAL
CONSULTANTS, INC.

December 15, 2006



■ 201 S. Lake Blvd, Suite 803
Pasadena • CA • 91101

■ Phone 626•583•1894
Fax 626•583•1411

■ www.raftelis.com

December 15, 2006

Ms. Darlene Morrow-Truver
Deputy Director
Services and Contract Division
City of San Diego
9192 Topaz Way
San Diego, CA 92123

Subject: Wastewater Cost of Service and Rate Design Report

Dear Ms. Morrow-Truver:

Raftelis Financial Consultants, Inc. is pleased to present this report on the wastewater cost of service, rate design and capacity fee study (Study) to the City of San Diego (City). We are confident that the results developed based on a cost of service analysis, when implemented, will result in fair and equitable sewer rates to the City's users and the revenue program will be acceptable to the State Water Resources Control Board (SWRCB).

The Study involved a review of the City's financial plan or rate case, usage characteristics, and rate structures. In addition, the Study also included a review of the City's existing capacity fees. The proposed changes to the City's existing rate structures and capacity fee are summarized below.

Rate Structure: Based on our review of the City's existing residential and commercial/industrial rate structures and, we propose the following:

- Continue the use of a rate structure that includes both a fixed monthly base fee and a variable charge based on water usage.
- Continue monthly SFR user charges based on a minimum 30-day winter water usage but with a usage cap of 20 hundred cubic feet (hcf) of water instead of the existing 14 hcf. In addition, a 95% return factor would be applied to SFR usage to account for water use that is not returned as sewer flow.
- Continue applying the same fixed monthly fee to all customers based on our justification of the costs allocated for base fee recovery.

Capacity Fee: Based on our review of the City's existing capacity fee, we estimate a full-cost-recovery capacity fee of \$4,124 per EDU.

The proposed rate structure, and rates are presented in the Executive Summary and the rationale is discussed in detail in Sections 2 through 9 of the report. The implementation of

the proposed wastewater rates and capacity fee should result in a revenue program that is fair and equitable and acceptable to the SWRCB.

It was a pleasure working with you and we wish to express our thanks to you Ms. Orrie Irwin, and Barbara Sharatz and to all staff members of the Metropolitan Wastewater Department for the support and cooperation extended throughout the study. We also express our thanks to Mr. Chuck Crandall for his assistance. If you have any questions, please call me at (626) 583-1894.

Very truly yours,

Raftelis Financial Consultants, Inc.



Sudhir Pardiwala
Vice President



Jon Davis
Project Manager

City of San Diego, California



WASTEWATER COST OF SERVICE
RATE STUDY REPORT

FINAL

Prepared By



December 15, 2006

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SECTION 1: EXECUTIVE SUMMARY

The City of San Diego (City) has commissioned a utility Cost of Service and Rate Design (Study) for the Metropolitan Wastewater Department (MWWDD). The Study includes a thorough review of revenue requirements, cost of service allocations, and design of a system of user charges for the City's wastewater service consistent with State Water Resources Control Board (SWRCB) Revenue Guidelines and City policies. This report documents the results of the Study, updates cost of service based wastewater rates for City customers, and suggests changes to the rate structure. In addition, it reviews options for development of the monthly customer base charge. Rate changes are projected to be considered for approval by City Council and become effective for retail customers May 1, 2007.

The City provides both wholesale wastewater transportation, treatment, and disposal services to the Participating Agencies (PAs) and retail collection, transportation, treatment and disposal services to the City's users. To finance its capital program, the City uses a combination of federal grants, state loans, bonds, rates, and reserves. The federal loans and grants are generally administered by the SWRCB. As a recipient of federal grants and state loans, the City is contractually obligated to comply with the SWRCB's Revenue Program Guidelines, which requires that system users be billed for service on a basis proportionate to use.

The focus of this Study is the City's retail wastewater service. The specific objectives of the Study include:

- Update flow, chemical oxygen demand (COD) and suspended solids (SS) loadings for all customer classes;
- Update and review the overall costs (revenue requirements) of providing wastewater service;
- Determine costs of service for the City's retail customers;
 - Review the allocation of costs to the wastewater parameters of Flow, Total Suspended Solids (TSS), and Chemical Oxygen Demand (COD);
 - Review the allocation of parameter costs to retail customer classes;
- Develop an appropriate Single Family Residential (SFR) class sewer cap in keeping with SWRCB guidance;
- Review the fixed base charge component of the customer monthly bill; and,
- Update full cost recovery Capacity Fees.

The Executive Summary highlights the principal findings and recommendations of the Study. The following additional sections document the review process findings and recommendations to address the objectives of this Study.

- Section 2: Introduction;
- Section 3: Wastewater System;
- Section 4: User Classifications and Loadings;
- Section 5: Revenue Requirements;
- Section 6: Study Issues;
- Section 7: Cost Of Service;
- Section 8: Rate Design; and,
- Section 9: Capacity Fee Review.

1.1 Wastewater System

This section of the Executive Summary provides a brief background of the wastewater system, a review of the revenue requirements and cost of service, an evaluation of issues, and suggested changes to wastewater rates and capacity fees.

The City owns and operates a regional wastewater system that includes both the Municipal (Muni) System and Metropolitan (Metro) System. The Muni System is primarily a sewage collection system that serves the City's service area. The Metro System includes facilities that provide advanced primary treatment, secondary treatment, tertiary reclamation, sludge processing and effluent disposal. The City holds two NPDES permits for the regional system that stipulate discharge limitations: the first covering advanced primary treatment at the Point Loma Wastewater Treatment Plant; and the second covering secondary treatment at the South Bay Water Reclamation Plant. The City provides retail wastewater services through the Muni System and wholesale wastewater treatment services to fifteen PAs pursuant to the terms of the Regional Wastewater Disposal Agreement. Some of the PAs transport their wastewater flow to the Metro System treatment facilities through the Muni collection system and are charged separate transportation fees.

1.2 User Classification and Loadings

In a previous Cost of Service Study the City adopted recommendations that resulted in the current system of user classifications. Residential users have similar characteristics and are, therefore, assumed to have identical TSS and COD loadings. The commercial/industrial user strength, however, varies widely based on the type of work they engage in. For the purpose of this Study it was determined that user classifications currently in place still accurately reflect conditions within the City. A more detailed discussion of User Classifications and Loadings is contained in Section 4.

1.3 Review of Revenue Requirements

Revenue requirements from rates are the net of all expenditures, including reserve requirements, less non-rate revenues. The City's principal sources of revenue to recover operating costs include sewer service charges paid by the City's retail users and full cost recovery from the PAs per their cost sharing agreements with the City. The primary sources of revenue to recover capital costs include sewer connection fees, capital fund balance, bond proceeds, state and federal grants and loans, capacity fees paid by City retail users and the PAs, pay-as-you-go revenues from the PAs and interest earnings.

The City's retail service area operations and maintenance (O&M) expenditures, which are the focus of this Study, are estimated to be in the range of \$206 to \$231 million per year between FY 2007 and FY 2011. Retail service area annual capital expenditures, including debt service and pay-as-you-go capital, are in the range of \$81 to \$137 million per year. Debt service constitutes the majority of capital expenditures and ranges between \$72 and \$102 million per year over that same time period.

In order to meet projected revenue requirements, including desired operating and debt service reserve fund levels, City staff proposed the following revenue adjustments, which are intended for docketing by the City Council in February 2007:

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Table ES-1 Proposed (2007) and Projected (2008-2010) Revenue Adjustments

May 1, 2007	May 1, 2008	May 1, 2009	May 1, 2010
8.75%	8.75%	7.00%	7.00%

1.4 Cost of Service

The total FY 2007 net cost of service to be recovered from the City's retail user rates is estimated to be approximately \$262 million, of which \$226 million are operating costs and the remaining \$37 million are capital costs mostly debt service costs. Additional capital costs are recovered from non-rate revenue including capacity fees.

The cost of service allocations presented in this study are based on the functional-design method approved by the SWRCB. The revenue requirements are allocated to different user classes in proportion to their use of the wastewater system. As mandated by the SWRCB, functional allocations are made to flow, TSS, and COD parameters. The cost of service allocations performed for the City's retail service area users are consistent with the system-wide proportionate use approach used in allocating revenue requirements between the City and the PAs.

As part of this Study, Raftelis Financial Consultants, Inc. (RFC) also evaluated options to cost justify the base fee by allocating costs attributable to customer accounts directly to another functional parameter.

1.5 Rate Design

The City's existing retail wastewater rate structure for Single Family Residential (SFR), Multi-Family Residential (MFR), and Commercial/Industrial user classes includes a fixed Base Fee and a Usage Rate. The Base Fee of \$11.32 per month is the same for all customer classes. The base fee currently recovers approximately 16 percent of the overall revenue requirements of the City's wastewater enterprise. The current Usage Rate is applied differently according to customer class:

- SFR usage is based on 100 percent return of minimum winter water usage and is capped at 14 hundred cubic feet (hcf) monthly. Users are billed at a rate of \$2.889 per hcf ;
- MFR usage is based on 95 percent return of water usage and billed at a rate of \$3.721 per hcf; and
- Commercial/Industrial usage is based on a sewer return rate, the percentage of metered potable water returned to the sewer, and pollutant loadings developed for each business type according to Standard Industrial Classification (SIC) codes.

Both MFR and Commercial/Industrial class customers may have individual return rates and pollutant loadings based on monitoring performed on their wastewater discharges by the City.

As mentioned, the overall focus of this Study was the review of the cost of service rate setting methodology originally developed for the City in 2003. Specifically, the Study focused on an update of system costs, flows and loadings. Generally, it was decided that system characteristics had not changed significantly since 2003 and a full review of cost allocation was not necessary at this time. The current rate structure meets regulatory guidelines and the City is satisfied with the rate structure, however, the City did want to review the effects of increasing the SFR sewer cap to conform more closely to guidance from SWRCB personnel.

1.6 Study Recommendations

This section of the Executive Summary outlines our suggestions. These suggestions impact various aspects of the wastewater rate structure and capacity fees.

1.6.1 Single Family Residential Sewer Cap

RFC recommends the SFR sewer cap be increased to 20 hcf and the assumed SFR return factor be dropped from 100 percent to 95 percent. SFR customers are currently subject to a 14 hcf sewer cap based on a mass balance analysis of customer winter usage. The purpose of the sewer cap is to determine the level at which it is assumed water usage ceases to be returned to the system as wastewater. Usage above the sewer cap is assumed to be outdoor usage for purposes such as irrigation and other outdoor uses. The prior cost of service study looked at this question and suggested that the sewer cap first be raised to its current level of 14 hcf and then, two years later, increased to 16 hcf. Guidance from SWRCB personnel suggests that the sewer cap be set at a level that captures 95 percent of the SFR accounts. Using this SWRCB direction, the calculated sewer cap would fluctuate between 17 and 21 hcf depending on climate conditions during the winter measurement months. In order to conform to SWRCB direction, the City has performed an analysis of SFR winter usage over several years to determine where the cap would fall. In order to set a stable cap, the City has chosen to average five years of winter usage and establish 20 hcf as the proposed SFR sewer cap.

The SWRCB guidance provides some latitude to assume that users return less than 100 percent of water use to the sewer system as wastewater. The City's climate may justify allowing a small percentage of water use for irrigation, even during the winter. We recommend the 95 percent return factor used for MFR be extended to include SFR usage as well.

1.6.2 Rate Design Changes

While the allocation of costs to customer classes must follow regulatory guidelines to ensure cost recovery proportionate to cost of serving those customer classes, the City has some flexibility in the design of the rate structure. To minimize impacts, retain simplicity, ensure reasonable stability of revenue, RFC recommends the continued use of a rate structure that includes both a fixed monthly base fee and a variable usage charge.

Base Fee: RFC recommends that the City continue to utilize a uniform monthly base fee for all system users. The current method for setting the base fee is appropriate under SWRCB guidance and the City may continue its use. This Study did review alternatives for development of a base fee as discussed in subsection 1.6.5.

Residential Usage Rate: RFC recommends that the City continue its existing method of computing monthly SFR wastewater charges, but with a usage cap of 20 hcf instead of the existing 14 hcf cap as discussed above. RFC also recommends revising the SFR return factor to 95 percent from the current 100 percent. A short discussion on levels of usage cap is presented in Section 6 of this report. The system mass balance analysis, which compares the actual total wastewater flow to flow implied from metered water use using a 20 hcf winter cap and a 95% return factor indicates these adjustments to the SFR usage cap are justified. RFC recommends that the City continue its existing method of determining monthly SFR user charges based on a 30-day minimum winter water usage but apply the 95 percent return factor. RFC also recommends that the City continue to compute MFR wastewater usage charges based on water usage and a 95 percent return factor. Table ES-2 presents a summary of the Residential Rate Schedule. All proposed rates include a projected May, 2007 revenue increase of 8.75%.

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Table ES-2 Proposed Residential Rate Schedule

Description	Usage Rate (\$/hcf of water use)	Base Fee (\$/account)
SFR Rates (1)	\$2.890	\$12.31
MFR Rates	\$4.038	\$12.31

(1) SFR rate based on a 20 hcf sewer cap and a 95% return factor

Commercial/Industrial Usage Rate: For commercial/industrial users, RFC recommends that the City continue to charge users based on their flow and strength. The strength and return factors for these users are based on industry standards and built into the City’s database.

RFC also recommends that wastewater charges for Commercial/Industrial users discharging greater than 25,000 gpd of flow continue to be calculated individually based on measured or estimated strength. The recommended cost of service rates are shown in Table ES-3. Rates include the 8.75% revenue increase.

Table ES-3 Proposed Commercial/Industrial Rate Schedule

Flow (\$ per hcf of wastewater)	TSS (\$/lb)	COD (\$/lb)	Base Fee (\$/account)
\$3.0257	\$0.4431	\$0.1801	\$12.31

Contract customers and hauled waste customers would continue to be charged on a unit cost rate in which the base fee is included in the unit rate for flow. The recommended unit cost of service rates are shown in Table ES-4. Rates include the 8.75% revenue increase.

Table ES-4 Proposed Unit Cost Rate Schedule

Flow (\$ per hcf of wastewater)	TSS (\$/lb)	COD (\$/lb)
\$3.1320	\$0.4586	\$0.1864

1.6.3 Rate Impacts

The main objective of this Study is to arrive at a fair and equitable allocation of costs to all user classes and individual users in proportion to their demand for wastewater services and to comply with guidance from the SWRCB. Overall increases for all customers are driven by inflationary pressures on both utility O&M and capital costs. Modifications to the sewer rate structure result in a range of customer impacts based on user classification and usage.

The impacts discussed in this paragraph compare rates under the existing and proposed rate structure. Due to the recommended change in the return factor from 100 percent to 95 percent, SFR users below the existing 14 hcf cap (approximately 85 percent of SFR accounts) will see increases ranging from 1.9 to 5.8 % less than the 8.75% overall increase. SFR users above the current 14 hcf cap will experience higher increases since usage up to the new 20 hcf cap will become billable. Compared to the average increase of 8.75 percent for the wastewater enterprise, the projected bill impacts for SFR vary from

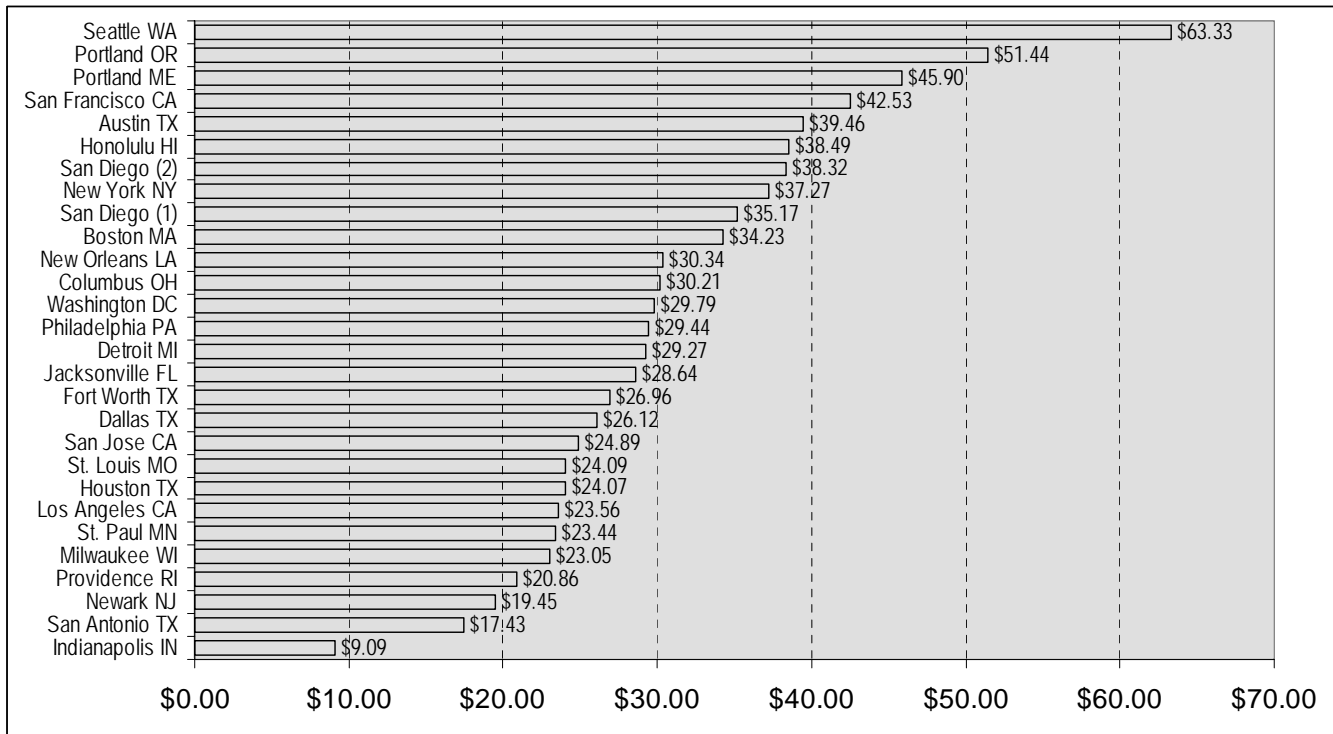
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increases of 2 percent to increases of 35 percent depending on metered water usage. SFR users above the current 14 hcf cap will experience higher increases since usage up to the new 20 hcf cap will become billable. Compared to the average increase of 8.75 percent for the wastewater enterprise, the projected bill impacts for SFR vary from increases of 2 percent to increases of 35 percent depending on metered water usage. MFR and Commercial/Industrial accounts will experience more consistent increases in their sewer service charges due to inflationary pressures on operating and capital costs since their rate structure will not be changed.

While the recommended changes lead to varying increases in wastewater charges, they ensure a fair and equitable allocation that is proportionate to use. In addition, all aspects of the Study including identification and aggregation of O&M and capital costs and the development of rate structures conform to the revenue program guidelines set forth by the SWRCB.

Monthly wastewater bills of the average SFR customer under proposed rates and customers of other comparable utilities in the nation are shown in Table ES-5. Bills are calculated under existing rate structures at 10 hcf of monthly usage. Proposed City customer bills are compared to those of other San Diego regional utilities in Table ES-6 based on 8.5hcf of monthly usage, the City average. The latter chart shows the City below the average as compared to other San Diego based agencies.

Table ES-5: National Comparison of Monthly Wastewater Bills

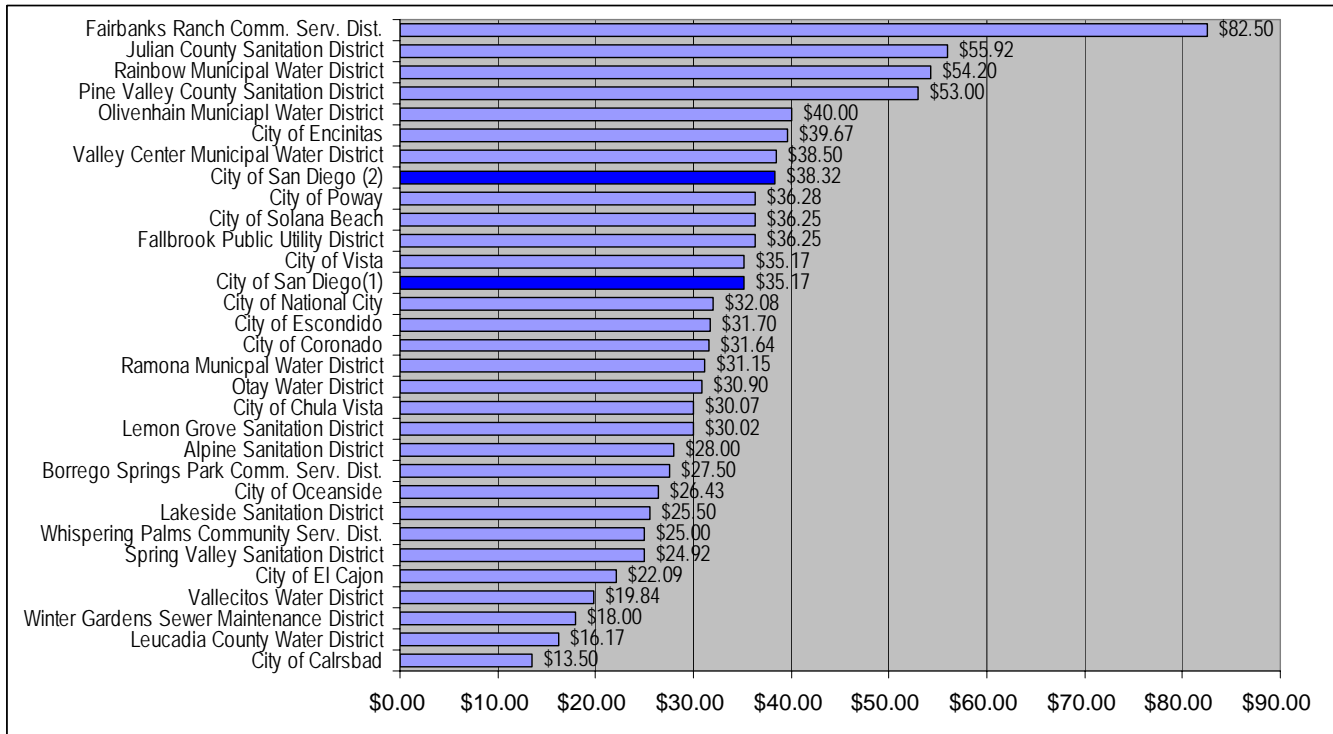


(1) based on existing rates

(2) based on proposed rates

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Table ES-6: Regional Comparison of Monthly Wastewater Bills



- (1) based on existing rates
- (2) based on proposed rates

1.6.4 Capacity Fee Update

Capacity fees are one-time fees used to recover the cost of providing the system capacity required when a new user connects to the wastewater system. Examples of such costs include those related to increasing wastewater transmission and treatment capacity in treatment plants, ocean outfalls, interceptors, pumping stations, and sewer mains.

The City currently charges \$3,710 per equivalent dwelling unit (EDU) or SFR account. The minimum capacity assigned to any sewer connection is one EDU. Qualifying low income housing is eligible for a reduced capacity fee as outlined in [Water Department Instruction 55.30](#). MFR units having individual, City-read water meters are assigned one EDU per unit, while MFR units that share a common water meter are charged based on a density-adjusted formula. Non-residential customers are charged on the basis of the number of fixture units, using a conversion factor that equates 20 fixture units to one EDU.

The City has incurred major costs over the last ten years to upgrade and expand facilities and will continue to incur additional costs to comply with EPA mandates to meet discharge requirements. The capital costs of existing facilities and growth-related portion of future costs of improvements to the City's facilities form the basis of the calculated capacity fee. The capital costs the City has incurred prior to 2006 and the future costs to be incurred over the next ten years were reviewed. The projects associated with these capital costs were examined and the net capacity available from these projects was determined in order to derive the capacity fee. These projects include sewer mains, pumping stations, treatment plant upgrades, outfall costs etc. The resultant full-cost-recovery capacity fee is \$4,124 per EDU.

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Implementation of the higher capacity fee would result in additional capacity fee revenue. Since these additional dollars would replace funds that would otherwise be supplied by current system users, and assuming the increase in cost per EDU does not result in a reduction in the number of EDU's sold, the funds from current system users could be utilized to reduce the magnitude of future capital replacement borrowings, offset operations and maintenance expenses, augment the rate stabilization fund, or for other appropriate purposes.

1.6.5 Base Charge Options

Base charges provide the City a source of stable revenues that do not vary with usage. Ideally the City would like to increase revenue from this source for stability. Rating agencies also prefer this type of revenue stability as it guarantees revenue recovery. However, as the base charge increases and variable charge decreases there is less incentive for conservation. Currently the City recovers 16 percent of the revenues from the base charge. The level of the base charge revenue as a percentage of total revenue was originally discussed and approved by stakeholders in the previous rate study completed in 2004. As a result we have proposed to increase the base charge by the average revenue increase of 8.75 percent to retain the current revenue distribution.

One of the objectives of this study was to evaluate alternative methods for allocating cost to be recovered through the monthly customer base charge. It is well accepted to incorporate a fixed component into the utility rate structure. Since most of the utility's costs are fixed, over the short term, revenue from the fixed component, or Base Charge, promotes revenue stability, which is critical to a strong financial position. This base charge is currently set to recover annual administrative costs from the Muni system. However, the City wanted to investigate alternatives for allocating costs to an account-based functional parameter, in addition to flow, TSS, and COD parameters. Then, a base charge unit cost could be calculated by dividing this account-based allocation by the total number of accounts in the City wastewater system.

RFC identified five specific types of costs that may be equitably allocated on an account basis and recovered through a customer base charge. These types of costs include:

- Meter reading, billing, and customer service costs; and,
- Inflow and infiltration costs;

and portions of:

- Administrative and General costs;
- Sewer lateral maintenance costs; and
- Debt Service costs.

These types of costs were chosen because all, or a portion of them, are more closely related to the number of system accounts than they are to system flow or loadings. Our analysis looked at historical Muni and Metro system operating costs and allocated them among flow, TSS, COD, and account-based functional parameters. The analysis showed that a reasonable allocation of these costs would justify the current level of base charge in the City system. Allocation of cost for base charge recovery is presented in more detail in Section 5.

It was determined that since the SFR class represents over 80 percent of overall system accounts, this account-based functional parameter allocation would disproportionately impact SFR users. In addition,

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the SWRCB guidance does not explicitly allow for cost allocation to functional parameters other than flow, TSS, and COD. Under SWRCB guidance, RFC believes the existing methodology for determination of the base fee is appropriate. For these reasons, the City has decided to continue with its existing methodology for development of the customer base charge.

SECTION 2: INTRODUCTION

2.1 Background

The City retained Raftelis Financial Consultants, Inc. (RFC) in 2006 to update a cost of service and rate design study and to address rate structure issues to ensure a continued fair and equitable system of user charges for the City's retail wastewater service. The City needs to finance capital expenditures required to meet conditions of a consent decree. The Study will help promote financial stability so that the City can access the debt markets to obtain financing at the lowest cost. This report documents the findings, analyses, results, and suggestions of the updated study.

The City owns and 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 City operates the regional wastewater system under two federal National Pollutant Discharge Elimination System (NPDES) permits that stipulate standards of discharge for the Pt. Loma Wastewater Treatment Plant and the South Bay Water Reclamation Plant. 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 new tertiary wastewater reclamation facilities. The City operates the wastewater system as a self-supporting enterprise and costs are accounted for separately under the wastewater enterprise fund.

To minimize the impact of the capital project initiatives on the City's users and its PAs, the City finances its eligible capital projects in part via a combination of federal loans and grants which are administered by the State Water Resources Control Board (SWRCB). As a recipient of various federal grants and state loans, the City is obligated to comply with SWRCB's Revenue Program Guidelines. The guidelines require that recipients of state-administered grants and/or loans establish a system of user charges that recovers operations, maintenance, and replacement costs from users on a basis proportionate to use. The guidelines specifically require a fair and equitable apportioning of costs based on each user class's contributions of flow and strength of wastewater pollutants discharged.

To comply with the revenue program guidelines, the City conducted a review of cost of service and developed a strength-based billing method to allocate costs among the various PAs and within the City retail system. The strength-based billing procedure is based on flow and the strength parameters of Total Suspended Solids (TSS) and Chemical Oxygen Demand (COD). The PAs are currently billed based on their contribution of flow, TSS and COD per the terms outlined in the service contracts between the City and the PAs and approved by the SWRCB in 1998. City retail users are also billed based on their customer class contribution of flow, TSS and COD as developed in a 2003 Cost of Service and Rate Study.

2.2 Objectives

Several related objectives need to be considered in the development of a financial plan and in the design of rates. This being the case, judgment plays a role in the final design of rate structures and rates. The major objectives of the study update are to:

- Ensure revenue sufficiency to meet the O&M and capital costs of the City's wastewater enterprise;

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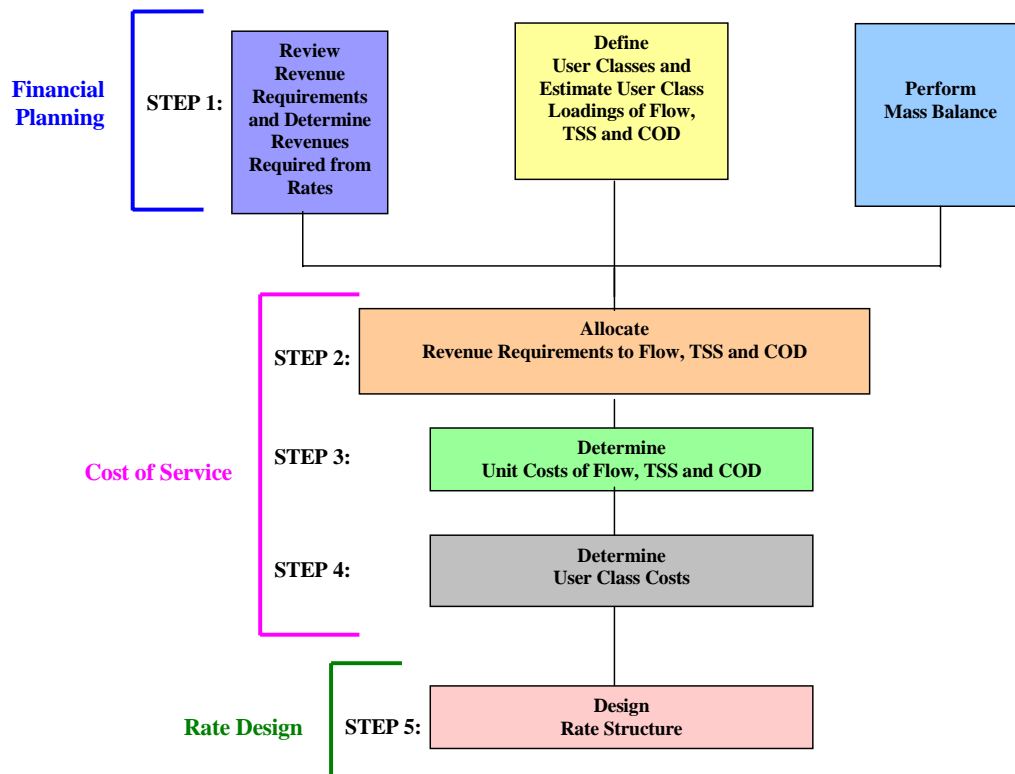
- Plan for revenue stability to provide for adequate operating and capital reserves and for the overall financial health of the wastewater enterprise;
- Maintain good financial ratings by providing for a stable and reliable financial position so that debt issuance can be achieved at the lowest cost;
- Ensure fairness and equitability in the development of a system of user charges;
- Minimize rate impacts to reduce financial hardship on the different user classes;
- Ensure compliance with regulatory requirements of the SWRCB; and
- Maintain eligibility for grants and loans.

2.3 Scope

The scope of this study update includes the determination of Wastewater User Rates through an update of system costs, flows, and loadings, review of rate design, determination of Capacity Fees, and compliance with SWRCB requirements. While User Rates facilitate the generation of adequate revenues to meet routine annual O&M and capital expenditures including debt service, Capacity Fees ensure that new users pay their fair share of costs so that existing users are not burdened with providing capacity for new users.

The comprehensive cost of service and rate design component includes three major processes. Figure 2-1 provides a graphical representation of the various steps involved in the comprehensive cost of service and rate design process.

Figure 2-1: Cost of Service and Rate Design Process



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The three major processes are as follows:

Financial Planning: Revenue requirements are projected for a five-year period from FY 2007 through FY 2011. Financial planning involves estimation of annual O&M and capital expenditures, annual debt service and reserve requirements, operating and capital revenue sources and the determination of required annual user revenues from rates and charges. User classification, annual user loadings estimation for the selected wastewater parameters, and system mass balance analysis are also performed concurrently.

Cost of Service: Cost of Service involves the apportioning of required annual revenues to the different user classes proportionate to their contributions of flow, TSS and COD to the wastewater system.

Rate Design: Rate Design involves the development of a fixed and variable schedule of rates for each of the different user classes to equitably recover the costs attributable to them.

The Capacity Fee development component includes the determination of wastewater infrastructure capacity and the associated costs required to accommodate new growth, and the design of one-time capacity fees for the different classes of new users.

2.4 Assumptions

Following are the assumptions used in the study:

1. Annual O&M and capital expenditures, annual revenues from the PAs, other revenue sources and reserve requirements, O&M inflation factors, and user account growth projections are all based on the City's Fiscal Year 2007 Rate Case.
2. Annual average wastewater system Flow and TSS/COD concentrations used in the system mass balance analysis are based on the Metropolitan Wastewater Department (MWWD)'s annual report on projected flows and strength. The data used in the Study is from the Projected Flow and Strength Report.
3. TSS strength assignment for the different user classes is based on the City's Sewer Classification Program's Standard Industrial Classification (SIC) Guidelines List. See Appendix 2.
4. COD strength assignment for the different commercial/industrial SIC classes is based on information in the City's billing database. See Appendix 2.

SECTION 3: WASTEWATER SYSTEM

This section of the report presents a brief overview of the regional system, the relationship between the City and its PAs that discharge to the regional system, and the City's existing retail rate structures.

3.1 Regional Wastewater System

A brief description of the City's regional wastewater system and the relationship between the City and the PAs that discharge to the regional system is presented in this sub section.

3.1.1 Regional Infrastructure

The City-owned regional wastewater system includes both the Muni System and the Metro System. The Muni system is primarily a sewage collection system that serves the City's service area and includes trunk lines, collector mains, pump stations and stormwater interceptor pump stations.

The Metro system infrastructure, which services both the City and its PAs, currently includes three wastewater treatment plants that are operational, two ocean outfalls, a biosolids processing center, three major pump stations, and several miles of force mains and gravity flow interceptors. A brief description of some of the major Metro System facilities is provided below.

Point Loma Wastewater Treatment Plant (PLWTP): The PLWTP is the principal treatment facility in the Metro system, with a permitted treatment capacity of 240 mgd of average daily flow. The PLWTP provides advanced primary treatment. The plant currently achieves a TSS removal rate of nearly 85-87 percent through the use of enhanced chemical treatment and Bio-Chemical Oxygen Demand (BOD) removal of 58 percent. The PLWTP receives raw solids from the South Bay Water Reclamation Plant (SBWRP).

North City Water Reclamation Plant (NCWRP): The NCWRP provides tertiary treatment, has a permitted capacity of 30 mgd of average daily flow, and produces about 5 mgd of reclaimed water. The non-usable secondary effluent from this plant is conveyed to the PLWTP and the solids from NCWRP are processed at the Metropolitan Biosolids Center (MBC). The City was required to construct the NCWRP and the SBWRP as a condition of EPA's modified permit for the PLWTP.

South Bay Water Reclamation Plant (SBWRP): The SBWRP is a recently completed sewage treatment facility that is capable of processing sewage to both secondary and tertiary treatment levels. The SBWRP has a permitted capacity of 15 mgd average daily flow. Treated effluent from the facility flows to the ocean through the South Bay Ocean Outfall. Sludge from the SBWRP is pumped to the Point Loma Plant. The plant currently produces about 2 mgd of reclaimed water.

Point Loma Ocean Outfall (PLOO): The Point Loma Ocean Outfall is a 4.5-mile long outfall that discharges treated sewage effluent at a depth of 320 feet of water.

Metropolitan Biosolids Center (MBC): The MBC provides state of the art sludge processing. The facility receives raw sludge from NCWRP and digested sludge from PLWTP, and after processing, returns the centrate to PLWTP.

South Bay Ocean Outfall (SBOO): The South Bay Ocean Outfall is a 3.5 mile long outfall that discharges treated sewage effluent at a depth of 100 feet of water.

The PLWTP, NCWRP, SBWRP, SBOO, PLOO, and MBC are all parts of an integrated regional system. Due to the complex exchange of effluents, solids and centrates, sharing of one common outfall and

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receipt of flows from the participating agencies, the Metro System is viewed and operated as “a regional system” from a permitting, regulatory compliance and operational efficiency standpoint. The City as the owner and operator of the regional system holds NPDES permits that stipulate discharge limitations. Currently, as per the NPDES permit requirements, a Mean Monthly TSS Removal percentage greater than or equal to 80 percent, and a Mean Annual BOD Removal percentage greater than or equal to 58 percent apply to the undiluted effluent discharged through the PLOO. The percentage removal rates are calculated on a system-wide basis.

3.1.2 Relationship Between the City and Participating Agencies

The Metro system provides “wholesale” treatment services including some conveyance, treatment and sludge disposal operations to the City and 15 PAs that are outside the City’s jurisdiction. Services to the PAs are provided pursuant to the terms of the Regional Wastewater Disposal Agreement, which expires on December 31, 2050. The PAs and the City are responsible for sewage collection operations within their own respective jurisdictions, and for the conveyance of the collected sewage through trunk lines to the Metro system. Some of the key provisions of the Regional Wastewater Disposal Agreement are as follows:

- The City has full ownership and rights of operation of the Metro system.
- The PAs pay for the services through a system of Sewer System Charges including O&M and capital. The Sewer System Charge is an annual full cost recovery – based calculation which takes into consideration both the flow and strength of the wastewater conveyed to the Metro system.
- The PAs’ share of capital costs is determined based on the proportion of flows received and strength of the flows.
- The PAs’ share of Metro O&M costs is based on their proportionate flow into the Metro system and the strength of their wastewater.
- The City determines the Sewer System Charge unit rates by allocating net O&M and capital costs among parameters of Flow, COD, and TSS based on the approved Functional-Design Methodology of allocation.

3.2 Existing Rate Structure

The City’s existing wastewater rate structures for the SFR, MFR, and Commercial/Industrial user classes include a fixed Base Fee and a Usage Rate. While the base fee is charged to each water meter, the usage rate is applied to a user’s water usage or wastewater generated. SFR customers wastewater is estimated based on the lowest monthly winter water usage and is capped at 14 hcf per month assuming 100 percent return to sewer. The City’s existing rates for residential user classes are included in Table 3-1.

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Table 3-1: Existing Residential User Rates

Description	Usage Rate (\$/hcf of water use)	Base Fee (\$/account)
SFR Rates (1)	\$2.889	\$11.32
MFR Rates	\$3.721	\$11.32

(1) SFR rate based on a 14 hcf sewer cap and 100% return to sewer

3.2.1 Base Fee

In the existing rate structure the base fee is identical for every user class. The SFR, MFR, and Commercial/Industrial users have the same monthly base fee of \$11.32 per meter. The base charge was last increased in March, 2005.

3.2.2 Usage Rate

The usage rate for all user classes is based on the volume of wastewater flow and the strength of TSS and COD. The usage rate varies by user class. The usage rates for SFR, MFR, and Commercial/Industrial user classes are discussed below.

SFR Usage Rate: The current SFR usage rate, effective July 1, 2006, is \$2.889 per hcf of the SFR's 30-day minimum metered water consumption during the previous winter months of December 2005 through March 2006. The usage rate is based on a 100 percent return of winter water usage to sewer, up to the current 14 hcf cap. Water usage in excess of the 30-day minimum usage established on July 1 is assumed to be used for irrigation, and is not billed for sewer services. For each SFR, the 30-day minimum winter months' water usage is revised annually on July 1, and this usage is the basis for monthly sewer service charges until the following July 1. New users who do not have a winter water usage history pay a flat monthly charge until their winter water usage is established.

Under the existing rate structure, the maximum monthly sewer charge including base fee that a SFR user can be charged is \$51.77.

MFR Usage Rate: The current MFR usage rate, effective as of March 1, 2005, is \$3.721 per hcf of water usage. This usage rate is applied to a MFR user's actual monthly water usage and is based on a 95 percent return to sewer. Return to sewer is the percentage of water usage that is returned to sewer as wastewater.

Commercial/Industrial Usage Rate: Commercial/industrial users are classified based on Standard Industrial Classification (SIC) code and are assigned TSS and COD strengths and percent return to sewer that are characteristic of their type of business. The rate applied to a user's monthly water usage depends on the user's TSS and COD strength and percent return to sewer. The commercial /industrial rates are presented in Table 3-2.

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Table 3-2: Existing Commercial/Industrial User Rates

Flow (\$ per hcf of wastewater)	TSS (\$/lb)	COD (\$/lb)	Base Fee (\$/account)
\$2.7534	\$0.4294	\$0.1544	\$11.32

Rates for strengths greater than 1,000 mg/l TSS, 2000 mg/L COD, or flows to sewer greater than 25,000 gpd, are computed individually and adjusted for percent return to sewer. Rates are computed on the basis of \$2.7534 per hcf of flow, \$0.4294 per pound of TSS, and \$0.1544 per pound of COD and are in addition to the base fee.

SECTION 4: USER CLASSIFICATION AND LOADINGS

In addition to the 15 PAs, who are the City’s “wholesale” users, the City’s wastewater enterprise has a mix of “retail” users within the City’s service area. The City’s retail users primarily comprise regular water/sewer, sewer only, and the Department of Navy users. A review of the City’s existing user classifications are discussed in the following subsections.

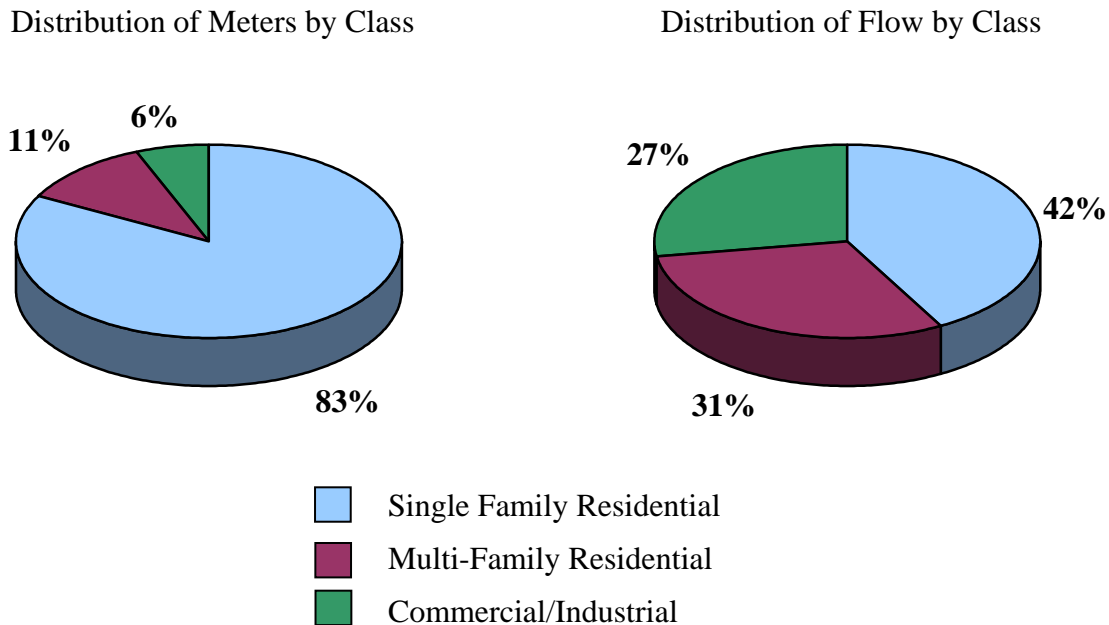
4.1 Existing User Classifications

The City currently serves a population of nearly 1.2 million within the City’s service area. In July, 2006 it is estimated that the City had a total of 270,805 meters. The breakdown of the City’s sewer user classes and the number of meters associated with each class as of FY 2006, are as follows:

<u>User Class Description</u>	<u>Number of Meters</u>	<u>Average Daily Wastewater Usage</u>
Single Family Residential (SFR)	223,996	46.45 MGD
Multi-Family Residential (MFR)	30,395	34.06 MGD
Commercial/Industrial	16,414	30.44 MGD

The percentage distribution of the meters is shown in Figure 4-1. Residential meters (SFR and MRF) comprise 94 percent of the total meters and 73 percent of total flow.

Figure 4-1 – Distribution of System by Class



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Residential Classification: The residential classes, including SFR and MFR, are homogenous in that all the users are assumed to have the same TSS and COD strengths. Since all residential accounts use the same TSS and COD strengths, they each have a single wastewater rate that includes all three parameters and is based on metered water usage. However, the volume of wastewater flows can vary among the individual users depending on water usage. The residential users are therefore classified into SFR and MFR user classes since they differ in their water usage characteristics. SFR water usage includes significant irrigation usage due to yard and garden areas whereas MFR water usage includes very low irrigation usage since most MFR users have very little yard area, if any. Usually, MFR complexes that have large common green areas and pools have separate irrigation meters.

Commercial/Industrial Classification: Typically, there is significant variability in both the volume of wastewater flows and wastewater strengths, among the different types of commercial/industrial users such as food service establishments, retail stores, and supermarkets. Therefore, to ensure fair and equitable determination of wastewater service charges, the City uses separate unit rates applied to flow, TSS, and COD loadings of users.

4.2 Wastewater Flow Estimation

In order to perform a cost of service analysis, wastewater flow needs to be estimated and projected for each user class. Wastewater flow is not measured for most users because of cost and/or accuracy concerns. Typically, flows are estimated based on winter water usage for SFR users and as a percentage return of water usage for MFR and most Commercial/Industrial users. Actual wastewater flow is measured for only a few large commercial/industrial users.

4.2.1 Residential Class

RFC reviewed the methods that the City currently uses to estimate annual wastewater flows for the residential class. The City currently uses the minimum monthly winter water usage with a monthly usage cap of 14 hcf to estimate wastewater flows for the SFR users, and actual monthly water usage to estimate wastewater flows for the MFR users. The methods used in estimating wastewater flows differ between SFR and MFR users due to the differences in their water consumption patterns.

SFR Wastewater Flow Estimation: SFR water consumption includes two types of water usage: domestic use (water used inside the home) and irrigation use (water used in the yard). While the level of domestic water usage is expected to remain fairly stable throughout the year, fluctuation in irrigation usage could occur due to seasonal changes, which in turn causes significant variations in total monthly water usage during the year. Irrigation usage is at its minimum levels during the winter period and therefore the water used during the winter period can be associated with domestic usage. Typically, domestic water returns to the sewer system and irrigation water does not. Therefore, for SFR users it is appropriate to use winter water usage as a direct approximation of annual wastewater flows returned to the sewer. The four-month period from December through March is deemed as the SFR winter water usage period. The minimum monthly usage during this period is used for billing purposes.

In San Diego, weather conditions are moderately dry even during winter months, which would result in some level of irrigation water use even during the winter period. To account for winter irrigation usage that does not return to the sewer, the City currently has set a usage cap of 14 hcf per month in estimating and billing annual SFR wastewater flows. Any water usage beyond the usage cap level is deemed as not being returned to the sewer and hence is not considered in computing the sewer bill. As a part of this study, RFC performed a mass balance analysis that indicated it would be appropriate to employ a usage

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cap higher than the current 14 hcf level. Based on that analysis and direction from the SWRCB, RFC recommends adoption of a SFR usage cap of 20 hcf instead of the current 14 hcf. SWRCB does not preclude the use of a residential return factor to account for outdoor water use so RFC also recommends a 95 percent return factor be incorporated into the SFR usage rate. The issue of SFR usage cap is discussed in greater detail in Section 6.

MFR Wastewater Flow Estimation: MFR water consumption relates predominantly to domestic use with very little or no irrigation use, since most MFR complexes have small green areas. MFR complexes with very large green belts are likely to have separate irrigation water meters. Therefore, MFR water usage levels remain relatively stable throughout the year and it is appropriate to use actual monthly water usage in estimating wastewater flows. However, MFR complexes do have some minimum irrigation usage, which does not return to the sewer, and therefore generally the City estimates MFR annual wastewater flows to be 95 percent of their annual water usage. Users that have significant return rate variations from this standard may apply for and receive variances.

4.2.2 Commercial/Industrial Class

Wastewater flows for the commercial/industrial users are estimated based on actual monthly water consumption. Water usage patterns vary significantly among the different types of commercial/industrial businesses and therefore the City typically assigns to each user a percent return to sewer, based on SIC code and assuming no irrigation. Users whose return to sewer varies significantly from what has been assigned can take advantage of an appeals process to have the return to sewer factor and usage rate reduced.

4.3 TSS and COD Strength Assignments

Residential Strength Assignments: The Engineering and Program Management Division of MWWD provided strength for the SFR class. The estimated strength for residential customers, both SFR and MFR is at 280 mg/L of TSS and 505 mg/L of COD, respectively. These strengths are used in the development of the residential rates.

Commercial/Industrial Strength Assignments: The City's existing sewer user classification and rate structures are based on wastewater flows, TSS concentrations, and COD concentrations. The City currently assigns TSS and COD strengths to the different classes of commercial/industrial users based on SIC codes. The City's Sewer Classification Program Industrial Classification Guidelines List is included as Appendix B. No changes were made to the existing TSS or COD assignments.

4.4 System Mass Balance

RFC worked with City staff to analyze historical FY 2006 water consumption as the base data to estimate annual wastewater flows and TSS/COD loadings for all user classes. Data reliability is critical because these historical flows and loadings are used to project future user class annual flows and strength loadings. Projected flows and loadings are later used in the cost of service analysis (to derive the unit costs of service and user class costs). A mass balance analysis is usually performed to verify the appropriateness of the estimated flows and loadings.

Mass balance is the process of matching and reconciling calculated total annual flows and strength loadings in pounds with the quantities actually received at the treatment facilities. The mass balance analysis takes into consideration other non-user flows such as the inflow & infiltration (I&I) flows that enter the sewer system. I&I flows refers to water that enters a sewer system from other sources

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including cracked sewer mains, manholes and sewer vents. Variances between the actual flows and loadings received at the treatment facilities and the calculated historical flows and loadings are used to assess the validity of assumptions.

The City's share of total annual average flows including I&I flows for FY 2006 is estimated at 116.9 mgd of which 2.7 mgd is the estimated I&I flow. When the calculated annual City flow and loadings were compared with the actual City share (inclusive of I&I) received at the treatment facilities, the analysis indicated a 1.3 percent variance. The calculated flows were slightly lower than the actual City's share of flows received.

The City's measured annual average TSS and COD strengths are 287 mg/l and 511 mg/l respectively. The mass balance analysis on loadings indicated that calculated TSS (inclusive of I&I) was 2.0 percent lower than measured TSS. The calculated COD was 5.2 percent higher than measured COD.

The mass balance analysis supported a revision in the monthly SFR usage cap from 14 hcf to 20 hcf and 95% return to sewer, which follows SWRCB guidelines. The loadings are not completely balanced; this is not unusual given the number of assumptions and strength estimates used for the different user types. Results within about 5 percent are not unreasonable for this analysis. The differences in flows and strengths are apportioned to all classes proportionately. Results of the Mass Balance Analysis are presented in Table 4-1.

Table 4-1 – Results of FY 2006 Mass Balance Analysis

User Class Description	Annual Wastewater Flow (hcf)	Annual TSS Loading (lbs)	Annual COD Loading (lbs)	Annual Wastewater Flow (MGD)
Single Family Residential (SFR) (winter flow @ 20 hcf, 95% return)	22,372,214	39,069,940	70,465,428	45.85
Multi-Family Residential (MFR) (metered flow, 95% return)	16,621,614	29,027,303	52,352,850	34.06
Commercial/Industrial	9,022,562	16,473,959	35,883,086	18.49
Commercial/Industrial (very large users)	5,274,383	7,867,056	35,997,211	10.81
Inflow & Infiltration (I&I)	1,325,650	826,808	413,404	2.72
Net Flow from Other Sources	1,386,327	9,506,378	15,171,635	2.84
Calculated Flow & Loadings	56,002,750	102,771,064	210,283,613	114.77
Measured Flow & Loadings	57,027,184	105,424,123	200,861,767	116.87
Percentage Difference	1.8%	2.5%	-4.7%	1.8%

4.5 Annual Wastewater Flows and Loadings Projection

Annual wastewater flows and TSS/COD loadings need to be projected for each user class to determine each user class' cost of service and sewer rates. A brief discussion on the method used in estimating

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user class flows and loadings for FY 2007 follows. User class flows and loadings are projected for the fiscal year, for which cost of service allocations are made and rates are calculated. In this Study, cost of service analysis and rate design is performed for FY 2007.

Table 4-2 summarizes the historical and projected average number of customer meters for FY 2007 to FY 2011. The projection of customer meters shown in Table 4-2 is based upon the City's Rate Case model for FY 2007 and beyond.

Table 4-2: Projected Meters

Customer Class	FY 2007	FY 2008	FY 2009	FY 2010	FY 2011
Single Family Residential (SFR)	230,156	233,171	236,225	239,320	242,455
Multi-Family Residential (MFR)	30,182	30,553	30,929	31,310	31,695
Commercial/Industrial	16,772	16,978	17,187	17,398	17,612
Total	277,110	280,703	284,342	288,028	291,762

The billable wastewater flows and loadings for FY 2007 for each user class are estimated based on the projected increase in the number of meters and the FY 2006 average annual billable wastewater flow and loadings per meter. Total user class billable flows are estimated to increase by about 3.2 percent between FY 2007 and FY 2011. A summary of projected estimates of user class billable wastewater flow is shown in Table 4-3.

Table 4-3: Projected User Class Flows

Customer Class	FY 2007 (hcf)	FY 2008 (hcf)	FY 2009 (hcf)	FY 2010 (hcf)	FY 2011 (hcf)
Single Family Residential (SFR) (At 20 hcf cap winter water use, 95% return)	22,987,450	23,288,586	23,593,666	23,902,743	24,215,869
Multi-Family Residential (MFR) (At 95% return metered flow)	16,505,263	16,708,278	16,913,790	17,121,829	17,332,428
Commercial/Industrial (At metered flow and assigned % return and strength)	15,857,492	16,052,539	16,249,986	16,449,861	16,652,194
Contract Customers (Navy)	1,056,398	1,069,392	1,082,545	1,095,861	1,109,340
Hauled Waste	82,769	83,787	84,818	85,861	86,917
Total	56,489,373	57,202,582	57,924,805	58,656,155	59,396,748

SECTION 5: REVENUE REQUIREMENTS

A review of a system's revenue requirements is a key first step in the rate design process. The review involves an analysis of annual operating revenues under existing rates, capital revenues, O&M and capital expenditures, transfers (if any) between operating and capital funds, and operating and capital reserve requirements. This section of the report provides a discussion of the projected revenues, O&M and capital expenditures, capital improvement financing plan, debt service requirements, and the revenue adjustments required to ensure the financial stability of the wastewater enterprise. The wastewater system revenues and expenditures are discussed from a regional system perspective and the discussion on required revenue adjustments relates exclusively to the City's users

5.1 System Revenues

The City's Metropolitan Wastewater Department (MWW) operates the regional wastewater system. The City derives its required annual operating and capital revenues from a number of sources. The principal sources of operating revenues are the sewer service charges from the City's users and the full cost recovery revenues from the PAs per their cost sharing agreement with the City. Other revenue sources include miscellaneous operating revenues such as Shipboard Waste and Hauled Waste Revenues and other non-operating revenues including revenue transfers from the rate stabilization fund. Capital revenue sources include sewer connection fees, capital funds, bond proceeds, state and federal grants and loans, capacity fees from the City, pay-as-you-go revenues from the PAs, and interest earnings.

RFC reviewed the various sources of operating and capital revenues and the City's financing plan. Table 5-1 presents the details of the operating and capital related revenues including user and capital revenues. The footnotes explain the basis for the revenue projections during the study period. The table however does not reflect other available revenues such as interest earnings, rate stabilization transfers, bond proceeds and capital grant monies. The comprehensive operating and capital flow of funds statements presented at the end of this section includes all those other revenues.

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Table 5-1: Projected Operating and Capital Revenues

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Revenue from Rates					
City User Charge Revenues (1)	\$231,602,945	\$235,942,100	\$238,956,600	\$242,010,700	\$245,105,200
Contract Customers (Navy) (2)	9,550,000	9,667,500	9,786,400	9,906,800	10,028,600
Other Operating Revenue					
Sewerage Treatment Service (3)	1,313,000	1,629,000	1,842,000	2,070,000	2,213,000
O&M Muni (4)	956,000	1,187,000	1,342,000	1,508,000	1,612,000
Transportation Charges Muni (5)	200,000	248,000	281,000	315,000	337,000
Sewer Service Charge - Misc (6)	2,238,000	2,329,000	2,423,000	2,520,000	2,620,000
Non-Operating Revenue (7)					
Services Rendered to Others	7,188,634	7,476,000	7,775,000	8,086,000	8,410,000
Sale of Power from Co-Generation	1,130,000	1,454,000	1,913,000	1,989,000	2,097,000
Other Non-Operating Revenues	9,000,000	2,080,000	2,163,000	2,250,000	2,340,000
Capital Revenue					
New Sewer Connections - City (8)	200,000	208,000	216,320	224,973	233,972
Capacity Charge Revenues (9)	14,000,000	14,560,000	15,142,400	15,748,096	16,378,020
Total Revenue	\$277,378,579	\$276,780,600	\$281,840,720	\$286,628,569	\$291,374,792

Notes:

- (1) SFR, MFR, and Commercial/Industrial rate revenue under existing rate structure
- (2) Contract Customer including Navy and hauled waste
- (3) Projected in Account RA-77553
- (4) Projected in Account RA-77556
- (5) Projected in Account RA-77566
- (6) Projected in Account RA-77585
- (7) Projections based on City's Prudent Rate Model
- (8) Based on projected connection costs and growth
- (9) Estimation of revenue under existing fees

5.2 System Expenditures

In order to provide for the continued operation of the City's regional wastewater system on a sound financial basis, revenues must be sufficient to meet the revenue requirements or cash obligations of the system. Revenue requirements include O&M expenses, capital improvement program (CIP) expenditures, principal and interest payments on existing debt, and other obligations. The wastewater enterprise's annual expenditures include two major components: the Muni expenditures and the Metro expenditures. Muni relates essentially to the collection system in the City's own retail service area and Metro relates to treatment and disposal services shared both by the City and the PAs.

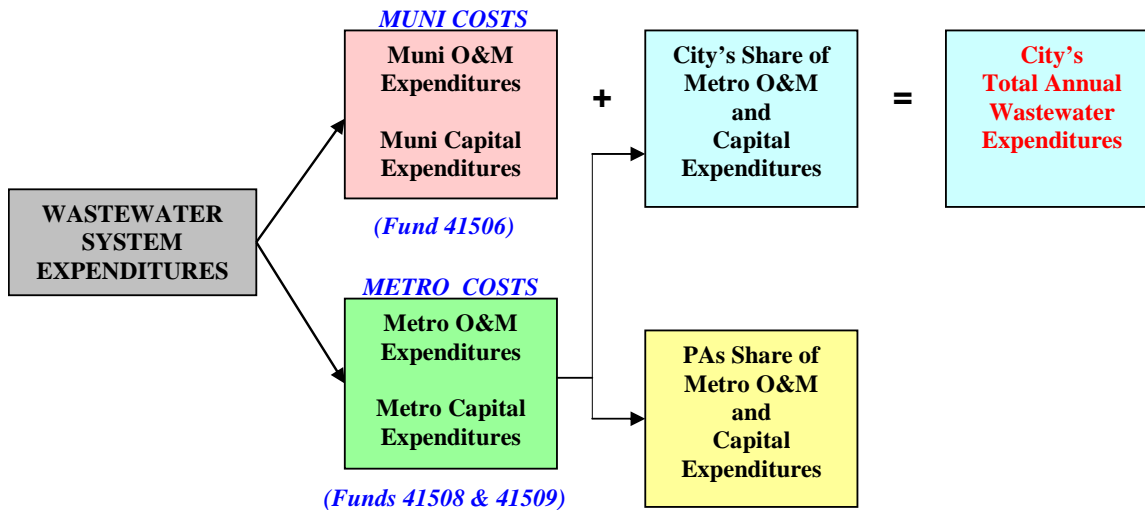
The MWWD Services and Contracts Division annually receives O&M and capital expenditures information for the Metro component from MWWD. The Services and Contracts Division incorporates these costs with the Muni annual O&M and CIP expenditures and develops comprehensive O&M and CIP cost projections for the entire wastewater enterprise as part of its financing plan development

The City maintains two types of O&M and three types of CIP funds for the wastewater enterprise: Muni Fund (41506) for the Muni component and, Metro Existing Facilities Fund (41508) and Metro New Construction Fund (41509) for the Metro component. The O&M funds include funds 41506 and 41509. The CIP funds include funds 41506, 41508, and 41509. Figure 5-1 provides a graphical representation

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of the different components and the relationship between them. Discussions on the different components of the wastewater system expenditures follow.

FIGURE 5-1: Components of the Wastewater System Expenditures



5.2.1 Operations and Maintenance Expenses

O&M expenditures include the costs of operating and maintaining wastewater collection, conveyance, treatment, ocean outfall and sludge disposal facilities. O&M Expenses also include costs incurred in providing technical services including laboratory services, cogeneration services, and other administrative and general costs of the wastewater system. These costs are a continuing normal obligation of the system, and are met from operating revenues as they are incurred.

The City is exclusively responsible for the Muni Fund 41506 annual O&M costs as they relate to the City's own retail service area. These Muni O&M expenditures include the City's pumping and collection costs, laboratory and other City wastewater-related administrative costs. Metro 41508 and 41509 O&M costs relate to the regional system operations shared by both the City and the PAs. Accordingly, the annual O&M costs of the Metro Funds 41508 and 41509 are allocated between the City and the PAs. These Metro annual O&M costs include:

- Metro pumping
- Metro treatment at PLWTP, NCWRP, MBC, and SBWRP.
- Technical Services including Wastewater Chemistry and Biology/Ocean Operations
- Ocean Outfalls
- Sludge Disposal
- Cogeneration
- Administrative and general costs including other City department services, data processing, general accounting and clean water program administration

RFC reviewed MWWD's allocation of annual Metro O&M expenditures between the City and the PAs. In deriving the annual Metro O&M costs allocable to the PAs, MWWD first identifies the billable and

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non-billable O&M costs. Non-billable costs include Muni O&M costs associated with central support facilities and maintenance. These costs are the exclusive responsibility of the City. Billable O&M is that portion of Metro annual O&M costs that is shared between the City and the PAs.

In order to allocate billable costs between the City and the PAs, MWWD first allocates the total billable O&M costs to the three parameters of Flow, TSS and COD. The allocation, which is discussed in detail in Section 6, is based on a cost of service allocation study that was conducted in 2003. Metro costs are, in turn, allocated between the City and the PAs in proportion to their contributions of Flow, TSS, and COD.

The comprehensive forecasted annual O&M expenditures for the study are based upon the City's budgeted FY 2007 expenditures, adjusted for anticipated changes in operations and the effect of inflation in future years. The City conservatively uses an inflationary factor of four percent in projecting all O&M expenditures. The City's projections of annual regional wastewater O&M expenditures are in the range of \$243-\$277 million (in inflated dollars) during FY 2007 through FY 2011. Table 5-2 presents the comprehensive annual O&M costs. O&M expenditures of Metro Funds 41508 and 41509 have been merged into one and the amounts are included in Metro fund 41509.

Table 5-2: Operating and Maintenance Expenditures

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Municipal Sewer Fund - 41506					
Operation and Maintenance	\$5,816,294	\$5,846,694	\$5,927,094	\$6,007,494	\$5,967,894
Env Monitoring and Tech Services	5,142,435	5,142,435	5,142,435	5,142,435	5,142,435
Wastewater Collection	56,026,014	55,449,075	56,033,179	56,598,844	55,806,051
Others	46,176,439	40,909,703	43,024,038	45,994,707	46,083,663
Total 41506 (uninflated)	113,161,182	107,347,907	110,126,746	113,743,480	113,000,043
Total 41506 (inflated)	116,690,497	115,587,363	119,575,801	126,757,450	129,450,730
Metro Existing Facilities Fund – 41508	0	0	0	0	0
Metro New Construction Fund - 41509					
Administration	11,207,609	11,801,525	11,717,220	11,951,661	12,848,313
Program Management	0	0	0	0	0
Services & Contracts	9,586,093	8,289,602	12,577,712	12,530,538	12,487,186
Engineering & Water Reclamation	0	0	0	0	0
Engineering & Program Mgmt	5,232,787	5,232,787	5,232,787	5,232,787	4,882,787
Operations & Maintenance	78,547,666	78,855,657	79,205,157	79,554,657	79,544,157
Env Monitoring and Tech Services	14,697,768	14,197,768	14,197,768	14,197,768	14,197,768
Unallocated Reserve	2,100,557	3,564,452	(434,709)	(1,778,897)	(3,176,853)
Total 41509 (uninflated)	121,372,480	121,941,791	122,495,935	121,688,514	120,783,357
Total 41509 (inflated)	126,143,357	131,601,381	137,845,547	142,660,511	147,639,697
Less PA Share	(36,955,841)	(39,103,367)	(40,889,961)	(43,427,141)	(45,880,668)
Total Metro (City Share)	89,187,516	92,498,014	96,955,587	99,233,369	101,759,029
Total City Expenditures (inflated)	\$205,878,013	\$208,085,377	\$216,531,388	\$225,990,819	\$231,209,759

The City's annual O&M expenditures, which include its own service area-related Muni expenditures and its share of Metro annual O&M, are presented in Table 5-2. The City's retail service area O&M expenditure, which is the focus of this study, is estimated to be in the range of \$206 to \$231 million (in inflated dollars) during FY 2007 through FY 2011.

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5.2.2 Capital Improvement Program

The City has developed a comprehensive wastewater CIP to address both the Muni and Metro wastewater system needs. The Muni system CIP projects generally include rehabilitation or replacement of sewer mains, trunk lines and interceptors, and upgrade or expansion of pump stations. The Metro CIP projects include, but are not limited to:

- City’s sewer main replacements and pump station upgrades;
- PLWTP site improvements and digester upgrades;
- PLWTP Grit Processing and sludge facilities;
- Outfall;
- Reclaimed water facilities;
- Otay River Pump Station;
- Metro Operations Center and other Metro projects; and,
- Environmental Monitoring and Technical Services projects.

The City maintains replacement and expansion funds for financing capital projects. Consistent with SWRCB revenue program requirements, the City distinguishes between replacement and expansion CIP costs. Similar to the O&M, the City maintains three CIP funds. The Muni Fund 41506 includes CIP that is associated exclusively with the City’s retail service area collection and pumping needs. The City bears exclusive responsibility for the Fund 41506 CIP project costs. The Metro Funds 41508 and 41509 CIP relate to the regional system infrastructure shared by both the City and the PAs. Therefore, the City and the PAs share the responsibility for these Metro Funds CIP costs. The Muni Fund and Metro Fund CIP projects include both replacement and expansion related projects. A summary of planned wastewater CIP expenditures for each year during the study period is shown in Table 5-3. The total wastewater CIP estimated for the study period is \$644 million. A list of proposed CIP projects for both Muni and Metro funds as reflected in the City’s Rate Case.

Table 5-3: Summary of Capital Improvement Plan

	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>
Municipal Sewer Fund - 41506	\$46,427,449	\$77,144,974	\$92,097,501	\$157,352,217	\$151,306,919
Metro Sewer Fund - 41508	3,335,592	1,190,134	2,203,381	9,726,253	17,039,610
Metro Sewer Fund - 41509	7,835,144	17,649,430	25,187,920	18,396,839	16,070,766
Regional Total	57,600,192	95,986,546	119,490,811	185,477,318	184,419,306
Less PA's Share	24,373,864	25,022,064	25,941,458	26,698,982	27,705,034
Total City Share	\$33,226,328	\$70,964,482	\$93,549,353	\$158,778,336	\$156,714,272

WASTEWATER COST OF SERVICE RATE STUDY

Capital Improvement Financing Plan

The CIP is funded through a combination of system revenues and debt financing. The CIP funding sources include the following:

System Revenues:

- Capacity charges from the City;
- Pay-as-you-go revenues from PAs; and,
- City connection fees.

Capital Financing:

- Bond proceeds;
- State Revolving Fund Loans (SRF);
- Grant receipts; and,
- Interest earnings.

Table 5-4: Summary of Capital Financing Plan

Annual Debt Service	FY 2007 (Budgeted \$)	FY 2008 (Projected \$)	FY 2009 (Projected \$)	FY 2010 (Projected \$)	FY 2011 (Projected \$)
Debt Service	\$71,226,983	\$76,557,057	\$82,438,600	\$89,477,356	\$100,813,124
SRF Loans	<u>697,384</u>	<u>1,159,628</u>	<u>1,146,193</u>	<u>1,135,936</u>	<u>1,132,501</u>
Total Debt Service	71,924,367	77,716,684	83,584,794	90,613,292	101,945,625
Plus: Pay-As-You-Go Capital	<u>9,269,657</u>	<u>14,254,433</u>	<u>22,148,071</u>	<u>35,289,232</u>	<u>34,753,684</u>
Total Capital Financing	\$81,194,024	\$91,971,118	\$105,732,865	\$125,902,524	\$136,699,308

Debt Service Requirements

Debt service requirements are included in Table 5-4, and consist of principal and interest payments on existing and projected debt. The City currently has debt payments associated with outstanding parity bonds (Series 1993 and Series 1995), Series 1997A and 1997B bonds, Series 1999A and 1999B bonds, and State Revolving Fund (SRF) interest free loans. Debt service requirements during the study period include annual payments in the range of \$71.9 to \$101.9 million. Total capital costs range from \$81.2 to \$136.7 million over the same period.

Debt Service Coverage

The City needs to meet debt service coverage requirements on its existing outstanding bond issues and new issues. Typically, to meet debt service coverage requirements and obtain a good bond rating, the City needs to ensure that adequate revenues are available to meet its expenditures. Rating agencies use coverage as a measure of an agency's ability to repay debt and ensure financial stability.

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Coverage requirements typically vary between 1.10 and 1.25. The City also has some debt with only a 1.00 coverage requirement. The Parity Obligations stipulate that City's Net System Revenues shall amount to at least 1.20 times the Maximum Annual Debt Service on all Parity Obligations Outstanding.

The System Revenues include sewer service charges from the City's users and the PAs, Shipboard Waste and other Muni Revenues. In addition, system revenues include all other moneys derived from the ownership and operation of the system including sewer connection fees, capacity fee revenues from the City, Pay-as-You-Go revenues from PAs, anticipated Grant Funds, funds transferred from the Rate Stabilization Fund and other interest earnings on reserve funds. Maximum Annual Debt Service includes annual principal and interest payments on outstanding and anticipated bonds.

Higher debt service coverage generally results in lower interest rates on debt. The revenue requirements projected for the study period will help the City successfully meet its existing debt service coverage requirement, which is 1.20.

5.2.3 Reserves

The City needs to have adequate cash reserves to meet its operating, capital, and debt service requirements. Debt service reserves provide protection from defaulting on annual debt service payments in times of financial crisis. The annual debt service reserve amount is estimated to be in the range of \$63 to \$93.5 million during the study period.

Operating reserves may be used to meet ongoing cash flow requirements as well as emergency requirements. Typically, a balance in the range of 10 percent and 50 percent of annual operating expenses is considered appropriate. This represents one to six months of working capital. In the past, the City has maintained a 45-day operating reserve. However, this reserve is now being built to a 70-day reserve over several years. Increasing the Operating Reserve Fund balance through rate-generated contributions has an impact on projected rate increases over the planning period.

WASTEWATER COST OF SERVICE RATE STUDY

Table 5-5: Cash Flow Statement

Description	Fiscal Year Ending June 30:				
	2007	2008	2009	2010	2011
Revenue	\$	\$	\$	\$	\$
Revenue Under Existing Rates	\$241,152,986	\$245,609,600	\$248,743,000	\$251,917,500	\$255,133,800
Additional Revenue Required:					
Year	Percent	Months Effective			
2007	8.75%	1	1,758,400	21,490,800	21,765,000
2008	8.75%	1		1,947,600	23,669,500
2009	7.00%	1			1,716,000
2010	7.00%	1			1,859,600
2011	4.00%	1			1,151,500
Total Revenue From Rates	242,911,386	269,048,000	295,893,500	320,646,600	346,608,600
Miscellaneous Revenue	4,707,000	5,393,000	5,888,000	6,413,000	6,782,000
Non Operating Revenue	17,318,634	11,010,000	11,851,000	12,325,000	12,847,000
Transfers from Other Funds/Reserves	19,494,437	14,768,000	15,358,720	15,973,069	16,611,992
Interest Income from Other Funds/Reserves	4,677,300	8,183,300	9,116,300	9,985,300	10,921,300
Total Revenue	289,108,757	308,402,300	338,107,520	365,342,969	393,770,892
Revenue Requirements					
O&M	209,188,511	212,542,949	218,809,171	228,516,479	237,192,098
Total Debt Service	71,924,367	77,716,684	83,584,794	90,613,292	101,945,625
Transfers to Other Funds/Reserves	1,777,720	4,035,537	10,243,718	10,485,765	18,963,818
Routine Capital Outlay	9,269,657	14,254,433	22,148,071	35,289,232	34,753,684
Total Revenue Requirements	292,160,255	308,549,604	334,785,753	364,904,768	392,855,225
Operating Fund Balance					
Net Annual Cash Balance	(3,051,498)	(147,304)	3,321,767	438,201	915,666
Beginning Working Capital Balance	5,000,000	1,948,502	1,801,199	5,122,965	5,561,166
Net Working Capital Balance	1,948,502	1,801,199	5,122,965	5,561,166	6,476,833
Working Capital Balance Goal [1]	24,291,139	26,904,800	29,589,350	32,064,660	34,660,860
Debt Service Coverage [2]	115%	130%	153%	155%	157%
Reserves Balance	95,434,164	109,059,627	127,595,953	145,119,168	163,085,429
Recommended Minimum Balance	\$64,848,439	\$65,888,314	\$67,830,843	\$70,840,108	\$73,529,551

[1] Cash balance goal of 10.0% revenues.

[2] Minimum bond coverage requirement is 115%. Includes transfers from rate stabilization and connection fees.

SECTION 6: STUDY ISSUES

In addition to the Cost of Service and Rate Setting process, this Study focused on three major areas:

- Adherence to SWRCB regulation and guidance on wastewater ratemaking;
- Modifications to rate design with respect to the SFR sewer cap and return factor; and,
- Options for cost allocations to the base fee.

These Study issues are discussed in the following subsections.

6.1 Compliance with Legal and Regulatory Requirements

The SWRCB provides direction on how sewer charges should be developed in California. Some of this direction is in the form of regulations contained in the Revenue Program Guidelines, while other direction is in the form of less formal guidance from SWRCB staff. The City's rate structure is in compliance with the revenue program guidelines, however, the SWRCB commented on the single family residential usage cap discussed below.

In addition Proposition 218 applies to water and sewer rates that require rates not exceed the cost of providing service and that rate revenues only be used for providing service. In addition, to comply with Proposition 218, the City must provide notices by mail to property owners and conduct a public hearing not less than 45 days after mailing the notice. At the public hearing, the City must consider all protests against the fee. If *written* protests against the proposed fee are not presented by a majority of owners of the parcels, the agency **may** impose the fee. Voter approval at an election is not required. The City intends to meet these requirements.

6.2 Impact on the Residential Sewer Cap

At the conclusion of the last study the City received notification from the SWRCB that the proposed cap on SFR customers must be set high enough to capture at least 95 percent of the users or all SFR customers with winter water use above the existing cap be surveyed to verify that each account is a SFR user and not multi-family or commercial user.

RFC performed an analysis of the winter water usage for the last five years and determined that the five-year average to cover 95 percent of the users resulted in a cap of 20 hcf per month. Using this cap and a 95% return factor, RFC conducted a mass balance as described in Section 4.4 of this report and obtained a reasonably good balance on the wastewater flow. The mass balance supports a revision of the monthly SFR usage cap from the current 14 hcf per month to 20 hcf and a 95% return factor.

6.3 Cost Allocation to the Base Fee

Another focus of this Study was to examine options for an equitable allocation of costs for recovery through the customer base fee. It is accepted practice in the utility ratemaking industry to identify costs that may be appropriately allocated to customer accounts and recover these costs through the customer base fee. RFC first examined Muni and Metro system O&M costs to isolate the types of expenditures typically allocated for base charge recovery. These costs fall into four categories:

- Customer service, billing, meter reading, and meter maintenance;
- A proportionate share of other administrative and general costs;

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- A proportionate share of costs associated with inflow and infiltration; and,
- A portion of costs associated with sewer lateral O&M.

In addition to O&M costs, a portion of capital costs may also be allocated for base fee recovery. It is common to include a portion of debt service, a component of capital cost, in the base fee since debt service is a fixed cost that must be recovered despite the level of billable flow through the system.

In order to allocate costs for a customer base fee, RFC developed a fourth wastewater parameter. Account based costs would become another parameter in addition to flow, TSS, and COD. Account based O&M and capital costs would then be allocated to the parameter and then to each customer class based on the number of accounts. This method of developing a base fee provides a more direct cost justification. In total, approximately \$41 million of costs were allocated for base fee recovery, which is comparable to the amount generated by the current base fee.

It was determined that since the SFR class represents over 80 percent of overall system accounts, this type of account-based allocation would disproportionately impact SFR users. In addition, the SWRCB guidance does not explicitly allow for cost allocation to functional parameters other than flow, TSS, and COD. Under SWRCB guidance, RFC believes the existing methodology for determination of the base fee is appropriate. For these reasons, the City has decided to continue with its existing methodology for development of the customer base charge.

SECTION 7: COST OF SERVICE

The determination of the City's user class flows and loadings discussed in Section 4 of this report, and the revenue requirements reviewed and finalized through the operating and capital cash flow analysis discussed in Section 5 of the report, provide the basis for performing the cost of service analysis. This section of the report discusses the allocation of operating and capital costs to the Flow, TSS and COD parameters, the determination of unit rates, and the calculation of user class cost responsibility.

The total revenue requirement net of miscellaneous revenue credits, by definition, is the net cost of providing service. This cost of service is then used as the basis to develop unit rates for the wastewater parameters and to allocate costs to the various user classes in proportion to the wastewater services rendered. The concept of proportionate allocation to user classes implies that allocations should take into consideration the quantity of wastewater a user contributes and the strength of wastewater.

In this study, wastewater rates were calculated for FY 2007, and accordingly FY 2007 revenue requirements are used in the cost allocation process.

7.1 Costs To Be Allocated

The annual revenue requirement or cost of service to be recovered from wastewater charges includes operation and maintenance expenses, costs associated with annual renewal and replacements, and other capital related costs. O&M expenses include costs directly related to the collection, treatment, and disposal of wastewater and maintenance of system facilities. Renewals and replacements represent the annual recurring capital outlay for minor system improvements and purchase of equipment.

The total FY 2007 net cost of service to be recovered from the City's retail users, as shown on line 14 in Table 7-1, is estimated at nearly \$262.3 million, of which \$225.6 million are operating costs and the remaining \$36.7 million are net capital costs. This is the amount that the City would expect to collect if the rates were in place for the full year. The cost of service analysis is based upon the need to generate annual revenues adequate to meet the estimated annual revenue requirement. As part of the cost of service analysis, revenues from other non-City user sources such as revenues from PAs are deducted from the appropriate cost elements. Additional deductions are made to reflect the use of rate stabilization fund and operating interest income. Adjustments are also made to account for cash balances.

To allocate the cost of service among the different user classes in proportion to their flow and strength contributions, costs first need to be allocated to selected wastewater parameters. The following subsection describes the allocation of the operating and capital cost of service amounts to the parameters of Flow, TSS, and COD.

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Table 7-1: Test Year COS

Revenue Requirements	Operating Cost (\$ Mil)	Capital Cost (\$ Mil)	Total (\$ Mil)
1 Operating & Maintenance Costs	\$205,878,013		\$205,878,013
2 Debt Service Requirements		71,924,367	71,924,367
3 Routine Capital Outlays		9,269,657	9,269,657
4 Transfers to Operating Fund	<u>5,088,218</u>		<u>5,088,218</u>
5 Subtotal	210,966,231	81,194,024	292,160,255
Less Revenue Requirements Met From Other Sources			
6 Miscellaneous Charges	4,707,000		4,707,000
7 Non-Operating Revenue		17,318,634	17,318,634
8 Transfers from Sewer Capital Fund		19,494,437	19,494,437
9 Interest – Capital Fund		<u>4,747,700</u>	<u>4,747,700</u>
10 Subtotal	4,707,000	41,560,771	46,267,771
Less Adjustments			
11 Adjustment for Annual Cash Balance		2,981,097	2,981,097
12 Adjustment to Annualize Rate Increase	<u>(19,342,400)</u>		<u>(19,342,400)</u>
13 Subtotal	(19,342,400)	2,981,097	(16,361,303)
14 Cost of Service Recovered Through Rates	\$225,601,631	\$36,652,155	\$262,253,786

7.2 Cost Allocation To Wastewater Parameters

The three cost allocation parameters are Wastewater Flow, TSS, and COD. TSS and COD constitute the strength components of the wastewater discharge. As discussed earlier, the percentages used to allocate the FY 2007 cost of service to the wastewater parameters are derived based on the functional-design method of allocation. The allocation of costs to the three parameters involves:

- Identification of functional areas and costs of the wastewater system.
- Apportioning of FY 2007 costs into O&M and Capital costs of service (from Table 7-1).
- Determination of O&M and CIP allocation percentages for the three parameters

7.3 Identification of Functional Areas

As described in Section 5, O&M costs can be categorized broadly into the functional areas of collection, treatment, laboratory, and administrative and general services. Different allocation bases are used to apportion each of these functional costs to the Flow, TSS, and COD parameters.

Under the functional-design method of allocation, both the function and the design of the facilities need to be considered in allocating costs to the parameters. The primary function of collection facilities such as trunk lines, sewer lines, and interceptors is to convey untreated influents to the treatment facilities and treated effluents from the treatment facilities to the final discharge location, which in the City’s case is the ocean. These collection facilities are designed (sized) according to the volume of flows that they are expected to handle. Hence, based on the functional-design method, since both the functional and design elements of the collection facilities relate exclusively to flow, all capital and O&M expenditures related to collection facilities are usually allocated entirely to wastewater flows.

From a functional-design perspective, treatment facilities include processes that relate to all three wastewater parameters. For instance, the primary function of the City’s PLWTP is the removal of TSS.

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In terms of design, the components in the plant including clarifiers and sedimentation basins are designed to handle expected volume of flows. With respect to operational performance, PLWTP removes TSS and is required to remove a significant portion of COD. Therefore, since the treatment facilities relate to all three parameters, capital and O&M expenditures associated with treatment facilities are allocated to Flow, TSS and COD parameters.

Laboratory services (also referred to as Technical Services) relate to both the flow and strength elements of wastewater and hence laboratory services related O&M costs are allocated to all three parameters.

Administrative and general services relate to indirect support activities necessary to operate a wastewater system and hence indirect costs are usually allocated to the parameters in proportion to the allocation of all other direct costs such as collection, treatment and technical services costs.

7.3.1 Determination of Allocation Percentages

As shown in Figure 5-1 in Section 5 of this report, the City's wastewater costs which are the focus of this Study include both Muni costs and the City's share of Metro costs. Available historical actual costs are usually used to derive allocation percentages. In this Study, FY 2007 Muni and Metro Annual O&M and FY 2007 Muni and Metro CIP total project costs are used as the basis to derive the allocation percentages. At the time this study was initiated, this was the most recent data available and the PAs and SWRCB had approved these allocations.

The Study performed the following steps to derive the allocation percentages for allocating the City's O&M and Capital costs.

- Reviewed MWWD's Metro O&M and Capital allocation percentages and made changes where necessary; and,
- Derived the overall cost allocation percentages for the City's O&M and Capital Costs.

The allocation percentages shown in Table 7-2 below are identical to those developed in the previous Cost of Service Study completed in 2003.

Table 7-2: Allocation Percentages to Parameters

Description	Total	Flow	COD	TSS
O&M	100.00%	65.96%	14.80%	19.24%
Capital	100.00%	76.72%	11.23%	12.05%

7.3.2 Apportioning of FY 2007 O&M and Capital Cost of Service

The O&M and Capital cost allocation percentages presented in Table 7-2 were used to allocate FY 2007 cost of service amounts to Flow, TSS and COD. Table 7-3 shows the allocation of FY 2007 cost of service to the three parameters.

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Table 7-3: Allocation of FY 2007 Costs

Description	Total \$	Flow \$	COD \$	TSS \$
O&M	\$225,601,631	\$148,806,836	\$33,389,041	\$43,405,754
Capital	<u>36,652,155</u>	<u>28,119,555</u>	<u>4,116,000</u>	<u>4,416,600</u>
Total Costs	\$262,253,786	\$176,926,391	\$37,505,041	\$47,822,354
Overall Allocation Percentages		67.46%	14.30%	18.24%

7.4 Unit Cost of Service

In order to allocate costs of service to the different user classes, unit costs of service need to be developed for Flow, TSS and COD. The unit costs of service are developed by dividing the total annual costs allocated to each parameter by the total annual loadings of the respective parameter (the projected annual Flows, TSS and COD loadings for FY 2007 were discussed in Section 4). Table 7-4 shows the development of the FY 2007 unit costs for each of the three wastewater parameters.

7.5 User Class Costs

The unit cost of Flows, TSS and COD shown in Table 7-4 is then applied to the projected FY 2007 flows and loadings of each user class to derive user class costs. Table 7-5 shows the FY 2007 user class loadings and cost responsibility for each user class.

Table 7-4: Unit Costs of Service

<u>Description</u>	<u>Total</u> \$	Flow	COD	TSS
		Average Daily Wastewater Flow \$	Total loading \$	Total loading \$
Net Operating Expense	\$225,601,631	\$148,806,836	\$33,389,041	\$43,405,754
Capital Costs	36,652,155	28,119,555	4,116,000	4,416,600
Total Cost of Service - \$	\$262,253,786	\$176,926,391	\$37,505,041	\$47,822,354
		67.46%	14.30%	18.24%
Total Units of Service		56,489,373	201,187,553	104,271,085
Units of Measure		hcf	lb/day	lb/day
Total Unit Cost of Service		\$3.1320	\$0.1864	\$0.4586

The SFR user class has the highest assignment of costs at \$103.9 million and the MFR user class costs are \$74.6 million. Together, these residential customer classes are responsible for 68 percent of the total cost of service. The non-residential user classes are responsible for the remaining 32 percent of the annual cost of service. Table 7-6 shows the projected distribution of each user class' meters, annual flows, TSS and COD loadings, and estimated FY 2007 revenues.

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Table 7-5: User Class Loadings and Cost Responsibility

<u>Customer Classification</u>	Flow		COD		TSS		Total
	<u>Annual</u> <u>WW Flow</u> hcf	<u>Cost</u> <u>Responsibility</u> \$	<u>Total</u> <u>loading</u> lb	<u>Cost</u> <u>Responsibility</u> \$	<u>Total</u> <u>loading</u> lb	<u>Cost</u> <u>Responsibility</u> \$	<u>Cost</u> <u>Responsibility</u> \$
SFR	22,987,450	\$71,997,376	\$72,403,227	\$13,497,286	\$40,144,364	\$18,411,605	\$103,906,267
MFR	16,505,263	51,694,973	51,986,380	9,691,213	28,824,131	13,219,751	74,605,937
Commercial/Industrial	15,857,492	49,666,136	61,672,797	11,496,938	25,804,868	11,835,012	72,998,086
Industrial	0	0	0	0	0	0	0
Shipboard Waste	1,139,167	3,567,906	15,124,784	2,819,537	9,497,357	4,355,819	10,743,261
Total	56,489,373	\$176,926,391	\$201,187,553	\$37,504,973	\$104,271,085	\$47,822,186	\$262,253,551

Table 7-6: User Class Distribution of Meters, Flow, Loadings, and Costs

<u>Customer Classification</u>	Meters	Flow	COD	TSS	Total
	<u>Total</u> <u>Number</u>	<u>Annual</u> <u>WW Flow</u> hcf	<u>Total</u> <u>loading</u> lb	<u>Total</u> <u>loading</u> lb	<u>Cost</u> <u>Responsibility</u> \$
SFR	230,156	22,987,450	72,403,227	40,144,364	\$103,906,267
MFR	30,182	16,505,263	51,986,380	28,824,131	74,605,937
Commercial/Industrial	16,772	15,857,492	61,672,797	25,804,868	72,998,086
Industrial	0	0	0	0	0
Shipboard Waste	0	1,139,167	15,124,784	9,497,357	10,743,261
Total	277,110	56,489,373	201,187,553	104,271,085	\$262,253,551

The cost of service allocations conducted in this study based on the functional-design method fully comply with the SWRCB's revenue program requirements since the City's FY 2007 revenue requirements are allocated to the different user classes proportionate to their use of the wastewater system. As mandated by SWRCB, allocations are based on the service parameters of flow, TSS, and COD. The cost of service allocation performed for the City's retail service area users is also consistent with the system-wide proportionate use approach used by MWWD in allocating wastewater system revenue requirements between the City and the PAs.

SECTION 8: RATE DESIGN

The revenue requirements and cost of service analyses described in the preceding sections of this report provide a basis for the design of wastewater rates. Rate design involves the development of rate schedules for each user class so as to recover the annual cost of service determined for each user class. In this Study, the focus of rate design is on the development of rate schedules for each of the City's retail service user classes, which was accomplished with input from the stakeholders' group. This section of the report discusses suggested wastewater rate structures, presents a schedule of rates for the City's user classes, and analyzes the impact of the proposed changes in user classifications, cost allocation and rate design on the user classes.

8.1 Rate Structure

The primary emphasis in the design of rate structures is ordinarily placed on achieving fairness and equity, with the objective being to ensure that each customer class, and each user within those classes pays their fair share of costs. In addition, rate structures should be easy to understand, simple to administer, and comply with regulatory requirements. A review of the existing City wastewater rate structures provides insights into the equitability of the current methodology and the changes, if any, that should be considered. The existing rate structure was discussed in detail in Section 3. Recommended rate structure changes are discussed in the following subsections.

While the methodology for cost allocation to user classes for equitable cost recovery is covered in some detail by the SWRCB guidelines, the City has some flexibility to design a rate structure that best meets its needs. For example, many California agencies levy flat charges on their SFR customers; the City could take the total revenue recovery from SFR customers and spread it equally amongst all SFR customers. This would provide a stable source of revenues and all SFR customers would have the same flat charge per month. The City used this type of structure in the past and moved away from it to incentivize conservation and be more equitable by charging users in proportion to the amount of wastewater discharged.

8.1.1 Base Fee

The current rate structure includes a base fee and a variable rate. The base fee is a cost recovery mechanism that is ordinarily included in the rate structure to recover certain fixed and indirect costs. Base fees provide a stable source of revenues independent of usage. RFC recommends that the City continue its existing practice of applying a monthly base fee to all its users. Currently the City collects about 16 percent of rate revenue through base charges. This percentage of revenue recovery was approved during the last rate study by stakeholders and City Council. RFC has therefore retained this percentage of revenue collection from the recommended rate structure. In addition, RFC determined that this level of base fee revenue can be reasonably justified based on the current cost structure.

In section 6.3, RFC identified the cost components that could be included in the base fee that can be collected from all users. The recommended base fee will generate about \$41 million and can reasonably be justified as shown in Table 8-1.

Because the indirect costs are common to all users, these costs should be shared equally by all the City's user meters. The monthly base fee is therefore obtained by dividing the FY 2007 indirect costs by the total number of annual City's user meters. The estimated monthly base fee of \$12.31 for FY 2007 is shown below.

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Table 8-1: Estimation of Monthly Base Fee

Cost Description	Allocation (\$ millions)
Billing, Collections, Customer Service, and Meter Reading Costs	15.4
Allocated Administrative and General Costs	1.3
Sewer Lateral O&M (Allocated from other City Departments)	2.5
Infiltration and Inflow Costs	5.4
Debt Service (25% of annual payments)	16.4
Total	41.0
Monthly Cost per Customer Account	\$12.31

8.1.2 Usage Rate

The usage rate recovers the City's direct costs, and is separately determined for each user class. Usage rates are developed based on the principle of maintaining inter-class revenue neutrality. This means that each user class would pay only its proportionate share of the costs of service (Refer to Table 7-5 for revenues required from each user class). Since a portion of the revenues required from each user class would be recovered through uniform monthly base fees, each user class' usage rate needs to be designed to recover only that portion of revenues that is not recovered through the base fee.

Annual base fee revenues for each user class for FY 2007 are estimated based on the number of meters in a given class and the suggested monthly base fee of \$12.31. The portion of revenues to be recovered through usage rates is then determined by deducting the annual base fee revenues from the user class's FY 2007 cost of service, as shown in Table 8-2.

Table 8-2: User Class Cost of Service, Base Fee Revenue, and Usage Revenue

User Class Description	Total COS	Base Fee Revenues	Usage Revenues	Unit Rate
	\$	\$	\$	Based on total COS
Single Family Residential	\$103,906,360	\$33,998,628	\$69,907,732	\$4.520
Multiple Family Residential	74,606,004	4,458,520	70,147,484	\$4.520
Commercial/Industrial	72,998,151	2,477,534	70,520,617	
Contract Services (Navy)	10,743,271	-	10,743,271	
Total Annual User Revenues	\$262,253,786	\$40,934,682	\$221,319,105	

The sewer usage rates for each user class are based on the user class' required annual usage revenues and the estimated annual volume of wastewater flows.

The SFR and MFR user classes are a homogenous group with the same strength characteristics; therefore, uniform sewer usage rates can be established for these classes. Note that because the SFR and MFR classes have the same return factor (95%) and strength, the unit rate, in \$/hcf of wastewater, based

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on total costs to be recovered, is the same for both classes. However, this is not the case with respect to commercial/industrial users. Commercial/industrial users vary significantly in terms of both metered water return factor and strength characteristics. Therefore, unit costs are used to develop usage rates for the non-residential class. In addition, SWRCB rules require that usage rates be computed individually for each of the Large Users. The design of usage rates for the various user classes is discussed in the following subsections.

SFR Usage Rate and Calculation of Monthly Wastewater Charge

The suggested SFR sewer usage rate is determined based on annualized average winter water usage with a usage cap of 20 hcf and an assumed return factor of 95 percent. The SFR usage rate for FY 2007 is \$2.890 per hcf of water, and was computed by dividing the estimated SFR FY 2007 usage revenue requirement by the annualized billable winter water usage estimated using a 20 hcf usage cap, as shown in Table 8-3.

Table 8-3: SFR Usage Rate

User Class Description	Usage Revenue Requirement \$	Winter Flow 20 hcf cap hcf	Unit Rates Flow (20hcf cap, 95% return) \$/hcf of wwater	Unit Rates Flow (20hcf cap, Metered use) \$/hcf of water
Single Family Residential	\$69,907,732	22,987,450	\$3.0411	\$2.8900

RFC recommends that the City should retain its existing method of computing monthly SFR wastewater charges. RFC also recommends changing the monthly usage cap to 20 hcf instead of the existing monthly usage cap of 14 hcf and changing the assumed return factor to 95 percent instead of the existing return factor of 100 percent. As in the existing method, winter water usage during the months of December through March would be monitored, and the 30-day lowest average usage would be computed. The \$2.890 per hcf of water use (\$3.0411 per hcf of wastewater with 95% return factor applied) rate would then be applied to this 30-day minimum water usage to determine a SFR user's monthly usage charge. However, the portion of the 30-day average usage that exceeds the 20 hcf monthly cap would not be billed. For instance, a SFR user with a 10 hcf, 30-day minimum water usage would be billed a monthly SFR usage charge of \$28.90. The total monthly SFR wastewater charge for that user including the monthly base fee of \$12.31 would be \$41.21. With the proposed usage cap set at 20 hcf, the maximum monthly wastewater charge (including the monthly base fee) a SFR user could be billed would be \$70.11 (20 hcf x \$2.890 + \$12.31)

MFR Usage Rate and Calculation of Monthly Wastewater Charge

The MFR Usage Rate is computed based on annual MFR usage revenues required and estimated annual water use. Typical MFR wastewater flow is 95 percent of annual metered water usage. The computed MFR usage rate for FY 2007 is \$4.0380 per hcf of water use (\$4.2500 per hcf of wastewater). Table 8-4 shows the determination of MFR usage rate per hcf of water.

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Table 8-4: MFR Usage Rate

User Class Description	Usage Revenue Requirement \$	Metered Water Flow hcf	Unit Rates Flow (95% return) \$/hcf of wwater*	Unit Rates Flow (Metered use) \$/hcf of water
Multiple Family Residential	\$70,147,484	16,505,263	\$4.2500	\$4.0380

* Wastewater flow is assumed to be 95% of metered water

To compute monthly wastewater charges, the usage rate of \$4.038 per hcf of water is directly applied to the user's water consumption if the user is assigned a 95 percent return to sewer. For example, for a MFR user with monthly water usage of 20 hcf of water and a 95 percent return to sewer, the usage charge is \$80.76. With the inclusion of the \$12.31 monthly base fee, the total monthly wastewater charge would be \$93.07.

For a MFR user with a return rate different than 95 percent return to sewer, the usage rate would be:

$$(\$4.2502) \times \text{Return factor} \times \text{Water Usage}$$

For an MFR user with 50 units of water use per month and a return factor of 90 percent the usage charge would be:

$$(\$4.2502) \times 0.90 \times 50 = \$191.26$$

With the inclusion of the \$12.31 monthly base fee, the total monthly wastewater charge would be \$203.57.

Commercial/Industrial Usage Rate and Calculation of Monthly Wastewater Charge

The development of sewer usage rates for the commercial/industrial users involves a two-step process. The unit costs of flow, TSS and COD for FY 2007 are first determined for the commercial/industrial user class as a whole and then, based on those unit costs, sewer usage rates are determined for Commercial/Industrial Users.

Determination of Commercial/Industrial User Loadings: The annual TSS and COD loadings are determined based on the users' annual water usage, assigned percent return factors, and assigned or measured TSS/COD strengths. For Large Users, the annual TSS/COD loadings are computed based on their actual assigned or measured strengths and estimated annual flows.

Determination of Commercial/Industrial User Unit Costs: The unit costs for flow, TSS and COD are determined based on the commercial/industrial annual flows, TSS/COD loadings, and estimated FY 2007 usage revenues required. The estimated FY 2007 annual usage revenue required is first allocated to flow, TSS and COD parameters. The cost allocated to each parameter is then divided by annual flows and loadings to derive the unit costs. Table 8-5 shows the development of commercial/industrial unit costs for the three parameters.

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Table 8-5: Commercial/Industrial Unit Costs for Flow, TSS, and COD

	<u>Base Fee</u>	<u>Flow</u>	<u>TSS</u>	<u>COD</u>
Allocated Costs (\$)	\$2,477,534	\$47,980,526	\$11,433,346	\$11,106,745
Units	201,262	15,857,492	25,804,868	61,672,797
	\$/bill	\$/hcf of wwater	\$/lb	\$/lbs
Unit Cost (\$)	\$12.31	\$3.0257	\$0.4431	\$0.1801

Determination of Sewer Usage Rates and Monthly Charges for Commercial/Industrial Users: For each meter, wastewater usage rates are computed based on the assigned percent return factor, and the analyzed or assigned strength values for TSS and COD, using the unit costs determined for the Commercial/Industrial user class. Where actual percent return and or strength has not been determined, default values are assigned as shown in Appendix B. In the case of most users, the rates are computed for the assigned TSS/COD strength range based on the mid-point strength of the range shown in Table 8-6.

Table 8-6: Strength Range Determination

COD TABLE			TSS TABLE			FLOW TABLE					
CD	PPM	FCTR	CD	PPM	FCTR	CD	PERCENT	FCTR	CD	PERCENT	FCTR
A	0000-0200	100	A	000-0100	50	A	100.0	1.00	K	50.0-54.9	0.52
B	0201-0400	300	B	101-0200	150	B	95.0-99.9	0.97	L	45.0-49.9	0.47
C	0401-0600	500	C	201-0300	250	C	90.0-94.9	0.92	M	40.0-44.9	0.42
D	0601-0800	700	D	301-0400	350	D	85.0-89.9	0.87	N	35.0-39.9	0.37
E	0801-1000	900	E	401-0500	450	E	80.0-84.9	0.82	O	30.0-34.9	0.32
F	1001-1200	1100	F	501-0600	550	F	75.0-79.9	0.77	P	25.0-29.9	0.27
G	1201-1400	1300	G	601-0700	650	G	70.0-74.9	0.72	Q	20.0-24.9	0.22
H	1401-1600	1500	H	701-0800	750	H	65.0-69.9	0.67	R	15.0-19.9	0.17
I	1601-1800	1700	I	801-0900	850	I	60.0-64.9	0.62	S	10.0-14.9	0.12
J	1801-2000	1900	J	901-1000	950	J	55.0-59.9	0.57	T	05.0-09.9	0.07
K	2001-2200	2100									

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Table 8-7 shows sample monthly sewer charge calculation for a user with a monthly water usage of 25 hcf, an assigned return to sewer of 80 percent, TSS of 380 mg/l and a COD of 620.

Table 8-7: Sample Calculation of Monthly Wastewater Charges

Type Charge	Water Use hcf	Return %	WW Flow hcf	Strength (1) Midpoint mg/l	Unit Rates	Charge \$
Flow	25	80	20		\$3.0257 per hcf	60.51
TSS (2)				350	\$0.4431 per lb	19.34
COD (2)				700	\$0.1801 per lb	15.73
Base Fee						12.31
Total						\$107.89

(1) TSS and COD strength midpoints are developed from table 8-6

(2) Mg/l of TSS and COD are converted to pounds using a conversion factor of 0.006237

Determination of Sewer Usage Rates and Monthly Charges for Large Users: For the Large Users, sewer usage rate is computed individually for each user based on the commercial/industrial unit costs. A sample monthly wastewater charge calculation for a Large User with measured TSS strength of 640 mg/l and COD strength of 2,520 mg/l is shown in Table 8-8.

Table 8-8: Sample Calculation of Monthly Wastewater Charges for Large Users

Type Charge	Water Use hcf	Return %	WW Flow hcf	Measured (1) Strength mg/l	Unit Rates	Charge \$
Flow	2,000	80	1,600		\$3.0257 per hcf	4841.17
TSS (2)				640	\$0.4431 per lb	2829.75
COD (2)				2520	\$0.1801 per lb	4528.87
Base Fee						12.31
Total						\$12,212.09

(1) TSS and COD strength for Large Users is determined through monitoring

(2) Mg/l of TSS and COD are converted to pounds using a conversion factor of 0.006237

8.2 Adequacy of Suggested Rates and Charges

The rates presented in this report should generate adequate wastewater user revenues to meet projected requirements for FY 2007. We recommend that the City conduct a financial review at the end of FY 2007 to review program changes and adjustments, and the adequacy of expected revenues for FY 2008 and subsequent years.

8.3 Customer Impact Analysis

RFC performed an impact analysis to evaluate the impact of the recommended changes to the rate structure and the changes to the SFR usage cap level. The impacts of each of these changes among user classes and within user classes are discussed below.

8.3.1 SFR Impacts

SFR customers will experience a range of impacts depending on their usage level. Impacts range from increases of about 2 percent to increases of about 35 percent. The maximum bill increases from \$51.77

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to \$70.11, predominantly because of the increase in the sewer cap. Table 8-9 shows the monthly bill impacts at different SFR usage levels.

Table 8-9: Sample SFR Rate Impacts

Metered Water (hcf)	Existing Base \$/bill	Existing Rate \$/hcf of water	Existing Bill \$	Proposed Base \$/bill	Proposed Rate \$/hcf of water	Proposed Bill \$	Change %
0	11.32	2.889	11.32	12.31	2.890	12.31	8.7%
2			17.10			18.09	5.8%
4			22.88			23.87	4.3%
6			28.65			29.65	3.5%
8			34.43			35.43	2.9%
9*			37.32			38.32	2.7%
10			40.21			41.21	2.5%
20			51.77			70.11	35.4%
30			51.77			70.11	35.4%
50			51.77			70.11	35.4%

* Average SFR Customer

8.3.2 MFR Impacts

MFR impacts are consistent at about 8.5%. Table 8-10 shows the monthly bill impacts at different MFR usage levels.

Table 8-10: Sample MFR Rate Impacts

Metered Water (hcf)	Existing Base \$/bill	Existing Rate \$/hcf of water	Existing Bill \$	Proposed Base \$/bill	Proposed Rate \$/hcf of water	Proposed Bill \$	Change %
20	11.32	3.721	85.74	12.31	4.038	93.07	8.5%
50			197.37			214.21	8.5%
100			383.42			416.11	8.5%
500			1,871.82			2,031.31	8.5%

8.3.3 Commercial/Industrial Impacts

Commercial/Industrial customer impacts vary based on the amount of usage and the strength of discharge. Table 8-11 shows the bill component cost increases Commercial/Industrial customers. As a class the revenues from these users increases by 9.7 percent over current revenues as a result of changes in the cost structure, i.e., the relative distribution of collection system, treatment and capital costs.

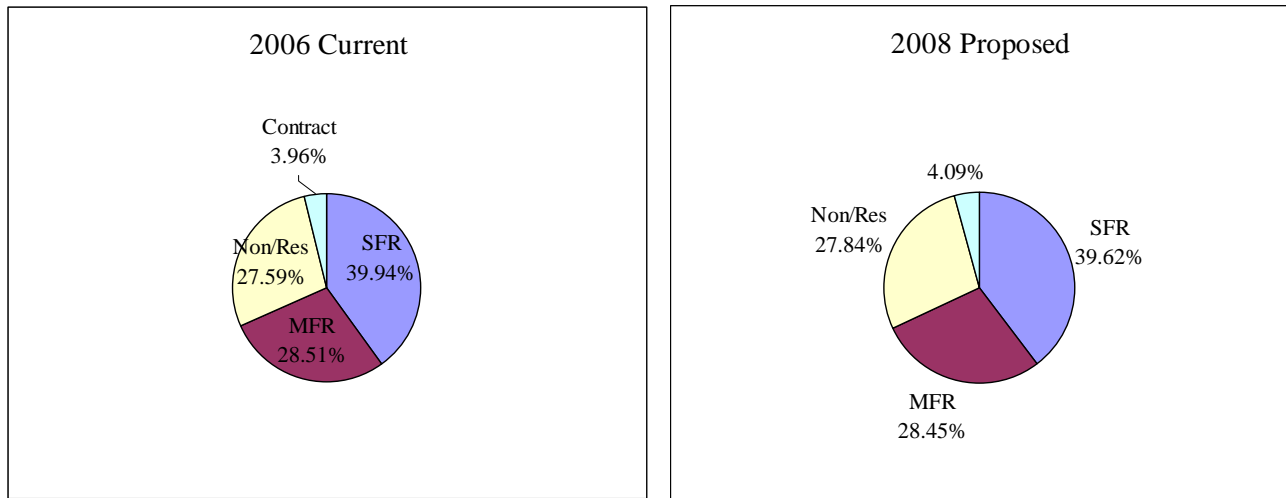
Table 8-11: Sample Commercial/Industrial Rate Impacts

		Current	Proposed	Change
Base	\$ per account	\$11.32	\$12.31	8.7%
Flow	\$/hcf of wwater	\$2.7534	\$3.0257	9.9%
TSS	\$/lb	\$0.4294	\$0.4431	3.2%
COD	\$/lb	\$0.1544	\$0.1801	16.6%

The relative difference in revenue generation from the different customer classes under the current rates and proposed rates is very minimal as shown in Figures 8-1 below.

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Figure 8-1 Relative Revenue Generation Under Current and Proposed Rates



8.3.4 Revenue Program

The revenue program developed as part of this Study is designed to meet all aspects of SWRCB guidelines including identification of costs, user classification, allocation of costs, and design of rate structures which recover costs on a basis proportionate to use.

RFC compiled and reviewed the City's financial information to ensure that annual O&M costs including replacement costs are identified and aggregated by wastewater functions. Other costs including capital costs related to expansion of system facilities, debt service costs and operating and capital requirements were also reviewed to ensure that they are aggregated and maintained in accordance with SWRCB guidelines.

The City's user classification was reviewed. Users and their associated flows and loadings were identified to ensure compliance with SWRCB revenue program requirements. In this Study, users with the same characteristics have been identified and grouped so that the costs of the system could be allocated to the classes in proportion to the user classes' demand on the wastewater system.

In accordance with the revenue program requirements, the City's annual costs were identified and allocated to the parameters of flow, TSS and COD in proportion to the percentage of costs that these three parameters represent. The functional-design method has been used to allocate the City's retail service area costs to the parameters. The allocation of costs is consistent with the proportional and system-wide allocation approach which has been approved by the SWRCB and which is currently applicable to the existing contractual agreements between the City and its PAs.

The rate structures presented in this study incorporate Flow, TSS, and COD parameters as mandated by the SWRCB and provide for a system of user charges that results in fair and equitable recovery of costs from the various user classes and users within each class.

The preceding sections of this report discussed all aspects of the study, from financial planning through development of wastewater rates. The overall user charge system that is designed to recover the costs of the system includes not only wastewater user rates but also one time capacity fees that are charged to new users that join the system. RFC reviewed the City's capital projects, capacity of various facilities, the existing capacity fee design and the adequacy of the City's existing capacity fees. The capacity fee review is discussed in the final section of this report.

SECTION 9: CAPACITY FEE REVIEW

As indicated in Section 5, one of the sources of system revenues is the one-time capacity (developer) fee that is applied to all users that connect to the City's Regional Wastewater System. This section of the report outlines the existing capacity fee structure, the regulatory requirements, computational methods, and the approach used in this Study to compute capacity fees and the capacity fee schedule.

The City applies two types of one-time fees to its wastewater system users: Capacity Fees and Connection Fees. A capacity fee is a one-time fee which is charged for new, additional or larger connections to the City's wastewater system. Capacity Fees recover the costs associated with providing additional facility capacity to new users and existing users requiring additional capacity. Connection fees are used to recover costs associated with the physical installation of lateral connections to sewer mains, and can be thought of as "plumbing charges". The scope of this study is limited to a review of the Capacity Fees.

9.1 Existing Capacity Fees

The City's existing capacity charge, based on Equivalent Dwelling Units (EDU), is a one-time charge determined per the City's Municipal Code Section 64.0410. An EDU is defined in terms of volume of wastewater flow discharged or the number of plumbing fixture units, which equate to an EDU. The City's EDU's are defined as follows:

- 280 gallons per day of wastewater flows = 1 EDU for single family residences
- Twenty Plumbing Fixture Units = 1 EDU for non residential users

The minimum capacity assigned to any sewer connection is one EDU. MFR units having individual, City-read water meters are charged one EDU per unit, while MFR units that share a common water meter are charged based on a density-adjusted formula. The formula is based on the theory that the more units per acre, the smaller the unit and therefore the less sewer capacity needed.

The City's present sewer capacity fee is \$3,710 per EDU and has been in effect since 2004. For commercial and industrial users meeting the eligibility criteria contained in Council Policy 900-12 (referred to as the Council Policy 900-12 Rate), and for affordable housing units and residential units constructed in redevelopment districts (referred to as the Preferential Rate), the City applies a reduced fee of \$1,500 per EDU. Though capacity fees are a form of user charge, they are not treated as operating revenues and are instead considered capital expansion revenues.

9.1.1 Philosophical Objective and Regulatory Requirements

The primary objectives of establishing a full cost recovery capacity fee are to achieve equity in distributing costs and to provide a mechanism by which new users can pay for the cost of the facilities required to serve them without burdening existing users. In short, the goal of a full cost recovery capacity fee is to ensure that growth pays its own way.

9.1.2 AB 1600

In California, the basic statutory standards governing water and sewer system development fees are embodied in Government Code Sections 66013, 66016, and 66022. Government Code 66013, which codifies AB 1600, provides:

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66013. (a) Notwithstanding any other provisions of law, when a local agency imposes fees for water connections or sewer connections, or imposes capacity charges, those fees or charges shall not exceed the estimated reasonable cost of providing the service for which the fee or charges is imposed, unless a question regarding the amount of the fee or charge imposed in excess of the estimated reasonable cost of providing the services or materials is submitted to, and approved by, a popular vote of two-thirds of those electors voting on the issue.
- (b) As used in this section:
- (1) “Sewer connection” means the connection of a building to a public sewer system.
 - (2) “Water connection” means the connection of building to a public water system, as defined in subdivision (e) of Section 4010.1 of the Health and Safety Code.
 - (3) “Capacity charges” means charges for facilities in existence at the time the charge is imposed or charges for new facilities to be constructed in the future which are of benefit to the person or property being charged.
 - (4) “Local agency” means a local agency as defined in Section 66000.
- (g) Any judicial action or proceeding to attack, review, set aside, void, or annul the ordinance, resolution, or motion imposing a fee or capacity charge subject to this section shall be brought pursuant to Section 66022.

The essence of Section 66013 is that a capacity fee may be no higher than the estimated reasonable cost of providing a service to new customers unless the voters have specifically approved a higher level for the fee.

9.2 Methods for Capacity Fee Determination

There are several methods that could be used to calculate capacity fees. Three approaches are discussed in this subsection.

9.2.1 System Buy-In Method

The buy-in concept is based on the premise that new users are buying into an existing system that already has the capacity to serve them, and by doing so they achieve a financial position on par with the existing users of the system who originally provided and paid for that capacity.

To foster equity between existing and new users under the buy-in method, the new users pay for the cost or value associated with the portion of existing system capacity that they use. If the existing system has 100 units of capacity for average usage or peak usage and the new user requires one unit of capacity, then the new user pays for 1/100 of the value of the existing system. Together, the new users (once paid up) and the existing users will face future capital challenges on equal footing since equivalent investments have been made. This method is applicable in situations where the existing system has adequate surplus capacity and does not require major upgrades or improvements.

9.2.2 Incremental Cost Method

The incremental-cost pricing method is based on the premise that new users should pay for the incremental portions of both existing reserve capacity which must be replaced, plus any new capacity which must be added to the system to meet their needs. The goal of this method is, once again, to eliminate or minimize the need to raise existing user rates in order to replace needed reserve capacity or fund new facilities to accommodate growth. This method is applicable under circumstances in which reserve capacity presently exists but must be replaced if used.

9.2.3 Specific Capacity Method

The specific capacity method determines capacity fees based on the cost to construct the incremental capacity required. For example, if it costs X dollars to construct Y units of new capacity, then the capacity fee per unit is determined to be X/Y. This method does not take into account the value of surplus capacity in existing facilities, and is therefore most applicable in situations where there is no available capacity in the existing facilities and new users have to be served entirely through the creation of additional capacity.

9.2.4 Approach for Determination of City Capacity Fees

The approach used in determining capacity fees should reflect system characteristics in addition to meeting regulatory requirements and policy considerations. In determining City capacity fees, RFC will continue to utilize a hybrid approach that incorporates some of the characteristics of the Buy-in and Specific Capacity methods. The hybrid approach has the advantage of including components which would not be considered otherwise, such as existing buildings, treatment plant, laboratories, etc. which may not necessarily need to be expanded for new users, but which benefit them. For example, capacity in the collection system and in the treatment and disposal systems would typically benefit a future user. Thus, the hybrid approach combines the value of the existing and future facilities and spreads them over the ultimate demand (including current and future capacity) to be met, and the ultimate demand provides the denominator needed for the calculation of the capacity fee. We believe that the hybrid approach is superior for the following reasons:

- Some elements of capacity are available in the existing system to meet the needs of future users. At the same time, the City is adding capacity to other elements where needed. The hybrid approach will fairly apportion the cost of both, and result in a reasonable fee which will ensure that existing users do not bear any part of the burden of providing capacity to new users.
- Although the incremental-cost method could be utilized, the absence of a formal system master plan outlining additional capacity added and the associated costs makes it difficult to estimate unit costs for facilities such as collector sewers. Lacking such estimates, use of the incremental-cost method would preclude capturing the cost of existing capacity to be used by new users.

9.3 Calculation of the City's Capacity Fees

The computation of Capacity Fees included the following steps:

- Estimation of costs of existing facilities benefiting future users
- Identification of outstanding principal on replacement debt

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- Identification of existing reserves
- Identification of expansion related CIP projects and their associated total capacity
- Estimation of grants used for expansion projects
- Estimation of interest on the debt used to finance future expansion projects
- Derivation of unit capacity cost and capacity fee per EDU

Table 9-1 shows the calculation of the capacity fees. We have used the original cost less depreciation (OCLD) method to determine the system buy-in value of existing facilities including general plant. For the buy-in component, the asset value is reduced by the outstanding principal on replacement debt to determine equity of the existing users to ensure that new users are not paying twice for the same capacity; once through payment of capacity fees and a second time through user fees which include debt service payments. By deducting the principal value of the replacement debt from the cost of the facilities, new users pay only for the equity portion of the existing facilities via the capacity charge. It is expected that new users will be sharing in the cost of the principal on the replacement debt once they join the system. Cash from operating, capital, and debt service reserves are added to derive the net buy-in equity.

A 10-year outlook was used in identifying future CIP projects. The CIP projects identified were classified into functional categories including large mains, treatment and disposal, ocean outfall, and general plant. Administration and General CIP projects such as laboratory, portable equipment, and miscellaneous assets were classified as General Plant. Costs for future projects were based on the CIP provided by the City. Future debt financing costs related to expansion projects are included in the expansion portion of the capacity fee so that existing users are not burdened with having to pay the costs of expansion related projects or related debt service. Expected grants for future facilities are credited towards the respective projects they will fund.

9.4 Unit Capacity Cost and Capacity Fee Per EDU

The unit capacity cost for each project is derived by dividing the total estimated cost of the project by the estimated average flow capacity of that project. Metro capacity considers the total capacity of the Metro system, 255 mgd; and Muni facilities consider only the City capacity in the system, 170 mgd. In this study, project capacity is estimated in terms of average flow per day. Although it is more prevalent to express project capacity in terms of peak flow units, use of average flow units can be substantiated. Peak flow capacity is more appropriate for water facilities, since they are designed for peak flow conditions. Wastewater treatment facilities are designed to handle peaks mostly resulting from infiltration and inflow rather than discharge from water use. Sewer pipes generally provide enough capacity to even out the peaks normally associated with customer use.

Since the capacity fee is expressed in terms of a fee per EDU, the average flow per EDU needs to be defined. The City defines the average flow of a sewer EDU as 280 gpd, and this value is used in determining the capacity fee per EDU. The system unit cost is applied to the estimated average flow per EDU to derive the capacity cost per EDU. The total capacity fee is merely the summation of these costs per EDU as shown in Table 9-1. Based on our analysis, the estimated full cost recovery capacity fee per EDU for projects constructed through 2012 is \$4,124. Implementation of the higher capacity fee results in additional capacity fee revenue. Since these additional dollars would replace funds that would otherwise be supplied by current system users, and assuming the increase in cost per EDU does not result in a reduction in the number of EDU's sold, the funds from current system users could be utilized

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to reduce the magnitude of future capital replacement borrowings, offset operations and maintenance expenses, augment the rate stabilization fund, or for other appropriate purposes.

Table 9-1: Wastewater Capacity Fee Calculation

Line No.		<u>System Buy-in</u>	<u>Expansion</u>	<u>Total</u>	Existing Capacity (MGD)	Unit Cost (\$/gpd)		EDU (gpd)	Cost (\$/EDU)
		Existing OCLD (\$)	CIP (\$)	Asset Base (\$)		Buy-in	Expansion		
Muni									
1	Mains >=16"	\$ 1,232,682,236	\$ 169,408,952	\$ 1,402,091,188	170	7.25	1.41	280	\$ 2,426
2	Treatment and Disposal	32,247,376	0	32,247,376	170	0.19	0.00	280	53
3	General Plant	4,424,564	6,014,287	10,438,850	170	0.03	0.04	280	17
Metro/Clean Water									
4	Mains	371,440,765	11,534,104	382,974,869	255	1.46	0.04	280	420
5	Treatment and Disposal	833,336,248	173,613,227	1,006,949,474	255	3.27	0.61	280	1,086
6	General Plant	25,740,410	19,481,358	45,221,767	255	0.10	0.04	280	41
7	Ocean Outfall	4,890,736	0	4,890,736	255	0.02	0.00	280	5
Replacement Debt Service Principal									
8	Muni Principal	(119,192,535)	0	(119,192,535)	170	(0.70)		280	(196)
9	Metro (City Portion)	(263,005,620)	0	(263,005,620)	170	(1.55)		280	(433)
9	Expansion Debt Interest	0	333,044,228	333,044,228	170	0.00	1.96	280	549
10	Reserves	95,434,164	0	95,434,164	170	0.56	0.00	280	157
11	System Buy-in Fee	\$ 2,217,998,342	\$ 713,096,155	\$ 2,931,094,497					\$ 4,124
Summary									
		<u>Calculated Cost (\$/EDU)</u>	<u>Existing Cost (\$/EDU)</u>						
12	Total Capacity Fee	\$4,124	\$3,710						

APPENDIX A - LIST OF ACRONYMS

BOD	Biochemical Oxygen Demand
CIP	Capital Improvement Plan
COD	Chemical Oxygen Demand
EDU	Equivalent Dwelling Unit
hcf	One Hundred Cubic Feet
I&I	Infiltration and Inflow
MBC	Metro Biosolids Center
Metro	Metropolitan Wastewater System
MFR	Multi-Family Residential
MGD	Million Gallons Per Day
Muni	Municipal Wastewater System
MWWD	Metropolitan Wastewater Department
NCWRP	North City Water Reclamation Plant
NPDES	National Pollution Discharge Elimination System
OCLD	Original Cost Less Depreciation
O&M	Operations and Maintenance
PAs	Participating Agencies
PLOO	Point Loma Ocean Outfall
PLWTP	Point Loma Wastewater Treatment Plant
TSS	Total Suspended Solids
RFC	Raftelis Financial Consultants, Inc.
SBOO	South Bay Ocean Outfall
SBWRP	South Bay Water Reclamation Plant
SFR	Single-Family Residential
SIC	Standard Industrial Classification
SQC	Sewer Quality Code
SRF	State Revolving Fund
SWRCB	State Water Resources Control Board

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APPENDIX B - COD, TSS, AND RETURN FACTORS BY SIC CODE

The table below shows how Commercial/Industrial customers are charged based on their flow (return to sewer), TSS, and COD. Very large users (wastewater flows above 25,000 gpd) are assigned default flow and strength factors based on their SIC code; Large industrial users are sampled and their actual flow and strength factors are determined. Actual flow and strength factors are used for billing thereafter. Unless site specific data is available or COD or TSS values exceed ranges identified in Table 8-6, all other Commercial/Industrial customers are assigned a Sewer Quality Code (SQC), based on their SIC code. Flow and strength billing factors are then established based on the midpoint of the SQC range shown in Table 8-6.

TABLE 250 VERSION 01

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SIC CODE TABLE WITH SQC

WATER DEPT U21

SIC CODE	DESCRIPTION	SQC (CD)	COD	TSS	FLOW
0100	AGRICULTURAL CROPS/FARMING	CBB	00600	00135	0.9500
0740	VETERINARY SERVICES	CCB	00600	00300	0.9500
1500	CONSTRUCTION/TRADE CONTRACTORS	BCB	00300	00300	0.9500
2010	MEAT PRODUCTS - PACKING, FREEZING, COOKING	JJB	02000	00920	0.9500
2040	TORTILLA FACTORIES	JIE	02000	00850	0.8000
2050	BAKERIES - CAKE, DONUT, PASTRIES, BREAD W/GRE	EEC	00850	00420	0.9000
2055	BAKERIES - CAKE, DONUT, PASTRIES, BREAD WO/GRE	JIC	02000	00900	0.9000
2080	BEVERAGES - BOTTLING COMPANIES	BCK	00300	00215	0.5000
2090	MISC FOOD PRODUCTS - PACKING, FREEZING OF SEAFOOD	BED	00300	00500	0.8500
2300	APPAREL & OTHER PRODUCTS MADE FROM FIBERS	BCB	00300	00250	0.9500
2500	FURNITURE & FIXTURE MAKING, WOOD, METAL, PLASTIC	BCB	00300	00300	0.9500
2600	PAPER PRODUCTS - CARDBOARD, BOXES, BAGS	BCB	00300	00300	0.9500
2700	PRINTING, PUBLISHING, ENGRAVING, BOOKBINDING	BCB	00300	00270	0.9500
2759	SILKSCREENING SERVICES	BCB	00300	00270	0.9500
2810	INDUSTRIAL INORGANIC CHEMICALS	BBB	00300	00170	0.9500
2820	PLASTICS, RESINS, MANMADE FIBERS	BBB	00300	00130	0.9500
2830	DRUGS, PHARMACEUTICALS, BIOLOGICAL PRODUCTS	BCB	00300	00250	0.9500
2840	SOAPS, CLEANING PREPS, PERFUME, COSMETICS	BDB	00300	00340	0.9500
2850	PAINTS, VARNISHES, ENAMELS	BCB	00300	00280	0.9500
2860	INDUSTRIAL ORGANIC CHEMICALS	EFB	00840	00600	0.9500
2890	MISC CHEMICAL PRODUCTS	BBB	00300	00200	0.9500
3000	RUBBER & MISCELLANEOUS PLASTICS PRODUCTS	BEB	00300	00450	0.9500
3200	STONE, CLAY, GLASS & CONCRETE PRODUCTS	BCB	00300	00250	0.9500
3400	PRIMARY & FABRICATED METAL PRODUCTS	BCB	00300	00250	0.9500

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3500	FABRICATED MACHINERY	FCB	01200	00470	0.9500
3570	COMPUTERS & OFFICE EQUIPMENT	CCB	00600	00250	0.9500
3600	ELECTRICAL & ELECTRONIC EQUIPMENT	BCB	00300	00250	0.9500
3670	CATHODE RAY TUBES,CIRCUIT BRDS,SEMI CONDUCTORS	BCB	00300	00100	0.9500
3700	VEHICLES & OTHER TRANSPORTATION	BCB	00360	00250	0.9500
3800	INSTRUMENTS - OPTICAL,MEDICAL,SURGICAL	BCB	00300	00250	0.9500
3900	MISC MANUFACTURING INDUSTRIES	BCB	00300	00250	0.9500
4000	TRANSPORTATION & RELATED SERVICES	BCB	00360	00250	0.9500
4220	PUBLIC STORAGE - SELF,REFRIG,AUTO,COM/HOME GOODS	BCB	00360	00300	0.9500
4300	U.S. POSTAL SERVICE SITES & FACILITIES	CCB	00600	00250	0.9500
4400	WATER TRANSPORTATION - BOAT YARDS, MARINAS	CCB	00600	00300	0.9500
4500	AIR TRANSPORTATION, AIRPORTS, TERMINALS, SERVICES	CCB	00600	00250	0.9500
4800	COMMUNICATION SERVICES - PHONE,TV,RADIO,CABLE,WIRE	CCB	00600	00250	0.9500
4900	PETROLEUM - DISTRIBUTION CENTERS,PIPELINES,REFINER	CCB	00600	00300	0.9500
4930	GAS & ELECTRIC COMPANIES	CCB	00600	00300	0.9500
4940	WATER - CITY SD WTR,PUMP STA,DISTRIB,FILTRATION	CCB	00600	00300	0.9500
4950	WASTEWATER-CITY MWWP,PUMP STA,COLLECTION,TREATMENT	CCB	00600	00300	0.9500
4953	SOLID WASTE-COLLECT & DISPOSAL OF REFUSE,LANDFILLS	CCB	00600	00300	0.9500
4955	WATER RECLAMATION PLANTS,PUMP STATIONS,TANKS	CCB	00600	00300	0.9500
4959	GROUNDWATER REMEDIATION - WATER DISPOSAL TO SEWER	CCB	00600	00300	0.9500
4961	COOLING TOWERS,COGENERATION,STEAM,AIR CONDITIONING	CCF	00600	00300	0.7500
4971	RECYCLED WATER METER ACCTS - IRRIGATION ONLY	N/A	00001	00001	0.0001
4972	RECYCLED WATER METER ACCTS - DISCHARGED TO SEWER	CCB	00600	00250	0.9500
4999	POTABLE IRRIGATION METER ON FUTURE RECYCLED MAIN	N/A	00001	00001	0.0001
5000	DURABLE GOODS - WHOLESALE DISTRIB CTRS,OUTLETS	CCB	00600	00300	0.9500
5100	NONDURABLE GOODS - WHOLESALE DISTRIB CTRS,OUTLETS	CCB	00600	00300	0.9500
5200	BUILDING SUPPLIES - RETAIL LUMBER,PAINT,NURSERY	CCB	00600	00300	0.9500
5300	DEPARTMENT STORES - RETAIL	CCB	00600	00300	0.9500
5400	FOOD STORES - GROCERY WITH G.R.E. COMPLIANCE	EEB	00850	00420	0.9500
5410	CONVENIENCE STORES - NO PRODUCE, MEAT/BUTCHER	CCB	00600	00250	0.9500
5420	FOOD STORES - GROCERY WITHOUT G.R.E. COMPLIANCE	IIB	01700	00850	0.9500
5600	APPAREL & ACCESSORY STORES SHOES,SPECIALTY,UNIFORM	CCB	00600	00300	0.9500
5700	HOME FURNISHING-APPLIANCE,FURNITURE,FLOOR COVERING	CCB	00600	00300	0.9500
5800	RESTAURANTS & FAST FOOD WITH G.R.E. COMPLIANCE	EDB	00850	00320	0.9500
5813	BARS & NIGHT CLUBS	BCB	00400	00240	0.9500
5820	RESTAURANTS & FAST FOOD WITHOUT G.R.E. COMPLIANCE	JGB	02000	00640	0.9500
5900	MISCELLANEOUS RETAIL STORES & SHOPS	CCB	00600	00250	0.9500

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6000	FINANCE SERVICES-REAL ESTATE, INVESTMENT, PROP MGTMT	CCB	00600	00250	0.9500
6500	RESIDENTIAL - MULTIPLE LIVING UNITS, APTS, CONDOS	CCB	00600	00250	0.9500
7000	HOTELS, MOTELS, LODGING WITH RESTAURANT/KITCHEN	CDB	00600	00400	0.9500
7010	HOTELS, MOTELS, LODGING WITHOUT RESTAURANT/KITCHEN	CCB	00600	00300	0.9500
7210	DRY CLEANING, GARMENT SERVICES	BCB	00300	00250	0.9500
7215	COIN OPERATED LAUNDRIES	BBC	00300	00110	0.9000
7218	COMMERCIAL LAUNDRY SERVICES - LINENS, UNIFORMS	GGE	01340	00700	0.8000
7230	BEAUTY SERVICES-HAIR SALONS, BARBER SHOPS, SCHOOLS	CCB	00600	00250	0.9500
7260	MORTUARIES WITH EMBALMING SERVICES	HIB	01600	00850	0.9500
7334	PHOTOCOPYING & BLUEPRINTING	BCB	00300	00250	0.9500
7340	DISINFECT, EXTERMINATE, CLEAN & JANITORIAL SERVICES	BCB	00300	00280	0.9500
7384	PHOTOFINISHING-FILM DEV, SLIDES, DIGITAL, ENLARGEMENT	BCB	00300	00210	0.9500
7389	WATER VENDING MACHINES, BOTTLED WATER, ICE MAKING	BBI	00300	00150	0.6000
7399	MISCELLANEOUS SERVICES - NO EATING OR DRINKING	BCB	00300	00250	0.9500
7400	FIRE SERVICE ONLY - CIS ACCOUNTS	N/A	00001	00001	0.0001
7435	FIRE SERVICE & IRRIGATION - CIS ACCTS	N/A	00001	00001	0.0001
7530	AUTOMOBILE SALES, RENTALS, REPAIR, GAS STATIONS	CCC	00600	00280	0.9400
7540	CAR WASHES	CBC	00600	00150	0.9000
7549	AUTO STEAM CLEANING	FHE	01200	00800	0.8000
7900	AMUSEMENT & RECREATION SERVICES	CCB	00600	00250	0.9500
7999	RESIDENTIAL REC BLS, LAUNDRY RMS, CABANAS, GUARDS	CCB	00600	00250	0.9500
8000	HEALTH SERVICES	CCB	00600	00250	0.9500
8050	CONVALESCENT HOMES, EXTENDED NURSING	CCB	00600	00250	0.9500
8060	HOSPITALS	CCB	00500	00200	0.9500
8070	MEDICAL & DENTAL LABORATORIES	DCB	00700	00250	0.9500
8100	LEGAL & SOCIAL SERVICES, MEMBERSHIP ORGS	CCB	00600	00250	0.9500
8200	EDUCATIONAL SERVICES - SCHOOLS, COLLEGES	CCB	00600	00250	0.9500
8400	MUSEUMS, BOTANICAL, ZOOLOGICAL GARDENS	CCB	00600	00250	0.9500
8660	CHURCHES	CCB	00600	00250	0.9500
8730	RESEARCH & DEVELOPMENT - TEST LABS, NEW TECHNOLOGY	DCB	00700	00250	0.9500
8900	PROFESSIONAL OFFICES	CCB	00600	00300	0.9500
8999	COMBINED COMMERCIAL & RETAIL	DCB	00800	00250	0.9500
9100	PUBLIC ADMIN - POLICE, FIRE, SAFETY, JUSTICE	CCB	00600	00250	0.9500
9700	ARMED FORCES, NATIONAL SECURITY	CCB	00600	00250	0.9500
9900	NONCLASSIFIABLE - SHELL & VACANT BLS, VACANT LOTS	CCB	00600	00250	0.9500