CITY OF SAN DIEGO

Water Cost of Service Rate Study

Final Report

RFC
RAFTELIS FINANCIAL CONSULTANTS, INC.

December 14, 2006

RAFTELIS FINANCIAL CONSULTANTS, INC.

201 S. Lake Ave, Suite 803
Pasadena • CA • 91101

Phone 626•583•1894
Fax 626•583•1411

www.raftelis.com

December 14, 2006

Ms. Marsi Steirer
Deputy Director
City of San Diego
600 B Street, Suite 600
San Diego, CA 92101-4587

Subject: Water Cost of Service Rate Study Report

Dear Ms. Steirer:

Raftelis Financial Consultants, Inc. (RFC) is pleased to present this report on the water 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 the cost of service analysis will result in fair and equitable water rates to the City's users.

The Study involved a review of the City's financial plan or rate case and incorporation of the revenue requirements projected therein to develop cost of service rates. RFC reviewed the City's current user classifications and water rate structure. In addition, the Study also included an update of the City's capacity fees. The proposed changes to the City's rate structure and capacity fee are summarized below.

***Rate Structure**:* Based on our review of the City's existing rate structure we propose the following:

- Classify customers into Single Family, Other Domestic (Multi-Family), Commercial/Industrial, and Irrigation/Construction based on their peaking characteristics. The proposed rates for he different classes are based on their peaking factors.
- Retain the three tiered rate structure for the Single Family customer class.
- Increase the amount of revenue to be collected from the variable commodity rates consistent with cost of service.

- Adjust meter rates for large meters in proportion to the cost of providing service.

Capacity Fee: Based on our review of the City's existing capacity fee, we estimate a full-cost-recovery capacity fee of $3,047 per EDU.

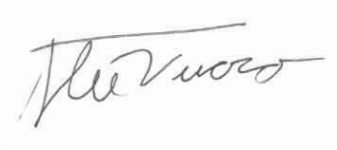
It was a pleasure working with you and we wish to express our thanks to Mr. Sam Gray and other staff members of the Water Department for the support and cooperation extended throughout the study. If you have any questions, please call me at (626) 583-1894.

Sincerely,

Raftelis Financial Consultants

Sudhir Pardiwala

Project Manager



Steve Vuoso

Consultant

TABLE OF CONTENTS

SECTION 1: EXECUTIVE SUMMARY

The City of San Diego (City) wished to conduct a comprehensive water cost of service and rate design study (Study) that included a review of revenue requirements, user classifications, costs of service, and the design of a system of user charge alternatives for the City's water service. In addition, the City also desired a review of its water capacity fees. This report documents the results of the Study, and suggests changes to user classifications, cost allocations and capacity charges which will serve to increase equity in the apportionment of costs during Fiscal Year 2008 and beyond.

The focus of this Study is primarily on the City's retail water service. The specific objective of this Study is to develop cost of service water rates that charge customers in proportion to the cost of serving them. The elements of this study include:

- Review of the costs of providing water procurement, treatment, and distribution to the City's users.
- Determination of the cost to provide service to the City's retail service area.
- Allocation of the cost of service to the water parameters of Base, Maximum Day, Maximum Hour, Meters and Services, Billing and Collecting, and Fire Protection.
- Allocation of parameter costs to the City's retail service user classes.
- Design of an equity enhancing system of charges including water user charges and capacity fees (discussed in the full report).

This section presents the cost of service review findings and suggested changes in summary form.

1.1 WATER SYSTEM

This section of the Executive Summary provides a brief description of the water system, a review of the revenue requirements and user classifications, an analysis of cost of service, and the design of water rates.

System Infrastructure: The City has managed and operated the water system since 1901 after purchasing the privately owned San Diego Water and Telephone Company. Since then the system has been expanded to supply approximately 270,000 accounts at the start of FY 2007, delivering approximately 240,000 acre-feet of water per year.

The City system consists of nine raw water storage facilities, three water treatment plants, 30 treated water storage facilities and over 3,460 miles of water lines. One of the nine raw water storage facilities, Lake Hodges Reservoir, is not currently connected to a treatment. The City owns and operates three water treatment plants with a combined current capacity of 294 million gallons per day (MGD). The 30 treated water storage facilities ensure consistent delivery to the 90 different pressure zones with the aid of 49 water pump stations.

While the City has grown, local water sources have remained static. On average, between 6 percent and 10 percent of the City's water supply is derived from local water sources. The balance of the City's water supply is purchased from the San Diego County Water Authority (CWA). These purchases from the CWA include treated water that is delivered to the City's water distribution system and raw water that is transported to the City's water treatment plants.

The 1997 Strategic Plan for Water Supply called for the doubling of water savings, from 13,000 acre-feet per year (AFY) to 26,000 AFY by 2005. This was to be accomplished by continuing successful water conservation programs. The City achieved its 2005 goal, and estimated a total of 30,350 AFY savings by the end of Fiscal Year 2006. (30,350 AFY is equal to 27.1 million gallons per day (MGD) of water saved. When compared to 11.6 mgd savings in 1997, the increase equates to 15.5 mgd. These efforts, along with proposed projects for cutting edge technologies such as brackish water desalination, are intended to provide the City with a reliable water supply that is less dependent on imports.

User/Usage Characteristics: The City has various types of customers, which are displayed in Figure ES-1. As expected, Single Family Residential makes up the bulk of City customers at approximately 80% of the meters. Other Domestic (Multi-Family) is the next largest class with more than 10% of the meters.

Figure ES-1 – Customer Makeup by Meters (as of 7/1/2006)

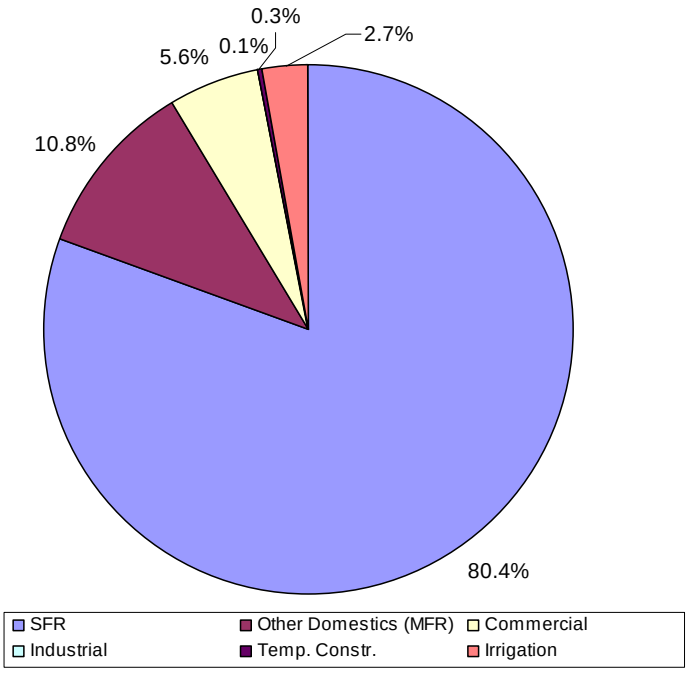


Table ES-1 provides information pertaining to the water usage associated with the various customer types. Single Family Residential, having a tiered rate structure, is further broken down by water usage within each rate block.

Table ES-1 – Projected Annual Water Usage by Class for FY 2008

Usage by Class	HCF	% of Total
SFR Blocks		
0 - 7	15,620,416	17.1%
8 - 14	8,943,800	9.8%
Over 14	9,915,197	10.8%
Total SFR	34,479,413	37.7%
Other Domestic (MFR)	20,519,164	22.4%
Commercial	22,207,400	24.3%
Industrial	1,613,743	1.8%
Temp. Construction	346,667	0.4%
Irrigation	12,294,791	13.4%
Total Non-SFR	56,981,765	62.3%
Total	**91,461,178**	**100.00%**

1.2 REVIEW OF REVENUE REQUIREMENTS

The City's principal source of operating revenues is revenue from rates. The primary sources of funding for capital improvements include water capacity fees, bond proceeds, grants, loans, pay-as-you-go revenues, and interest earnings.

The City estimates overall annual water Operation and Maintenance (O&M) expenditures in the range of $279 - $308.2 million during the study period from FY 2008 through FY 2011. This includes water purchase costs ranging from $120 to $124 million for the same period. Existing debt service on outstanding revenue bonds requires annual payments in the range of $52 to $56 million. For purposes of this analysis, the City is expected to issue additional debt of $538 million (this excludes the portion due to interim financing) in FY 2008 and FY 2010 combined, which will add $25 million in annual debt service by FY 2011. The proceeds from these revenue bond issues will help finance the water Capital Improvement Program (CIP) estimated at approximately $600 million for the study period.

The total FY 2008 revenue requirements from the City's retail users—which is generated by totaling O&M, debt service, and cash-financed capital projects and deducting any revenue from other non-rate sources—is estimated to be $287.4 million, of which approximately $219.8 million are operating costs. The remaining $67.6 million are capital-related costs related to debt service and cash-financed capital projects. In order to meet projected revenue requirements and to maintain desired operating funds, the following annual revenue adjustments are recommended. These revenue requirements are used to develop the fixed meter charges and commodity rates in a manner consistent with cost of service principles.

FY 2008	FY 2009	FY 2010	FY 2011
6.5%	6.5%	6.5%	6.5%

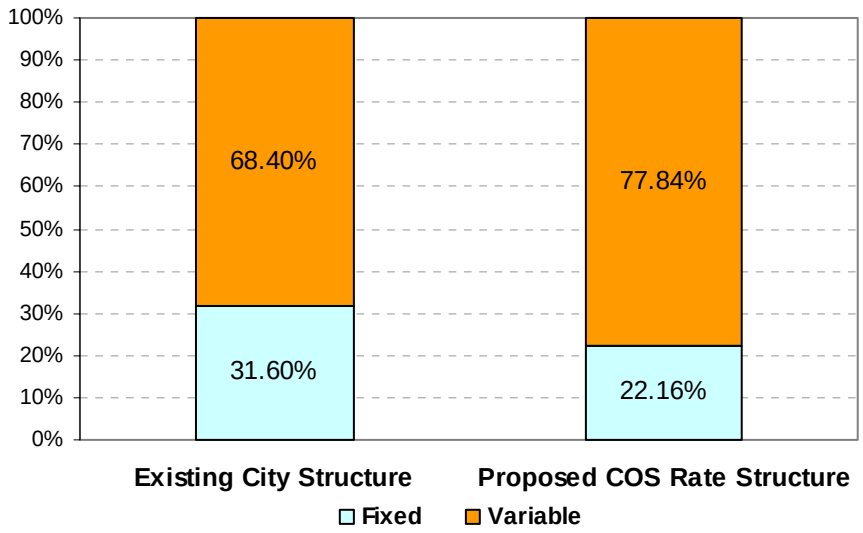
1.3 COST OF SERVICE

Cost of service (COS) is a methodical process by which revenue requirements are used to generate a system of fair and equitable costs in proportion to the service received for each user class. The cost of service allocations conducted in this study are based on the base-extra capacity method endorsed by the American Water Works Association (AWWA), a nationally recognized industry group. The other method endorsed by the AWWA, the commodity-demand method, is more suitable for agencies with a number of large wholesale customers. Under the base-extra capacity method, revenue requirements are allocated to the different user classes proportionate to their use of the water system. Allocations are based on average day (base), maximum day peak (Max Day) usage, maximum hour peak (Max Hour) usage, meters and services, billing and collection, and fire protection. Use of this methodology results in an AWWA accepted cost distribution amongst customer classes and a means of calculating and designing rates to proportionately recover those costs.

There is some flexibility in the design of the rate structure to meet the City's pricing objectives while being consistent with cost of service principles. In order to meet the City's pricing objective of revenue stability and to prevent the percentage of fixed revenue from dropping to an undesirable level, capital costs related to peaking capacity were allocated to the meter charge component of the monthly fixed charge. These costs represent the standby costs related to providing peaking capacity in the system. This practice is consistent with cost of service principles and accepted rate setting methodologies. The City's projected fixed revenue for FY 2008 under existing rate structure is approximately $90.7 million. Under the proposed COS-based rate structure, the fixed revenue is projected to be $63.7 million.

There are positives and negatives associated with the decrease in fixed revenue. Typically, a larger percentage of fixed rate revenue results in greater revenue stability since a greater percentage of total revenues are not influenced by fluctuations in consumption due to the weather. At the same time, the decrease in fixed revenue will improve equitability concerning cost recovery in that users who use limited amounts of water, and therefore place smaller demands on the system, will pay lower bills. Figure ES-2 reflects the percentage breakdown of fixed and variable revenue under City and the proposed COS rates for FY 2008. The remaining years of the study should be consistent with these percentages. Any changes in consumption patterns could potentially impact the rate revenue composition, but these deviations would most likely be negligible with respect to revenue stability.

Figure ES-2 – Rate Revenue Composition FY 2008



1.4 RATE DESIGN

The City's water rates, effective as of July 1, 2006, include fixed service charges and water commodity rates as shown in Figure ES-2. The service charges are consistent across all user classes and vary by meter size. Current service charges range from $15.87 per month for a 3/4 inch meter which is typically used by Single Family Residential (SFR, also referred to as Single Family Domestic by the City) customers to $6,514.14 per month for a 16 inch meter used by large industrial or wholesale customers.

The City has two main user classes: Single Family Residential, and all remaining customers. The commodity rates vary by user class. SFR Customers are billed on a three-block increasing rate structure. The remaining customers are charged a uniform rate of $2.003 per hundred cubic feet (HCF) of water used. California-American Water Company (Cal-Am) and certain Agricultural customers have contractually negotiated rates which will not be reviewed under the scope of this study.

The rates presented in this Study incorporate AWWA recommended methodologies adapted to meet the City's specific characteristics and provide for a system of user charges that will enhance the proportionate recovery of costs from the various user classes. Rates are designed to meet the City's pricing objectives consistent with cost of service principles.

1.5 STUDY RECOMMENDATIONS

This section of the Executive Summary outlines our observations and suggestions with respect to changes which will enhance equity in the apportionment and recovery of costs. These changes include modifications to user classifications, cost allocations, and water rates.

1.5.1 Optional User Classification

The City's existing user classification scheme is adequate to support a rate structure that fairly and equitably recovers costs. However, the City may wish to consider establishing the following user classes based on their peaking characteristics:

- SFR
- Other Domestic (Multi-Family)
- Commercial and Industrial
- Irrigation and Construction

These customers' classes can then be charged unique cost of service based commodity rates that more accurately reflect and recover the cost of serving these customer classes.

1.5.2 Rate Design Changes

Raftelis Financial Consultants (RFC) suggests the continued use of a rate structure that includes both a fixed monthly service charge and a variable water usage charge. The proposed COS rates have been designed to fairly and equitably recover the costs of providing water service to each customer class in proportion to their use of the water system and are consistent with the requirements of Proposition 218.

Service Charge: RFC suggests that the City continue to utilize a monthly service charge which is consistent for all users of similar sized meters. The cost elements to be recovered in the service charge include costs based on capacity such as:

- Maintenance of meters and services
- A portion of capital costs allocated to provide peaking capacity
- Public fire protection (hydrants) and costs that are independent of meter size such as:
- Meter reading
- Customer billing and collection

The service charges for larger meters currently used by the City are higher than those derived from the application of industry standards. RFC therefore suggests that the City consider revising service charges to more proportionately recover its costs of providing service. A list of the City's projected 2008 rates and alternative COS service charges is shown in Table ES-2. The reduced revenue from service charges results in slightly higher commodity rates to maintain full cost recovery. Use of proposed COS based service charges would result in a reduced bill for some Single Family Residential (SFR) Customers, which would benefit low volume water users.

Table ES-2 - Rate Alternatives

Meter Size inches	2007 Existing $/month	2008 City $/month	2008 Proposed $/month	2009 Proposed $/month	2010 Proposed $/month	2011 Proposed $/month
			Service Charge			
5/8	15.87	16.90	15.18	16.17	17.22	18.34
3/4	15.87	16.90	15.18	16.17	17.22	18.34
1	17.11	18.22	22.17	23.61	25.15	26.78
1 1/2	75.41	80.31	38.13	40.61	43.25	46.06
2	116.24	123.80	58.09	61.87	65.89	70.17
3	414.73	441.69	104.98	111.80	119.07	126.81
4	692.00	736.98	171.83	183.00	194.89	207.56
6	1,542.72	1,643.00	337.46	359.39	382.76	407.63
8	2,081.78	2,217.10	537.01	571.92	609.09	648.68
10	2,793.63	2,975.22	770.49	820.57	873.91	930.71
12	3,892.44	4,145.45	1,435.00	1,528.28	1,627.61	1,733.41
16	6,514.14	6,937.56	2,499.62	2,662.10	2,835.13	3,019.42

Customer Class	2007 Existing $/HCF	2008 City $/HCF	2008 Proposed $/HCF	2009 Proposed $/HCF	2010 Proposed $/HCF	2011 Proposed $/HCF
			Commodity Rate			
SFR						
0 - 7	1.731	1.844	2.262	2.409	2.566	2.732
7-14	2.163	2.304	2.461	2.621	2.791	2.973
Over 14	2.372	2.526	2.775	2.955	3.147	3.352
General Service						
Other Domestics (MFR)	2.003	2.133	2.461	2.621	2.791	2.973
Commercial & Industrial	2.003	2.133	2.357	2.510	2.673	2.847
Temp. Constr. & Irrigation	2.003	2.133	2.524	2.688	2.863	3.049

Commodity Rates: The costs of water service not recovered through the service charges are recovered in the commodity rates. RFC suggests the City consider implementation of separate commodity rates for Single-Family Residential; Other Domestic; Commercial and Industrial; and Irrigation and Construction customer classes. Table ES-2 presents a summary of the City's projected 2008 and alternative rate schedules for FY 2008 and beyond.

Single-Family Residential Commodity Rate: Since SFR is more homogenous than other customer classes, a tiered rate structure that equitably recovers costs of providing service and promoting conservation can be designed relatively easily. RFC suggests that the City continue utilizing its tiered rate structure for SFR customers. The lower rates for the first tier are justified because smaller users typically put smaller demands on the system and are credited for a portion of the capital costs allocated to peaking.

All Other Customers' Commodity Rates: For Other Domestics; Commercial and Industrial; and Irrigation & Construction customer classes, RFC suggests that the City implement the different class-based uniform commodity rates shown in Table ES-2. These proposed rates reflect the estimated peaking demands of each class and provide a greater correlation between costs and revenues.

1.5.3 Rate Impact

The main objective of this Study is to present options that will result in a proportionate allocation of costs to all user classes in proportion to the costs of serving these customers. The suggested revisions to service charges and commodity rates are designed to meet that objective.

The cost of service analysis indicates that under the current (2007) system of rates and charges, some users have been paying less for their proportionate demand for water services while others have been contributing more. However, the differences between revenue and cost are small and suggest that overall costs are being recovered in an equitable manner among customer classes.

This study reassigns revenue requirements among the various user classes to calculate the proposed COS rates. Table ES-3 presents a comparison of the distribution of projected revenue (FY 2008) and cost among customer classes. As you can see, revenues by class closely match costs by class. The biggest difference between revenue and cost is in the SFR class, where 42.1 percent of revenue and 44.2 percent of costs are contributed by single family users. Table ES-3 indicates that based on COS, 2.16 percent more revenue should be recovered from SFR customers than under current rates. Less revenue should be recovered from other domestics, commercial, industrial, temporary construction and irrigation customers.

Table ES-3 Projected Cost Distribution vs. Revenue FY 2008

Line No.	Customer Class	Revenue Distribution Under Existing Rate Structure	Cost Distribution Under Proposed Rates	Difference
1	SFR	42.1%	44.2%	2.16%
2	Other Domestics (MFR)	21.8%	21.1%	-0.76%
3	Commercial	21.6%	20.6%	-1.06%
4	Industrial	1.4%	1.4%	-0.04%
5	Temp. Constr.	0.8%	0.5%	-0.27%
6	Irrigation	12.3%	12.2%	-0.03%
7	Total	100%	100%	0.0%

The impacts discussed in this paragraph compare rates under the City 2008 and the proposed COS based rate structures. Under the proposed COS-based rates, most large volume SFR users will receive higher bills, while most low volume users will experience a reduction in monthly bills. Higher volume SFR users will experience these increases due to the higher usage rates that accompany and offset reduced service charges. At the same time, COS rates will encourage conservation and provide low-volume users with material rate relief. General Service customers

will, depending on relative levels of water usage, receive bills which are higher, lower, or about the same as under the 2007 rate structure due in large part to reductions in the meter based service charge. While the suggested changes lead to increases in water bills for some large volume users and decreases for others, they result in a cost recovery that is proportionate to use.

As stated, different customer classes will be impacted by the rate adjustments differently. An analysis of the City's customer meter size and water usage characteristics provides guidance in understanding the impact of the rate adjustments.

Table ES-4 below shows the monthly bills given varying levels of usage for the relevant customer classes under the four different scenarios: 2007 Existing, 2008 City, and 2008-2011 Proposed COS. User classes with identical rates were grouped together.

Table ES-4 – Monthly Bill Calculations

SFR - 3/4" HCF/Month	FY 07 Existing $/Mo.	FY 08 City $/Mo.	FY 08 Proposed $/Mo.	FY 09 Proposed $/Mo.	FY 10 Proposed $/Mo.	FY 11 Proposed $/Mo.
2	19.33	20.59	19.70	20.98	22.35	23.80
4	22.79	24.28	24.23	25.80	27.48	29.27
6	26.26	27.96	28.75	30.62	32.61	34.73
8	30.15	32.11	33.48	35.65	37.97	40.44
10	34.48	36.72	38.40	40.89	43.55	46.38
12	38.80	41.32	43.32	46.13	49.13	52.33
13*	40.97	43.63	45.78	48.76	51.92	55.30
14	43.13	45.93	48.24	51.38	54.72	58.27
16	47.87	50.98	53.79	57.29	61.01	64.98
18	52.62	56.04	59.34	63.20	67.31	71.68
20	57.36	61.09	64.89	69.11	73.60	78.39

*Average Usage

The median monthly household income in the City is $5,173 (annual income of $62,085) as of 2005. A $45.78 water bill—the SFR bill assuming average usage and Proposed FY 08 rates—represents less than one percent (1%) of monthly median household income. By EPA guidelines, bills of less than two percent (2%) of median housing income are deemed affordable.

Table ES-4 – Monthly Bill Calculations (cont.)

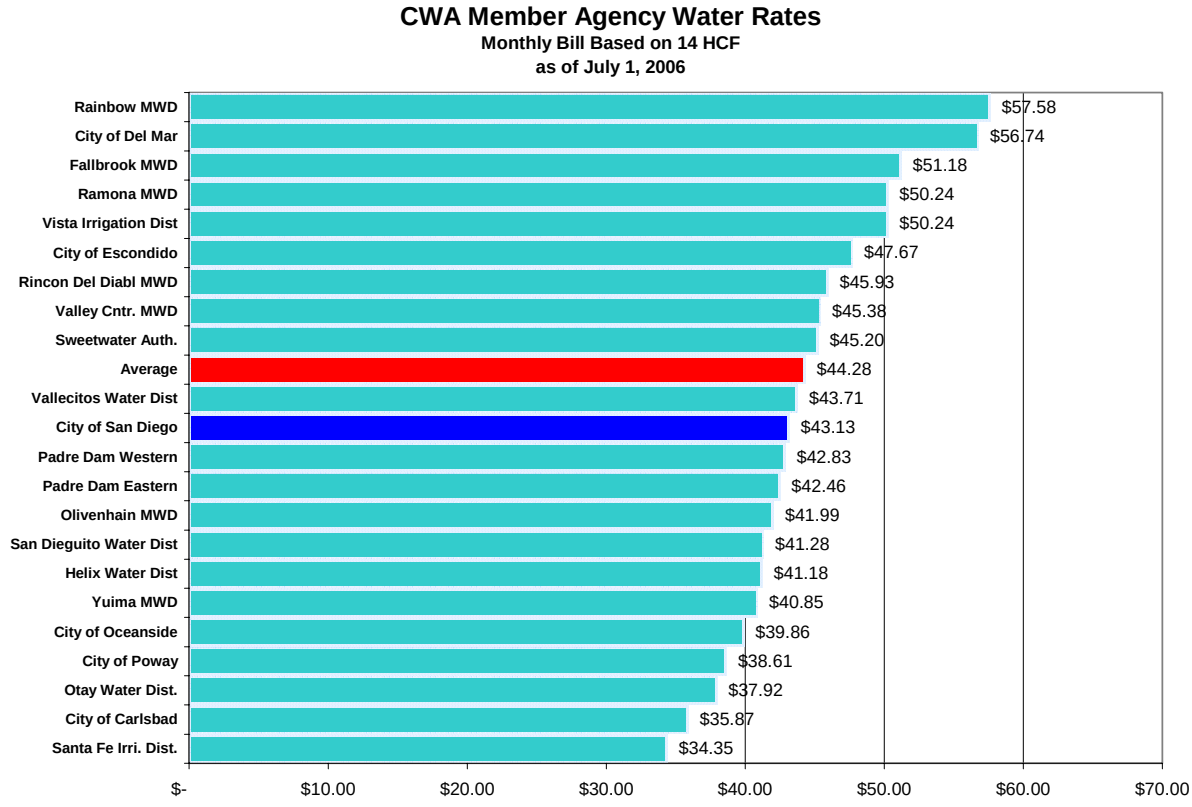
Other Domestic (MFR) 3/4" HCF/Month	FY 07 Existing $/Mo.	FY 08 City $/Mo.	FY 08 Proposed $/Mo.	FY 09 Proposed $/Mo.	FY 10 Proposed $/Mo.	FY 11 Proposed $/Mo.
20	55.93	59.57	64.39	68.58	73.03	77.78
40	95.99	102.23	113.60	120.99	128.85	137.23
60	136.05	144.89	162.81	173.40	184.67	196.67
80	176.11	187.56	212.03	225.81	240.48	256.12
100	216.17	230.22	261.24	278.22	296.30	315.56
120	256.23	272.88	310.45	330.63	352.12	375.01
140	296.29	315.55	359.66	383.04	407.94	434.45
160	336.35	358.21	408.87	435.45	463.75	493.90
180	376.41	400.88	458.08	487.86	519.57	553.34
200	416.47	443.54	507.29	540.27	575.39	612.79

Commercial/ Industrial - 1 1/2" HCF/Month	FY 07 Existing $/Mo.	FY 08 City $/Mo.	FY 08 Proposed $/Mo.	FY 09 Proposed $/Mo.	FY 10 Proposed $/Mo.	FY 11 Proposed $/Mo.
50	175.56	186.97	155.98	166.12	176.91	188.41
100	275.71	293.63	273.82	291.62	310.58	330.77
150	375.86	400.29	391.67	417.13	444.24	473.12
200	476.01	506.95	509.52	542.64	577.91	615.47
250	576.16	613.61	627.37	668.14	711.57	757.83
300	676.31	720.27	745.21	793.65	845.24	900.18
350	776.46	826.93	863.06	919.16	978.90	1,042.53
400	876.61	933.59	980.91	1,044.67	1,112.57	1,184.89
450	976.76	1,040.25	1,098.75	1,170.17	1,246.24	1,327.24
500	1,076.91	1,146.91	1,216.60	1,295.68	1,379.90	1,469.59

Temp. Const / Irrigation - 2" HCF/Month	FY 07 Existing $/Mo.	FY 08 City $/Mo.	FY 08 Proposed $/Mo.	FY 09 Proposed $/Mo.	FY 10 Proposed $/Mo.	FY 11 Proposed $/Mo.
200	516.84	550.43	562.84	599.42	638.39	679.88
400	917.44	977.07	1,067.59	1,136.98	1,210.89	1,289.59
600	1,318.04	1,403.71	1,572.34	1,674.54	1,783.39	1,899.31
800	1,718.64	1,830.35	2,077.09	2,212.10	2,355.89	2,509.02
1,000	2,119.24	2,256.99	2,581.84	2,749.66	2,928.39	3,118.73
1,200	2,519.84	2,683.63	3,086.59	3,287.22	3,500.89	3,728.45
1,400	2,920.44	3,110.27	3,591.34	3,824.78	4,073.39	4,338.16
1,600	3,321.04	3,536.91	4,096.09	4,362.34	4,645.89	4,947.87
1,800	3,721.64	3,963.55	4,600.84	4,899.89	5,218.39	5,557.58
2,000	4,122.24	4,390.19	5,105.59	5,437.45	5,790.89	6,167.30

Figure ES-3 shows a comparison of the monthly bills for SFR customers using 14 HCF of water for the City and surrounding agencies. The chart reflects the City's current rates. The City's current charge is below the average for the region. Because rates for surrounding agencies in 2008 are unknown to the City, it is difficult to make a similar chart reflecting the bills under the City's proposed rate increases.

Figure ES-3 – Monthly Bill Comparison



1.5.4 Capacity Fees

Capacity (developer) fees are one-time fees used to recover some or all of the costs of providing the system capacity required when a new user connects to the water system. Examples of such costs include those related to increasing transmission and treatment capacity in treatment plants, storage reservoirs, pumping stations, and water mains. If capacity fees are insufficient to fully offset system capacity costs, shortfalls are offset using revenues derived from current system users' rates and charges.

The City currently charges $2,550 per dwelling unit or its equivalent. The water used by an average SFR is equated to one equivalent dwelling unit (EDU) and equals 500 gallons per day (GPD). Non-residential customers are charged based upon calculated usage or an inventory of plumbing components that are assigned a number of "fixture units" which are converted to

EDU's using a conversion factor that equates 20 fixture units to one EDU. The minimum capacity assigned to any user is one EDU.

The City has a comprehensive Capital Improvement Program (CIP) planned for the study period. The CIP identifies the growth related and replacement portion of each project's cost. The growth related costs that benefit future users 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 eight 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 a full-cost-recovery capacity fee. These projects include water supply, water mains, distribution mains, pumping stations, treatment plant, and reservoirs costs, etc., yielding a capacity fee of $3,047 per EDU.

This fee represents the amount required to recover the costs associated with providing additional facility capacity to new users and existing users requiring additional capacity. The increase of approximately $600 per EDU results primarily from an increase in capital expansion projects and the high inflation in capital costs in the last few years.

SECTION 2: INTRODUCTION

2.1 BACKGROUND

The City is planning significant capital improvements over the next few years to meet regulatory requirements and construct capital projects. To finance these capital projects the City needs to borrow money from the capital markets. In anticipation of going to the debt markets to procure the lowest cost funding, the City wants to conduct rate studies to ensure the financial viability of the water enterprise and ascertain that the rates are fair and proportional to the cost of serving customers.

The City retained Raftelis Financial Consultants (RFC) to conduct a comprehensive cost of service and rate design study that could be utilized to evaluate and enhance the user charges for the City's retail water service to ensure that there is a proportionate recovery of costs from the various user classes. This report documents the findings, analyses, and suggestions that are the result of that effort.

The City owns and operates a water system that provides water to an approximately 1.3 million people in the City of San Diego. The Water System provides service to residential, commercial, and industrial customers as well as four wholesale customers: California-American Water Company (Cal-Am), the City of Del Mar (Del Mar), and the Santa Fe and San Dieguito Irrigation Districts. In addition to existing reclaimed water customers such as the City of Poway and customers within the City, the City has an agreement to sell to the Otay Water District. The City operates the water system as a self-supporting enterprise, with revenues and expenditures accounted for separately from its other enterprise and General Fund activities.

2.2 OBJECTIVES

Several objectives should be considered in the development of a financial plan and in the design of rates. The major objectives of the study were:

- Ensure Revenue Sufficiency to meet the operation and maintenance (O&M) and capital needs of the City's water enterprise
- Plan for Revenue Stability to provide for adequate operating and capital reserves and the overall financial health of the water enterprise
- Maintain investment grade Financial Ratings so that debt issuance can be achieved at the lowest cost to ratepayers
- Provide for Fairness and Equitability in the development of a system of user charges
- Minimize Rate Impacts to reduce financial hardship on user classes and individual members of those classes
- Maintain simplicity for ease of administration and implementation as well as customer understanding and acceptance.

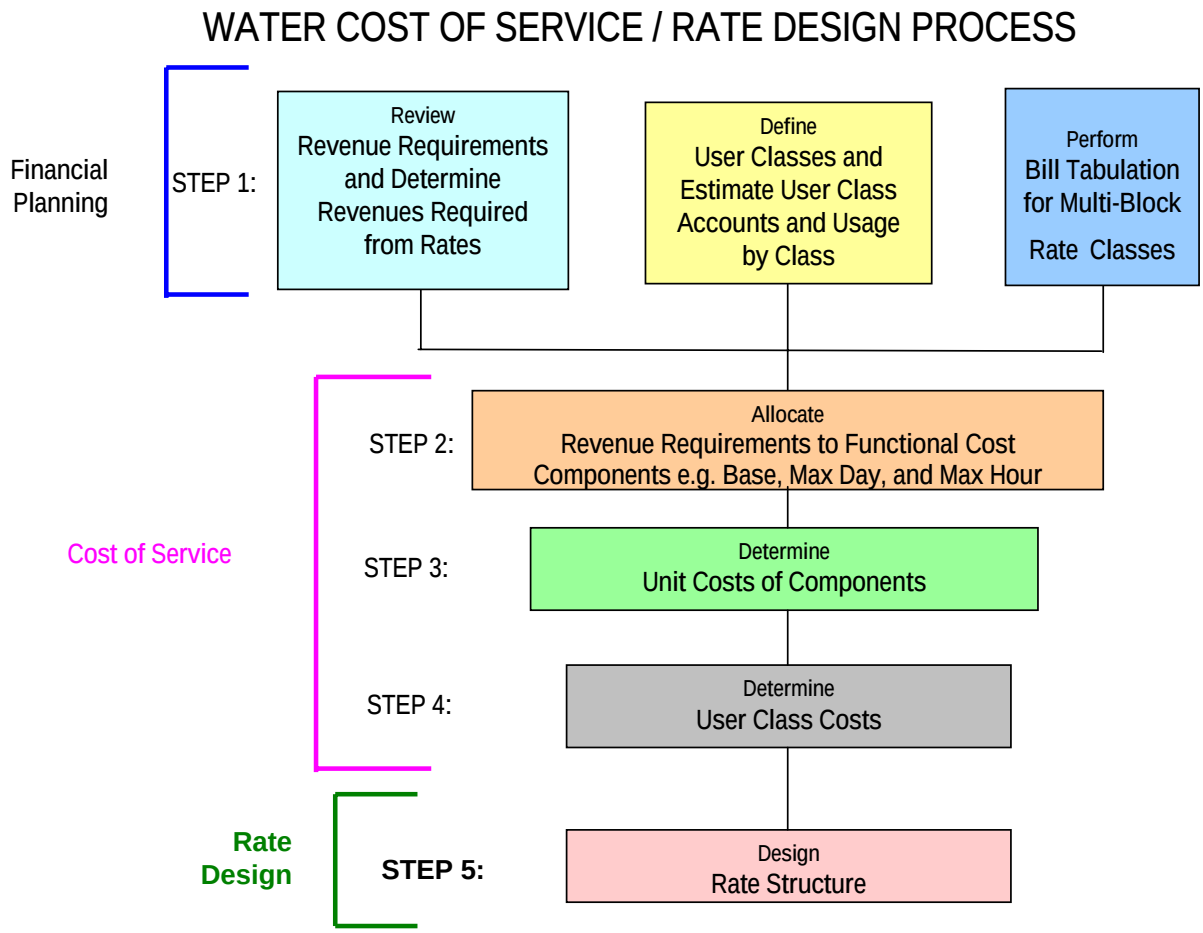
Some of these objectives are interrelated. This being the case, judgment plays a role in the final design of rate structures and rates.

2.3 SCOPE OF THE STUDY

The scope of this Study results in the development of cost based water user rates and capacity fees through a comprehensive cost of service and rate design study process. The comprehensive cost of service (COS) and rate design effort make up the first three major processes and the capacity fee development makes up the fourth. Figure 2-1 provides a graphical representation of the various steps involved in the comprehensive cost of service and rate design process. The four major processes are as follows:

- Financial Planning: User and usage data from the most recent fiscal year is compiled. The single family residential usage in the different rate tiers is analyzed to determine revenues that will be collected from this class. Operating and capital costs are compiled and revenue requirements are projected for a four-year period from FY 2008 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.
- Cost of Service Analysis: Cost of Service Analysis involves identifying and apportioning annual revenue requirements to the different user classes proportionate to their demand on the water system.
- Rate Design: Rate Design involves the development of a fixed and variable schedule of rates for each of the different user classes to proportionately recover the costs attributable to them. This is also where other policy objectives can be achieved, such as discouraging wasteful water use.
- Capacity Fee Development: The capacity fee development component includes the determination of water infrastructure capacity, the associated costs required to accommodate new growth, and the design of one-time capacity fees for new users.

Figure 2-1 – Cost of Service / Rate Design Process



2.4 ASSUMPTIONS USED IN THE STUDY

The following assumptions are used in the study:

1. Annual O&M and capital expenditures, 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. The RFC rate model assumes that the unit price of purchased water will remain the same throughout the forecast period, based on the assumption that any CWA price increases will be passed through to customers as they occur, consistent with applicable provisions of the Municipal Code.
2. Annual water system accounts and volume data used in the Study are based on data from the *Customer Information System* provided by the City.
3. Hydraulic capacity ratios are based on rated capacity of meters as indicated in *AWWA M6 Water Meters - Selection, Installation, Testing and Maintenance.*

This Study report includes six sections in addition to the Executive Summary and the Introduction. A brief description of each section follows.

Section 3 describes the water system and 2007 rates for the various types of customers. In addition a description of contractual agreements between the City and various wholesale water providers is included.

Section 4 describes the existing and suggested user classifications.

Section 5 includes a discussion on water system revenues and expenditures, capital program financing including debt service, required annual revenue adjustments and the determination of annual revenues required from user rates.

Section 6 includes a detailed discussion on the Cost of Service. This includes allocation of costs to water parameters and the determination of unit costs.

Section 7 presents a discussion on alternative rate structures. This section also includes a detailed discussion on the merits of alternative rate structures and the expected impact on the different user classes.

Section 8 describes the methodology used in determining capacity fees for a single family residence.

SECTION 3: WATER SYSTEM

This section of the report presents a brief overview of the system, the relationship between the City and its wholesale customers that receive service from the City, and 2007 retail rates.

3.1 WATER SYSTEM

This is a brief description of the City's water system and the relationship between the City and wholesale customers that receive service from the City.

3.1.1 Water System Infrastructure

The City-owned water system provides water storage, potable, raw, and recycled water to approximately 270,000 retail and several wholesale customers at the start of FY 2007. Potable water is currently supplied by three water treatment plants with a combined rated capacity of 294 MGD. Supplemental treated supplies from CWA are used to meet peak demands in excess of this capacity. Upgrades to all three plants will increase future rated capacity to 455 MGD, thereby reducing the need for purchased treated water and providing capacity for customer growth.

In addition to the treatment plants, the water system also includes nine raw water storage facilities, 29 treated water storage facilities and more than 3,460 miles of transmission and distribution lines. A brief description of some of the major facilities is provided below.

Alvarado Water Treatment Plant (AWTP): The AWTP was originally constructed in 1951 with a capacity of 66 MGD. In the mid-1970's, it was expanded to 120 MGD and is currently undergoing further expansion. The AWTP is located next to Murray Reservoir near Interstate 8 and serves the general area from National City to the San Diego River. The Capital Improvement Program includes another upgrade to 200 MGD by 2011.

Miramar Water Treatment Plant (MWTP): The MWTP was originally constructed in 1962 with a rated capacity of 140 MGD. MWTP is located next to Miramar Reservoir off Interstate 15 and is still rated at 140 MGD. The MWTP serves the general area north of the San Diego River. The Capital Improvement Program includes an upgrade to the plant that will increase its rated capacity to 215 MGD by 2008.

Otay Water Treatment Plant (OWTP): The OWTP was originally constructed in 1940 and is currently rated at 34 MGD. The OWTP serves the general area along the Mexico border and portions of south central San Diego. The Capital Improvement Program includes an upgrade to the plant that will increase its rated capacity to 40 MGD by 2011.

Raw Water Reservoirs: The City averages less than 10 inches of rainfall per year. This limited precipitation recharges the local reservoirs. The Water Department maintains and operates nine local raw water reservoirs with a combined accessible capacity of 382,400 acre-feet (AF). Lower Otay, Barrett, and Morena Reservoirs (137,700 AF) service the OWTP. El Capitan, San Vincent, Sutherland and Lake Murray Reservoirs (237,500 AF) service the AWTP, and Miramar Reservoir (7,200 AF) services the MWTP. The ninth reservoir, Lake Hodges (33,600 AF), is not connected to the City's water treatment facilities. These facilities maintain minimum storage levels sufficient for approximately 7 months demand at restricted usage levels. The City purchased approximately 200,000 AF during 2006, of which approximately 12 percent was

treated. As populations increase water purchases from CWA will increase and the City will be able to utilize increased treatment capacity to minimize potable water purchases.

Water Delivery: The system contains over 3,400 miles of pipelines ranging in size from 4 inches in diameter to pipes big enough for most professional basketball players to walk in (84”). The system utilizes 45 pump stations to maintain pressure in 90 different pressure zones to provide service to the City’s customers.

3.2 RATE STRUCTURE

The City’s water rate structure for all retail user classes includes a fixed service charge and a commodity rate. While the service charge is charged to each water meter and varies with meter size, the commodity rate is applied to a customer’s water usage. The City’s FY 2007 rates for the various user classes are shown in Table 3-1.

3.2.1 Service Charges

The FY 2007 service charges are shown in Table 3-1 below. The typical SFR user has a 5/8 inch or 3/4 inch meter and pays $15.87 per month. Customers with larger demands need larger meters. Larger meters are more expensive to maintain and replace, so under AWWA methodology larger meters are charged higher monthly service charges. The City’s current service schedule shows larger meters being charged significantly more than smaller meters when compared to the AWWA methodology as determined by the ratios of the meter capacities. For example, an eight inch meter has a capacity of 1,600 gpm compared to 30 gpm for a 3/4-inch meter. The ratio of the capacities is 53.3. The ratio of the charges is 131.1 which is significantly higher than the 53.3 hydraulic capacity ratio. Refer to Appendix A for further explanation of meter capacities.

Table 3-1 - Summary of 2007 Rates

Service Charge

Meter Size	2007 Existing
inch	$/month
5/8	15.87
3/4	15.87
1	17.11
1 1/2	75.41
2	116.24
3	414.73
4	692.00
6	1,542.72
8	2,081.78
10	2,793.63
12	3,892.44
16	6,514.14

Commodity Rate

Customer Class	Volume Block	2007 Existing
	HCF	$/HCF
Single Family Residential		
Block 1	0 - 7	1.731
Block 2	8 - 14	2.163
Block 3	Over 14	2.372
Other Domestics	All Volume	2.003
Commercial	All Volume	2.003
Industrial	All Volume	2.003
Temp. Constr.	All Volume	2.003
Irrigation	All Volume	2.003

3.2.2 Commodity Rates

The City currently has separate commodity rates for Single Family Residential (SFR) customers. The remaining retail customers (Other Domestic, Commercial, Industrial, Temporary Construction, and Irrigation) are billed under the same uniform commodity rate.

SFR customers are billed on a three-block increasing rate structure. SFR customers using 7 hundred cubic feet (HCF) or less per month are billed 1.731 per HCF. SFR customers using up to 14 HCF per month are billed $1.731 per HCF for the first 7 HCF and $2.163 for each HCF up to 14. For SFR customers using more than 14 HCF per month, all usage over 14 is billed at $2.372 per HCF. The rate for each unit of consumption within each block increases as customers move from block 1 through to block 3; hence the name three-block increasing rate structure.

All other retail customers are charged a uniform rate of $2.003 per HCF for all consumption. Since customers are so diverse, it is difficult to design multi-block rates that will equitably accommodate large and small customers so it is common in the industry to use a uniform rate. Despite the fact that these customers are billed at the same rate, we have tracked their costs separately by defining them as separate customer classes as explained in the next section.

SECTION 4: USER CLASSIFICATION

One of the major tasks in the cost of service and rate design process is the classification of the users of the water system and the determination of annual demand and peaking factors associated with each class. The classification of the City's users is discussed in this section of the report.

4.1 WATER USER CLASSIFICATION

Since the focus of this Study is the City's retail users, discussions on water user classification relates exclusively to the users within the City's service area. A review of the City's existing user classifications and alternative user classes is presented in the following subsections.

4.1.1 Existing City User Classifications

The City currently serves a population of nearly 1.3 million within the City's service area. In an ideal scenario, a utility with unlimited resources and perfect information could calculate and implement unique rates for every customer based on each customer's individual usage patterns and their unique costs. However, since in the real world it is costly and time prohibitive to separately track each customer's demands and costs, utilities group customers with similar characteristics into categories or user classifications so rates can be effectively calculated and implemented to recover utility costs in an equitable manner. The breakdown of the City's water user classes and the number of meters associated with each class at the start of FY 2007 are as follows:

User Class Description	Number of Meters
Single Family Domestic (SFR)	217,625
Other Domestic (MFR)	29,329
Commercial	15,273
Industrial	243
Temporary Construction	777
Irrigation	7,421
Total	270,678

These are the classes that can be identified and isolated with the existing data in the City's billing system. The percentage distribution of the accounts is shown in Figure 4-1. Residential accounts (SFR and MFR) comprise over 91 percent of the total water user accounts serviced, and represent 56 percent of the water usage as shown in Figure 4-2. Note that some of the Single Family, Multi-Family, Commercial, and Industrial accounts have been classified as Irrigation as discussed below.

Residential Classification: The City's residential users are classified into SFR and Other Domestic classes. SFR refers to individual dwelling units served by a separate meter, whereas Other Domestic encompasses multi-family dwellings such as apartment or condominium complexes, in which two or more dwelling units share the same meter. These residential classes

are assumed to be homogenous in water usage and therefore are assigned the same peaking factors. However, usage and peaking will vary among the individual customers.

Figure 4-1 – Projected Distribution of Water User Accounts

(Fiscal Year 2007)

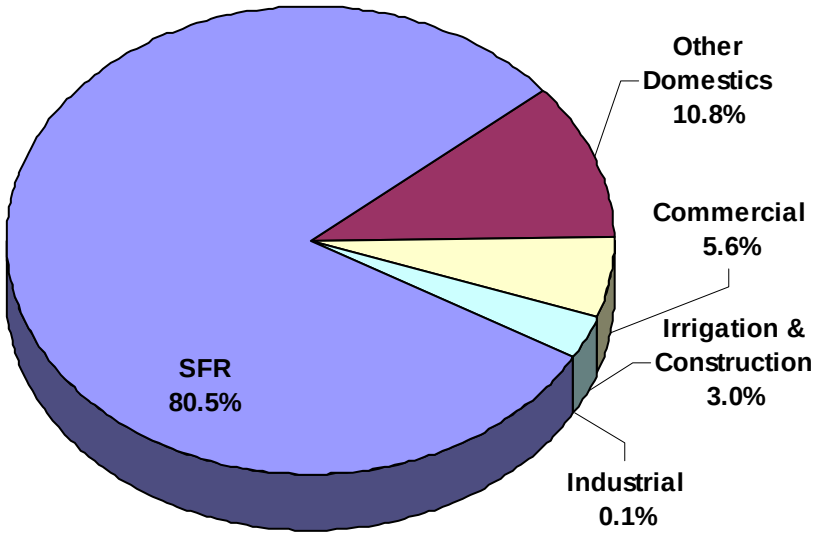
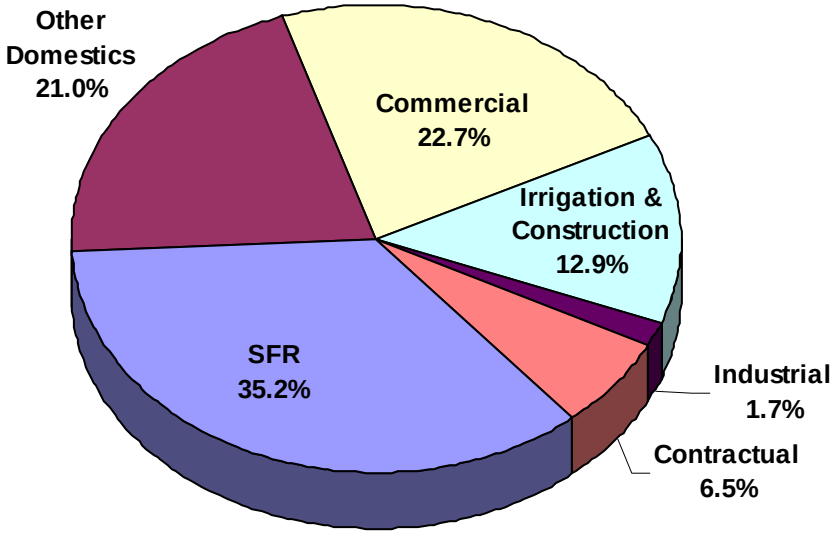


Figure 4-2 – Projected Distribution of Water Usage

(Fiscal Year 2007)



Commercial/Industrial Classification: Commercial and Industrial user classes are comprised of a diverse group of customers. The commercial and industrial user classes are essentially

"catch-all" categories. All customers that haven't been otherwise classified are put into these categories. These customers are treated equivalently in cost calculations and are assigned the same peaking factors. These customers also typically have lower peaking factors than residential customers.

Irrigation: The City does not currently recognize "Irrigation" as a user class. However, there is sufficient data to separate these users into such a class. For purposes of Study analysis, such a class was created by separating the SFR, Other Domestic, Commercial, and Industrial accounts that are used solely for irrigation into a new class. Throughout the Study we have assumed that these Irrigation accounts are a separate user class for cost allocation and recovery purposes.

Temporary Construction: Temporary construction refers to meters that are placed on fire hydrants during construction in order to provide water to the construction site until a permanent metered service is installed. However, since the data is available, we have tracked these users as a separate class. Costs for these customers are usually higher than the average customer because administering a transient meter is more difficult than a fixed meter that is read by the same meter reader in the same place just as mass production is cheaper than unique production.

Irrigation & Construction users typically have high peak demands. This means that relatively large amounts of water are used in short periods of time when compared to average usage. Peak usage is more costly to deliver than constant usage because it requires more pumping and larger capacity facilities to produce and deliver the water demanded in a short time span.

4.1.2 Optional User Classifications

Based on peaking characteristics of different customer classes RFC recommends that customers be classified as the follows:

- Single Family Residential
- Multi-family Residential or Other Domestic
- Commercial and Industrial
- Irrigation and Construction

The justification for creating new user classes is to track costs and design separate rates for these customers as a means of increasing equity among ratepayers. The City currently has the data available to create new user classes and establish associated rates. The City currently has classified customers as SFR, Other Domestic, Commercial, Industrial, Temporary Construction, Irrigation, Agricultural and Wholesale user classes. Since all customers except SFR pay the same rate, they are essentially being treated as one user class, which could be referred to for discussion purposes as General Service. Agricultural and Wholesale user rates are established contractually so they are outside the scope of this rate study.

Residential customers, including SFR and Other Domestic are estimated to have similar peaking characteristics. However, since only SFR rates are tiered, they are separated into SFR and Other Domestic classes. Commercial and Industrial customers are estimated to have similar peaking characteristics and can be included into another class because they have lower peaking characteristics than residential customers. Temporary Construction demand characteristics are similar to those of Irrigation; both customers have higher peak demands than the other classes, therefore it is reasonable to consider creating a separate user class for them. This class is referred to as Irrigation & Construction.

Customers other than SFR vary considerably in size which makes it impractical and potentially inequitable to place them on a fixed multi-block rate structure. If such a multi-block rate structure is used, small customers would likely remain in the bottom block paying at the lowest rate, while large customers that may use water more consistently (and therefore cost less to serve than customers having higher peaking factors) would pay for the bulk of their water at the higher rates. Therefore tiered rates are not generally developed for these customers.

To maintain fairness and equitability, rates should be higher for customers with higher peak usage. This is the justification for a separate rate. For example, if Irrigation & Construction customers are charged a rate commensurate with the higher cost of providing them with service, doing so would reduce the burden on other customers and avoid potential cross-class subsidization.

Conservation inducement is the ultimate reason for creating an Irrigation user class. Non-agricultural irrigation is frequently discretionary in nature. This means that, in a time of shortage, irrigation is essentially a luxury. It is useful to track discretionary use separately in case mandatory reduction is needed, for example, in the case of a drought. Reduction in discretionary usage results in fewer detrimental effects than reduction in other types of usage. Therefore, if, during a drought, irrigation customers are identified separately, they can be targeted for conservation through conservation rates or programs. This can help reduce the need to cut back on other types of usage that can more severely impact the local constituents and economy.

SECTION 5: REVENUE REQUIREMENTS

A review of a utility's revenue requirements is a key first step in the rate design process. The review involves an analysis of annual operating revenues under 2007 rates, capacity fee revenues, operation and maintenance (O&M) expenses, capital expenditures, transfers between funds, and 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 water enterprise. The water system revenues and expenditures are discussed from a City perspective and the discussion on required revenue adjustments relates exclusively to the City's users.

5.1 SYSTEM REVENUES

The City's Water Department operates the water system. The City derives its required annual operating and capital revenues from a number of sources. The principal sources of operating revenues from rates are the water service charges from the City's users which are expected to grow from $279 million in FY 2007 to $370 million by FY 2011. These revenue estimates include 6.5 percent annual rate increases in FY 2008 through FY 2011, but do not include pass through rate revenues. Other revenue sources include miscellaneous operating revenues such as reclaimed water sales, service charges, and other non-operating revenues including revenue transfers from the rate stabilization fund. Capital revenue sources include water connection fees, capacity fees, capital funds, bond proceeds, grants and loans, and interest earnings.

Reclaimed water revenues are expected to increase from $4 to $9.5 million over the study period due to new customers and increased demand from existing customers. Reclaimed revenues will continue to supplant revenues from potable water service charges as existing customers convert from potable to reclaimed water supplies. Revenues will also be lost as customers convert to reclaimed water since reclaimed water is priced below potable water. Reduced water purchases will further offset the revenue losses of conversion to reclaimed.

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. The table however does not reflect other available sources of funds such as bond proceeds and capital grant funds. Capacity revenues are based on proposed capacity fees. The comprehensive operating and capital flow of funds statements presented at the end of this section includes all these other revenues.

Table 5 - 1 Summary of Water Revenue

Line No.	Description	Estimated 2007 $	Projected 2008 $	2009 $	2010 $	2011 $
	Revenue from Rates					
1	Revenue Under Existing Rates	278,601,800	280,955,700	282,626,200	284,666,200	287,281,900
2	Revenue from Rate Increases	-	18,262,100	37,935,500	59,196,200	82,296,500
3	Total Revenue from Rates	278,601,800	299,217,800	320,561,700	343,862,400	369,578,400
	Other Operating Revenues					
4	Reclaimed Revenue	4,012,000	7,013,382	7,832,539	8,304,302	9,472,200
5	Fire Service and Auto. Sprinkler Svc.	1,493,333	1,498,111	1,503,815	1,498,420	1,500,115
6	Backflow Charges	482,333	470,111	470,148	474,198	471,486
7	Service Charge	1,375,000	1,401,125	1,427,746	1,454,874	1,482,516
8	Subtotal Other Operating Revenues	7,362,700	10,382,700	11,234,200	11,731,800	12,926,300
	Miscellaneous Revenues					
9	Land and Building Rentals	4,252,000	4,332,788	4,415,111	4,498,998	4,584,479
10	New Water Services	2,402,000	2,447,638	2,494,143	2,541,532	2,589,821
11	Services Rendered to Others	10,762,382	10,966,867	11,175,238	11,387,567	11,603,931
12	Other Revenue	393,813	401,295	408,920	416,690	424,607
13	Lakes Recreation	1,340,611	31,300	31,895	32,501	33,118
14	Subtotal Miscellaneous Revenues	19,150,806	18,179,900	18,525,300	18,877,300	19,236,000
15	**Other Income**					
16	Damages Recovered	290,200	295,714	301,332	307,058	312,892
17	Sale of Land	3,213,413	115,000	115,000	115,000	115,000
18	Subtotal Other Income	3,503,613	410,714	416,332	422,058	427,892
19	**Interest Income**	8,744,400	21,201,700	13,548,700	22,393,200	15,716,000
	Capacity Charge Revenue					
21	Capacity Charges	12,457,000	14,291,979	14,452,666	14,575,633	14,406,520
22	**Total Revenues**	329,820,319	363,684,792	378,738,898	411,862,391	432,291,111

5.2 SYSTEM EXPENDITURES

For sound financial operation of the City's water system, the revenues generated must be sufficient to meet the revenue requirements or cash obligations of the system. Revenue requirements include water purchase costs, O&M expenses, capital improvement program (CIP) expenditures, principal and interest payments on existing debt, and other obligations.

For the purposes of this study we have divided capital projects into two distinct categories: Replacement and Expansion. Replacement capital projects are projects that will improve or replace existing facilities that serve existing customers. Expansion capital projects are projects that will increase the capacity or ability of the system to provide service to new customers. Projects are categorized in this manner because capacity charge revenues are reserved for expansion related costs and therefore cannot be used for Replacement projects. This type of accounting ensures compliance with California Government Code Sections 66000 et seq., commonly referred to as “AB 1600.” Section 8 explains this in more detail.

5.2.1 Operation and Maintenance Expenses

O&M expenditures include the cost of operating and maintaining water supply, treatment, storage, and distribution facilities. O&M expenses also include the costs of providing technical

services such as laboratory services and other administrative costs of the water system such as meter reading and billings. These costs are a normal obligation of the system, and are met from operating revenues as they are incurred. The comprehensive forecasted annual O&M expenditures for the study are based upon the City's budgeted FY 2007 expenditures, adjusted for changes since the budget was developed and 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, except for Salaries and Wages. Salaries and Wages are increased by 4% in FY08 but are not increased thereafter. Projected O&M expenditures for the study period are detailed in Table 5 -2.

Table 5 - 2 Summary of Operating Costs

Line No.	Description	Budget Year 2007	Projected 2008	2009	2010	2011
		$	$	$	$	$
1	Water Purchase Costs	125,340,073	120,025,426	121,027,939	122,276,807	123,612,021
2	Administration	16,040,642	17,638,691	18,245,734	19,531,784	20,216,367
3	Customer Support	32,627,635	35,878,164	37,112,926	39,728,828	41,121,312
4	Water Operations	73,207,771	88,063,275	90,476,588	100,489,521	103,370,233
5	Engineering And CIP Management	8,863,795	9,746,851	10,082,293	10,792,943	11,171,232
6	Water Policy And Strategic Planning	6,952,380	7,645,011	7,908,118	8,465,521	8,762,235
7	**Total O&M**	**263,032,296**	**278,997,419**	**284,853,598**	**301,285,404**	**308,253,399**

Water Purchases are tracked separately and vary from $120 million to $124 million in 2008 through 2011. Inventories are assumed to remain at current levels in the same period which allows for simplified forecasting. Water purchase costs are forecast to increase at an average of 0.9 percent over the study period compared to an anticipated 4 percent average increase in other operating costs. This can be attributed to the fact that conservation efforts and the reclaimed water program will partially offset the demand for additional potable water supplies. The unit price of purchased water is assumed to remain the same throughout the forecast period, reflecting the CWA price increases which go into effect in January, 2007. It is assumed that future CWA price increases will be passed through to customers as they occur, consistent with applicable provisions of the Municipal Code.

The operating financial plan is presented after discussion of the capital financing plan because it has impacts on the revenue requirements from rates.

5.2.2 Water Capital Improvement Program

The City has developed a comprehensive water Capital Improvement Program (CIP) to address current and future water system needs. As Table 5-3 indicates, the total estimated water CIP for the study period of FY 2008 to FY 2011 is $585 million. These projected costs include a four percent annual inflation factor due to anticipated increases in construction costs over time. This inflation rate is a conservative estimate and ensures that the City has adequate resources reserved to complete the necessary projects.

Table 5 – 3: Summary of Projected Capital Improvement Program

Line No.	Description	2008	2009	2010	2011
1	Water Treatment Plants	71,312,495	47,600,699	29,499,980	3,389,671
2	Transmission Pipelines	9,782,916	17,109,888	4,620,633	38,476,636
3	Distribution Lines	31,200,000	43,280,000	45,102,614	46,933,049
4	Pump Stations	7,317,320	4,111,657	525,318	752,652
5	Treated Water Reservoirs	8,842,219	22,890,797	36,739,879	13,913,634
6	Reclaimed Water Facility	8,147,718	5,799,238	637,745	500,000
7	Miscellaneous	6,104,298	2,302,466	1,795,162	1,162,724
8	Contingencies	6,251,250	6,208,946	3,127,047	3,087,750
9	Raw Water Reservoirs	1,748,221	5,081,715	10,060,136	23,641,411
10	Program Management	4,000,000	4,000,000	4,000,000	4,000,000
11	**Total**	**154,706,437**	**158,385,406**	**136,108,514**	**135,857,527**

5.2.3 Major Capital Improvement Financing Plan

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

System Revenues:	**Capital Financing:**
Capacity charges	Bond proceeds
Pay-as-you-go revenues	Grant receipts and Contributions
	Interest earnings

The City has distinguished between repair and replacement and expansion CIP costs to properly apply revenue sources. New customers will benefit from capacity created by expansion projects. These projects will be funded by capacity charges and bond proceeds. Capacity charge revenues will range from $14.3 to $14.4 million over the study period of FY 2008 through FY 2011 at increased capacity fee levels, as detailed in Section 8.

Table 5-4 presents the proposed CIP financing plan to finance major CIP replacement projects over the four-year period from FY 2008 to FY 2011, and Table 5-5 presents the proposed CIP financing plan for major CIP expansion projects.

Table 5 – 4: Replacement Capital Financing Plan

Line No.	Description	Estimated 2007 $	Projected 2008 $	2009 $	2010 $	2011 $
	Sources of Funds					
1	Transfer from Operating Fund	23,202,300	14,971,700	25,550,800	11,011,200	51,431,600
2	Prior Year Encumbrances Cancelled	2,000,000	1,000,000	1,000,000	1,000,000	1,000,000
3	Continuing Appropriations	60,451,376	59,001,900	66,734,500	50,768,300	43,870,100
4	Proposed Revenue Bond	-	-	-	-	-
5	Proposed Revenue Bond to Replacement		187,712,053	-	193,390,120	-
6	Short Term Financing	30,795,171				
7	SRF Loan Receipts					
8	Grants Receipts	2,456,000	1,000,000	550,000	-	-
9	Grants Receivable/Reimbursable	(272,000)	(1,050,000)	(550,000)	-	(5)
10	Contribution in Aid	75,000	-	-	-	-
11	Total Sources of Funds	118,707,847	262,635,653	93,285,300	256,169,620	96,301,695
	Uses of Funds					
12	CIP - Repair & Replacement	33,435,999	74,924,275	104,395,921	105,732,873	96,332,728
13	Capital Improvement Encumbrances	50,661,557	58,394,148	42,427,952	35,529,719	59,436,096
14	Continuing Appropriations	8,340,381	8,340,381	8,340,381	8,340,381	8,340,381
15	Subtotal CIP	92,437,937	141,658,804	155,164,254	149,602,973	164,109,205
16	Short Term Financing Repayment		31,395,676			
17	Bond Proceed Deductions	-	27,209,151	-	39,290,801	-
18	Total Uses of Funds	92,437,937	200,263,631	155,164,254	188,893,773	164,109,205
	Fund Balance					
19	Net Annual Cash Balance	26,269,909	62,372,022	(61,878,954)	67,275,847	(67,807,510)
20	Beginning Fund Balance	(26,204,800)	65,109	62,437,131	558,177	67,834,024
21	Cumulative Fund Balance	65,109	62,437,131	558,177	67,834,024	26,514

Table 5 – 5: Expansion Capital Financing Plan

Line No.	Description	Estimated 2007 $	Projected 2008 $	2009 $	2010 $	2011 $
	Sources of Funds					
1	Capacity Charges	12,457,000	14,291,979	14,452,666	14,575,633	14,406,520
2	Proposed Revenue Bond		147,012,947	-	66,764,880	-
3	Short Term Financing	26,204,829				
4	SRF Loan Receipts	-	-	-	-	-
5	Grants/Contributions	1,887,000	-	-	-	-
6	Loan from Operating Fund	0	0	30,000,000	0	60,100,000
7	Interest Income	617800	7094500	836600	4746500	756500
8	Total Sources of Funds	41,166,629	168,399,426	45,289,266	86,087,013	75,263,020
	Uses of Funds					
9	CIP - Expansion	28,452,015	79,782,162	53,989,485	30,375,641	39,524,799
10	Subtotal CIP	28,452,015	79,782,162	53,989,485	30,375,641	39,524,799
11	Short Term Financing Repayment		26,715,824			
12	Bond Proceed Deductions	-	21,309,753	-	13,564,527	-
13	Debt Service Payment	17,844,082	23,506,831	28,510,028	36,158,955	41,959,785
14	Total Uses of Funds	46,296,097	151,314,570	82,499,513	80,099,123	81,484,585
	Fund Balance					
15	Net Annual Cash Balance	(5,129,468)	17,084,856	(37,210,247)	5,987,890	(6,221,565)
16	Beginning Fund Balance	26,204,829	21,075,362	38,160,218	949,971	6,937,861
17	Cumulative Fund Balance	21,075,362	38,160,218	949,971	6,937,861	716,295

5.2.4 Debt Service Requirements

Debt service requirements consist of principal and interest payments on existing debt. The City currently has debt service obligations associated with the outstanding 1998 Certificates of Undivided Interest, and 2002 Subordinated Water Revenue Bonds. Existing and anticipated debt service, including interim financing requirements, results in annual payments in the range of $53 to $81 million.

5.2.5 Debt Service Coverage

The City must meet debt service coverage requirements on its outstanding bond issues. Coverage requirements typically vary between 1.0 and 1.60 or higher. The 1998 Certificates of Undivided Interest, which are parity obligations, stipulate that the City's Adjusted Net System Revenues shall amount to at least 1.20 times the Annual Debt Service on all Parity Obligations Outstanding. The System Revenues include funds derived from the ownership and operation of the system including water service charges from the City's users, reclaimed revenue, service charges, capacity charges, revenues received from contracts, and transfers from the Rate Stabilization Fund or Secondary Purchase Fund to pay for O&M of the Water System. Annual Debt Service includes annual principal and interest payments on outstanding bonds.

5.2.6 Reserves

The City requires adequate cash reserves to meet operating, capital, and debt service requirements. Debt service reserves or restricted reserves provide protection from defaulting on annual debt service payments in times of financial difficulty. One year of debt service payments is required in reserve, so each time the City issues new bonds, additional proceeds are added to the restricted reserve. The current reserve is $40.7 million and will be increased in FY 2008 and FY 2010 by $23.5 million and $18.7 million, respectively, in order to maintain adequate reserves.

Operating reserves may be used to meet ongoing cash flow requirements as well as emergency requirements. Typically, a balance in the range of 10 to 50 percent of annual operating expenses is considered appropriate. This represents one to six months of working capital. The City currently maintains a minimum 45-day operating reserve, but has recently decided to move toward a minimum 70-day operating reserve. The minimum operating reserves are shown in Table 5-6. Interest from reserve funds may be used to finance operations.

The City also has other reserves. The Secondary Purchase Reserve is similar in function to the operating reserve. The Secondary Purchase Reserve is a reserve for water purchases. It is set at 6 percent of total water purchases in order to ensure that enough revenue is on hand to purchase water if local supplies are deficient. Finally, the Rate Stabilization Fund is essentially a reserve in that it can be used to supplement operations revenues and maintain the debt coverage in times of need.

5.3 PROPOSED REVENUE ADJUSTMENTS

The pro forma operations statement or cash flow summary presented in Table 5-6 provides a basis for evaluating the timing and level of water revenue increases required to meet the projected revenue requirements for the study period. In order to meet projected revenue requirements and to maintain desired operating and debt reserve fund balances, the following revenue adjustments are recommended:

Effective Date	Increases
July 1, 2008	6.5 percent
July 1, 2009	6.5 percent
July 1, 2010	6.5 percent
July 1, 2011	6.5 percent

Table 5 – 6: Operating Financing Plan

Line No.	Description			Estimated 2007 $	Projected 2008 $	2009 $	2010 $	2011 $
	Revenue							
1	Revenue Under Existing Rates			278,601,800	280,955,700	282,626,200	284,666,200	287,281,900
	Additional Revenue Required:							
	Year	Percent	Months Effective					
2	2007	0.0%	12	0	0	0	0	0
3	2008	6.5%	12		18,262,100	18,370,700	18,503,300	18,673,300
4	2009	6.5%	12			19,564,800	19,706,000	19,887,100
5	2010	6.5%	12				20,986,900	21,179,700
6	2011	6.5%	12					22,556,400
8	Total Revenue From Rates			278,601,800	299,217,800	320,561,700	343,862,400	369,578,400
9	Reclaimed Revenue			4,012,000	7,013,382	7,832,539	8,304,302	9,472,200
10	Fire Service and Auto. Sprinkler Svc.			1,493,333	1,498,111	1,503,815	1,498,420	1,500,115
11	Backflow Charges			482,333	470,111	470,148	474,198	471,486
12	Service Charge			1,375,000	1,401,100	1,427,700	1,454,900	1,482,500
	Non-Operating Revenue							
13	Miscellaneous Revenue			19,150,806	18,179,900	18,525,300	18,877,300	19,236,000
14	Other Income			3,503,613	410,714	416,332	422,058	427,892
15	Rate Stabilization Fund Transfer			0	0	0	0	0
16	Transfer from Expansion Fund			17,844,082	23,506,831	28,510,028	36,158,955	41,959,785
17	Interest Earnings			8,126,500	14,107,300	12,712,100	17,646,600	14,959,500
18	**Total Revenue**			**334,589,468**	**365,805,249**	**391,959,662**	**428,699,131**	**459,087,878**
	Revenue Requirements							
19	Net Water Purchases			125,340,073	120,025,426	121,027,939	122,276,807	123,612,021
20	O&M Expense			137,692,223	158,971,992	163,825,659	179,008,596	184,641,378
21	Total O&M Expense			263,032,296	278,997,419	284,853,598	301,285,404	308,253,399
	Debt Service							
22	Bond Debt Service			41,247,300	51,445,500	60,401,500	71,499,400	79,301,300
23	SRF Loans			1,376,000	1,376,000	1,376,000	1,376,000	1,376,000
25	Total Debt Service			42,623,300	52,821,500	61,777,500	72,875,400	80,677,300
	Transfers to Other Funds							
26	Transfer to Capital Replacement Fund			23202300	14971700	25550800	11011200	51431600
27	Loan to Capital Expansion Fund					30,000,000		60,100,000
28	Transfer to Rate Stabilization Fund			0	0	0	0	0
29	Secondary Purchase Reserve Transfer			917,500	(318,900)	60,200	74,900	80,100
30	Total Transfers			24,119,800	14,652,800	55,611,000	11,086,100	111,611,700
31	**Total Revenue Requirements**			**329,775,396**	**346,471,719**	**402,242,098**	**385,246,904**	**500,542,399**
	Operating Fund Balance							
32	Net Annual Cash Balance			4,814,072	19,333,530	(10,282,435)	43,452,228	(41,454,521)
33	Beginning Fund Balance			18,049,800	22,863,872	42,197,402	31,914,967	75,367,195
34	Fund Balance			22,863,872	42,197,402	31,914,967	75,367,195	33,912,673
35	Minimum Required Balance			22,634,300	26,132,400	26,930,200	29,426,100	35,410,700
36	Debt Service Coverage on Parity Basis			1.61	1.43	1.53	1.41	1.55
37	Required Debt Service Coverage			1.20	1.20	1.20	1.20	1.20

SECTION 6: COST OF SERVICE

The City's user classifications as described 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 parameters, the determination of unit rates, and the estimation of user class cost responsibility.

6.1 COST OF SERVICE ANALYSIS

The total revenue requirements net of revenue credits from miscellaneous sources, is by definition, the cost of providing service as shown in Table 6-1. This cost is then used as the basis to develop unit rates for the water parameters and to allocate costs to the various user classes in proportion to the water services rendered. The concept of proportionate allocation to user classes implies that allocations should take into consideration not only the average quantity of water used but also the peak rate at which it is consumed. There are costs associated with design and construction of facilities used to meet peak demands, and these need to be allocated appropriately so that users with higher peaks pay proportionately more to offset their cost. In this Study, water rates were calculated for FY 2008, and accordingly FY 2008 is defined as the Test Year. Test Year revenue requirements are used in the cost allocation process.

6.1.1 Cost of Service to be Allocated

The annual revenue requirements or costs of service to be recovered from commodity charges include operation and maintenance (O&M) expenses, costs associated with annual renewal and replacements, and other capital related costs. O&M expenses include costs directly related to the supply, treatment, and distribution of water as well as routine maintenance of system facilities. This maintenance is often referred to as Routine Capital and represents the annual recurring capital outlay for minor system improvements and purchase of equipment.

The total FY 2008 cost of service to be recovered from the City's retail users, shown in Table 6-1 on line 15, is estimated at just over $287.4 million, of which approximately $219.8 million is operating costs and the remaining $67.6 million is capital costs, which consists of debt service and pay-go capital costs. The cost of service analysis is based upon the premise of generating annual revenues adequate to meet the estimated annual revenue requirements. As part of the cost of service analysis, revenues from customers with contractually based rates such as Cal-Am and agricultural users are deducted from the appropriate cost elements. Adjustments are also made to account for cash balances and mid-year rate increases to ensure adequate collection of revenue as shown in the operating cash flow (Table 5-6). Since the FY 2008 rate increase is scheduled for the start of the fiscal year the "Adjustment to Annualize Rate Increase" is set to zero.

To allocate the cost of service among the different user classes in proportion to their usage and peaking demands, costs first need to be allocated to selected water parameters. The following section describes the allocation of the operating and capital costs of service to the selected parameters of the water system.

Table 6-1: Cost to be Recovered from User Rates

Line No.		Operating Expense $	Capital Cost $	Total $
	Revenue Requirements			
1	O&M Expense (1)	278,997,419		278,997,419
2	Debt Service Requirements		52,821,500	52,821,500
3	Capital Transfer		14,971,700	14,971,700
4	Operating Transfer	(318,900)		(318,900)
5	Subtotal	278,678,519	67,793,200	346,471,719
	Less Revenue Requirements Met from Other Sources			
6	Cal-Am Revenue by Contract	11,304,800	191,200	11,496,000
7	Agricultural Revenue by Contract	269,400	5,900	275,300
8	Miscellaneous Charges (2)	28,973,343		28,973,343
9	Expansion Debt Payment	23,506,831		23,506,831
10	Interest from Operations	14,107,300		14,107,300
11	Subtotal	78,161,674	197,100	78,358,774
	Less Adjustments			
12	Adjustment for Annual Cash Balance	(19,333,530)		(19,333,530)
13	Adjustment to Annualize Rate Increase	0		0
14	Subtotal	(19,333,530)	0	(19,333,530)
15	Cost of Service to be Recovered from Rates	219,850,375	67,596,100	287,446,475

(1) Does not include cost related to potential increased water supply costs.

(2) Misc. Chages is mostly comprised of Land and Building Rentals, New Water Services and Services Rendered to Others

6.1.2 Functional Cost Components

The total cost of water service is analyzed by system function in order to equitably distribute costs of service to the various classes of customers. For this analysis, water utility costs of service are assigned to three basic functional cost components including base costs, extra capacity costs and customer service related costs.

Base costs are those operating and capital costs of the water system associated with serving customers to the extent required for a constant average rate of use. Extra capacity costs represent those operating costs incurred to meet customer peak demands for water in excess of average day usage, plus those capital costs for extra plant and system capacity beyond that required to supply water at the average rate of use. Total extra capacity costs are subdivided into costs associated with maximum day and maximum hour demands.

Customer service costs include customer related, meter, and fire hydrant related costs. Customer costs are uniform for all customers and include such costs as meter reading, billing, collecting, and accounting. Meter service costs include maintenance and capital costs associated with meters and services and fire hydrant related costs. These costs are assigned based on meter size or meter capacity.

The separation of costs of service into these principal components provides the means for further allocation of such costs to the various customer classes on the basis of their respective base, extra capacity and customer requirements for service.

6.1.3 Allocation to Functional Cost Components

The water utility is comprised of various facilities each designed and operated to fulfill a given function. In order to provide adequate service to its customers at all times, the utility must be capable of not only providing the total amount of water used, but also supplying water at peak or maximum rates of demand. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers on the basis of respective responsibilities for each particular type of service.

6.1.4 Determination of Allocation Percentages

Allocation percentages are usually derived from actual historical production as is the case in this Study. RFC performed the following steps to derive the allocation percentages for apportioning the City's O&M and capital costs. Customer service related costs are allocated directly to their cost component so no allocation percentages are necessary. Volume related cost allocation requires some calculation. Table 6-2 will help in understanding the allocation percentage calculations.

The first step is to assign system peaking factors. Base is equal to average daily demand (ADD) and assigned a value of 1.0. The City's maximum day (Max Day) demand is estimated to be 1.5 times the ADD. Max Day is therefore assigned a value of 1.5. The maximum instantaneous usage is approximated by the maximum hourly (Max Hour) usage and is estimated to be 2.5 times the ADD. Max Hour is therefore assigned a value of 2.5. This is based on previous studies and confirmed by City staff. These peaking factors are typical of larger systems.

Allocations are calculated based on these factors. Allocation percentages are calculated by dividing the number of units by the peaking factor for the design basis. Cost categories that are solely Base related, such as source of supply, are allocated 100 percent to Base. Cost categories that are designed to meet Max Day peaks, such as treatment plants, are allocated to Base and Max Day factors. The treatment plant is sized for max day and has to be sized 1.5 times the ADD. Therefore the allocations are as follows:

Base: 66.7%	=	(1.0/1.5) x 100
Max Day: 33.3%	=	(0.5/1.5) x 100

Cost categories such as Distribution that are designed for Max Hour peaks are allocated similarly. The Base allocation percentage is calculated by dividing the Base units of 1.0 by the Max Day peaking factor of 2.5. The Max Day allocation percentage is calculated by dividing the Max Day units (0.5) by the Max Hour factor of 2.5. And the Max Hour allocation percentage is calculated by dividing the Max Hour units by the total peak of 2.5.

Base: 40.0%	=	(1.0/2.5) x 100
Max Day: 20.0%	=	(0.5/2.5) x 100
Max Hour: 40.0%	=	(1.0/2.5) x 100

The results of the allocation are presented in Table 6-2 below.

Table 6-2: Calculation of Allocation Percentages

Capacity	Peaking Factor	Units	Allocation Percentages		
Design Basis:			*Base*	*Max Day*	*Max Hour*
Base	1.0	1.0	100%		
Max Day	1.5	0.5	66.7%	33.3%	
Max Hour	2.5	1.0	40%	20%	40%

These percentages are used to spread the operating and capital improvement costs amongst Base, Max Day, and Max Hour parameters for cost of service calculations.

6.1.5 Operating Expense

Projected net operating expenses for FY 2008 are allocated to cost components on the basis of an allocation of operation and maintenance expense. Operation and maintenance expense for the test year is allocated to cost components in the same manner as plant investment, based on the design criteria of the facilities.

Administration and general expenses are related to total system operations and are allocated in relation to all other operating expenses. The resulting allocation of operation and maintenance expense serves as the basis for allocating the FY 2008 net operating costs to the base, extra capacity and customer costs functions shown in Table 6-3.

6.1.6 Allocation of Plant Investment and Capital Costs

Capital costs include capital improvements financed from annual revenues, debt service and other sources. A reasonable method of assigning capital costs to functional components is to allocate such costs on the basis of net plant investment.

Net plant investment is represented by the total cost of water utility facilities less accumulated depreciation. The estimated fiscal year net plant investment in water facilities consists of net plant in service as of June 30, 2005, and the estimated cost of proposed major capital improvements.

The investment in distribution mains and storage, designed to meet maximum hour demands, is allocated to base, maximum day and maximum hour. The investment in general plant is allocated to each cost component on the basis of all other plant investment. The resulting allocation of net plant investment serves as the basis for allocating the capital costs shown in Table 6-3.

6.1.7 Allocation of Costs to Customer Classes

The total cost responsibility of each customer class may be estimated by the distribution of the functionally allocated total cost of service for the utility among the classes based on the respective service requirements of each class.

The allocation of costs of service into these principal components (Base, Extra Capacity and Customer) provides a means for further allocation of costs to the various customer classes on the basis of their respective service requirements.

6.1.8 Unit Costs of Service

In order to allocate costs of service to the different user classes, unit costs of service need to be developed for each cost category. The unit costs of service are developed by dividing the total annual costs allocated to each parameter by the total annual units of the respective category. Table 6-3 shows the units of service and the development of the FY 2008 unit costs for each of the cost categories.

Different units are used for the different cost categories. The volume related costs categories are based on volumetric units of one hundred cubic feet or HCF (about 748 gallons). The extra capacity categories of Max Day and Max Hour are based on a rate of usage so they are calculated in HCF per day. Customer related cost categories are based on accounts or equivalent meters.

Once the total number of units is known they can be used to calculate unit costs. The allocated costs are simply divided by the total number of units for each category to determine the unit costs of each category as shown in Table 6-3.

Table 6-3: Cost Allocation and Unit Cost Calculation FY 2008

				Extra Capacity		Customer	
Line No.	Description	Total	Base	Max Day	Max Hour	Meters & Services	Billing & Collecting
		$	$	$	$	$	$
1	Adjusted Net Operating	219,850,375	169,045,375	10,166,600	7,989,200	15,331,300	17,317,900
2	Adjusted Capital Costs	67,596,100	29,200,900	3,289,950	4,068,950	31,036,300	-
3	Adjusted Cost of Service $	287,446,475	198,246,275	13,456,550	12,058,150	46,367,600	17,310,900
	Units of Service						
4	Inside City		91,461,178	226,605	368,211	387,101	277,404
5	Outside City		161,000	299	604	161	99
6	Total Units of Service		91,622,178	226,904	368,814	387,262	277,503
	Units of Measure		HCF	HCF/day	HCF/day	Equiv Mtrs	Accounts
	Unit Cost of Service						
7	Operating		1.85	44.81	21.66	39.59	62.41
8	Capital		0.32	14.50	11.03	80.14	0.00
9	Total Unit Cost of Service		2.16	59.30	32.69	119.73	62.41

6.1.9 User Class Costs

The unit cost of each of the cost categories shown in Table 6-3 is then applied to the projected FY 2008 usage and units of each user class to derive user class costs. Table 6-4 shows the FY 2008 user class units and cost responsibility for each user class.

Table 6-4: User Class Water Cost of Service for FY 2008

Line No.	Item	Total	Base	Extra Capacity Max Day	Extra Capacity Max Hour	Customer Meters & Services	Customer Per Customer
		$	$	$	$	$	$
	Inside City						
	SFD						
1	Units		34,479,413	94,464	141,696	235,702	223,276
2	Costs - $	126,994,041	74,604,373	5,602,193	4,632,671	28,221,029	13,933,775
	Other Domestics						
3	Units		20,519,164	56,217	84,325	67,416	30,091
4	Costs - $	60,438,607	44,398,070	3,333,941	2,756,965	8,071,788	1,877,843
	Commercial						
5	Units		22,207,400	30,421	76,053	47,385	15,571
6	Costs - $	58,986,793	48,050,968	1,804,122	2,486,497	5,673,474	971,731
	Industrial						
7	Units		1,613,743	2,211	5,527	1,598	249
8	Costs - $	4,010,384	3,491,715	131,100	180,686	191,324	15,558
	Temp. Constr.						
9	Units		346,667	1,187	1,662	4,659	797
10	Costs - $	1,482,473	750,095	70,408	54,341	557,880	49,749
	Irrigation						
11	Units		12,294,791	42,105	58,948	30,341	7,420
12	Costs - $	35,122,846	26,602,691	2,497,062	1,927,256	3,632,783	463,053
13	**Subtotal Inside City**	**287,035,143**	**197,897,913**	**13,438,827**	**12,038,417**	**46,348,277**	**17,311,709**
14	**Subtotal Outside City**	411,332	348,362	17,723	19,733	19,323	6,191
15	**Total Cost of Service - $**	287,446,475	198,246,275	13,456,550	12,058,150	46,367,600	17,317,900

The SFR user class has the highest assignment of costs at just under $127 million followed by the Other Domestics (MFR) user class at $60.4 million. Together, the City's residential classes (SFR and Other Domestic) are responsible for 65 percent of the total cost of service. The commercial and industrial classes are responsible for 22 percent of the annual cost of service, and the remaining 13 percent is associated with irrigation and construction users.

Table 6-5 presents a comparison of the distribution of projected revenue (FY 2008) and cost among customer classes. As you can see, revenues by class closely match costs by class. Approximately 44 percent of both costs and revenues can be attributed to the SFR customer class. The biggest difference between revenue and cost is in the SFR class where 42.1 percent of revenue and 44.2 percent of costs are contributed by single family users. Table 6-5 indicates that based on COS, 2.16 percent more revenue should be recovered from SFR customers than under

current rates. Less revenue should be recovered from other domestics, commercial and temporary construction customers. However, the differences between revenue and cost are small and suggest that overall costs are being recovered in an equitable manner among customer classes.

Table 6-5: Cost Distribution Among Customer Classes, FY 2008

Line No.	Customer Class	Revenue Distribution Under Existing Rate Structure	Cost Distribution Under Proposed Rates	Difference
1	SFR	42.1%	44.2%	2.16%
2	Other Domestics (MFR)	21.8%	21.1%	-0.76%
3	Commercial	21.6%	20.6%	-1.06%
4	Industrial	1.4%	1.4%	-0.04%
5	Temp. Constr.	0.8%	0.5%	-0.27%
6	Irrigation	12.3%	12.2%	-0.03%
7	Total	100%	100%	0.0%

Once the user class cost responsibility is determined, the next step is to design user rate schedules to recover the revenues required from each user class, which is discussed in the next section. The rate design analysis will illustrate how revenues are collected within each class using the current rate structure and how they compare to costs.

SECTION 7: 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 COS based water rates. Rate design is the process of development of rate schedules for each user class which will recover the annual cost of service determined for each user class from the members of that class in an equitable manner. 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. This section of the report discusses the 2008 water rate structures and a schedule of COS based rates for the City's user classes. It also suggests alternatives for changing the 2008 structure that would improve the equitability of cost recovery by class and customer. Finally, this section analyzes the impact of these alternative cost allocations and rate designs on user classes and customers within user classes.

7.1 RATE STRUCTURE

Rate structures should be designed in such a way as to ensure that users pay only their proportionate share of costs. In addition, rate structures should be easy to understand, simple to administer, and comply with regulatory requirements. A review of the 2007 rate structures provides insights into the equitability of the current methodology and the changes, if any, that should be considered. The 2007 rate structure was discussed in detail in Section 3.

There are no suggested changes to the 2007 rate structuring approach for any of the City's user classes, which incorporates both a fixed charge in the form of a service charge and a variable charge in the form of a commodity rate. In other words, the annual revenues required from each user class presented in Section 6 (Table 6-4) would be recovered through a combination of a fixed monthly service charge and variable commodity rate. The service charge and the suggested commodity rate for the various user classes are discussed in detail below.

7.1.1 Service Charges

A service charge is a cost recovery mechanism that is generally included in the rate structure to recover meter, customer and public fire protection related costs (i.e. costs related to maintaining hydrants), and which provides a stable source of revenue independent of water consumption. Therefore, customer costs related to meter reading, billing, and fire protection are recovered through the service charge. We suggest that the City continue its existing practice of applying consistent monthly service charges to users across all classes.

Customer related costs are fixed expenditures that relate to operational support activities including accounting, water billing, customer service, and administrative and technical support. The customer related costs are essentially common-to-all costs that are independent of user class characteristics. A service charge provides a mechanism for recovering a portion of the fixed costs and ensures a stable source of user revenues for the utility. In addition, there are capacity related costs such as meter maintenance and peaking charges that are included based on the hydraulic capacity of the meters. Since facilities are designed to meet peaking requirements, RFC has assigned a portion of the capital costs related to peaking to the service charge. The City's customer related costs for FY 2008 are estimated at $63.7 million. Table 7-1 presents details of the costs considered for service charge calculations and is duplicative of some of the data contained in Table 6-4.

Table 7-1: Customer Related Costs Used to Determine Service Charges

Line No.	Description	Customer Meters & Services $	Customer Billing & Collecting $
1	Adjusted Net Operating	15,331,300	17,317,900
2	Adjusted Capital Costs	31,036,300	-
3	Adjusted Cost of Service $	46,367,600	17,317,900
	Units of Service		
4	Inside City	387,101	277,404
5	Outside City	161	99
6	Total Units of Service	387,262	277,503
	Units of Measure	Equiv Mtrs	Accounts
	Unit Cost of Service		
7	Operating	39.59	62.41
8	Capital	80.14	0.00
9	Total Unit Cost of Service	119.73	62.41

Once the costs are known, they are divided by the number of units of service associated with those costs to determine annual unit costs. Meters and Services are associated with equivalent meters to reflect the fact that Meters and Service costs are higher for larger meters. Billing and Collecting are associated with accounts because they are similar for all customers. Annual unit costs are shown on line 9 of Table 7-1.

Annual unit costs are divided by 12 to reflect the fact that they are recovered monthly. These monthly costs are shown in Table 7-2 and listed as Meter Unit Cost and Billing Unit Cost. Meter Unit Costs are multiplied by the meter capacity ratio as discussed in Appendix A to calculate the Adjusted Meter Cost. The Adjusted Meter Cost is then added to the Billing Unit Cost to compute the cost based service charge shown in the right hand column of Table 7-2.

Table 7-2: Cost-Based Monthly Service Charges Calculation

Inside City

Meter Size in.	Meter Unit Cost $	Meter Ratio	Adjusted Meter Cost $	Billing Unit Cost $	Calculated Service Charge $
5/8	9.98	1.00	9.98	5.20	15.18
3/4	9.98	1.00	9.98	5.20	15.18
1	9.98	1.70	16.96	5.20	22.17
1 1/2	9.98	3.30	32.93	5.20	38.13
2	9.98	5.30	52.88	5.20	58.09
3	9.98	10.00	99.78	5.20	104.98
4	9.98	16.70	166.63	5.20	171.83
6	9.98	33.30	332.26	5.20	337.46
8	9.98	53.30	531.81	5.20	537.01
10	9.98	76.70	765.29	5.20	770.49
12	9.98	143.30	1,429.80	5.20	1,435.00
16	9.98	250.00	2,494.41	5.20	2,499.62

7.1.2 Commodity Rate

The commodity rate is the rate developed for each user class which will recover the City's variable volume related costs. The annual estimated FY 2008 revenues required, less annual cost based service charge revenues, are the revenues that need to be recovered through a commodity rate.

COS based commodity rates are developed for each user class based on the principle of maintaining inter-class and intra-class revenue neutrality and equity. This means that each user class would only pay its assigned share of costs of service (Refer to Table 7-3 for revenues required from each user class), and that each member of each class would only pay his or her fair share of user class costs. Since a portion of the revenues required from each user class is to be recovered through uniform monthly service charges, commodity rates are designed to recover only that portion of revenues that is not recovered through the service charge.

Annual service charge revenues for each user class for FY 2008 are estimated based on the forecast number of meters by size in a given class and the COS based monthly service charges in Table 7-2. The portion of revenues to be recovered through commodity rates is then determined by deducting the annual service charge revenues from the user class's FY 2008 cost of service. Table 7-3 shows the total assigned cost by class, the annual costs related to meters and recovered from the service charge, and the annual costs related to volume that are to be recovered from the commodity rate.

Table 7-3: Cost-Based Monthly Commodity Charge Calculation, FY 2008

Line No.		Total Costs $	Meter Costs $	Volume Costs $	Units of Service HCF	Commodity Rate $/HCF
	Inside City					
1	SFR	126,993,900	42,154,800	84,839,100	34,479,413	2.461
2	Other Domestics (MFR)	60,438,600	9,949,600	50,489,000	20,519,164	2.461
3	Commercial	58,986,800	6,645,200	52,341,600	22,207,400	2.357
4	Industrial	4,010,400	206,900	3,803,500	1,613,743	2.357
5	Temp. Constr.	1,482,500	607,600	874,900	346,667	2.524
6	Irrigation	35,122,800	4,095,800	31,027,000	12,294,791	2.524
7	Total Inside City	287,035,000	63,659,900	223,375,100	91,461,178	2.442

The water commodity rate for each user class is computed based on the user class' annual usage revenues required and the estimated annual volume of water usage. The cost based commodity rate is shown in Table 7-3.

The user classes can be sorted into groups with similar peaking characteristics, resulting in a uniform water commodity rate that is the same within the group. Due to similar usage characteristics, residential customers are grouped together, commercial and industrial are grouped together, and construction and irrigation are grouped together. Table 7-3 illustrates this point. Note that the commodity rate is the same for the grouped classes.

The City currently differentiates between SFR and all other classes for rate design. To encourage conservation, SFR rates are tiered. Many agencies across the state use such a

structure to encourage conservation. The State of California also encourages use of conservation rate structures. RFC recommends the City retain its existing tiered rate structure to encourage conservation. Tiered rates are more practical to implement for the SFR class because this class is a fairly homogenous class. Since the small users do not put as much demand on the system, the first tier usage is provided a lower rate by discounting a part of the capital costs associated with peaking. The second tier is based on the COS rate and the third tier is designed to recover the remainder of the revenues form this class.

Table 7-4 shows the rates for the different classes. Rates for FY 2007 and two alternatives for FY 2008 rates are shown that include the 6.5 percent increase over FY 2007 rates. The first column called "2007 Existing" shows the actual 2007 rates for comparison purposes. The first of the 2008 rates is called "2008 City" and reflects a continuation of the rate structure currently used by the City, i.e., across the board or equal increases to the base rate and commodity rates. This is the incumbent rate structure updated for the 6.5 percent rate increase applied equally across all rates scheduled for FY 2008. The second option called "Proposed" is the Cost of Service based rate schedule. These rates are designed to be used with the cost-based monthly service charges shown in Table 7-2. Table 7-4 shows complete rate schedules for FY 2007 and the two alternative FY 2008 rates, as well as the proposed rates for 2009-2011.

Table 7-4: Existing Rates and Rate Alternatives

Meter Size inches	2007 Existing $/month	2008 City $/month	2008 Proposed $/month	2009 Proposed $/month	2010 Proposed $/month	2011 Proposed $/month
	Service Charge					
5/8	15.87	16.90	15.18	16.17	17.22	18.34
3/4	15.87	16.90	15.18	16.17	17.22	18.34
1	17.11	18.22	22.17	23.61	25.15	26.78
1 1/2	75.41	80.31	38.13	40.61	43.25	46.06
2	116.24	123.80	58.09	61.87	65.89	70.17
3	414.73	441.69	104.98	111.80	119.07	126.81
4	692.00	736.98	171.83	183.00	194.89	207.56
6	1,542.72	1,643.00	337.46	359.39	382.76	407.63
8	2,081.78	2,217.10	537.01	571.92	609.09	648.68
10	2,793.63	2,975.22	770.49	820.57	873.91	930.71
12	3,892.44	4,145.45	1,435.00	1,528.28	1,627.61	1,733.41
16	6,514.14	6,937.56	2,499.62	2,662.10	2,835.13	3,019.42

Customer Class	2007 Existing $/HCF	2008 City $/HCF	2008 Proposed $/HCF	2009 Proposed $/HCF	2010 Proposed $/HCF	2011 Proposed $/HCF
	Commodity Rate					
SFR						
0 - 7	1.731	1.844	2.262	2.409	2.566	2.732
7-14	2.163	2.304	2.461	2.621	2.791	2.973
Over 14	2.372	2.526	2.775	2.955	3.147	3.352
General Service						
Other Domestics (MFR)	2.003	2.133	2.461	2.621	2.791	2.973
Commercial & Industrial	2.003	2.133	2.357	2.510	2.673	2.847
Temp. Constr. & Irrigation	2.003	2.133	2.524	2.688	2.863	3.049

Table 7-5 shows the revenues anticipated to be generated by each user class under the existing City rate structure and the proposed COS rates. The difference in total revenue under the two options results from rounding errors and is less than two-tenths of one percent (0.2 percent). There will be small changes to the revenue recovery from classes as the cost structure changes. Therefore rates should be reviewed regularly.

Table 7-5: Revenue from Rate Alternatives

Line No.	Customer Class	2007 Existing Revenue $	2008 City Revenue $	2008 COS Revenue $	COS vs. City
	Inside City				
1	SFR	113,282,900	120,646,300	127,019,500	105%
2	Other Domestics	58,738,500	62,556,500	60,439,800	97%
3	Commercial	58,176,400	61,957,800	58,987,600	95%
4	Industrial	3,855,300	4,105,900	4,010,400	98%
5	Temp. Constr.	2,120,800	2,258,700	1,482,600	66%
6	Irrigation	33,012,300	35,158,100	35,123,400	100%
7	**Subtotal Inside City**	269,186,200	286,683,300	287,063,300	100%
14	**Subtotal Outside City**	358,700	382,000	411,300	108%
15	**Total**	269,544,900	287,065,300	287,474,600	100%

7.1.3 Rate Option Comparison

The two rate alternatives for FY 2008 presented here will produce approximately the same amount of revenue, but individual ratepayers will be impacted differently under each. The readily apparent difference between the alternatives is the service charge. The City's existing rate structure incorporates a higher service charge with a much larger cost difference between small and large meters than would be derived using AWWA standard methodology. This is clear when City service charges and COS service charges are compared in Table 7-4. Note that overall City service charges are higher and they are considerably higher for the largest meter charges. 5/8 inch meter charges are 11 percent higher and 12 inch meter charges are 57 percent higher under City rates than COS rates. Since overall the same amount of revenue will be recovered under each rate option, higher service charges must be complemented with lower commodity rates.

7.2 IMPACT ANALYSIS

RFC performed an analysis to evaluate the impact of the two rate alternatives on various users. A comparison of the rate alternatives on Single Family Residential customers is shown below in Table 7-6. Negative numbers are shown in parentheses. By using the proposed COS rates, residential customers using less than 5 HCF per month would receive a reduction in bills compared with what the City rates would be in 2008 if the existing rate structure was retained. This means that the effect of reducing the service charge is greater than the effect of the increased commodity rate for customers using less than 5 units of water. It also means that many residential users will receive higher bills under the COS rates than the City rates. Under COS based rates, water bills for SFR customers using 25 HCF (approximately 2 times the average) would be 6.8 percent greater than with the City rates.

Table 7-6: Single Family Residential Bill Comparisons

Monthly Usage HCF	2007 Existing Rate $	2008 City Rate $	2008 COS Rate $	COS minus City $	COS vs. City
0	15.87	16.90	15.18	(1.72)	(10.2%)
1	17.60	18.75	17.44	(1.30)	(7.0%)
2	19.33	20.59	19.70	(0.88)	(4.3%)
3	21.06	22.43	21.97	(0.47)	(2.1%)
4	22.79	24.28	24.23	(0.05)	(0.2%)
5	24.53	26.12	26.49	0.37	1.4%
6	26.26	27.96	28.75	0.79	2.8%
7	27.99	29.81	31.01	1.21	4.1%
8	30.15	32.11	33.48	1.37	4.3%
9	32.31	34.41	35.94	1.52	4.4%
10	34.48	36.72	38.40	1.68	4.6%
11	36.64	39.02	40.86	1.84	4.7%
12	38.80	41.32	43.32	1.99	4.8%
13	40.97	43.63	45.78	2.15	4.9%
14	43.13	45.93	48.24	2.31	5.0%
15	45.50	48.46	51.02	2.56	5.3%
20	57.36	61.09	64.89	3.80	6.2%
25	69.22	73.72	78.77	5.05	6.8%
30	81.08	86.35	92.64	6.29	7.3%
35	92.94	98.98	106.52	7.53	7.6%
40	104.80	111.61	120.39	8.78	7.9%
50	128.52	136.87	148.14	11.27	8.2%
60	152.24	162.14	175.89	13.76	8.5%
80	199.68	212.66	231.39	18.73	8.8%

A comparison of the rate alternative impacts on various commercial and industrial customers is shown below in Table 7-7, and once again negative numbers are shown in parentheses. As is the case with residential users, large volume commercial and industrial users will receive higher bills under the COS rates compared to the City rates. However, the reduction in meter charges will benefit low volume users. Customers with large meters will see a noticeable reduction in their meter charges that will partially offset higher commodity rates.

Table 7-7: Non-SFR (Commercial, Industrial, etc.) Bill Comparisons

Line No.	Customer Type	Meter Size Inches	Monthly Usage HCF	2007 Existing Rate $	2008 City Rate $	2008 COS Rate $	2008 COS minus City $	2008 COS vs. Existing
	Hospitals							
1	Low Monthly Flow	2	90	296.51	315.78	270.21	(45.57)	(14.4%)
2	Medium Monthly Flow	2	260	637.02	678.43	670.90	(7.53)	(1.1%)
3	High Monthly Flow	2	975	2,069.17	2,203.66	2,356.11	152.45	6.9%
	Printing/Graphics Services							
4	Low Monthly Flow	5/8	10	35.90	38.23	38.75	0.52	1.3%
5	Medium Monthly Flow	5/8	70	156.08	166.23	180.17	13.94	8.4%
6	High Monthly Flow	5/8	225	466.55	496.87	545.49	48.62	9.8%
	Offices/Auto Serivce Stations							
7	Low Monthly Flow	5/8	20	55.93	59.57	62.32	2.75	4.6%
8	Medium Monthly Flow	5/8	70	156.08	166.23	180.17	13.94	8.4%
9	High Monthly Flow	5/8	230	476.56	507.54	557.28	49.74	9.8%
	Auto Dealers							
10	Low Monthly Flow	5/8	15	45.92	48.90	50.53	1.63	3.3%
11	Medium Monthly Flow	5/8	65	146.07	155.56	168.38	12.82	8.2%
12	High Monthly Flow	5/8	165	346.37	368.88	404.08	35.20	9.5%
	Retail/Commercial Businesses							
13	Low Monthly Flow	1 1/2	20	115.47	122.98	85.27	(37.71)	(30.7%)
14	Medium Monthly Flow	1 1/2	60	195.59	208.30	179.55	(28.76)	(13.8%)
15	High Monthly Flow	1 1/2	260	596.19	634.94	650.94	15.99	2.5%
	Hotels							
16	Low Monthly Flow	1 1/2	65	205.61	218.97	191.33	(27.64)	(12.6%)
17	Medium Monthly Flow	1 1/2	260	596.19	634.94	650.94	15.99	2.5%
18	High Monthly Flow	1 1/2	720	1,517.57	1,616.21	1,735.13	118.92	7.4%
	Mini-Shopping Centers							
19	Low Monthly Flow	2	35	186.35	198.46	140.58	(57.87)	(29.2%)
20	Medium Monthly Flow	2	75	266.47	283.79	234.86	(48.92)	(17.2%)
21	High Monthly Flow	2	210	536.87	571.77	553.05	(18.72)	(3.3%)
	Industrial Laundry							
22	Low Monthly Flow	3	175	765.26	815.00	517.44	(297.55)	(36.5%)
23	Medium Monthly Flow	3	400	1,215.93	1,294.97	1,047.76	(247.21)	(19.1%)
24	High Monthly Flow	3	920	2,257.49	2,404.23	2,273.37	(130.86)	(5.4%)
	Food Service Establishments							
25	Low Monthly Flow	1 1/2	20	115.47	122.98	85.27	(37.71)	(30.7%)
26	Medium Monthly Flow	1 1/2	60	195.59	208.30	179.55	(28.76)	(13.8%)
27	High Monthly Flow	1 1/2	175	425.94	453.62	450.60	(3.03)	(0.7%)
	Supermarkets							
28	Low Monthly Flow	1 1/2	35	145.52	154.97	120.62	(34.35)	(22.2%)
29	Medium Monthly Flow	1 1/2	75	225.64	240.30	214.90	(25.40)	(10.6%)
30	High Monthly Flow	1 1/2	210	496.04	528.28	533.09	4.81	0.9%
	Apartment Complex							
31	Low Monthly Flow	3	60	534.91	569.68	252.61	(317.06)	(55.7%)
32	Medium Monthly Flow	3	600	1,616.53	1,721.60	1,581.32	(140.28)	(8.1%)
33	High Monthly Flow	3	1,200	2,818.33	3,001.52	3,057.67	56.15	1.9%

SECTION 8: CAPACITY FEES

As indicated in Section 5, one of the sources of system revenues is the one-time capacity (developer) fee that is applied to all new or expanded connections to the City's Water 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 water 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 water 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 water mains, and can be thought of as "plumbing charges". The scope of this study is limited to a review of the Capacity fees.

8.1 EXISTING CAPACITY FEES

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

500 gallons per day of water usage = 1 EDU for single family residences

Twenty Plumbing Fixture Units = 1 EDU for non residential users

The minimum capacity assigned to any water connection is one EDU. Multi-Family Residential (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 water capacity needed.

The City's present water capacity fee is $2,550 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.

8.1.1 Philosophical Objectives 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.

8.1.2 AB 1600

In California, the state legislature enacted statutes in 1987 which imposed procedural and substantive requirements relating to the calculation, adoption, administration and enforcement of impact fee systems. Under the provisions of AB 1600, whenever a local agency imposes a fee as a condition to the approval of a development project for payment of the costs of public facilities related to the project, the agency must identify the purpose of the fee and the public facilities to be financed. The basic statutory standards governing water and sewer system capacity (development) fees are embodied in Government Code Sections 66000 et seq. An important requirement in designing water capacity charges is spelled out in Government Code 66013 which requires that capacity charges must be based on an estimate of the reasonable cost of providing capacity. Following are relevant portions of Government Code 66013:

> 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

8.2 COMPUTATIONAL METHODS FOR CAPACITY FEE DETERMINATION

There are several methods that could be used to calculate capacity fees. Three industry-accepted computational approaches are discussed below.

8.2.1 System Buy-in Method

The buy-in concept is based on the premise that new users are buying into an existing system which already has the capacity to serve them, and by doing so they achieve a financial position

that is 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.

8.2.2 Incremental-Cost Pricing Method

The incremental-cost pricing method is based on the premise that new users should pay for the incremental portion of both existing reserve capacity which must be replaced, and 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.

8.2.3 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.

8.2.4 Suggested Approach for the Determination of City's Municipal 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, we suggest 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, laboratories, etc. which may not necessarily need to be expanded for new users, but which benefit them. There will, for example, typically be capacity in the distribution system and, in this case, in the supply system that a future user will benefit from. 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.

- While the incremental-cost method could be utilized, the absence of a formal system master plan makes it difficult to estimate unit costs for facilities such as transmission and distribution mains. Absent such estimates, use of the incremental-cost method would preclude capturing the cost of existing capacity to be used by new users.
- Since the specific capacity method requires that the capacity provided by each capital project in the system be determined, and the current CIP does not include the capacity of all facilities which will benefit new users, its use would also be inappropriate.

8.3 COMPUTATION OF CITY'S CAPACITY FEES

The computation of capacity fees includes the following steps:

- Estimation of costs of existing facilities benefiting future users
- Identification of outstanding principal on replacement debt
- 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 expansion projects
- Derivation of unit capacity cost and capacity fee per EDU

Table 8-1 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 hydrants and 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; i.e., 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 in fact 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 reserves related to replacement projects are added to derive the net buy-in equity.

An eight-year outlook was used in identifying future CIP projects. The CIP projects identified were classified into functional categories including source of supply, pump stations, transmission, production, storage and distribution. Administration and General CIP projects such as operations center, miscellaneous, contingencies and program management were classified as General Plant. Costs for future projects were based on the CIP. The capacity of some facilities such as new distribution lines was not readily identifiable. The value of new distribution mains was combined with existing mains and the ultimate capacity used to estimate unit costs. Costs of existing distribution pipes smaller than 16-inches in diameter which a developer will typically install as a condition of development were excluded. Expansion projects are included in the expansion portion of the capacity fee. 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 used to reduce the total asset value used to calculate the capacity fee. Past grants were not considered since the project(s) for which they were used cannot be identified in the current asset list. The amount is small and when depreciated would result in an even smaller impact.

8.3.1 Derivation of 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 usage capacity of that project. In this Study, project capacity is estimated in terms of average or peak usage per day. Since many water capital facilities are designed based on a peak demand, peaking has to be taken into account. This is done after unit capacity costs are calculated. The future capacity of the system after the implementation of the CIP program listed is used as the average capacity for most components for the system. The current treatment capacity is 294 million gallons per day (MGD), and after completion of the plant expansions proposed in the CIP, system capacity will be 462.5 MGD, of which 161 MGD is from expansion of existing water treatment plants and 7.5 MGD is from reclaimed water capacity. Expansion storage was associated with a capacity of 25 MGD based on estimates of additional capacity provided by the storage projects specifically. Associated costs are divided by capacities to calculate unit costs for each category as shown in Table 8-1.

The City defines a water EDU's average usage as 500 gallons per day (GPD), and this value is used in determining the capacity fee per EDU. Since water facilities are designed based on peak capacity, a demand basis was assigned to each category and an actual demand per EDU was calculated. Facilities designed for average day demand (ADD) are assigned a standard demand of 500 GPD. Facilities designed on a max day demand (MDD) are assigned a demand of 750 GPD based on a peaking factor of 1.5 as explained in Section 6. Facilities designed for a maximum hour demand (MHD) are assigned a demand of 1,250 GPD based on a peaking factor of 2.5 as explained in Section 6. After demand is established the unit cost is multiplied by the demand to calculate the cost per EDU shown in Table 8-1. The capacity fee is merely the sum of these costs per EDU.

Based on our analysis, the estimated full cost recovery capacity fee per EDU for projects constructed through 2015 is $3,047. The increase of approximately $600 per EDU results primarily from an increase in capital expansion projects and the high inflation in capital costs in the last few years.

Table 8-1: Water Capacity Fee Calculation

Line No.		System Buy-in Existing OCLD ($)	Expansion CIP ($)	Total Asset Base ($)	Associated Capacity (MGD)	Unit Cost Buy-in ($/gpd)	Unit Cost Expansion ($/gpd)	EDU (gpd)	Demand Basis	Demand (gpd)	Cost ($/EDU)
1	Source of Supply	35,687,904	56,049,275	91,737,179	462.5	0.08	0.12	500	ADD	500	99
2	Pump Stations	3,051,000	14,791,587	17,842,587	462.5	0.01	0.03	500	MHD	1,250	48
3	Transmission	16,997,890	136,064,082	153,061,972	462.5	0.04	0.29	500	MDD	750	248
4	Production*	0	127,089,879	127,089,879	168.5	0.00	0.75	500	MDD	750	566
5	Storage	0	16,970,082	16,970,082	25.0	0.00	0.68	500	MDD	750	509
6	Distribution Mains>=16"	141,270,668	18,651,909	159,922,577	462.5	0.31	0.04	500	MHD	1,250	432
7	Hydrants	10,023,758	0	10,023,758	462.5	0.02	0.00	500	ADD	500	11
8	General Plant	43,251,493	28,852,063	72,103,556	462.5	0.09	0.06	500	ADD	500	78
9	Repl Debt Service Principal	(339,251,383)	0	(339,251,383)	462.5	(0.73)	0.00	500	MDD	750	(550)
10	Expansion Debt Interest	0	347,517,874	347,517,874	168.5	0.00	2.06	500	MDD	750	1,547
11	Reserves	73,364,000	0	73,364,000	462.5	0.16	0.00	500	MDD	750	119
12	Expected Grants	0	(13,600,000)	(13,600,000)	168.5	0.00	(0.08)	500	MDD	750	(61)
13	**System Buy-in Fee**	**(15,604,670)**	**732,386,752**	**716,782,081**							**$3,047**

350

	Summary	Calculated Cost ($/EDU)	Existing Cost ($/EDU)
14	**Total Capacity Fee**	**$3,047**	**$2,550**

APPENDIX A : EQUIVALENT METER CALCULATIONS

This section describes some of the calculations used in cost of service calculations. An explanation of the calculations is useful in understanding the cost of service analysis that is detailed in Section 6. The calculation of equivalent meters is explained below.

Equivalent Meters

Equivalent meters are used rather than just meters in order to recognize the fact that larger meters are more expensive to install, maintain and replace than smaller meters. Appendix Table A-1 shows the calculation of equivalent meters. Meters are assigned a hydraulic capacity by size which is based on the maximum measurable flow rate of the meter. For example a 5/8 inch meter has a hydraulic capacity of 30 gallons per minute (gpm) whereas a 6 inch meter has a hydraulic capacity of 1,000 gpm. In this study 5/8 inch and 3/4 inch meters are considered the base measure of a meter because they are both used for residential metering and are essentially interchangeable.

A ratio of capacity is calculated by dividing the large meter capacities by the base meter capacity which in this case is 30 gpm. This results in a hydraulic capacity ratio that is used to calculate equivalent meters. The actual number of meters by size is multiplied by the corresponding capacity ratio to calculate equivalent meters. For example: the capacity ratio for a 6 inch meter is 33.3 = 1,000gpm / 30gpm. Essentially each 6 inch meter is equivalent to 33.3 base meters.

Appendix Table A-1 – Cost Allocation and Unit Cost Calculation

Meter Size	2007 Meters	Hydraulic Capacity gpm	Hydraulic Capacity Ratio	Equvalent Meters
5/8 and 3/4	225,988	30	1.00	228,953
1	22,107	50	1.70	38,091
1 1/2	10,136	100	3.30	33,825
2	11,276	160	5.30	60,300
3	439	300	10.00	4,433
4	373	500	16.70	6,317
6	170	1,000	33.30	5,740
8	79	1,600	53.30	4,216
10	13	2,300	76.70	944
12	1	4,300	143.30	180
16	1	7,500	250.00	180
	274,119			383,178

By using equivalent meters in cost calculations we do not have to track all meters by meter size. This allows for more concise analysis and explanation. The net effect of using equivalent meters instead of tracking all meters by size is the same. Equivalent meters are used in the unit cost calculation of meters and services in the cost of service section.