CITY OF LA HABRA
DEPARTMENT OF PUBLIC WORKS

Water Cost of Service and Rate Study

Draft Report / October 6, 2021

RAFTELIS

RAFTELIS

445 S. Figueroa Street
Suite #1925
Los Angeles, CA 90071

Phone 626.583.1894
Fax 828.484.2442

www.raftelis.com

October 6, 2021

Mr. Brian Jones
Water/Sewer Manager
City of La Habra Department of Public Works
621 W Lambert Road
La Habra, CA 91706

Subject: Water Cost of Service Study Report

Dear Mr. Jones:

Raftelis is pleased to present this water cost of service study to the City of La Habra Department of Public Works (City). The study involved a comprehensive review of the City's financial plan and rate structure, and the calculation of cost of service-based water rates for a period of five fiscal years (FY 2022 – FY 2026). We are confident that our study produces fair and equitable water rates for the City's customers, while maintaining compliance with the requirements of Proposition 218.

This report includes an Executive Summary, along with detailed presentations of the five-year financial plan, cost of service analysis, and rate derivation for the water utility.

It was a pleasure working with you and we wish to express our thanks for the support that you and Ms. Zukie Chiu, provided during the study. If you have any questions, please call me at (626) 583-1894.

Sincerely,
RAFTELIS FINANCIAL CONSULTANTS, INC.

Sudhir D. Pardiwala, PE
Executive Vice President

Ethan Edwards
Associate Consultant

This page intentionally left blank to facilitate two-sided printing

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

This page intentionally left blank to facilitate two-sided printing

1. EXECUTIVE SUMMARY

The City of La Habra (City) engaged Raftelis Financial Consultants, Inc. (Raftelis) to develop a comprehensive financial plan and rate study for implementation in fiscal year (FY) 2022. This report documents the assumptions, methods, analyses, and proposed rates developed in the study.

The major objectives of the study include the following:

1. Ensure *Revenue Sufficiency* to meet the operation and maintenance (O&M) and capital needs of the City's water utility.
2. Ensure that rates are *Fair and Equitable*, in accordance with industry-standard *Cost of Service* guidelines
3. Plan for *Rate and Revenue Stability* to prevent rate spikes, preserve the overall financial health of the utility, and maintain adequate operating and capital reserves under varying supply and demand conditions.

This executive summary provides an overview of the study, including recommendations for water rates beginning in January 2022 through January 2026.

System Background

The City of La Habra Department of Public Works supplies potable water to about 13,700 water service connections through 140 miles of water main transmission pipelines. The City receives its water from three main sources: local groundwater wells, groundwater from the Main San Gabriel Basin (Basin) which is provided by the California Domestic Water Company (Cal Domestic), and imported water from Metropolitan Water District of Orange County (MWDOC).

Financial Plan

In order to determine the revenue adjustments needed to fund the City's ongoing expenses, Raftelis projected the operations and maintenance (O&M) costs, capital improvement costs, debt service costs, reserve requirements, etc., for the study period (FY 2022 to FY 2026). O&M expenses include the cost of operating and maintaining facilities; the costs of providing technical services; and other administrative costs of the water system such as meter reading and billing. O&M projections are based on the City's FY 2022 adopted budget and the City's projected budgetary increases through FY 2026. The City uses different inflation factors for different types of budgeted expenditures.

The proposed financial plan and water rates are based on historical water sales, adjusted for anticipated usage growth. The City expects that sales in FY 2022 will total 8,574 AF. Sales projections are based on the current level of usage per account. Usage only increases with account growth, which is projected at 0.25% per year for the single family residential customer class only.

In addition to its operating expenses, which includes the increasing cost of water and power, the City is planning significant capital expenditures over the next several years. Capital projects are funded

by revenues from water rates and reserves. The City has debt service obligations in the form of principal and interest on the previously issued water revenue bonds.

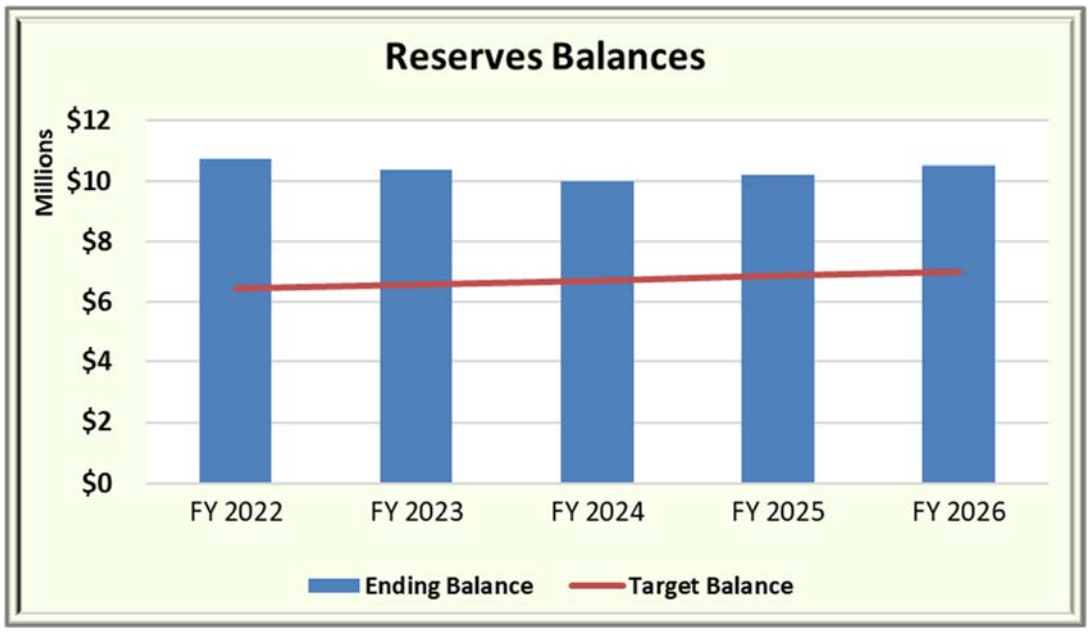
To ensure that the City will have adequate revenues to fund expenses and maintain sufficient reserves, Raftelis recommends the revenue adjustments in **Table 1-1**. Note that the first rate increase will go into effect in January 2022, and each subsequent increase will be in January of each year. Our financial planning model incorporates the timing of the rate increase into all revenue projections and rate calculations.

Table 1-1: Proposed Revenue Adjustments

Effective Date	Revenue Adjustment
Jan - 2022	3%
Jan - 2023	3%
Jan - 2024	3%
Jan - 2025	3%
Jan - 2026	3%

Figure 1-1 shows the total reserve balances projected based on the financial plan. The red line represents the total current target, including an operating reserve target of 25% of annual operating expenses and a capital reserve target of 100% of the average annual CIP for the study period. The City's reserves are anticipated to be above target levels for the entire study period, with the amounts over the target as unrestricted funds.

Figure 1-1: Total Reserves Balances



Cost of Service Analysis and Rate Design

To calculate fair and equitable rates and ensure that users pay in proportion to the cost of providing service, Raftelis performed cost of service analysis based on the Base-Extra Capacity Method described in the American Water Works Association (AWWA) *Manual M1*. Following this method, we tabulate the City's total revenue requirement (the amount to be recovered by rates) for FY 2022. We then group all operating and capital costs by function and allocate the functionalized costs to "cost causation components" such as base demand, peaking costs, and general costs. We then derive the unit costs of each cost causation component and use the unit costs to allocate costs to each customer class. Finally, we design rates to equitably recover costs from each customer class. This approach is consistent with Proposition 218 requirements and industry-standard rate making principles.

Proposed Water Rates

Raftelis recommends that the City retain its current rate structure with tiered rates for single family customers and uniform rates for the remaining classes. Our cost of service analysis divides single-family residential usage into three tiers based on the nature of water use and water demand.

The rates are designed to be consistent with cost of service.

Table 1-2 shows the proposed rates for the next five fiscal years. Rates for FY 2022 are based on the cost of serving each customer class. In subsequent years rates increase according to the percentage adjustments shown in **Table 1-1.**

Table 1-2: Proposed Rate Schedule

Effective Date:	1/1/2021	1/1/2022	1/1/2023	1/1/2024	1/1/2025	1/1/2026
GENERAL SERVICE	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**
Monthly Fixed Charges						
Meter Size						
5/8"	*$17.99*	$18.04	$18.58	$19.14	$19.71	$20.30
3/4"	*$24.87*	$25.32	$26.08	$26.86	$27.67	$28.50
1"	*$38.64*	$39.87	$41.07	$42.30	$43.57	$44.87
1 1/2"	*$73.08*	$76.24	$78.53	$80.88	$83.31	$85.81
2"	*$114.41*	$119.89	$123.49	$127.19	$131.01	$134.94
3"	*$210.83*	$221.75	$228.40	$235.25	$242.31	$249.58
4"	*$348.58*	$367.25	$378.27	$389.62	$401.30	$413.34
6"	*$692.96*	$731.02	$752.95	$775.54	$798.81	$822.77
8"	*$1,106.21*	$1,167.53	$1,202.56	$1,238.63	$1,275.79	$1,314.07
Volumetric Rates (per ccf)						
Residential						
Tier 1 8	*$2.54*	$2.60	$2.68	$2.76	$2.84	$2.93
Tier 2 16	*$4.14*	$4.63	$4.77	$4.91	$5.06	$5.21
Tier 3 16+	*$6.01*	$6.74	$6.94	$7.15	$7.36	$7.59
Multifamily						
Uniform Tier	*$3.71*	$3.59	$3.70	$3.81	$3.92	$4.04
Commercial						
Uniform Tier	*$3.77*	$3.77	$3.88	$4.00	$4.12	$4.24
Municipal						
Uniform Tier	*$4.59*	$4.34	$4.47	$4.60	$4.74	$4.88
Irrigation						
Uniform Tier	*$5.40*	$5.47	$5.63	$5.80	$5.98	$6.16
FIRELINE SERVICE						
Monthly Fixed Charges						
Meter Size						
2"	*$8.82*	$8.26	$8.51	$8.76	$9.03	$9.30
3"	*$17.60*	$17.35	$17.87	$18.41	$18.96	$19.53
4"	*$32.74*	$33.02	$34.01	$35.03	$36.08	$37.16
6"	*$87.11*	$89.27	$91.95	$94.71	$97.55	$100.47
8"	*$180.87*	$186.28	$191.87	$197.62	$203.55	$209.66
10"	*$321.92*	$332.22	$342.19	$352.45	$363.03	$373.92
Volumetric Rates (per ccf)						
Fireline						
Uniform Tier	*$5.40*	$5.47	$5.63	$5.80	$5.98	$6.16

Customer Impacts

Table 1-3 below shows the impacts of the proposed rates on monthly single-family residential bills, for customers with 5/8" and 1" meters and various levels of usage. These two meter sizes serve the largest number of customers in the City. Due to rounding in the calculations, some values may not

add to the penny. For comparison purposes, the impacts on very low-end to very high-end users are shown.

Table 1-3: Rate Impacts

Single Family Residential 5/8"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$28.15	$28.44	1%	$0.29	9%	$3.48
	8	$38.31	$38.84	1%	$0.53	29%	$6.36
Average Monthly	14	$63.15	$66.62	5%	$3.47	61%	$41.64
	18	$83.45	$89.36	7%	$5.91	76%	$70.92
Double Average	28	$143.55	$156.76	9%	$13.21	93%	$158.52
	36	$191.63	$210.68	10%	$19.05	97%	$228.60
Very High	40	$215.67	$237.64	10%	$21.97	98%	$263.64

Single Family Residential 1"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$48.80	$50.27	3%	$1.47	16%	$17.64
	8	$58.96	$60.67	3%	$1.71	38%	$20.52
Average Monthly	14	$83.80	$88.45	6%	$4.65	63%	$55.80
	18	$104.10	$111.19	7%	$7.09	76%	$85.08
Double Average	28	$164.20	$178.59	9%	$14.39	92%	$172.68
	36	$212.28	$232.51	10%	$20.23	97%	$242.76
Very High	50	$296.42	$326.87	10%	$30.45	99%	$365.40

Multifamily	Usage (ccf)	# of Units	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual Impact
5/8" Example	18	2	$84.77	$82.66	-2%	($2.11)	-$25.32
3/4" Example	25	2	$117.62	$115.07	-2%	($2.55)	-$30.60
1.0" Example	40	4	$187.04	$183.47	-2%	($3.57)	-$42.84
1.5" Example	124	12	$533.12	$521.40	-2%	($11.72)	-$140.64
2.0" Example	266	32	$1,101.27	$1,074.83	-2%	($26.44)	-$317.28

Commercial	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual Impact
5/8" Example	12	$63.23	$63.28	0%	$0.05	$0.60
3/4" Example	13	$73.88	$74.33	1%	$0.45	$5.40
1.0" Example	24	$129.12	$130.35	1%	$1.23	$14.76
1.5" Example	46	$246.50	$249.66	1%	$3.16	$37.92
2.0" Example	94	$468.79	$474.27	1%	$5.48	$65.76
3.0" Example	195	$945.98	$956.90	1%	$10.92	$131.04
4.0" Example	387	$1,807.57	$1,826.24	1%	$18.67	$224.04
6.0" Example	446	$2,374.38	$2,412.44	2%	$38.06	$456.72

2. OVERVIEW

INTRODUCTION

In August 2021, the City of La Habra Public Works Department (City) engaged Raftelis Financial Consultants, Inc. (Raftelis) to conduct a cost of service analysis and rate study for the water utility. This report documents the methods, results, and proposed rates developed in the study.

The major objectives of the study include the following:

1. Ensure *Revenue Sufficiency* to meet the operation and maintenance (O&M) and capital needs of the City's water utility.
2. Ensure that rates are *Fair and Equitable*, in accordance with *Cost of Service* guidelines used in the industry.
3. Plan for *Rate and Revenue Stability* to prevent rate spikes, preserve the overall financial health of the utility, and maintain adequate operating and capital reserves under varying conditions.

This Report provides an overview of the Study and includes a recommended water rate schedule for the fiscal years (FY) 2022 through 2026.

ORGANIZATION OF THE REPORT

This Report includes two sections in addition to the Executive Summary and this Overview.

- ***Section 3 – Water Utility Financial Plan*** describes the long-range financial plan for the water utility, based on the results of the water rate study. It also includes a description of the water system, key assumptions such as account and usage growth, and the inflationary assumptions involved in the financial projections.

- ***Section 4 – Cost of Service Analysis*** contains a detailed description of the Cost of Service (COS) Analysis, which involves allocation of costs to water system parameters and the determination of unit costs.

- ***Section 5 – Rate Design*** includes the derivation of fair and equitable water rates for the study period FY 2022-2026, a detailed discussion of the proposed water rates, and the resulting customer impacts.

3. WATER UTILITY FINANCIAL PLAN

This section describes the long-range financial plan for the water utility, including water sales projections, operating and capital expenses, non-rate revenues, and capital financing plan. The financial plan determines the overall revenue adjustments needed to maintain financial stability.

SYSTEM BACKGROUND

The City of La Habra Department of Public Works supplies potable water to a population of approximately 63,100 people, with about 13,600 active water service connections. The City supplies water from three main sources: local groundwater wells, groundwater from the Main San Gabriel Basin which is provided by the California Domestic Water Company and imported water from Metropolitan Water District of Orange County (MWDOC). The City maintains three storage reservoirs totaling 16.8 million gallons in capacity, as well as three groundwater wells, five booster pumping stations, 140 miles of water main transmission pipelines, and 57 pressure regulating stations.

KEY ASSUMPTIONS

This section describes the assumptions used to project the expenses and reserve targets that determine the City's revenue requirement. The revenue requirement is the basis for determining the necessary revenue adjustments (i.e., the average increase in rates for the entire City) for each year of the study period. Specific rate changes for individual classes are based on the cost of service and may vary from the average rate increase.

To ensure that future costs are reasonably projected, it is necessary to make informed assumptions about inflationary factors and water costs. O&M projections are based on the City's FY 2022 adopted budget and the projected budgetary increases in subsequent years based on the assumptions shown in **Table 3-1**. The City uses different inflation factors for different expenditures within the budget. On average, the O&M costs are increasing at approximately 3.2% per year driven primarily by increases in the water purchase costs resulting from reduced water available per share.

The revenue calculated for each of the fiscal years in the Financial Plan is a function of the number of meters, meter size, account growth, water use, and existing rates. We project water demand (and the supply required to meet this demand) based on actual usage in FY 2021, with any adjustments for usage growth in FY 2022 onwards. We also assume annual account growth of 0.25% for the single family customer class.

Table 3-1 shows the inflationary and other assumptions used in the financial planning model for the planning period FY 2022- FY 2026.

Table 3-1: Key Assumptions

	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Inflation Factors						
General	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Salary	3.5%	3.5%	3.5%	3.5%	3.5%	3.5%
Benefits	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Utilities	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Water Costs	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Capital	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Inflated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Account Growth						
Single Family Residential	0.25%	0.25%	0.25%	0.25%	0.25%	0.25%
Multifamily	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Commercial	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Municipal	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Irrigation	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Fireline	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Usage Growth						
Single Family Residential	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Residential	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Revenues Escalation Factors						
Non-Rate Revenues	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
Reserve Interest Rate	1.00%	1.00%	1.00%	1.00%	1.00%	1.00%

ACCOUNT AND USAGE PROJECTIONS

Table 3-2 shows the estimated number of water accounts by meter size for fiscal year (FY) 2022 through FY 2026. Raftelis estimated the number of accounts by tabulating FY 2021 (actual) revenue data provided by the City and escalating the number of single family accounts by 0.25% per year. The number of accounts (meters) are used to forecast the amount of fixed revenue the City will receive from the meter service charge.

Table 3-2: Projected Water Accounts by Meter Size

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Single Family Residential							
5/8"	8,138	8,159	8,179	8,200	8,220	8,241	8,261
3/4"	614	616	618	619	621	622	624
1"	2,826	2,834	2,841	2,848	2,855	2,862	2,869
1 1/2"	25	26	26	26	26	26	26
2"	9	10	10	10	10	10	10
3"	-	-	-	-	-	-	-
4"	-	-	-	-	-	-	-
6"	-	-	-	-	-	-	-
8"	-	-	-	-	-	-	-
Total Meters	**11,612**	**11,645**	**11,674**	**11,703**	**11,732**	**11,761**	**11,790**
Multifamily							
5/8"	266	266	266	266	266	266	266
3/4"	5	5	5	5	5	5	5
1"	257	257	257	257	257	257	257
1 1/2"	149	149	149	149	149	149	149
2"	215	215	215	215	215	215	215
3"	5	5	5	5	5	5	5
4"	4	4	4	4	4	4	4
6"	3	3	3	3	3	3	3
8"	4	4	4	4	4	4	4
Total Meters	**908**	**908**	**908**	**908**	**908**	**908**	**908**
Commercial							
5/8"	196	196	196	196	196	196	196
3/4"	23	23	23	23	23	23	23
1"	307	307	307	307	307	307	307
1 1/2"	126	126	126	126	126	126	126
2"	167	167	167	167	167	167	167
3"	14	14	14	14	14	14	14
4"	6	6	6	6	6	6	6
6"	6	6	6	6	6	6	6
8"	-	-	-	-	-	-	-
Total Meters	**845**	**845**	**845**	**845**	**845**	**845**	**845**
Municipal							
5/8"	8	8	8	8	8	8	8
3/4"	1	1	1	1	1	1	1
1"	21	21	21	21	21	21	21
1 1/2"	9	9	9	9	9	9	9
2"	54	54	54	54	54	54	54
3"	2	2	2	2	2	2	2
4"	2	2	2	2	2	2	2
6"	-	-	-	-	-	-	-
8"	-	-	-	-	-	-	-
Total Meters	**97**	**97**	**97**	**97**	**97**	**97**	**97**
Irrigation							
5/8"	8	8	8	8	8	8	8
3/4"	3	3	3	3	3	3	3
1"	37	37	37	37	37	37	37
1 1/2"	35	35	35	35	35	35	35
2"	80	80	80	80	80	80	80
3"	1	1	1	1	1	1	1
4"	1	1	1	1	1	1	1
6"	1	1	1	1	1	1	1
8"	1	1	1	1	1	1	1
Total Meters	**167**	**167**	**167**	**167**	**167**	**167**	**167**
Fireline							
2"	2	2	2	2	2	2	2
3"	-	-	-	-	-	-	-
4"	15	15	15	15	15	15	15
6"	7	7	7	7	7	7	7
8"	7	7	7	7	7	7	7
10"	2	2	2	2	2	2	2
Total Meters	**33**	**33**	**33**	**33**	**33**	**33**	**33**
TOTAL ACCTS	**13,662**	**13,695**	**13,724**	**13,753**	**13,782**	**13,811**	**13,840**

Water Use

Table 3-3 shows the projected water use for FY 2022 through FY 2026 by customer class. The projections are based on small increases due to account growth.

Table 3-3: Projected Annual Water Use by Customer Class

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Single Family Residential							
Tier 1	941,472	943,826	946,185	948,551	950,922	953,299	955,683
Tier 2	538,341	539,687	541,036	542,389	543,745	545,104	546,467
Tier 3	389,391	390,364	391,340	392,319	393,300	394,283	395,268
Multifamily							
Uniform Tier	983,590	983,590	983,590	983,590	983,590	983,590	983,590
Commercial							
Uniform Tier	468,972	468,972	468,972	468,972	468,972	468,972	468,972
Municipal							
Uniform Tier	97,754	97,754	97,754	97,754	97,754	97,754	97,754
Irrigation							
Uniform Tier	310,798	310,798	310,798	310,798	310,798	310,798	310,798
Fireline							
Uniform Tier	50	50	50	50	50	50	50
Total Residential	2,852,794	2,857,467	2,862,152	2,866,848	2,871,556	2,876,276	2,881,008
Total Non-Residential	877,524	877,524	877,524	877,524	877,524	877,524	877,524
Total Fireline	50	50	50	50	50	50	50
TOTAL WATER SALES	**3,730,368**	**3,735,041**	**3,739,726**	**3,744,422**	**3,749,130**	**3,753,850**	**3,758,582**
AF	8,564	8,574	8,585	8,596	8,607	8,618	8,629

Note that the units of volume used in **Table 3-3** and throughout the study include hundred cubic feet (CCF) and acre-feet (AF). One CCF is equal to 748 standard gallons, while one AF is equal to 435.6 CCF or 325,828 gallons.

FINANCIAL PLAN

Raftelis incorporated the assumptions above into the Financial Plan. To estimate the amount of rate revenue needed per year, Raftelis projected annual expenses and revenues, reserve balances, capital expenditures, and debt service coverage ratios. This section of the report provides a discussion of O&M expenses, the Capital Improvement Plan (CIP), current debt service, reserve funding, projected revenues under existing rates, and the revenue adjustments required to ensure fiscal sustainability for the utility.

Revenue Requirement

A utility's revenue requirement is the amount of revenue needed from rates to operate, maintain, and ensure fiscal solvency of the utility. The revenue requirement in each fiscal year includes O&M expenses, rate-funded capital expenditures, debt service payments, and reserve requirements, less any miscellaneous revenues.

O&M Expenses

Table 3-4 shows the City's projected O&M expenses for FY 2022 to 2026. O&M expenses include staff salary and benefit expenses, water supply costs, administration expenses, equipment, and other

miscellaneous costs. The Special Departmental costs included in Water Operations include water production and debt service costs. These expenses are inflated based on the City's current financial projections (see **Table 3-1** for the inflation factors applied to various expense items).

Water Supply Costs

Raftelis also projected water supply costs for each of the City's water sources. Local groundwater costs include pumping and treating water from local wells but are inputted as $0 as the costs are accounted for in the O&M as pumping, electricity, personnel services, and related costs. Groundwater from California Domestic Water Company has a variety of unit costs depending on the pump station used to supply the water, and on the types of water rights involved. Treated water from MWDOC has a unit cost as well. Raftelis projected future water supply costs using the current rates, the City's supply mix projections, water cost inflation factors, projected demand, and the City's water loss factor. The water loss factor is reasonably estimated at 6 percent based on input from City staff. **Table 3-5** shows these projections.

Table 3-4: O&M Expenses

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Water Customer Service							
Personnel Services							
Salaries - Full Time	$199,334	$206,311	$213,531	$221,005	$228,740	$236,746	$245,032
Salaries - Full Time Cl	$1,298	$1,343	$1,391	$1,439	$1,490	$1,542	$1,596
Buyback Vacation Lea	$1,534	$1,611	$1,691	$1,776	$1,865	$1,958	$2,056
1-Time Salary Adjustn	$11,656	$12,239	$12,851	$13,494	$14,168	$14,877	$15,621
Medicare	$2,645	$2,777	$2,916	$3,062	$3,215	$3,375	$3,544
PERS-Employer Share	$59,770	$62,758	$65,896	$69,191	$72,651	$76,283	$80,097
PERS - City Pd Employ	$98	$102	$108	$113	$119	$125	$131
Medical Insurance	$46,945	$49,292	$51,757	$54,344	$57,062	$59,915	$62,910
Worker's Compensati	$1,108	$1,163	$1,221	$1,282	$1,346	$1,414	$1,484
Unemployment Insura	$424	$446	$468	$491	$516	$542	$569
OPEB-Other Post Emp	$6,378	$6,697	$7,032	$7,383	$7,753	$8,140	$8,547
PERS-Cost Sharing	-$2,020	-$2,121	-$2,227	-$2,338	-$2,455	-$2,578	-$2,707
Operations & Mainter							
Professional Service	$223,779	$230,493	$237,408	$244,530	$251,866	$259,422	$267,204
Postage	$77,091	$79,404	$81,786	$84,239	$86,767	$89,370	$92,051
Other Materials & Sup	$2,825	$2,910	$2,997	$3,087	$3,179	$3,275	$3,373
Outside Printing	$32,495	$33,469	$34,474	$35,508	$36,573	$37,670	$38,800
Risk Management Adı	$13,104	$13,497	$13,902	$14,319	$14,749	$15,191	$15,647
Information Services (	$2,400	$2,472	$2,546	$2,623	$2,701	$2,782	$2,866
Administrative Costs	$48,108	$49,551	$51,038	$52,569	$54,146	$55,770	$57,443
Training & Conferenc	$0	$0	$0	$0	$0	$0	$0
Subtotal	**$728,971**	**$754,414**	**$780,784**	**$808,117**	**$836,448**	**$865,818**	**$896,265**
Water Operations							
Personnel Services							
Salaries - Full Time	$1,105,057	$1,143,734	$1,183,764	$1,225,196	$1,268,078	$1,312,461	$1,358,397
Salaries - Part Time	$64,230	$66,478	$68,804	$71,212	$73,705	$76,285	$78,955
Salaries - Overtime	$96,322	$99,693	$103,182	$106,794	$110,532	$114,400	$118,404
Buyback Vacation Lea	$5,511	$5,786	$6,076	$6,380	$6,699	$7,033	$7,385
Final Vacation Payoff	$707	$742	$779	$818	$859	$902	$947
Final Sick Leave Payof	$0	$0	$0	$0	$0	$0	$0
Final Comp Time Payc	$0	$0	$0	$0	$0	$0	$0
1-Time Salary Adjustn	$52,410	$55,030	$57,782	$60,671	$63,704	$66,890	$70,234
1-Time Salary Adj-Cla	$250	$263	$276	$289	$304	$319	$335
Medicare	$17,718	$18,604	$19,534	$20,511	$21,536	$22,613	$23,744
PERS-Employer Share	$323,653	$339,836	$356,827	$374,669	$393,402	$413,072	$433,726
PERS - City Pd Employ	$337	$354	$372	$390	$410	$430	$452
PERS-Cost Sharing	-$11,098	-$11,653	-$12,236	-$12,848	-$13,490	-$14,165	-$14,873

Medical Insurance	$234,404	$246,124	$258,430	$271,352	$284,919	$299,165	$314,123
Worker's Compensati	$107,519	$112,895	$118,540	$124,467	$130,691	$137,225	$144,086
Unemployment Insura	$2,644	$2,776	$2,915	$3,060	$3,214	$3,374	$3,543
Auto/Uniform/Tool/Ce	$3,460	$3,633	$3,814	$4,005	$4,205	$4,416	$4,636
OPEB-Other Post Emp	$33,864	$35,557	$37,335	$39,202	$41,162	$43,220	$45,381
Operations & Mainter							
Other Materials & Sup	$250,474	$257,989	$265,728	$273,700	$281,911	$290,368	$299,079
Professional Service	$677,230	$697,547	$718,473	$740,028	$762,228	$785,095	$808,648
Outside Printing	$9,276	$9,554	$9,840	$10,136	$10,440	$10,753	$11,076
Safety Equipment and	$3,680	$3,790	$3,904	$4,021	$4,142	$4,266	$4,394
Postage	$5,056	$5,207	$5,364	$5,525	$5,690	$5,861	$6,037
Dues & Memberships	$2,688	$2,769	$2,852	$2,937	$3,025	$3,116	$3,209
Publications & Subscr	$0	$0	$0	$0	$0	$0	$0
Leases	$1,357,820	$1,398,555	$1,440,511	$1,483,727	$1,528,238	$1,574,086	$1,621,308
Training & Conferenc	$2,671	$2,751	$2,834	$2,919	$3,006	$3,096	$3,189
Utilities - Telephone	$6,316	$6,506	$6,701	$6,902	$7,109	$7,322	$7,542
Utilities - Electricity	$373,346	$433,125	$446,119	$459,502	$473,287	$487,486	$502,111
IT Equipment Replace	$22,344	$23,014	$23,705	$24,416	$25,148	$25,903	$26,680
Risk Management Adı	$366,876	$377,882	$389,219	$400,895	$412,922	$425,310	$438,069
Information Services C	$150,600	$155,118	$159,772	$164,565	$169,502	$174,587	$179,824
Administrative Costs	$364,764	$375,707	$386,978	$398,587	$410,545	$422,861	$435,547
Advertising	$0	$0	$0	$0	$0	$0	$0
Awards & Recognitior	$207	$213	$219	$226	$233	$240	$247
Special Events	$3,572	$3,679	$3,789	$3,903	$4,020	$4,141	$4,265
Miscellaneous	$73,274	$75,472	$77,736	$80,068	$82,470	$84,944	$87,493
Interfund Transfers O	$71,250	$73,388	$75,589	$77,857	$80,193	$82,598	$85,076
Interest Expense	$703,693	$724,803	$746,547	$768,944	$792,012	$815,772	$840,246
Principal Payments	$875,000	$901,250	$928,288	$956,136	$984,820	$1,014,365	$1,044,796
Bad Debt Expense	$161	$165	$170	$175	$181	$186	$192
Capital Outlay							
Equipment	$31,533	$31,533	$31,533	$31,533	$31,533	$31,533	$31,533
Improvements	$0	$0	$0	$0	$0	$0	$0
Repair & Maint - Equi	$193,033	$193,033	$193,033	$193,033	$193,033	$193,033	$193,033
Repair & Maintenanc	$165,153	$165,153	$165,153	$165,153	$165,153	$165,153	$165,153
Repair & Maintenanc	$0	$0	$0	$0	$0	$0	$0
Rent & Leases-Equipr	$4,112	$4,112	$4,112	$4,112	$4,112	$4,112	$4,112
Vehicle Replacement	$89,961	$89,961	$89,961	$89,961	$89,961	$89,961	$89,961
Vehicles	$0	$0	$0	$0	$0	$0	$0
Water Purchase							
Purchases for Resale	$5,881,411	$5,900,000	$6,000,886	$6,293,668	$6,601,678	$6,925,713	$7,266,611
Subtotal	**$13,722,484**	**$14,032,126**	**$14,385,211**	**$14,938,796**	**$15,516,522**	**$16,119,502**	**$16,748,905**
Water Projects							
Personnel Services							
Salaries - Full Time	$360	$373	$386	$400	$414	$428	$443
Medicare	$5	$5	$5	$5	$6	$6	$6
PERS-Employer Share	$89	$94	$98	$103	$109	$114	$120
PERS-Cost Sharing	-$4	-$4	-$4	-$4	-$4	-$5	-$5
Medical Insurance	$83	$87	$92	$96	$101	$106	$111
Worker's Compensati	$13	$14	$15	$16	$16	$17	$18
Unemployment Insura	$1	$1	$1	$1	$1	$1	$1
OPEB-Other Post Emp	$9	$9	$10	$10	$11	$11	$12
Operations & Mainter							
Professional Service	$118,659	$122,218	$125,885	$129,661	$133,551	$137,558	$141,685
Outside Printing	$0	$0	$0	$0	$0	$0	$0
Advertising	$3,886	$4,003	$4,123	$4,247	$4,374	$4,505	$4,640
Capital Outlay							
Improvements	$537,766	$537,766	$537,766	$537,766	$537,766	$537,766	$537,766
Subtotal	**$660,867**	**$664,566**	**$668,376**	**$672,300**	**$676,343**	**$680,507**	**$684,797**
TOTAL O&M	**$15,112,322**	**$15,451,106**	**$15,834,371**	**$16,419,213**	**$17,029,313**	**$17,665,827**	**$18,329,966**

Table 3-5: Water Supply Costs

Unit Costs($/AF)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Local Groundwater							
Delivery Costs	$0	$0	$0	$0	$0	$0	$0
Cal Domestic Treated							
Lift 1: Entitlement	$533	$542	$569	$598	$627	$659	$692
Lift 1: Leased	$533	$542	$569	$598	$627	$659	$692
Lift 1: Entitlement (Class A Shares)	$322	$325	$341	$358	$376	$395	$415
Lift 1: Over-Entitlement (Nov 2016 Shares)	$0	$0	$0	$0	$0	$0	$0
Lift 1: Over-Entitlement	$1,114	$1,137	$1,194	$1,254	$1,316	$1,382	$1,451
Lift 2: Entitlement	$657	$671	$705	$740	$777	$816	$856
Lift 2: Leased	$657	$671	$705	$740	$777	$816	$856
Lift 2: Entitlement (Class A Shares)	$362	$367	$385	$405	$425	$446	$468
Lift 2: Over-Entitlement (Nov 2016 Shares)	$0	$0	$0	$0	$0	$0	$0
Lift 2: Over-Entitlement	$1,154	$1,179	$1,238	$1,300	$1,365	$1,433	$1,505
MWDOC	$0	$0	$0	$0	$0	$0	$0
Treated Water Assessment Cost	$1,105	$1,124	$1,180	$1,239	$1,301	$1,366	$1,435
AVERAGE UNIT COST (AF)	**$536**	**$547**	**$574**	**$603**	**$633**	**$664**	**$697**
Total Demand (AF)	8,564	8,574	8,585	8,596	8,607	8,618	8,629
Water Loss Factor	2.85%	6.00%	6.00%	6.00%	6.00%	6.00%	6.00%

Water Supply	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Local Groundwater							
Local Supply	2,075	2,300	2,456	2,456	2,456	2,456	2,456
Cal Domestic Treated							
Lift 1: Entitlement	1,775	1,771	1,771	1,771	1,771	1,771	1,771
Lift 1: Leased	34	34	34	34	34	34	34
Lift 1: Entitlement (Class A Shares)	362	345	345	345	345	345	345
Lift 1: Over-Entitlement (Nov 2016 Shares)	-	-	-	-	-	-	-
Lift 1: Over-Entitlement	973	955	955	955	955	955	955
Lift 2: Entitlement	1,785	1,789	1,789	1,789	1,789	1,789	1,789
Lift 2: Leased	35	35	35	35	35	35	35
Lift 2: Entitlement (Class A Shares)	332	348	348	348	348	348	348
Lift 2: Over-Entitlement (Nov 2016 Shares)	-	-	-	-	-	-	-
Lift 2: Over-Entitlement	894	963	963	963	963	963	963
MWDOC							
Treated Water	550	582	438	449	461	472	484
TOTAL WATER SUPPLY	**8,815**	**9,122**	**9,133**	**9,145**	**9,156**	**9,168**	**9,179**

Total Supply Costs	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Local Groundwater							
Local Supply	$0	$0	$0	$0	$0	$0	$0
Cal Domestic Treated							
Lift 1: Entitlement	$946,075	$959,882	$1,007,876	$1,058,270	$1,111,183	$1,166,743	$1,225,080
Lift 1: Leased	$18,122	$18,428	$19,349	$20,317	$21,333	$22,399	$23,519
Lift 1: Entitlement (Class A Shares)	$116,564	$112,125	$117,731	$123,618	$129,799	$136,289	$143,103
Lift 1: Over-Entitlement (Nov 2016 Shares)	$0	$0	$0	$0	$0	$0	$0
Lift 1: Over-Entitlement	$1,083,922	$1,085,835	$1,140,127	$1,197,133	$1,256,990	$1,319,839	$1,385,831
Lift 2: Entitlement	$1,172,745	$1,200,419	$1,260,440	$1,323,462	$1,389,635	$1,459,117	$1,532,073
Lift 2: Leased	$22,995	$23,485	$24,659	$25,892	$27,187	$28,546	$29,973
Lift 2: Entitlement (Class A Shares)	$120,184	$127,716	$134,102	$140,807	$147,847	$155,240	$163,002
Lift 2: Over-Entitlement (Nov 2016 Shares)	$0	$0	$0	$0	$0	$0	$0
Lift 2: Over-Entitlement	$1,031,676	$1,135,377	$1,192,146	$1,251,753	$1,314,341	$1,380,058	$1,449,061
Cal Domestic Assessment Fees	$169,413	$169,413	$169,413	$169,413	$169,413	$169,413	$169,413
Cal Domestic Meter Fees	$49,646	$49,646	$51,135	$52,669	$54,250	$55,877	$57,553
Cal Domestic Stock Purchases	$76,250	$76,250	$76,250	$76,250	$76,250	$76,250	$76,250
MWDOC							
Treated Water	$607,750	$653,922	$516,550	$556,591	$599,382	$645,100	$693,932
MWDOC Readiness to Serve Fee	$12,528	$12,528	$12,904	$13,291	$13,690	$14,100	$14,523
MWDOC Capacity Charges	$78,264	$78,264	$78,264	$78,264	$78,264	$78,264	$78,264
MWDOC Meter Charges	$194,116	$194,116	$199,939	$205,938	$212,116	$218,479	$225,034
TOTAL WATER SUPPLY COSTS	**$5,700,250**	**$5,897,406**	**$6,000,886**	**$6,293,668**	**$6,601,678**	**$6,925,713**	**$7,266,611**

Capital Improvement Plan

Table 3-6 shows the City's planned capital expenditures from FY 2022 to 2026. Costs are listed in inflated dollars. All capital improvements will be funded through rate revenues.

Table 3-6: Detailed Capital Improvement Plan – Inflated

Inflated Capital Expenditures ($)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
ANNUAL PROGRAMS						
Annual Water Valve Replacement Pr	$112,000	$112,000	$112,000	$112,000	$112,000	$112,000
Annual Cast Iron Pipe Replacement V	$1,125,000	$1,125,000	$1,125,000	$1,125,000	$1,125,000	$1,125,000
Annual Water Meter Replacement Pr	$500,000	$500,000	$500,000	$500,000	$25,000	$25,000
La Habra Turf Removal Program	$50,000	$50,000	$50,000	$50,000	$50,000	$50,000
Public Works Yard Assessment	$0	$17,000	$0	$0	$0	$0
ONE TIME PROJECTS						
Foothile Zone Consolidation Project		$1,000,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Replace Tower Packing Idaho Well		$0	$0	$65,000	$0	$0
Drill Well		$0	$0	$0	$0	$0
TOTAL INFLATED CAPITAL EXPENDITUI	**$1,787,000**	**$2,804,000**	**$2,787,000**	**$2,852,000**	**$2,312,000**	**$2,312,000**

Debt Service

The City pays existing debt service, including both principal and interest payments, on three previously-issued Water Revenue Bonds. The City does not plan to issue any additional debt during the study period. **Table 3-7** shows the projected debt service payments for the next five years.

Table 3-7: Debt Service Payments

All Funds	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Existing Debt Service							
Principal	$875,000	$910,000	$945,000	$990,000	$1,025,000	$1,065,000	$1,110,000
Interest	$1,390,848	$1,357,050	$1,321,640	$1,284,178	$1,244,560	$1,202,603	$1,158,100
Debt Service	**$2,265,848**	**$2,267,050**	**$2,266,640**	**$2,274,178**	**$2,269,560**	**$2,267,603**	**$2,268,100**

Proposed Financial Plan and Revenue Adjustments

The proposed revenue adjustments ensure adequate revenue to fund operating expenses, capital expenditures, and compliance with bond covenants. The financial planning model assumes the revenue adjustments occur January 1 of each year. The proposed revenue adjustments enable the City to maintain adequate cash reserves, execute the CIP shown in **Table 3-6,** and exceed its debt service coverage requirement of 125% over the study period.

Table 3-8 shows the proposed revenue adjustments for FY 2022 through 2026. These increases are needed to finance the operating and capital expenses and reserves funding, and to provide revenue stability for the City. Raftelis recommends revenue adjustments of 3% for each year study period, starting in FY 2022 and ending in FY 2026.

Table 3-8: Proposed Revenue Adjustments

Effective Date	Revenue Adjustment
Jan - 2022	3%
Jan - 2023	3%
Jan - 2024	3%
Jan - 2025	3%
Jan - 2026	3%

Table 3-9 shows the cash flow detail for the study period, including the proposed revenue adjustments and all applicable revenue requirements. Note that the calculated water supply costs, as well as debt service costs, are shown separately from the O&M expenses to avoid double-counting these expenses.

Table 3-9: Proposed Water Cash Flow

			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Revenues									
Rate Revenues			$18,597,446	$19,503,161	$19,528,766	$19,554,331	$19,580,023	$19,605,676	$19,631,456
Revenue Adjustments									
FY 2021	0%	January	$0	$0	$0	$0	$0	$0	$0
FY 2022	3%	January		$292,547	$585,863	$586,630	$587,401	$588,170	$588,944
FY 2023	3%	January			$301,719	$604,229	$605,023	$605,815	$606,612
FY 2024	3%	January				$311,178	$623,173	$623,990	$624,810
FY 2025	3%	January					$320,934	$642,710	$643,555
FY 2026	3%	January						$330,995	$662,861
FY 2027	3%	January							$341,374
Total Rate Revenues				$19,795,709	$20,416,348	$21,056,368	$21,716,554	$22,397,357	$23,099,611
Other Revenue				$13,695	$13,695	$13,695	$13,695	$13,695	$13,695
Interest Income				$109,826	$107,301	$103,775	$103,102	$105,629	$108,603
Subtotal - Revenues				**$19,919,230**	**$20,537,345**	**$21,173,838**	**$21,833,351**	**$22,516,681**	**$23,221,909**
Expenses									
O&M Expenses				$9,120,575	$9,387,366	$9,666,043	$9,954,347	$10,252,628	$10,561,245
Water Supply Costs				$5,897,406	$6,000,886	$6,293,668	$6,601,678	$6,925,713	$7,266,611
Water Power Costs				$433,125	$446,119	$459,502	$473,287	$487,486	$502,111
Total Debt Service				$2,267,050	$2,266,640	$2,274,178	$2,269,560	$2,267,603	$2,268,100
Rate Funded CIP				$2,804,000	$2,787,000	$2,852,000	$2,312,000	$2,312,000	$2,312,000
Subtotal - Expenses				**$20,522,156**	**$20,888,011**	**$21,545,390**	**$21,610,873**	**$22,245,429**	**$22,910,066**
Net Cash Flow				**($602,926)**	**($350,666)**	**($371,553)**	**$222,478**	**$271,251**	**$311,843**
Debt Coverage				278%	291%	295%	300%	305%	309%
Target Coverage				125%	125%	125%	125%	125%	225%

The last two lines of **Table 3-9** show the calculated debt coverage calculation, as well as the target coverage. Debt coverage is expressed as a ratio of net revenues (total revenue less O&M expenses and water supply costs) to total debt service payments in each year. The City exceeds its debt

coverage requirement of 125% throughout the study period. The coverage excludes lease expenses from the expenses for coverage calculations.

Figures 3-1 through **3-4** display the Financial Plan in graphical format. **Figure 3-1** shows the modeled revenue adjustments (red bars) for the next five years on the left-hand axis. **Figure 3-1** also graphs the calculated and required debt coverage requirements, as shown by the green and purple lines respectively, on the right-hand axis.

Figure 3-1: Revenue Adjustments & Debt Coverage Ratios

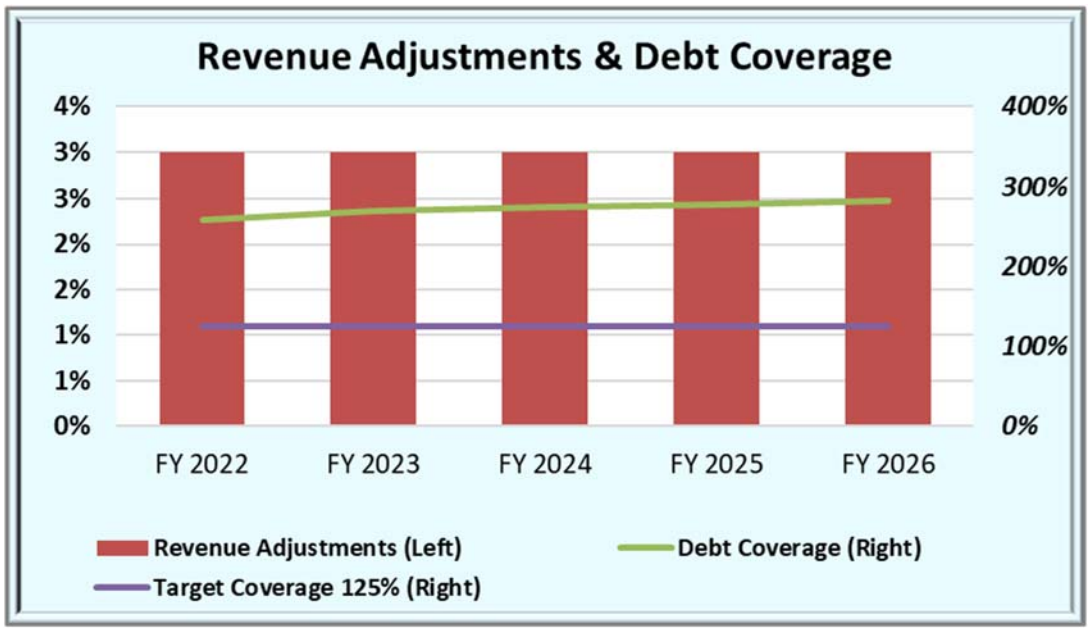


Figure 3-2 graphically illustrates the Financial Plan – it compares existing and proposed revenues with projected expenses. The expenses, including O&M, debt service, and rate-funded CIP, are shown by the stacked bars. Note that water supply costs are included in the O&M expenses in this graph. Total revenues under existing and proposed rates are shown by the horizontal blue and red lines, respectively. Revenues under the existing rates are not enough to meet expenses and would cause a significant draw on the reserves as shown by the gap between blue line and the top of the expense bars. The net cash flow under the proposed revenue adjustments are shown in orange and shows a small draw on reserves in the first three years and a small supplement to the reserves in the last two years.

Figure 3-2: Water Utility Financial Plan

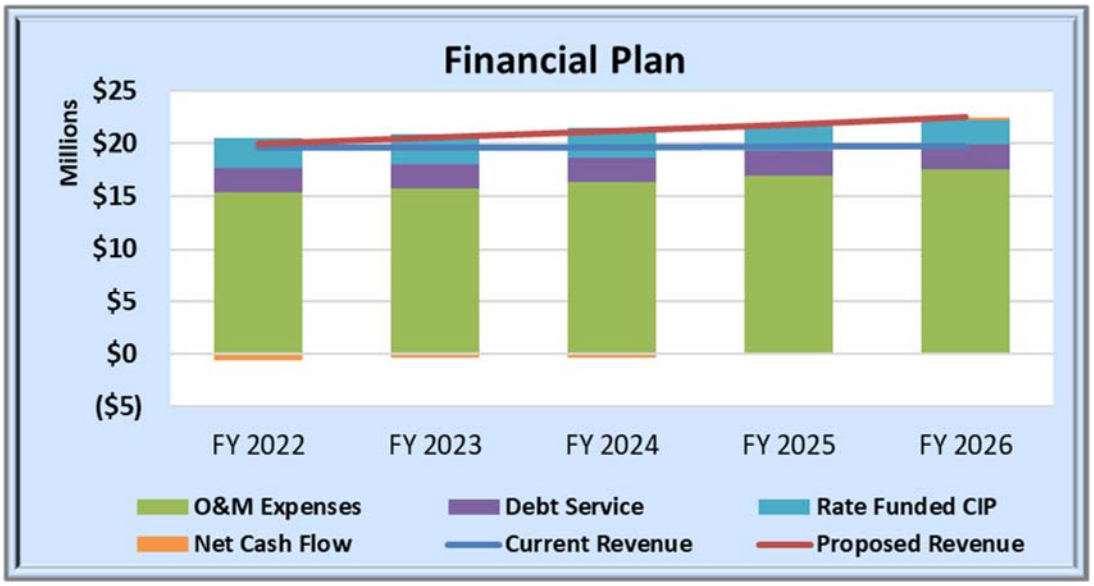


Figure 3-3 summarizes the projected CIP. The capital projects are funded entirely by rate revenue.

Figure 3-3: Capital Financing Plan

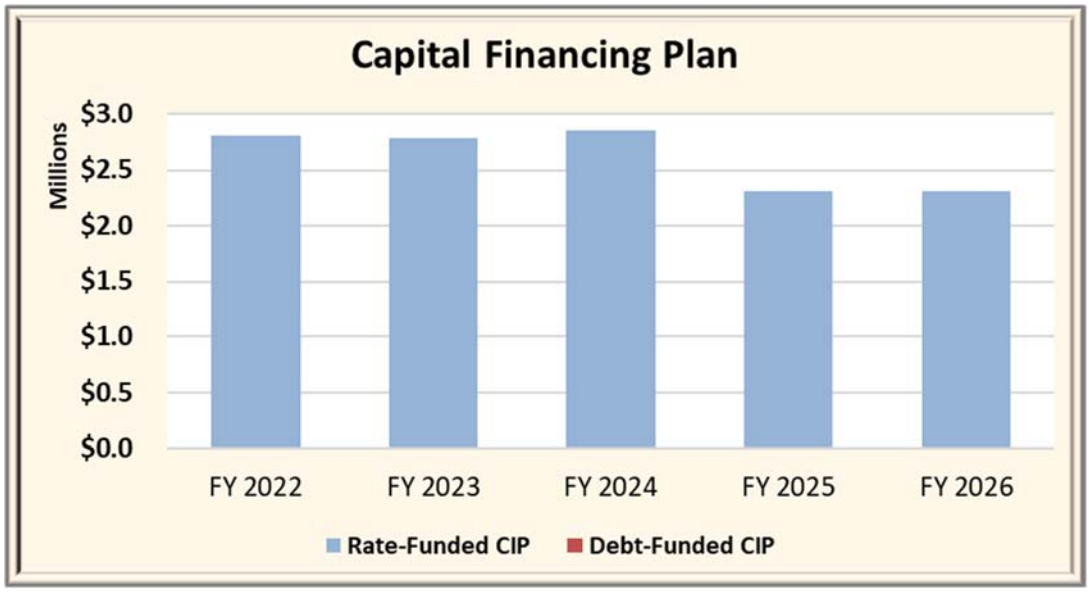


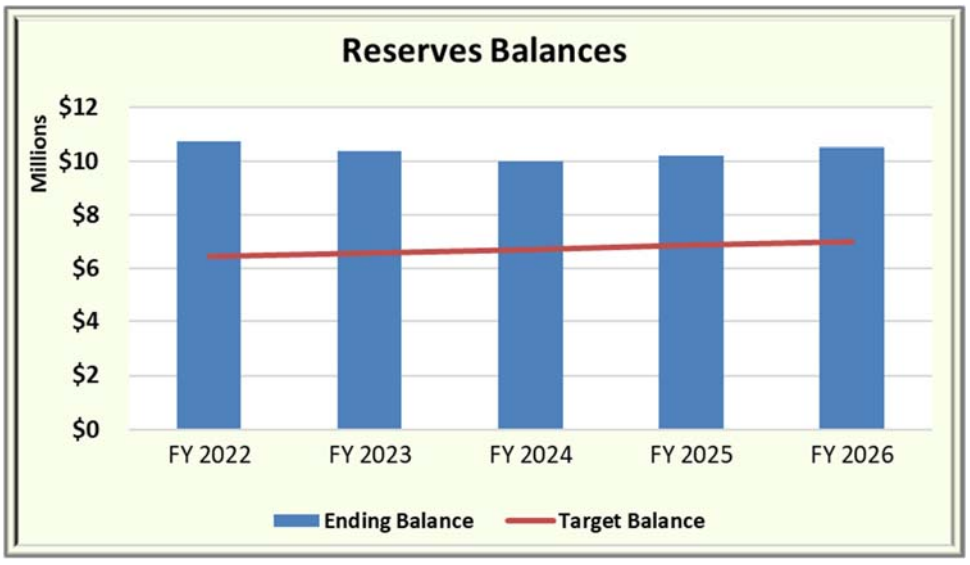
Table 3-10 shows the projected cash balance and the reserves target for the operating and capital reserves in the water utility. The net cash flow comes from the bottom of **Table 3-9**.

Table 3-10: Projected Reserve Balances

	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Operating Reserve Fund						
Unrestricted Cash	$7,717,820	$4,164,075	$3,664,968	$3,138,571	$3,199,508	$3,302,218
Cash moved to Operating Reserve		*$1,429,013*	*$146,211*	*$152,525*	*$159,128*	*$166,035*
Operating Reserve	$2,529,580	$3,958,593	$4,104,803	$4,257,328	$4,416,457	$4,582,492
Net Cash Flow	($602,926)	($352,897)	($373,872)	$220,066	$268,744	$309,237
Transfer to Capital Reserve	($1,521,806)	$0	$0	$0	$0	$0
Ending Balance (Unrestricted Cash)	$5,593,088	$3,811,179	$3,291,096	$3,358,637	$3,468,253	$3,611,455
Interest	*$91,301*	*$78,937*	*$75,321*	*$74,556*	*$76,988*	*$79,863*
Operating Re 25%	*$3,862,776*	*$3,958,593*	*$4,104,803*	*$4,257,328*	*$4,416,457*	*$4,582,492*
Capital Reserve						
Beginning Balance	$1,091,594	$2,613,400	$2,613,400	$2,613,400	$2,613,400	$2,613,400
Transfer from Operating Reserves	$1,521,806	$0	$0	$0	$0	$0
Debt Proceeds	$0	$0	$0	$0	$0	$0
Debt Funded CIP	$0	$0	$0	$0	$0	$0
Ending Balance	$2,613,400	$2,613,400	$2,613,400	$2,613,400	$2,613,400	$2,613,400
Interest	*$18,525*	*$26,134*	*$26,134*	*$26,134*	*$26,134*	*$26,134*
Capital Reserves Target	$2,613,400	$2,613,400	$2,613,400	$2,613,400	$2,613,400	$2,613,400
Total Reserves	**$10,736,068**	**$10,383,171**	**$10,009,299**	**$10,229,365**	**$10,498,109**	**$10,807,347**

Figure 3-4 displays the resulting aggregate fund balance for the water utility. The red line represents the total current target, which equals 25% of annual O&M expenses for the operating reserve fund, and 100% of the average annual CIP costs for the capital reserve fund. The operating reserve provides funds for working capital and to meet any unexpected changes in operating costs during the year and the capital reserve provides revenues to meet capital expenses and unexpected increases to the CIP costs. The dark blue stacked bar is the end-year balance of the unrestricted operating cash, operating, and capital reserves. Reserves are expected to fall slightly in FY 2022, FY 2023, and FY 2024 as cash from the operating fund is used to fund capital projects and meet other expenses. The balance will then increase as increased rate revenues contribute to positive net cash flows in subsequent years. The City's reserves remain above the target through the entire study period.

Figure 3-4: Total Reserves Balances



4. COST OF SERVICE ANALYSIS

This section describes the methodology of allocating costs equitably to customers. This is intended to ensure that customers pay their fair share, proportional to the cost of serving them.

METHODOLOGY

As stated in the American Water Works Association (AWWA) M1 Manual, "the costs of water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." To develop utility rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility, we follow the Cost of Service (COS) methodology discussed below.

1) Calculate Revenue Requirement

The rate-making process starts by determining the revenue requirement. In this study the "test year" is FY 2022. The revenue requirement should sufficiently fund the utility's O&M, debt service, capital expenses, and reserve requirements.

2) Cost of Service Analysis (COS)

The annual cost of providing water service is distributed among customer classes commensurate with their service requirements. A COS analysis involves the following:

1. Functionalizing costs. Examples of functions are supply, treatment, transmission, distribution, storage, meter servicing, customer billing, etc.
2. Allocating functionalized costs to cost causation components. Cost causation components include supply, base delivery, maximum day, maximum hour[1], meter service, customer service and fire service costs.
3. Calculating cost to serve each customer class. Allocate cost causation components to the total customer demands to determine unit costs for each cost causation component and spread the unit costs to customer classes in proportion to their demands on the water system. This is described in the M1 Manual published by AWWA.

A COS analysis considers both the average quantity of water consumed (base delivery costs) and the peak rate at which it is consumed (peaking or capacity costs as identified by maximum day and maximum hour demands).[2] Peaking costs are costs that are incurred during peak times of consumption. The water system is designed to handle peak demands and additional costs are associated with designing, constructing, and operating and maintaining larger facilities needed to

[1] Collectively, maximum day and maximum hour costs are known as peaking costs or capacity costs.

[2] System capacity is the system's ability to supply water to all delivery points at the time when demanded. It is measured by each customer's water demand at the time of the greatest system demand. The time of greatest demand is known as peak demand. Both the operating costs and the capital asset related costs incurred to accommodate the peak demands are allocated to each customer class based upon the class's peaking characteristics.

meet peak demands. The peak demand costs need to be allocated to those imposing such costs on the utility. In other words, not all customer classes share the same responsibility for peaking costs.

3) Rate Design and Calculations

Rates do more than simply recover costs. Within the legal framework and industry standards, properly designed rates should support and optimize a blend of various utility objectives, such as conservation, affordability for essential needs and revenue stability among other objectives. Rates may also act as a public information tool in communicating these objectives to customers.

4) Rate Adoption

Rate adoption is the last step of the rate-making process to comply with Proposition 218. Raftelis documented the rate study results in this Study Report to help educate the public about the proposed changes, the rationale and justifications behind the changes and their anticipated financial impacts in lay terms.

A cost of service analysis distributes a utility's revenue requirements (costs) to each customer class equitably. After determining a utility's revenue requirements, the next step in a cost of service analysis is to functionalize its O&M costs, based on the City's current O&M budget:

1. **Supply** – represents the cost of producing water from various sources
2. **Customer Service** – represents the costs associated with meter reading, billing and customer and meter service
3. **Water Operations** – represents the costs of operating and maintaining the water system
4. **Water Projects** – covers the costs of minor repairs and capital outlay
5. **Water Fund** - covers some labor related expenses for the utility

Capital costs are similarly functionalized based on the assets which include land, water supply, wells reservoirs, meters, distribution and transmission systems, buildings, machinery and equipment, vehicles, and treatment plant.

The functionalization of costs allows us to better allocate the functionalized costs to the **cost causation components**. The cost causation components include:

1. **Supply** – variable costs associated with providing water supply to all customers
2. **Base Delivery** – fixed costs associated with providing service under average conditions
3. **Peaking** (maximum day and maximum hour) – costs associated with meeting demand in excess of average use
4. **Fire** – costs associated with providing fire protection capacity
5. **Meters** – costs associated with maintenance of meters and capacity costs
6. **Customer** – costs incurred to provide meter reading, billing, and customer service
7. **General** – costs that cannot be allocated directly to any one cost causation component

Peaking costs are divided into maximum day and maximum hour demand. The maximum day demand is the maximum amount of water used in a single day in a year. The maximum hour demand

is the maximum usage in an hour on the maximum usage day. Different facilities, such as distribution and storage facilities (and the O&M costs associated with those facilities), are designed to meet the peaking demands of customers. Therefore, extra capacity[3] costs include the O&M and capital costs associated with meeting peak customer demand. This method is consistent with the AWWA M1 Manual and is widely used in the water industry to perform cost of service analyses.

ANALYSIS

Revenue Requirement Determination

Table 4-1 shows the revenue requirement derivation with the total revenue required from rates. The totals shown in the "Operating" and "Capital" columns are the total O&M and capital revenue requirements, respectively, that are to be recovered through rates. The operating costs and debt service costs are from Table 3-4 and **Table 3-7** and the capital costs from **Table 3-6**.

Raftelis calculated the revenue requirement using FY 2022 expenses, which include O&M expenses, water supply costs, rate funded capital expenses and existing and proposed debt service. To arrive at the rate revenue requirement, we subtract revenue offsets (e.g., non-rate revenues). We also adjust for the timing of rate increases, and for annual cash balances. These adjustments are then combined to arrive at the total annual revenue requirement from rates. This is the amount that the City's rates are designed to collect.

[3] *The terms extra capacity, peaking and capacity costs are used interchangeably.*

Table 4-1: Revenue Requirement Determination

	FY 2022		
	Operating	Capital	Total
Revenue Requirements			
O&M Expenses (less supply and debt costs)	$9,120,575	$0	$9,120,575
Water Supply Costs	$5,897,406	$0	$5,897,406
Water Power Costs	$433,125	$0	$433,125
Existing Debt Service	$0	$2,267,050	$2,267,050
Proposed Debt Service	$0	$0	$0
Rate Funded CIP	$0	$2,804,000	$2,804,000
Subtotal	**$15,451,106**	**$5,071,050**	**$20,522,156**
Revenue Offsets			
Non Rate Revenue	$13,695	0	$13,695
Interest Income	$109,826	0	$109,826
Subtotal	**$123,521**	**$0**	**$123,521**
Less Adjustments			
Additional Revenue to Annualize Rate Increase	-$292,547	0	-$292,547
Transfers from (to) reserves	$0	$602,926	$602,926
Subtotal	**-$292,547**	**$602,926**	**$310,379**
Annual Revenue to be Recovered from Rates	**$15,620,132**	**$4,468,124**	**$20,088,256**

Peaking Factors

Water systems are designed to handle maximum day (Max Day) and maximum hour (Max Hour) demands. Different customer classes exhibit different peaking characteristics. Typically, irrigation causes the highest peaks since it is primarily associated with summer demand. Single family residential customers use significant of their water usage for irrigation and have relatively higher peaking factors compared to multi-family or commercial customers. Irrigation customers have the highest peaking factors. To assign costs appropriately we analyzed the water use patterns of each class of customers and the peaking characteristics of the City's water system.

Error! Reference source not found. shows the system-wide peaking factors provided by the City that are used to derive the cost component allocation bases for Base Delivery, Max Day, and Max Hour costs. The Base Delivery, or Base use is considered average daily demand over one year, which has been normalized to a factor of 1.00. The Max Day peaking factor indicates that the Max Day demand is 2.20 times greater than the average daily demand. Similarly, the Max Hour peaking factor shows that the Max Hour demand is 3.30 times greater than average demand.

The percentage allocations of costs are calculated using the equations outlined.

The Base allocation is *1/1 x 100%= 100%*

The Max Day allocation are calculated as follows:

- Base Delivery: *1 / 2.2 x 100% = 45%*
- Max Day: *(2.2 - 1) / 2.2 x 100% = 55%*

The Max Hour allocations are calculated as follows:

- Base Delivery: *1 / 3.3 x 100% = 30%*
- Max Day: *(2.2 - 1) / 3.3 x 100% = 36%*
- Max Hour: *(3.3 – 2.2) / 3.3 x 100% = 33%*

Since the water system is also designed to provide fire flow demands, based on Insurance Standards Office (ISO) standards, 10% of the total Max Day and Max Hour demands are allocated to fire and the percentage allocations to Max Day and Max Hour are reduced as shown in **Table 4-2**.

Table 4-2 also shows the derivation of the peaking factors by customer class and tier, determined by dividing the total maximum monthly usage by the average monthly usage for each customer class and tier. For this analysis, we employ the classes and tiers used in the proposed rate schedule, including a separate class for multifamily residential accounts. These peaking factors are used to allocate the peaking costs to each customer class and tier. See the Rate Derivation portion of this Section for a detailed discussion of tier widths and the use of peaking factors in determining rates.

Municipal use consists of indoor use and irrigation similar to residential use. Municipal use is relatively small, and the peaking factors can fluctuate significantly when use is small therefore, the municipal customer is assessed a peaking factor based on the average of the residential tiered peaking factors. Firelines should not have any use except for fire suppression. Fireline use is small and will have very high peaking factors, therefore the high irrigation peaking factors are used for fire demand.

Table 4-2: Peaking Factors for the System and for Customer Classes

System Peaking Factors

Peaking Factors		Percentage Allocations			
		Base	Max Day	Max Hour	Fire
Base Demand	1.00	1			
		100%			
Max Day Demand (MD)	2.20	1	1.2		
		40%	50%		10%
Max Hour Demand (MH)	3.30	1	1.2	1.1	
		27%	33%	30%	10%
Average MD+MH		34%	41%	15%	10%

Customer Class Peaking Factors

Customer Specific Tiers & Usage		Total Annual Consumption	Max Monthly	Avg Monthly	Peaking Factor
Single Family Residential					
Tier 1	1-8 ccf	943,826	81,380	78,456	1.04
Tier 2	9-16 ccf	539,687	56,691	44,862	1.26
Tier 3	>16 ccf	390,364	54,176	32,449	1.67
Multifamily					
Uniform Tier		983,590	89,782	81,966	1.10
Commercial					
Uniform Tier		468,972	44,937	39,081	1.15
Municipal					
Uniform Tier		97,754	14,040	8,146	1.32
Irrigation					
Uniform Tier		310,798	87,617	25,900	1.67
Fireline					
Uniform Tier		50	27	4	1.67

Equivalent Meters

To allocate meter-related costs appropriately, the concept of equivalent meters needs to be understood. By using equivalent meters instead of a straight meter count, the analysis accounts for the fact that larger meters impose larger demands and are more expensive to install, maintain, and replace than smaller meters. Equivalent meters are used in calculating meter service costs.

Equivalent meters are based on meter hydraulic capacity. Equivalent meters represent the potential demand on the water system in terms of the base or smallest meter size. A ratio of hydraulic capacity is calculated by dividing large meter capacities by the base meter capacity. The capacity ratio is calculated using the meter capacity in gallons per minute (gpm) provided in the AWWA M1 Manual *Principles of Water Rates, Fees and Charges (7th Edition)*.

The base meter is the smallest meter, in this case, a 5/8-inch meter. The actual number of meters by size is multiplied by the corresponding capacity ratio to calculate equivalent meters. **Table 4-3** shows the equivalent meters for FY 2022. Note that equivalent meters associated with fireline

accounts are calculated separately, with their own hydraulic capacity ratios based on industry standards.

Table 4-3: Equivalent Meters

Meter Size	Capacity (gpm)	AWWA Ratio	Number of Meters	Equivalent Meters
5/8"	20	1.0	8,637	8,637
3/4"	30	1.5	648	972
1"	50	2.5	3,456	8,640
1 1/2"	100	5.0	345	1,725
2"	160	8.0	526	4,208
3"	300	15.0	22	330
4"	500	25.0	13	325
6"	1,000	50.0	10	500
8"	1,600	80.0	5	400
10"	2,300	115.0	-	-
	TOTAL METERS:		**13,662**	**25,737**

Allocation of Functionalized Expenses to Cost Causation Components

Table 4-4 allocates the O&M and capital expenses to each cost component. The functional costs are allocated according to industry standards based on the design characteristics of the different components of the water function. For example, water supply costs are allocated 100% to the Supply component, Water Customer Service costs are allocated primarily to Customers and the balance to Meters, Water Operations costs are based on the water system and are allocated on the average of Max Day and Max Hour adjusted for the fixed charges associated with water supply. Water Project costs primarily related to the infrastructure are allocated to the average of the Max Day and Max Hour components. Finally, Water Fund costs are allocated to General.

Capital costs are allocated based on the system assets because capital costs are incurred to refurbish and replace system assets. Using system assets takes a longer term view of the allocations of capital costs and provides a consistent allocation of costs from year to year even if the capital costs associated with different types of system assets change every year. Well costs are allocated on the basis of Max Day, Reservoirs are also based on Max Day and need Fire Flow capacity, Distribution costs are allocated on the basis of Max Hour including Fire Flow, and Meter Service costs are allocated to the Meter component. Costs, such as Vehicles, which cannot be readily functionalized are allocated to General, and then spread amongst all the other cost causation components proportionate to the overall cost allocation.

Table 4-4 shows the total resulting cost causation component allocation for O&M expenses. This resulting allocation is used to allocate the City's operating revenue requirement to the cost causation components. Base costs are further split into Supply and Base Delivery.

The bottom half of

Table 4-4 shows the cost allocations for the City's assets. These allocations are derived in a similar manner as the O&M allocation - first, we functionalized the City's assets and then allocated them to the cost causation components, resulting in the asset allocations shown at the bottom of

Table 4-4. For each of the City's assets, we consider the replacement value of each asset to estimate the cost allocations.

Table 4-4: Allocation of Functionalized O&M and Capital Expenses to Cost Components

Line #	Expense Allocation	Supply	Base Delivery	Power	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
1	**Water Supply Costs**	100%	0%	0%	0%	0%	0%	0%	0%	0%	**100%**
2	**Water Power Costs**	0%	0%	100%	0%	0%	0%	0%	0%	0%	**100%**
3	**Water Customer Service**	0%	0%	0%	0%	0%	0%	25%	75%	0%	**100%**
4	**Water Operations**	0%	44%	0%	34%	12.00%	10%	0%	0%	0%	**100%**
5	**Water Projects**	0%	34%	0%	41%	15%	10%	0%	0%	0%	**100%**
6	**Water Fund**	0%	0%	0%	0%	0%	0%	0%	0%	100%	**100%**

7	Expense Allocation	Supply	Base Delivery		Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
8	**Water Supply Costs**	$5,897,406	$0	$0	$0	$0	$0	$0	$0	$0	**$5,897,406**
9	**Water Power Costs**	$0	$0	$433,125	$0	$0	$0	$0	$0	$0	**$433,125**
10	**Water Customer Service**	$0	$0	$0	$0	$0	$0	$188,604	$565,811	$0	**$754,414**
11	**Water Operations**	$0	$3,366,530	$0	$2,640,713	$924,191	$770,159	$0	$0	$0	**$7,701,595**
12	**Water Projects**	$0	$224,039	$0	$274,385	$99,685	$66,457	$0	$0	$0	**$664,566**
13	**Water Fund**	$0	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
14	**TOTAL EXPENSES**	$5,897,406	$3,590,570	$433,125	$2,915,099	$1,023,876	$836,616	$188,604	$565,811	$0	**$15,451,106**
15	***% Allocation***	***38%***	***23%***	***3%***	***19%***	***7%***	***5%***	***1%***	***4%***	***0%***	**$0**

16	Asset Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
17	**Land**	0	0	0	0	0	0	0	100%	**100%**
18	**Supply**	100%	0	0	0	0	0	0	0%	**100%**
19	**Well**	0	45%	55%	0%	0%	0	0	0	**100%**
20	**Reservoir**	0	40%	50%	0%	10%	0	0	0	**100%**
21	**Meters**	0	0%	0%	0%	0%	100%	0	0	**100%**
22	**Distribution**	0	27%	33%	30%	10%	0	0	0	**100%**
23	**Transmission**	0	45%	55%	0%	0%	0	0	0	**100%**
24	**Buildings**	0	0%	0%	0%	0	0	0	100%	**100%**
25	**Machinery & Equipment**	0	0%	0%	0%	0	0	0	100%	**100%**
26	**Vehicles**	0	0%	0%	0%	0	0	0	100%	**100%**
27	**Treatment Plant**	0	45%	55%	0%	0%	0	0	0	**100%**

28	Asset Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
29	**Land**	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
30	**Supply**	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
31	**Well**	$0	$6,902,962	$8,283,554	$0	$0	$0	$0	$0	**$15,186,516**
32	**Reservoir**	$0	$9,185,349	$11,249,473	$0	$2,270,536	$0	$0	$0	**$22,705,358**
33	**Meters**	$0	$0	$0	$0	$0	$5,238,285	$0	$0	**$5,238,285**
34	**Distribution**	$0	$13,814,960	$16,919,445	$15,367,203	$5,122,401	$0	$0	$0	**$51,224,009**
35	**Transmission**	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
36	**Buildings**	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
37	**Machinery & Equipment**	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
38	**Vehicles**	$0	$0	$0	$0	$0	$0	$0	$369,958	**$369,958**
39	**Treatment Plant**	$0	$0	$0	$0	$0	$0	$0	$0	**$0**
40	**TOTAL ASSETS**	**$0**	**$29,903,271**	**$36,452,472**	**$15,367,203**	**$7,392,937**	**$5,238,285**	**$0**	**$369,958**	**$94,724,126**
41	***% Allocation***	***0%***	***32%***	***38%***	***16%***	***8%***	***6%***	***0%***	***0%***	

Unit Cost Causation Component Derivation

Our end goal is to proportionately distribute the cost causation components to each user class. To accomplish this, we calculate unit costs for each cost causation component. The first step in this process is to calculate the total number of service units demanded by each class for each cost causation component. This is shown in **Table 4-5**. Power costs are spread only on the groundwater supplies. The capacity or peaking factor for each customer class is taken from

Table 4-2. The total equivalent meters are from **Table 4-3**.

Table 4-5: Derivation of Cost Causation Component Units of Service

Customer Class	Annual Usage (ccf)	Average Daily Usage	Max Day			Max Hour			Equivalent Meters	Number of Bills
			Capacity Factor	Total Capacity	Extra Capacity	Capacity Factor	Total Capacity	Extra Capacity		
Single Family Residential									16,378	139,740
Tier 1 1-8 ccf	943,826	2,586	1.04	2,682	96	1.56	4,023	1,341		
Tier 2 9-16 ccf	539,687	1,479	1.26	1,868	390	1.90	2,803	934		
Tier 3 >16 ccf	390,364	1,069	1.67	1,786	716	2.50	2,678	893		
Multifamily									4,026	10,896
Uniform Tier	983,590	2,695	1.10	2,952	257	1.64	4,428	1,476		
Commercial									3,624	10,140
Uniform Tier	468,972	1,285	1.15	1,477	193	1.72	2,216	739		
Municipal									619	1,164
Uniform Tier	97,754	268	1.32	354	87	1.99	532	177		
Irrigation									1,090	2,004
Uniform Tier	310,798	852	1.67	1,422	570	2.50	2,132	711		
Fireline									3,880	396
Uniform Tier	50	0	1.67	0	0	2.50	0	0		
Total	**3,735,041**	**10,233**	**0**	**12,542**	**2,309**	**0**	**18,813**	**6,271**	**29,617**	**164,340**

Table 4-6 shows the cost causation component unit cost derivations. The operating revenue requirement shown in **Table 4-1** is allocated to the cost causation components using the resulting O&M allocation from Line 15 of

Table 4-4 Similarly, the capital revenue requirement in **Table 4-1** is allocated to the cost causation components using the asset allocations from Line 41 of

Table 4-4. General and Administrative costs, which cannot be tied to a specific function, are redistributed in proportion to the resulting allocations of the other cost causation components, except Supply.

Table 4-6: Unit Cost Calculation

	Supply	ase Delivery	Power	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
Operating Expenses	$5,961,920	$3,629,849	$437,863	$2,946,988	$1,035,077	$845,768	$190,667	$572,000	$0	$15,620,132
Capital Expenses	$0	$1,410,533	$0	$1,719,458	$724,869	$348,724	$247,089	$0	$17,451	$4,468,124
Total Cost of Service	**$5,961,920**	**$5,040,382**	**$437,863**	**$4,666,446**	**$1,759,946**	**$1,194,492**	**$437,756**	**$572,000**	**$17,451**	**$20,088,256**
Allocation of General Cost		$6,234	$542	$5,772	$2,177	$1,477	$541	$707	($17,451)	
Allocation of Public Fire Protection Cost						($1,160,090)	$1,160,090			
Allocation of Base & Peaking Costs to Meter		$0	$0	($2,102,498)	($792,955)		$2,895,453			
Total Adjusted COS	**$5,961,920**	**$5,046,616**	**$438,405**	**$2,569,720**	**$969,167**	**$35,879**	**$4,493,841**	**$572,708**	**$0**	**$20,088,256**
Unit of Service	3,735,041 ccf	3,735,041 ccf	3,720,024 ccf	2,309 ccf/day	6,271 ccf/day	46,559 unit/yr	308,844 EMU/yr	164,340 bills/yr		
Unit Cost	**$1.60** *per ccf of usage*	**$1.35** *per ccf of usage*	**$0.12** *per ccf of gw usage*	**$1,113.06** *per ccf/day of peaking*	**$154.55** *per ccf/day of peaking*	**$0.77** *per unit per month*	**$14.55** *per EMU per month*	**$3.48** *per bill*		

The total adjusted cost of service is divided by the units of service from **Table 4-5** to calculate the unit cost. For example, the unit cost for the Base Delivery component is determined by dividing the total base delivery cost by total water use in ccf, while annual billing and customer service costs are divided by the estimated number of bills in each year. These unit costs are used to distribute the cost causation components to the customer classes.

We analyzed the relative capacity of public hydrants and private fire and found that 97% of the Fire cost component represents public fire protection costs. This amount is reallocated to the Meter component, and the remaining Fire cost component is allocated to private fireline service. 45% of the peaking cost components (Max Day and Max Hour) is also reallocated to the Meter component to provide revenue stability in the face of varying demands and retain the current fixed revenue as a percentage of total rate revenue of approximately 25.5%, so costs associated with peak demand are collected by the fixed meter charges rather than the volumetric rates.

Distribution of Cost Causation Components to Customer Classes

The final step in the cost of service analysis is to distribute the cost causation components to the user classes using the unit costs derived in **Table 4-6,** thereby arriving at the cost to serve each customer class. **Table 4-7** shows the cost allocation to each class. The Supply and Base Delivery cost components are collected through the commodity (volumetric) rates ($/ccf) for potable water. The Max Day, Max Hour, Meter and Customer cost components are collected through the City's monthly meter service charges, providing fixed revenue. The City wants to ensure revenue stability in the face of varying water sales. The proposed revenue from fixed charges is approximately 25.4% of total rate revenue, comparable to the existing share of fixed revenues.

To derive the cost to serve each class, the unit costs from **Table 4-6** are multiplied by the service units shown in **Table 4-5** for each customer class and tier. For example, the supply costs for the Residential class are calculated by multiplying the supply unit cost by the annual usage in each residential tier. Similarly, the Customer costs are derived by multiplying the Customer unit cost by the total number of bills in each year. Similar calculations yield the total cost to serve each user class, as shown in **Table 4-7**. Supply costs include the costs of power on the groundwater allocated to each customer class that are shown in Table 5-3. Note that the total cost of service is equal to the revenue requirement in **Table 4-1,** as intended. We have now calculated the cost to serve each user class and can proceed to derive rates that collect the cost to serve each class.

Table 4-7: Allocation of Costs to Customer Classes

Customer Class	Supply	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	TOTAL
Single Family Residential								
Tier 1	$855,369	$1,275,254	$107,268	$207,268				$2,445,159
Tier 2	$1,190,598	$729,200	$433,958	$144,388				$2,498,144
Tier 3	$1,165,087	$527,443	$797,050	$137,982				$2,627,562
Multifamily								
Uniform Tier	$1,685,469	$1,328,982	$286,023	$228,097				$3,528,571
Commercial								
Uniform Tier	$803,625	$633,653	$214,293	$114,166				$1,765,737
Municipal								
Uniform Tier	$167,510	$132,081	$96,436	$27,391				$423,418
Irrigation								
Uniform Tier	$532,580	$419,936	$634,590	$109,858				$1,696,964
Fireline								
Uniform Tier	$86	$68	$102	$18				$273
Fire					$35,879			$35,879
Meter (EMUs)						$4,493,841		$4,493,841
Customer (Bills)							$572,708	$572,708
Total	**$6,400,325**	**$5,046,616**	**$2,569,720**	**$969,167**	**$35,879**	**$4,493,841**	**$572,708**	**$20,088,256**

5. RATE DERIVATION

This section includes the calculation of rates and the results of the study. It also includes bill impacts for residential customers under the proposed rates.

EXISTING RATE STRUCTURE AND RATES

The City's existing rate structure consists of a schedule of fixed charges based on meter size, and a uniform volumetric rate for all customer classes. **Table 5-1** shows the existing rate structure and rates.

Table 5-1: Existing Monthly Rate Structure and Rates

		Effective Date:	1/1/2021
GENERAL SERVICE			**FY 2021**
Monthly Fixed Charges			
Meter Size			
5/8"			*$17.99*
3/4"			*$24.87*
1"			*$38.64*
1 1/2"			*$73.08*
2"			*$114.41*
3"			*$210.83*
4"			*$348.58*
6"			*$692.96*
8"			*$1,106.21*
Volumetric Rates (per ccf)			
Residential			
Tier 1	8		*$2.54*
Tier 2	16		*$4.14*
Tier 3	16+		*$6.01*
Multifamily			
Uniform Tier			*$3.71*
Commercial			
Uniform Tier			*$3.77*
Municipal			
Uniform Tier			*$4.59*
Irrigation			
Uniform Tier			*$5.40*
FIRELINE SERVICE			
Monthly Fixed Charges			
Meter Size			
2"			*$8.82*
3"			*$17.60*
4"			*$32.74*
6"			*$87.11*
8"			*$180.87*
10"			*$321.92*
Volumetric Rates (per ccf)			
Fireline			
Uniform Tier			*$5.40*

PROPOSED MONTHLY FIXED CHARGE

We propose the City retain its schedule of fixed charges by meter size for all customer classes. **Table 5-2** shows the derivation of the monthly fixed charge, which represents the Peaking, Meter and Customer cost components determined in **Table 4-6**. This charge accounts for the fact that even when a customer does not use any water, the City incurs fixed costs related to maintaining the ability to serve each connection.

Meter Capacity Component

The meter capacity component collects capacity (also known as peaking) costs. Capacity related costs can be allocated to and collected through the meter service charge by meter size. This reflects the fact that larger meters have the potential to demand more capacity compared to smaller meters. The potential capacity demanded is proportional to the potential flow through each meter size as established by the AWWA hydraulic capacity ratios which are shown in the "Meter Ratio" column of **Table 5-2**. The ratios show the potential flow through each meter size compared to the flow through a 5/8-inch meter. The Meter capacity component for larger meters is scaled up using the AWWA capacity ratios shown in the "AWWA Ratio" column of **Table 5-2**.

Allocating capacity costs by meter size is a common way to recover the fixed cost of operating the utility.

Customer/Billing Component

The customer/billing component recovers costs associated with meter reading, customer billing and collection as well as customer service costs. These costs are the same for all meter sizes as it costs the same to provide billing and customer services to a small meter as it does a larger meter. The customer/billing component is derived in the "Customer" column of **Table 5-2.**

Table 5-2: Derivation of the Monthly Fixed Charges

Meter Size	AWWA Ratio	Meter Count	Meter	Customer	Fixed Charge	Current Charge	Difference		Revenue
General Service									
5/8"	1.00	8,637	$14.55	$3.48	**$18.04**	*$17.99*	$0.05	0%	$1,869,738
3/4"	1.50	648	$21.83	$3.48	**$25.32**	*$24.87*	$0.45	2%	$196,888
1"	2.50	3,456	$36.38	$3.48	**$39.87**	*$38.64*	$1.23	3%	$1,653,489
1 1/2"	5.00	345	$72.75	$3.48	**$76.24**	*$73.08*	$3.16	4%	$315,634
2"	8.00	526	$116.40	$3.48	**$119.89**	*$114.41*	$5.48	5%	$756,746
3"	15.00	22	$218.26	$3.48	**$221.75**	*$210.83*	$10.92	5%	$58,542
4"	25.00	13	$363.76	$3.48	**$367.25**	*$348.58*	$18.67	5%	$57,291
6"	50.00	10	$727.53	$3.48	**$731.02**	*$692.96*	$38.06	5%	$87,722
8"	80.00	5	$1,164.04	$3.48	**$1,167.53**	*$1,106.21*	$61.32	6%	$70,052
Firelines									
2"	6.19	2	$4.77	$3.48	**$8.26**	*$8.82*	($0.56)	-6%	$198
3"	17.98	0	$13.86	$3.48	**$17.35**	*$17.60*	($0.25)	-1%	$0
4"	38.32	15	$29.53	$3.48	**$33.02**	*$32.74*	$0.28	1%	$5,944
6"	111.31	7	$85.78	$3.48	**$89.27**	*$87.11*	$2.16	2%	$7,499
8"	237.21	7	$182.79	$3.48	**$186.28**	*$180.87*	$5.41	3%	$15,648
10"	426.58	2	$328.73	$3.48	**$332.22**	*$321.92*	$10.30	3%	$7,973
Total									**$5,103,363**

PROPOSED COMMODITY RATES

Raftelis recommends that the City retain its current rate structure with tiered rates for single family customers and uniform rates for the remaining customers. With an average density of 3.43 persons per single family residential account, at 55 gpd per person, the state standard for indoor use, the first tier of 8 ccf provides water for indoor use. The second tier provides average water use in summer and the third tier covers any additional usage.

Unit Cost Definitions

The commodity rates for each class and tier are derived by summing of the unit rates ($/ccf) for:

1. Supply
2. Base Delivery
3. Peaking

Supply costs are costs related to the cost of purchasing and producing water. The City has several potential sources of water—local groundwater, groundwater from California Domestic Water Company from entitlement and over entitlement and purchased treated water from MWDOC. To ensure that all customers receive their fair share of the low-cost water, we first allocate water from each source to each class of customers in proportion to their total use. Then, we assign the low-cost source(s) of water (in our case both local and Cal Domestic groundwater) to the single-family residential Tier 1 until that demand is satisfied. Similarly, we continue to allocate low to higher cost water to the demand first in Tier 2 and then Tier 3. Demand for water in Tiers 2 and 3 is met with Cal Domestic groundwater and imported MWDOC water, both of which are more expensive sources. This method of allocation ensures that all single family customers benefit fairly from the lowest cost sources of water and customers that use more water pay for the higher cost sources of water. For multifamily and non-residential customer classes, the supply mix is blended and allocated based on the demands of each class. The allocation of water supply sources to various customer classes and tiers is shown in **Table 5-3**.

Table 5-3: Allocation of Water Supply

Water Sources	Groundwater	Cal Domestic Entitlement	Cal Domestic Over Entitlement	MWDOC	Total
Available Supply (AF)	2,300	4,322	1,918	582	**9,122**
Cost of Supply	$0	$2,767,309	2,245,511	$949,100	**$5,961,920**
Water Power Cost of Supply	$118,072	$221,872	98,461	$0	**$438,405**
Average Unit Cost ($/AF)	$51	$692	$1,222	$1,631	
Rank	1	2	3	4	

Water Sources	Groundwater	Cal Domestic Entitlement	MWDOC	Cal Domestic Over Entitlement	Total
Sales (AF), net of loss	2,162	4,063	547	1,803	**8,574**
Sales (ccf), net of loss	941,767	1,769,703	238,218	785,352	**3,735,041**
Cost of Supply	$0	$2,767,309	$949,100	$2,245,511	**$5,961,920**
Water Power Cost of Supply	$118,072	$221,872	$0	$98,461	**$438,405**
Unit Cost of Demand ($/ccf)	**$0.13**	**$1.69**	**$3.98**	**$2.98**	**$1.60**

Customer Class	Usage (ccf)	Groundwater	Cal Domestic Entitlement	MWDOC	Cal Domestic Over Entitlement	Total
Single Family Residential	1,873,877	472,486	887,863	119,515	394,013	**1,873,877**
Multifamily	983,590	248,006	466,036	62,733	206,815	**983,590**
Commercial	468,972	118,248	222,204	29,911	98,609	**468,972**
Municipal	97,754	24,648	46,317	6,235	20,554	**97,754**
Irrigation	310,798	78,366	147,260	19,822	65,350	**310,798**
Fireline	50	13	24	3	11	**50**
Total	**3,735,041**	**941,767**	**1,769,703**	**238,218**	**785,352**	**3,735,041**

Base Delivery costs are the operating and capital costs associated with delivering water to all customers at a constant average rate of use – also known as serving customers under average daily demand conditions. Therefore, base delivery costs are spread over all units of water irrespective of customer class or tier.

Peaking costs represent the cost of providing Max Day and Max Hour flow capacity to each customer and are assessed based on total usage.

Table 5-4 shows the proposed commodity rates, including the three previously discussed rate components, for each customer class. The Supply components for each tier are taken from **Table 5-3** and the Base Delivery component is from **Table 4-6**. The peaking costs are calculated by taking the max hour and max day costs from **Table 4-7** and dividing the use in each tier or class.

Table 5-4: Derivation of the Commodity Rates

Customer Class		Usage (ccf)	Supply	Base Delivery	Peaking	Total Rate	Current Rate	Difference	Revenue
Single Family Residential									
Tier 1	8	943,826	$0.91	$1.35	$0.33	**$2.60**	*$2.54*	2%	$2,453,947
Tier 2	16	539,687	$2.21	$1.35	$1.07	**$4.63**	*$4.14*	12%	$2,498,750
Tier 3	16+	390,364	$2.98	$1.35	$2.40	**$6.74**	*$6.01*	12%	$2,631,057
Multifamily									
Uniform Tier		983,590	$1.71	$1.35	$0.52	**$3.59**	*$3.71*	-3%	$3,531,088
Commercial									
Uniform Tier		468,972	$1.71	$1.35	$0.70	**$3.77**	*$3.77*	0%	$1,768,024
Municipal									
Uniform Tier		97,754	$1.71	$1.35	$1.27	**$4.34**	*$4.59*	-5%	$424,252
Irrigation									
Uniform Tier		310,798	$1.71	$1.35	$2.40	**$5.47**	*$5.40*	1%	$1,700,065
Fireline									
Uniform Tier		50	$1.71	$1.35	$2.40	**$5.47**	*$5.40*	1%	$274
Total		**3,735,041**	**$6,400,325**	**$5,046,616**	**$3,538,887**				**$15,007,457**

The proposed schedule of water rates for FY 2022-2026 is summarized in **Table 5-5**. The rates derived for FY 2022 in **Table 5-2** and **Table 5-4** are adjusted by the revenue adjustment percentages in

Table 3-8 to determine the rates in subsequent years.

Table 5-5: Proposed Water Rates

		Effective Date:	1/1/2021	1/1/2022	1/1/2023	1/1/2024	1/1/2025	1/1/2026
GENERAL SERVICE			**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**
Monthly Fixed Charges								
Meter Size								
5/8"			*$17.99*	$18.04	$18.58	$19.14	$19.71	$20.30
3/4"			*$24.87*	$25.32	$26.08	$26.86	$27.67	$28.50
1"			*$38.64*	$39.87	$41.07	$42.30	$43.57	$44.87
1 1/2"			*$73.08*	$76.24	$78.53	$80.88	$83.31	$85.81
2"			*$114.41*	$119.89	$123.49	$127.19	$131.01	$134.94
3"			*$210.83*	$221.75	$228.40	$235.25	$242.31	$249.58
4"			*$348.58*	$367.25	$378.27	$389.62	$401.30	$413.34
6"			*$692.96*	$731.02	$752.95	$775.54	$798.81	$822.77
8"			*$1,106.21*	$1,167.53	$1,202.56	$1,238.63	$1,275.79	$1,314.07
Volumetric Rates (per ccf)								
Residential								
Tier 1	8		*$2.54*	$2.60	$2.68	$2.76	$2.84	$2.93
Tier 2	16		*$4.14*	$4.63	$4.77	$4.91	$5.06	$5.21
Tier 3	16+		*$6.01*	$6.74	$6.94	$7.15	$7.36	$7.59
Multifamily								
Uniform Tier			*$3.71*	$3.59	$3.70	$3.81	$3.92	$4.04
Commercial								
Uniform Tier			*$3.77*	$3.77	$3.88	$4.00	$4.12	$4.24
Municipal								
Uniform Tier			*$4.59*	$4.34	$4.47	$4.60	$4.74	$4.88
Irrigation								
Uniform Tier			*$5.40*	$5.47	$5.63	$5.80	$5.98	$6.16
FIRELINE SERVICE								
Monthly Fixed Charges								
Meter Size								
2"			*$8.82*	$8.26	$8.51	$8.76	$9.03	$9.30
3"			*$17.60*	$17.35	$17.87	$18.41	$18.96	$19.53
4"			*$32.74*	$33.02	$34.01	$35.03	$36.08	$37.16
6"			*$87.11*	$89.27	$91.95	$94.71	$97.55	$100.47
8"			*$180.87*	$186.28	$191.87	$197.62	$203.55	$209.66
10"			*$321.92*	$332.22	$342.19	$352.45	$363.03	$373.92
Volumetric Rates (per ccf)								
Fireline								
Uniform Tier			*$5.40*	$5.47	$5.63	$5.80	$5.98	$6.16

BILL IMPACTS

Table 5-6 shows the impacts on hypothetical residential customers with 5/8" and 1" meters at various levels of water usage. These two meter sizes serve the largest number of customers in the City. Due to rounding in the calculations, some values may not add to the penny.

Table 5-6: Residential Water Monthly Rate Impacts

Single Family Residential 5/8"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$28.15	$28.44	1%	$0.29	9%	$3.48
	8	$38.31	$38.84	1%	$0.53	29%	$6.36
Average Monthly	14	$63.15	$66.62	5%	$3.47	61%	$41.64
	18	$83.45	$89.36	7%	$5.91	76%	$70.92
Double Average	28	$143.55	$156.76	9%	$13.21	93%	$158.52
	36	$191.63	$210.68	10%	$19.05	97%	$228.60
Very High	40	$215.67	$237.64	10%	$21.97	98%	$263.64

Single Family Residential 1"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$48.80	$50.27	3%	$1.47	16%	$17.64
	8	$58.96	$60.67	3%	$1.71	38%	$20.52
Average Monthly	14	$83.80	$88.45	6%	$4.65	63%	$55.80
	18	$104.10	$111.19	7%	$7.09	76%	$85.08
Double Average	28	$164.20	$178.59	9%	$14.39	92%	$172.68
	36	$212.28	$232.51	10%	$20.23	97%	$242.76
Very High	50	$296.42	$326.87	10%	$30.45	99%	$365.40

Multifamily	Usage (ccf)	# of Units	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual Impact
5/8" Example	18	2	$84.77	$82.66	-2%	($2.11)	-$25.32
3/4" Example	25	2	$117.62	$115.07	-2%	($2.55)	-$30.60
1.0" Example	40	4	$187.04	$183.47	-2%	($3.57)	-$42.84
1.5" Example	124	12	$533.12	$521.40	-2%	($11.72)	-$140.64
2.0" Example	266	32	$1,101.27	$1,074.83	-2%	($26.44)	-$317.28

Commercial	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual Impact
5/8" Example	12	$63.23	$63.28	0%	$0.05	$0.60
3/4" Example	13	$73.88	$74.33	1%	$0.45	$5.40
1.0" Example	24	$129.12	$130.35	1%	$1.23	$14.76
1.5" Example	46	$246.50	$249.66	1%	$3.16	$37.92
2.0" Example	94	$468.79	$474.27	1%	$5.48	$65.76
3.0" Example	195	$945.98	$956.90	1%	$10.92	$131.04
4.0" Example	387	$1,807.57	$1,826.24	1%	$18.67	$224.04
6.0" Example	446	$2,374.38	$2,412.44	2%	$38.06	$456.72

WATER RATE SURVEY

Figure 5-1 Table 5-6shows the Orange County water rate survey for comparable utilities in the same area as the City. The total bill calculations assume 14 ccf of water for applicable utilities. The red bars show the City's current and proposed bill and the red line indicates the average bill, which is $65.40. The City's proposed charge is very close to the average in the Orange County survey.

Figure 5-1: Water Rate Survey