CITY OF LA HABRA

DEPARTMENT OF PUBLIC WORKS

Water Cost of Service and Rate Study

Draft Report / October 10, 2019

RAFTELIS

RAFTELIS

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October 10, 2019

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

Subject: Water Cost of Service Study Report

Dear Mr. Jones:

Raftelis Financial Consultants, Inc. (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 ten fiscal years (FY 2020 – FY 2024). 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 ten-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

Sindhu Sundar
Associate Consultant

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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) 2020. 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 2020 through January 2024.

System Background

The City of La Habra Department of Public Works supplies potable water to about 13,000 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). These sources account for roughly 35, 60, and 5 percent of the City's water supply, respectively. Because of the recent drought, the safe yield in the Basin has been reduced so that the amount of relatively cheap water from Cal Domestic has dropped and the City has to buy more expensive Lift 2 water. The City has purchased $2.3 million worth water rights that will provide 140-200 ac-ft of water annually. The City has recategorized customers so that some single family customers in the last study are now in the multi-family class.

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 2020 to FY2024). 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 2020 adopted budget and the City's projected budgetary increases through FY 2024. 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 2020 will total 7,828 AF. Usage is expected to grow minimally due to the development of vacant properties, population growth, and takeover of county service islands currently served by California Domestic Water Company. Account growth is also projected at 0.25% per year for the single family customer class only.

In addition to its operating expenses, the City is planning significant capital expenditures over the next several years. Capital projects are funded by revenues from water rates. The City has debt service obligations in the form of principal and interest on the previously issued water revenue bonds and is refinancing some of its old debt to reduce debt service costs.

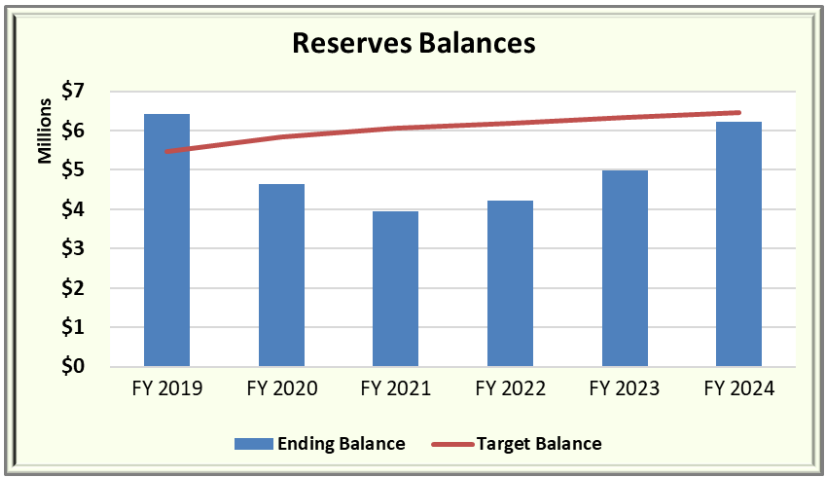
To ensure that the City will have adequate revenues to fund expenses and maintain sufficient reserves, Raftelis recommends the revenue adjustments in **Table 1-1**. Note that the first rate increase will go into effect in January 2020, and each subsequent increase will be in January of each year. Our financial planning model incorporates the timing of the rate increase into all revenue projections and rate calculations.

Table 1-1: Proposed Revenue Adjustments

Fiscal Year	Revenue Adjustment
FY 2020	9.0%
FY 2021	9.0%
FY 2022	8.0%
FY 2023	3.0%
FY 2024	3.0%

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 just below target levels by FY 2024, and under the target in FYs 2020 through 2023.

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 2020. 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 2020 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

Meter Size	WWA Ratio	Meter Count	Meter	Customer	ixed Charge	rent Charge	Difference
General Service							
5/8"	1.00	8,233	$12.64	$3.85	**$16.50**	*$14.81*	$1.69
3/4"	1.50	626	$18.96	$3.85	**$22.82**	*$20.70*	$2.12
1"	2.50	3,217	$31.59	$3.85	**$35.45**	*$32.49*	$2.96
1 1/2"	5.00	338	$63.19	$3.85	**$67.05**	*$61.95*	$5.10
2"	8.00	528	$101.10	$3.85	**$104.96**	*$97.31*	$7.65
3"	15.00	24	$189.56	$3.85	**$193.42**	*$179.80*	$13.62
4"	25.00	16	$315.94	$3.85	**$319.80**	*$297.65*	$22.15
6"	50.00	14	$631.88	$3.85	**$635.74**	*$592.26*	$43.48
8"	80.00	6	$1,011.01	$3.85	**$1,014.87**	*$945.81*	$69.06
Firelines							
2"	6.19	2	$4.23	$3.85	**$8.09**	*$4.75*	$3.34
3"	17.98	0	$12.29	$3.85	**$16.15**	*$8.05*	$8.10
4"	38.32	0	$26.18	$3.85	**$30.04**	*$13.73*	$16.31
6"	111.31	5	$76.06	$3.85	**$79.92**	*$34.12*	$45.80
8"	237.21	7	$162.08	$3.85	**$165.94**	*$69.27*	$96.67
10"	426.58	1	$291.48	$3.85	**$295.34**	*$122.16*	$173.18

Customer Class		Usage (ccf)	Supply	ase Delivery	Peaking	Total Rate	Current Rate	Difference
Residential								
Tier 1	8	880,853	$0.45	$1.48	$0.39	**$2.33**	*$2.33*	*$0.00*
Tier 2	16	455,010	$1.31	$1.48	$1.01	**$3.80**	*$3.88*	*($0.08)*
Tier 3	17+	365,174	$2.70	$1.48	$1.32	**$5.51**	*$4.65*	*$0.86*
Multifamily								
Uniform Tier		891,833	$1.16	$1.48	$0.75	**$3.40**	*$2.84*	*$0.56*
Commercial								
Uniform Tier		471,412	$1.16	$1.48	$0.81	**$3.46**	*$3.32*	*$0.14*
Municipal								
Uniform Tier		91,956	$1.16	$1.48	$1.56	**$4.21**	*$3.91*	*$0.30*
Irrigation								
Uniform Tier		253,413	$1.16	$1.48	$2.30	**$4.95**	*$4.51*	*$0.44*
Fireline								
Uniform Tier		23	$1.16	$1.48	$2.30	**$4.95**	*$4.51*	*$0.44*
Total		**3,409,673**	**$3,952,917**	**$5,062,301**	**$3,064,872**			

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. Over 60% of customers with 5/8" meters will see reductions in their monthly bills under the proposed rate schedule, and 75% will have less than a 1% increase in monthly bills. For comparison purposes, the impacts on very low-end to very high-end users are shown. The fixed

meter charge for the 1" meter is high compared to the current charge, and results in a larger impact to customers with 1" meters.

Table 1-3: Rate Impacts

Single Family 5/8"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$24.13	$25.82	7%	$1.69	17%	$20.28
	8	$33.45	$35.14	5%	$1.69	40%	$20.28
Average Monthly	12	$48.97	$50.34	3%	$1.37	61%	$16.44
	16	$64.49	$65.54	2%	$1.05	76%	$12.60
Double Average	24	$101.69	$109.62	8%	$7.93	91%	$95.16
	32	$138.89	$153.70	11%	$14.81	96%	$177.72
Very High	40	$176.09	$197.78	12%	$21.69	98%	$260.28

Single Family 1"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$41.81	$44.77	7%	$2.96	22%	$35.52
	8	$51.13	$54.09	6%	$2.96	45%	$35.52
Average Monthly	12	$66.65	$69.29	4%	$2.64	62%	$31.68
	16	$82.17	$84.49	3%	$2.32	74%	$27.84
Double Average	24	$119.37	$128.57	8%	$9.20	89%	$110.40
	32	$156.57	$172.65	10%	$16.08	95%	$192.96
Very High	40	$193.77	$216.73	12%	$22.96	98%	$275.52

Multifamily	Usage (ccf)	# of Units	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual Impact
5/8" Example	44	3	$139.77	$166.10	19%	$26.33	$315.96
3/4" Example	330	25	$957.90	$1,144.82	20%	$186.92	$2,243.04
1.0" Example	72	4	$236.97	$280.25	18%	$43.28	$519.36
1.5" Example	180	14	$573.15	$679.05	18%	$105.90	$1,270.80
2.0" Example	268	32	$858.43	$1,016.16	18%	$157.73	$1,892.76

Commercial	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual
5/8" Example	40	$147.61	$154.90	5%	$7.29	$87.48
3/4" Example	33	$130.26	$137.00	5%	$6.74	$80.88
1.0" Example	117	$420.93	$440.27	5%	$19.34	$232.08
1.5" Example	74	$307.63	$323.09	5%	$15.46	$185.52
2.0" Example	387	$1,382.15	$1,443.98	4%	$61.83	$741.96
3.0" Example	1269	$4,392.88	$4,584.16	4%	$191.28	$2,295.36
4.0" Example	2266	$7,820.77	$8,160.16	4%	$339.39	$4,072.68
6.0" Example	264	$1,468.74	$1,549.18	5%	$80.44	$965.28

2. OVERVIEW

INTRODUCTION

In June 2020, 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. The water available from the City's water rights has reduced based on a reduced safe yield in the Main San Gabriel Basin.
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) 2020 through 2024.

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 2020-2024, 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 62,500 people, with about 13,000 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). These sources account for roughly 35, 60, and 5 percent of the City's water supply, respectively. Because of the recent drought, the safe yield in the Basin has been reduced so that the amount of relatively cheap water from Cal Domestic has dropped and the City has to buy more expensive Lift 2 water. The City has purchased $2.3 million worth water rights that will provide 140-200 ac-ft of water annually. The City has recategorized customers so that some single family customers in the last study are now in the multi-family class. 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.

The City expects small demand increases over the study period due to the development of vacant properties, population growth, and takeover of county service islands currently served by California Domestic Water Company.

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 2020 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 6.5% 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 2019, with adjustments for usage

growth in FY 2020 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 2020- FY 2024.

Table 3-1: Key Assumptions

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Inflation Factors					
General	0.0%	3.0%	3.0%	3.0%	3.0%
Salary	0.0%	3.5%	3.5%	3.5%	3.5%
Benefits	0.0%	5.0%	5.0%	5.0%	5.0%
Utilities	0.0%	5.0%	5.0%	5.0%	5.0%
Water Costs	0.0%	5.0%	5.0%	5.0%	5.0%
Capital	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Inflated	0.0%	0.0%	0.0%	0.0%	0.0%
Account Growth					
Residential	0.25%	0.25%	0.25%	0.25%	0.25%
Multifamily	0.00%	0.00%	0.00%	0.00%	0.00%
Commercial	0.00%	0.00%	0.00%	0.00%	0.00%
Municipal	0.00%	0.00%	0.00%	0.00%	0.00%
Irrigation	0.00%	0.00%	0.00%	0.00%	0.00%
Fireline	0.00%	0.00%	0.00%	0.00%	0.00%
Usage Growth (from Dashboard)					
Residential	0.0%	0.0%	0.0%	0.0%	0.0%
Non-Residential	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%
Reserve Interest Rate	1.00%	1.00%	1.00%	1.50%	2.00%

ACCOUNT AND USAGE PROJECTIONS

Table 3-2 shows the estimated number of water accounts by meter size for fiscal year (FY) 2019 through FY 2024. Raftelis estimated the number of accounts by tabulating FY 2019 (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

Accounts Data	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Residential						
5/8"	7,731	7,751	7,770	7,790	7,809	7,829
3/4"	590	592	593	595	596	598
1"	2,596	2,603	2,609	2,616	2,623	2,629
1 1/2"	22	23	23	23	23	23
2"	9	10	10	10	10	10
Total Meters	**10,948**	**10,979**	**11,005**	**11,034**	**11,061**	**11,089**
Multifamily						
5/8"	264	264	264	264	264	264
3/4"	5	5	5	5	5	5
1"	254	254	254	254	254	254
1 1/2"	145	145	145	145	145	145
2"	214	214	214	214	214	214
3"	6	6	6	6	6	6
4"	5	5	5	5	5	5
6"	4	4	4	4	4	4
8"	4	4	4	4	4	4
Total Meters	**901**	**901**	**901**	**901**	**901**	**901**
Commercial						
5/8"	199	199	199	199	199	199
3/4"	25	25	25	25	25	25
1"	296	296	296	296	296	296
1 1/2"	124	124	124	124	124	124
2"	167	167	167	167	167	167
3"	12	12	12	12	12	12
4"	7	7	7	7	7	7
6"	6	6	6	6	6	6
8"	-	-	-	-	-	-
Total Meters	**836**	**836**	**836**	**836**	**836**	**836**
Municipal						
5/8"	12	12	12	12	12	12
3/4"	-	-	-	-	-	-
1"	26	26	26	26	26	26
1 1/2"	10	10	10	10	10	10
2"	58	58	58	58	58	58
3"	4	4	4	4	4	4
4"	2	2	2	2	2	2
6"	2	2	2	2	2	2
8"	-	-	-	-	-	-
Total Meters	**114**	**114**	**114**	**114**	**114**	**114**
Irrigation						
5/8"	7	7	7	7	7	7
3/4"	4	4	4	4	4	4
1"	38	38	38	38	38	38
1 1/2"	36	36	36	36	36	36
2"	79	79	79	79	79	79
3"	2	2	2	2	2	2
4"	2	2	2	2	2	2
6"	2	2	2	2	2	2
8"	2	2	2	2	2	2
Total Meters	**172**	**172**	**172**	**172**	**172**	**172**
Fireline						
2"	2	2	2	2	2	2
3"	-	-	-	-	-	-
4"	-	-	-	-	-	-
6"	5	5	5	5	5	5
8"	7	7	7	7	7	7
10"	1	1	1	1	1	1
Total Meters	**15**	**15**	**15**	**15**	**15**	**15**
TOTAL ACCOUNTS	**12,986**	**13,017**	**13,043**	**13,072**	**13,099**	**13,127**

Water Use

Table 3-3 shows the projected water use for FY 2020 through FY 2024 by customer class. The projections are based on small increases due to account growth.

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

Usage Data by Class (ccf)	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Residential						
Tier 1	878,656	880,853	883,055	885,262	887,476	889,694
Tier 2	453,875	455,010	456,147	457,288	458,431	459,577
Tier 3	364,263	365,174	366,087	367,002	367,919	368,839
Multifamily						
Uniform Tier	891,833	891,833	891,833	891,833	891,833	891,833
Commercial						
Uniform Tier	471,412	471,412	471,412	471,412	471,412	471,412
Municipal						
Uniform Tier	91,956	91,956	91,956	91,956	91,956	91,956
Irrigation						
Uniform Tier	253,413	253,413	253,413	253,413	253,413	253,413
Fireline						
Uniform Tier	23	23	23	23	23	23
Total Residential	2,588,627	2,592,869	2,597,122	2,601,385	2,605,659	2,609,943
Total Non-Residential	816,781	816,781	816,781	816,781	816,781	816,781
Total Fireline	23	23	23	23	23	23
TOTAL WATER SALES	**3,405,431**	**3,409,673**	**3,413,926**	**3,418,189**	**3,422,463**	**3,426,747**
AF	7,818	7,828	7,837	7,847	7,857	7,867

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 2020 to 2024. 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. 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. **Table 3-5** shows these projections.

Table 3-4: O&M Expenses

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Water Customer Service					
Personnel Services					
Salaries - Full Time	$218,638	$226,290	$234,210	$242,408	$250,892
Benefits	$120,320	$126,336	$132,653	$139,285	$146,250
Operations & Maintenance					
Materials & Supplies	$106,200	$109,386	$112,668	$116,048	$119,529
Special Departmental	$120,776	$124,399	$128,131	$131,975	$135,934
Professional Service	$232,820	$239,805	$246,999	$254,409	$262,041
Training & Conferences	$500	$515	$530	$546	$563
Repair & Maint - Equipment	$400	$412	$424	$437	$450
Subtotal	**$799,654**	**$827,143**	**$855,616**	**$885,108**	**$915,659**
Water Operations					
Personnel Services					
Salaries - Full Time	$1,219,555	$1,262,239	$1,306,418	$1,352,142	$1,399,467
Salaries - Part Time	$136,917	$141,709	$146,669	$151,802	$157,115
Salaries - Overtime	$139,074	$143,942	$148,980	$154,194	$159,591
Benefits	$764,359	$802,577	$842,706	$884,841	$929,083
Allowances	$5,016	$5,267	$5,530	$5,807	$6,097
Operations & Maintenance					
Other Materials & Supplies	$283,500	$292,005	$300,765	$309,788	$319,082
Dues & Subscriptions	$4,675	$4,815	$4,960	$5,108	$5,262
Training & Meetings	$16,000	$16,480	$16,974	$17,484	$18,008
Repair & Maintenance	$398,888	$410,855	$423,180	$435,876	$448,952
Rent & Leases	$1,000	$1,030	$1,061	$1,093	$1,126
Professional Service	$724,300	$746,029	$768,410	$791,462	$815,206
Outside Printing	$0	$0	$0	$0	$0
Special Departmental	$3,316,307	$3,415,796	$3,518,270	$3,623,818	$3,732,533
Safety Equipment and Uniforms	$0	$0	$0	$0	$0
Capital Outlay					
Equipment	$363,000	$363,000	$363,000	$363,000	$363,000
Improvements	$60,000	$60,000	$60,000	$60,000	$60,000
Water Purchase					
Purchases for Resale (Wtr/Fuel)	$3,952,917	$4,551,030	$4,784,525	$5,038,499	$5,305,947
Subtotal	**$11,385,508**	**$12,216,774**	**$12,691,447**	**$13,194,914**	**$13,720,469**
Water Projects					
Personnel Services					
Salaries - Full Time	$15,617	$16,164	$16,729	$17,315	$17,921
Benefits	$7,817	$8,208	$8,618	$9,049	$9,502
Operations & Maintenance					
Professional Service	$299,000	$307,970	$317,209	$326,725	$336,527
Special Departmental	$6,400	$6,592	$6,790	$6,993	$7,203
Subtotal	**$328,834**	**$338,933**	**$349,346**	**$360,083**	**$371,153**
Water Fund					
Compensated Absenses	$11,597	$11,945	$12,303	$12,672	$13,053
Subtotal	**$11,597**	**$11,945**	**$12,303**	**$12,672**	**$13,053**
TOTAL O&M	**$12,525,593**	**$13,394,795**	**$13,908,713**	**$14,452,777**	**$15,020,334**

Table 3-5: Water Supply Costs

Unit Costs($/AF)	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Local Groundwater					
Delivery Costs	$0	$0	$0	$0	$0
Cal Domestic Treated					
Lift 1: Entitlement	$488	$512	$538	$565	$593
Lift 1: Leased	$488	$512	$538	$565	$593
Lift 1: Entitlement (Class A Shares)	$283	$297	$312	$328	$344
Lift 1: Over-Entitlement (Nov 2016 Shares)	$218	$229	$241	$253	$265
Lift 1: Over-Entitlement	$1,141	$1,198	$1,258	$1,321	$1,387
Lift 2: Entitlement	$609	$639	$671	$705	$740
Lift 2: Leased	$609	$639	$671	$705	$740
Lift 2: Entitlement (Class A Shares)	$322	$338	$355	$373	$391
Lift 2: Over-Entitlement (Nov 2016 Shares)	$218	$229	$241	$253	$265
Lift 2: Over-Entitlement	$1,180	$1,239	$1,301	$1,366	$1,434
MWDOC					
Treated Water Assessment Cost	$1,064	$1,117	$1,173	$1,232	$1,293
AVERAGE UNIT COST (AF)	**$552**	**$579**	**$608**	**$639**	**$671**
Total Demand (AF)	7,828	7,837	7,847	7,857	7,867
Water Loss Factor	11.08%	11.08%	11.08%	11.08%	11.08%
Water Supply Needed	8,803	8,814	8,825	8,836	8,847

Water Supply, AF	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Local Groundwater					
Local Supply	3,000	3,000	3,000	3,000	3,000
Cal Domestic Treated		-			
Lift 1: Entitlement	1,775	1,469	1,469	1,469	1,469
Lift 1: Leased	36	30	36	36	36
Lift 1: Entitlement (Class A Shares)	360	360	360	360	360
Lift 1: Over-Entitlement (Nov 2016 Shares)	-	-	-	-	-
Lift 1: Over-Entitlement	599	917	917	922	928
Lift 2: Entitlement	1,639	1,356	1,356	1,356	1,356
Lift 2: Leased	33	27	33	33	33
Lift 2: Entitlement (Class A Shares)	333	333	333	333	333
Lift 2: Over-Entitlement (Nov 2016 Shares)	-	-	-	-	-
Lift 2: Over-Entitlement	553	847	846	851	856
MWDOC					
Treated Water	475	475	476	476	477
TOTAL WATER SUPPLY	**8803**	**8814**	**8825**	**8836**	**8847**

Total Supply Costs	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Local Groundwater					
Local Supply	$0	$0	$0	$0	$0
Cal Domestic Treated					
Lift 1: Entitlement	$866,250	$752,664	$790,298	$829,812	$871,303
Lift 1: Leased	$17,479	$15,167	$19,271	$20,234	$21,246
Lift 1: Entitlement (Class A Shares)	$101,957	$107,055	$112,407	$118,028	$123,929
Lift 1: Over-Entitlement (Nov 2016 Shares)	$0	$0	$0	$0	$0
Lift 1: Over-Entitlement	$683,880	$1,099,191	$1,153,165	$1,217,994	$1,286,441
Lift 2: Entitlement	$997,881	$867,030	$910,382	$955,901	$1,003,696
Lift 2: Leased	$20,135	$17,495	$22,199	$23,309	$24,474
Lift 2: Entitlement (Class A Shares)	$107,084	$112,438	$118,060	$123,963	$130,161
Lift 2: Over-Entitlement (Nov 2016 Shares)	$0	$0	$0	$0	$0
Lift 2: Over-Entitlement	$652,851	$1,049,319	$1,100,844	$1,162,731	$1,228,073
MWDOC					
Treated Water	$505,400	$530,670	$557,899	$586,527	$616,624
TOTAL WATER SUPPLY COSTS	**$3,952,917**	**$4,551,030**	**$4,784,525**	**$5,038,499**	**$5,305,947**

Capital Improvement Plan

Table 3-6 shows the City's planned capital expenditures from FY 2020 to 2024. 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 2020	FY 2021	FY 2022	FY 2023	FY 2024
ANNUAL PROGRAMS					
Annual Water Valve Replacement Program	$112,000	$112,000	$112,000	$112,000	$112,000
Annual Cast Iron Pipe ReplacemenWalve Program	$1,125,000	$1,125,000	$1,125,000	$1,125,000	$1,125,000
Annual Water Meter Replacement Program	$500,000	$500,000	$500,000	$500,000	$25,000
La Habra Turf Removal Program	$50,000	$50,000	$50,000	$50,000	$50,000
Park Irrigation Improvement - Smart Timer Installation	$0	$0	$0	$0	$0
ONE TIME PROJECTS					
Interconnection -- Zone 20 to Zone 18 at Riviera Court	$0	$0	$0	$0	$0
Foothill Zone Consolidation Project	$800,000	$1,000,000	$1,000,000	$1,000,000	$1,000,000
Rehabilitation of OC-45	$250,000	$0	$0	$0	$0
SCADA System Upgrade	$70,000	$0	$0	$0	$0
TOTAL INFLATED CAPITAL EXPENDITURES	**$2,907,000**	**$2,787,000**	**$2,787,000**	**$2,787,000**	**$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 is refinancing its 2010 revenue bonds which will result in reducing the debt service in FY 2021. 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 2020	FY 2021	FY 2022	FY 2023	FY 2024
Existing Debt Service					
Principal	$860,000	$875,000	$910,000	$945,000	$990,000
Interest	$2,022,103	$1,383,500	$1,369,243	$1,333,685	$1,296,255
Debt Service	**$2,882,103**	**$2,258,500**	**$2,279,243**	**$2,278,685**	**$2,286,255**

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 2020 through 2024. 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 9% for the first two years, 8% the following year and an increase of 3% each in FY 2023 and FY 2024.

Table 3-8: Proposed Revenue Adjustments

Fiscal Year	Revenue Adjustment
FY 2020	9.0%
FY 2021	9.0%
FY 2022	8.0%
FY 2023	3.0%
FY 2024	3.0%

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 2019	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Revenues								
Rate Revenues			$14,481,053	$15,143,031	$15,162,785	$15,183,390	$15,203,603	$15,223,887
Revenue Adjustments								
FY 2020	9%	January		$681,436	$1,364,651	$1,366,505	$1,368,324	$1,370,150
FY 2021	9%	January			$743,735	$1,489,491	$1,491,473	$1,493,463
FY 2022	8%	January				$721,575	$1,445,072	$1,447,000
FY 2023	3%	January					$292,627	$586,035
FY 2024	3%	January						$301,808
Total Rate Revenues			$14,481,053	$15,824,468	$17,271,170	$18,760,961	$19,801,099	$20,422,343
Other Revenue			$774,532	$603,102	$431,673	$431,673	$431,673	$431,673
Interest Income			$63,079	$55,353	$42,783	$40,612	$68,518	$112,224
Subtotal - Revenues			**$15,318,664**	**$16,482,923**	**$17,745,626**	**$19,233,246**	**$20,301,290**	**$20,854,015**
Expenses								
O&M Expenses			$6,873,287	$8,572,676	$8,843,766	$9,124,188	$9,414,279	$9,714,386
Water Supply Costs			$4,095,759	$3,952,917	$4,551,030	$4,784,525	$5,038,499	$5,305,947
Total Debt Service			$2,883,378	$2,882,103	$2,258,500	$2,279,243	$2,278,685	$2,286,255
Rate Funded CIP			$1,300,000	$2,907,000	$2,787,000	$2,787,000	$2,787,000	$2,312,000
Subtotal - Expenses			**$15,152,424**	**$18,314,696**	**$18,440,295**	**$18,974,956**	**$19,518,463**	**$19,618,588**
Net Cash Flow			**$166,240**	**($1,831,773)**	**($694,669)**	**$258,290**	**$782,827**	**$1,235,427**
Debt Coverage			151%	137%	193%	234%	257%	255%
Target Coverage			125%	125%	125%	125%	125%	125%

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.

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

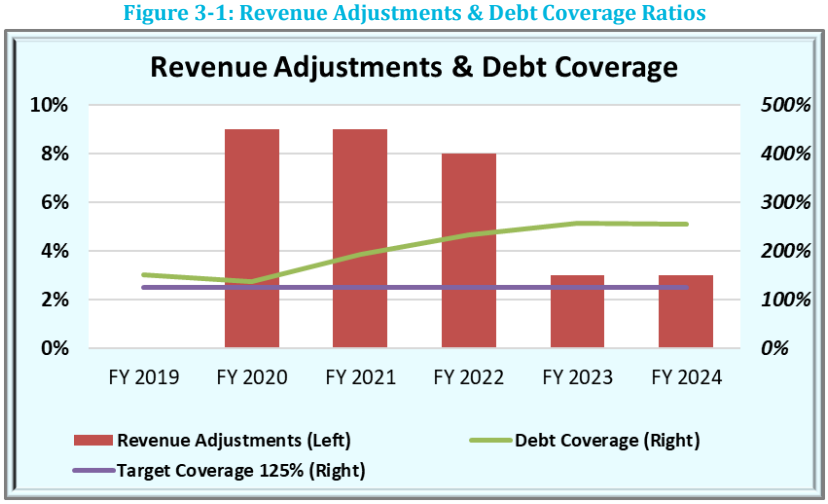


Figure 3-2 graphically illustrates the Financial Plan – it compares existing and proposed revenues with projected expenses. The expenses, including O&M, debt service, and rate-funded CIP, are shown by the stacked bars. Note that water supply costs are included in the O&M expenses in this graph. Total revenues under existing and proposed rates are shown by the horizontal red and blue lines, respectively. The net cash flow is shown in orange.

Figure 3-2: Water Utility Financial Plan

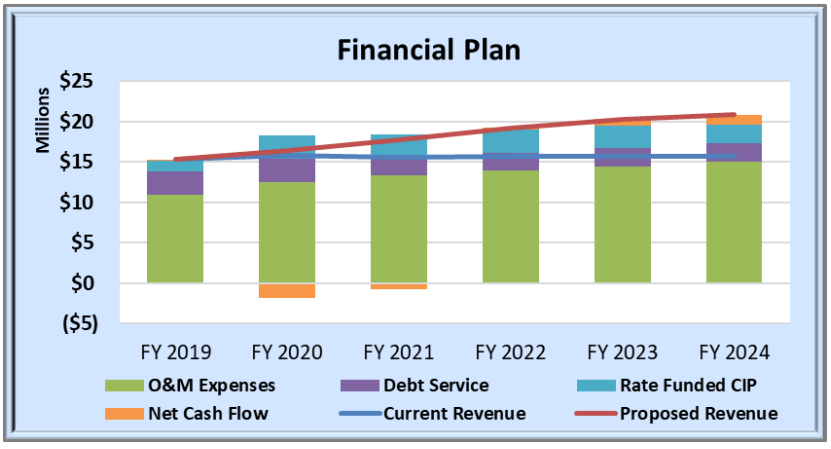


Figure 3-3 summarizes the projected CIP. The capital projects are funded entirely by rate revenue.

Figure 3-3: Capital Financing Plan

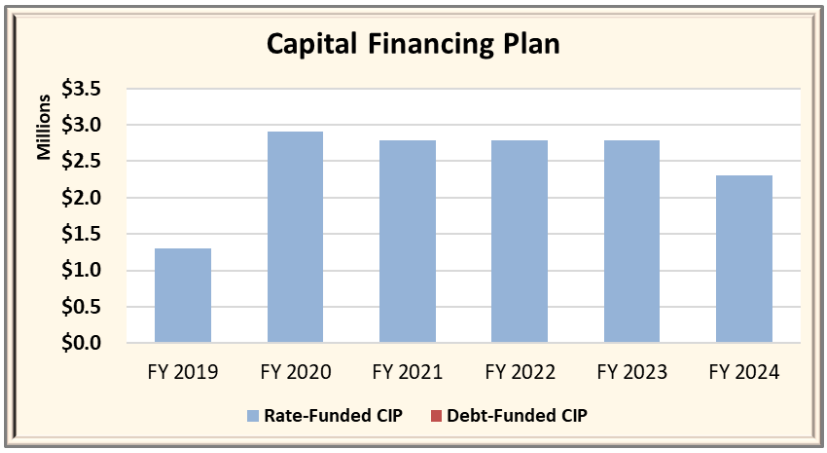


Table 3-10 shows the projected cash balance and the reserves target for the operating and capital reserves in the water utility. The net cash flow comes from the bottom of Table 3-9.

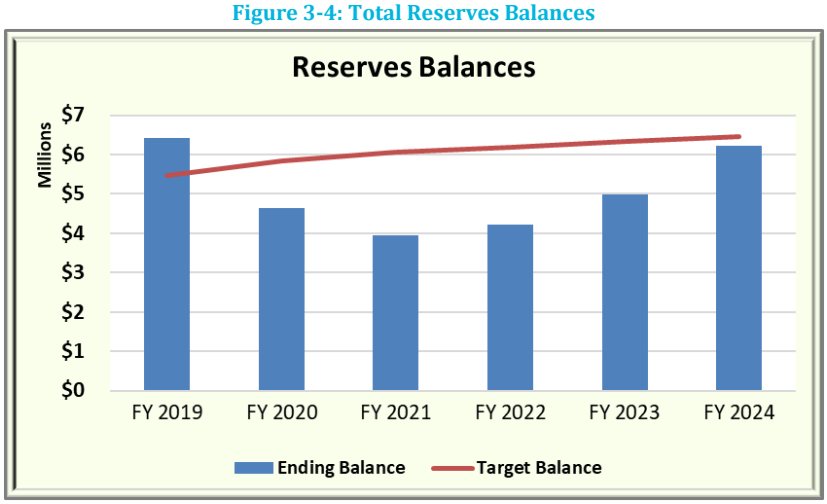
Table 3-10: Projected Reserve Balances

		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024
Operating Reserve Fund						
Beginning Balance		$6,478,835	$3,131,398	$3,348,699	$3,477,178	$3,613,194
Net Cash Flow		($1,831,773)	($694,669)	$258,290	$782,827	$1,235,427
Transfer to Capital Reserve		($1,515,664)	$911,970	($129,810)	($646,811)	($1,093,538)
Ending Balance		$3,131,398	$3,348,699	$3,477,178	$3,613,194	$3,755,083
Interest		*$48,051*	*$32,400*	*$34,129*	*$53,178*	*$73,683*
Operating Reserve Target	25%	*$3,131,398*	*$3,348,699*	*$3,477,178*	*$3,613,194*	*$3,755,083*
Capital Reserve						
Beginning Balance		$0	$1,515,664	$603,694	$733,504	$1,380,315
Transfer from Operating Reserves		$1,515,664	($911,970)	$129,810	$646,811	$1,093,538
Debt Proceeds		$0	$0	$0	$0	$0
Debt Funded CIP		$0	$0	$0	$0	$0
Ending Balance		$1,515,664	$603,694	$733,504	$1,380,315	$2,473,853
Interest		*$7,578*	*$10,597*	*$6,686*	*$15,854*	*$38,542*
Capital Reserves Target		$2,716,000	$2,716,000	$2,716,000	$2,716,000	$2,716,000
Total Reserves		$4,647,062	$3,952,393	$4,210,683	$4,993,509	$6,228,936

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 operating and capital reserves. Reserves are expected to fall in FY 2020, FY 2021 and FY 2022 as cash from the operating fund is used to fund capital projects. The balance will then increase as increased rate revenues contribute to positive net cash flows in subsequent years. The City's reserves are just below target by the end of the 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 all 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 2020. 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 their 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 associated capital 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

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 the capital costs from Table 3-6.

Raftelis calculated the revenue requirement using FY 2020 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.

Table 4-1: Revenue Requirement Determination

	FY 2020		
	Operating	Capital	Total
Revenue Requirements			
O&M Expenses (less supply and debt cost	$8,572,676		$8,572,676
Water Supply Costs	$3,952,917		$3,952,917
Existing Debt Service		$2,882,103	$2,882,103
Proposed Debt Service		$0	$0
Rate Funded CIP		$2,907,000	$2,907,000
Subtotal	**$12,525,593**	**$5,789,103**	**$18,314,696**
Revenue Offsets			
Non Rate Revenue	$603,102		$603,102
Interest Income	$55,353		$55,353
Subtotal	**$658,455**	**$0**	**$658,455**
Less Adjustments			
Adjustments to Annualize Rate Increase	-$681,436		-$681,436
Adjustments for Annual Cash Balance		$1,831,773	$1,831,773
Subtotal	**-$681,436**	**$1,831,773**	**$1,150,337**
Annual Revenue to be Recovered from F	**$12,548,574**	**$3,957,330**	**$16,505,904**

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

Peaking Factors

Water systems are designed to handle maximum day (Max Day) and maximum hour (Max Hour) demands. The Max Day demand is the maximum amount of water used in a single day in a year. The Max Hour demand is the maximum usage in an hour on the Max Day. Different facilities, such as distribution and storage facilities, are designed to meet the peaking demands of customers. Therefore, peaking costs, also known as extra capacity costs, are associated with meeting peak customer demand. Peaking costs are therefore based on Max Day and Max Hour demands.

Error! Reference source not found. shows the system-wide peaking factors 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 (Column C, Line 1). The Max Day peaking factor (Line 2) indicates that the Max Day demand is 2 times greater than the average daily demand. Similarly, the Max Hour peaking factor (Column C, Line 3) shows that the Max Hour demand is 3 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 x 100% = 50%*
- Max Day: *(2 - 1) / 2 x 100% = 50%*

The Max Hour allocations are calculated as follows:

- Base Delivery: *1 / 3 x 100% = 33%*
- Max Day: *(2 - 1) / 3 x 100% = 33%*
- Max Hour: *(3 - 2) / 3 x 100% = 33%*

Since the water system is also designed to provide fire flow demands, 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 proportionately 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.

Due to issues with the available billing data, the Municipal customer is assessed a peaking factor based on the average of the Commercial and Irrigation peaking factors (indoor use by Municipal

buildings is assumed to be the same as Commercial use, and outdoor use is primarily irrigation for public parks). Also, because fireline usage is mainly for flushing and flow testing, we apply the peaking factor for Irrigation to this class as well (in theory, firelines should not have any usage except in cases of fire suppression).

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	100%	0%	0%	0%
Max Day Demand (MD)	2.00	45%	45%	0%	10%
Max Hour Demand (MH)	3.00	30%	30%	30%	10%
Average MD+MH		38%	38%	15%	10%

Customer Class Peaking Factors

Customer Specific Tiers & Usage		Total Annual Consumption	Max Monthly	Avg Monthly	Peaking Factor
Residential					
Tier 1	1-8 ccf	880,853	80,011	73,404	1.09
Tier 2	9-16 ccf	455,010	52,326	37,917	1.38
Tier 3	>16 ccf	365,174	46,560	30,431	1.53
Multifamily					
Uniform Tier		891,833	93,642	74,319	1.26
Commercial					
Uniform Tier		471,412	50,677	39,284	1.29
Municipal					
Uniform Tier		91,956	12,567	7,663	1.64
Irrigation					
Uniform Tier		253,413	42,024	21,118	1.99
Fireline					
Uniform Tier		23	4	2	1.99

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 2020. 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	8,233	8,233
3/4"	30	1.5	626	939
1"	50	2.5	3,217	8,043
1 1/2"	100	5.0	338	1,690
2"	160	8.0	528	4,224
3"	300	15.0	24	360
4"	500	25.0	16	400
6"	1,000	50.0	14	700
8"	1,600	80.0	6	480
10"	2,300	115.0	-	-
		TOTAL METERS:	**13,002**	**25,069**

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	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
1	**Water Supply Costs**	100%								**100%**
2	**Water Customer Service**						25%	75%		**100%**
3	**Water Operations**		47.500%	30.500%	12.00%	10%				**100%**
4	**Water Projects**		38%	38%	15%	10%				**100%**
5	**Water Fund**								100%	**100%**

6	Expense Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
7	**Water Supply Costs**	$3,952,917	$0	$0	$0	$0	$0	$0	$0	**$3,952,917**
8	**Water Customer Service**	$0	$0	$0	$0	$0	$199,914	$599,741	$0	**$799,654**
9	**Water Operations**	$0	$3,530,481	$2,266,940	$891,911	$743,259	$0	$0	$0	**$7,432,591**
10	**Water Projects**	$0	$123,313	$123,313	$49,325	$32,883	$0	$0	$0	**$328,834**
11	**Water Fund**	$0	$0	$0	$0	$0	$0	$0	$11,597	**$11,597**
12	**TOTAL EXPENSES**	$3,952,917	$3,653,793	$2,390,253	$941,236	$776,143	$199,914	$599,741	$11,597	**$12,525,593**
13	***% Allocation***	***32%***	***29%***	***19%***	***8%***	***6%***	***2%***	***5%***	***0%***	

14	Asset Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
15	**Well**		50%	50%	0%	0%				**100%**
16	**Reservoir**		45%	45%	0%	10%				**100%**
17	**Meters**						100%			**100%**
18	**Distribution**		30%	30%	30%	10%				**100%**
19	**Vehicles**								100%	**100%**

20	Asset Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
21	**Well**	$0	$6,319,154	$6,319,154	$0	$0	$0	$0	$0	**$12,638,308**
22	**Reservoir**	$0	$8,502,989	$8,502,989	$0	$1,889,553	$0	$0	$0	**$18,895,532**
23	**Meters**	$0	$0	$0	$0	$0	$4,439,389	$0	$0	**$4,439,389**
24	**Distribution**	$0	$12,910,264	$12,910,264	$12,910,264	$4,303,421	$0	$0	$0	**$43,034,212**
25	**Vehicles**	$0	$0	$0	$0	$0	$0	$0	$307,881	**$307,881**
26	**TOTAL ASSETS**	**$0**	**$27,732,407**	**$27,732,407**	**$12,910,264**	**$6,192,974**	**$4,439,389**	**$0**	**$307,881**	**$79,315,322**
27	***% Allocation***	***0%***	***35%***	***35%***	***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**. 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	Tiers	Annual Usage (ccf)	Average Daily Usage, ccf/day	Max Day Capacity Factor	Max Day Total Capacity, ccf/day	Max Day Extra Capacity, ccf/day	Max Hour Capacity Factor	Max Hour Total Capacity,ccf /day	Max Hour Extra Capacity, ccf/day	Equivalent Meters	Number of Bills
Residential										15,342	131,748
Tier 1	1-8 ccf	880,853	2,413	1.09	2,630	217	1.64	3,946	1,315		
Tier 2	9-16 ccf	455,010	1,247	1.38	1,720	474	2.07	2,580	860		
Tier 3	>16 ccf	365,174	1,000	1.53	1,531	530	2.30	2,296	765		
Multifamily										4,079	10,812
Uniform Tier		891,833	2,443	1.26	3,079	635	1.89	4,618	1,539		
Commercial										3,588	10,032
Uniform Tier		471,412	1,292	1.29	1,666	375	1.94	2,499	833		
Municipal										801	1,368
Uniform Tier		91,956	252	1.64	413	161	2.46	620	207		
Irrigation										1,260	2,064
Uniform Tier		253,413	694	1.99	1,382	687	2.99	2,072	691		
Fireline										2,656	180
Uniform Tier		23	0	1.99	0	0	2.99	0	0		
Total		**3,409,673**	**9,342**		**12,421**	**3,080**		**18,632**	**6,211**	**27,726**	**156,204**

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 13 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 27 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	Base Delivery	Max Day	Max Hour	Fire	Meter	Customer	General	TOTAL
Operating Expenses	$3,952,917	$3,667,750	$2,394,639	$942,963	$777,567	$200,280	$600,841	$11,618	$12,548,574
Capital Expenses	$0	$1,383,671	$1,383,671	$644,140	$308,990	$221,497	$0	$15,361	$3,957,330
Total Cost of Service	**$3,952,917**	**$5,051,420**	**$3,778,309**	**$1,587,103**	**$1,086,557**	**$421,778**	**$600,841**	**$26,980**	**$16,505,904**
Allocation of General Cost		$10,880	$8,138	$3,418	$2,340	$908	$1,294	($26,980)	
Allocation of Public Fire Protection Cost					-$1,067,119	$1,067,119			
Allocation of Base & Peaking Costs to Meter		$0	($1,628,172)	($683,924)		$2,312,097			
Total Adjusted COS	**$3,952,917**	**$5,062,301**	**$2,158,275**	**$906,597**	**$21,778**	**$3,801,901**	**$602,135**	**$0**	**$16,505,904**
Unit of Service	3,409,673 ccf	3,409,673 ccf	3,080 ccf/day	6,211 ccf/day	31,872 unit/yr	300,840 EMU/yr	156,204 bills/yr		
Unit Cost	**$1.16** *per ccf of usage*	**$1.48** *per ccf of usage*	**$700.82** *per ccf/day of peaking*	**$145.98** *per ccf/day of peaking*	**$0.68** *per unit per month*	**$12.64** *per EMU per month*	**$3.85** *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 98% 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. 43% 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 26.6%, 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 26.6% 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**. 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
Residential								
Tier 1	$1,021,194	$1,307,791	$152,217	$191,994				$2,673,196
Tier 2	$527,504	$675,547	$331,987	$125,562				$1,660,600
Tier 3	$423,355	$542,169	$371,614	$111,725				$1,448,862
Multifamily								
Uniform Tier	$1,033,924	$1,324,094	$445,219	$224,705				$3,027,941
Commercial								
Uniform Tier	$546,519	$699,900	$262,491	$121,604				$1,630,515
Municipal								
Uniform Tier	$106,607	$136,526	$113,000	$30,157				$386,289
Irrigation								
Uniform Tier	$293,788	$376,239	$481,704	$100,842				$1,252,573
Fireline								
Uniform Tier	$27	$34	$44	$9				$114
Fire					$21,778			$21,778
Meter (EMUs)						$3,801,901		$3,801,901
Customer (Bills)							$602,135	$602,135
Total	**$3,952,917**	**$5,062,301**	**$2,158,275**	**$906,597**	**$21,778**	**$3,801,901**	**$602,135**	**$16,505,904**

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. In addition, the City assesses a surcharge to multifamily customers, based on the number of dwelling units for each account. **Table 5-1** shows the existing rate structure and rates.

Table 5-1: Existing Monthly Rate Structure and Rates

Effective	1/1/2019 FY 2019
GENERAL SERVICE	
Monthly Fixed Charges	
Meter Size	
5/8"	$14.81
3/4"	$20.70
1"	$32.49
1 1/2"	$61.95
2"	$97.31
3"	$179.80
4"	$297.65
6"	$592.26
8"	$945.81
Volumetric Rates (per ccf)	
Residential	
Tier 1 (0-8 ccf)	$2.33
Tier 2 (9-16 ccf)	$3.88
Tier 3 (>16 ccf)	$4.65
Multi-Family	$2.84
Commercial	$3.32
Municipal	$3.91
Irrigation	$4.51
FIRELINE SERVICE	
Monthly Fixed Charges	
Meter Size	
2"	$4.75
3"	$8.05
4"	$13.73
6"	$34.12
8"	$69.27
10"	$122.16
12"	-
Volumetric Rate (per ccf)	$4.51

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, especially in the event of a drought or other water shortage.

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	8,233	$12.64	$3.85	**$16.50**	*$14.81*	$1.69	11%	$1,630,134
3/4"	1.50	626	$18.96	$3.85	**$22.82**	*$20.70*	$2.12	10%	$171,424
1"	2.50	3,217	$31.59	$3.85	**$35.45**	*$32.49*	$2.96	9%	$1,368,512
1 1/2"	5.00	338	$63.19	$3.85	**$67.05**	*$61.95*	$5.10	8%	$271,955
2"	8.00	528	$101.10	$3.85	**$104.96**	*$97.31*	$7.65	8%	$665,027
3"	15.00	24	$189.56	$3.85	**$193.42**	*$179.80*	$13.62	8%	$55,705
4"	25.00	16	$315.94	$3.85	**$319.80**	*$297.65*	$22.15	7%	$61,402
6"	50.00	14	$631.88	$3.85	**$635.74**	*$592.26*	$43.48	7%	$106,804
8"	80.00	6	$1,011.01	$3.85	**$1,014.87**	*$945.81*	$69.06	7%	$73,071
Firelines									
2"	6.19	2	$4.23	$3.85	**$8.09**	*$4.75*	$3.34	70%	$194
3"	17.98	0	$12.29	$3.85	**$16.15**	*$8.05*	$8.10	101%	$0
4"	38.32	0	$26.18	$3.85	**$30.04**	*$13.73*	$16.31	119%	$0
6"	111.31	5	$76.06	$3.85	**$79.92**	*$34.12*	$45.80	134%	$4,795
8"	237.21	7	$162.08	$3.85	**$165.94**	*$69.27*	$96.67	140%	$13,939
10"	426.58	1	$291.48	$3.85	**$295.34**	*$122.16*	$173.18	142%	$3,544
Total									**$4,426,505**

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.

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 f 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. 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)	3,000	4,175	1,153	475	**8,803**
Cost of Supply	$0	$2,110,786	1,336,731	$505,400	**$3,952,917**
Average Unit Cost ($/AF)	$0	$506	$1,160	$1,064	
Rank	1	2	4	3	

Water Sources	Groundwater	Cal Domestic Entitlement	MWDOC	Cal Domestic Over Entitlement	Total
Sales (AF), net of loss	2,668	3,713	422	1,025	**7,828**
Sales (ccf), net of loss	1,161,992	1,617,249	183,982	446,450	**3,409,673**
Cost of Supply	$0	$2,110,786	$505,400	$1,336,731	**$3,952,917**
Unit Cost of Demand ($/ccf)	**$0.00**	**$1.31**	**$2.75**	**$2.99**	**$1.16**

Customer Class	Usage (ccf)	Groundwater	Cal Domestic Entitlement	MWDOC	Cal Domestic Over Entitlement	Total
Residential	1,701,036	579,701	806,822	91,786	222,727	**1,701,036**
Multifamily	891,833	303,930	423,007	48,122	116,773	**891,833**
Commercial	471,412	160,654	223,596	25,437	61,725	**471,412**
Municipal	91,956	31,338	43,616	4,962	12,040	**91,956**
Irrigation	253,413	86,361	120,197	13,674	33,181	**253,413**
Fireline	23	8	11	1	3	**23**
Total	**3,409,673**	**1,161,992**	**1,617,249**	**183,982**	**446,450**	**3,409,673**

Customer Class	Usage (ccf)	Groundwater	Cal Domestic Entitlement	MWDOC	Cal Domestic Over Entitlement	UNIT COST
Residential						
Tier 1	880,853	579,701	301,152	0	0	**$0.45**
Tier 2	455,010	0	455,010	0	0	**$1.31**
Tier 3	365,174	0	50,660	91,786	222,727	**$2.70**
Multifamily						
Uniform Tier	891,833	303,930	423,007	48,122	116,773	**$1.16**
Commercial						
Uniform Tier	471,412	160,654	223,596	25,437	61,725	**$1.16**
Municipal						
Uniform Tier	91,956	31,338	43,616	4,962	12,040	**$1.16**
Irrigation						
Uniform Tier	253,413	86,361	120,197	13,674	33,181	**$1.16**
Fireline						
Uniform Tier	23	8	11	1	3	**$1.16**
Total	**3,409,673**	**1,161,992**	**1,617,249**	**183,982**	**446,450**	**$1.16**

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**. Note that peaking costs are recovered through the fixed charges, and not included in the commodity rate calculations.

Table 5-4: Derivation of the Commodity Rates

Customer Class		Usage (ccf)	Supply	Base Delivery	Peaking	Total Rate	Current Rate	Difference	Revenue
Residential									
Tier 1	8	880,853	$0.45	$1.48	$0.39	**$2.33**	*$2.33*	0%	$2,052,387
Tier 2	16	455,010	$1.31	$1.48	$1.01	**$3.80**	*$3.88*	-2%	$1,729,037
Tier 3	17+	365,174	$2.70	$1.48	$1.32	**$5.51**	*$4.65*	18%	$2,012,107
Multifamily									
Uniform Tier		891,833	$1.16	$1.48	$0.75	**$3.40**	*$2.84*	20%	$3,032,232
Commercial									
Uniform Tier		471,412	$1.16	$1.48	$0.81	**$3.46**	*$3.32*	4%	$1,631,086
Municipal									
Uniform Tier		91,956	$1.16	$1.48	$1.56	**$4.21**	*$3.91*	8%	$387,135
Irrigation									
Uniform Tier		253,413	$1.16	$1.48	$2.30	**$4.95**	*$4.51*	10%	$1,254,394
Fireline									
Uniform Tier		23	$1.16	$1.48	$2.30	**$4.95**	*$4.51*	10%	$114
Total		**3,409,673**	**$3,952,917**	**$5,062,301**	**$3,064,872**				**$12,098,491**

The proposed schedule of water rates for FY 2020-2024 is summarized in **Table 5-5**. The rates derived for FY 2020 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

Commented [AA1]: Formatting is inconsistent. First two tables have no borders. Same thing in Table 1-3.

		Effective Date:	*January 2020*	*January 2021*	*January 2022*	*January 2023*	*January 2024*
GENERAL SERVICE		***FY 2019***	**FY 2020**	**FY 2021**	**FY 2022**	**FY 2023**	**FY 2024**
Monthly Fixed Charges							
Meter Size							
5/8"		*$14.81*	$16.50	$17.99	$19.60	$21.17	$21.81
3/4"		*$20.70*	$22.82	$24.87	$27.11	$29.28	$30.16
1"		*$32.49*	$35.45	$38.64	$42.12	$45.49	$46.85
1 1/2"		*$61.95*	$67.05	$73.08	$79.66	$86.04	$88.62
2"		*$97.31*	$104.96	$114.41	$124.70	$134.68	$138.72
3"		*$179.80*	$193.42	$210.83	$229.80	$248.19	$255.63
4"		*$297.65*	$319.80	$348.58	$379.95	$410.35	$422.66
6"		*$592.26*	$635.74	$692.96	$755.32	$815.75	$840.22
8"		*$945.81*	$1,014.87	$1,106.21	$1,205.77	$1,302.23	$1,341.30
Volumetric Rates (per ccf)							
Residential							
Tier 1	8	*$2.33*	$2.33	$2.54	$2.77	$2.99	$3.08
Tier 2	16	*$3.88*	$3.80	$4.14	$4.51	$4.88	$5.02
Tier 3	17+	*$4.65*	$5.51	$6.01	$6.55	$7.07	$7.28
Multifamily							
Uniform Tier		*$2.84*	$3.40	$3.71	$4.04	$4.36	$4.49
Commercial							
Uniform Tier		*$3.32*	$3.46	$3.77	$4.11	$4.44	$4.57
Municipal							
Uniform Tier		*$3.91*	$4.21	$4.59	$5.00	$5.40	$5.56
Irrigation							
Uniform Tier		*$4.51*	$4.95	$5.40	$5.88	$6.35	$6.54
FIRELINE SERVICE							
Monthly Fixed Charges							
Meter Size							
2"		*$4.75*	$8.09	$8.82	$9.61	$10.38	$10.69
3"		*$8.05*	$16.15	$17.60	$19.19	$20.72	$21.34
4"		*$13.73*	$30.04	$32.74	$35.69	$38.55	$39.70
6"		*$34.12*	$79.92	$87.11	$94.95	$102.55	$105.63
8"		*$69.27*	$165.94	$180.87	$197.15	$212.93	$219.31
10"		*$122.16*	$295.34	$321.92	$350.89	$378.96	$390.33
Volumetric Rates (per ccf)							
Fireline							
Uniform Tier		*$4.51*	$4.95	$5.40	$5.88	$6.35	$6.54

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 5/8"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$24.13	$25.82	7%	$1.69	17%	$20.28
	8	$33.45	$35.14	5%	$1.69	40%	$20.28
Average Monthly	12	$48.97	$50.34	3%	$1.37	61%	$16.44
	16	$64.49	$65.54	2%	$1.05	76%	$12.60
Double Average	24	$101.69	$109.62	8%	$7.93	91%	$95.16
	32	$138.89	$153.70	11%	$14.81	96%	$177.72
Very High	40	$176.09	$197.78	12%	$21.69	98%	$260.28

Single Family 1"	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	% Bills At or Below	Total Annual Impact
Low Volume	4	$41.81	$44.77	7%	$2.96	22%	$35.52
	8	$51.13	$54.09	6%	$2.96	45%	$35.52
Average Monthly	12	$66.65	$69.29	4%	$2.64	62%	$31.68
	16	$82.17	$84.49	3%	$2.32	74%	$27.84
Double Average	24	$119.37	$128.57	8%	$9.20	89%	$110.40
	32	$156.57	$172.65	10%	$16.08	95%	$192.96
Very High	40	$193.77	$216.73	12%	$22.96	98%	$275.52

Multifamily	Usage (ccf)	# of Units	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual Impact
5/8" Example	44	3	$139.77	$166.10	19%	$26.33	$315.96
3/4" Example	330	25	$957.90	$1,144.82	20%	$186.92	$2,243.04
1.0" Example	72	4	$236.97	$280.25	18%	$43.28	$519.36
1.5" Example	180	14	$573.15	$679.05	18%	$105.90	$1,270.80
2.0" Example	268	32	$858.43	$1,016.16	18%	$157.73	$1,892.76

Commercial	Usage (ccf)	Current Bill	Proposed Bill	Monthly Impact (%)	Monthly Impact ($)	Total Annual
5/8" Example	40	$147.61	$154.90	5%	$7.29	$87.48
3/4" Example	33	$130.26	$137.00	5%	$6.74	$80.88
1.0" Example	117	$420.93	$440.27	5%	$19.34	$232.08
1.5" Example	74	$307.63	$323.09	5%	$15.46	$185.52
2.0" Example	387	$1,382.15	$1,443.98	4%	$61.83	$741.96
3.0" Example	1269	$4,392.88	$4,584.16	4%	$191.28	$2,295.36
4.0" Example	2266	$7,820.77	$8,160.16	4%	$339.39	$4,072.68
6.0" Example	264	$1,468.74	$1,549.18	5%	$80.44	$965.28