CITY OF Santa fe springs

Water and Reclaimed Water Rate Study

Final Report / April 3, 2020







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March 24, 2020

Mr. Noe Negrete Director of Public Works City of Santa Fe Springs 11710 E. Telegraph Road Santa Fe Springs, CA 90670

Subject: Water and Reclaimed Water Rate Study Report

Dear Mr. Negrete,

Raftelis is pleased to provide this Water and Reclaimed Water Rate Study Report to the City of Santa Fe Springs. This report presents the analyses, rationales, and methodologies utilized in the study to determine water rates that meet the requirements of California Constitution Article XIII D, Section 6, commonly referred to as Proposition 218.

The study involved a comprehensive review of the City's current water and reclaimed water rate structures, longterm financial plan, revenue requirements, and alternative rate structures to determine proposed water and reclaimed water rates that are in line with the City's policy objectives.

The main objectives that informed the study include:

- » Developing a long-term financial plan for water and reclaimed water
- » Ensuring financial sufficiency to fully fund operating and capital costs and meet reserve requirements
- » Deriving water rates that fairly and equitably recover costs from all customer classes to maintain compliance with Proposition 218 requirements
- » Designing water rates that are fair, equitable, and easy to understand

It has been a pleasure working with you and we thank you and other City staff for the support provided during this study.

Sincerely,

Sudhir Pardiwala Executive Vice President

Nancy Phan Senior Consultant

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1. Executive Summary

Study Background

The City of Santa Fe Springs (City) engaged Raftelis in 2019 to complete a Water and Reclaimed Water Rate Study. The study consists of a long-range financial plan, cost of service analysis, and rate design and derivation. It encompasses a four-year financial plan and four years of proposed rates, for adoption beginning in June 2020 and January of every year thereafter.

The objectives of the Water and Reclaimed Water Rate Study include:

- » Developing a long-term financial plan for water and reclaimed water
- » Ensuring financial sufficiency to fully fund operating and capital costs and meet reserve requirements
- » Deriving water rates that fairly and equitably recover costs from all customer classes to maintain compliance with Proposition 218 requirements
- » Designing water rates that are fair, equitable, and easy to understand and implement

The study period is from fiscal year (FY) 2020 through FY 2023. For the purposes of this study, FY 2020 is the year starting in July 1, 2019 and ending in June 30, 2020.

Current Rates

The City's current rate structure consists of a monthly meter service charge, a monthly fire service charge, and consumption-based quantity rates. All customers pay the same rates based on their meter size and consumption, for either water or reclaimed water.

Table 1-1 shows the current monthly meter and fire service charges, which are charged based on meter or fire line size.

Α	В	С	D
Line	Meter Size	Monthly Meter Service Charge	Monthly Fire Service Charge
1	5/8 x 3/4-in	\$12.40	N/A
2	3/4-in	\$12.40	N/A
3	1-in	\$16.09	N/A
4	1 1/2-in	\$59.55	N/A
5	2-in	\$83.25	N/A
6	2.5-in	N/A	\$54.40
7	3-in	\$167.61	N/A
8	4-in	\$220.89	\$82.14
9	6-in	\$277.00	\$102.12
10	8-in	\$368.52	\$138.75
11	10-in	\$555.00	\$175.38

Table 1-1: Current Monthly Service Charges

Table 1-2 shows the current quantity rates for water and reclaimed water. Customers are charged per hundred cubic feet (hcf) of water consumption. All water customers pay the same rate for each unit of water within the five monthly tiers; all reclaimed water customers are charged based on a four-tier rate structure. Please note that the current reclaimed water tiers include consumption in both hcf and acre-feet. The City also has a Senior Discount program, funded by the General Fund, that discounts the Tier 1 water quantity rate by 15 percent.

Α	В	С	D
Line	Customer Type	Monthly Tiers (hcf)	Quantity Rates (\$/hcf)
1	Water		
2	Tier 1	Up to 18	\$3.17
3	Tier 2	19-36	\$3.62
4	Tier 3	37-100	\$4.14
5	Tier 4	101-400	\$4.24
6	Tier 5	400+	\$4.34
7			
8	Reclaimed Water		
9	Tier 1	Up to 18 hcf	\$3.06
10	Tier 2	19 hcf - 25 AF	\$3.45
11	Tier 3	26AF-50 AF	\$3.33
12	Tier 4	50 AF+	\$3.17

Table 1-2: Current Quantity Rates

Results and Recommendations

Raftelis recommends that the City implement annual revenue adjustments beginning in June 2020 and for every January in the study period thereafter. The revenue adjustments, which are discussed in detail in Section 3, allow the City to fully fund its operating and capital costs and to build reserves over time. For the four-year study period, Raftelis recommends that the City implement a 9.5 percent adjustment in the first three years and a 6.0 percent adjustment in the final year.

The proposed rate structure remains the same for the monthly meter and fire service charges. However, Raftelis recommends that the City adopt the following changes for the quantity rates:

- » Three-tier rate structure for Single Family Residential customers, based on water efficiency standards and actual customer usage characteristics
- » Uniform rate structure for non-residential and reclaimed water customers

Proposed Rates

Table 1-3 and **Table 1-4** show the proposed monthly meter service charges and monthly fire service charges for the study period, respectively.

Α	В	С	D	E	F
Line	Meter Size	June 2020	January 2021	January 2022	January 2023
1	5/8 x 3/4-in	\$20.97	\$22.97	\$25.16	\$26.67
2	3/4-in	\$20.97	\$22.97	\$25.16	\$26.67
3	1-in	\$31.36	\$34.34	\$37.61	\$39.87
4	1 1/2-in	\$57.33	\$62.78	\$68.75	\$72.88
5	2-in	\$88.50	\$96.91	\$106.12	\$112.49
6	3-in	\$171.62	\$187.93	\$205.79	\$218.14
7	4-in	\$265.12	\$290.31	\$317.89	\$336.97
8	6-in	\$524.86	\$574.73	\$629.33	\$667.09
9	8-in	\$836.54	\$916.02	\$1,003.05	\$1,063.24
10	10-in	\$2,187.16	\$2,394.95	\$2,622.48	\$2,779.83

Table 1-3: Proposed Monthly Meter Service Charges (All Classes)

Α	В	C	D	E	F
Line	Fire Line Size	June 2020	January 2021	January 2022	January 2023
1	2.5-in	\$15.70	\$17.20	\$18.84	\$19.98
2	4-in	\$40.89	\$44.78	\$49.04	\$51.99
3	6-in	\$108.52	\$118.83	\$130.12	\$137.93
4	8-in	\$225.17	\$246.57	\$270.00	\$286.20
5	10-in	\$400.63	\$438.69	\$480.37	\$509.20

Table 1-4: Proposed Monthly Fire Service Charges

Table 1-5 shows the proposed quantity rates, charged per hcf of water consumption, based on the recommendations for the alternative rate structure. The City will also increase the Senior Discount program, funded by the General Fund, that discounts the Tier 1 quantity rate by 25 percent.

Table 1-5: Proposed Quantity Rates

Α	В	C	D	E	F	G
Line	Customer Class	Monthly Tiers (hcf)	June 2020	January 2021	January 2022	January 2023
1	Single Family Residential					
2	Tier 1	Up to 9	\$2.56	\$2.81	\$3.08	\$3.27
3	Tier 2	10-25	\$3.92	\$4.30	\$4.71	\$5.00
4	Tier 3	25+	\$5.62	\$6.16	\$6.75	\$7.16
5	Non-Residential		\$3.66	\$4.01	\$4.40	\$4.67
6	Reclaimed Water		\$3.49	\$3.83	\$4.20	\$4.46

Rates for the cities of Downey and Norwalk are by agreement.

Customer Impacts

Table 1-6 and **Figure 1-1** show the monthly bill impacts for a Single Family customer with a 3/4-inch meter at various levels of water usage. The average Single Family customer uses 13 hcf a month and will see an increase of approximately \$6 per month.

Table 1-6: Monthly Bill Impacts, Single Family Residential Customer with 3/4-in Meter

Α	В	C	D	E
Line	Monthly Usage	Proposed Monthly Bill	Current Monthly Bill	Difference (\$)
1	5 hcf	\$33.77	\$28.25	\$5.52
2	9 hcf	\$44.01	\$40.93	\$3.08
3	13 hcf	\$59.69	\$53.61	\$6.08
4	16 hcf	\$71.45	\$63.12	\$8.33
5	20 hcf	\$87.13	\$76.70	\$10.43
6	25 hcf	\$106.73	\$94.80	\$11.93
7	30 hcf	\$134.83	\$112.90	\$21.93



Figure 1-1: Monthly Bill Impacts, Single Family Residential Customer with 3/4-in Meter

Similarly, **Table 1-7** and **Figure 1-2** show the monthly bill impacts for a Commercial customer with a 2-inch meter at various levels of water usage. The average Commercial customer uses 80 hcf per month and will see a reduction of approximately \$6 per month.

		•		
Α	В	С	D	Ε
Line	Monthly Usage	Proposed Monthly Bill	Current Monthly Bill	Difference (\$)
1	20 hcf	\$161.70	\$147.55	\$14.15
2	50 hcf	\$271.50	\$263.43	\$8.07
3	80 hcf	\$381.30	\$387.63	(\$6.33)
4	100 hcf	\$454.50	\$470.43	(\$15.93)
5	150 hcf	\$637.50	\$682.43	(\$44.93)
6	200 hcf	\$820.50	\$894.43	(\$73.93)
7	300 hcf	\$1,186.50	\$1,318.43	(\$131.93)
8	500 hcf	\$1,918.50	\$2,176.43	(\$257.93)

Table 1-7: Monthly Bill Impacts, Commercial Customer with 2-in Meter



Figure 1-2: Monthly Bill Impacts, Commercial Customer with 2-in Meter

2. Study Methodology

This section of the report details the legal compliance framework and methodology used to develop the financial plan and water rates for this study. Please note that Raftelis is not a legal firm and the phrase "legal compliance framework" is for literary convenience only.

Legal Framework

The rate-making process, especially for water agencies in California, begins with reviewing the legal requirements and framework currently in place. The major legal requirements include Proposition 218 and Article X, Section 2 of the California Constitution, which are outlined in the following sections.

CALIFORNIA CONSTITUTION – ARTICLE XIII D, SECTION 6 (PROPOSITION 218)

Proposition 218 was enacted by voters in 1996 to ensure, in part, that fees and charges imposed for ongoing delivery of a service to a property ("property-related fees and charges") are proportional to, and do not exceed, the cost of providing service. Water service fees and charges are property-related and subject to the provisions of Proposition 218.

The principal requirements, as they relate to public water service fees and charges, are as follows:

- 1. Revenues derived from a property-related charge imposed by a public agency shall not exceed the costs required to provide the property-related service.
- 2. Revenues derived by the fee or charge shall not be used for any purpose other than that for which the fee or charge was imposed.
- 3. The amount of the fee or charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
- 4. No fee or charge may be imposed for a service unless that service is actually used or immediately available to the owner of property.
- 5. A written notice of the proposed fee or charge shall be mailed to the record owner of each parcel not less than 45 days prior to a public hearing, when the agency considers all written protests against the charge.

As stated in the American Water Works Association's (AWWA) *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1, Seventh Edition* (M1 Manual), "water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." Proposition 218 requires that water rates cannot be "arbitrary and capricious," meaning that the rate-setting methodology must establish a clear nexus between costs and the rates charged.

CALIFORNIA CONSTITUTION – ARTICLE X, SECTION 2

Article X, Section 2 of the California Constitution was established in 1976 and states the following:

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

Article X, Section 2 of the California Constitution institutes the need to preserve the State's water supplies and to discourage the wasteful or unreasonable use of water by encouraging conservation. As such, public agencies are constitutionally mandated to maximize the beneficial use of water, prevent waste, and encourage conservation.

Methodology

Step 1: Long Term Financial Plan

The first step of the study is to develop a long-term financial plan that projects the water utility's revenues, expenses, capital project financing, annual debt service, and reserve funding. The financial plan is used to determine the revenue adjustment, which allows the water utility to recover adequate revenues to fund expenses and reserves.

Step 2: Revenue Requirement Determination for Test Year

After completing the long-term financial plan, the rate-making process can begin by determining the revenue requirement for the test year, also known as the rate-setting year. The rate-setting year for this study is FY 2020. The revenue requirement should sufficiently fund the utility's operating and maintenance (O&M) costs, annual debt service, capital improvement plan (CIP) costs, and reserve funding as projected based on the utility's FY 2020 budget.

Step 3: Cost of Service Analysis

The annual cost of providing water service, or the revenue requirement, is then distributed to customer classes and tiers commensurate with their use of and burden on the system. A cost of service analysis involves the following steps:

- 1. Functionalize costs the different components of the revenue requirement are categorized into functions such as supply, transmission and distribution (T&D), customer service and billing, etc.
- 2. Allocate to cost causation components the functionalized costs are then allocated to cost causation components such as supply, base delivery, peaking, meter, customer, etc.
- 3. Develop unit costs unit costs for each cost causation component are determined using units of service, such as total usage, peaking units, equivalent meters, number of customers, etc. for each customer class and dividing the cost causation component costs by the respective service units.
- 4. Calculate customer costs by applying the unit costs to the service units for each customer class and tier.

A cost of service analysis considers both the average water demand and peak demand. Peaking costs are incurred during periods of peak consumption, most often coinciding with summertime water usage. There are additional capacity-related costs associated with designing, constructing, operating, maintaining, and replacing facilities to meet peak demand. These peaking costs are allocated to the different customer classes based on each respective class's water consumption patterns. The patterns of usage impose additional costs for the utility and are used to determine the expense of the peaking-related facilities.

Step 4: Rate Design and Calculation

After allocating the revenue requirement to each customer class and tier, the rate design and calculation process can begin. Rates do more than simply recover costs; within the legal framework and industry standards, properly designed rates should support and optimize for the City's policy objectives. Rates also act as a public information tool in communicating these policy objectives to customers. This process also includes a rate impact analysis for all proposed water rates and sample customer bill impacts.

Step 5: Administrative Record Preparation and Rate Adoption

The final step in a rate study is to develop the administrative record in preparation for the rate adoption process. The administrative record, also known as the study report, documents the results of the rate study and presents the methodologies, rationale, justifications, and calculations utilized to determine the proposed rates. A thorough and methodological administrative record serves two important functions: maintaining defensibility in a stringent legal environment and communicating the rate adoption process to customers and important stakeholders.

3. Financial Plan

This report section discusses O&M expenses, CIP, reserve funding, projected revenue under existing rates, and revenue adjustments needed to ensure the City's fiscal sustainability and solvency. The study period covers FY 2020 through FY 2023. The budget year, which for this study is FY 2020, is the year from which revenues and expenses are projected for the study period. Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report.

Current Rates

Table 3-1 show the City's current monthly service charges. The monthly meter service charge (Column C) is charged to all water and reclaimed water customers based on meter size. The monthly fire service charge (Column D) is charged to all private fire service customers based on fire line size.

Α	В	C	D
Line	Meter Size	Monthly Meter Service Charge	Monthly Fire Service Charge
1	5/8 x 3/4-in	\$12.40	N/A
2	3/4-in	\$12.40	N/A
3	1-in	\$16.09	N/A
4	1 1/2-in	\$59.55	N/A
5	2-in	\$83.25	N/A
6	2.5-in	N/A	\$54.40
7	3-in	\$167.61	N/A
8	4-in	\$220.89	\$82.14
9	6-in	\$277.00	\$102.12
10	8-in	\$368.52	\$138.75
11	10-in	\$555.00	\$175.38

Table 3-1: Current Monthly Service Charges

The City's current quantity rates, which are charged based on monthly water consumption in hcf, are shown in **Table 3-2**. All water customers are charged based on a five-tier rate structure; all reclaimed water customers are charged based on a four-tier rate structure.

Α	В	С	D
Line	Customer Type	Monthly Tiers (hcf)	Quantity Rates (\$/hcf)
1	Water		
2	Tier 1	1-18	\$3.17
3	Tier 2	19-36	\$3.62
4	Tier 3	37-100	\$4.14
5	Tier 4	101-400	\$4.24
6	Tier 5	400+	\$4.34
7			
8	Reclaimed Water		
9	Tier 1	18 hcf	\$3.06
10	Tier 2	19 hcf-25 AF	\$3.45
11	Tier 3	26AF-50 AF	\$3.33
12	Tier 4	50 AF+	\$3.17

Table 3-2: Current Quantity Rates

Customer Accounts and Usage

The City is largely built out and does not expect to add any significant number of accounts from new development or redevelopment during the study period. Additionally, the City does not expect a change in water demand. City staff provided customer accounts, meter counts, and water usage for FY 2019, which stay constant for the study period from FY 2020 through FY 2023.

Table 3-3 and Table 3-4 show the customer accounts by meter size and water usage by customer class, respectively.

Table 3-3: Customer Accounts and Meter Sizes

Α	В	С	D	E	F	G
Line	Customer Type	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
1	Water					
2	5/8 x 3/4-in	158	158	158	158	158
3	3/4-in	2,972	2,972	2,972	2,972	2,972
4	1-in	1,259	1,259	1,259	1,259	1,259
5	1 1/2-in	596	596	596	596	596
6	2-in	538	538	538	538	538
7	3-in	52	52	52	52	52
8	4-in	26	26	26	26	26
9	6-in	5	5	5	5	5
10	8-in	0	0	0	0	0
11	10-in	1	1	1	1	1
12	Total - Water	5,607	5,607	5,607	5,607	5,607
13						
14	Reclaimed Water					
15	5/8 x 3/4-in	0	0	0	0	0
16	3/4-in	0	0	0	0	0
17	1-in	3	3	3	3	3
18	1 1/2-in	38	38	38	38	38
19	2-in	65	65	65	65	65
20	3-in	12	12	12	12	12
21	4-in	1	1	1	1	1
22	6-in	0	0	0	0	0
23	8-in	1	1	1	1	1
24	10-in	0	0	0	0	0
25	Total - Reclaimed Water	120	120	120	120	120
26						
27	Fire Service					
28	2.5-in	20	20	20	20	20
29	4-in	33	33	33	33	33
30	6-in	202	202	202	202	202
31	8-in	342	342	342	342	342
32	10-in	125	125	125	125	125
33	Total - Fire Service	722	722	722	722	722
34						
35	Total Accounts	6,449	6,449	6,449	6,449	6,449
36	Water	5,607	5,607	5,607	5,607	5,607
37	Reclaimed Water	120	120	120	120	120
38	Fire Service	722	722	722	722	722

Table 3-4: Water Usage by Customer Class and Tier

Α	В	С	D	E	F	G
Line	Customer Class	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
1	Single Family Residential					
2	Tier 1	454,643	454,643	454,643	454,643	454,643
3	Tier 2	61,002	61,002	61,002	61,002	61,002
4	Tier 3	40,080	40,080	40,080	40,080	40,080
5	Tier 4	17,968	17,968	17,968	17,968	17,968
6	Tier 5	1,239	1,239	1,239	1,239	1,239
7	Total - Single Family Residential	574,933	574,933	574,933	574,933	574,933
8						
9	Senior Discount					
10	Tier 1	7,879	7,879	7,879	7,879	7,879
11	Tier 2	247	247	247	247	247
12	Tier 3	4	4	4	4	4
13	Tier 4	0	0	0	0	0
14	Tier 5	0	0	0	0	0
15	Total - Senior Discount	8,130	8,130	8,130	8,130	8,130
16						
17	Non-Residential					
18	Tier 1	233,625	233,625	233,625	233,625	233,625
19	Tier 2	161,773	161,773	161,773	161,773	161,773
20	Tier 3	341,204	341,204	341,204	341,204	341,204
21	Tier 4	544,999	544,999	544,999	544,999	544,999
22	Tier 5	215,846	215,846	215,846	215,846	215,846
23	Total - Non-Residential	1,497,446	1,497,446	1,497,446	1,497,446	1,497,446
24						
25	Downey Water	22 (17	22 (17	22 (17	22 (17	22 (17
26	Tier 2	33,647	33,647	33,647	33,647	33,647
27	Tier 2	3,000	3,000	3,000	3,000	3,000
28	Ther 5	2,427	2,427	2,427	2,427	2,427
29	Tier 5	5,990	5,990	5,990	5,990	5,990
21	Tetal Deverey Water	2,901	2,901	2,901	2,901	2,901
22	Total - Downey water	47,904	47,904	47,904	47,904	47,904
32	Norwalk Water					
34	Tier 1	0	0	0	0	0
35	Tier 2	0	0	0	0	0
36	Tier 3	0	0	0	0	0
37	Tier 4	0	0	0	0	0
38	Tier 5	21 798	21 798	21 798	21 798	21 798
39	Total - Norwalk Water	21,798	21,798	21,798	21,798	21,798
40	Totul - Horwark Water	21,770	21,770	21,770	21,770	21,770
41	Reclaimed Water					
42	Tier 1	44 480	44 480	44 480	44 480	44 480
43	Tier 2	376 338	376 338	376 338	376,338	376 338
44	Tier 3	0	0	0	0	0
45	Tier 4	0	0	0	0	0
46	Total - Reclaimed Water	420.818	420.818	420.818	420.818	420.818
47						
48	Total Usage (hcf)	2.571.089	2.571.089	2.571.089	2.571.089	2.571.089
49	Water	2.150.271	2.150.271	2.150.271	2.150.271	2.150.271
50	Reclaimed Water	420,818	420,818	420,818	420,818	420,818

Revenues

Table 3-5 shows the calculated rate revenues for the study period, which is calculated by multiplying the current rates shown in **Table 3-1** and **Table 3-2** by the projected customer accounts and water usage in **Table 3-3** and **Table 3-4** respectively.

Water meter service charge revenues (**Table 3-5**, Line 2) are calculated by multiplying the monthly meter service charge (**Table 3-1**, Column C) by the projected water accounts (**Table 3-3**, Lines 1-12) for each year of the study period. This is then multiplied by 12 months for a full year of service charge revenue. Reclaimed water meter service charge revenues (**Table 3-5**, Line 3) are calculated similarly, using the monthly meter service charges (**Table 3-1**, Column C) and reclaimed water customer account projections (**Table 3-3**, Lines 14-25). Fire service charge revenues (**Table 3-5**, Line 4) are calculated using the monthly fire service charges (**Table 3-1**, Column D) and fire service accounts (**Table 3-3**, Lines 27-33).

Variable revenues for water customers (**Table 3-5**, Lines 8-10) are calculated by multiplying the quantity rate for water customers (Table 3-2, Lines 1-6) by the water usage for each customer class (**Table 3-4**, Lines 1-39). The Senior Discount revenues (**Table 3-5**, Line 9) include the 15 percent discount on Tier 1 usage for that customer class. Reclaimed water variable revenues (**Table 3-5**, Line 11) are calculated similarly using the quantity rate for reclaimed water (**Table 3-2**, Lines 8-12) by the reclaimed water usage (**Table 3-4**, Lines 41-46).

Α	В	С	D	Ε	F
Line	Calculated Rate Revenues	FY 2020	FY 2021	FY 2022	FY 2023
1	Fixed Charges				
2	Water Meter Service Charge	\$1,868,982	\$1,868,982	\$1,868,982	\$1,868,982
3	Reclaimed Water Meter Service Charge	\$123,878	\$123,878	\$123,878	\$123,878
4	Fire Service Charge	\$1,125,622	\$1,125,622	\$1,125,622	\$1,125,622
5	Total - Fixed Charges	\$3,118,482	\$3,118,482	\$3,118,482	\$3,118,482
6					
7	Variable Charges				
8	Single Family Residential	\$1,909,542	\$1,909,542	\$1,909,542	\$1,909,542
9	Senior Discount	\$22,141	\$22,141	\$22,141	\$22,141
10	Non-Residential	\$6,246,514	\$6,246,514	\$6,246,514	\$6,246,514
11	Reclaimed Water	\$1,434,475	\$1,434,475	\$1,434,475	\$1,434,475
12	Total - Variable Charges	\$9,612,672	\$9,612,672	\$9,612,672	\$9,612,672
13					
14	Total Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
15	Water	\$10,047,179	\$10,047,179	\$10,047,179	\$10,047,179
16	Reclaimed Water	\$1,558,353	\$1,558,353	\$1,558,353	\$1,558,353
17	Fire Service	\$1,125,622	\$1,125,622	\$1,125,622	\$1,125,622

Table 3-5: Calculated Rate Revenues at Current Rates

In addition to rate revenues, the City generates miscellaneous revenues. The City expects these revenues to remain constant, as shown in **Table 3-6**, with the exception of interest income, which is calculated based on the reserve interest rate (Line 2) and the City's fund balances.

Table 3-6: Revenue Escalation Factors

Α	В	С	D	E	F
Line	Revenue Escalation Factors	FY 2020	FY 2021	FY 2022	FY 2023
1	Miscellaneous Revenue	0.0%	0.0%	0.0%	0.0%
2	Reserve Interest Rate	1.0%	1.0%	1.0%	1.0%

Table 3-7 shows the projected revenues for the study period. Rate revenues (Line 1) are derived from the calculated rate revenues (**Table 3-5**, Line 14). Interest earnings (Line 2) are calculated based on the reserve interest rate (**Table 3-6**, Line 2) and the City's projected fund balances. The remaining miscellaneous revenues (Lines 3-9) are not inflated for future years.

Α	В	С	D	E	F
Line	Projected Revenues	FY 2020	FY 2021	FY 2022	FY 2023
1	Metered Water Sales	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
2	Interest Earnings	\$59,000	\$107,112	\$117,205	\$91,003
3	Reconnection Fees	\$1,000	\$1,000	\$1,000	\$1,000
4	Rentals	\$100	\$100	\$100	\$100
5	Miscellaneous	\$100	\$100	\$100	\$100
6	Miscellaneous Fees	\$58,000	\$58,000	\$58,000	\$58,000
7	Testing Fees	\$30,000	\$30,000	\$30,000	\$30,000
8	Damage to City Property	\$8,000	\$8,000	\$8,000	\$8,000
9	Restitution Emergency Response	\$500	\$500	\$500	\$500
10	Total - Revenues	\$12,887,854	\$12,935,966	\$12,946,059	\$12,919,857
11	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
12	Miscellaneous Revenues	\$97,700	\$97,700	\$97,700	\$97,700
13	Interest Earnings	\$59,000	\$107,112	\$117,205	\$91,003

Table 3-7: Projected Revenues

O&M Expenses

Table 3-8 provides the escalation factors used to project O&M expenses across the study period. These factors are applied to the different expenses according to their nature to better forecast the change in these expenses over time. Raftelis worked closely with City staff to determine and verify the escalation factors to best match the City's financial planning process.

Table 3-8: Expense Escalation Factors

Α	В	С	D	E	F
Line	Expense Escalation Factors	FY 2020	FY 2021	FY 2022	FY 2023
1	General	3%	3%	3%	3%
2	Salaries	2%	2%	2%	2%
3	Benefits	3%	3%	3%	3%
4	Utilities	5%	5%	5%	5%
5	Chemical	2%	2%	2%	2%
6	Capital	3%	3%	3%	3%

The City purchases water from two different sources: City of Whittier, and Central Basin Municipal Water District (Central Basin MWD). For every AF of water purchased from City of Whittier, the City recharges the same amount using water from the Water Replenishment District of Southern California (WRD of SoCal). Additionally, the City purchases reclaimed water from Central Basin MWD.

Table 3-9 shows the water supply availability and costs by each of the three sources. City of Whittier charges a variable rate per AF of water (Lines 8-9) and WRD of SoCal charges a variable rate per AF of water (Lines 11-12). Central Basin MWD's costs include a variable rate per AF of water (Lines 14-15) and three different fixed charges (Lines 18-20). WRD of Socal charges the City based on the quantity of recycled water (Lines 23-24). The water supply costs, in lieu of data from City staff, is projected for future years using the Utilities escalation factor (**Table 3-8**, Line 4).

Table 3-9: Water Supply Source and Costs

Α	В	С	D	E	F
Line	Water Supply Source and Costs	FY 2020	FY 2021	FY 2022	FY 2023
1	Annual Quantity Available (AF)				
2	City of Whittier	2,417	2,417	2,417	2,417
3	Water Replenishment WRD of SoCal	2,417	2,417	2,417	2,417
4	Central Basin MWD Tier 1	3,000	3,000	3,000	3,000
5					
6	Water Variable Rates (\$/AF)				
7	City of Whittier				
8	Jul - Dec	\$282	\$282	\$296	\$311
9	Jan - Jun	\$282	\$296	\$311	\$326
10	Water Replenishment WRD of SoCal				
11	Jul - Dec	\$339	\$356	\$374	\$392
12	Jan - Jun	\$339	\$356	\$374	\$392
13	Central Basin MWD Tier 1				
14	Jul - Dec	\$1,240	\$1,268	\$1,331	\$1,398
15	Jan - Jun	\$1,268	\$1,331	\$1,398	\$1,468
16					
17	Water Fixed Charges				
18	MWD Capacity Charge	\$35,751	\$37,538	\$39,415	\$41,386
19	Central Basin Meter Service Charges	\$35,751	\$37,538	\$39,415	\$41,386
20	MWD Readiness-to-Serve Pass-Through	\$43,157	\$45,315	\$47,581	\$49,960
21					
22	Reclaimed Water Variable Rates (\$/hcf)				
23	Jul - Dec	\$1.67	\$1.76	\$1.85	\$1.94
24	Jan - Jun	\$1.76	\$1.85	\$1.94	\$2.03

Table 3-10 shows the water demand and production by each source of water. The water loss percentage (Lines 1-3) represents the amount of water produced that is lost during transmission, distribution, or leaks. The water usage proportion (Lines 5-7) shows that the City's customers demand slightly more water during the first half of the fiscal year than the latter half due to increase summertime water usage.

Water demand (Line 10) is calculated based on the annual water usage (**Table 3-4**, Line 49) converted to AF¹ and water production (Line 11) is equal to the water demand with water loss (Line 2). The amount of water produced by source (Lines 13-16) is determined based on the water availability for each source (**Table 3-9**, Lines 2-4). Water purchased from City of Whitter is significantly cheaper than water purchased from Central Basin MWD, so the City purchases the maximum amount from Whittier and the remaining from Central Basin MWD. The amount of water purchased from Whittier is recharged using water from WRD of Socal (Lines 18-20). The water production and recharge by period (Lines 22-35) is calculated using the water production and recharge by source (Lines 13-20) and the water usage proportion (Lines 5-7).

Reclaimed water demand (Line 38) is based on projected reclaimed water usage (**Table 3-4**, Line 50); reclaimed water production (Line 39) is equal to demand accounting for water loss (Line 3). Reclaimed water production by period (Lines 41-44) also uses the water usage proportion (Lines 5-7).

¹ One AF is approximately 435.6 hcf.

Table 3-10: Water Demand and Production by Source

A	B	C	D	E	F
Line	Water Demand and Production	FY 2020	FY 2021	FY 2022	FY 2023
1	Water Loss				
2	Water	7%	7%	7%	7%
3	Reclaimed Water	3%	3%	3%	3%
4					
5	Water Usage Proportion				
6	Jul-Dec	55%	55%	55%	55%
7	Jan-Jun	45%	45%	45%	45%
8					
9	Water Demand and Production (AF)				
10	Water Demand	4.936	4.936	4.936	4.936
11	Water Produced	5.308	5,308	5,308	5.308
12		-,	-,	- ,	-,
13	Water Production by Source (AF)				
14	City of Whittier	2.417	2.417	2,417	2.417
15	Central Basin MWD Tier 1	2.891	2.891	2.891	2.891
16	Total - Water Production by Source (AF)	5,308	5,308	5,308	5,308
17		-)	-)	-)	- ,
18	Water Recharge by Source (AF)				
19	Water Replenishment WRD of SoCal	2.417	2.417	2.417	2.417
20	Total - Water Recharge by Source (AF)	2,417	2,417	2,417	2,417
21		_,	_,	_,	_,
22	Water Production by Period (AF)				
23	City of Whittier				
24	Jul-Dec	1 329	1 329	1 329	1 329
25	Jan-Jun	1,088	1,088	1,088	1,088
26	Central Basin MWD Tier 1	_,	_,	_,	_,
2.7	Jul-Dec	1.590	1 590	1 590	1.590
28	Jan-Jun	1,301	1,301	1,301	1.301
29	Total - Water Production by Period (AF)	5.308	5,308	5,308	5,308
30		0,000	5,500	0,000	5,500
31	Water Recharge by Period (AF)				
32	Water Replenishment WRD of SoCal				
33	Jul-Dec	1 329	1 329	1 329	1 329
34	Jan-Jun	1 088	1,022	1 088	1 088
35	Total - Water Recharge by Period (AF)	2,417	2,417	2.417	2.417
36	Total Water Recharge by Ferrou (Tri)	_ ,117	_ ,117	2 , 117	_ ,117
37	Reclaimed Water Demand and Production (hcf)				
38	Reclaimed Water Demand	420 818	420 818	420 818	420 818
39	Reclaimed Water Produced	433 833	433 833	433 833	433 833
40		100,000	100,000	100,000	100,000
41	Reclaimed Water Production by Period (hcf)				
42	Jul-Dec	238 608	238 608	238 608	238 608
43	Jan-Jun	195 225	195 225	195 225	195 225
44	Total - Reclaimed Water Production by Period (hcf)	433 833	433 833	433 833	433 833
38 39 40 41 42 43 44	Reclaimed Water Demand Reclaimed Water Produced Reclaimed Water Production by Period (hcf) Jul-Dec Jan-Jun Total - Reclaimed Water Production by Period (hcf)	420,818 433,833 238,608 195,225 433,833	420,818 433,833 238,608 195,225 433,833	420,818 433,833 238,608 195,225 433,833	420,818 433,833 238,608 195,225 433,833

Table 3-11 shows the calculated water supply costs by source. City of Whittier costs (Line 2) is calculated by multiplying the amount of water produced from Whittier (**Table 3-10**, Lines 24-25) by the unit cost per AF of water (**Table 3-9**, Lines 8-9). City of Whittier replenishment costs from WRD of Socal (Line 3) is calculated by multiplying the amount of water produced from WRD of Socal (**Table 3-10**, Lines 33-34) by the unit rate (**Table 3-9**, Lines 11-12). Central Basin MWD costs (Line 4) are calculated by multiplying the water produced from Central Basin MWD (**Table 3-10**, Lines 27-28) by the variable rate (**Table 3-9**, Lines 14-15). The Central Basin MWD capacity, meter service, and readiness-to-serve costs (Lines 5-7) are equal to the annual fixed charges (**Table 3-9**, Lines 18-20). Reclaimed water purchase costs (Line 11) are calculated by multiplying the unit rate (**Table 3-9**, Lines 23-24) by the amount of reclaimed water produced in hcf (**Table 3-10**, Lines 42-43).

Α	В	С	D	Ε	F
Line	Water Supply Cost	FY 2020	FY 2021	FY 2022	FY 2023
1	Water				
2	City of Whittier	\$681,355	\$696,685	\$731,519	\$768,095
3	City of Whittier - Replenishment Cost	\$819,282	\$860,246	\$903,258	\$948,421
4	Central Basin MWD Tier 1	\$3,620,910	\$3,747,900	\$3,935,295	\$4,132,059
5	MWD Capacity Charge	\$35,751	\$37,538	\$39,415	\$41,386
6	Central Basin Meter Service Charges	\$35,751	\$37,538	\$39,415	\$41,386
7	MWD Readiness-to-Serve Pass-Through	\$43,157	\$45,315	\$47,581	\$49,960
8	Total - Water	\$5,236,206	\$5,425,222	\$5,696,483	\$5,981,307
9					
10	Reclaimed Water				
11	Central Basin MWD	\$742,378	\$779,497	\$818,472	\$859,396
12	Total - Reclaimed Water	\$742,378	\$779,497	\$818,472	\$859,396
13					
14	Total Water Supply Costs	\$5,978,584	\$6,204,720	\$6,514,956	\$6,840,703
15	Water	\$5,236,206	\$5,425,222	\$5,696,483	\$5,981,307
16	Reclaimed Water	\$742,378	\$779,497	\$818,472	\$859,396

Table 3-11: Calculated Water Supply Costs

Table 3-12 shows the projected O&M expenses for the study period. City staff provided the O&M expense budget for FY 2020 and every year beyond is inflated using the expense escalation factors (**Table 3-8**). Please note that the water and reclaimed water purchase costs (Lines 9-10) were previously calculated based on the water production estimates and supply costs (**Table 3-11**, Lines 15-16).

Table 3-12: Projected O&M Expenses

Α	В	С	D	Ε	F
Line	Projected O&M Expenses	FY 2020	FY 2021	FY 2022	FY 2023
1	Water Utility Administration				
2	Salaries & Benefits	\$673,300	\$690,996	\$709,173	\$727,844
3	Maintenance & Operations	\$629,700	\$648,591	\$668,049	\$688,090
4	Total - Water Utility Administration	\$1,303,000	\$1,339,587	\$1,377,222	\$1,415,934
5					
6	Water Purchases				
7	Salaries & Benefits	\$37,900	\$38,897	\$39,921	\$40,973
8	Maintenance & Operations	\$19,300	\$19,879	\$20,475	\$21,090
9	Water Purchase	\$5,236,206	\$5,425,222	\$5,696,483	\$5,981,307
10	Reclaimed Water Purchase	\$742,378	\$779,497	\$818,472	\$859,396
11	Total - Water Purchases	\$6,035,784	\$6,263,496	\$6,575,352	\$6,902,766
12					
13	Billing and Collection				
14	Salaries & Benefits	\$632,100	\$648,009	\$664,334	\$681,087
15	Maintenance & Operations	\$580,000	\$597,400	\$615,322	\$633,782
16	Total - Billing and Collection	\$1,212,100	\$1,245,409	\$1,279,656	\$1,314,868
17					
18	Backflow				
19	Salaries & Benefits	\$632,100	\$648,009	\$664,334	\$681,087
20	Maintenance & Operations	\$142,000	\$146,260	\$150,648	\$155,167
21	Total - Backflow	\$774,100	\$794,269	\$814,982	\$836,254
22					
23	Distribution System Maintenance				
24	Salaries & Benefits	\$761,200	\$781,276	\$801,899	\$823,085
25	Maintenance & Operations	\$656,100	\$675,783	\$696,056	\$716,938
26	Total - Distribution System Maintenance	\$1,417,300	\$1,457,059	\$1,497,956	\$1,540,023
27					
28	Production Facilities Maintenance				
29	Salaries & Benefits	\$455,900	\$465,018	\$474,318	\$483,805
30	Maintenance & Operations	\$430,200	\$443,106	\$456,399	\$470,091
31	Total - Production Facilities Maintenance	\$886,100	\$908,124	\$930,718	\$953,896
32					
33	Other	*2 000	*2 000	*• 1 • •	*2 2 7
34	Contractual Services	\$3,000	\$3,090	\$3,183	\$3,278
35	Transfer to General Fund	\$1,156,300	\$1,156,300	\$1,156,300	\$1,156,300
36	Total - Other	\$1,159,300	\$1,159,390	\$1,159,483	\$1,159,578
37					¢14 100 010
38	I otal O&M Expenses	\$12,787,684	\$13,167,334	\$13,635,368	\$14,123,319
39	Water Utility Administration	\$1,303,000	\$1,339,587	\$1,377,222	\$1,415,934
40	Water Purchases	\$6,035,784	\$6,263,496	\$6,575,352	\$6,902,766
41	Billing and Collection	\$1,212,100	\$1,245,409	\$1,279,656	\$1,314,868
42	Backflow	\$774,100	\$794,269	\$814,982	\$836,254
43	Distribution System Maintenance	\$1,417,300	\$1,457,059	\$1,497,956	\$1,540,023
44	Production Facilities Maintenance	\$886,100	\$908,124	\$930,718	\$953,896
45	Otner	\$1,139,300	\$1,139,390	\$1,139,483	\$1,139,378

Debt Service

The City plans to issue a \$7 million bond in FY 2021 to pay for a portion of CIP costs. **Table 3-13** shows the proposed debt terms, issuance amount, and proceeds. The bond proceeds are equal to the bond issuance less issuance cost (Line 4).

Α	В	С
Line	Proposed Debt	FY 2021
1	Debt Terms	
2	Interest Rate	5%
3	Term (years)	30
4	Issuance Cost	2%
5		
6	Proposed Bonds	
7	Bond Issuance	\$7,000,000
8	Bond Proceeds	\$6,860,000

Table 3-13: Proposed Debt Issuance

Table 3-14 shows the City's existing and proposed debt service. The City is currently paying down two prior revenue bonds, issued in 2013 and 2018. The proposed debt service is based on the bond issuance amount and interest rate in **Table 3-13**.

Table 3-14: Existing and Proposed Debt Service

Α	В	С	D	E	F
Line	Debt Service	FY 2020	FY 2021	FY 2022	FY 2023
1	Existing Bonds				
2	2013 Water Revenue Bonds	\$256,438	\$256,438	\$256,438	\$256,438
3	2018 Subordinate Water Revenue Bonds	\$200,000	\$200,000	\$205,000	\$210,000
4	Total - Existing Bonds	\$456,438	\$456,438	\$461,438	\$466,438
5					
6	Proposed Bonds				
7	2021 Revenue Bonds	\$0	\$455,360	\$455,360	\$455,360
8	Total - Proposed Bonds	\$0	\$455,360	\$455,360	\$455,360
9					
10	Total Debt Service	\$456,438	\$911,798	\$916,798	\$921,798
11	Existing	\$456,438	\$456,438	\$461,438	\$466,438
12	Proposed	\$0	\$455,360	\$455,360	\$455,360

Capital Projects

City staff provided the capital improvement plan, shown in **Table 3-15**. The capital project costs for FY 2021 and beyond are inflated by the Capital escalation factor (**Table 3-8**, Line 6).

Α	В	С	D	E	F
Line	Capital Projects	FY 2020	FY 2021	FY 2022	FY 2023
1	Construct New Water Well in Zone 1	\$0	\$0	\$0	\$1,519,437
2	Upgrade Connection on Rivera Road	\$0	\$265,225	\$273,182	\$0
3	Construct Transmission Main along Carmenita Road	\$0	\$0	\$0	\$1,114,254
4	Construct New Water Well in Zone 2	\$0	\$1,060,900	\$1,092,727	\$1,125,509
5	Extend Pipeline at Coyote Creek Crossing	\$0	\$0	\$527,241	\$543,058
6	Repair Pipeline at Florence Avenue Railroad Crossing	\$0	\$185,658	\$191,227	\$0
7	Install Cathodic Protection at Reservoir No. 1	\$0	\$244,007	\$251,327	\$0
8	Install Cathodic Protection at Reservoir No. 2	\$0	\$0	\$166,641	\$171,640
9	Upgrade Motor Reservoir No. 1	\$0	\$0	\$874,182	\$0
10	Upgrade Motor Reservoir No. 2	\$0	\$848,720	\$0	\$0
11	Upgrade SCADA System	\$0	\$0	\$273,182	\$168,826
12	Upgrade Interconnect with Downey on Florence Avenue	\$0	\$206,876	\$213,082	\$219,474
13	Replacement of Water Main on Nova Street	\$0	\$0	\$0	\$0
14	Replacement of Water Main on Roma Street	\$0	\$0	\$0	\$0
15	Equipment Replacement Fund (Annual Budget)	\$0	\$265,225	\$273,182	\$281,377
16	Annual Routine CIP	\$1,545,000	\$0	\$0	\$0
17	Total - Capital Projects	\$1,545,000	\$3,076,610	\$4,135,972	\$5,143,575

Table 3-15: Capital Improvement Plan

Table 3-16 shows the proposed capital financing plan based on the capital improvement plan (**Table 3-15**). The debt proceeds (Line 4) from the proposed bond issuance in FY 2021 are from **Table 3-13**, Line 8. With the proposed bond proceeds, the City can fund nearly two years of capital project costs in FY 2021 and FY 2022 (Line 9). All other capital project costs above and beyond the amount covered by bond proceeds are funded through rates (Line 8).

Table 3-16: Capital Financing Plan

Α	В	С	D	E	F
Line	Capital Financing Plan	FY 2020	FY 2021	FY 2022	FY 2023
1	Capital Project Costs	\$1,545,000	\$3,076,610	\$4,135,972	\$5,143,575
2					
3	Proposed Debt				
4	Proceeds	\$0	\$6,860,000	\$0	\$0
5	Balance	\$0	\$6,860,000	\$3,783,390	\$0
6					
7	Capital Financing Plan				
8	Rate Funded	\$1,545,000	\$0	\$352,582	\$5,143,575
9	Debt Funded	\$0	\$3,076,610	\$3,783,390	\$0
10	Total - Capital Financing Plan	\$1,545,000	\$3,076,610	\$4,135,972	\$5,143,575

Reserve Policy

Sufficient reserves allow the City to mitigate potential financial risks such as unexpected O&M or capital expenses, asset failure, and natural disasters and to fund capital project costs upfront. The study uses the recommended reserve policy, which is as follows:

- » Operating: 3 months or 25 percent of annual O&M expenses
- » Capital: 5-year average rate funded CIP costs

Status Quo Financial Plan

Table 3-17 shows the projected financial plan under current rates with no revenue adjustments. Revenues (Lines 10-15) are from **Table 3-7**, O&M expenses (Lines 17-26) are from **Table 3-12**, debt service (Lines 29-30) is from **Table 3-14**, and rate funded capital projects (Line 31) is from **Table 3-16**. Please note that interest earnings (Line 14) is less than shown in **Table 3-7** because there are no revenue adjustments in this scenario.

Net cash flow (Line 34), which is calculated by subtracting O&M expenses, CIP spending, and debt service from revenues, is negative for all years. This signifies that the City's current revenues are not sufficient to meet operating and capital costs. Net revenue (Line 35), which is calculated by subtracting O&M expenses from revenues, is negative for the last three years of the study period, which shows that current revenues are not sufficient to meet operating expenses. In addition, debt coverage (Line 37) is below the required coverage of 1.25 for all years of the study.

Table 3-17: Projected Cash Flow, Status Quo

Α	В	С	D	E	F
Line	Operating Cash Flow	FY 2020	FY 2021	FY 2022	FY 2023
1	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
2					
3	Revenue Adjustments				
4	FY 2020 - 0.0% - June	\$0	\$0	\$0	\$0
5	FY 2021 - 0.0% - January		\$0	\$0	\$0
6	FY 2022 - 0.0% - January			\$0	\$0
7	FY 2023 - 0.0% - January				\$0
8	Total - Revenue Adjustments	\$0	\$0	\$0	\$0
9					
10	Revenues				
11	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
12	Revenue Adjustments	\$0	\$0	\$0	\$0
13	Miscellaneous Revenues	\$97,700	\$97,700	\$97,700	\$97,700
14	Interest Earnings	\$59,000	\$96,746	\$81,083	\$15,798
15	Total - Revenues	\$12,887,854	\$12,925,599	\$12,909,936	\$12,844,651
16					
17	O&M Expenses				
18	Water Utility Administration	\$1,303,000	\$1,339,587	\$1,377,222	\$1,415,934
19	Water Purchases	\$6,035,784	\$6,263,496	\$6,575,352	\$6,902,766
20	Billing and Collection	\$1,212,100	\$1,245,409	\$1,279,656	\$1,314,868
21	Backflow	\$774,100	\$794,269	\$814,982	\$836,254
22	Distribution System Maintenance	\$1,417,300	\$1,457,059	\$1,497,956	\$1,540,023
23	Production Facilities Maintenance	\$886,100	\$908,124	\$930,718	\$953,896
24	Debt Service	\$3,000	\$3,090	\$3,183	\$3,278
25	Interfund Transfers	\$1,156,300	\$1,156,300	\$1,156,300	\$1,156,300
26	Total - O&M Expenses	\$12,787,684	\$13,167,334	\$13,635,368	\$14,123,319
27					
28	Debt and Capital				
29	Existing Debt Service	\$456,438	\$456,438	\$461,438	\$466,438
30	Proposed Debt Service	\$0	\$455,360	\$455,360	\$455,360
31	Rate Funded Capital Projects	\$1,545,000	\$0	\$352,582	\$5,143,575
32	Total - Debt and Capital	\$2,001,438	\$911,798	\$1,269,379	\$6,065,373
33					
34	Net Cash Flow	(\$1,901,268)	(\$1,153,532)	(\$1,994,811)	(\$7,344,041)
35	Net Revenue	\$100,170	(\$241,734)	(\$725,431)	(\$1,278,668)
36					
37	Calculated Debt Coverage	0.22	(0.27)	(0.79)	(1.39)
38	Required Debt Coverage	1.25	1.25	1.25	1.25

Table 3-18 shows the projected operating and capital fund balances without revenue adjustments. The ending balance (Line 20) decreases every year, except for FY 2021 due to the debt proceeds (Line 10), eventually becoming negative in the final year of the study. The City's funds will fall below target levels (Line 22) starting in FY 2022. Please note that the difference in beginning and ending balances, excluding debt proceeds and debt funded capital projects (Line 28) is equal to the net cash flow shown in Table 3-17.

Α	В	C	D	E	F
Line	Fund Balances	FY 2020	FY 2021	FY 2022	FY 2023
1	Operating and Capital Funds				
2					
3	Beginning Balance	\$10,309,303	\$8,408,035	\$11,037,893	\$5,259,693
4					
5	Sources of Funds				
6	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
7	Revenue Adjustments	\$0	\$0	\$0	\$0
8	Miscellaneous Revenues	\$97,700	\$97,700	\$97,700	\$97,700
9	Interest Earnings	\$59,000	\$96,746	\$81,083	\$15,798
10	Debt Proceeds	\$0	\$6,860,000	\$0	\$0
11	Total - Sources of Funds	\$12,887,854	\$19,785,599	\$12,909,936	\$12,844,651
12					
13	Uses of Funds				
14	O&M Expenses	\$12,787,684	\$13,167,334	\$13,635,368	\$14,123,319
15	Debt Service	\$456,438	\$911,798	\$916,798	\$921,798
16	Rate Funded Capital Projects	\$1,545,000	\$0	\$352,582	\$5,143,575
17	Debt Funded Capital Projects	\$0	\$3,076,610	\$3,783,390	\$0
18	Total - Uses of Funds	\$14,789,122	\$17,155,741	\$18,688,137	\$20,188,692
19					
20	Ending Balance	\$8,408,035	\$11,037,893	\$5,259,693	(\$2,084,348)
21					
22	Reserve Target	\$5,523,297	\$6,208,331	\$7,251,435	\$8,256,784
23	Operating - 25% of O&M expenses	\$3,196,921	\$3,291,833	\$3,408,842	\$3,530,830
24	Capital - 100% of 5-year average CIP	\$2,326,376	\$2,916,498	\$3,842,593	\$4,725,954
25					
26	Beginning Balances	\$10,309,303	\$8,408,035	\$11,037,893	\$5,259,693
27	Ending Balances	\$8,408,035	\$11,037,893	\$5,259,693	(\$2,084,348)
28	Difference (Less Debt Proceeds)	(\$1,901,268)	(\$1,153,532)	(\$1,994,811)	(\$7,344,041)

Table 3-18: Projected Fund Balances, Status Quo

The following figures show the status quo financial plan without revenue adjustments in a visual format.

Figure 3-1 shows the projected financial plan without revenue adjustments. The current revenues, represented by the line, is below the stacked columns, which represent the operating and capital costs. This results in a negative cash flow, shown as the green bars, and a decrease in fund balances for all years of the study.



Figure 3-1: Projected Financial Plan, Status Quo

Figure 3-2 shows the debt coverage projections without revenue adjustments. The City will not meet required debt coverage for all years of the study.



Figure 3-2: Projected Debt Coverage, Status Quo

Figure 3-3 shows the projected fund balances without revenue adjustments. As shown in **Table 3-18**, the City's reserves will be negative by the end of the study period.



Figure 3-3: Projected Fund Balances, Status Quo

Proposed Financial Plan

The results of the financial plan without revenue adjustments (Table 3-17 and **Table 3-18**) presents the necessity of implementing revenue adjustments. **Table 3-19** shows the proposed revenue adjustments that will allow the City to fund operating and capital costs, fund reserves over time, and meet debt coverage requirements.

Table 3-19: Proposed Revenue Adjustments

Α	В	С	D
Line	Fiscal Year	Month Effective	Proposed Adjustment
1	2020	June	9.5%
2	2021	January	9.5%
3	2022	January	9.5%
4	2023	January	6.0%

Table 3-20 shows the projected cash flow with proposed revenue adjustments from **Table 3-19**. Net cash flow (Line 34) is negative for the first and last years of the study period, which means that the City will draw down reserves to fund its operating and capital costs. However, net revenue (Line 35) is positive for all years of the study, which shows that the City's proposed revenues are sufficient to fund all operating expenses. The City is expected to meet its debt coverage requirement in FY 2021 and beyond.

Α	В	С	D	Ε	F
Line	Operating Cash Flow	FY 2020	FY 2021	FY 2022	FY 2023
1	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
2					
3	Revenue Adjustments				
4	FY 2020 - 9.5% - June	\$100,788	\$1,209,460	\$1,209,460	\$1,209,460
5	FY 2021 - 9.5% - January		\$662,179	\$1,324,358	\$1,324,358
6	FY 2022 - 9.5% - January			\$725,086	\$1,450,172
7	FY 2023 - 6.0% - January				\$501,454
8	Total - Revenue Adjustments	\$100,788	\$1,871,639	\$3,258,904	\$4,485,444
9					
10	Revenues				
11	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
12	Revenue Adjustments	\$100,788	\$1,871,639	\$3,258,904	\$4,485,444
13	Miscellaneous Revenues	\$97,700	\$97,700	\$97,700	\$97,700
14	Interest Earnings	\$59,000	\$107,112	\$117,205	\$91,003
15	Total - Revenues	\$12,988,642	\$14,807,604	\$16,204,963	\$17,405,301
16					
17	O&M Expenses				
18	Water Utility Administration	\$1,303,000	\$1,339,587	\$1,377,222	\$1,415,934
19	Water Purchases	\$6,035,784	\$6,263,496	\$6,575,352	\$6,902,766
20	Billing and Collection	\$1,212,100	\$1,245,409	\$1,279,656	\$1,314,868
21	Backflow	\$774,100	\$794,269	\$814,982	\$836,254
22	Distribution System Maintenance	\$1,417,300	\$1,457,059	\$1,497,956	\$1,540,023
23	Production Facilities Maintenance	\$886,100	\$908,124	\$930,718	\$953,896
24	Debt Service	\$3,000	\$3,090	\$3,183	\$3,278
25	Interfund Transfers	\$1,156,300	\$1,156,300	\$1,156,300	\$1,156,300
26	Total - O&M Expenses	\$12,787,684	\$13,167,334	\$13,635,368	\$14,123,319
27					
28	Debt and Capital				
29	Existing Debt Service	\$456,438	\$456,438	\$461,438	\$466,438
30	Proposed Debt Service	\$0	\$455,360	\$455,360	\$455,360
31	Rate Funded Capital Projects	\$1,545,000	\$0	\$352,582	\$5,143,575
32	Total - Debt and Capital	\$2,001,438	\$911,798	\$1,269,379	\$6,065,373
33					
34	Net Cash Flow	(\$1,800,480)	\$728,473	\$1,300,216	(\$2,783,391)
35	Net Revenue	\$200,958	\$1,640,271	\$2,569,595	\$3,281,982
36					
37	Calculated Debt Coverage	0.44	1.80	2.80	3.56
38	Required Debt Coverage	1.25	1.25	1.25	1.25

Table 3-20: Projected Cash Flow, Proposed Adjustments

Table 3-21 shows the projected operating and capital fund balances with the proposed revenue adjustments from **Table 3-19**. The City's ending balances (Line 20) will meet reserve target levels (Line 22) for the first three years of the study and will be slightly under target levels for the final year. Please note that the difference in beginning and ending balances, excluding debt proceeds and debt funded capital projects (Line 28) is equal to the net cash flow shown in **Table 3-20**.

Α	В	С	D	E	F
Line	Fund Balances	FY 2020	FY 2021	FY 2022	FY 2023
1	Operating and Capital Funds				
2					
3	Beginning Balance	\$10,309,303	\$8,508,823	\$13,020,687	\$10,537,512
4					
5	Sources of Funds				
6	Rate Revenues	\$12,731,154	\$12,731,154	\$12,731,154	\$12,731,154
7	Revenue Adjustments	\$100,788	\$1,871,639	\$3,258,904	\$4,485,444
8	Miscellaneous Revenues	\$97,700	\$97,700	\$97,700	\$97,700
9	Interest Earnings	\$59,000	\$107,112	\$117,205	\$91,003
10	Debt Proceeds	\$0	\$6,860,000	\$0	\$0
11	Total - Sources of Funds	\$12,988,642	\$21,667,604	\$16,204,963	\$17,405,301
12					
13	Uses of Funds				
14	O&M Expenses	\$12,787,684	\$13,167,334	\$13,635,368	\$14,123,319
15	Debt Service	\$456,438	\$911,798	\$916,798	\$921,798
16	Rate Funded Capital Projects	\$1,545,000	\$0	\$352,582	\$5,143,575
17	Debt Funded Capital Projects	\$0	\$3,076,610	\$3,783,390	\$0
18	Total - Uses of Funds	\$14,789,122	\$17,155,741	\$18,688,137	\$20,188,692
19					
20	Ending Balance	\$8,508,823	\$13,020,687	\$10,537,512	\$7,754,121
21					
22	Reserve Target	\$5,523,297	\$6,208,331	\$7,251,435	\$8,256,784
23	Operating - 25% of O&M expenses	\$3,196,921	\$3,291,833	\$3,408,842	\$3,530,830
24	Capital - 100% of 5-year average CIP	\$2,326,376	\$2,916,498	\$3,842,593	\$4,725,954
25					
26	Beginning Balances	\$10,309,303	\$8,508,823	\$13,020,687	\$10,537,512
27	Ending Balances	\$8,508,823	\$13,020,687	\$10,537,512	\$7,754,121
28	Difference (Less Debt Proceeds)	(\$1,800,480)	\$728,473	\$1,300,216	(\$2,783,391)

Table 3-21: Projected Fund Balances, Proposed Adjustments

The following figures show the financial plan with proposed revenue adjustments in a visual format.

Figure 3-4 shows the projected financial plan with proposed revenue adjustments. The proposed revenues, represented by the green line, is above the stacked columns for FY 2021 and FY 2022, which represent the operating and capital costs. The City will draw down its reserves in FY 2020 and FY 2023, while building reserves in FY 2021 and FY 2022.



Figure 3-5 shows the debt coverage projections with proposed revenue adjustments. The City will meet debt coverage requirements for the last three years of the study.



Figure 3-5: Projected Debt Coverage, Proposed Adjustments

Figure 3-6 shows the projected fund balances with proposed revenue adjustments. As shown in **Table 3-21**, the City's reserves exceed target levels for the first three years of the study, with reserves falling slightly below target levels in the last year.



Figure 3-6: Projected Fund Balances, Proposed Adjustments

4. Cost of Service Analysis

This section of the report outlines the cost of service analysis, which allocates the revenue requirement to each cost component and customer class. Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report.

Process and Approach

The first step in the cost of service analysis process is to determine the revenue requirement, which is based on the results of the financial plan and the proposed revenue adjustments. The framework and methodology utilized to develop the cost of service analysis and apportion the revenue requirement to each customer class and tier is informed by the processes outlined in the M1 Manual.

Cost of service analyses are tailored specifically to meet the unique needs of each utility. However, there are four distinct steps in every analysis to recover costs from customer classes in an accurate, equitable, and defensible manner:

- 1. Cost functionalization: O&M expenses and capital assets are categorized by their function in the system. Functions include supply, production, T&D, customer service, billing, etc.
- 2. Cost causation component allocation: the functionalized costs are then allocated to cost causation components based on their burden on the system. The cost causation components include supply, peaking, delivery, meter, customer, etc. The revenue requirement is allocated accordingly to the cost causation components and results in the total revenue requirement for each cost causation component.
- 3. Unit cost development: the revenue requirement for each cost causation component is divided by the appropriate units of service such as total usage, peaking units, equivalent meters, number of customers, etc. for each customer class and dividing the cost causation component costs by the respective service units to determine the unit cost for each cost causation component.
- 4. Revenue requirement distribution: the unit costs are utilized to distribute the revenue requirement for each cost causation component to customer classes and tiers based on their individual service units. The City's customer classes include Single Family Residential, Non-Residential, and Reclaimed Water.

Cost Components

The cost components used in this study include:

- » Water Supply represents the costs of purchasing potable water
- » Reclaimed Water Supply represents the costs of purchasing reclaimed water
- » Base represents the costs of delivering water to customers under average demand conditions
- » Max Day represents the costs of delivering water to customers under Max Day conditions
- » Max Hour represents the costs of delivering water to customers under Max Hour conditions
- » Meter represents the costs of servicing and installing meters
- » Customer represents the costs of customer service and billing
- » General represents all other costs that have a general or administrative function

Revenue Requirement

Table 4-1 shows the City's revenue requirement for the rate-setting year, which for this study is FY 2020. The revenue requirements (Lines 1-5), also known as costs, are equal to the O&M expenses, debt service, and rate funded capital projects for FY 2020 (**Table 3-20**, Column C, Line 26, Lines 29-30, and Line 31). Revenue offsets

(Lines 7-10), also known as non-rate revenues, equal to the miscellaneous revenues for FY 2020 (**Table 3-20**, Column C, Lines 13-14). The adjustment to annualize rate increase (Line 13) recognizes that the revenue adjustment in FY 2020 is a partial year increase; the revenue adjustment is effective in June for one month of the fiscal year. The adjustment for transfer from reserves (Line 14) is equal to negative net cash flow for FY 2020 (**Table 3-20**, **(Table 3-20**, Column C, Line 34).

The total revenue required from rates (Line 17) is calculated using the following equation:

Revenue requirements (Line 5) - Revenue offsets (Line 10) - Adjustments (Line 15) = Total Revenue required from rates (Line 17)

Α	В	С	D	Ε
Line	Revenue Requirement - FY 2020	Operating	Capital	Total
1	Revenue Requirements			
2	O&M Expenses	\$12,787,684	\$0	\$12,787,684
3	Debt Service	\$0	\$456,438	\$456,438
4	Rate Funded Capital Projects	\$0	\$1,545,000	\$1,545,000
5	Total - Revenue Requirements	\$12,787,684	\$2,001,438	\$14,789,122
6				
7	Less Revenue Offsets			
8	Miscellaneous Revenues	\$97,700	\$0	\$97,700
9	Interest Earnings	\$59,000	\$0	\$59,000
10	Total - Revenue Offsets	\$156,700	\$0	\$156,700
11				
12	Less Adjustments			
13	Adjustment to Annualize Rate Increase	(\$1,108,671)	\$0	(\$1,108,671)
14	Transfer from (to) Reserves	\$1,800,480	\$0	\$1,800,480
15	Total - Adjustments	\$691,808	\$0	\$691,808
16				
17	Total - Revenue Required from Rates	\$11,939,176	\$2,001,438	\$13,940,613

Table 4-1: Revenue Requirement

Proposed Tiers

Raftelis recommends that the City adopts an alternative rate structure for the quantity rates, which includes the following changes:

- » Three-tier rate structure for Single Family Residential customers, based on water efficiency standards and actual customer usage characteristics
- » Uniform rate structure for non-residential and reclaimed water customers

For Single Family Residential customers, the proposed Tier 1 will change from 18 hcf to 9 hcf per month, which represents the indoor water use efficiency standard. The first tier is based on the 55 gallons per capita per day (gpcd) standard set forth by Senate Bill 606 and Assembly Bill 1668, codified in Water Code Section 10608.20, for a family of four. The first tier breakpoint is calculated as such:

55 gallons/per person per day x 30 days/month x 4 people/household x 1 hcf/748 gallons = 9 hcf (rounded up to nearest hcf)

The proposed Tier 2 will change from 36 hcf to 25 hcf per month. The second tier represents the residential water usage over the indoor allotment. Proposed Tier 3 includes the highest 15 percent of residential water usage. The proposed tier breakpoints are designed to represent indoor use, non-indoor use, and excessive use.

Raftelis recommends a uniform rate for Non-Residential customers, which include customer types such as Multi-Family Residential, Commercial, Institutional, etc. Water usage for these customer types do not vary widely based on seasonality; therefore, a uniform rate is both fair and easy to understand and administer.

Peaking Factors

Table 4-2 shows the system-wide peaking factors used to derive the cost component allocation bases for Base (Delivery), Max Day, and Max Hour costs. Base represents average daily demand during the year, which has been normalized to a factor of 1.00 (Column C, Line 1). City staff provided Max Day and Max Hour peaking factors. The Max Day peaking factor (Column C, Line 2) shows that the Max Day demand is two times greater than the average daily demand. The Max Hour peaking factor (Column C, Line 3) signifies that the Max Hour demand is three times greater than average demand.

The allocation bases (Columns D to F) are calculated using the equations outlined in this section. Columns are represented in these equations as letters and rows are represented as numbers. For example, Column D, Line 2 is shown as D2.

The Max Day allocations are calculated as follows:

- » Base Delivery: C1 / C2 x 100% = D2
- » Max Day: (C2 C1) / C2 x 100% = E2

The Max Hour allocations are calculated as follows:

- » Base Delivery: C1 / C3 x 100% = D3
- » Max Day: $(C2 C1) / C3 \times 100\% = E3$
- » Max Hour: (C3 C2) / C3 x 100% = F3

The average between Max Day and Max Hour (Line 4) is equal to the average of the allocation bases for Max Day (Columns D to F, Line 2) and Max Hour (Columns D to F, Line 3).

Table 4-2: System-Wide Peaking Factors C D

Α	В	С	D	E	F	G
Line	Allocation Factor	Peaking Factor	Base	Max Day	Max Hour	Total
1	Base	1.00	100.0%	0.0%	0.0%	100.0%
2	Max Day	2.00	50.0%	50.0%	0.0%	100.0%
3	Max Hour	3.00	33.3%	33.3%	33.3%	100.0%
4	Average Max Day/Max Hour		41.7%	41.7%	16.7%	100.0%

Table 4-3 shows the peaking factors by customer class and tier based on the maximum monthly usage divided by average monthly usage for each class and tier. The maximum month peaking factor is used as a proxy for the class-and tier-specific Max Day peaking factors. The peaking factors for Single Family Residential customers are based on the proposed tiers. All other customers are charged a uniform rate and therefore have a class-specific peaking factor.

Table 4-3:	Class-Specific	Peaking	Factors
------------	-----------------------	---------	---------

Α	В	C	D
Line	Customer Class	Monthly Tiers (hcf)	Peaking Factor
1	Single Family Residential		1.35
2	Tier 1	9	1.09
3	Tier 2	25	1.31
4	Tier 3	25+	2.13
5	Non-Residential		1.26
6	Downey Water		1.35
7	Norwalk Water		1.13
8	Reclaimed Water		1.58

Table 4-4 shows the calculation of additional capacity required to meet Max Day and Max Hour demands of each customer class and tier. Annual usage is derived from water usage projections for FY 2020 (**Table 3-4**, Column D). First, annual usage (Column D) is converted to average daily use (Column E), assuming 365 days in a year. The peaking or capacity factors (Column F) are from **Table 4-3** and are multiplied by the average daily use (Column E) to arrive at the total capacity required to meet each class's Max Day demand (Column G). The extra capacity required to meet Max Day demands (Column H) is calculated by subtracting the average daily use (Column E) from the total capacity for Max Day (Column G).

For Max Hour demands, the class- and tier-specific peaking factors (Column F) are inflated based on the ratio between the system-wide Max Day and Max Hour peaking factors (**Table 4-2**: Column C, Line 3 divided by Column C, Line 2) to determine the Max Hour peaking factors for all classes and tiers. The total capacity for Max Hour demands (Column J) is calculated by multiplying the average daily use (Column E) by the Max Hour peaking factors (Column I). The extra capacity required for Max Hour demands (Column K) is equal to the Max Hour total capacity (Column J) less the Max Day total capacity (Column G).

Α	В	C	D	E	F	G	Η	Ι	J	K
						Max Day			Max Hour	
Line	Customer Class	Monthly Tiers (hcf)	Annual Use (hcf)	Average Daily Use (hcf/day)	Capacity Factor	Total Capacity (hcf/day)	Extra Capacity (hcf/day)	Capacity Factor	Total Capacity (hcf/day)	Extra Capacity (hcf/day)
1	Single Family Residential									
2	Tier 1	9	197,115	540	1.09	587	47	1.63	880	293
3	Tier 2	25	208,321	571	1.31	746	176	1.96	1,120	373
4	Tier 3	25+	177,627	487	2.13	1,037	550	3.20	1,555	518
5										
6	Non-Residential		1,497,446	4,103	1.26	5,176	1,073	1.89	7,764	2,588
7	Downey Water		47,964	131	1.35	177	46	2.03	266	89
8	Norwalk Water		21,798	60	1.13	67	8	1.70	101	34
9	Reclaimed Water		420,818	1,153	1.58	1,822	669	2.37	2,732	911
10	Total		2,571,089	7,044		9,612	2,568		14,418	4,806

Table 4-4: Water Usage and Capacity

Equivalent Meters

Equivalent meter units are used to allocate meter-related costs appropriately and equitably. Larger meters impose larger demands; are more expensive to install, maintain, and replace than smaller meters; and commit a greater capacity in the water system.

Equivalent meter units are based on meter hydraulic capacity and are calculated to represent the potential demand on the water system compared to a base meter size. A ratio of hydraulic capacity is calculated by dividing larger meter capacities by the base meter capacity. The base meter in this study is the 3/4-inch meter, which is also the most common meter size.

Table 4-5 shows the equivalent meters for the test year, FY 2020, for water and reclaimed water. The actual number of meters (Columns E and G) is derived from the customer account projections for FY 2020 (**Table 3-3**, Column D).

The capacity in gallons per minute (gpm) is based on capacity data from the M1 Manual (Column C). The capacity ratios (Column D) are calculated by dividing the capacity in gpm for each meter size (Column C) by the capacity in gpm for the 3/4-inch meter (Column C, Line 2). The actual number of accounts (Columns E and G) are multiplied by the capacity ratios (Column D) to determine the number of equivalent meters (Columns F and H).

Α	В	С	D	E	F	G	Η
				Wa	iter	Recla	imed
Line	Meter Size	Capacity	Capacity	Number of	Equivalent	Number of	Equivalent
		(gpm)	Ratio	Meters	Meters	Meters	Meters
1	5/8 x 3/4-in	30	1.00	158	158	0	0
2	3/4-in	30	1.00	2,972	2,972	0	0
3	1-in	50	1.67	1,259	2,098	3	5
4	1 1/2-in	100	3.33	596	1,987	38	127
5	2-in	160	5.33	538	2,869	65	347
6	3-in	320	10.67	52	555	12	128
7	4-in	500	16.67	26	433	1	17
8	6-in	1,000	33.33	5	167	0	0
9	8-in	1,600	53.33	0	0	1	53
10	10-in	4,200	140.00	1	140	0	0
11	Total - Meters			5,607	11,379	120	676

Table 4-5: Equivalent Meters

Similar to equivalent water meters, private fire lines and public fire hydrants are also converted to equivalent lines based on fire line capacities. **Table 4-6** shows the equivalent lines for private fire lines and public fire hydrants. Private fire line counts are derived from customer account projections in FY 2020 (**Table 3-3**, Column D).

The fire line capacity ratios (Column C) are determined based on the Hazen-Williams equation for flow through pressure conduits, as explained in the M1 Manual. The flow potential is dependent on the diameter of the fire line raised to the power of 2.63. The fire line capacity ratio is normalized based on the capacity of a 6-inch fire line.

Α	В	С	D	E	F
Line	Fire Line Size	Fire Ratio	Number of Lines	Equivalent Lines	Percent of System
1	Private Fire Lines				
2	2.5-in	0.10	20	2	
3	4-in	0.34	33	11	
4	6-in	1.00	202	202	
5	8-in	2.13	342	729	
6	10-in	3.83	125	479	
7	Total - Private Fire Lines		722	1,423	69.4%
8					
9	Public Hydrants				
10	2.5-in x 2.5-in x 4-in	0.54	1,155	629	
11	Total - Public Hydrants		1,155	629	30.6%

Table 4-6: Equivalent Fire Lines

Operating and Capital Allocations

Table 4-7 shows the allocation of O&M expenses to each cost component, as developed from the City's O&M expense budget in FY 2020. O&M expenses are used in the cost of service analysis to allocate the operating revenue requirement (**Table 4-1**, Column C, Line 17) to derive the relative share of costs under each cost component. The operating functions (Column B) are allocated based on a percentage (Lines 2-11) for each cost component depending on the nature of their function. Then the percentages for each cost component are multiplied by the O&M expenses (Lines 14-23) to determine the total percentage of O&M expenses to each cost component. Please note that the O&M expenses are equal to the FY 2020 budget (**Table 3-12**, Column C).

Water Utility Administration (Line 2) is allocated to General. Water Purchases (Line 2) represent the salary, benefits, and maintenance costs of the water purchase department and is allocated to Base. Water Supply Cost (Line 4) and Reclaimed Water Supply Cost (Line 5) are the actual costs to purchase water from the various sources and are allocated to the Water Supply and Reclaimed Water Supply cost components, respectively. Billing and Collection costs (Line 6) are allocated to the Customer and Meter cost components. Backflow costs (Line 7) are allocated entirely to Meter. Distribution System Maintenance costs (Line 8) are allocated to Max Hour based on the allocation bases (**Table 4-2**, Columns D through F, Line 3) because distribution systems are designed to accommodate Max Hour flows. Production Facilities Maintenance (Line 9) are allocated to Max Day based on the allocation bases (**Table 4-2**, Column D through F, Line 2) because these facilities are sized to accommodate Max Day demands. Contractual services and transfers to the General fund (Lines 10-11) are allocated to General.

Table 4-8 shows the allocation of capital assets to each cost component. Capital assets are utilized in cost of service analyses to allocate capital costs because annual CIP costs can fluctuate greatly from year to year. Capital assets remain relatively stable and are more representative of the City's investments in its water utility over time. This study used asset information from FY 2017.

The City's assets are functionalized to include source of Supply Plant, Pumping and Treatment Plant, Transmission, and Land and Water Rights (Lines 2-4 and 7), which are all allocated to Max Day. Distributionrelated assets (Line 5) are allocated to Max Hour because distribution systems are sized to handle Max Hour demand. General Plant and Construction in Progress (Lines 6 and 8) are allocated to General.

Table 4-7:	O&M Ex	pense A	llocation
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Α	В	С	D	E	F	G	H	I	J	K	L
Line	Function	Rationale	Water Supply	Reclaimed Supply	Base	Max Day	Max Hour	Meter	Customer	General	Total
1	Percentage Allocation										
2	Water Utility Administration	General								100%	100%
3	Water Purchases	Base			100%						100%
4	Water Supply Cost	Water Supply	100%								100%
5	Reclaimed Water Supply Cost	Reclaimed Supply		100%							100%
6	Billing and Collection	Meter/Customer						75%	25%		100%
7	Backflow	Meter						100%			100%
8	Distribution System Maintenance	Max Hour			33%	33%	33%				100%
9	Production Facilities Maintenance	Max Day			50%	50%					100%
10	Contractual Services	General								100%	100%
11	Transfer to General Fund	General								100%	100%
12											
13	Dollar Allocation										
14	Water Utility Administration									\$1,303,000	\$1,303,000
15	Water Purchases				\$57,200						\$57,200
16	Potable Water Supply Cost		\$5,236,206								\$5,236,206
17	Reclaimed Water Supply Cost			\$742,378							\$742,378
18	Billing and Collection							\$909,075	\$303,025		\$1,212,100
19	Backflow							\$774,100			\$774,100
20	Distribution System Maintenance				\$472,433	\$472,433	\$472,433				\$1,417,300
21	Production Facilities Maintenance				\$443,050	\$443,050					\$886,100
22	Contractual Services									\$3,000	\$3,000
23	Transfer to General Fund									\$1,156,300	\$1,156,300
24	Total - O&M Expenses		\$5,236,206	\$742,378	\$972,683	\$915,483	\$472,433	\$1,683,175	\$303,025	\$2,462,300	\$12,787,684
25											
26	O&M Allocation Percentage		40.9%	5.8%	7.6%	7.2%	3.7%	13.2%	2.4%	19.3%	100.0%

Α	В	С	D	E	F	G	H	I	J	K	L
Line	Function	Rationale	Water Supply	Reclaimed Supply	Base	Max Day	Max Hour	Meter	Customer	General	Total
1	Percentage Allocation										
2	Source of Supply Plant	Max Day			50%	50%					100%
3	Pumping and Treatment Plant	Max Day			50%	50%					100%
4	Transmission	Max Day			50%	50%					100%
5	Distribution	Max Hour			33%	33%	33%				100%
6	General Plant	General								100%	100%
7	Land and Water Rights	Max Day			50%	50%					100%
8	Construction in Progress	General								100%	100%
9											
10	Dollar Allocation										
11	Source of Supply Plant			\$0	\$1,516,046	\$1,516,046					\$3,032,091
12	Pumping and Treatment Plant			\$0	\$41,608	\$41,608					\$83,216
13	Transmission			\$0	\$3,528,916	\$3,528,916					\$7,057,831
14	Distribution			\$0	\$7,057,831	\$7,057,831	\$7,057,831				\$21,173,493
15	General Plant			\$0						\$1,096,135	\$1,096,135
16	Land and Water Rights			\$0	\$1,692,487	\$1,692,487					\$3,384,974
17	Construction in Progress			\$0						\$7,094,206	\$7,094,206
18	Total - Capital Assets		\$0	\$0	\$13,836,887	\$13,836,887	\$7,057,831	\$0	\$0	\$8,190,341	\$42,921,946
19											
20	Asset Allocation Percentage		0.0%	0.0%	32.2%	32.2%	16.4%	0.0%	0.0%	19.1%	100.0%

Table 4-8: Capital Asset Allocation

Fire Service Allocation

Peak capacity, as represented by Max Day and Max Hour, also include capacity required to meet demands for firefighting. Max Day and Max Hour costs encompass capacity required to meet peak customer demands, public fire service, and private fire service. **Table 4-9** derives the allocation of Max Day and Max Hour costs to these three components, as outlined in the M1 Manual. The Max Hour fire capacity assumes a four hour fire with 6,000 gallons per minute of capacity required.

The total Max Day capacity demanded for fire (Column C, Line 4) is calculated as follows, with letters representing columns and numbers representing rows:

C2 kgals/min * 60 min/hour * C1 hours * 1000 gals / 748 gals/hcf

The total Max Hour capacity demanded for fire (Column D, Line 4) is calculated as follows:

[D2 kgals/min * 60 min/hour * 24 hours/day * 1000 gals / 748 gals/hcf] - C4 hcf

Public fire hydrants account for a portion of the total fire capacity (Line 5) based on its proportionate share of the equivalent fire lines (**Table 4-6**, Column F, Line 11). The total capacity demanded for fire (Line 4) is multiplied by the public fire allocation (Line 5) to determine the additional capacity required for public fire service (Line 8). The remaining capacity demanded for fire is allocated to private fire service (Line 9). The customer demand capacity is equal to the Max Day and Max Hour demand for all other customers (**Table 4-4**, Column H and K, Line 10). The proportion of system capacity for each of these components (Lines 13-17) is later used to allocate Max Day and Max Hour costs across the different components.

Α	В	С	D					
Line	Fire Capacity Estimate	Max Day	Max Hour					
1	Hours for Fire	4.0						
2	kgals/min	6.0	6.0					
3								
4	Capacity Demanded for Fire (hcf)	1,925	9,626					
5	Allocation to Public Fire	30.6% 30.6%						
6								
7	System Capacity							
8	Public Fire Capacity	590	2,949					
9	Private Fire Capacity	1,335	6,677					
10	Customer Demand Capacity	2,568 4,						
11	Total	4,493	14,432					
12								
13	Proportion of System Capacity							
14	Public Fire Capacity	13.1%	20.4%					
15	Private Fire Capacity	29.7% 46.						
16	Customer Demand Capacity	57.2%	33.3%					
17	Total	100.0%	100.0%					

Table 4-9: Fire Capacity Estimate

Unit Cost and Allocation to Classes

Table 4-10 shows the allocation of the revenue requirement to each cost component. Please note that the revenue requirement (Column L, Lines 3 and 8) is equal to the revenue required from rates (**Table 4-1**, Column E, Line 17). Operating expenses (Line 1) are derived from the operating revenue requirement (**Table 4-1**, Column C, Line 17) and are allocated to each cost component based on the O&M expense percentage allocation (**Table 4-7**, Line 26). Capital expenses (Line 2) are derived from the capital revenue requirement (**Table 4-1**, Column D, Line 17) and are allocated to each cost component based on the capital asset percentage allocation (**Table 4-8**, Line 20).

Public fire costs (Line 4) are reallocated to Meter from Max Day and Max Hour based on the public fire proportion of system capacity (**Table 4-9**, Line 14). Public fire service is a benefit shared by all customers. Similarly, private fire costs (Line 5) are reallocated to the Private Fire cost component from Max Day and Max Hour based on the private fire proportion of system capacity (**Table 4-9**, Line 15). Next, General costs (Line 6) are reallocated from the General cost component to the other components based on its proportional share of total costs less Water Supply and Reclaimed Water Supply components. Backflow connections are primarily needed for private fire service and 75 percent of backflow costs (Line 7) are allocated to Private Fire.

The resulting allocation of costs (Line 8) are then divided by units of service for each component (Line 10) to determine the unit cost per component (Line 13). Water Supply is divided by total hcf of water usage (**Table 4-4**, Column D, Line 2-8); Reclaimed Water Supply is divided by total hcf of reclaimed water usage (**Table 4-4**, Column D, Line 9). Base costs are divided by all water and reclaimed water usage in hcf (**Table 4-4**, Column D, Line 10). Max Day and Max Hour costs are divided by the extra capacity for each cost component, respectively (**Table 4-4**, Columns H and K, Line 10). Meter costs are divided by annual equivalent meters (**Table 4-5**, Columns F and H, Line 11 multiplied by 12 months). Customer costs are divided by annual bills (**Table 4-5**, Column E and G, Line 11 multiplied by 12 months). Private Fire costs are divided by annual equivalent lines (**Table 4-6**, Column E, Line 7 multiplied by 12 months).

Table 4-11 shows the allocation of the revenue requirement to each customer class and tier based on the unit costs for each cost component (**Table 4-10**, Line 13). The unit costs for each component are multiplied by the units of service for each class and tier from **Table 4-4**, **Table 4-5**, and **Table 4-6**. Please note that the total cost of service (Column K, Line 11) is equal to the total revenue required from rates (**Table 4-1**, Column E, Line 17).

Α	В	C	D	E	F	G	H	I	J	K	L
Line	Revenue Requirement	Water Supply	Reclaimed Supply	Base	Max Day	Max Hour	Meter	Customer	Private Fire	General	Total
1	Operating Expenses	\$4,888,765	\$693,119	\$908,142	\$854,738	\$441,086	\$1,571,490	\$282,918	\$0	\$2,298,918	\$11,939,176
2	Capital Expenses	\$0	\$0	\$645,210	\$645,210	\$329,105	\$0	\$0	\$0	\$381,913	\$2,001,438
3	Total - Cost of Service	\$4,888,765	\$693,119	\$1,553,352	\$1,499,948	\$770,190	\$1,571,490	\$282,918	\$0	\$2,680,831	\$13,940,613
4	Allocation of Public Fire Costs				(\$196,897)	(\$157,386)	\$354,282				\$0
5	Allocation of Private Fire Costs				(\$445,767)	(\$356,315)			\$802,082		\$0
6	Allocation of General Costs			\$733,418	\$404,769	\$121,102	\$909,257	\$133,580	\$378,705	(\$2,680,831)	\$0
7	Backflow to Private Fire						(\$580,575)		\$580,575		\$0
8	Total - Adjusted Cost of Service	\$4,888,765	\$693,119	\$2,286,770	\$1,262,053	\$377,591	\$2,254,455	\$416,499	\$1,761,361	\$0	\$13,940,613
9											
10	Units	2,150,271	420,818	2,571,089	2,568	4,806	144,664	77,388	17,079		
11	Units of Service	hcf, potable	hcf, reclaimed	hcf, total	hcf/day	hcf/day	annual equiv. meters	annual bills	annual equiv. lines		
12											
13	Unit Cost	\$2.27	\$1.65	\$0.89	\$491.45	\$78.57	\$15.58	\$5.38	\$103.13		
14	Units of Service	hcf, potable	hcf, reclaimed	hcf, total	hcf/day	hcf/day	equiv. meter/month	bill/month	equiv. line/month		

Table 4-11: Cost Allocation to Customer Classes

Α	В	С	D	E	F	G	H	Ι	J	K
Line	Customer Class	Water Supply	Reclaimed Supply	Base	Max Day	Max Hour	Meter	Customer	Private Fire	Total
1	Single Family Residential						\$909,549	\$262,015		\$3,488,487
2	Tier 1	\$448,152	\$0	\$175,317	\$22,912	\$23,046				
3	Tier 2	\$473,630	\$0	\$185,284	\$86,338	\$29,322				
4	Tier 3	\$403,846	\$0	\$157,985	\$270,365	\$40,728				
5										
6	Non-Residential	\$3,404,530	\$0	\$1,331,854	\$527,392	\$203,317	\$1,136,890	\$79,631		\$6,683,614
7	Downey Water	\$109,049	\$0	\$42,660	\$22,603	\$6,969	\$61,900	\$18,988		\$262,168
8	Norwalk Water	\$49,559	\$0	\$19,388	\$3,815	\$2,651	\$19,636	\$1,485		\$96,534
9	Reclaimed Water	\$0	\$693,119	\$374,283	\$328,628	\$71,558	\$126,480	\$7,750		\$1,601,819
10	Fire Service	\$0	\$0	\$0	\$0	\$0	\$0	\$46,629	\$1,761,361	\$1,807,991
11	Total Cost of Service	\$4,888,765	\$693,119	\$2,286,770	\$1,262,053	\$377,591	\$2,254,455	\$416,499	\$1,761,361	\$13,940,613

5. Rate Design and Derivation

This section of the report details the calculation of the proposed water and reclaimed water rates that were developed in the study. Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report. All rates shown in this section are rounded up to the nearest cent.

Proposed Adjustments

Table 5-1 shows the proposed revenue adjustments. The rate-setting year, which the cost of service analysis is based upon, is FY 2020, meaning that the revenue adjustment for that year is already included in the proposed rates shown in this section of the report. The proposed rates for FY 2021 through FY 2023 are calculated by multiplying the revenue adjustment for those years across-the-board from the previous years' rate.

Α	В	С	D
Line	Fiscal Year	Month Effective	Proposed Adjustment
1	2020	June	9.5%
2	2021	January	9.5%
3	2022	January	9.5%
4	2023	January	6.0%

Table 5-1: Proposed Revenue Adjustments

Monthly Meter Service Charge

Table 5-2 shows the monthly meter service charge calculation, which consists of the Meter and Customer cost components. As identified earlier, the Meter cost component is divided into the unit cost based on equivalent meter units. The Meter unit cost (**Table 4-10**, Column H, Line 13) must be multiplied by the capacity ratio for each meter size (Column C) to appropriately reflect the share of cost by meter size. A customer's share of the Customer does not vary with meter size and therefore the Customer unit cost (**Table 4-10**, Column I, Line 13) is applied equally across all meter sizes. These components are added together to arrive at the total proposed charge for FY 2020 (Column G).

Α	В	C	D	E	F	G	H	Ι
т •	Monthly Meter	Capacity	Number		0	Proposed	Current	Difference
Line	Service Charge	Ratio	of Meters	Meter	Customer	Charge	Charge	(\$)
1	5/8 x 3/4-in	1.00	158	\$15.58	\$5.38	\$20.97	\$12.40	\$8.57
2	3/4-in	1.00	2,972	\$15.58	\$5.38	\$20.97	\$12.40	\$8.57
3	1-in	1.67	1,262	\$25.97	\$5.38	\$31.36	\$16.09	\$15.27
4	1 1/2-in	3.33	634	\$51.95	\$5.38	\$57.33	\$59.55	(\$2.22)
5	2-in	5.33	603	\$83.12	\$5.38	\$88.50	\$83.25	\$5.25
6	3-in	10.67	64	\$166.23	\$5.38	\$171.62	\$167.61	\$4.01
7	4-in	16.67	27	\$259.73	\$5.38	\$265.12	\$220.89	\$44.23
8	6-in	33.33	5	\$519.47	\$5.38	\$524.86	\$277.00	\$247.86
9	8-in	53.33	1	\$831.15	\$5.38	\$836.54	\$368.52	\$468.02
10	10-in	140.00	1	\$2,181,77	\$5.38	\$2,187,16	\$555.00	\$1.632.16

Table 5-2: Monthly Meter Service Charge Calculation (All Classes)

Monthly Fire Service Charge

Table 5-3 shows the calculation of the monthly fire service charge. The Private Fire unit cost (**Table 4-10**, Column J, Line 13) is multiplied by the fire ratios (Column C) to arrive at the Private Fire cost for each meter size. Similar to the monthly meter service charge calculation, Customer costs do not vary between customer types or meter sizes; therefore, the Customer unit cost is applied equally across all fire line sizes. These two components are added together to arrive at the total proposed charge for FY 2020 (Column G).

Α	В	C	D	E	F	G	Η	Ι
Line	Monthly Fire	Fire	Number	Drivoto Firo	rivate Fire Customer	Proposed	Current	Difference
	Service Charge	Ratio	of Meters	T IIvate File		Charge	Charge	(\$)
1	2.5-in	0.10	20	\$10.31	\$5.38	\$15.70	\$54.40	(\$38.70)
2	4-in	0.34	33	\$35.50	\$5.38	\$40.89	\$82.14	(\$41.25)
3	6-in	1.00	202	\$103.13	\$5.38	\$108.52	\$102.12	\$6.40
4	8-in	2.13	342	\$219.78	\$5.38	\$225.17	\$138.75	\$86.42
5	10-in	3.83	125	\$395.24	\$5.38	\$400.63	\$175.38	\$225.25

Table 5-3: Monthly Fire Service Charge Calculation

Quantity Rates

The City purchases water from two separate sources to serve its potable water customers. **Table 5-4** shows the Water Supply unit cost by source of supply. The available supply (Line 1) is equal to the annual water usage and is allocated among supply sources based on the proportion of water production from each source (**Table 3-10**, Column C, Line 14 divided by Line 16 and Line 15 divided by Line 16 for Whittier and Central Basin, respectively). The cost of service (Line 2) is equal to the Water Supply cost (**Table 4-10**, Column C, Line 8). The unit cost for each source is calculated by dividing the cost of service by source by the available supply.

Table 5-4: Water Supply Unit Cost Calculation by Source

Α	В	С	D	E
Line	Water Supply Unit Cost	City of Whittier	Central Basin MWD	Total
1	Available Supply (hcf)	979,219	1,171,052	2,150,271
2	Cost of Service	\$1,401,064	\$3,487,701	\$4,888,765
3	Unit Cost	\$1.43	\$2.98	\$2.27

Table 5-5 shows the Water Supply unit cost for each customer class and tier. City of Whittier water is significantly cheaper than Central Basin MWD water and water from this source is allocated equally among customer classes based on proportion of usage. However, within the Single Family Residential customer class, Tier 1 receives the cheapest source of water first. Tier 2 receives the remaining amount of Whittier water and a portion of Central Basin MWD water. Tier 3 is served entirely by Central Basin MWD water. Allocating the cheapest source of water for the lower tiers aligns with Article X, Section 2 of the California Constitution, which mandates that water resources are allocated to beneficial use; indoor use for public health and safety (which is represented by Tier 1) is the most essential use of water. All other customers pay for a blended supply source, equal to the Water Supply unit cost (**Table 4-10**, Column C, Line 13).

Α	В	С	D	E	F	G
Line	Customer Class	Annual Use (hcf)	City of Whittier	Central Basin MWD	Total Cost	Unit Cost
1	Single Family Residential	583,063	265,523	317,540		
2	Tier 1	197,115	197,115	0	\$282,031	\$1.43
3	Tier 2	208,321	68,408	139,913	\$514,575	\$2.47
4	Tier 3	177,627	0	177,627	\$529,021	\$2.98
5						
6	Non-Residential	1,497,446	681,927	815,519	\$3,404,530	\$2.27
7	Downey Water	47,964	21,842	26,122	\$109,049	\$2.27
8	Norwalk Water	21,798	9,927	11,871	\$49,559	\$2.27
9	Total	2,150,271	979,219	1,171,052	\$4,888,765	\$2.27

Table 5-5: Water Supply Unit Cost Calculation by Customer Class

Table 5-6 shows the Peaking unit cost calculation for each customer class and tier. The peaking costs (Column D) are derived from the Max Day and Max Hour costs for each class and tier (**Table 4-11**, Columns F and G). The peaking costs are divided by annual use (Column C) to determine the Peaking unit cost (Column E).

Α	В	С	D	E
Line	Customer Class	Annual Use (hcf)	Peaking Costs	Unit Cost
1	Single Family Residential			
2	Tier 1	197,115	\$45,957	\$0.23
3	Tier 2	208,321	\$115,659	\$0.56
4	Tier 3	177,627	\$311,093	\$1.75
5				
6	Non-Residential	1,497,446	\$730,709	\$0.49
7	Downey Water	47,964	\$29,572	\$0.62
8	Norwalk Water	21,798	\$6,466	\$0.30
9	Reclaimed Water	420,818	\$400,186	\$0.95
10	Total	2,571,089	\$1,639,644	\$0.64

Table 5-6: Peaking Unit Cost Calculation

Table 5-7 shows the quantity rate calculation for all customer classes and tiers. The Supply unit cost is equal to the Water Supply unit cost by class and tier (**Table 5-5** Column G) or the Reclaimed Water Supply unit cost (**Table 4-10**, Column D, Line 13) depending on customer type. Base unit costs (**Table 4-10**, Column E, Line 13) are applied equally to all classes and tiers. The Peaking unit cost (**Table 5-6**, Column E) is specific to each class and tier. The proposed charge (Column G) is equal to the sum of the three unit costs.

Table 5-7: Quantity Rate Calculation

Α	В	С	D	E	F	G
Line	Customer Class	Monthly Tiers (hcf)	Supply	Base	Peaking	Proposed Rate
1	Single Family Residential					
2	Tier 1	9	\$1.43	\$0.89	\$0.23	\$2.56
3	Tier 2	25	\$2.47	\$0.89	\$0.56	\$3.92
4	Tier 3	25+	\$2.98	\$0.89	\$1.75	\$5.62
5						
6	Non-Residential		\$2.27	\$0.89	\$0.49	\$3.66
7	Reclaimed Water		\$1.65	\$0.89	\$0.95	\$3.49

Proposed Rates

Table 5-8 shows the proposed monthly meter service charges for the study period. Please note that the June 2020 rates (Column C) are equal to that derived in **Table 5-2**. Proposed monthly meter service charges for all future years are equal to the previous years' rate multiplied by the proposed revenue adjustments in **Table 5-1**.

Table 5-8: Proposed Monthly Meter Service Charges

Α	В	С	D	E	F
Line	Meter Size	June 2020	January 2021	January 2022	January 2023
1	5/8 x 3/4-in	\$20.97	\$22.97	\$25.16	\$26.67
2	3/4-in	\$20.97	\$22.97	\$25.16	\$26.67
3	1-in	\$31.36	\$34.34	\$37.61	\$39.87
4	1 1/2-in	\$57.33	\$62.78	\$68.75	\$72.88
5	2-in	\$88.50	\$96.91	\$106.12	\$112.49
6	3-in	\$171.62	\$187.93	\$205.79	\$218.14
7	4-in	\$265.12	\$290.31	\$317.89	\$336.97
8	6-in	\$524.86	\$574.73	\$629.33	\$667.09
9	8-in	\$836.54	\$916.02	\$1,003.05	\$1,063.24
10	10-in	\$2,187.16	\$2,394.95	\$2,622.48	\$2,779.83

Table 5-9 shows the proposed monthly fire service charges for the study period. Please note that the June 2020 rates (Column C) are equal to that derived in **Table 5-3**. Proposed monthly fire service charges for all future years are equal to the previous years' rate multiplied by the proposed revenue adjustments in **Table 5-1**.

Α	В	С	D	Ε	F
Line	Fire Line Size	June 2020	January 2021	January 2022	January 2023
1	2.5-in	\$15.70	\$17.20	\$18.84	\$19.98
2	4-in	\$40.89	\$44.78	\$49.04	\$51.99
3	6-in	\$108.52	\$118.83	\$130.12	\$137.93
4	8-in	\$225.17	\$246.57	\$270.00	\$286.20
5	10-in	\$400.63	\$438.69	\$480.37	\$509.20

Table 5-9: Proposed Monthly Fire Service Charges

Table 5-10 shows the proposed quantity rates for the study period. Please note that the June 2020 rates (Column C) are equal to that derived in **Table 5-7**. The costs of service for Downey and Norwalk Water were derived in this study to accurately allocate costs to the other customer classes. However, the City sets the rates for these customers based on a separate agreement. Proposed quantity rates for all future years are equal to the previous years' rate multiplied by the proposed revenue adjustments in **Table 5-1**.

Table 5-10: Proposed Quantity Rates

Α	В	C	D	Ε	F	G
Line	Customer Class	Monthly Tiers (hcf)	June 2020	January 2021	January 2022	January 2023
1	Single Family Residential					
2	Tier 1	Up to 9	\$2.56	\$2.81	\$3.08	\$3.27
3	Tier 2	10-25	\$3.92	\$4.30	\$4.71	\$5.00
4	Tier 3	25+	\$5.62	\$6.16	\$6.75	\$7.16
5	Non-Residential		\$3.66	\$4.01	\$4.40	\$4.67
6	Reclaimed Water		\$3.49	\$3.83	\$4.20	\$4.46

Customer Impacts

Table 5-11 and **Figure 5-1** show the monthly bill impacts for a Single Family customer with a 3/4-inch meter at various levels of water usage. The average Single Family customer uses 13 hcf a month and will see an increase of approximately \$6 per month.

Table 5-11: Monthly Bill Impacts, Single Family Residential Customer with 3/4-in Meter

Α	В	С	D	E
Line	Monthly Usage	Proposed Monthly Bill	Current Monthly Bill	Difference (\$)
1	5 hcf	\$33.77	\$28.25	\$5.52
2	9 hcf	\$44.01	\$40.93	\$3.08
3	13 hcf	\$59.69	\$53.61	\$6.08
4	16 hcf	\$71.45	\$63.12	\$8.33
5	20 hcf	\$87.13	\$76.70	\$10.43
6	25 hcf	\$106.73	\$94.80	\$11.93
7	30 hcf	\$134.83	\$112.90	\$21.93

Figure 5-1: Monthly Bill Impacts, Single Family Residential Customer with 3/4-in Meter



Table 5-12 and **Figure 5-2** show the monthly bill impacts for a Commercial customer with a 2-inch meter at various levels of water usage. The average Commercial customer uses 80 hcf per month and will see a reduction of approximately \$6 per month.

Α	В	C	D	E
Line	Monthly Usage	Proposed Monthly Bill	Current Monthly Bill	Difference (\$)
1	20 hcf	\$161.70	\$147.55	\$14.15
2	50 hcf	\$271.50	\$263.43	\$8.07
3	80 hcf	\$381.30	\$387.63	(\$6.33)
4	100 hcf	\$454.50	\$470.43	(\$15.93)
5	150 hcf	\$637.50	\$682.43	(\$44.93)
6	200 hcf	\$820.50	\$894.43	(\$73.93)
7	300 hcf	\$1,186.50	\$1,318.43	(\$131.93)
8	500 hcf	\$1,918.50	\$2,176.43	(\$257.93)

Table 5-12: Monthly Bill Impacts, Commercial Customer with 2-in Meter

Figure 5-2: Monthly Bill Impacts, Commercial Customer with 2-in Meter

