



**CITY OF SONOMA**

# **Water Rate Study**

**FINAL REPORT / AUGUST 10, 2023**





August 10, 2023

Mr. Mike Berger  
Public Works Director  
City of Sonoma  
No. 1 The Plaza  
Sonoma, CA 95476

**Subject: Water Financial Plan and Rate Study Report**

Dear Mr. Berger:

Raftelis is pleased to provide this Water Financial Plan and Rate Study report for the City of Sonoma (City) to develop a ten-year financial plan and to establish five years of water rates that are equitable and align with Proposition 218.

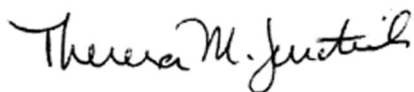
The major objectives of the study include the following:

- Develop a financial plan for the water enterprise to ensure financial sufficiency, meet operation and maintenance (O&M) costs, ensure sufficient funding for capital replacement and refurbishment (R&R) needs, and maintain the financial health of the enterprises
- Review the reserve fund targets
- Perform a cost-of-service analysis to ensure a nexus between proposed rates and the cost of providing services to customers
- Update the rates for the water enterprise
- Design drought surcharge rates for times of declared water shortages

The report summarizes the key findings and recommendations related to the development of the water enterprise financial plan and the development of the updated water rates.

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

Sincerely,

A handwritten signature in black ink that reads 'Theresa M. Jurotich'.

**Theresa Jurotich, P.E. (KS, WA), PMP**  
*Manager*

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# 1. Executive Summary

## 1.1. Background of the Study

In 2023, the City of Sonoma (City) engaged Raftelis Financial Consultants (Raftelis) to conduct a Water Rate Study for the City’s water utility. The study included the development of a ten-year financial plan, a cost-of-service analysis, and the development of proposed water rates for five years beginning in fiscal year (FY) 2024<sup>1</sup>. This report provides a detailed explanation of the rate setting process and serves as part of the administrative record of the City’s proposed changes to its water rates.

This executive summary describes the rate study process, methodology, and recommendations for the City’s water rates. The City strives to provide high quality, dependable water service to the community while maintaining financial stability, affordability, and adequate levels of investment in infrastructure. The City wishes to establish a five-year schedule of rates that:

- Meet the City’s water enterprise fiscal needs for operation and maintenance (O&M) costs, capital replacement and refurbishment (R&R) costs to maintain the system, reserve goals, and to maintain the financial health of the enterprise, and
- Fairly and equitably recover the costs of providing service and that align with Proposition 218.

## 1.2. Objectives of the Study

The major objectives of the study include the following:

- Develop a ten-year financial plan for the City’s water utility to ensure financial sufficiency, recover O&M costs, ensure sufficient funding for capital projects, and improve the financial health of the water utility
- Perform a cost-of-service analysis that calculates the cost to serve each customer class
- Develop water rates for FY 2024 through FY 2028 that are fair, equitable, and in proportion to the cost of providing service to the City’s water customers
- Design drought surcharge rates for times of declared water shortages

## 1.3. Study Process and Methodology

Raftelis first developed a financial plan for the City, which established the total revenue adjustments<sup>2</sup> needed to meet capital investment, operational expenses, and debt service proposed during the study period (FY 2023-FY 2033). Raftelis worked with City staff to refine inputs and provide a recommended financial plan and associated water rates for the City Council’s consideration. After developing the financial plan, Raftelis performed a cost-of-service analysis to determine the water rates.

The water rates presented in this executive summary were developed using cost-of-service principles set forth by the American Water Works Association M1 Manual titled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). As stated in AWWA M1 Manual, “water rates and charges should be recovered from

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<sup>1</sup> The fiscal year begins on July 1 and runs through June 30. For example, FY 2024 is July 1, 2023 through June 30, 2024.

<sup>2</sup> Revenue adjustments are defined as additions to gross rate revenues on an annual basis. Actual changes to rates are based on the revenue adjustment, cost-of-service allocations, and rate design.

classes of customers in proportion to the cost of serving those customers.” Raftelis follows industry standard rate setting methodologies set forth by the AWWA M1 Manual to ensure this study aligns with Proposition 218 requirements and creates rates that do not exceed the proportionate cost of providing water services.

Throughout the report many tables are rounded and may not sum exactly due to extra decimals not shown for ease of reading.

## 1.4. Results and Recommendations

### 1.4.1. Proposed Financial Plan

With the assistance of City staff, Raftelis conducted a status quo cash flow analysis to evaluate whether existing water rates adequately fund the City’s various water-related expenses over the ten-year study period. The analysis projected annual revenues, operation and maintenance expenses, debt service payments, and capital expenditures through FY 2033. Raftelis projects that with no rate increases over the study period, the City will fully deplete its reserves by the end of FY 2030. This projected outcome of depleted reserve funds demonstrates a need for water revenue adjustments now to avoid larger increases later.

Raftelis worked with City staff to develop proposed revenue adjustments over the five-year study period, plus a projection, for informational purposes only, for the last half of the 10-year financial plan (Table 1-1). The proposed water revenue adjustments were selected to ensure the water operating fund has sufficient funds to cover annual expenses and to maintain reserves at or above target levels. The total reserve target includes an operating reserve target of 2 months of annual operating expenses, a capital reserve target of the average of the 5-year capital improvement plan, and a rate stabilization reserve of 15 percent of the annual commodity revenue. The percentages shown in Table 1-1 are the annual changes in rate revenue required to maintain a financially viable water utility and to fully fund planned capital projects.

**Table 1-1: Proposed Revenue Adjustments**

Effective Date	Revenue Adjustment
Dec. 1, 2023	5.0%
July 1, 2024	5.0%
July 1, 2025	5.0%
July 1, 2026	5.0%
July 1, 2027	5.0%
July 1, 2028	4.0%
July 1, 2029	4.0%
July 1, 2030	4.0%
July 1, 2031	4.0%
July 1, 2032	4.0%

The following items affect the City’s water utility revenue requirement (i.e., costs) and consequently its water rates. The City’s expenses include O&M expenses, capital expenses, and debt service.

- **Water Purchase Expense:** The City obtains roughly 88 percent of its water supply from the Sonoma County Water Agency (SCWA). The rate set by the SCWA for water sold to the City is expected to increase by approximately 10 percent per year between FY 2024 and FY 2025. Water purchase

expenses represented approximately 49 percent of the City water utility’s total operating expenses in FY 2022 (most recent year of actuals).

- O&M Expenses: The City’s other O&M expenses are expected to increase at a rate of about 3.5 percent per year.
- Water System Capital Investment: The City anticipates an average of approximately \$1.5 million (uninflated) in annual capital expenditures. This capital investment includes replacement of key water system infrastructure, investment in meter system upgrades to automated metering infrastructure, and other capital projects.

Figure 1-1 shows the proposed ten-year financial plan. Status Quo revenue is shown by the red line. Projected revenue is shown by the blue line. Annual expenditures are shown by the columns. Green bars above the X-axis show the net cash to build up the reserves and green bars below the X-axis show withdrawals from reserves to fund costs. Current rates are neither sufficient to cover annual operating and maintenance expenses nor capital-related expenditures. Therefore, revenue adjustments are required to generate sufficient revenue to cover annual operating and maintenance costs, capital projects, and maintain reserves over the study period.

Figure 1-1: Proposed Water Financial Plan

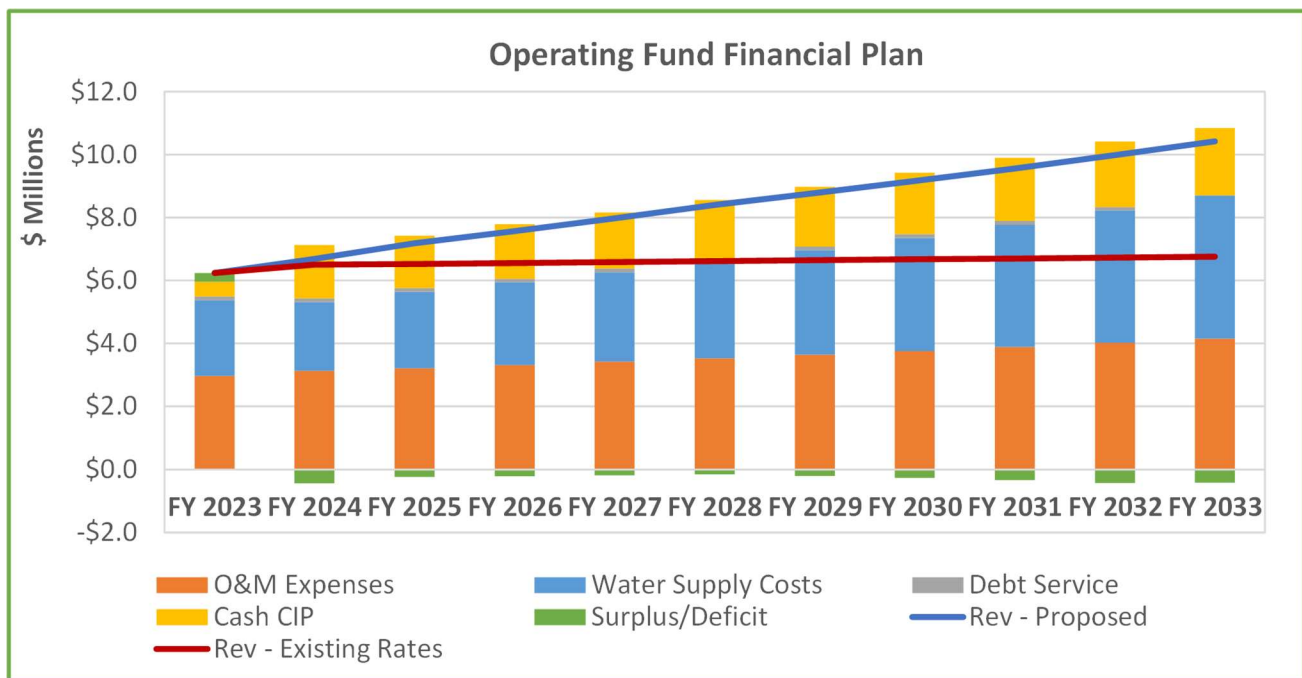


Figure 1-2 shows projected operating and capital ending balances over the study period relative to the City’s total reserve targets under the proposed financial plan. Even with the planned revenue adjustments, reserves are drawn down each year, reaching the target level by the end of the study period.

Figure 1-2: Proposed Water Financial Plan – Projected Ending Balances

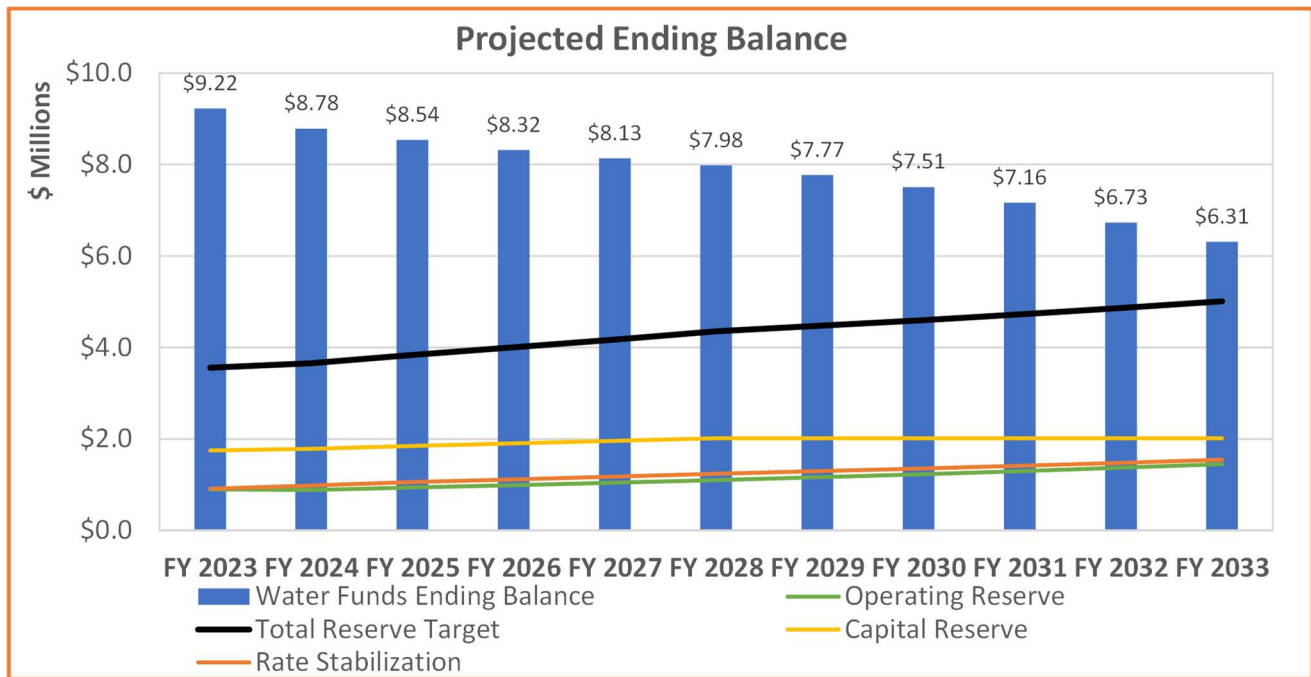
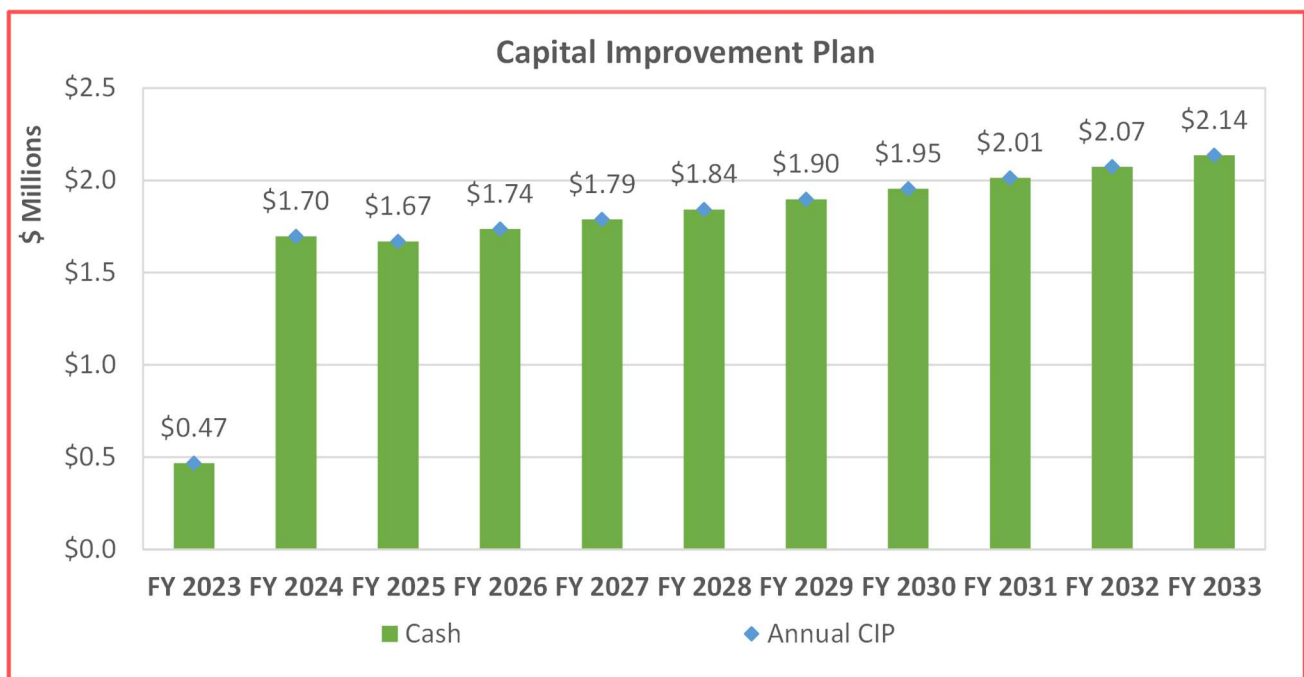


Figure 1-3 shows the proposed capital improvement plan (inflated dollars) and planned funding source over the study period. The proposed financial plan assumes that all capital projects over the study period will be cash funded through rate revenue.

Figure 1-3: Water Capital Funding Sources



### 1.4.2. Proposed Water Rates

The City’s water rate structure includes a monthly fixed charge based on meter size, a tiered volumetric rate for single-family customers, and uniform volumetric rates by customer class for all other customer classes. The City also has a monthly fixed charge for private fire service connections based on the diameter of the fire line. No changes are proposed for the water rate structure.

Table 1-2 shows the current and proposed monthly service charges and monthly fire line charges. These fixed charges are designed to primarily recover costs that are relatively fixed, such as customer service costs, meter servicing and maintenance costs, as well as costs associated with public and private fire protection.

**Table 1-2: Proposed Monthly Service Charges Through FY 2028**

Meter/ Connection Size	Current Charge	FY 2024 cost-of-service	FY 2025 5% Adjustment	FY 2026 5% Adjustment	FY 2027 5% Adjustment	FY 2028 5% Adjustment
<b>Monthly Service Charge</b>						
5/8"	\$30.46	\$33.35	\$35.02	\$36.78	\$38.62	\$40.56
3/4"	\$30.46	\$33.35	\$35.02	\$36.78	\$38.62	\$40.56
1"	\$30.46	\$33.35	\$35.02	\$36.78	\$38.62	\$40.56
1 1/2"	\$50.19	\$57.86	\$60.76	\$63.80	\$66.99	\$70.34
2"	\$73.86	\$87.28	\$91.65	\$96.24	\$101.06	\$106.12
3"	\$136.98	\$165.72	\$174.01	\$182.72	\$191.86	\$201.46
4"	\$207.99	\$253.97	\$266.67	\$280.01	\$294.02	\$308.73
6"	\$405.24	\$499.11	\$524.07	\$550.28	\$577.80	\$606.69
<b>Fire Line Charge</b>						
2"	\$0.82	\$14.08	\$14.79	\$15.53	\$16.31	\$17.13
4"	\$4.98	\$41.28	\$43.35	\$45.52	\$47.80	\$50.19
6"	\$14.41	\$103.09	\$108.25	\$113.67	\$119.36	\$125.33
8"	\$30.72	\$209.70	\$220.19	\$231.20	\$242.76	\$254.90
10"	\$55.21	\$370.06	\$388.57	\$408.00	\$428.40	\$449.82

Table 1-3 presents the current and proposed volumetric charge assessed per thousand gallons (kgal) of water consumed per month. This charge is designed to primarily recover the variable costs associated with operating the water utility, such as the cost of supplying water from SCWA as well as costs for delivering water during average demand conditions, system capacity costs, and conservation-relate costs.

**Table 1-3: Proposed Volumetric Charge Rates Through FY 2028**

Class	Current Charge	FY 2024 cost-of-service	FY 2025 5% Adjustment	FY 2026 5% Adjustment	FY 2027 5% Adjustment	FY 2028 5% Adjustment
SFR Tier 1	\$6.19	\$6.13	\$6.44	\$6.77	\$7.11	\$7.47
SFR Tier 2	\$8.37	\$8.06	\$8.47	\$8.90	\$9.35	\$9.82
SFR Tier 3	\$9.86	\$9.86	\$10.36	\$10.88	\$11.43	\$12.01
MFR	\$8.16	\$7.98	\$8.38	\$8.80	\$9.24	\$9.71
Comm	\$7.93	\$7.98	\$8.38	\$8.80	\$9.24	\$9.71
Municipal	\$8.16	\$8.40	\$8.82	\$9.27	\$9.74	\$10.23
Irrigation	\$8.69	\$9.15	\$9.61	\$10.10	\$10.61	\$11.15
Construction (Hydrant) (1)	\$10.74	\$14.42	\$15.15	\$15.91	\$16.71	\$17.55

(1) Private fire water use is also charged at this rate.

Table 1-4 shows the current and proposed elevation charge for Zone 2. This charge is designed to recover the cost of pumping water to customers residing in a higher elevation zone (Zone 2, shown in the City’s Water Master Plan Figure 1-1, and copied in Appendix A). Customers residing inside the lower elevation zones do not pay a surcharge.

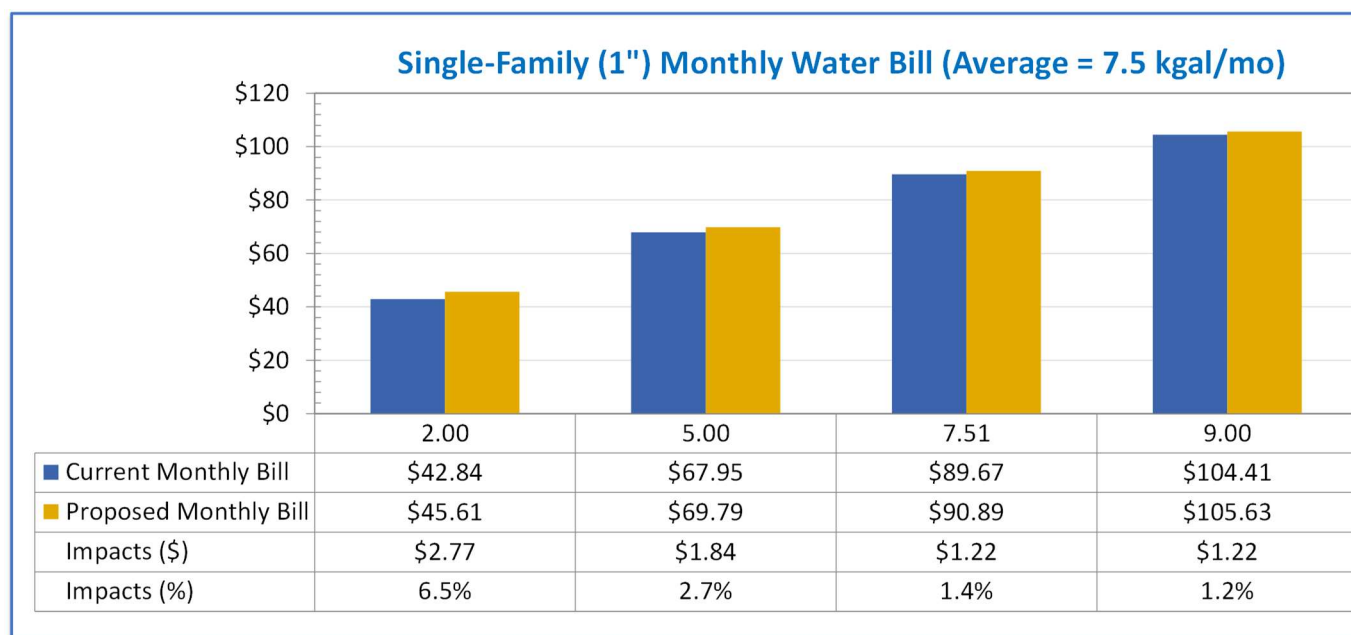
**Table 1-4: Proposed Elevation Charge Through FY 2028**

Zone	Current Charge	FY 2024 cost-of-service	FY 2025 5% Adjustment	FY 2026 5% Adjustment	FY 2027 5% Adjustment	FY 2028 5% Adjustment
Zone 2	\$2.40	\$3.22	\$3.39	\$3.56	\$3.74	\$3.93

### 1.4.3. Typical Bill

Figure 1-4 shows a comparison of single-family water bills at different water usage levels and on a 1-inch meter.

**Figure 1-4: Single-Family Bill Comparison at Different Usage (kgal/mo)**



### 1.4.4. Neighboring Agency Comparison

Figure 1-5 shows a comparison of monthly water bills for a single-family customer on a 1-inch meter using 7.5 kgal/mo. The comparison shows current FY 2023 rates and adopted or proposed rates for FY 2024 and FY 2025.

Figure 1-5: Neighboring Agency Comparison



### 1.4.5. Drought Surcharge

In periods of drought when water sales are reduced, the City will lose revenue and fail to cover its expenses. Raftelis developed drought surcharges to supplement revenues due to drought by recovering the net revenue loss. The projected losses and revenue shortfall, by reduction level, is shown in Table 1-5.

Table 1-5: Drought Surcharge by Percent Usage Reduction

	FY 2024	0 - 10% Reduction	10 - 20% Reduction	20 - 30% Reduction	30 - 40% Reduction	40 - 50% Reduction
<b>Projected Potable Variable Revenue</b>	<b>\$4,549,587</b>	<b>\$4,083,190</b>	<b>\$3,704,370</b>	<b>\$3,193,830</b>	<b>\$2,702,152</b>	<b>\$2,304,365</b>
Revenue Shortfall		(\$466,396)	(\$845,217)	(\$1,355,756)	(\$1,847,434)	(\$2,245,222)
Cost Savings		\$240,116	\$443,881	\$709,102	\$970,338	\$1,180,106
<b>Net Revenue Shortfall to be Recovered</b>		<b>(\$226,280)</b>	<b>(\$401,336)</b>	<b>(\$646,654)</b>	<b>(\$877,096)</b>	<b>(\$1,065,116)</b>
% Revenue Shortfall		6%	11%	20%	32%	46%

## 2. Rate Setting Methodology

This study was conducted using industry-standard principles outlined in the AWWA Manual M1. The process and approach Raftelis utilized in the study to determine water rates is informed by the City's policy objectives, the current water system and rates, and the legal requirements in California (namely, Proposition 218). The resulting financial plan, cost of service analysis, and rate design process follows five key steps, outlined below, to determine proposed rates that achieve the City's objectives, meet industry standards, and align with relevant regulations.

1. **Financial Plan - Projections:** The first step is to develop a multi-year financial plan that projects the City'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 City to recover adequate revenues to fund expenses and reserves.
2. **Financial Plan - Revenue Requirement Determination:** After completing the financial plan, the rate-making process begins by determining the revenue requirement for the test year, also known as the rate-setting year. The test year for this study is FY 2024. The revenue requirement should sufficiently fund the City's operating costs, annual debt service (including coverage requirements), capital expenditures, and reserve funding as projected based on the annual budget estimates.
3. **Cost-of Service-Analysis:** The annual cost of providing water service, or the revenue requirement, is then distributed to customer classes commensurate with their use of and burden on the water system. A cost-of-service analysis involves the following steps:
  - a. Functionalize costs – the different components of the revenue requirement are categorized into functions such as supply, transmission/distribution, storage, customer service, etc.
  - b. Allocate to cost causation components – the functionalized costs are then allocated to cost-causation components such as supply, base delivery, peaking, etc.
  - c. Develop unit costs – unit costs for each cost-causation component are determined using units of service, such as total use, peaking units, equivalent meters, number of customers, etc., for each component.
  - d. Distribute cost components – the cost components are allocated to each customer class using the unit costs in proportion to their units of service (demand and burden on the system).

A water cost-of-service analysis also considers both the average water demand and peak demand. Peaking costs are incurred during periods of peak consumption, most often coinciding with summer water use and irrigation needs. There are additional capacity-related costs associated with designing, constructing, operating, maintaining, and replacing facilities to meet peak demand. Peaking imposes additional costs on a water utility and are used to determine the cost burden on peaking-related facilities.

4. **Rate Design:** After allocating the revenue requirement to each customer class, the project team designs and calculates rates. Rates do more than simply recover costs; within the legal framework and industry standards, properly designed rates should support and optimize 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 and sample customer bill impacts. Additionally, where tiered rates are developed, the project team determines the cost to serve each tier as a sub-class, to ensure a nexus to costs incurred.



5. **Administrative Record Preparation and Rate Adoption:** The final step in a rate study is to develop the administrative record (report) in conjunction with the rate adoption process. This report serves as the administrative record for this study. The administrative record documents the study results and presents the methodologies, rationale, justifications, and calculations used 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 rationale for revenue adjustments and proposed rates to customers and key stakeholders.

Values shown in report tables and figures are rounded to the digit shown. Therefore, any manual reproduction of the calculations shown may not match the precise results displayed in the report.

### 3. Water System

This section briefly describes the City’s water system and ratepayer base. The City provided customer account and water use data for FY 2021, FY 2022, and partial FY 2023. Raftelis developed a water rate model in Microsoft Excel to project financial and rate calculations over a ten-year study period through FY 2033. The City’s fiscal year spans from July 1 through June 30. Projections in future years were generally made based on actual or budgeted FY 2022 or FY 2023 data using key assumptions outlined below. All assumptions were discussed with, and reviewed by, City staff to ensure that the City’s unique characteristics were incorporated. Note that most table values shown throughout this report are rounded to the last digit shown and, therefore, may not calculate precisely to the values shown.

#### 3.1. Water System Background

The City provides water services to approximately 4,500 connections that serve residential, commercial, municipal, and irrigation customers as well as private fire lines. Most of the City’s water supply is purchased wholesale from the Sonoma County Water Agency (SCWA). SCWA’s wholesale water rates are projected to increase 10.6 percent between FY 2023 and FY 2024 and another 10 percent between FY 2024 and FY 2025. The financial plan assumes that SCWA costs will continue to increase by 7.6 percent annually, based on the historical and anticipated increases between FY 2021 and FY 2025. The City supplements its water supply purchases with groundwater produced by seven City-owned wells (not all the wells are currently operational).

The City’s existing rate structure is based on a rate study completed in 2018. The most recent water rate increase went into effect on July 1, 2022 and is shown in Table 3-1.

**Table 3-1: Current Water Rates**

Charge Type	Current	Charge Type	Current
<b>Monthly Service Charges</b>		<b>Volumetric Charges, \$/kgal</b>	
5/8"	\$30.46	<b>Residential Volumetric Charges</b>	
3/4"	\$30.46	Tier 1: 0-2 kgal	\$6.19
1"	\$30.46	Tier 2: 2 - 7 kgal	\$8.37
1 1/2"	\$50.19	Tier 3: > 7kgal	\$9.86
2"	\$73.86	<b>Other Classes</b>	
3"	\$136.98	Multi-Family Residential	\$6.56
4"	\$207.99	Commercial	\$6.37
6"	\$405.24	Municipal	\$6.56
<b>Fire Line Fixed Charges</b>		Irrigation	\$6.98
2"	\$0.82	Fire & Hydrant	\$8.64
4"	\$4.98	<b>Elevation Charges, \$/kgal</b>	
6"	\$14.41	Zone 2	\$1.92
8"	\$30.72		
10"	\$55.21		

### 3.2. Number of Accounts and Fire Lines

Table 3-2 shows the actual number of potable water accounts by meter size for FY 2022 and the projected number of accounts through the study period. Based on discussions with City staff, the total number of accounts is projected to increase at 0.5 percent per year. The number of accounts is used to forecast the amount of fixed revenue the City will receive from the monthly meter charge as well as to forecast the annual water use.

**Table 3-2: Water Accounts by Meter Size**

Meter Size	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
5/8"	253	252	253	254	256	257
3/4"	2,568	2,554	2,566	2,579	2,591	2,603
1"	1,249	1,256	1,262	1,268	1,274	1,280
1 1/2"	143	144	145	145	146	147
2"	106	106	107	107	108	108
3"	22	22	22	22	22	22
4"	9	9	9	9	9	9
6"	1	1	1	1	1	1
<b>Total</b>	<b>4,351</b>	<b>4,344</b>	<b>4,365</b>	<b>4,385</b>	<b>4,406</b>	<b>4,427</b>
Meter Size	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
5/8"	258	259	260	262	263	264
3/4"	2,616	2,628	2,641	2,653	2,666	2,679
1"	1,286	1,292	1,298	1,305	1,311	1,317
1 1/2"	148	148	149	150	150	151
2"	109	109	110	110	111	111
3"	23	23	23	23	23	23
4"	9	9	9	9	9	9
6"	1	1	1	1	1	1
<b>Total</b>	<b>4,448</b>	<b>4,469</b>	<b>4,491</b>	<b>4,512</b>	<b>4,533</b>	<b>4,555</b>

Table 3-3 shows the number of fire lines by connection size for FY 2023. Raftelis projected the number of fire lines and forecasted the amount of fixed revenue that the City will collect from the fire line fixed charge using the same methods described above for water accounts. For reference: fire lines are private sprinkler connections or hydrants that provide additional fire suppression as a standby service.

**Table 3-3: Fire Lines by Connection Size**

Connection Size	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
2"	9	9	9	9	9	9
4"	74	76	76	77	77	78
6"	60	62	62	63	63	63
8"	20	20	20	20	20	20
10"	3	3	3	3	3	3
<b>Total</b>	<b>166</b>	<b>170</b>	<b>171</b>	<b>172</b>	<b>172</b>	<b>173</b>

Connection Size	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
2"	9	9	9	9	9	9
4"	78	78	79	79	80	80
6"	64	64	64	64	65	65
8"	21	21	21	21	21	21
10"	3	3	3	3	3	3
<b>Total</b>	<b>174</b>	<b>175</b>	<b>176</b>	<b>176</b>	<b>177</b>	<b>178</b>

### 3.3. Water Use

Table 3-4 shows actual and forecasted annual water use by customer class and tier based on individual customer consumption data provided by the City and analyzed by Raftelis. Based on discussions with City staff, the forecast presumes an approximate 6 percent increase in demand in FY 2024 due to water restrictions being lifted. Thereafter, increased water use is driven by the increase in customer accounts. A small portion of the total usage shown in Table 3-4 is from customers in Zone 2. Table 3-5 shows the projected Zone 2 usage.

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**Table 3-4: Water Use by Customer Class and Tier (kgal)**

Customer	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
<b>Residential Volumetric Consumption</b>						
Tier 1	79,363	78,600	83,309	83,707	84,107	84,509
Tier 2	117,540	110,600	117,226	117,786	118,349	118,915
Tier 3	115,077	107,500	113,940	114,484	115,031	115,581
<b>Other Uniform Volumetric Consumption</b>						
Multi-Family	85,973	82,900	87,866	88,286	88,708	89,132
Commercial	69,344	65,900	69,848	70,182	70,517	70,854
Municipal	36,876	32,900	34,871	35,038	35,205	35,373
Irrigation	42,957	41,800	44,304	44,516	44,729	44,943
Construction	780	900	954	959	964	969
Private Fire	309	300	318	320	322	324
<b>Total, kgal</b>	<b>548,220</b>	<b>521,400</b>	<b>552,636</b>	<b>555,278</b>	<b>557,932</b>	<b>560,600</b>
Customer	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
<b>Residential Volumetric Consumption</b>						
Tier 1	84,913	85,319	85,727	86,137	86,549	86,963
Tier 2	119,483	120,054	120,628	121,204	121,783	122,365
Tier 3	116,133	116,688	117,246	117,806	118,369	118,935
<b>Other Uniform Volumetric Consumption</b>						
Multi-Family	89,558	89,986	90,416	90,848	91,282	91,718
Commercial	71,193	71,533	71,875	72,218	72,563	72,910
Municipal	35,542	35,712	35,883	36,054	36,226	36,399
Irrigation	45,158	45,374	45,591	45,809	46,028	46,248
Construction	974	979	984	989	994	999
Private Fire	326	328	330	332	334	336
<b>Total, kgal</b>	<b>563,280</b>	<b>565,973</b>	<b>568,680</b>	<b>571,397</b>	<b>574,128</b>	<b>576,873</b>

**Table 3-5: Zone 2 Projected Usage (kgal)**

Customer	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Zone 2, kgal	5,990	5,500	5,829	5,857	5,885	5,913
Customer	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
Zone 2, kgal	5,941	5,969	5,998	6,027	6,056	6,085

### 3.4. Inflationary Assumptions

Inflationary assumptions shown in Table 3-6 were used to project O&M expenses beyond the FY 2023 budget. To ensure that future costs are reasonably projected, Raftelis worked with the City to generate assumptions regarding inflationary factors including general and salary inflation and water cost inflation. The inflationary factors were then applied to the FY 2023 budgeted cost estimates to develop the FY 2024 and subsequent year estimates.

**Table 3-6: Inflationary Assumptions**

Category	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028+
General	3.0%	3.0%	3.0%	3.0%	3.0%
Salary	8.0%	3.0%	3.0%	3.0%	3.0%
Benefits	8.0%	8.0%	8.0%	8.0%	8.0%
Utilities	6.0%	5.0%	4.0%	3.0%	3.0%
Construction	6.0%	5.0%	4.0%	3.0%	3.0%
Insurance	3.0%	3.0%	3.0%	3.0%	3.0%
Professional Services	3.0%	3.0%	3.0%	3.0%	3.0%
Water Purchase Cost	*	10.0%	7.6%	7.6%	7.6%

\* Using SCWA's planned rate for FY 2024.

Interest earnings on cash reserves are projected assuming a 1 percent annual interest rate. Revenues from late fees and shutoffs are projected to increase at 0.5 percent per year. Other miscellaneous revenue is forecast to remain flat.

## 4. Financial Plan

This section describes the ten-year financial plan. The proposed financial plan is used to determine the overall revenue adjustments and total amount of revenue required from rates. The revenue covers O&M expenses, capital expenses, any debt service, and reserve funding. Revenue adjustments represent the average rate-based revenue increase for the City as a whole; rate changes for individual customers will depend on the cost-of-service analysis and rate design.

To develop the financial plan, Raftelis projected annual expenses and revenues, existing debt service, modeled reserve balances and transfers between funds, and accounted for planned capital expenditures. This section of the report provides a discussion of projected revenue, O&M expenses, debt service, the capital improvement plan (CIP), reserve funding under existing rates, and the revenue adjustments required to ensure fiscal sustainability. The financial plan starts with current account data and water use as well as current rates to determine if the current rates are adequately meeting the revenue requirements.

### 4.1. Current Water Rate Revenue

The City's revenues consist of rate revenues, interest earnings on cash reserves, and other miscellaneous revenues. The rate revenue projections shown below assume that current FY 2023 (Table 3-1) rates are effective throughout the study period; and, therefore, represent estimated revenues in the absence of any rate increase. This status quo scenario provides a baseline from which Raftelis evaluates the need for revenue adjustments.

#### 4.1.1. Calculated Water Rate Revenues

Raftelis projected water rate revenues from fixed meter charges, fire line charges, and volume charges for FY 2023 through FY 2033 based on current FY 2023 water rates, the projected number of water meters, projected private fire connections, and projected water use.

The City collects fixed monthly service revenue from its customers based on meter size. Table 4-1 shows projected fixed meter charge revenues under current rates over the study period. Fixed charge revenues are calculated by meter size in each year as follows based on current FY 2023 water rates (from Table 3 1) and the projected number of water meters (from Table 3 3). The following shows an example calculation for a 3/4" meter. This calculation is repeated for all meter sizes to determine the total fixed charge revenue in each fiscal year throughout the study period.

$$\text{Annual Fixed Charge Revenue for } \frac{3}{4}'' \text{ meter} = [\text{FY 2023 fixed monthly rate } \frac{3}{4}'' \text{ meter}] \times [\text{Number of } \frac{3}{4}'' \text{ connections}] \times [12 \text{ Bills per year}]$$

**Table 4-1: Projected Fixed Charge Revenues Under Current Rates**

Meter Size	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
5/8"	\$92,111	\$92,550	\$92,988	\$93,427	\$93,866	\$94,304
3/4"	\$933,538	\$937,997	\$942,493	\$946,989	\$951,522	\$956,054
1"	\$459,367	\$461,579	\$463,772	\$466,001	\$468,231	\$470,461
1 1/2"	\$86,728	\$87,150	\$87,572	\$87,993	\$88,415	\$88,836
2"	\$93,950	\$94,393	\$94,836	\$95,279	\$95,723	\$96,166
3"	\$36,163	\$36,327	\$36,491	\$36,656	\$36,820	\$36,985
4"	\$22,463	\$22,463	\$22,463	\$22,463	\$22,463	\$22,463
6"	\$4,863	\$4,863	\$4,863	\$4,863	\$4,863	\$4,863
<b>Total</b>	<b>\$1,729,183</b>	<b>\$1,737,322</b>	<b>\$1,745,478</b>	<b>\$1,753,672</b>	<b>\$1,761,902</b>	<b>\$1,770,131</b>

Meter Size	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
5/8"	\$94,743	\$95,181	\$95,620	\$96,095	\$96,570
3/4"	\$960,623	\$965,229	\$969,834	\$974,476	\$979,118
1"	\$472,690	\$474,957	\$477,223	\$479,489	\$481,792
1 1/2"	\$89,258	\$89,679	\$90,101	\$90,523	\$90,944
2"	\$96,609	\$97,052	\$97,495	\$97,938	\$98,382
3"	\$37,149	\$37,313	\$37,478	\$37,642	\$37,806
4"	\$22,463	\$22,463	\$22,463	\$22,463	\$22,463
6"	\$4,863	\$4,863	\$4,863	\$4,863	\$4,863
<b>Total</b>	<b>\$1,778,398</b>	<b>\$1,786,737</b>	<b>\$1,795,077</b>	<b>\$1,803,490</b>	<b>\$1,811,939</b>

Revenues for fire line services under existing rates are calculated similarly to the fixed meter charge. The estimated revenues under current rates are shown in Table 4-2.

**Table 4-2: Projected Fire Line Charge Revenue Under Current Rates**

Connection Size	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
2"	\$89	\$89	\$89	\$89	\$89	\$89
4"	\$4,542	\$4,566	\$4,590	\$4,613	\$4,637	\$4,661
6"	\$10,721	\$10,773	\$10,825	\$10,877	\$10,929	\$10,980
8"	\$7,373	\$7,410	\$7,447	\$7,483	\$7,520	\$7,557
10"	\$1,988	\$1,988	\$1,988	\$1,988	\$1,988	\$1,988
<b>Total</b>	<b>\$24,712</b>	<b>\$24,824</b>	<b>\$24,937</b>	<b>\$25,050</b>	<b>\$25,162</b>	<b>\$25,275</b>

Connection Size	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
2"	\$89	\$89	\$89	\$89	\$89
4"	\$4,685	\$4,709	\$4,733	\$4,757	\$4,781
6"	\$11,032	\$11,084	\$11,136	\$11,188	\$11,240
8"	\$7,594	\$7,631	\$7,668	\$7,705	\$7,741
10"	\$1,988	\$1,988	\$1,988	\$1,988	\$1,988
<b>Total</b>	<b>\$25,388</b>	<b>\$25,500</b>	<b>\$25,613</b>	<b>\$25,726</b>	<b>\$25,838</b>

Table 4-3 shows projected volume charge revenues under current rates over the study period. Volume charge revenues are calculated by customer class and tier in each year based on current FY 2023 water rates and projected water use (Table 3 5). The following shows an example calculation for a commercial customer. This



calculation is repeated for all classes and tiers to determine the total volumetric charge revenue in each fiscal year throughout the Study Period.

$$\text{Commercial Volume Charge Revenue} = [\text{Commercial FY 2023 rate per kgal}] \times [\text{Commercial Water Use in kgal}]$$

**Table 4-3: Volumetric Charge Revenue Projections**

Customer	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Residential						
Tier 1	\$486,534	\$515,683	\$518,146	\$520,622	\$523,111	\$525,611
Tier 2	\$925,722	\$981,182	\$985,869	\$990,581	\$995,319	\$1,000,073
Tier 3	\$1,059,950	\$1,123,448	\$1,128,812	\$1,134,206	\$1,139,629	\$1,145,071
Multi-Family	\$676,464	\$716,987	\$720,414	\$723,857	\$727,317	\$730,793
Commercial	\$522,587	\$553,895	\$556,543	\$559,200	\$561,872	\$564,560
Municipal	\$268,464	\$284,547	\$285,910	\$287,273	\$288,644	\$290,023
Irrigation	\$363,242	\$385,002	\$386,844	\$388,695	\$390,555	\$392,423
Construction	\$9,666	\$10,246	\$10,300	\$10,353	\$10,407	\$10,461
Private Fire	\$3,222	\$3,415	\$3,437	\$3,458	\$3,480	\$3,501
Zone 2 Surcharge	\$13,200	\$13,990	\$14,057	\$14,124	\$14,191	\$14,258
<b>Total</b>	<b>\$4,329,051</b>	<b>\$4,588,394</b>	<b>\$4,610,332</b>	<b>\$4,632,370</b>	<b>\$4,654,524</b>	<b>\$4,676,775</b>
Customer	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	
Residential						
Tier 1	\$528,125	\$530,650	\$533,188	\$535,738	\$538,301	
Tier 2	\$1,004,852	\$1,009,656	\$1,014,477	\$1,019,324	\$1,024,195	
Tier 3	\$1,150,544	\$1,156,046	\$1,161,567	\$1,167,118	\$1,172,699	
Multi-Family	\$734,286	\$737,795	\$741,320	\$744,861	\$748,419	
Commercial	\$567,257	\$569,969	\$572,689	\$575,425	\$578,176	
Municipal	\$291,410	\$292,805	\$294,201	\$295,604	\$297,016	
Irrigation	\$394,300	\$396,186	\$398,080	\$399,983	\$401,895	
Construction	\$10,514	\$10,568	\$10,622	\$10,676	\$10,729	
Private Fire	\$3,523	\$3,544	\$3,566	\$3,587	\$3,609	
Zone 2 Surcharge	\$14,326	\$14,395	\$14,465	\$14,534	\$14,604	
<b>Total</b>	<b>\$4,699,135</b>	<b>\$4,721,614</b>	<b>\$4,744,174</b>	<b>\$4,766,851</b>	<b>\$4,789,643</b>	

#### 4.1.2. Non-Operating Revenue

In addition to the rate-based revenue, the water utility also has several sources of non-operating revenue shown below in Table 4-4. Non-operating revenues are based on the City's FY 2023 budget and are not escalated in subsequent years, with the exception of "Late Fees & Shut-Off" (which is assumed to increase consistent with the projected growth in accounts) and interest revenue, which is estimated beginning in FY 2023 based on estimated beginning fund balances, revenues and expenses, and the assumed interest rate.

**Table 4-4: Projected Non-Operating Revenue**

Line Item	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Interest Income	\$90,849	\$90,013	\$86,593	\$84,277	\$82,239	\$80,535
Finance Charges	\$2,665	\$2,665	\$2,665	\$2,665	\$2,665	\$2,665
Late Fees & Shutoff	\$32,640	\$32,796	\$32,953	\$33,111	\$33,269	\$33,428
Change in Account Fees	\$27,429	\$27,429	\$27,429	\$27,429	\$27,429	\$27,429
Licenses & Permits	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<b>Total</b>	<b>\$154,584</b>	<b>\$153,904</b>	<b>\$150,641</b>	<b>\$148,482</b>	<b>\$146,602</b>	<b>\$145,058</b>

Line Item	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
Interest Income	\$78,736	\$76,384	\$73,356	\$69,486	\$65,210
Finance Charges	\$2,665	\$2,665	\$2,665	\$2,665	\$2,665
Late Fees & Shutoff	\$33,588	\$33,748	\$33,909	\$34,071	\$34,234
Change in Account Fees	\$27,429	\$27,429	\$27,429	\$27,429	\$27,429
Licenses & Permits	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
<b>Total</b>	<b>\$143,418</b>	<b>\$141,227</b>	<b>\$138,359</b>	<b>\$134,652</b>	<b>\$130,539</b>

## 4.2. Water Utility Expenses

The City’s water utility expenses include O&M expenses, capital expenses, and debt service payments.

### 4.2.1. Total Operations and Maintenance Budget

#### 4.2.1.1. Water Purchase Cost

The City obtains most of its water from the SCWA and pays rates established by the SCWA for its wholesale water purchases. The City provided Raftelis with its budgeted SCWA purchased amount for FY 2023 and planned SCWA rates for FY 2024. For FY 2025, the City provided an estimated 10 percent increase to the SCWA rate. For FY 2026 onwards, Raftelis assumed a 7.6 percent annual increase in SCWA wholesale rates based on increases since FY 2021. The forecast assumes that the City obtains about 88 percent of its water from SCWA and the rest from groundwater wells. Costs associated with pumping groundwater from the City’s wells are included in the summary of O&M expenses in the following subsection. Additionally, the study assumes an 8.9 percent water loss factor, which increases the amount of water supply required. This loss factor was generated by comparing the totals of produced and purchased water versus total metered sales over the last four fiscal years. Water supply cost projections for FY 2024 – FY 2033 are calculated by multiplying the amount of water purchased from SCWA by the SCWA wholesale rate and are shown in Table 4-5. The City can purchase a maximum of 3,000 AF per year from SCWA, but the City is currently well below that maximum.

**Table 4-5: Projected Purchased Water Cost Expenses**

Line Item	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Water Sales	1,696	1,704	1,712	1,720	1,729
Total Supply Required (1)	1,862	1,871	1,880	1,889	1,898
City Wells	238	238	238	238	238
SCWA	1,624	1,633	1,642	1,651	1,660
SCWA, \$/AF	\$1,348	\$1,483	\$1,596	\$1,717	\$1,848
Total SCWA Costs	\$2,189,291	\$2,421,421	\$2,620,069	\$2,835,011	\$3,067,570
Line Item	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
Water Sales	1,737	1,745	1,754	1,762	1,770
Total Supply Required (1)	1,907	1,916	1,925	1,935	1,944
City Wells	238	238	238	238	238
SCWA	1,669	1,678	1,687	1,697	1,706
SCWA, \$/AF	\$1,989	\$2,140	\$2,303	\$2,478	\$2,667
Total SCWA Costs	\$3,319,195	\$3,591,455	\$3,886,011	\$4,204,717	\$4,549,554

(1) Includes water loss.

**4.2.1.2. Pass-Through Rates**

California Government Code Section 53756 allows for pass-through adjustments for unforeseen increases in wholesale water costs. Based on discussions with City staff, the financial plan assumes that wholesale water rates will increase by 10 percent in FY 2025 and then approximately 7.6 percent per year for the duration of the study period. Should the costs of wholesale water exceed the estimated increase due to drought conditions or for any other reason, the City may choose to pass-through any wholesale water rate increases imposed on the City by SCWA that are greater than the average annual increase already included in the financial plan assumptions.

**4.2.1.3. Operating and Maintenance Expenses**

The City provided Raftelis with its water utility budget for FY 2023. Raftelis used the escalation percentages shown in Table 3-6 to project expenses for the financial plan. A summary of the City’s projected O&M budget is shown by fiscal year in Table 4-6. Note that water supply costs from Table 4-5 are included in the total O&M shown in Table 4-6.

**Table 4-6: Projected O&M Expenses**

Line Item	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Salary & Wages	\$712,877	\$769,907	\$793,004	\$816,794	\$841,298	\$866,537
Employee Benefits	\$370,750	\$400,410	\$432,442	\$467,038	\$504,401	\$544,753
Professional Services	\$463,135	\$496,224	\$502,201	\$518,043	\$534,430	\$551,382
Property Services	\$159,700	\$174,266	\$183,365	\$191,137	\$197,359	\$203,785
Operations	\$138,290	\$143,521	\$148,151	\$152,801	\$157,456	\$162,253
Supplies	\$194,200	\$200,774	\$207,022	\$213,375	\$219,825	\$226,470
Water Purchase	\$2,401,147	\$2,189,291	\$2,421,421	\$2,620,069	\$2,835,011	\$3,067,570
Capital Assts	\$15,420	\$15,883	\$16,359	\$16,850	\$17,355	\$17,876
Internal Service & Capital	\$231,696	\$239,601	\$247,463	\$255,240	\$262,897	\$270,784
Transfers	\$687,026	\$687,026	\$687,026	\$687,026	\$687,026	\$687,026
<b>Total</b>	<b>\$5,374,241</b>	<b>\$5,316,902</b>	<b>\$5,638,454</b>	<b>\$5,938,373</b>	<b>\$6,257,058</b>	<b>\$6,598,436</b>
Line Item	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	
Salary & Wages	\$892,533	\$919,309	\$946,888	\$975,295	\$1,004,554	
Employee Benefits	\$588,333	\$635,400	\$686,232	\$741,130	\$800,421	
Professional Services	\$568,318	\$585,803	\$603,854	\$622,491	\$641,733	
Property Services	\$210,421	\$217,275	\$224,352	\$231,662	\$239,211	
Operations	\$167,196	\$172,290	\$177,539	\$182,949	\$188,525	
Supplies	\$233,316	\$240,370	\$247,637	\$255,124	\$262,838	
Water Purchase	\$3,319,195	\$3,591,455	\$3,886,011	\$4,204,717	\$4,549,554	
Capital Assts	\$18,412	\$18,965	\$19,534	\$20,120	\$20,723	
Internal Service & Capital	\$278,908	\$287,275	\$295,893	\$304,770	\$313,913	
Transfers	\$687,026	\$687,026	\$687,026	\$687,026	\$687,026	
<b>Total</b>	<b>\$6,963,659</b>	<b>\$7,355,168</b>	<b>\$7,774,966</b>	<b>\$8,225,284</b>	<b>\$8,708,497</b>	

#### 4.2.2. Capital Expenses

Projected capital improvement plan (CIP) costs in the financial plan were provided by City staff through FY 2027. FY 2028 – FY 2033 estimated CIP is based on the average of the prior three years. Individual CIP project costs are shown in Table 4-7 and were escalated 6 percent in FY 2024, 5 percent in FY 2025, 4 percent in FY 2026, and 3 percent per year thereafter, based on recent increases in, and projected estimates of, construction cost inflation.

**Table 4-7: Projected Capital Improvement Plan Costs Through FY 2028**

Line Item	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Urban Water Master Plan & Minor Water Master Plan Update	\$0	\$0	\$0	\$86,814	\$0	\$0
Water Meter System Upgrades (AMI)	\$0	\$1,696,000	\$1,113,000	\$578,760	\$596,123	\$0
Well No. 1 Vault Cover and Air Exchange Improvements	\$125,000	\$0	\$0	\$0	\$0	\$0
Norrborn Tank Coating Renewal	\$265,000	\$0	\$0	\$0	\$0	\$0
Well No. 3 Water Disinfection Equipment Replacement	\$45,000	\$0	\$0	\$0	\$0	\$0
Loyal Valley Road & Thorsnberry Water Valve Box, Frame, Cover, Replacement	\$32,500	\$0	\$0	\$0	\$0	\$0
Future Undesignated Projects	\$0	\$0	\$556,500	\$1,070,706	\$1,192,246	\$1,842,019
<b>Total</b>	<b>\$467,500</b>	<b>\$1,696,000</b>	<b>\$1,669,500</b>	<b>\$1,736,280</b>	<b>\$1,788,368</b>	<b>\$1,842,019</b>
Line Item	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	
Future Undesignated Projects	\$1,897,280	\$1,954,198	\$2,012,824	\$2,073,209	\$2,135,405	
<b>Total</b>	<b>\$1,897,280</b>	<b>\$1,954,198</b>	<b>\$2,012,824</b>	<b>\$2,073,209</b>	<b>\$2,135,405</b>	

**4.2.3. Existing Debt Service**

The water utility’s outstanding debt service payments related to its 2012 Refunding Water Installment Sale Revenue Bonds issue are shown in Table 4-8. These bonds refinanced a 2001 Bond Issuance used to finance the construction of a water tank project and the installation of water mains and laterals. The debt is expected to be retired in FY 2032.

**Table 4-8: Existing Debt Service**

Line Item	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
2012 Refunding Water Installment Sale						
Principal	\$85,000	\$85,000	\$90,000	\$90,000	\$95,000	\$100,000
Interest	\$36,563	\$33,248	\$29,835	\$26,325	\$22,718	\$18,915
<b>Total</b>	<b>\$121,563</b>	<b>\$118,248</b>	<b>\$119,835</b>	<b>\$116,325</b>	<b>\$117,718</b>	<b>\$118,915</b>
Line Item	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033	
2012 Refunding Water Installment Sale						
Principal	\$105,000	\$105,000	\$110,000	\$115,000	\$0	
Interest	\$14,918	\$10,823	\$6,630	\$2,243	\$0	
<b>Total</b>	<b>\$119,918</b>	<b>\$115,823</b>	<b>\$116,630</b>	<b>\$117,243</b>	<b>\$0</b>	

The City does not anticipate issuing new debt to pay for capital improvements during the study period.

### 4.3. Financial Policies

#### 4.3.1. Debt Coverage Requirements

The City must meet or exceed a debt coverage requirement of 125 percent. Debt coverage is calculated by dividing net operating revenues by total debt service in each fiscal year.

#### 4.3.2. Reserve Policies

The City has the following reserve policies:

- Operating reserve: The operating reserve is used primarily to meet ongoing cash flow requirements. The City’s operating reserve target level equals two months of O&M expenses, which is used to calculate operating reserve target levels throughout the study period.
- Capital reserve: The capital reserve is used to cover any unexpected and unplanned infrastructure repairs and replacements not included in the CIP budget. The City’s capital reserve target level equals the annual average CIP expenditures (averaged over the next five years). The capital reserve target levels do not include any debt funded CIP projects (none anticipated).
- Rate stabilization reserve: The rate stabilization reserve is used during periods of short-term revenue shortages due to economic recession, drought, or other causes to alleviate the need to quickly implement substantial rate increases. The current Rate Stabilization Reserve target level is 15 percent of annual volumetric charge revenue.

### 4.4. Proposed Financial Plan and Revenue Adjustments

The proposed revenue adjustments help ensure adequate revenue to fund operating expenses, capital expenditures, and meet reserve targets. The financial plan modeling assumes the first revenue adjustment occurs on December 1, 2023. The proposed revenue adjustments, along with a gradual drawdown of reserves to target levels, will enable the City to meet operating costs and to execute the CIP. Table 4-9 shows the proposed revenue adjustments for the rate-setting period. Adjustments beyond the 5-year rate setting period are shown for informational purposes only.

**Table 4-9: Proposed Revenue Adjustments**

Effective Date	Revenue Adjustment
Dec. 1, 2023	5.0%
July 1, 2024	5.0%
July 1, 2025	5.0%
July 1, 2026	5.0%
July 1, 2027	5.0%
July 1, 2028	4.0%
July 1, 2029	4.0%
July 1, 2030	4.0%
July 1, 2031	4.0%
July 1, 2032	4.0%

Table 4-10 shows the cash flow detail through the study period. Line 16 shows total revenue, which is the sum of revenue from current rates (Line 1), additional rate revenue resulting from the proposed revenue

adjustments (Line 12), non-operating revenue (Line 14), and estimated interest earnings (Line 15). Line 20 shows net operating revenue, which is calculated by subtracting operating expenses (Line 19) from total revenue (Line 16). Line 22 shows total debt service. Line 23 shows capital expenditures to be funded through rates during the study period. Line 24 is the net cash and equals net operating revenue (Line 20) less the sum of debt (Line 22) and capital (Line 23). A positive value indicates an addition to the reserve balance and a negative value indicates a withdrawal from reserves.

Ending balances for the water utility in Line 26 are determined by summing the starting balance in Line 25 and the net cash change in Line 24. The City provided the starting balance for FY 2023. The ending fund balance is projected to be at or above the target reserve level (Line 27) throughout the study period.

Debt service coverage (Line 28) is calculated by dividing net operating revenue (Line 20) by total debt service (Line 22) and is expected to stay above the minimum coverage requirement of 125 percent over the study period.

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Table 4-10: Water Utility Cashflow Detail

No.		FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2031	FY 2032	FY 2033
1	Revenue Under Existing Rates	\$6,082,946	\$6,350,540	\$6,380,747	\$6,411,091	\$6,441,588	\$6,472,182	\$6,502,921	\$6,533,852	\$6,564,864	\$6,596,066	\$6,627,420
	Mo. Effctv.											
	FY	First Year	Adjustment									
2	2024	7	5.0%	\$185,224	\$319,037	\$322,079	\$323,609	\$325,146	\$326,693	\$328,243	\$329,803	\$331,371
3	2025	12	5.0%		\$334,989	\$338,183	\$339,790	\$341,403	\$343,027	\$344,655	\$346,293	\$347,940
4	2026	12	5.0%			\$353,411	\$355,093	\$356,779	\$360,179	\$361,888	\$363,608	\$365,337
5	2027	12	5.0%				\$372,847	\$374,618	\$378,188	\$379,983	\$381,789	\$383,603
6	2028	12	5.0%					\$393,349	\$397,097	\$398,982	\$400,878	\$402,784
7	2029	12	4.0%						\$331,982	\$333,561	\$335,145	\$336,737
8	2030	12	4.0%							\$346,904	\$348,550	\$350,207
9	2031	12	4.0%								\$362,492	\$364,215
10	2032	12	4.0%									\$378,784
11	2033	12	4.0%									
12	Revenue Adjustment Revenue	\$0	\$185,224	\$654,027	\$1,010,548	\$1,388,202	\$1,788,145	\$2,128,619	\$2,485,648	\$2,859,938	\$3,252,315	\$3,663,583
13	Total Sales Revenue	\$6,082,946	\$6,535,764	\$7,034,774	\$7,421,639	\$7,829,790	\$8,260,326	\$8,631,540	\$9,019,500	\$9,424,802	\$9,848,381	\$10,291,003
14	Miscellaneous	\$63,735	\$63,891	\$64,048	\$64,205	\$64,363	\$64,522	\$64,682	\$64,843	\$65,004	\$65,166	\$65,329
15	Interest	\$90,849	\$90,013	\$86,593	\$84,277	\$82,239	\$80,535	\$78,736	\$76,384	\$73,356	\$69,486	\$65,210
16	Total Revenue	\$6,237,530	\$6,689,668	\$7,185,415	\$7,570,122	\$7,976,392	\$8,405,384	\$8,774,959	\$9,160,726	\$9,563,162	\$9,983,032	\$10,421,542
	Operating Expenses											
17	Water Purchase	\$2,401,147	\$2,189,291	\$2,421,421	\$2,620,069	\$2,835,011	\$3,067,570	\$3,319,195	\$3,591,455	\$3,886,011	\$4,204,717	\$4,549,554
18	All Other O&M	\$2,973,094	\$3,127,611	\$3,217,034	\$3,318,304	\$3,422,047	\$3,530,866	\$3,644,464	\$3,763,712	\$3,888,956	\$4,020,567	\$4,158,944
19	Total O&M	\$5,374,241	\$5,316,902	\$5,638,454	\$5,938,373	\$6,257,058	\$6,598,436	\$6,963,659	\$7,355,168	\$7,774,966	\$8,225,284	\$8,708,497
20	Net Operating Revenue	\$863,289	\$1,372,766	\$1,546,961	\$1,631,749	\$1,719,334	\$1,806,948	\$1,811,300	\$1,805,559	\$1,788,196	\$1,757,748	\$1,713,045
	Debt											
21	Existing Debt	\$121,563	\$118,248	\$119,835	\$116,325	\$117,718	\$118,915	\$119,918	\$115,823	\$116,630	\$117,243	\$0
22	Total Debt Service	\$121,563	\$118,248	\$119,835	\$116,325	\$117,718	\$118,915	\$119,918	\$115,823	\$116,630	\$117,243	\$0
	CIP											
23	Paygo CIP Spending	\$467,500	\$1,696,000	\$1,669,500	\$1,736,280	\$1,788,368	\$1,842,019	\$1,897,280	\$1,954,198	\$2,012,824	\$2,073,209	\$2,135,405
24	Net Cash Changes	\$274,226	-\$441,482	-\$242,374	-\$220,856	-\$186,752	-\$153,986	-\$205,898	-\$264,462	-\$341,259	-\$432,703	-\$422,361
25	Starting Balance	\$8,947,767	\$9,221,993	\$8,780,512	\$8,538,137	\$8,317,281	\$8,130,529	\$7,976,543	\$7,770,645	\$7,506,183	\$7,164,924	\$6,732,221
26	Ending Balance	\$9,221,993	\$8,780,512	\$8,538,137	\$8,317,281	\$8,130,529	\$7,976,543	\$7,770,645	\$7,506,183	\$7,164,924	\$6,732,221	\$6,309,860
27	Target Reserves	\$3,554,582	\$3,653,204	\$3,838,588	\$4,001,913	\$4,173,218	\$4,353,372	\$4,469,924	\$4,593,370	\$4,724,132	\$4,862,721	\$5,009,650
28	Debt Service Coverage	710%	1161%	1291%	1403%	1461%	1520%	1510%	1559%	1533%	1499%	#N/A



The next four figures display the proposed ten-year financial plan in graphical form. Figure 4-1 illustrates the operating financial plan, which compares existing and proposed revenues with projected expenses. The expenses include O&M, water supply costs, debt service, cash-funded capital projects, and reserve funding. Expenses are represented by the stacked bars. Total projected revenues at existing and proposed rates are shown by the red and blue lines, respectively. Figure 4-1 shows that projected revenue from existing rates would fail to generate sufficient revenue to fund projected expenses over the study period and clearly demonstrates the need for revenue adjustments.

**Figure 4-1: Proposed Operating Financial Plan**

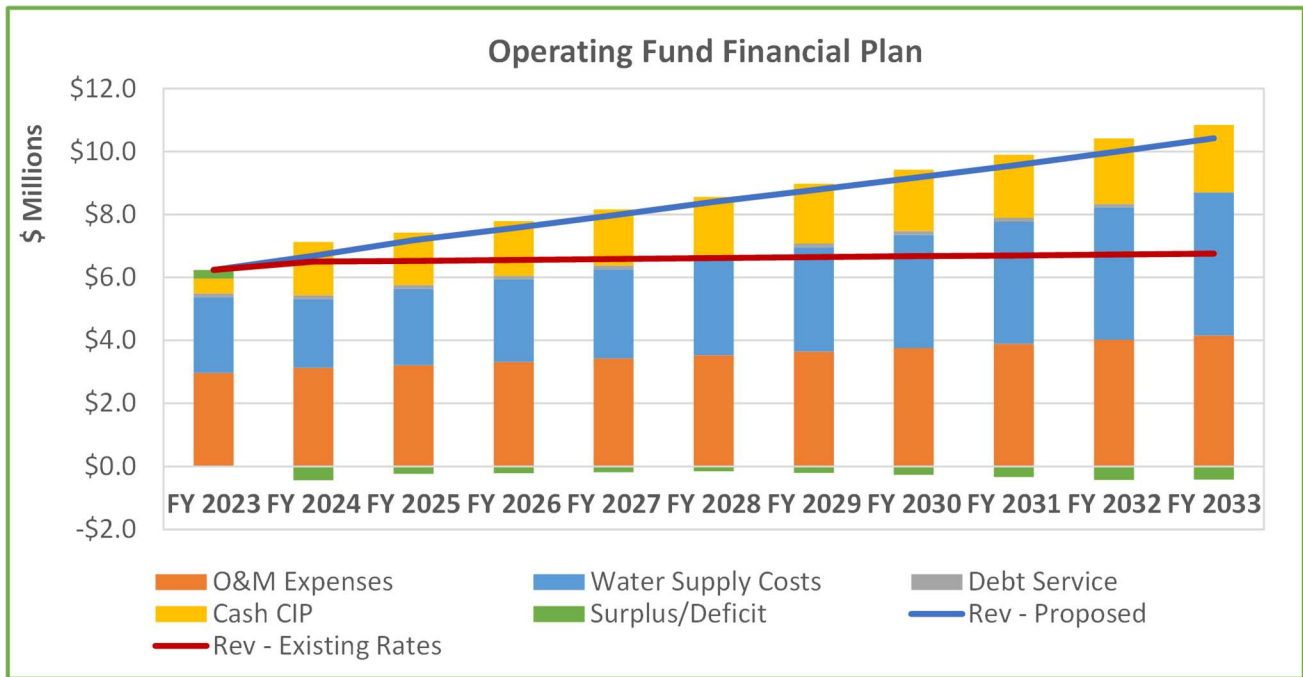


Figure 4-2 summarizes projected CIP expenditures (inflated) by funding source. Total CIP expenditures in millions of dollars in each fiscal year are displayed at the top of the stacked bars. No new debt service is proposed during the study period. All capital is anticipated to be funded with cash generated from rates and/or from reserves.

Figure 4-2: Projected CIP and Funding Sources

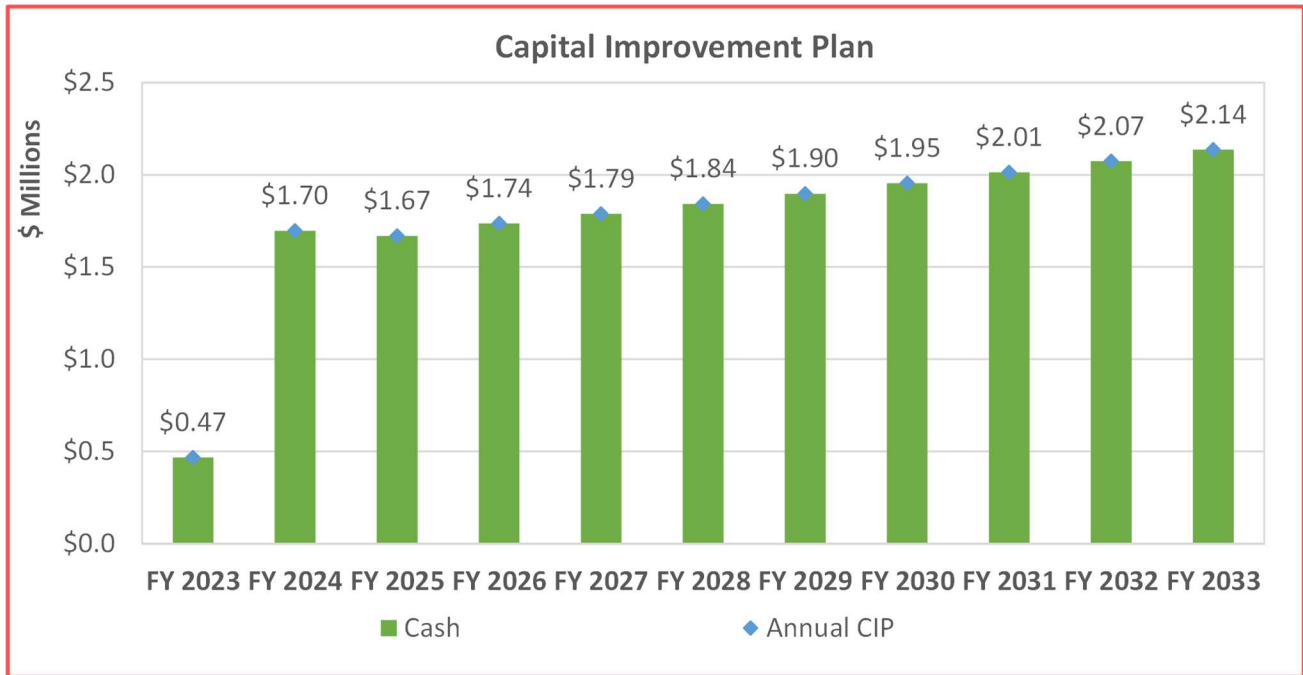


Figure 4-3 shows projected debt service coverage in orange versus the minimum required in grey. Figure 4-3 demonstrates that with the proposed annual revenue adjustments, the debt coverage requirement is exceeded throughout the study period. Note that the projected and minimums terminate in FY 2032, the year the existing debt service is anticipated to be retired.

Figure 4-3: Projected Debt Coverage

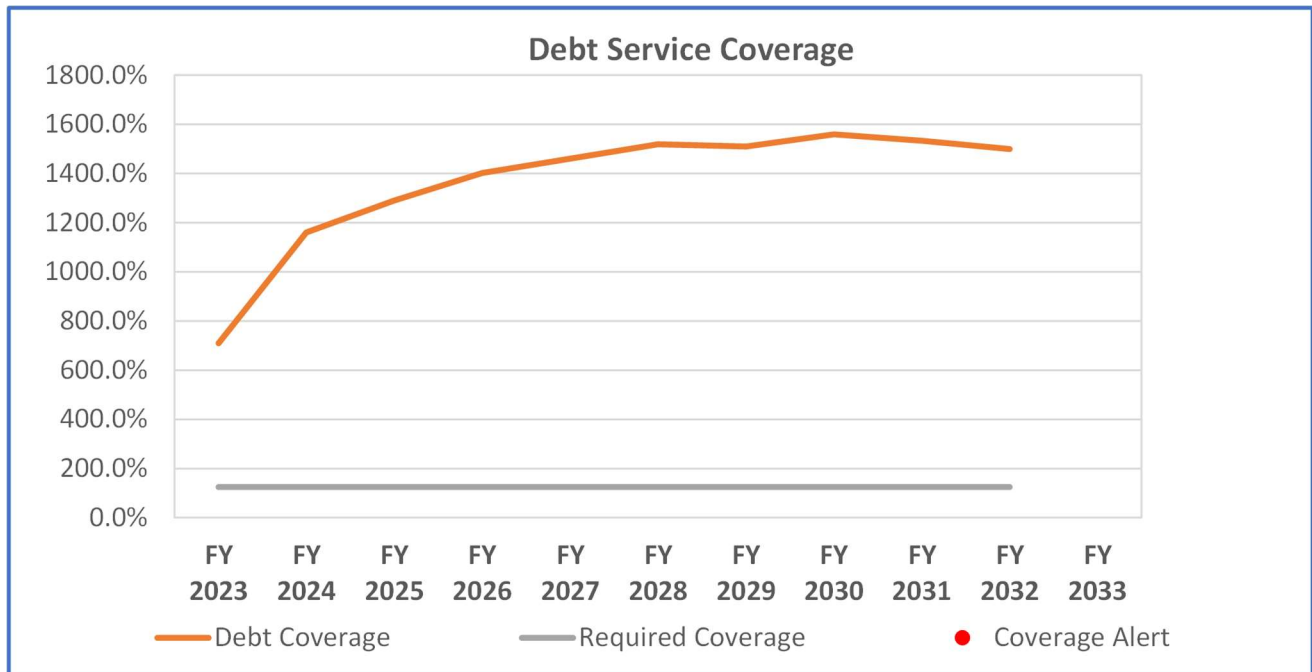
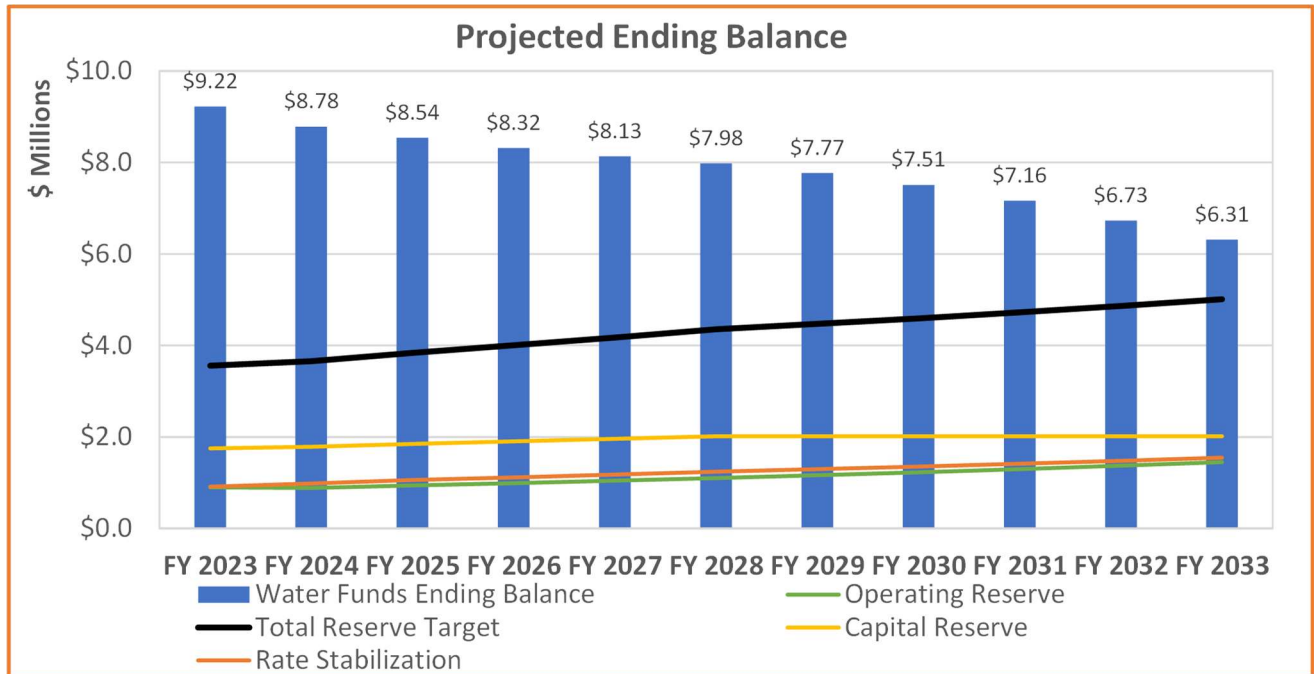


Figure 4-4 displays the water utility’s projected yearly ending balance (blue bars). The total reserve target is the sum of each individual reserve target and is represented by the black line. Individual reserve targets are also shown for the operating reserve (green line), capital reserve (yellow line), and rate stabilization reserve (orange line). Figure 4-4 demonstrates that under the proposed financial plan, the total reserve balance is drawn down over the course of the study period but is projected to remain above target minimums in FY 2033.

Figure 4-4: Total Reserve Ending Balance



## 5. Cost-of-Service Analysis

The cost-of-service analysis allocates the overall rate revenue requirement to customer classes based on their proportion of use of and burden on the City's water system. This provides the basis for the development of proposed water rates.

The first step in the cost-of-service analysis is to determine the revenue required from rates. The total revenue requirement is determined in the financial plan and the proposed revenue adjustments in Section 4. The framework and methodology utilized to develop the cost-of-service analysis and to apportion the revenue requirement to each customer class and tier is informed by the processes outlined in the AWWA Manual M1.

After determining a utility's revenue requirement, the next step in a cost-of-service analysis is to functionalize its O&M costs to the following functional categories:

- Supply - cost of purchasing water from SCWA and supplying groundwater
- Pumping and Conveyance – costs associated with pumping and conveying water through the system
- Treatment - cost of treating water to drinking water quality
- Transmission and Distribution (T&D) - cost associated with pipes, pumps, mains, etc.
- Storage - cost associated with storing treated water
- Billing and Collection - costs associated with meter reading and billing
- Customer Service – costs associated with customer service
- General & Administration - general and administrative costs incurred by the City
- Meters - costs associated with meter maintenance and replacement
- Conservation – costs incurred for conservation programs, messaging, and rebates
- Private Fire Protection – costs associated with private fire protection

The functionalization of costs allows for a better allocation of the functionalized costs to cost-causation components. The cost-causation components used in this study are:

- Customer Service: Pertains to costs directly associated with serving customers, irrespective of the amount of water used, and generally include meter reading, bill generation, accounting, customer service, and collection expenses.
- Meter Capacity: Maintenance and capital costs related to water meters and associated services. Costs incurred are generally proportional to the size of the water meter.
- Supply Cost: costs related to the purchase of water from SCWA and production of groundwater from City wells.
- Conservation: Costs associated with the City's water conservation efforts, which include general conservation efforts and the extra costs associated with necessary flushing of water mains without discharging water.
- Base: Costs that vary with the total quantity of water demanded within the water system under average conditions. Costs may include O&M expenses for: supply, treatment, pumping, transmission and distribution facilities, and capital costs related to plant investment that are associated with serving customers at a constant, or average, annual rate of use. Base costs are therefore spread over all units of water equally.

- **Max Day:** Different facilities, such as distribution and storage facilities, and the O&M costs associated with those facilities, are designed to meet the peak demands placed on the system by customers. Peaking costs include the O&M and capital costs associated with meeting peak customer demand in excess of the average annual rate of use or base use requirements. Peaking costs are separated into max day and max hour. Max day pertains to the maximum amount of water used in a single day in a year.
- **Max Hour:** Peaking costs pertaining to the maximum usage experienced by the system in an hour-long period.
- **Fire:** Costs associated with providing fire protection services.
- **Elevation:** Costs associated with pumping water to customers in higher elevation zones.

## 5.1. Cost-of-Service Calculations

### 5.1.1. Revenue Requirement Determination

Table 5-1 shows the net revenue requirement from rates for FY 2024, the test year (Column C, Line 12). The totals shown in Column C are the total O&M and capital revenue requirements that are to be allocated to the cost-causation components. Raftelis calculated the revenue requirement using FY 2024 expenses, which include O&M expenses, rate funded capital expenses, and existing debt service. The rate revenue requirement is adjusted for revenue offsets from other sources and for other adjustments. The total revenue requirement is the amount that fixed and commodity rates are designed to collect.

The total revenue requirement shown in Line 5 is equal to operating expenses (Table 4-6) and capital-related expenses (Table 4-7 and Table 4-8). Revenues from other sources, totaled in Line 8, comprise miscellaneous revenues and interest income (Table 4-4) and reduce the total revenue required from rates. The adjustment for cash (Line 9) is subtracted to account for the withdrawal from reserves to help cover revenue requirements. The mid-year increase (Line 10) reflects that the FY 2024 revenue adjustment occurs partway through the fiscal year and is used to annualize the rates for an entire fiscal year.

**Table 5-1: FY 2024 Revenue Requirement Determination**

Line No.	Revenue Requirements	Operating (A)	Capital (B)	Total (C)
<b>Revenue Requirements</b>				
1	Water Purchases	\$2,189,291		\$2,189,291
2	Other Operating	\$3,127,611		\$3,127,611
3	Current Debt Service		\$118,248	\$118,248
4	Rate Funded Capital		\$1,696,000	\$1,696,000
5	<b>Total</b>	<b>\$5,316,902</b>	<b>\$1,814,248</b>	<b>\$7,131,149</b>
<b>Revenue From Other Sources</b>				
6	Non-Operating Revenues	-\$63,891		-\$63,891
7	Interest	-\$90,013		-\$90,013
8	<b>Total</b>	<b>-\$153,904</b>	<b>\$0</b>	<b>-\$153,904</b>
<b>Adjustments</b>				
9	Adjustment for Cash Balance	-\$441,482		-\$441,482
10	Adjustment for Annualizing Rate Increase	\$132,303		\$132,303
11	<b>Total</b>	<b>-\$309,179</b>	<b>\$0</b>	<b>-\$309,179</b>
12	<b>Total Revenue Required</b>	<b>\$4,853,819</b>	<b>\$1,814,248</b>	<b>\$6,668,067</b>

### 5.1.2. Peaking Factors

Peaking factors represent the ratio of water moving through the system during the maximum day and maximum hour of water use relative to the water use during an average day within a year. Peaking factors are used to allocate peaking costs (max day and max hour costs) to customer classes. Table 5-2 shows the system-wide peaking factors used to derive the cost component allocation bases for base (average daily demand delivery), max day, and max hour costs. Raftelis utilized max day and max hour factors provided in the City’s 2018 Final Water Master Plan, Section 6.1 and 6.2, in terms of million gallons per day (MGD). Per the Water Master Plan, the average flow amount is 2.08 MGD, the maximum day flow amount is 4.16 MGD (or 2 times average flow), and the maximum hour flow amount is 6.24 MGD (or 3 times average flow). Base costs represent average daily demand during the year, which is normalized to a factor of 1.00 (Column A, Line 1). The max month factor (Column A, Line 4) is the maximum month usage divided by the average monthly usage using FY 2021 billing data.

**Table 5-2: System-wide Peaking Factors and Allocation to Cost-causation Components**

Line No.	Factor	System-Wide (A)	Base (B)	Max Day (C)	Max Hour (D)	Total (E)
1	Base	1.00	100%	0%	0%	100%
2	Max Day	2.00	50%	50%	0%	100%
3	Max Hour	3.00	33%	33%	33%	100%
4	Max Month	1.52				

The allocation bases (Columns B, C, and D) are calculated using the equations outlined below. Columns are represented in these equations as letters and rows are represented as numbers. For example, Column C, Line 2 is shown as C2.

The max day allocations are calculated as follows:

$$\text{Base} = A1 / A2 \times 100\% = B2$$

$$\text{Max Day} = 100\% - B2 = C2$$

The peak hour allocations are calculated as follows:

$$\text{Base} = A1 / A3 \times 100\% = B3$$

$$\text{Max Day} = (A2 - A1) / A3 \times 100\% = C3$$

$$\text{Peak Hour} = 100\% - B3 - C3 = D3$$

The max day and max hour peaking factors for each customer class are shown in Table 5-3. The max month to average month (MM/AM) factor (Column C) is the maximum month usage divided by the average month. The MM/AM factor (Column C) is multiplied by the ratio of the system-wide max day factor to the system-wide max month factor (2.00/1.52) from Table 5-2 to determine the max day capacity factor (Column D). The max hour factor (Column E) is the max day factor (Column D) times the ratio of max hour to max day from Table 5-2 (Column A, Line 3 divided by Line 2).

**Table 5-3: Max Day and Max Hour Capacity Factors by Class**

Customer Class	Max. Month (kgal) (A)	Avg. Mo. (kgal) (B)	MM/AM (C)	Max Day (D)	Max Hour (E)
Single Family	51,132	33,346	1.53	2.02	3.04
Tier 1	6,925	6,742	1.03	1.36	2.03
Tier 2	14,491	11,553	1.25	1.66	2.48
Tier 3	29,716	15,051	1.97	2.61	3.91
Multi-Family	10,857	8,321	1.30	1.72	2.58
Commercial	7,372	5,662	1.30	1.72	2.58
Municipal	5,340	3,343	1.60	2.11	3.16
Irrigation	9,341	4,392	2.13	2.81	4.21
Hydrant (Construction)	3,662	628	5.84	7.70	11.55

**5.1.3. Functionalization of O&M Expenses**

With assistance and input from City staff, Raftelis functionalized the water utility’s projected O&M budget for the test year on a line-item basis. Each line item was assigned to one of the functional categories listed at the beginning of Section 5. Table 5-4 shows a summary of the functionalization of the City’s O&M expenses. Functionalizing O&M expenses allows Raftelis to follow the principles of rate-setting theory in which the end goal is to allocate the City’s O&M expenses to cost-causation components and ultimately to user classes.

**Table 5-4: FY 2024 O&M Expenses by Functional Category**

Functional Category	O&M Expense, \$	O&M Expenses, %
Supply	\$2,189,291	41.2%
Pumping and Conveyance	\$89,880	1.7%
Treatment	\$25,750	0.5%
Transmission and Distribution	\$301,923	5.7%
Storage	\$8,240	0.2%
General & Administration	\$2,434,017	45.8%
Meters	\$103,000	1.9%
Conservation	\$164,800	3.1%
<b>Total Test Year O&amp;M</b>	<b>\$5,316,902</b>	<b>100.0%</b>

**5.1.4. Allocation of O&M Expenses to Cost Causation Components**

After functionalizing expenses, the next step is to allocate the functionalized expenses to cost-causation components. To do so, we use the system-wide peaking factors, which are shown in Table 5-2. Table 5-5 shows the allocation basis for the water utility’s O&M costs. The top row shows the cost-causation components and Column J shows O&M expenses by functional category (from Table 5-4). The allocation basis for each functional category is shown in Column A. Base, max day, and max hour allocations come from Table 5-2. All other functional categories are allocated to cost causation components by Raftelis based on industry norms and input from City staff. The percentages shown in Lines 1-8 in Table 5-5 are multiplied by the total O&M (Column J) for each functional category to determine the dollar amount to be allocated to each cost causation component in Columns B-I, Lines 9-16.

**Table 5-5: Allocation of Functionalized O&M Expenses to Cost-Causation Components**

Line No.	Functional Category	Allocation Basis (A)	Customer Service (B)	Meter Capacity (C)	Supply (D)	Conservation (E)	Base (F)	Max Day (G)	Max Hour (H)	Elevation (I)	O&M Expense (J)
<b>O&amp;M Allocation by Cost-Causation Component, %</b>											
1	Supply	Supply			100.00%						\$2,189,291
2	Pumping and Conveyance	Electricity Costs			77.84%					22.16%	\$89,880
3	Treatment	Base					100.00%				\$25,750
4	Transmission and Distribution	Max Hour					33.33%	33.33%	33.33%		\$301,923
5	Storage	Max Day					50.00%	50.00%			\$8,240
6	General & Administration	Staff Allocation	20.00%	40.00%			40.00%				\$2,434,017
7	Meters	Meter		100.00%							\$103,000
8	Conservation	Conservation				100.00%					\$164,800
<b>O&amp;M Allocation by Cost-Causation Component, \$</b>											
9	Supply		\$0	\$0	\$2,189,291	\$0	\$0	\$0	\$0	\$0	\$2,189,291
10	Pumping and Conveyance		\$0	\$0	\$69,962	\$0	\$0	\$0	\$0	\$19,919	\$89,880
11	Treatment		\$0	\$0	\$0	\$0	\$25,750	\$0	\$0	\$0	\$25,750
12	Transmission and Distribution		\$0	\$0	\$0	\$0	\$100,641	\$100,641	\$100,641	\$0	\$301,923
13	Storage		\$0	\$0	\$0	\$0	\$4,120	\$4,120	\$0	\$0	\$8,240
14	General & Administration		\$486,803	\$973,607	\$0	\$0	\$973,607	\$0	\$0	\$0	\$2,434,017
15	Meters		\$0	\$103,000	\$0	\$0	\$0	\$0	\$0	\$0	\$103,000
16	Conservation		\$0	\$0	\$0	\$164,800	\$0	\$0	\$0	\$0	\$164,800
17	Total		\$486,803	\$1,076,607	\$2,259,253	\$164,800	\$1,104,118	\$104,761	\$100,641	\$19,919	\$5,316,902

**5.1.5. Functionalization of Assets**

Capital-related costs are allocated based on the assets of the system in recognition of the fact that the assets need to be replaced over time and that capital expenses will, over time, generally match the overall asset base. This distribution of costs allows the allocation of capital expenses to the cost-causation components previously defined in this section. Raftelis was provided an asset list for the City’s water utility for FY 2022. Raftelis assigned each listed asset to a functional category and calculated the value of each asset using the replacement cost less depreciation (RCLD) valuation method. Table 5-6 shows a summary of water utility assets by functional category. The capital-related expenses shown in Line 12, Column B of Table 5-1 are allocated to the functional categories using the percent of total assets in Table 5-6.

**Table 5-6: Current Asset Value by Functional Category**

Functional Category	Asset Value (RCLD)	% of Total Assets	Capital-Related
Supply	\$1,853,891	7.8%	\$142,344
Transmission and Distribution	\$13,250,287	56.1%	\$1,017,370
Storage	\$5,973,137	25.3%	\$458,623
Meters	\$117,211	0.5%	\$9,000
Fire Hydrants	\$991,590	4.2%	\$76,135
General & Administration	\$1,442,759	6.1%	\$110,776
<b>Total</b>	<b>\$23,628,875</b>	<b>100%</b>	<b>\$1,814,248</b>

**5.1.6. Allocation of Capital Expenses to Cost-Causation Components**

Table 5-7 shows the allocation of capital-related expenses to the cost causation components. Lines 1-6 show the allocation bases to each cost-causation component in Columns B-I for the six functional categories for which functionalized assets have been assigned. Column J shows the total capital-related costs allocated to the functional categories, matching the values in Table 5-6.



Lines 7-12 in Table 5-7 show the allocation of capital-related expenses from current debt service and rate funded CIP to the cost-causation components. This is determined for each cost-causation component by multiplying the dollar amount in Column J, Lines 7-12 by the corresponding total allocation percentage in Lines 1-6. Line 13 is the sum of Lines 7-12.

**Table 5-7: Allocation of Capital Expenses to Cost-Causation Components**

Line No.	Functional Category	Allocation Basis (A)	Customer Service (B)	Meter Capacity (C)	Supply (D)	Conservation Base (E)	Max Day (G)	Max Hour (H)	Public Fire (I)	Capital Expense (J)	
<b>Capital-Related Allocation by Cost-Causation Component, %</b>											
1	Supply	Supply			100.00%					\$142,344	
2	Transmission & Distribution	Max Hour				33.33%	33.33%	33.33%		\$1,017,370	
3	Storage	Max Day				50.00%	50.00%			\$458,623	
4	General & Administration	Staff Allocation	20.00%	40.00%		40.00%				\$110,776	
5	Meters	Meter		100.00%						\$9,000	
6	Fire	Fire Hydrants							100.00%	\$76,135	
<b>Capital-Related Allocation by Cost-Causation Component, \$</b>											
7	Supply		\$0	\$0	\$142,344	\$0	\$0	\$0	\$0	\$142,344	
8	Transmission & Distribution		\$0	\$0	\$0	\$0	\$339,123	\$339,123	\$339,123	\$0	\$1,017,370
9	Storage		\$0	\$0	\$0	\$0	\$229,312	\$229,312	\$0	\$0	\$458,623
10	General & Administration		\$22,155	\$44,311	\$0	\$0	\$44,311	\$0	\$0	\$0	\$110,776
11	Meters		\$0	\$9,000	\$0	\$0	\$0	\$0	\$0	\$0	\$9,000
12	Fire		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$76,135	\$76,135
13	Total		\$22,155	\$53,310	\$142,344	\$0	\$612,745	\$568,435	\$339,123	\$76,135	\$1,814,248

### 5.1.7. Equivalent Meters

Equivalent meters (EMs) are used to allocate meter-related costs. Larger meters can impose both greater average and peak demands on the system and are more expensive to install, maintain, and replace than smaller meters. This study uses a hydraulic capacity (capacity) ratio to calculate equivalent meters. The capacity ratio is based on meter hydraulic capacity and is calculated to represent the potential demand on the water system compared to the base meter size. A ratio of hydraulic capacity is calculated by dividing the capacity of a meter at a given size by the base meter capacity using the maximum safe operating flow rates in gallons per minute (gpm). Consistent with previous studies, the base meter used in the study is the 1" meter. Smaller meters are assigned a ratio of 1.

Table 5-8 shows the meter capacity and capacity ratio for each meter size. The capacity in gpm is based on the safe operating flow rates provided in the AWWA Manual M1. The capacity ratios (Column D) are calculated by dividing the capacity in gpm (Column C) for each meter size (Column A) by the capacity in gpm for the 1" meter (Column C, Line 3). Column E shows the estimated equivalent meters based on the capacity ratio. Meter counts (Column B) at each size are multiplied by the capacity ratio (Column D) to arrive at the total number of equivalent meters (Column E).

**Table 5-8: Equivalent Meters**

Line No.	Meter Size (A)	Test Year Meters (B)	AWWA Capacity (gpm) (C)	AWWA Ratio (D)	Equivalent Meters (E)
1	5/8"	253	20	1.0	253
2	3/4"	2,566	30	1.0	2,566
3	1"	1,262	50	1.0	1,262
4	1 1/2"	145	100	2.0	289
5	2"	107	160	3.2	341
6	3"	22	320	6.4	141
7	4"	9	500	10.0	90
8	6"	1	1,000	20.0	20
9	8"	0	0	0.0	0
10		4,365			4,963

**5.1.8. Allocation of Public and Private Fire Protection Costs**

Water systems provide two types of fire protection: public fire protection for firefighting (i.e., fire hydrants) and private fire protection (i.e., fire lines for private structures with sprinkler systems for fire suppression and private fire hydrants). Raftelis performed a fire demand analysis to determine the share of fire protection costs allocated to public versus private fire protection. The City provided Raftelis with a count of fire hydrants. The number of private fire connections is shown in Table 3-3.

Table 5-9 shows the calculation of equivalent fire demand associated with public hydrants and private fire lines. Each connection size has a fire flow demand factor similar to the hydraulic capacity factor of a water meter. The diameter of the connection (in inches) is raised to the 2.63 power to determine the fire demand factor (Column A).<sup>3</sup> Hydrants are presumed to have one 4-inch and two 2-inch openings. The equivalent demand ratio (Column B) takes the relative flow capacity factor at each fire line size divided by the 2-inch flow capacity (Line 1, Column A) to establish each connection on an equivalent basis. The equivalent demand ratio is multiplied by the number of hydrants (Column C) or connections (Column D) at each size and summed to calculate the equivalent number of hydrants (Column C, Line 8) and connections (Column D, Line 8). Line 9 shows the proportional share of equivalent fire connections between public (Column C) and private (Column D).

<sup>3</sup> Hazen-Williams equation and AWWA Manual M1

**Table 5-9: Equivalent Fire Connections**

Line No.	Fire Line Size	Relative Flow Capacity Factor (A)	Equivalent Demand Ratio (B)	Public Fire Hydrants (C)	Private Fire Connections (D)
1	2"	6.2	1.00		9
2	4"	38.3	6.19		76
3	Hydrant	60.6	9.79	514	0
4	6"	111.3	17.98		62
5	8"	237.2	38.32		20
6	10"	426.6	68.91		3
7	Total			514	171
8	Equivalent No. of Connections			5,030	2,579
9	Proportional Share			66%	34%

Table 5-10 shows the max day and max hour extra capacity requirements based on fire flow information in the 2018 Final Water Master Plan, Section 7.1. The information in Table 5-9 and Table 5-10 is used to determine the amount of max day and max hour demand due to fire flow. The flow rates (Column A) and durations (Column B) are converted to kgal per day to determine max day and max hour requirements<sup>4</sup>.

**Table 5-10: Fire Service Share of Peaking Requirements**

No	Simultaneous Fires	Max Fire Flow (A) (gpm)	Duration (B) (hours)	Max Day Fire Flow (C) (kgal/day)	Max Hour Fire Flow (D) (kgal/day)
1	Residential	1,500	2	180	2,160
2	All Other Land Use Categories	2,000	2	240	2,880
3	Total			420	5,040

**5.1.9. Unit Costs of Service**

The end goal of a cost-of-service analysis is to distribute the revenue requirement to each customer class. Raftelis calculated unit costs for each cost component by assessing the total water demand, meter count, or equivalent service units. Table 5-11 shows the units of service for each customer class. The Max Day Capacity Factor (Column E) and the Max Hour Capacity Factor (Column H) are the demand factors shown in Table 5-3. Max Day Total Capacity (Column F) is the Annual Use (Column D), divided by 365, and multiplied by the Max Day Capacity Factor (Column E). Max Day Extra Capacity (Column G) is the difference between the Max Day Total Capacity (Column F) and the Annual Use (Column D), divided by 365. Max Hour Total Capacity (Column I) is the Annual Use (Column D), divided by 365, and multiplied by the Max Hour Capacity Factor (Column H). Max Hour Extra Capacity (Column J) is the difference between the Max Hour Total Capacity (Column I) and the Max Day Total Capacity (Column F).

<sup>4</sup> For example, the residential max day fire flow = A1 \* 60 min/hr \* B1 \* 1kgal/1000gal and the max hour fire flow = A1 \* 60 min/hr \* 24hr/day \* 1kgal/1000gal.

Public fire Max Day Total Capacity is equal to Max Day Fire Flow (Table 5-10, Column C, Line 3) multiplied by public fire’s proportional share of fire connections (Table 5-9, Column C, Line 9). Public fire Max Day Extra Capacity is the same as its total capacity. Public fire Max Hour Total Capacity is equal to Max Hour Fire Flow (Table 5-10, Column D, Line 3) multiplied by public fire’s proportional share of fire connections (Table 5-9, Column C, Line 9). Public fire Max Hour Extra Capacity is its Max Hour Total Capacity less its Max Day Total Capacity. Max day and max hour factors for private fire are calculated similarly using its proportional share of connections (Table 5-9, Column D, Line 9).

**Table 5-11: Units of Service**

Line No	Customer Class	Acts (A) No.	Bills (B) No.	Equivalent Meters (C) No.	Annual Use (D) kgal	Max Day Requirements			Max Hour Requirements			Public Fire Protection (K) Hydrants
						Capacity Factor (E)	Total Capacity (F) kgal/day	Extra Capacity (G) kgal/day	Capacity Factor (H)	Total Capacity (I) kgal/day	Extra Capacity (J) kgal/day	
1	Single Family				314,475							
2	Tier 1				83,309	1.36	309	81	2.03	464	155	
3	Tier 2				117,226	1.66	532	211	2.48	798	266	
4	Tier 3				113,940	2.61	814	501	3.91	1,220	407	
5	Multi-Family				87,866	1.72	415	174	2.58	622	207	
6	Commercial				69,848	1.72	329	138	2.58	493	164	
7	Municipal				34,871	2.11	201	106	3.16	302	101	
8	Irrigation				44,304	2.81	341	219	4.21	511	170	
9	Construction				954	7.70	20	18	11.55	30	10	
10	Subtotal	4,365	52,374	4,963	552,318			1,447			1,480	
11	Public Fire		0				278	278		3,332	3,054	514
12	Private Fire	171	2,050				142	142		1,708	1,566	
13	Total Water	4,535	54,424	4,963	552,318			1,867			6,100	514

Table 5-12 shows the operating and capital-related revenue requirements allocated to cost components. Revenue offsets and adjustments from Table 5-1 are subtracted to arrive at the net revenue requirement (prior to adjustments) in Line 5. Line 1 matches Line 17 from Table 5-5. Line 2 matches Line 13 from Table 5-7. As shown in Line 3 of Table 5-12, all revenue offsets (from Column C, Line 8 in Table 5-1) are applied to the Supply cost-causation component. In Line 4, the total Adjustments (from Column C, Line 11 in Table 5-1) are allocated in proportion to the total operating costs in Line 1 of Table 5-12. The total cost of service in Column A, Line 5 is the same as the revenue requirement shown in Column C, Line 12 of Table 5-1.

**Table 5-12: Total Adjusted Cost-of-Service Calculation**

Line No	Line Item	Total (A)	Customer Service (B)	Meter Capacity (C)	Supply (D)	Conservation (E)	Base (F)	Max Day (G)	Max Hour (H)	Public Fire (I)	Private Fire (J)	Elevation (K)
1	Total Operating	\$5,316,902	\$486,803	\$1,076,607	\$2,259,253	\$164,800	\$1,104,118	\$104,761	\$100,641	\$0	\$0	\$19,919
2	Total Capital	\$1,814,248	\$22,155	\$53,310	\$142,344	\$0	\$612,745	\$568,435	\$339,123	\$76,135	\$0	\$0
3	Revenue Offsets	-\$153,904	\$0	\$0	-\$153,904	\$0	\$0	\$0	\$0	\$0	\$0	\$0
4	Adjustments	-\$309,179	-\$28,308	-\$62,605	-\$131,376	-\$9,583	-\$64,205	-\$6,092	-\$5,852	\$0	\$0	-\$1,158
5	Total Prior To Adjustment	\$6,668,067	\$480,651	\$1,067,312	\$2,116,317	\$155,217	\$1,652,659	\$667,104	\$433,912	\$76,135	\$0	\$18,760
	Reallocations											
6	Public Fire Costs	\$0	\$0	\$392,564	\$0	\$0	\$0	-\$99,188	-\$217,240	-\$76,135	\$0	\$0
7	Private Fire Costs	\$0	\$0	\$0	\$0	\$0	\$0	-\$50,854	-\$111,379	\$0	\$162,233	\$0
8	Total Reallocations	\$0	\$0	\$392,564	\$0	\$0	\$0	-\$150,042	-\$328,620	-\$76,135	\$162,233	\$0
9	Total Adjusted Costs-of-Service	\$6,668,067	\$480,651	\$1,459,876	\$2,116,317	\$155,217	\$1,652,659	\$517,062	\$105,292	\$0	\$162,233	\$18,760

The net revenue requirements are further adjusted for public and private fire peaking impacts. Public fire’s proportion of total max day costs (Column G, Line 5) are determined based on the ratio of public fire Max Day Extra Capacity (Table 5-11, Column G, Line 11) to Total System Extra Capacity (Table 5-11, Column G, Line 13). Public fire’s proportion of max hours costs (Column H, Line 6) are determined based on the ratio of public fire Max Day Extra Capacity (Table 5-11, Column J, Line 11) to Total System Extra Capacity (Table 5-11, Column J, Line 13). Line 6 shows that public fire max day and max hour costs, as well as direct public fire costs, are allocated to the meter component since public fire protection is a fixed cost of the system.

Private fire’s share of max day and max hour demand are calculated similarly to public fire. Line 7 of Table 5-12 shows the allocation of private fire peaking costs to the private fire component.

The total adjusted cost of service for the test year is shown in Line 9, which is the sum of Lines 5 and 8. This represents the amount that must be recovered by the City’s fixed charges and volumetric rates in the test year. The adjusted cost-of-service allocations to each cost-causation component are used to calculate the City’s FY 2024 proposed water rates.

Table 5-13 divides the adjusted cost-of-service (Table 5-12, Line 9) by the respective units of service for each cost component, to determine the unit cost for each component.

**Table 5-13: Unit Costs of Service**

Line Item	Customer Service	Meter Capacity	Supply	Conservation	Base	Max Day	Max Hour	Private Fire	Elevation
	Bills	EMs/yr	kgal	kgal	kgal	kgal/day	kgal/day	Eq. Cnnct./yr	Zone 2 Usage
Adjusted Cost of Service	\$480,651	\$1,459,876	\$2,116,317	\$155,217	\$1,652,659	\$517,062	\$105,292	\$162,233	\$18,760
Units	54,424	4,963	552,318	552,318	552,318	1,447	1,480	2,579	5,829
Unit Cost, \$/unit	\$8.83	\$294.16	\$3.83	\$0.28	\$2.99	\$357.24	\$71.13	\$62.90	\$3.22

# 6. Rate Design and Derivation

Rate design is the process by which the cost causation components derived in Line 9 of Table 5-12 are converted into rates and charges that recover those costs. These rates are designed to recover the total cost of service (Table 5-12, Column A, Line 9).

## 6.1. Proposed Fixed Charges

From the calculations in Table 5-13, the proposed fixed charges are determined for each meter size. Table 6-1 shows the derivation of the monthly service charge. The Customer Service Cost component (Column E) is equal to the unit rate from Table 5-13. As the cost of issuing a bill does not vary by meter size, it remains uniform for all meter sizes. The Meter Capacity Cost component (Column D) is the Meter Capacity unit cost from Table 5-13 divided by 12 months for the 5/8", 3/4", and 1" meter. For meters larger than 1", this unit rate is multiplied by the Meter Ratio (Column C) to derive the Meter Capacity Cost (Column D) associated with those larger meter sizes. The proposed monthly service charge (Column F) is the sum of Columns D and E and is rounded up to the nearest penny for revenue sufficiency. The Current Charge (Column G) is shown for comparison.

**Table 6-1: Monthly Service Charge Derivation (\$/mo)**

Meter Size	Total Meters	Meter Ratio	Meter Capacity Cost	Customer Service Cost	Proposed Charge	Current Charge
(A)	(B)	(C)	(D)	(E)	(F)	(G)
5/8"	253	1.00	\$24.51	\$8.83	\$33.35	\$30.46
3/4"	2,566	1.00	\$24.51	\$8.83	\$33.35	\$30.46
1"	1,262	1.00	\$24.51	\$8.83	\$33.35	\$30.46
1 1/2"	145	2.00	\$49.03	\$8.83	\$57.86	\$50.19
2"	107	3.20	\$78.44	\$8.83	\$87.28	\$73.86
3"	22	6.40	\$156.89	\$8.83	\$165.72	\$136.98
4"	9	10.00	\$245.13	\$8.83	\$253.97	\$207.99
6"	1	20.00	\$490.27	\$8.83	\$499.11	\$405.24

Table 6-2 shows the derivation of the private fire protection service charge. The charge shown in Column E is the unit rate shown for Private Fire in Table 5-13 divided by 12 months multiplied by the Fire Demand Factor (Column C). The total Monthly Fire Protection Charge (Column D) is the sum of Columns D and E, rounded up to the nearest cent. The current monthly charge is shown in Column G for comparison.

**Table 6-2: Private Fire Protection Service Charge Derivation (\$/mo)**

Connection Size (A)	Number of Connections (B)	Fire Demand Factor (C)	Billing Charge (D)	Private Fire Protection (E)	Proposed Charge (F)	Current Rates (G)
2"	9	1.00	\$8.83	\$5.24	\$14.08	\$0.82
4"	76	6.19	\$8.83	\$32.45	\$41.28	\$4.98
6"	62	17.98	\$8.83	\$94.26	\$103.09	\$14.41
8"	20	38.32	\$8.83	\$200.86	\$209.70	\$30.72
10"	3	68.91	\$8.83	\$361.22	\$370.06	\$55.21

The proposed five-year monthly service and fire line charges are shown in Table 6-3. The rates for FY 2024 are derived from the cost-of-service analysis and the proposed revenue adjustments from Table 4-9 are used to determine the proposed water rates and charges for FY 2025 to FY 2028 by escalating the rates shown in FY 2024, rounded up to the nearest penny.

**Table 6-3: Proposed Monthly Service and Fire Line Charges Through FY 2028**

Meter/ Connection Size	Current Charge	FY 2024 cost-of-service	FY 2025 5% Adjustment	FY 2026 5% Adjustment	FY 2027 5% Adjustment	FY 2028 5% Adjustment
<b>Monthly Service Charge</b>						
5/8"	\$30.46	\$33.35	\$35.02	\$36.78	\$38.62	\$40.56
3/4"	\$30.46	\$33.35	\$35.02	\$36.78	\$38.62	\$40.56
1"	\$30.46	\$33.35	\$35.02	\$36.78	\$38.62	\$40.56
1 1/2"	\$50.19	\$57.86	\$60.76	\$63.80	\$66.99	\$70.34
2"	\$73.86	\$87.28	\$91.65	\$96.24	\$101.06	\$106.12
3"	\$136.98	\$165.72	\$174.01	\$182.72	\$191.86	\$201.46
4"	\$207.99	\$253.97	\$266.67	\$280.01	\$294.02	\$308.73
6"	\$405.24	\$499.11	\$524.07	\$550.28	\$577.80	\$606.69
<b>Fire Line Charge</b>						
2"	\$0.82	\$14.08	\$14.79	\$15.53	\$16.31	\$17.13
4"	\$4.98	\$41.28	\$43.35	\$45.52	\$47.80	\$50.19
6"	\$14.41	\$103.09	\$108.25	\$113.67	\$119.36	\$125.33
8"	\$30.72	\$209.70	\$220.19	\$231.20	\$242.76	\$254.90
10"	\$55.21	\$370.06	\$388.57	\$408.00	\$428.40	\$449.82

## 6.2. Volumetric Charge Rates

The following subsection describes the derivation of volumetric charge rates for each customer class and tier. The volumetric charges are designed to recover the revenue requirements for the following cost causation components, **Supply**, **Base**, **Max Day** and **Max Hour** (collectively referred to as **Peaking**), and **Conservation**. These four cost-causation components generally vary with the amount of water used and are recovered by dollar per kgal rates. The revenue requirement in FY 2024 for each is shown in Line 9 of Table 5-12. Note that the Peaking revenue requirement is the sum of the Max Day and Max Hour revenue requirements. Units of service for each component are shown in Table 5-13. The remainder of this subsection details the derivation of unit costs by customer class and tier and then the summation of the unit costs of the four cost causation components to determine the proposed volumetric charge rates.

### 6.2.1. Supply Unit Cost

Supply costs are costs related to the cost of purchasing and producing water. The City has two sources of water, each incurring different supply-related costs, as shown in Table 6-4. Table 6-4 shows the determination of per kgal supply costs for water from the City’s wells and from SCWA. This must be determined to calculate a weighted average supply unit cost for each single-family residential (SFR) tier. Table 6-4 determines the share of water supply obtained from groundwater (“GW” in the table) from City wells in Line 4. This percentage is multiplied by total projected test year SFR usage in Line 5 to determine the amount of groundwater allocated to SFR customers. The Source/Notes column in Lines 8-15 of Table 6-4 provides a description of the determination of SCWA and City groundwater unit supply costs in Lines 16 and 17 respectively.

**Table 6-4: Groundwater and SCWA Supply Unit Costs**

Line	Line Item	Total	Source/Notes
1	SCWA Purchased Water	1,624 AF	Table 4-5
2	Well/Groundwater	238 AF	Table 4-5
3	Total Purchased/Acquired Water	1,862 AF	Line 1 + Line 2
4	GW as percent of total	12.78%	Line 2 / Line 3
5	Single Family Usage	314,475 kgals	Table 3-4
6	GW To Meet Single Family Demand	40,194 kgals	Line 4 x Line 5
7	SCWA To Meet Single Family Demand	274,281 kgals	Line 5 - Line 6
8	Total Supply Cost	\$2,116,317	Table 5-12, Col. D, Line 9
9	Total Consumption	552,318 kgals	Table 5-11, Col. D, Line 13
10	Consumption met by GW	70,593 kgals	Line 4 x Line 9
11	Consumption met by SCWA Import	481,725 kgals	Line 9 - Line 10
12	SCWA Portion of Supply Cost	97%	Table 5-5, Col. D, Line 19 / Line 17
13	GW Portion of Supply Cost	3%	Table 5-5, Col. D, Line 10 / Line 17
14	SCWA Cost	\$2,050,782	Line 8 x Line 12
15	GW Cost	\$65,535	Line 8 x Line 13
16	SCWA Import Cost (\$/kgal)	\$4.26	Line 14 / Line 11
17	Groundwater Cost (\$/kgal)	\$0.93	Line 15 / Line 10

The supply unit cost varies by tier for SFR customers, who are levied the volumetric charge based on three tiers under the current rate structure. As Tier 1 is designed to apply to essential water usage, it is appropriate that Tier 2 and Tier 3 are allocated a greater proportion of cost recovery of expenses related to the purchase of SCWA water. Therefore, the relatively less expensive City well supply costs are allocated first to SFR Tier 1 water use. All users in the class benefit from this approach of allocating lowest cost water to highest priority use as even high volume SFR water customers must first pass through Tier 1.

Table 6-5 shows the amount of projected test year (FY 2024) SFR water supplies provided by each source of supply. Raftelis analyzed FY 2021, FY 2022, and partial FY 2023 water use data to determine the percentages of SFR projected usage in each tier (Column A). These percentages were multiplied by total projected SFR usage in the test year (Table 6-4, Line 5) to determine test year usage within each tier (Column B). Column C, Line 1 shows that all of the City groundwater supply available to serve SFR customers (Table 6-4, Line 6) is



fully allocated to Tier 1. Column D, Line 1 shows the remaining SFR Tier 1 supply required from SCWA in the test year to satisfy Tier 1 demand. Lines 2 and 3 demonstrate that all projected Tier 2 and 3 demand is required to be met by SCWA supplies.

**Table 6-5: SFR Usage by Tier and Source of Supply**

Line	Tier	% in Tier (A)	Use in Tier (B)	GW Use In Tier (C)	SCWA Use in Tier (D)
1	Tier 1	26%	83,309 kgals	40,194 kgals	43,115 kgals
2	Tier 2	37%	117,226 kgals	0 kgals	117,226 kgals
3	Tier 3	36%	113,940 kgals	0 kgals	113,940 kgals

Table 6-6 shows the final determination of supply unit costs for each SFR tier. Column A is determined by dividing Column C in Table 6-5 by Column B in Table 6-5. Column B is determined by dividing Column D by Column B (both of Table 6-5). Unit supply costs shown in Columns C and D were determined in Lines 16-17 of Table 6-4. A weighted average is used to determine the final SFR Supply unit costs in Column E.

**Table 6-6: Supply Unit Cost for SFR Tiered Rates**

Line	Tier	% Met by GW (A)	% Met by SCWA (B)	GW Cost (C)	SCWA Cost (D)	Average Cost (E)
1	Tier 1	48%	52%	\$0.93	\$4.26	\$2.65
2	Tier 2	0%	100%	\$0.93	\$4.26	\$4.26
3	Tier 3	0%	100%	\$0.93	\$4.26	\$4.26

The supply unit cost shown in Table 5-13 represents the unit cost across all users with a uniform volumetric rate structure: Multi-family residential, Commercial, Municipal, Irrigation, and Construction (Hydrant).

**6.2.2. Base Unit Cost**

The base cost-causation component pertains to the costs to treat and deliver water under average daily demand conditions. Since the base cost-causation component is designed to recover costs incurred to meet average day demands, the base unit cost is uniform for all units of water, regardless of customer class or tier. The Base unit cost is shown in Table 5-13.

**6.2.3. Peaking Unit Cost**

The peaking cost-causation component is designed to recover costs incurred to meet customer peak demands in excess of average daily demand. Total peaking costs are comprised of max day and max hour costs. The peaking costs are distributed to each tier using peaking factors derived for each class and tier.

Table 6-7 shows the derivation of peaking unit costs for each customer class and tier. The max day costs (Column A) are the max day unit costs from Table 5-13 apportioned to each customer class by the classes’/tier’s respective max day extra capacity (Table 5-11, Column G). The max hour costs (Column B) are the max hour unit costs from Table 5-13 apportioned to each customer class by the classes’/tier’s respective max hour extra capacity (Table 5-11, Column J). Total Peaking Costs (Column C) are the sum of Columns A and B. Water use (Column D) comes from Table 5-11, Column D. The unit rates (Column E) for each class

and tier are the Total Peaking Costs (Column C) divided by the Water Use (Column D). The Totals shown in Columns A and B match the totals shown for max day and max hour, respectively, in Table 5-12.

**Table 6-7: Derivation of Peaking Unit Costs**

Class	Max Day Allocated Costs (A)	Max Hour Allocated Costs (B)	Total Peaking Costs (C)	Water Use (kgal) (D)	Unit Rate (E)
SFR Tier 1	\$29,012	\$11,006	\$40,017	83,309	\$0.48
SFR Tier 2	\$75,231	\$18,912	\$94,143	117,226	\$0.80
SFR Tier 3	\$179,109	\$28,933	\$208,043	113,940	\$1.83
Multifamily	\$62,111	\$14,745	\$76,856	87,866	\$0.87
Commercial	\$49,135	\$11,697	\$60,832	69,848	\$0.87
Municipal	\$37,841	\$7,165	\$45,006	34,871	\$1.29
Irrigation	\$78,364	\$12,118	\$90,482	44,304	\$2.04
Construction (Hydrant)	\$6,259	\$716	\$6,975	954	\$7.31
<b>Total</b>	<b>\$517,062</b>	<b>\$105,292</b>			

#### 6.2.4. Conservation Unit Cost

The conservation cost-causation component pertains to costs associated with the City’s water conservation efforts, which include general conservation efforts and the extra costs associated with necessary flushing of water mains without discharging water. The conservation unit cost shown in Table 5-13 represents the average unit cost across all users and is applied to the Multi-family residential, Commercial, Municipal, Irrigation, and Construction (Hydrant) customer classes.

SFR conservation costs are calculated based on total class usage and the uniform unit rate from Table 5-13. Since conservation-related costs are made increasingly necessary because of wasteful and/or inefficient water use, all conservation costs allocated to the SFR customer class are designated to be recovered by Tier 3 (which represents all water use above average water use). All SFR water users, even those with use in Tier 3, benefit from Tier 1 and Tier 2 water being exempted from conservation cost recovery.

Table 6-8 shows the determination of the conservation unit costs for each customer class and tier. Column A is the annual test year water usage from Table 5-11, Column D. Column B shows the conservation unit cost from Table 5-13. The conservation cost for each class and tier (Column C) equals Column A times Column B. Column D shows the total SFR conservation costs (sum of Lines 1 -3, Column C) being applied to Tier 3 water use only. For the other customer classes, the value in Column D equals Column C. The Unit Cost is shown in Column E and is the cost in Column D divided by the Water Use in Column A.

**Table 6-8: Derivation of Conservation Unit Costs**

Line No.	Class	Water Use (kgal) (A)	Conservation Unit Cost (B)	Conservation Cost Allocation (C)	SFR Redistributed (D)	Unit Cost (E)
1	SFR Tier 1	83,309	\$0.28	\$23,412		
2	SFR Tier 2	117,226	\$0.28	\$32,944		
3	SFR Tier 3	113,940	\$0.28	\$32,020	\$88,376	\$0.78
4	Multifamily	87,866	\$0.28	\$24,693	\$24,693	\$0.28
5	Commercial	69,848	\$0.28	\$19,629	\$19,629	\$0.28
6	Municipal	34,871	\$0.28	\$9,800	\$9,800	\$0.28
7	Irrigation	44,304	\$0.28	\$12,451	\$12,451	\$0.28
8	Construction (Hydrant)	954	\$0.28	\$268	\$268	\$0.28
9	Total	552,318		\$155,217	\$155,217	

**6.2.5. Derivation of Proposed FY 2024 Volumetric Charge Rates**

To determine proposed FY 2024 volumetric charge rates, the Supply, Base, Peaking, and Conservation unit costs are summed for each customer class and tier. The calculation of FY 2024 volumetric charge rates is shown below in Table 6-9. The total unit cost is rounded up to the nearest penny.

**Table 6-9: Derivation of FY 2019 Volumetric Charge Rates (\$/kgal)**

Class	Supply Cost	Base Cost	Peaking Cost	Conservation Cost	Total Cost
SFR Tier 1	\$2.65	\$2.99	\$0.48	\$0.00	\$6.13
SFR Tier 2	\$4.26	\$2.99	\$0.80	\$0.00	\$8.06
SFR Tier 3	\$4.26	\$2.99	\$1.83	\$0.78	\$9.86
Multi-Family	\$3.83	\$2.99	\$0.87	\$0.28	\$7.98
Commercial	\$3.83	\$2.99	\$0.87	\$0.28	\$7.98
Municipal	\$3.83	\$2.99	\$1.29	\$0.28	\$8.40
Irrigation	\$3.83	\$2.99	\$2.04	\$0.28	\$9.15
Construction (Hydrant) (1)	\$3.83	\$2.99	\$7.31	\$0.28	\$14.42

(1) Private fire water use is also charged at this rate.

Table 6-10 shows the current FY 2023 and proposed FY 2024 through FY 2028 volumetric charge rates. The FY 2024 rates were determined in Table 6-9. The FY 2024 volumetric charge rates are then increased in each subsequent year by the revenue adjustments shown in Table 4-9 and rounded up to the nearest cent.

**Table 6-10: Proposed Volumetric Charge Rates through FY 2028 (\$/kgal)**

Class	Current Charge	FY 2024 cost-of-service	FY 2025 5% Adjustment	FY 2026 5% Adjustment	FY 2027 5% Adjustment	FY 2028 5% Adjustment
SFR Tier 1	\$6.19	\$6.13	\$6.44	\$6.77	\$7.11	\$7.47
SFR Tier 2	\$8.37	\$8.06	\$8.47	\$8.90	\$9.35	\$9.82
SFR Tier 3	\$9.86	\$9.86	\$10.36	\$10.88	\$11.43	\$12.01
MFR	\$8.16	\$7.98	\$8.38	\$8.80	\$9.24	\$9.71
Comm	\$7.93	\$7.98	\$8.38	\$8.80	\$9.24	\$9.71
Municipal	\$8.16	\$8.40	\$8.82	\$9.27	\$9.74	\$10.23
Irrigation	\$8.69	\$9.15	\$9.61	\$10.10	\$10.61	\$11.15
Construction (Hydrant) (1)	\$10.74	\$14.42	\$15.15	\$15.91	\$16.71	\$17.55

(1) Private fire water use is also charged at this rate.

### 6.3. Elevation Charge Rate

The elevation charge rate is designed to recover the revenue requirement associated with the elevation cost-causation component. These costs are associated with pumping water to Zone 2, which is at a higher elevation area within the City’s water service area. Only customers in Zone 2 are levied the elevation charge.

Table 6-11 shows the proposed elevation charge for FY 2024 through FY 2028. The proposed FY 2024 charge is equal to the elevation unit cost shown in Table 5-13, rounded up to the nearest penny. This charge is increased in each subsequent year by the revenue adjustments shown in Table 4-9 and are rounded up to the nearest cent.

**Table 6-11: Proposed Elevation Charge (\$/kgal)**

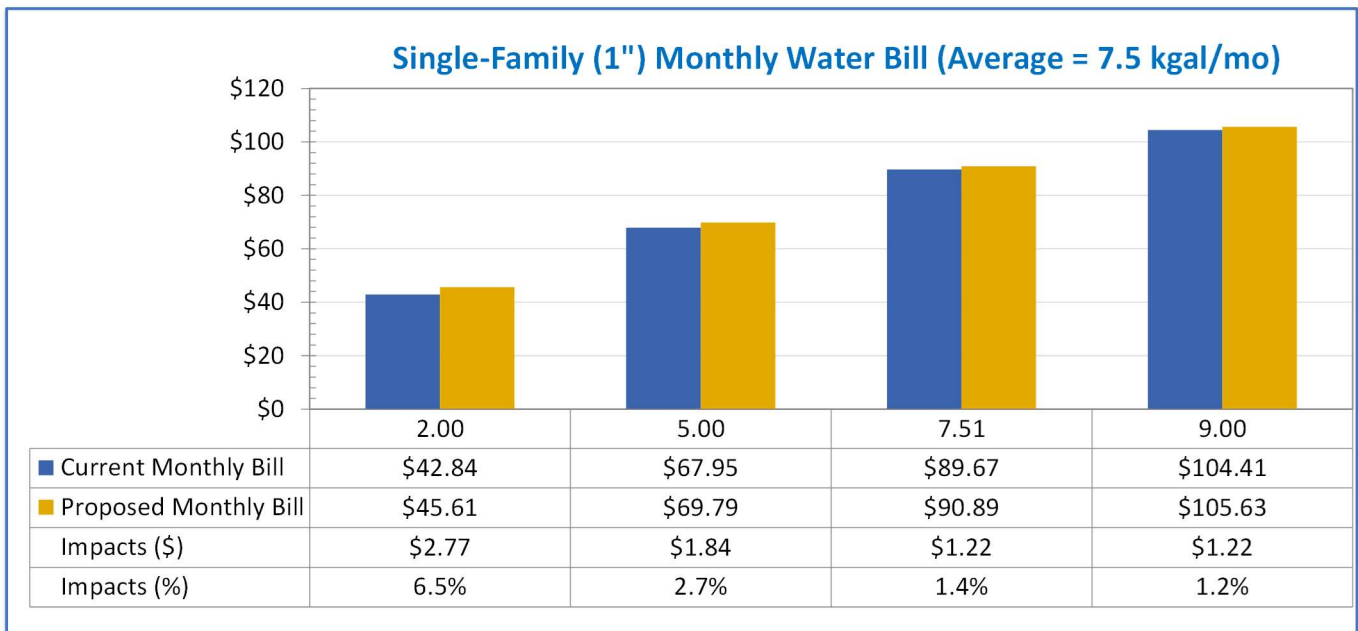
Zone	Current Charge	FY 2024 cost-of-service	FY 2025 5% Adjustment	FY 2026 5% Adjustment	FY 2027 5% Adjustment	FY 2028 5% Adjustment
Zone 2	\$2.40	\$3.22	\$3.39	\$3.56	\$3.74	\$3.93

# 7. Customer Bill Impacts and Neighboring Agency Comparison

## 7.1. Single-Family Bill Impacts

Figure 7-1 shows calculated monthly water bills (which includes the monthly service charge and volumetric charge) for single-family residential customers in Zones 1 or 3 at various levels of monthly water usage under current FY 2023 rates and proposed FY 2024 rates. The blue bars in Figure 7-1 represent monthly water bills under the current rates. The gold bars show monthly water bills using the proposed FY 2024 rates. The current and proposed monthly bills in Figure 7-1 are calculated assuming a 1-inch meter size. The dollar difference between current and proposed monthly bills at different monthly water use levels is shown in the Impacts (\$) row of Figure 7-1. These amounts were selected to give a cross-section of the City’s usage patterns. The first column, at 2 kgal of use, indicates use that is wholly contained within the first tier, the second indicates median residential usage (5 kgal), the third is average usage for all residential customers (7.5 kgal), and the fourth column shows usage at the 75<sup>th</sup> percentile (75 percent of bills are at or below 9 kgal/mo).

Figure 7-1: Single-Family Residential Monthly Bill Impacts



## 7.2. Neighboring Agency Comparison

Figure 7-2 shows a comparison of monthly water bills for a single-family customer on a 1-inch meter using 7.5 kgal/month. The comparison shows current FY 2023 rates and adopted or proposed rates for FY 2024 and FY 2025.

Figure 7-2: Neighboring Agency Comparison



# 8. Drought Rates

As part of the study, Raftelis calculated a demand reduction surcharge (i.e., drought rate or drought surcharge) to recover the revenue shortfall that occurs because of demand reduction during water shortage situations.

A drought surcharge may be imposed during times of a declared drought when a certain level of reduction from the base usage has been mandated. A drought surcharge is charged on each unit of water used and is calculated to recover costs resulting from a loss of volumetric revenue due to reduced water use. The amount of the drought surcharge at different levels of usage reduction is based upon the City’s projected revenue shortfall, adjusted for changes in costs.

To determine the demand reduction surcharge, the first step is to project the water demand reduction for each customer class under different levels of shortage. Table 8-1 shows the projected water demand for each customer class and tier at different levels of reduction. Raftelis analyzed individual customer usage data, assuming that customers using more water are expected to reduce more since they have more discretionary water use. The analysis calculates the increase in commodity rates that need to be applied to all usage, including the SFR tiers, at each percentage reduction in usage. A magnified version of this table is presented in Appendix B. Note that the reduction achieved under each drought stage is lower than the maximum targeted at each level but falls at the upper end of each range.

**Table 8-1: Projected Water Demand by Percent Usage Reduction**

Usage Data (kgal)	Monthly Tier	Proposed		0 - 10%		10 - 20%		20 - 30%		30 - 40%		40 - 50%	
		Rates	FY 2024	% Reduction	Reduction	% Reduction	Reduction	% Reduction	Reduction	% Reduction	Reduction	% Reduction	Reduction
<b>Single Family Residential</b>													
Tier 1	2	\$6.13	83,309	-2.0%	81,643	-7.0%	77,477	-10.0%	74,978	-15.0%	70,813	-15.0%	70,813
Tier 2	5	\$8.06	117,226	-12.0%	103,159	-25.0%	87,920	-30.0%	82,058	-40.0%	70,336	-45.0%	64,474
Tier 3	7+	\$9.86	113,940	-20.0%	91,152	-30.0%	79,758	-50.0%	56,970	-65.0%	39,879	-75.0%	28,485
<b>Subtotal Single Family</b>			<b>314,475</b>	<b>-12%</b>	<b>275,954</b>	<b>-22%</b>	<b>245,155</b>	<b>-32%</b>	<b>214,006</b>	<b>-42%</b>	<b>181,027</b>	<b>-48%</b>	<b>163,772</b>
<b>Multi-Family</b>													
Commercial		\$7.98	87,866	-5%	83,473	-10.0%	79,079	-30.0%	61,506	-35.0%	57,113	-45.0%	48,326
Municipal		\$7.98	69,848	-5%	66,356	-10.0%	62,863	-15.0%	59,371	-30.0%	48,894	-45.0%	38,416
Irrigation		\$8.40	34,871	-5%	33,127	-10.0%	31,384	-15.0%	29,640	-30.0%	24,410	-45.0%	19,179
		\$9.15	44,304	-10%	39,874	-20.0%	35,443	-30.0%	31,013	-40.0%	26,582	-50.0%	22,152
<b>Total Non-Single Family</b>			<b>236,889</b>	<b>-6%</b>	<b>222,829</b>	<b>-12%</b>	<b>208,770</b>	<b>-23%</b>	<b>181,530</b>	<b>-34%</b>	<b>156,999</b>	<b>-46%</b>	<b>128,074</b>
<b>Hydrant</b>													
		\$14.42	954	0%	954	0%	954	0%	954	0%	954	0%	954
<b>Total Potable Water (kgal)</b>			<b>552,318</b>		<b>499,737</b>		<b>454,879</b>		<b>396,490</b>		<b>338,980</b>		<b>292,800</b>
<b>Total Potable Water (AF)</b>			1,695		1,534		1,396		1,217		1,040		899
<b>% Total Reduction</b>				<b>-10%</b>		<b>-18%</b>		<b>-28%</b>		<b>-39%</b>		<b>-47%</b>	

The next step is to estimate the water supply cost savings that result when there is a reduction in demand. For this study, Raftelis presumed that the overall reduction percentage for a stage is met by reducing the amount of water purchases. The variable costs associated with each supply are used to determine the cost savings. Almost all other costs are fixed and will not vary based on water demand; therefore, no other costs are included in the analysis. Table 8-2 shows the estimated cost savings in the water supply costs for each stage due to the reduction in usage. The total supply assumes an 8.9 percent water loss from the water usage shown in Table 8-1.

**Table 8-2: Estimated Cost Savings by Percent Usage Reduction**

	FY 2024	0 - 10% Reduction	10 - 20% Reduction	20 - 30% Reduction	30 - 40% Reduction	40 - 50% Reduction
<b>SUPPLY (AF)</b>						
Groundwater Wells	238	238	238	238	238	238
Sonoma County Water Agency	1,624	1,446	1,295	1,098	904	749
<b>Total Potable Supply</b>	<b>1,862</b>	<b>1,684</b>	<b>1,533</b>	<b>1,336</b>	<b>1,142</b>	<b>987</b>
<b>VARIABLE COST (\$/AF)</b>						
Groundwater	\$294	\$294	\$294	\$294	\$294	\$294
SCWA	\$1,348	\$1,348	\$1,348	\$1,348	\$1,348	\$1,348
<b>TOTAL VARIABLE COSTS</b>	<b>\$2,259,253</b>	<b>\$2,019,137</b>	<b>\$1,815,372</b>	<b>\$1,550,151</b>	<b>\$1,288,915</b>	<b>\$1,079,147</b>
<b>TOTAL WATER SUPPLY COSTS</b>	<b>\$2,259,253</b>	<b>\$2,019,137</b>	<b>\$1,815,372</b>	<b>\$1,550,151</b>	<b>\$1,288,915</b>	<b>\$1,079,147</b>
Cost Savings		\$240,116	\$443,881	\$709,102	\$970,338	\$1,180,106

The final step is to calculate the drought surcharge, shown in Table 8-3. First, the projected potable water revenue is calculated by multiplying the demand projections from Table 8-1 for each level of reduction in use and the proposed water rates in FY 2024. The revenue shortfall is determined by comparing this revenue for each reduction level with the FY 2024 revenues. Next, we add the estimated cost savings from Table 8-2 for each reduction level. The net shortfall to be recovered is divided by the projected demand at each reduction level (Table 8-1) to arrive at a uniform dollar increase per unit of water for each reduction level. Table 8-3 shows the proposed surcharge that will be available to impose effective December 1, 2023. For future fiscal years, the “% Revenue Shortfall” percentages shown in Table 8-3 would be applied to the rates in effective at the time the drought rates are implemented.

**Table 8-3: Drought Surcharge by Percent Usage Reduction**


	FY 2024	0 - 10% Reduction	10 - 20% Reduction	20 - 30% Reduction	30 - 40% Reduction	40 - 50% Reduction
<b>Projected Potable Variable Revenue</b>	<b>\$4,549,587</b>	<b>\$4,083,190</b>	<b>\$3,704,370</b>	<b>\$3,193,830</b>	<b>\$2,702,152</b>	<b>\$2,304,365</b>
Revenue Shortfall		(\$466,396)	(\$845,217)	(\$1,355,756)	(\$1,847,434)	(\$2,245,222)
Cost Savings		\$240,116	\$443,881	\$709,102	\$970,338	\$1,180,106
<b>Net Revenue Shortfall to be Recovered</b>		<b>(\$226,280)</b>	<b>(\$401,336)</b>	<b>(\$646,654)</b>	<b>(\$877,096)</b>	<b>(\$1,065,116)</b>
% Revenue Shortfall		6%	11%	20%	32%	46%
\$/kgal Increase - Dec. 1, 2023		\$0.46	\$0.89	\$1.64	\$2.59	\$3.64





**APPENDIX A:**


**City of Sonoma Service Area**

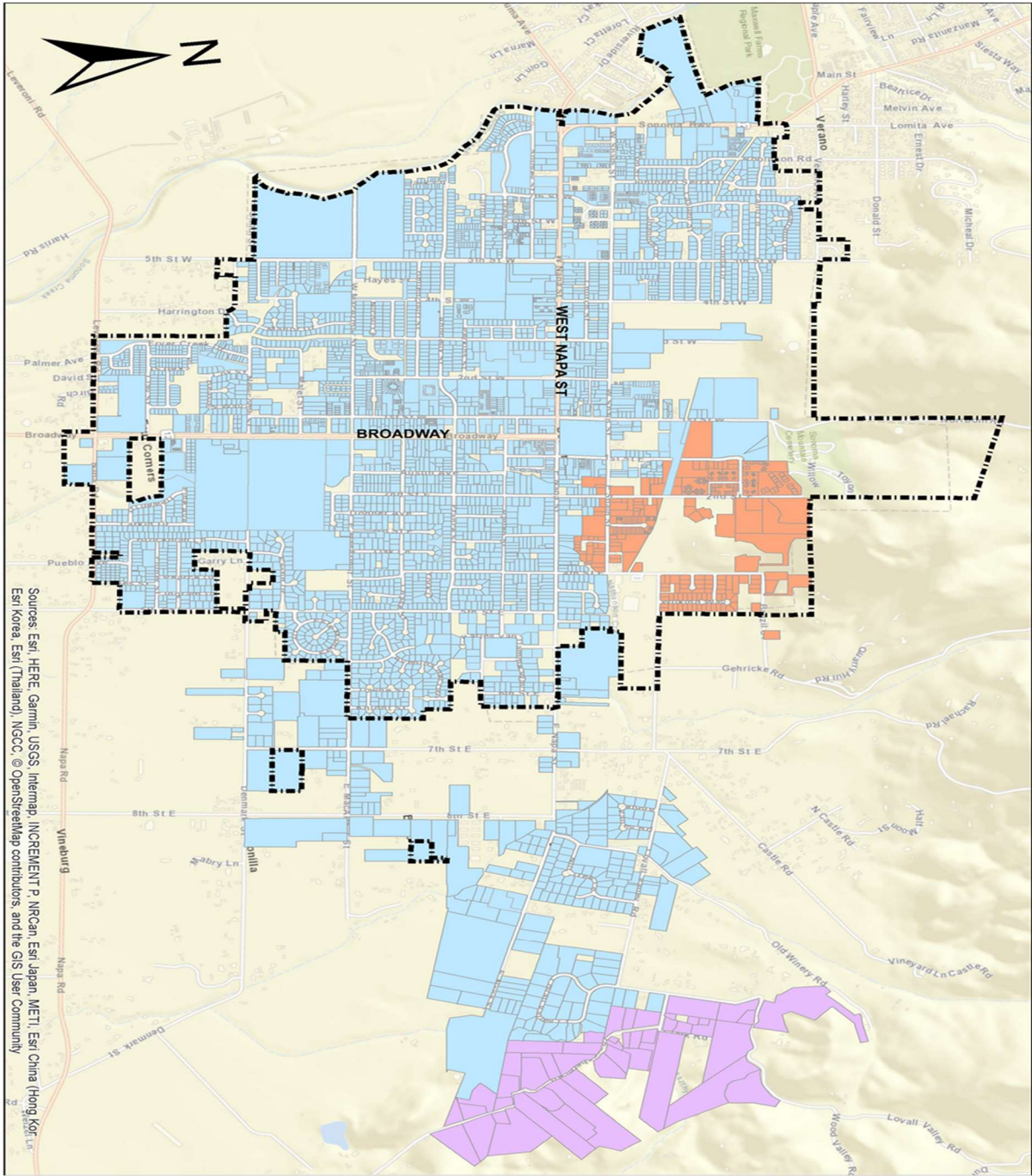


 City Limits

 ZONE 1

 ZONE 2

 ZONE 3



**APPENDIX B:**

**Projected Water Demand by  
Percent Usage Reduction**



**Table 8-1: Projected Water Demand by Percent Usage Reduction**

Usage Data (kgal)	Monthly Tier	Proposed		0 - 10%		10 - 20%		20 - 30%		30 - 40%		40 - 50%	
		Rates	FY 2024	% Reduction	Reduction	% Reduction	Reduction	% Reduction	Reduction	% Reduction	Reduction	% Reduction	Reduction
Single Family Residential													
Tier 1	2	\$6.13	83,309	-2.0%	81,643	-7.0%	77,477	-10.0%	74,978	-15.0%	70,813	-15.0%	70,813
Tier 2	5	\$8.06	117,226	-12.0%	103,159	-25.0%	87,920	-30.0%	82,058	-40.0%	70,336	-45.0%	64,474
Tier 3	7+	\$9.86	113,940	-20.0%	91,152	-30.0%	79,758	-50.0%	56,970	-65.0%	39,879	-75.0%	28,485
<b>Subtotal Single Family</b>			<b>314,475</b>	<b>-12%</b>	<b>275,954</b>	<b>-22%</b>	<b>245,155</b>	<b>-32%</b>	<b>214,006</b>	<b>-42%</b>	<b>181,027</b>	<b>-48%</b>	<b>163,772</b>
Multi-Family		\$7.98	87,866	-5%	83,473	-10.0%	79,079	-30.0%	61,506	-35.0%	57,113	-45.0%	48,326
Commercial		\$7.98	69,848	-5%	66,356	-10.0%	62,863	-15.0%	59,371	-30.0%	48,894	-45.0%	38,416
Municipal		\$8.40	34,871	-5%	33,127	-10.0%	31,384	-15.0%	29,640	-30.0%	24,410	-45.0%	19,179
Irrigation		\$9.15	44,304	-10%	39,874	-20.0%	35,443	-30.0%	31,013	-40.0%	26,582	-50.0%	22,152
<b>Total Non-Single Family</b>			<b>236,889</b>	<b>-6%</b>	<b>222,829</b>	<b>-12%</b>	<b>208,770</b>	<b>-23%</b>	<b>181,530</b>	<b>-34%</b>	<b>156,999</b>	<b>-46%</b>	<b>128,074</b>
Hydrant		\$14.42	954	0%	954	0%	954	0%	954	0%	954	0%	954
<b>Total Potable Water (kgal)</b>			<b>552,318</b>		<b>499,737</b>		<b>454,879</b>		<b>396,490</b>		<b>338,980</b>		<b>292,800</b>
<b>Total Potable Water (AF)</b>			<b>1,695</b>		<b>1,534</b>		<b>1,396</b>		<b>1,217</b>		<b>1,040</b>		<b>899</b>
<b>% Total Reduction</b>					<b>-10%</b>		<b>-18%</b>		<b>-28%</b>		<b>-39%</b>		<b>-47%</b>