

CITY OF BRENTWOOD

Water and Wastewater Rate Study

FINAL DRAFT REPORT / April 11, 2023



April 11, 2023

Ms. Debra Galey
Senior Analyst
City of Brentwood
150 City Park Way
Brentwood, CA 94513

Subject: Water and Wastewater Financial Plan Study Report

Dear Ms. Galey:

Raftelis is pleased to provide this Water and Wastewater Financial Plan study report for the City of Brentwood (City) to address current financial challenges the City is facing and to establish water and wastewater rates that equitably recover costs from its customers.

The major objectives of the study include the following:

- Develop financial plans for the water and wastewater enterprises to ensure financial sufficiency, meet operation and maintenance (O&M) costs, ensure sufficient funding for capital replacement and refurbishment (R&R) needs, and improve the financial health of the enterprises
- Develop sound and sufficient reserve fund targets and reserves
- Review current rate structures for the water and wastewater enterprises
- Prepare a five-year schedule of rates

The report summarizes the key findings and recommendations related to developing the financial plans for water and wastewater utilities and the development of the updated water and wastewater 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,



Sudhir D. Pardiwala, P.E.
Executive Vice President



Theresa Jurotich
Manager

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1. Executive Summary

In 2022, the City of Brentwood (City) engaged Raftelis Financial Consultants, Inc. (Raftelis) to conduct a comprehensive Water and Wastewater Cost-of-Service study to determine user charges for the City's water and wastewater services that ensure proportionate recovery of costs from the various user classes. This report documents the resultant findings, analyses, and recommendations.

The major objectives of the study include the following:

- Develop Financial Plans for the water and wastewater funds to ensure financial sufficiency, recover operation and maintenance (O&M) costs, meet debt coverage requirements, fund capital repairs and replacements (R&R), and ensure sufficient funding of City financial reserves.
- Conduct a Cost-of-Service analysis for the water and wastewater systems to recover costs proportionate to the service received.
- Develop fair and equitable water and wastewater rates that provide revenue stability for recovering fixed costs, maintain affordable service, and align with the requirements of Proposition 218.

The water cost-of-service study was prepared using the principles established by the American Water Works Association (AWWA). AWWA *“Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1* (seventh edition) (the “M1 Manual”). The wastewater cost-of-service study was prepared based on the principles established by the Water Environment Federation (WEF) and described in *Financing and Charges for Wastewater Systems*.

This executive summary provides an overview of the study and includes findings and recommendations for water and wastewater rates.

A fiscal year for the City is from July 1 to June 30 the following year. Therefore, July 1, 2022, through June 30, 2023, is identified as FY 2023; July 1, 2023, through June 30, 2024, is identified as FY 2024 and so on. The City bills are based on a thousand gallons (kgal); therefore, one unit of water is a thousand gallons.

1.1. System Background

The City was incorporated in 1948 and provides potable water to approximately 21,500 connections serving a population of approximately 64,900. The City supplies potable water from the City's wells, as well as from surface water that is treated at the City of Brentwood Treatment Plant (Brentwood TP). The City contracts with Contra Cost Water District to receive water treated at the Randall Bold Water Treatment Plant (RBWTP) on a take-or-pay basis. Surface water originates in the Sierra Nevada mountains and is diverted from the Sacramento-San Joaquin Delta. The City's water distribution system includes about 300 miles of water mains. The cost of water supply has increased during the recent drought due to tightening water supplies and environmental and regulatory requirements.

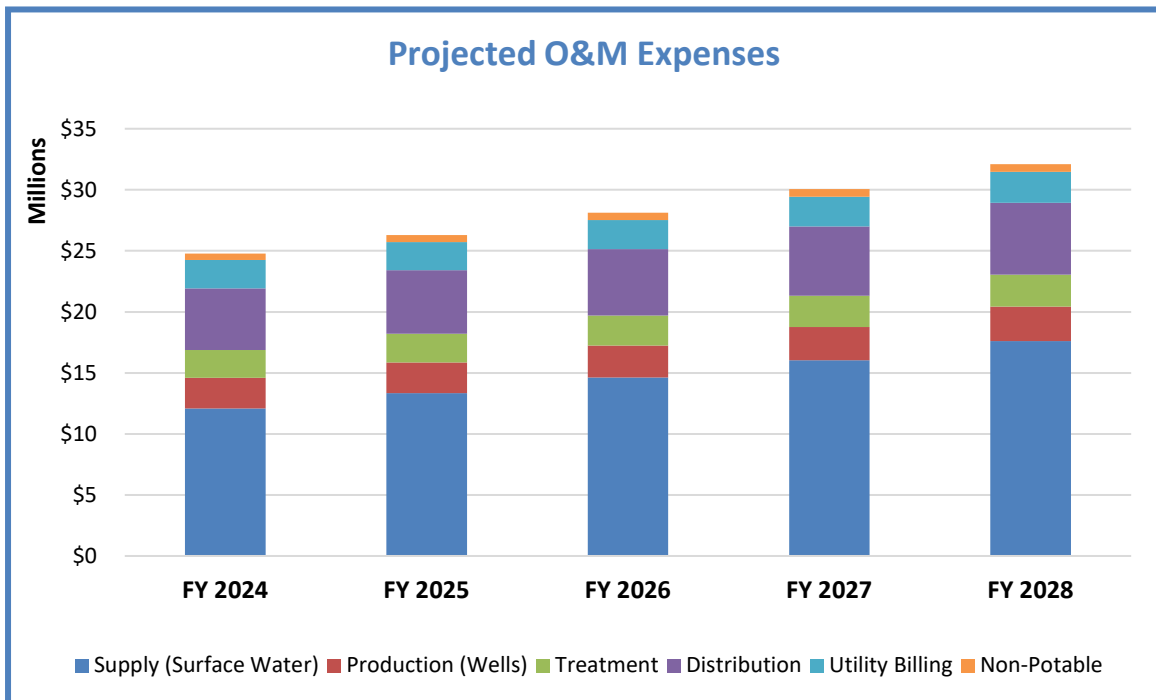
Additionally, non-potable water is available in some areas of the City for irrigation and is supplied with untreated water pumped from the Sacramento-San Joaquin Delta by the East Contra Costa Irrigation District. The City's Wastewater Treatment Plant (WWTP) also produces recycled water suitable for non-potable reuse. Recycled water is distributed through the City's non-potable water supply system.

The City wastewater system collects, treats, and disposes of wastewater from approximately 21,100 connections. Wastewater is treated at the City’s WWTP with a current capacity of 5.0 million gallons per day (MGD). The WWTP is an extended aeration/activated sludge facility. Treated effluent, if not recycled, is discharged into Marsh Creek. In addition to the treatment plant, the wastewater system includes approximately 200 miles of wastewater mains and lateral connections.

1.2. Water Enterprise Financial Plan

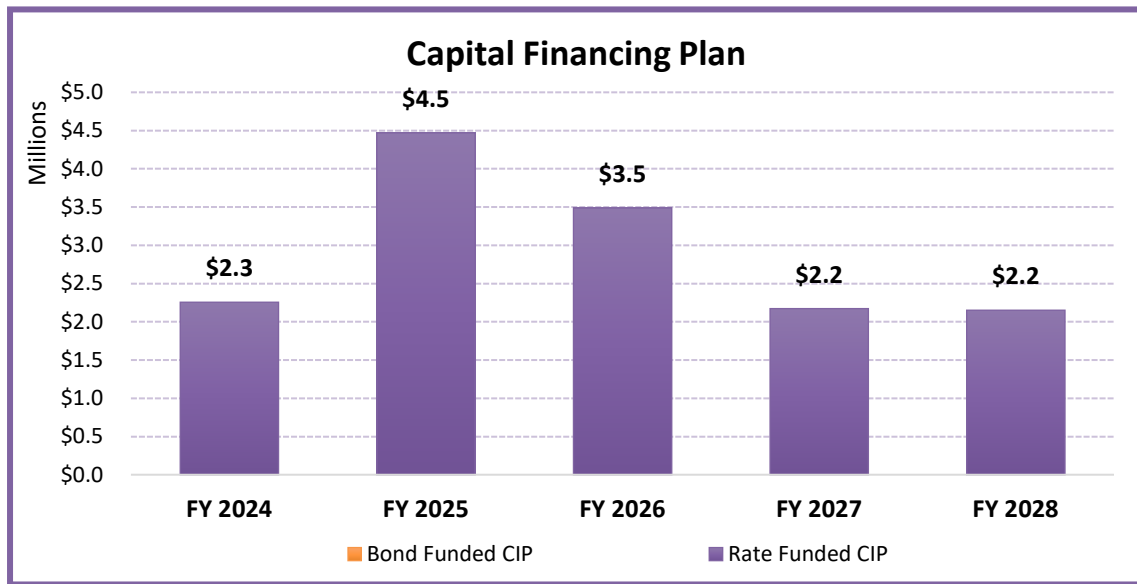
To determine the revenue adjustments needed to meet the ongoing expenses of the City’s water enterprise and provide fiscal stability, Raftelis projected the revenue requirements, including operations and maintenance (O&M) expenses, capital improvement expenses, debt service costs, reserve requirements, etc., for the study period. O&M expenses include the cost of operating and maintaining water supply, treatment, storage, and distribution facilities, as well as the costs of providing technical services such as engineering services and other administrative costs of the water system such as meter reading and billing. O&M projections are based on the City’s projected budgetary increases in FY 2024 and beyond. The City uses inflation factors that are indicative of industry increases for different expenditures within the budget, such as personnel, supplies, or fuel, to capture the impact of various market forces. Potable water usage is projected to remain constant (excluding usage growth due to new accounts). The proposed financial plan and water rates are based on this level of water usage. Figure 1-1 shows the projected water O&M expenses over the planning period.

Figure 1-1: Water Enterprise Projected O&M Expenses



In addition to operating expenses, the City is planning capital expenditures totaling about \$14.5 million, to be funded by water rates from FY 2024 through FY 2028. Existing annual debt service payments are about \$2.8 million over the planning period. No new debt is anticipated. Figure 1-2 shows the water CIP that will be funded by rates over the planning period.

Figure 1-2: Water Enterprise Capital Financing Plan



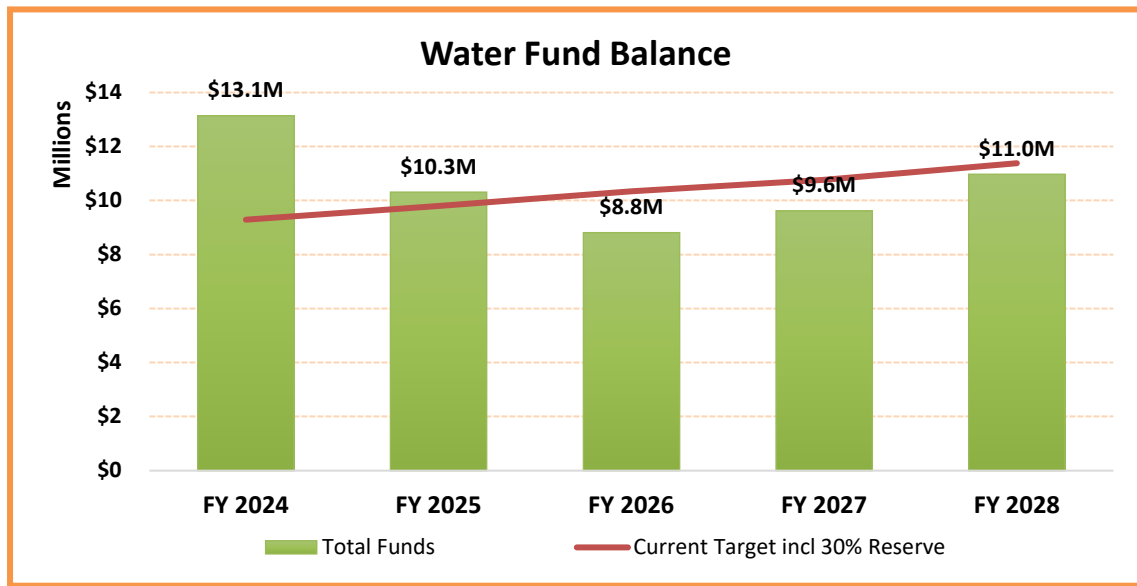
To ensure that the City will have adequate revenues to fund water operating and capital expenses and to maintain sufficient reserves, Raftelis recommends the revenue adjustments in Table 1-1.

Table 1-1: Annual Water Revenue Adjustments

Fiscal Year	Effective Date	Revenue Adjustment
FY 2024	July 1, 2023	6.5%
FY 2025	July 1, 2024	6.5%
FY 2026	July 1, 2025	6.5%
FY 2027	July 1, 2026	6.5%
FY 2028	July 1, 2027	6.5%

Figure 1-3 shows the resulting cash balance for the water utility. The red line represents the total current target, which is equal to 30 percent of annual operating expenses and debt service payments.

Figure 1-3: Water Enterprise Total Cash Balance



1.3. Proposed Water Rates

Raftelis recommends that the City retain its current inclining rate structure, as well as current residential and non-residential tier definitions that are based upon the cost and availability of groundwater and surface water supply sources and customers’ usage characteristics. The current residential tiers are: Tier 1 is set at 0 to 5 thousand gallons (kgal) per month; Tier 2 is set at 6 to 14 kgal per month; Tier 3 is set at 15 to 20 kgal per month; Tier 4 is any usage above Tier 3. Non-residential customers currently have two tiers, with Tier 1 set at 0 to 5 kgal per month and Tier 2 defined as any usage above Tier 1. The rates are revised to be more consistent with the actual cost of service. Table 1-2 shows the proposed rates for the next five years, effective July 1 of each year.

Table 1-2: Proposed Monthly Water Rates

	Current	July 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027	
Monthly Base Rate							
Meter Size							
5/8" or 3/4"	\$27.61	\$28.16	\$30.00	\$31.95	\$34.03	\$36.25	
1"	\$39.03	\$41.24	\$43.93	\$46.79	\$49.84	\$53.08	
1 1/2"	\$67.61	\$73.91	\$78.72	\$83.84	\$89.29	\$95.10	
2"	\$101.90	\$113.13	\$120.49	\$128.33	\$136.68	\$145.57	
3"	\$210.52	\$237.31	\$252.74	\$269.17	\$286.67	\$305.31	
4"	\$295.65	\$420.31	\$292.65	\$293.65	\$294.65	\$295.65	
6"	\$753.55	\$858.20	\$913.99	\$973.40	\$1,036.68	\$1,104.07	
Commodity Rate (\$/kgal)							
Residential	Monthly (kgal)						
Tier 1	5	\$3.28	\$3.18	\$3.39	\$3.62	\$3.86	\$4.12
Tier 2	14	\$6.31	\$6.60	\$7.03	\$7.49	\$7.98	\$8.50
Tier 3	20	\$7.41	\$8.33	\$8.88	\$9.46	\$10.08	\$10.74
Tier 4	21+	\$7.64	\$8.43	\$8.98	\$9.57	\$10.20	\$10.87
Non-Residential							
Tier 1	5	\$3.39	\$3.20	\$3.41	\$3.64	\$3.88	\$4.14
Tier 2	6+	\$6.87	\$7.98	\$8.50	\$9.06	\$9.65	\$10.28
Hydrant		\$6.87	\$8.91	\$9.49	\$10.11	\$10.77	\$11.48
Non-Potable		\$1.60	\$1.08	\$1.19	\$1.23	\$1.27	\$1.31

The City reserves the right to pass through costs that are not within the City’s control, such as water purchased costs, electrical costs, chemical costs, etc. to the proposed rates when such an action is deemed necessary. The financial plan has built in projected increases in these costs. However, if those costs exceed the projected amount, the additional costs may be recovered through higher rates.

1.4. Customer Impacts - Water

Table 1-3 below shows the impacts of the proposed rates on a typical residential customer with a 1-inch meter using an average of 10 kgal of water monthly. Actual impacts will vary per customer dependent upon water usage.

Table 1-3: Residential Water Monthly Rate Impacts

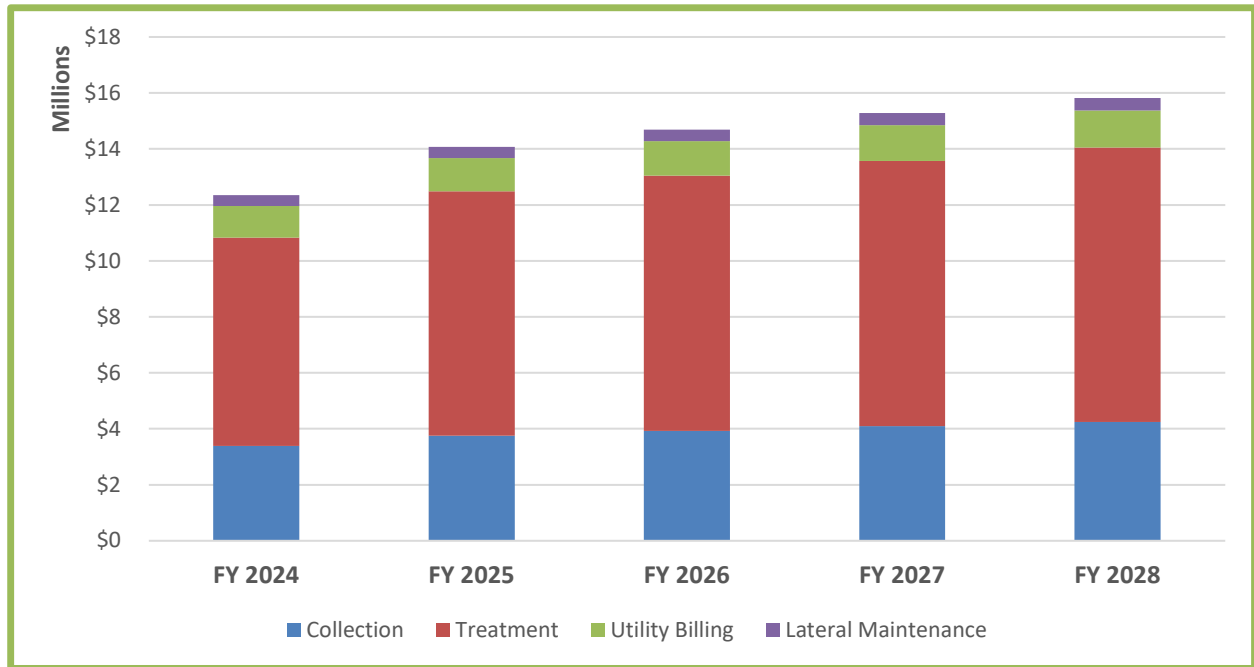
Residential	Usage (kgal)	Current Bill	Proposed Bill	Difference	\$ Difference	% Bills at or below
Average	10	\$86.98	\$90.14	3.6%	\$3.16	65.2%

1.5. Wastewater Enterprise Financial Plan

Raftelis projected the revenue requirements, including O&M expenses, capital improvement expenses, debt service costs, and reserve requirements for the wastewater enterprise over the study period. O&M expenses

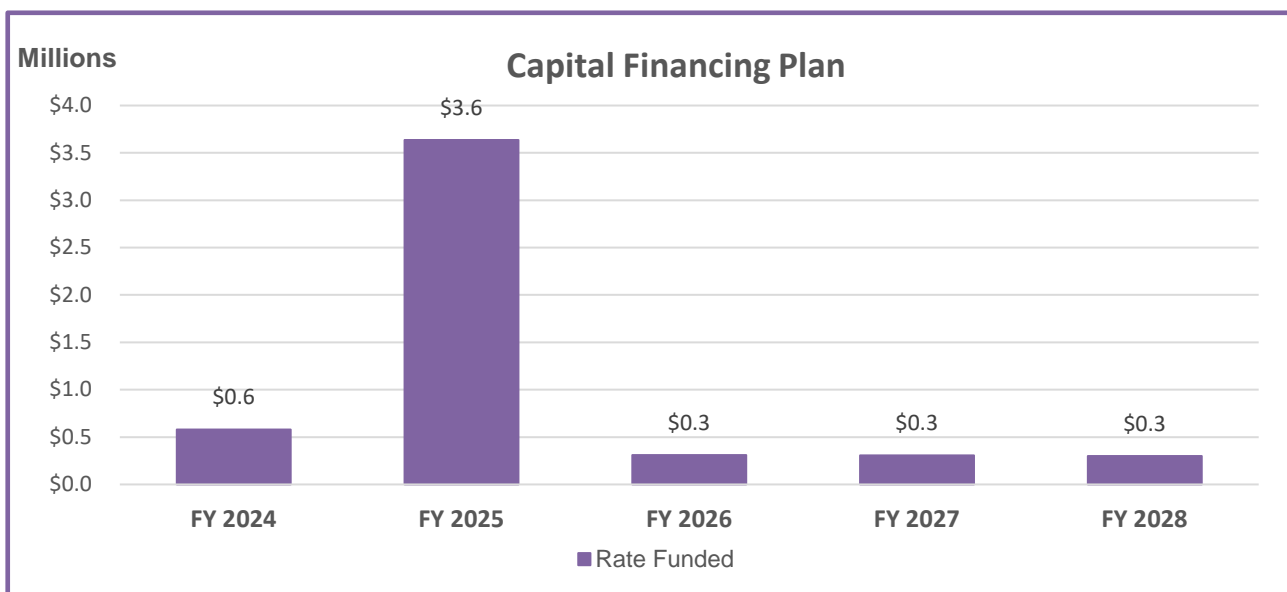
include wastewater collection, wastewater treatment, billing, and lateral maintenance. O&M projections are based on the City’s projected budgetary increases in FY 2024 and beyond. The City uses different inflation factors for different expenditures within the budget. Figure 1-4 shows the projected wastewater enterprise O&M expenses over the planning period.

Figure 1-4: Wastewater Enterprise Projected O&M Expenses



In addition to operating expenses, the City’s wastewater enterprise is planning capital expenditures totaling about \$5.1 million over the study period. Wastewater rate revenue will be used to finance planned capital expenditures. Existing annual debt service payments increase from \$191,000 to about \$1 million over the planning period. Figure 1-5 shows the wastewater enterprise’s CIP funded by rates over the planning period.

Figure 1-5: Wastewater Enterprise Capital Financing Plan



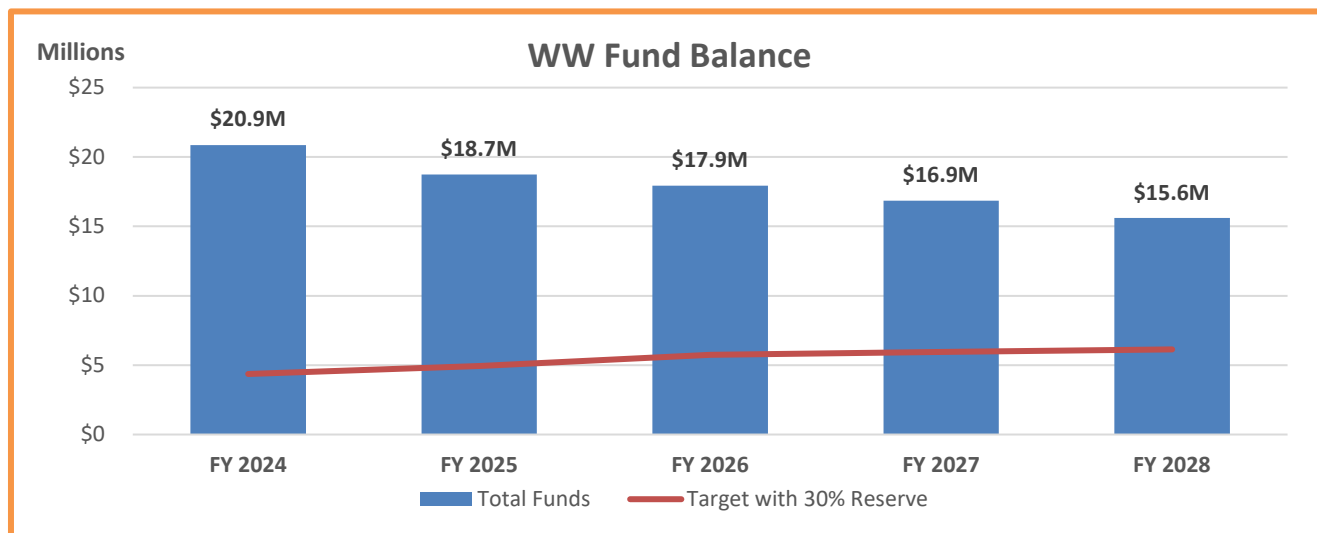
To ensure that the City will have adequate revenues to fund the wastewater enterprise’s operating and capital expenses and to maintain sufficient reserves, Raftelis recommends the revenue adjustments shown in Table 1-4. The proposed adjustments are necessary to meet debt service coverage requirements of 110 percent for the SRF loans.

Table 1-4: Annual Wastewater Revenue Adjustments

Fiscal Year	Effective Date	Revenue Adjustment
FY 2024	July 1, 2023	2.0%
FY 2025	July 1, 2024	2.0%
FY 2026	July 1, 2025	2.0%
FY 2027	July 1, 2026	2.0%
FY 2028	July 1, 2027	2.0%

Figure 1-6 shows the resulting cash balance for the wastewater enterprise. The red line represents the total current target, which is equal to 30 percent of the wastewater enterprise’s annual operating expenses and debt service payments. It should be noted that while the cash balance is projected to exceed the target, SRF loan debt coverage calculations do not take into account existing cash balance when meeting coverage requirements.

Figure 1-6: Wastewater Enterprise Cash Balance



1.6. Proposed Wastewater Rates

Table 1-5 shows proposed wastewater rates for FY 2024 through FY 2028. Revenue adjustments of 2% occur on July 1 of each fiscal year throughout the planning period.

Table 1-5: Proposed Monthly Wastewater Rates

	July 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
Monthly Base Charge (per dwelling unit)	\$19.51	\$19.91	\$20.31	\$20.72	\$21.14
Monthly Lateral Maintenance Fee (per account)	\$4.07	\$4.16	\$4.25	\$4.34	\$4.43
Residential Variable Charge per unit (\$/kgal)*	\$6.70	\$6.84	\$6.98	\$7.12	\$7.27
Residential Monthly Maximum Charge (capped 7 kgal/mo)	\$70.48	\$71.95	\$73.42	\$74.90	\$76.46
Non-Residential Variable Charge (\$/kgal of actual water use)					
Low Strength	\$4.53	\$4.63	\$4.73	\$4.83	\$4.93
Medium Low Strength	\$5.13	\$5.24	\$5.35	\$5.46	\$5.57
Medium Strength	\$5.76	\$5.88	\$6.00	\$6.12	\$6.25
Medium High Strength	\$10.16	\$10.37	\$10.58	\$10.80	\$11.02
High Strength	\$11.60	\$11.84	\$12.08	\$12.33	\$12.58

*Residential users' variable charge is based on water usage during two lowest production winter months. Capped at 7 kgal/mo.

1.7. Customer Impacts – Wastewater

Table 1-6 shows the monthly bill impact for residential customers at average winter usage. Note that residential customers are currently billed based on water use during the two lowest-use winter months.

Table 1-6: Residential Wastewater Monthly Rate Impacts

	Monthly Usage (kgal)	Current Monthly Bill	Proposed Monthly Bill	Difference (\$)	Difference %	% of Bills At or Below
Average	4	\$47.33	\$50.38	\$3.05	6.4%	44%

1.8. Drought Surcharge

In case of drought and further sales reductions, the City would lose revenue and fail to cover its expenses. Raftelis has developed drought rates to supplement reduced revenue due to drought as shown in Table 1-7.

Table 1-7: Drought Surcharge by Percent Usage Reduction

	FY 2024	10% Reduction	20% Reduction	30% Reduction	40% Reduction	50% Reduction
Projected Potable Variable Revenue	\$19,178,966	\$17,162,016	\$15,334,702	\$13,811,009	\$11,762,816	\$10,219,536
Revenue Shortfall		(\$2,016,951)	(\$3,844,264)	(\$5,367,958)	(\$7,416,150)	(\$8,959,430)
Cost Savings		\$647,261	\$1,269,944	\$1,641,164	\$2,290,650	\$2,824,388
Net Revenue Shortfall to be Recovered		(\$1,369,690)	(\$2,574,321)	(\$3,726,793)	(\$5,125,500)	(\$6,135,042)
% Revenue Shortfall		8%	17%	27%	44%	60%
\$ Increase per unit - July 1, 2023		\$0.46	\$0.95	\$1.50	\$2.35	\$3.16

2. Overview

2.1. Introduction

In 2022, the City engaged Raftelis Financial Consultants, Inc. (Raftelis) to conduct a comprehensive Water and Wastewater Cost-of-Service study that could be utilized to evaluate and optimize user charges for the City's water and wastewater services while ensuring a proportionate recovery of costs from the various user classes. This report documents the resultant findings, analyses, and recommendations.

The major objectives of the study include the following:

- Develop Financial Plans for the water and wastewater enterprises to ensure financial sufficiency, meet operation and maintenance (O&M) costs, ensure sufficient funding of City financial reserves, meet debt coverage requirements, and fund capital repairs and replacements (R&R).
- Conduct a Cost-of-Service analysis for the water and wastewater systems.
- Develop fair and equitable water and wastewater rates that adequately recover costs, provide revenue stability for recovering fixed costs, and maintain affordable service, and align with the requirements of Proposition 218.

2.2. Legal Requirements and Rate Setting Methodology

The water cost-of-service study was prepared using the principles established by the AWWA. AWWA *“Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1* (seventh edition) (the “M1 Manual”). The wastewater cost-of-service study was prepared based on the principles established by the WEF and described in *Financing and Charges for Wastewater Systems*. The general principles of rate structure design and the objectives of the study are described below.

According to the M1 Manual, the first step in the ratemaking process is to determine the adequate and appropriate level of funding for a given utility. This is referred to as determining the “revenue requirement.” This analysis considers the short-term and long-term service objectives of the utility over a given planning horizon, including capital facilities, system operations and maintenance, and financial reserve policies, to determine the adequacy of a utility's existing rates to recover its costs. A number of factors may affect these projections, including the number of customers served, water-use trends, extraordinary gains or expenses, weather, conservation, use restrictions, inflation, interest rates, capital finance needs, changes in tax laws, and other changes in operating and economic conditions.

After determining a utility's revenue requirements, the next step is determining the cost-of-service. Utilizing a public agency's approved budget, financial reports, operating data, and capital improvement plans, a cost-of-service study generally categorizes the operating system costs by function (e.g., treatment, storage, pumping, distribution/collection, etc.). Asset costs are similarly functionalized to determine the cost-of-service.

After the assets and the costs of operating those assets are properly categorized by function, these “functionalized costs” are allocated first to cost causation components and then to the various customer classes (e.g., single-family residential, multi-family residential, and commercial) by determining the characteristics of those classes and the contribution of each to incurred costs such as base costs, peaking costs, delivery costs, service characteristics, and demand patterns for water and flow and strength for wastewater.

Rate design is the final part of the rate-making procedure and uses the revenue requirement and cost-of-service analysis to determine appropriate rates for each customer class. Rates utilize “rate components” that build-up to rates for commodity charges, and rates for fixed charges, for the various customer classes and meter sizes servicing customers. In the case of inclining tier water rates, the rate components define the cost-of-service *within* each customer class, effectively treating each tier as a sub-class and determining the cost to serve each tier.

California Constitution – Article XIII D, Section 6 (Proposition 218)

Proposition 218, reflected in the California Constitution as Article XIII D, was enacted in 1996 to ensure that rates and fees are reasonable and proportional to the cost of providing service. The principal requirements, as they relate to public water service are as follows:

- A property-related charge (such as water rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property related service.
- Revenues derived by the charge shall not be used for any purpose other than that for which the charge was imposed.
- The amount of the charge imposed upon any parcel shall not exceed the proportional cost-of-service attributable to the parcel.
- No charge may be imposed for a service unless that service is actually used or immediately available to the owner of property.
- A written notice of the proposed charge shall be mailed to the record owner of each parcel at least 45 days prior to the public hearing, when the agency considers all written protests against the charge.

As stated in AWWA’s *M1 Manual*, “water rates and charges should be recovered from 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 on a parcel basis. The methodology in the M1 Manual is a nationally recognized industry ratemaking standard which courts have recognized is consistent with Proposition 218.

California Constitution Article X, section 2 mandates that water resources be put to beneficial use and that the waste or unreasonable use of water be prevented through conservation. Section 106 of the Water Code declares that the highest priority use of water is for domestic purposes, with irrigation secondary. Thus, management of water resources is part of the property-related service provided by public water suppliers to ensure the resource is available over time. The City established inclining tiered (also known as inclining block) water rates to incentivize customers to conserve water. The inclining tier rates (as well as rates for uniform rate classes) need to be based on the proportionate costs incurred to provide water to customers to achieve compliance with Proposition 218.

Tiered Rates – “Inclining” tier rate structures (which are synonymous with “increasing” tier rate structures and “tiered” rates), when properly designed and differentiated by customer class, allow a water utility to send conservation price signals to customers. Due to heightened interest in water conservation and efficiency of water use, inclining tier water rates have gained widespread use, especially in relatively water-scarce regions like Southern California. Tiered rates meet the requirements of Proposition 218 as long as the tiered rates reasonably reflect the proportionate cost of providing service in each tier.

3. Water Rates

This section describes the long-range financial plan for the water utility, findings and results of the water rate study, a detailed discussion of the proposed water rates, and the customer impacts resulting from the proposed rates. It also includes a description of the water system, the determination of annual revenues required from rates, and a detailed discussion of the cost-of-service, which includes allocation of costs to water cost causation parameters and the determination of unit costs.

3.1. Water System Background

The City was incorporated in 1948 and provides potable water to approximately 21,500 connections serving a population of approximately 64,900. In FY 2022, the City supplied approximately 1,775 AF of water from the City's wells, as well as an additional 9,429 AF of water from the City of Brentwood Treatment Plant (Brentwood TP) and the Randall Bold Water Treatment Plant (RBWTP). The City has a take-or-pay contract with Contra Costa Water District to receive water from the RBWTP. Potable water delivered to customers is a blend of City well water and treated surface water. Surface water originates in the Sierra Nevada mountains and is diverted from the Sacramento-San Joaquin Delta. The City's water distribution system includes about 300 miles of water mains. Based on the City's records, the cost of supplying water has increased during the recent drought due to reduced water usage and environmental and regulatory requirements. To meet water quality requirements, it has been necessary for the City to reduce its supply from groundwater wells and increase supply through the Brentwood TP, which is a more extensive and costly process.

Additionally, non-potable water is available in some areas of the City for irrigation. The City's non-potable supply is untreated water pumped from the Sacramento-San Joaquin Delta by the East Contra Costa Irrigation District, as well as recycled water produced at the City's Wastewater Treatment Plant (WWTP).

3.2. Water Account and Usage Assumptions

Table 3-1 shows the estimated number of water accounts by meter size for FY 2022 through FY 2028. Raftelis estimated the number of accounts by tabulating FY 2022 (actual) account data provided by the City and escalating the number of accounts based on account growth rates shown in Table 3-2. Account growth rates are based on the City's General Plan population growth rates and are typically driven by new residential and nonresidential development. The number of accounts (meters) is used to forecast the fixed revenue the City will receive from the meter service charge.

Table 3-1: Projected Water Accounts by Meter Size

	Actual FY 2022	Projected FY 2023	Projected FY 2024	Projected FY 2025	Projected FY 2026	Projected FY 2027	Projected FY 2028
5/8" or 3/4"	7,920	8,016	8,122	8,193	8,222	8,255	8,289
1"	12,568	12,720	12,888	13,001	13,046	13,100	13,153
1 1/2"	247	250	253	255	256	257	258
2"	454	459	465	469	470	472	474
3"	42	42	43	43	43	43	43
4"	35	35	36	36	36	36	36
6"	11	11	11	11	11	11	11
Total Meters	21,277	21,534	21,817	22,008	22,085	22,175	22,266

Table 3-2: Water Account Growth

Fiscal Year	Account Growth
FY 2023	1.21%
FY 2024	1.32%
FY 2025	0.88%
FY 2026	0.35%
FY 2027	0.41%
FY 2028	0.41%

Table 3-3 shows actual water use in FY 2022 and projected water use for FY 2023 through FY 2028 by customer class. The revenue calculated in each fiscal year in the Water Enterprise Financial Plan is a function of the number of meters, meter size, account growth, water use, and existing rates. The rate study determines water rates for the next five years based on usage assumptions for FY 2024 through FY 2028.

Table 3-3: Projected Water Use by Customer Class

Water Use (kgal)	Tier Limit (kgal)	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Residential								
Tier 1	5	1,145,110	1,158,966	1,174,264	1,184,598	1,188,744	1,193,618	1,198,511
Tier 2	14	935,560	946,880	959,379	967,822	971,209	975,191	979,189
Tier 3	20	220,956	223,630	226,581	228,575	229,375	230,316	231,260
Tier 4	21+	210,382	212,928	215,738	217,637	218,398	219,294	220,193
Subtotal Residential		2,512,008	2,542,403	2,575,963	2,598,631	2,607,727	2,618,418	2,629,154
Non-Residential								
Tier 1	5	45,908	46,463	47,077	47,491	47,657	47,853	48,049
Tier 2	6+	631,542	639,184	647,621	653,320	655,607	658,295	660,994
Subtotal Non-Residential		677,450	685,647	694,698	700,811	703,264	706,147	709,042
Hydrant		9,893	9,893	9,893	9,893	9,893	9,893	9,893
Subtotal Hydrant		9,893	9,893	9,893	9,893	9,893	9,893	9,893
Non-Potable		475,961	479,924	484,299	487,254	488,440	489,834	491,233
TOTAL USAGE		3,675,312	3,717,867	3,764,852	3,796,590	3,809,323	3,824,292	3,839,323

3.3. Inflationary and Other Assumptions

This subsection describes the assumptions used in projecting operating and capital expenses that determine the overall revenue adjustments required to ensure the financial stability of the City's water enterprise.

Revenue adjustments represent the average increase in rates for the City as a whole. Note that rate changes for individual classes will depend upon the cost of service and actual volume of water used.

To ensure that future costs are reasonably projected, it is necessary to make informed assumptions about inflationary factors, water costs, and use. Non-rate revenue and O&M projections are based on the City's FY 2024 projections and projected budgetary increases in FY 2025 through FY 2028. The City uses inflation factors that are indicative of industry increases for different expenditures within the budget, such as personnel, supplies, or fuel, to capture the impact of market forces over time. On average, the O&M costs are increasing by approximately 6.7 percent per year throughout the study period.

3.4. Water Enterprise Financial Plan

The assumptions discussed above were incorporated into the Water Enterprise Financial Plan. To develop the Water Enterprise Financial Plan, Raftelis projected annual expenses and revenues and modeled reserve balances, capital expenditures, and calculated debt service coverage ratios to estimate the additional rate revenue needed per year. This section of the report discusses O&M expenses, the Capital Improvement Plan (CIP), reserve funding, projected revenue under existing rates, and the revenue adjustments needed to ensure the fiscal sustainability and solvency of the City.

3.4.1. Revenue Requirement

A utility's yearly revenue requirement is the yearly revenue needed to operate, maintain, and ensure fiscal solvency. The revenue requirement includes O&M expenses, rate funded capital expenditures, debt service payments, and reserve requirements (funding for reserves). The basis of the expenses is the City's Fiscal Model, Operating Budget, and 5-year Capital Improvement Program.

3.4.1.1. O&M Expenses

The water enterprise's projected O&M expenses are shown in Table 3-4. The Water Enterprise Financial Plan study period is from FY 2024 to FY 2028. O&M expenses include the cost of purchased surface water, operating and maintaining groundwater wells, treatment, distribution facilities, meter reading, billing, and providing non-potable water service. Table 3-4 summarizes the projected O&M expenses in two different ways: by function and by type of expenditures.

Table 3-4: Projected Water Enterprise O&M Expenses

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Supply (Surface Water)	\$12,090,971	\$13,346,276	\$14,623,678	\$16,040,219	\$17,601,689
Production (Wells)	\$2,503,519	\$2,508,820	\$2,618,302	\$2,723,505	\$2,817,856
Treatment	\$2,290,824	\$2,364,865	\$2,468,278	\$2,555,455	\$2,633,662
Distribution	\$5,050,248	\$5,201,047	\$5,437,186	\$5,668,924	\$5,876,841
Utility Billing	\$2,309,529	\$2,290,399	\$2,374,965	\$2,456,881	\$2,532,452
Non-Potable	\$520,812	\$575,329	\$598,564	\$620,562	\$640,287
TOTAL O&M EXPENSES	\$24,765,904	\$26,286,736	\$28,120,973	\$30,065,545	\$32,102,787

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Personnel Services	\$5,299,485	\$5,560,988	\$5,844,235	\$6,136,887	\$6,388,621
Supplies and Services	\$14,924,939	\$16,404,931	\$17,800,688	\$19,312,016	\$20,958,511
Other Supplies and Services	\$2,012,975	\$2,089,267	\$2,173,046	\$2,244,757	\$2,315,691
Internal Service	\$1,126,872	\$1,271,592	\$1,315,964	\$1,358,963	\$1,403,393
Capital Outlay	\$880,821	\$384,629	\$388,476	\$392,360	\$396,284
Non-Potable	\$520,812	\$575,329	\$598,564	\$620,562	\$640,287
Internal Service	\$24,765,904	\$26,286,736	\$28,120,973	\$30,065,545	\$32,102,787

3.4.1.2. Capital Improvement Plan

Table 3-5 shows the City’s CIP for FY 2024 through FY 2028, which totals approximately \$14.5 million. The projects will be funded through rates.

Table 3-5: Detailed Water Enterprise Capital Improvement Plan – Inflated

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Fund #562 - Water					
80466.00 Transfer to 2015 Lease Revenue Bond	\$189,725	\$188,312	\$180,365	\$172,695	\$150,792
80562.00 Transfer To Water Capital Proj	\$390,000	\$508,000	\$344,000	\$0	\$0
80562.00 Trf To Water CIP - WWTP Admin Lab bldg (Water & WW Lab)	\$340,000	\$860,000	\$0	\$0	\$0
80562.00 Trf to Water CIP - Corp Yard General	\$0	\$600,000	\$0	\$0	\$0
80562.00 Trf to Water CIP - Corp Yard to remain	\$0	\$500,000	\$0	\$0	\$0
80562.00 O'Hara Ave./Lone Tree Way Water Upgrade	\$0	\$55,000	\$618,250	\$0	\$0
80562.00 Trf To Water CIP - Water Storage Capacity at Los Vaqueros	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000	\$1,000,000
WTP Security Improvements	\$0	\$223,000	\$344,000	\$0	\$0
Waterline Imp - Kent Dr	\$335,000	\$0	\$0	\$0	\$0
Zone 2 Reduced Water Pressure Zone	\$0	\$535,000	\$0	\$0	\$0
WTP Expansion	\$0	\$0	\$1,000,000	\$1,000,000	\$1,000,000
Total Water CIP	\$2,254,725	\$4,469,312	\$3,486,615	\$2,172,695	\$2,150,792

3.4.1.3. Debt Service

The City is not planning to issue any additional debt during this planning period. Table 3-6 shows the existing debt service payments for the Brentwood Water Treatment Plant through FY 2028. Annual debt service payments for the planning period average \$2.6 million per year.

Table 3-6: Water Enterprise Debt Service Payments

Fund 560 Only	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Water Revenue Refunding Bonds Series 2014					
Principal	\$1,437,096	\$1,547,096	\$1,647,096	\$1,102,096	\$1,187,096
Interest	\$1,398,560	\$1,296,060	\$1,188,060	\$1,075,060	\$989,310
Total Debt Service	\$2,835,656	\$2,843,156	\$2,835,156	\$2,177,156	\$2,176,406

3.4.1.4. Proposed Financial Plan and Revenue Adjustments

The proposed revenue adjustments help ensure adequate revenue to fund operating expenses, capital expenditures, and compliance with bond covenants. The Financial Plan model assumes the revenue adjustments occur on July 1 of each year. The proposed revenue adjustments would enable the City to execute the CIP shown in Table 3-5 and comply with its debt service coverage requirements over the study period.

Table 3-7 shows the proposed revenue adjustments for FY 2024 through FY 2028. These increases are needed to finance the operating and capital expenses and reserves funding.

Table 3-7: Proposed Water Revenue Adjustments

Fiscal Year	Effective Date	Revenue Adjustment
FY 2024	July 1, 2023	6.5%
FY 2025	July 1, 2024	6.5%
FY 2026	July 1, 2025	6.5%
FY 2027	July 1, 2026	6.5%
FY 2028	July 1, 2027	6.5%

Table 3-8 shows the cash flow detail over the next five years.

Table 3-8: Proposed Water Enterprise Cash Flow

Potable Water	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Revenue at Current Rates	\$27,743,954	\$27,986,676	\$28,084,063	\$28,198,544	\$28,313,494
Additional Revenue:					
Fiscal Year	Revenue Adjustments	Month Effective			
2024	6.5%	July	\$1,803,357	\$1,819,134	\$1,825,464
2025	6.5%	July		\$1,937,378	\$1,944,119
2026	6.5%	July			\$2,070,487
2027	6.5%	July			\$2,214,057
2028	6.5%	July			\$2,223,083
					\$2,367,583
Additional Rate Revenue	\$1,803,357	\$3,756,512	\$5,840,070	\$8,077,934	\$10,478,447
Total Rate Revenue	\$29,547,311	\$31,743,188	\$33,924,133	\$36,276,478	\$38,791,941
Current Services	\$292,964	\$294,632	\$299,151	\$303,839	\$308,169
Other Revenue	\$338,109	\$351,212	\$362,990	\$375,362	\$388,162
Standby Charges	\$38,616	\$38,230	\$37,848	\$37,469	\$37,094
Operating Transfers	\$350,000	\$350,000	\$350,000	\$350,000	\$350,000
Transfers from WW Fund for Water Supply Costs	\$0	\$0	\$0	\$0	\$0
Interest Income	\$78,613	\$232,109	\$189,230	\$182,349	\$203,794
TOTAL REVENUE	\$30,645,613	\$33,009,371	\$35,163,352	\$37,525,497	\$40,079,160
O&M Expenses					
Supply (Surface Water)	\$12,090,971	\$13,346,276	\$14,623,678	\$16,040,219	\$17,601,689
Production (Wells)	\$2,503,519	\$2,508,820	\$2,618,302	\$2,723,505	\$2,817,856
Treatment	\$2,290,824	\$2,364,865	\$2,468,278	\$2,555,455	\$2,633,662
Distribution	\$5,050,248	\$5,201,047	\$5,437,186	\$5,668,924	\$5,876,841
Utility Billing	\$2,309,529	\$2,290,399	\$2,374,965	\$2,456,881	\$2,532,452
Transfer to Capital R&R (@80% of book depr. exp.)	\$2,686,296	\$2,817,722	\$2,817,722	\$2,927,106	\$2,927,106
Existing Debt Service	\$2,835,656	\$2,843,156	\$2,835,156	\$2,177,156	\$2,176,406
Proposed Debt Service	\$0	\$0	\$0	\$0	\$0
Rate Funded Capital Projects*	\$2,254,725	\$4,469,312	\$3,486,615	\$2,172,695	\$2,150,792
Reserve Funding	\$0	\$0	\$0	\$0	\$0
TOTAL EXPENSES	\$32,021,769	\$35,841,597	\$36,661,902	\$36,721,940	\$38,716,804
Net Cash Flow	(\$1,376,156)	(\$2,832,225)	(\$1,498,550)	\$803,557	\$1,362,356

*Non-potable water is responsible for a portion of the capital costs. Potable capital costs, in addition to non-potable capital costs, represent the total Capital Improvement Plan.

Table 3-9 shows the calculated debt coverage calculations for primary and secondary debt coverage requirements. The City’s debt service payments are shared proportionately between the water enterprise fund and the development impact fee fund when the funded capital project or facility provides service to both existing rate payers and new development. To calculate the City’s primary debt coverage ratios, the total revenue, including the development impact fee revenue, and the total debt service payments are included. The City’s primary debt coverage requirement is 125 percent for the water utility. To calculate the City’s secondary debt coverage ratios, total debt service payments are included, but development impact fee revenue is excluded from total revenue. The City’s secondary debt coverage requirement is 100 percent for the water utility. The City meets and exceeds its primary and secondary debt coverage requirements throughout the study period.

Table 3-9: Water Enterprise Debt Coverage Calculation

Debt Coverage Calculation	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Projected Facility Fees Revenue	\$3,509,850	\$3,517,350	\$3,509,350	\$2,851,350	\$2,850,600
Projected Non-Potable Revenue	\$520,812	\$575,329	\$598,564	\$620,562	\$640,287
Projected Water Revenue	\$30,645,613	\$33,009,371	\$35,163,352	\$37,525,497	\$40,079,160
Non-Potable O&M Expenses	\$520,812	\$575,329	\$598,564	\$620,562	\$640,287
Water O&M Expenses (no depr.)	\$24,245,092	\$25,711,407	\$27,522,409	\$29,444,983	\$31,462,500
Total Debt Service	\$3,509,850	\$3,517,350	\$3,509,350	\$2,851,350	\$2,850,600
Primary Requirement					
Calculated Debt Coverage	282%	307%	318%	383%	402%
Required Debt Coverage	125%	125%	125%	125%	125%
Secondary Requirement					
Calculated Debt Coverage	182%	207%	218%	283%	302%
Required Debt Coverage	100%	100%	100%	100%	100%

The next four figures display the Financial Plan in graphical format. Figure 3-1 shows the modeled revenue adjustments (blue bars) for the next five years on the left-hand axis. The green and red lines on the right-hand axis show the calculated and required primary debt coverage requirements. The solid lines pertain to the primary debt coverage requirement and the dashed lines to the secondary requirement.

Figure 3-1: Proposed Water Enterprise Revenue Adjustments and Debt Coverage Ratios

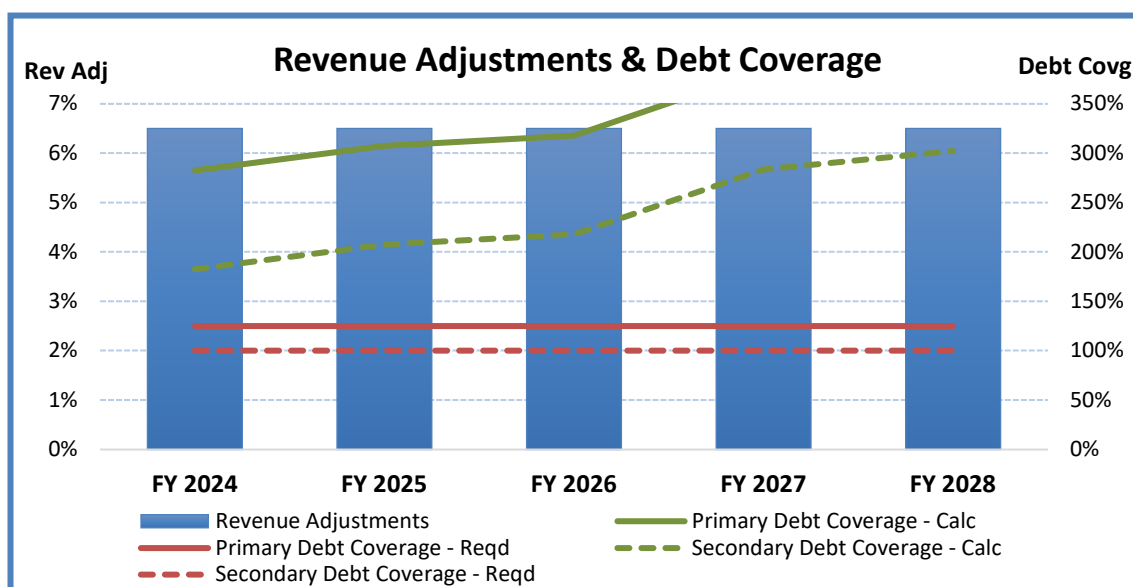


Figure 3-2 graphically illustrates the Water Enterprise Financial Plan – it compares existing and proposed revenues with projected expenses. The expenses include water supply, O&M, debt service, capital costs, and reserves transfers shown by the stacked bars. The horizontal orange and blue lines show total revenues at

existing and proposed rates, respectively. Current revenue from existing rates, in orange, does not meet future total expenses and clearly demonstrates the need for revenue adjustments.

Figure 3-2: Proposed Potable Water Financial Plan

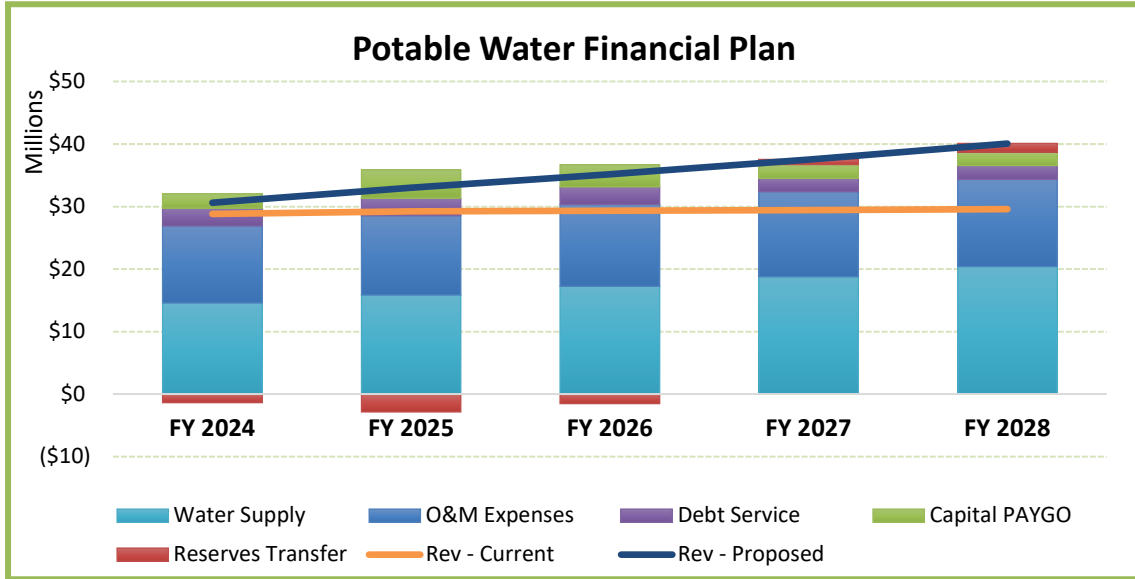


Figure 3-3 summarizes the projected CIP to be funded by water rates.

Figure 3-3: Projected Water Enterprise Capital Projects

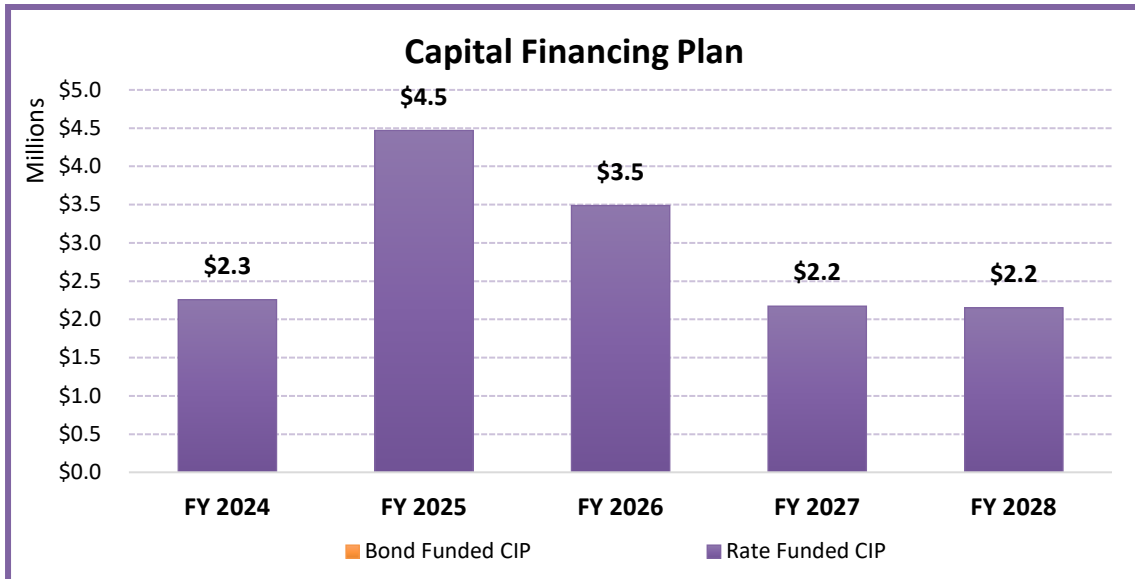


Figure 3-4 displays the resulting fund balance for the water utility. The red line represents the total current target, which is equal to 30 percent of annual operating expenses and debt service payments, based on Budget and Fiscal Policy 2.7.3, adopted June 22, 2021.

Figure 3-4: Water Enterprise Total Cash Balance

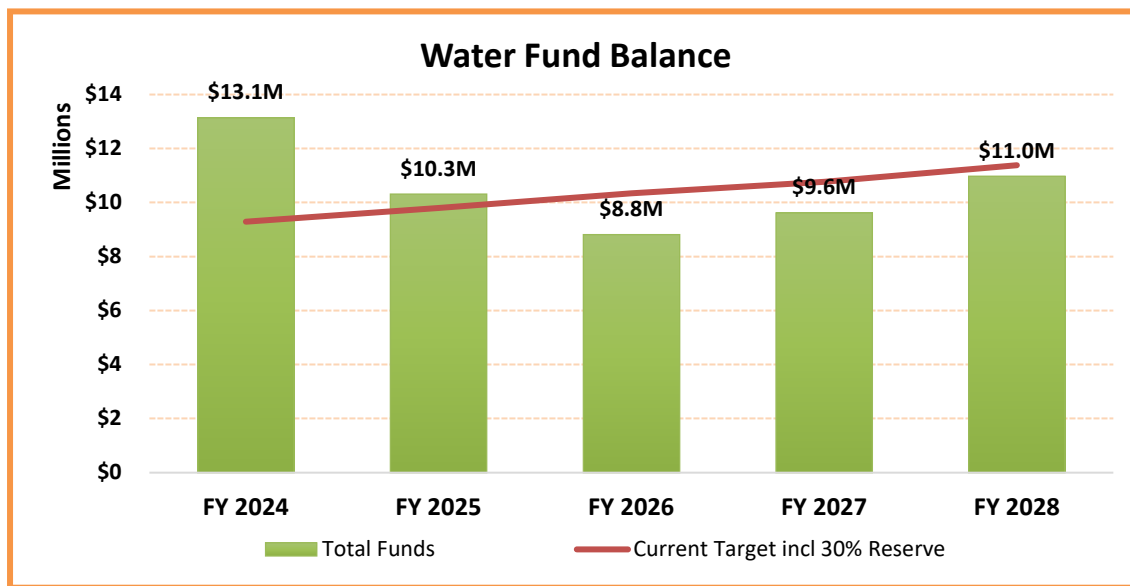


Table 3-10 shows the projected cash balance for the water enterprise using the City’s projected beginning balance for FY 2024. This table corresponds with Figure 3-4.

Table 3-10: Projected Water Enterprise Cash Balance

Water Fund	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Beginning Balance	\$14,513,780	\$13,137,625	\$10,305,399	\$8,806,849	\$9,610,406
Net Cash Flow	(\$1,376,156)	(\$2,832,225)	(\$1,498,550)	\$803,557	\$1,362,356
Ending Balance	\$13,137,625	\$10,305,399	\$8,806,849	\$9,610,406	\$10,972,762

3.5. Water Cost-of-Service Analysis

A cost-of-service analysis distributes a utility’s revenue requirements (costs) to each customer class in proportion to the service received. After determining a utility’s revenue requirements, the next step in a cost-of-service analysis is to functionalize its O&M costs as follows:

- Supply (Surface Water) – represents the cost of purchasing surface water and production from groundwater wells
- Treatment – represents the cost of treating the water
- Storage – represents the cost of the reservoirs
- Distribution – represents the operating and maintenance cost of the water distribution system
- Utility Billing – represents the costs associated with billing and customer service
- Non-Potable – represents the cost of operating and maintaining the non-potable water system

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

- Supply – costs associated with providing water supply to all customers

- Base Delivery costs – costs associated with providing service under average conditions
- Peaking costs (maximum day and maximum hour) – costs that are associated with meeting the peak demand in excess of the average rate of use
- Fire flow capacity – costs associated with providing capacity within the water system to supply water to public fire hydrants and private fire sprinkler systems. Fire sprinkler systems are required for all new residential and nonresidential structures per California Building Standards Codes.
- Meter service – costs associated with maintenance and capital costs of meters and services
- Billing and customer service – costs incurred to provide billing and customer service
- General and administrative costs – costs that cannot be specifically allocated to one of the other cost causation components

Peaking costs are further divided into maximum day and maximum hour demand. The maximum day demand is the maximum amount of water used in a single day in a year. The maximum hour demand is the maximum usage in an hour on the maximum usage day. Different facilities, such as distribution and storage facilities (and the O&M costs associated with those facilities), are designed to meet the peaking demands of customers. Therefore, extra capacity¹ costs include the O&M and capital costs associated with meeting peak customer demand. This method is consistent with the AWWA M1 Manual and is widely used in the water industry to perform cost-of-service analyses.

3.5.1. Allocation of Functionalized Expenses to Cost Components

After functionalizing expenses, the next step is to allocate the functionalized expenses to cost causation components. To do so we must identify system wide peaking factors, which were provided by the City and are shown in **Error! Reference source not found.**. The system-wide peaking factors, based on the City March 2006 Water Master Plan, are used to derive the cost component allocation bases (i.e., percentages) shown in Table 3-11. Functionalized expenses are then allocated to the cost components using these allocation bases. To understand the interpretation of the percentages, we must first establish the base use as the average daily demand during the year.

Table 3-11: System-Wide Peaking Factors and Allocation to Cost Causation Components

	Factor	Base Delivery	Max Day	Max Hour	Fire
Base	1.00	100%	0%	0%	0%
Max Day	2.10	43%	47%	0%	10%
Max Hour	4.00	22%	24%	44%	10%

Source: City of Brentwood Water Master Plan

To determine the relative proportion of costs to assign to Base Delivery, Max Day and Max Hour, allocations are calculated based on these factors. Cost components that are related to the provision of average day demand (ADD), such as source of supply, are allocated 100 percent to Base Delivery. Cost components that are designed to meet Max Day peaks, such as reservoirs and transmission facilities, are allocated to Base Delivery and Max Day factors. Since facilities such as reservoirs and distribution systems are also designed to provide capacity for fire supply, an allocation is also provided for fire flow, which is subtracted from the Base Delivery and Max Day components. The Max Day allocation is as follows:

¹ The terms extra capacity, peaking and capacity costs are used interchangeably.

Base Delivery: 43% = $(1.00/2.10) \times 100 - 5\%$ (half the fire allocation)
 Max Day: 47% = $(2.10-1.00)/2.10 \times 100 - 5\%$ (half the fire allocation)
 Fire: 10%

The fire allocation is based on Insurance Services Office (ISO) standard. Cost components such as those related to the distribution system that are designed for Max Hour peaks are allocated similarly. The allocation of Max Hour facilities is shown below:

Base Delivery: 22% = $(1.00/4.00) \times 100 - 3.33\%$ (1/3 fire allocation)
 Max Day: 24% = $(2.10-1.00)/4.00 \times 100 - 3.33\%$ (1/3 fire allocation)
 Max Hour: 44% = $(4.00-2.10)/4.00 \times 100 - 3.33\%$ (1/3 fire allocation)
 Fire: 10%

Collectively the maximum day and hour cost components are known as peaking costs. These allocation bases are used to assign the functionalized costs to the cost causation components.

In the absence of daily and hourly peaking factors, we use monthly peaks for the different customer classes. For the analysis to spread the costs among the different classes equitably, it is important to get the relative ratios of the peaks, which are provided by the monthly peaks. Table 3-12 shows the derivation of the peaking factors by customer class and tier by dividing the total maximum monthly usage by the average monthly usage for each customer class and tier based on monthly water usage records provided by the City. These peaking factors are used to allocate the peaking costs to each customer class and tier in the rate derivation section.

Table 3-12: Peaking Factors by Customer Class

Customer Specific	Proposed Tiers Kgal	Max Monthly Kgal	Average Monthly Kgal	Peaking Factor
Residential		295,504	209,334	1.41
Tier 1	5	101,409	95,426	1.06
Tier 2	14	118,116	77,963	1.52
Tier 3	20	36,373	18,413	1.98
Tier 4	21+	39,606	17,532	2.26
Non-Residential		90,866	56,454	1.61
Tier 1	5	4,274	3,826	1.12
Tier 2	6+	86,592	52,629	1.65
Hydrant		3,032	824	3.68

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

Equivalent meters are based on meter hydraulic capacity. Equivalent meters represent the potential demand on the water system in terms of the base or smallest meter size. A ratio of hydraulic capacity is calculated by dividing large meter capacities by the base meter capacity. The base meter is the smallest meter, in our case, a 3/4-inch meter. The actual number of meters by size is multiplied by the corresponding capacity ratio to calculate equivalent meters. The capacity ratio is calculated using the meter capacity in gallons per minute (gpm) provided in the AWWA M1 Manual (7th Edition). Table 3-13 shows the equivalent meters for FY 2024.

Table 3-13: Equivalent Meters

Meter Size	Capacity (gpm)	AWWA Ratio	Number of Meters	Equivalent Meters
5/8" or 3/4"	30	1.0	8,122	8,122
1"	50	1.7	12,888	21,479
1 1/2"	100	3.3	253	843
2"	160	5.3	465	2,480
3"	350	11.7	43	500
4"	630	21.0	36	752
6"	1300	43.3	11	488
Total			21,817	34,663

Table 3-14 allocates the O&M expenses and asset values to each cost component. The functional costs are allocated according to industry standards based on the nature of the water function. For example: water supply and production costs are allocated 100 percent to the Supply component. Treatment costs are allocated on the basis of Max Day because plants are designed to meet Max Day demand. Distribution costs are allocated on the basis of Max Hour and fire supply because distribution systems are designed to meet instantaneous peaks (Max hour) and fire flow requirements. Utility billing costs are allocated 100 percent to the Customer component. Some costs, which cannot be readily classified into one of the functions, are allocated to General and then spread amongst all the other cost causation components proportionate to the overall cost allocation.

Table 3-14: Allocation of Functionalized O&M and Capital Expenses to Cost Causation Components - Water

O&M Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Supply (Surface Water)	100%									100%
Production (Wells)	100%									100%
Treatment		48%	52%							100%
Distribution		22%	24%	44%	10%					100%
Utility Billing								100%		100%
Transfer to Capital R&R		36%	37%	18%	6%		1%		2%	100%

O&M Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Supply (Surface Water)	\$12,090,971	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,090,971
Production (Wells)	\$2,503,519	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,503,519
Treatment	\$0	\$1,090,869	\$1,199,956	\$0	\$0	\$0	\$0	\$0	\$0	\$2,290,824
Distribution	\$0	\$1,094,220	\$1,220,477	\$2,230,526	\$505,025	\$0	\$0	\$0	\$0	\$5,050,248
Utility Billing	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,309,529	\$0	\$2,309,529
Transfer to Capital R&R	\$0	\$977,032	\$987,766	\$490,392	\$151,322	\$0	\$19,924	\$0	\$59,861	\$2,686,296
TOTAL O&M EXPENSES	\$14,594,490	\$3,162,121	\$3,408,198	\$2,720,918	\$656,347	\$0	\$19,924	\$2,309,529	\$59,861	\$26,931,388
TOTAL O&M Allocation, %	54.2%	11.7%	12.7%	10.1%	2.4%	0.0%	0.1%	8.6%	0.2%	100%

Capital Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Land									100%	100%
Well		100%								100%
Reservoir		43%	47%		10%					100%
Distribution		22%	24%	44%	10%					100%
Transmission		43%	47%		10%					100%
Buildings									100%	100%
Machinery & Equipment							100%			100%
Vehicles									100%	100%
Pumps		48%	52%							100%
Treatment Plant		48%	52%							100%
Non-Potable										

Capital Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Land	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$62,556	\$62,556
Well	\$0	\$4,925,469	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,925,469
Reservoir	\$0	\$4,470,940	\$4,970,486	\$0	\$1,049,047	\$0	\$0	\$0	\$0	\$10,490,474
Distribution	\$0	\$14,062,805	\$15,685,436	\$28,666,486	\$6,490,525	\$0	\$0	\$0	\$0	\$64,905,252
Transmission	\$0	\$5,566,622	\$6,188,591	\$0	\$1,306,135	\$0	\$0	\$0	\$0	\$13,061,348
Buildings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,436,693	\$3,436,693
Machinery & Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$1,164,664	\$0	\$0	\$1,164,664
Vehicles	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Pumps	\$0	\$1,191,739	\$1,310,913	\$0	\$0	\$0	\$0	\$0	\$0	\$2,502,653
Treatment Plant	\$0	\$26,896,087	\$29,585,696	\$0	\$0	\$0	\$0	\$0	\$0	\$56,481,783
TOTAL ASSETS	\$0	\$57,113,662	\$57,741,123	\$28,666,486	\$8,845,707	\$0	\$1,164,664	\$0	\$3,499,249	\$157,030,892
Total Asset Allocation, %	0%	36.4%	36.8%	18.3%	5.6%	0.0%	0.7%	0.0%	2.2%	100%

Table 3-14Error! Reference source not found. shows the total resulting cost causation component allocation for O&M expenses. This resulting allocation is used to allocate the City’s operating revenue requirement to the cost causation components.

Table 3-14 also shows the total allocation for the City’s assets, which are used to allocate the capital costs. The resulting total asset allocation is derived in a similar manner as the O&M allocation - first, Raftelis functionalized the City’s assets and then allocated them to the cost causation components based upon asset function and utilization resulting in the asset total allocation shown at the bottom of Table 3-14. The capital costs are allocated on the basis of assets because the capital costs are used to replace assets, and in the long term all assets need to be replaced. This allocation method also provides a more stable allocation of capital costs, which can vary significantly from year-to-year both in size and in function.

3.5.2. Revenue Requirement Determination

Table 3-15 shows the revenue requirement derivation with the total revenue required from rates. The totals shown in the “Operating” and “Capital” columns are the total O&M and capital revenue requirements, respectively. The total is the rate revenue to be collected through rates. This operating and capital revenue requirement will be allocated to the cost causation components using the allocation percentages shown in Table 3-14 to determine unit costs.

Table 3-15: Water Revenue Requirement Determination

FY 2024	Operating	Capital	Total
Revenue Requirements			
O&M Expenses	\$24,245,092		\$24,245,092
Transfer to Capital R&R	\$2,686,296		\$2,686,296
Existing Debt Service		\$2,835,656	\$2,835,656
Rate Funded Capital Projects		\$2,254,725	\$2,254,725
Reserve Funding		\$0	\$0
Total Revenue Requirements	\$26,931,388	\$5,090,381	\$32,021,769
Less: Revenue Offsets			
Current Services	\$292,964		\$292,964
Other Revenue	\$338,109		\$338,109
Standby Charges		\$38,616	\$38,616
Operating Transfers	\$350,000		\$350,000
Interest Income	\$78,613		\$78,613
Total Revenue Offsets	\$1,059,686	\$38,616	\$1,098,302
Adjustments			
Transfer to (from) Reserves		(\$1,376,156)	(\$1,376,156)
Total Adjustments	\$0	(\$1,376,156)	(\$1,376,156)
Net Revenue Requirement from Rates	\$25,871,702	\$3,675,609	\$29,547,311

Raftelis calculated the revenue requirement using FY 2024 expenses, which include O&M expenses, rate funded capital expenses, and existing and proposed debt service. To arrive at the rate revenue requirement, we subtract revenue offsets from other expenses and adjust for annual cash balances (transfers to or from reserves). The adjustments are added to arrive at the net revenue requirement from rates. This is the amount that fixed charge and commodity rates are designed to collect.

3.5.3. Unit Cost Component Derivation

Our end goal is to proportionately distribute the cost causation components to each user class. To do so we must calculate the cost causation component unit costs, which starts by assessing the total service units demanded by each class for each cost causation component. This is shown in Table 3-16Error! Reference source not found.. The capacity or peaking factor for each customer class is taken from Table 3-12. The total equivalent meters are from Table 3-13.

Table 3-16: Derivation of Service Units - Water

	Monthly Tiers (kgal)	Annual Use (kgal)	Maximum Day Requirements			Maximum Hour Requirements			No. of Meters (Equiv.)	No. of Bills (No.)
			Average Daily Use (kgal/day)	Capacity Factor	Total Capacity (kgal/day)	Extra Capacity (kgal/day)	Capacity Factor	Total Capacity (kgal/day)		
Residential										
Tier 1	5	1,174,264	3,217	1.06	3,410	193	2.02	6,496	3,085	
Tier 2	14	959,379	2,628	1.52	3,995	1,367	2.90	7,610	3,615	
Tier 3	20	226,581	621	1.98	1,229	608	3.77	2,341	1,112	
Tier 4	21+	215,738	591	2.26	1,336	745	4.30	2,544	1,209	
Non-Residential										
Tier 1	5	47,077	129	1.12	144	15	2.13	275	131	
Tier 2	6+	647,621	1,774	1.65	2,928	1,153	3.14	5,576	2,649	
Hydrant		9,893	27	3.68	100	73	7.01	190	90	
TOTAL		3,280,554				4,154		11,891	34,663	261,803

Table 3-17 shows the cost causation component unit cost derivation. The operating revenue requirement shown in Table 3-15 is allocated to the cost causation components using the total O&M allocation from Table 3-14. Similarly, the capital revenue requirement in Table 3-15 is allocated to the cost causation components using the total asset allocation from Table 3-14. General and Administrative costs, which cannot be tied to a specific function, are redistributed in proportion to the resulting allocation of the other cost causation components, except Supply. The Fire cost component represents capacity available in the water system to supply water flow for fire protection and is reallocated to the meter component since all customers share in this capacity cost. To provide revenue stability, a portion of the extra capacity costs is allocated to the meter component to collect approximately 34 percent of the rate revenue from fixed charges. This also covers the City’s fixed costs that are not dependent upon water volume. The total adjusted cost-of-service is divided by the units of service to calculate the unit cost. For example, the unit cost for the base component is determined by dividing the total base cost by total water use in kgal. For another example, annual billing and customer service costs are divided by the estimated number of monthly bills in a year. The unit costs are used to distribute the cost causation components to the customer classes.

Table 3-17: Unit Cost Calculation - Water

	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Operating Expenses	\$14,020,232	\$3,037,699	\$3,274,094	\$2,613,856	\$630,521	\$0	\$19,140	\$2,218,654	\$57,506	\$25,871,702
Capital Expenses	\$0	\$1,336,855	\$1,351,542	\$670,994	\$207,051	\$0	\$27,261	\$0	\$81,907	\$3,675,609
Total Cost of Service	\$14,020,232	\$4,374,554	\$4,625,635	\$3,284,851	\$837,572	\$0	\$46,401	\$2,218,654	\$139,412	\$29,547,311
Allocation of General Cost		\$39,633	\$41,908	\$29,761	\$7,588	\$0	\$420	\$20,101	(\$139,412)	\$0
Allocation of Public Fire Protection Cost					(\$845,160)		\$845,160			\$0
Allocation of Peaking Cost to Meter			(\$4,247,465)	(\$3,016,296)			\$7,263,761			\$0
Total Adjusted Cost of Service	\$14,020,232	\$4,414,187	\$420,079	\$298,315	\$0	\$0	\$8,155,742	\$2,238,755	\$0	\$29,547,311
Unit of Service	3,280,554	3,280,554	4,154	11,891			34,663	261,803		
Unit	kgal	kgal	kgal/day	kgal/day			equiv meters	bills		
Unit Cost	\$4.27	\$1.35	\$101.12	\$25.09			\$19.61	\$8.55		

3.5.4. Distribution of Cost Causation Components to Customer Classes

The final step in a cost-of-service analysis is to distribute the cost causation components to the user classes using the unit costs derived in Table 3-17 to arrive at the cost to serve each customer class. The classes are categorized based on similar land use and water usage habits. Table 3-18 shows the derivation of the cost to serve (i.e., cost-of-service for) each class. The Supply, Base Delivery, Max Day, and Max Hour cost components are collected through the commodity (volumetric) rates (\$/kgal) for potable water. The Meter

and Customer cost components are collected through the City’s monthly meter service charge, thereby providing fixed revenue. The proposed fixed revenue from rates is retained at approximately 34 percent to match the current fixed revenue.

Table 3-18: Allocation of Cost to Customer Class – Water

	Supply	Base Delivery	Max Day	Max Hour	Meter	Customer	TOTAL
Residential							
Tier 1	\$5,018,499	\$1,580,045	\$19,519	\$77,408			\$6,695,471
Tier 2	\$4,100,136	\$1,290,904	\$138,207	\$90,688			\$5,619,935
Tier 3	\$968,350	\$304,879	\$61,516	\$27,900			\$1,362,646
Tier 4	\$922,009	\$290,289	\$75,307	\$30,322			\$1,317,927
Non-Residential							
Tier 1	\$201,194	\$63,345	\$1,565	\$3,279			\$269,383
Tier 2	\$2,767,763	\$871,414	\$116,620	\$66,454			\$3,822,250
Hydrant	\$42,280	\$13,312	\$7,345	\$2,264			\$65,201
Base Meters					\$8,155,742	\$2,238,755	\$10,234,855
TOTAL	\$14,020,232	\$4,414,187	\$513,430	\$364,607	\$7,996,099	\$2,238,755	\$29,547,311

To derive the variable cost to serve each class, the unit costs from Table 3-17 are multiplied by the corresponding service units shown in Table 3-16 for each customer class. For example, the supply cost for the residential class is calculated by multiplying the supply unit cost (\$4.27 per kgal) by the annual residential use in each tier (Table 3-16). Similar calculations for each of the remaining user classes and tiers and cost components yield the total variable cost to serve each user class shown in Table 3-18. Costs charged to meters, including meter and customer costs, are applied to customers based on their meter size. Note that the total cost-of-service is equal to the revenue requirement in Table 3-15, as intended. We have now calculated the cost to serve each user class and can proceed to design rates to collect the cost to serve each class.

Table 3-16 through Table 3-17 are reproduced in Appendix A in a larger font format.

3.6. Water Rate Design

3.6.1. Existing Rate Structure and Rates

The City’s existing rate structure consists of a monthly base charge, which is a fixed charge determined by the size of the meter serving a property. In addition, the City has a four-tiered commodity rate structure for residential customers and a two-tiered rate structure for non-residential customers. Residential customers that include an Accessory Dwelling Unit (“ADU”), in addition to the main dwelling unit, are charged at a Multi-Family rate. ADUs with water use that is separately metered are billed separately from the main dwelling unit at a Single Family rate. Non-potable water customers and customers using water from hydrants, typically for construction purposes, have a uniform rate. Table 3-19 shows the existing rate structure and rates.

Table 3-19: Existing Monthly Water Rates

		Current
Monthly Base Rate		
Meter Size		
5/8" or 3/4"		\$27.61
1"		\$39.03
1 1/2"		\$67.61
2"		\$101.90
3"		\$210.52
4"		\$295.65
6"		\$753.55
Commodity Rate (\$/kgal)		
Residential	Monthly (kgal)	
Tier 1	5	\$3.28
Tier 2	14	\$6.31
Tier 3	20	\$7.41
Tier 4	21+	\$7.64
Non-Residential		
Tier 1	5	\$3.39
Tier 2	6+	\$6.87
Hydrant		\$6.87
Non-Potable		\$1.60

3.6.2. Proposed Monthly Fixed Charge

Table 3-20 shows the derivation of the monthly base charge. The unit costs derived in Table 3-17 feed into the meter charge derivation, as the meter charge is designed to collect the amount of revenue shown in the “Meter” and “Customer” columns of Table 3-20.

Table 3-20: Derivation of the Monthly Fixed Charge

Meter Size	Meter Ratio	Meter	Customer/ Billing	Total Charges	Current Charges	Difference
5/8" or 3/4"	1.00	\$19.61	\$8.55	\$28.16	\$27.61	2%
1"	1.67	\$32.68	\$8.55	\$41.24	\$39.03	6%
1 1/2"	3.33	\$65.36	\$8.55	\$73.91	\$67.61	9%
2"	5.33	\$104.57	\$8.55	\$113.13	\$101.90	11%
3"	11.67	\$228.75	\$8.55	\$237.31	\$210.52	13%
4"	21.00	\$411.76	\$8.55	\$420.31	\$295.65	42%
6"	43.33	\$849.66	\$8.55	\$858.20	\$753.55	14%

Two components comprise the fixed meter charges: meter capacity and customer service (or billing), both of which are described below. This charge recognizes the fact that even when a customer does not use any water, the City incurs fixed costs in connection with maintaining the ability or readiness to serve each connection.

3.6.2.1. Meter Capacity Component

The meter capacity component collects capacity (also known as peaking) related costs. Capacity-related costs can be allocated to and collected through the meter service charge by meter size. This reflects the fact that larger meters have the potential to demand more capacity compared to smaller meters. The potential capacity demanded is proportional to the potential flow through each meter size as established by the AWWA hydraulic capacity ratios, discussed earlier in Table 3-13, and shown in the “Meter Ratio” column of Table 3-20. The ratios show the potential flow through each meter size compared to the flow through a 3/4-inch meter. For example, the “Meter Ratio” column in Table 3-20 shows that the flow through a 2-inch meter is 5.33 times that of a 3/4-inch; therefore, the meter capacity component of the base charge is 5.33 times that of the 3/4-inch meter. The meter capacity component for a 3/4-inch meter is shown in the “Meter” column of Table 3-20, and the capacity component for larger meters is scaled up using the AWWA capacity ratios shown in the “Meter Ratio” column of Table 3-20.

Allocating capacity costs by meter size is a common way to ensure capacity costs are passed on to customers requiring greater capacity in the system. Meter charges provide revenue stability, especially in light of decreasing revenues during a drought or other water shortage.

3.6.2.2. Customer/Billing Component

The customer/billing component recovers costs associated with meter reading, customer billing, and collection, as well as customer service costs. These costs are the same for all meter sizes, as it costs the same to provide billing and customer services to a small meter as it does a larger meter. The customer/billing component is shown in the “Customer/Billing” column of Table 3-20.

3.6.3. Proposed Commodity Rates

3.6.3.1. Residential Tier Definitions

The City’s current rate structure includes four tiers for residential customers. Tier 1 is from 0 to 5 kgal per month, Tier 2 is 6 to 14 kgal per month, Tier 3 is 15 to 20 kgal per month, and Tier 4 is 21 kgal per month or more. The water use patterns in the last few years have been impacted by drought, the Covid epidemic and economic changes; therefore, we have used the data from the previous rate study. Based on the previous rate study, using the last normal consumption patterns, the first tier provided water from the lowest cost source. Tier 2 (6 to 14 kgal per month) represents the FY 2013 and FY 2014 average monthly water usage for residential customers. Tier 3 (15 to 20 kgal per month) represents the FY 2013 and FY 2014 average summer water usage between June and September for residential customers. This allocation provides sufficient outdoor water for an average residential customer. Tier 4 represents usage over 20 kgal per month.

Raftelis proposes that the City retain its existing residential tier definitions to minimize customer impacts and provide rate stability.

3.6.3.2. Non-Residential Tier Definitions

The City's current rate structure includes two tiers for non-residential customers. Tier 1 is from 0 to 5 kgal per month. Tier 2 is 6 kgal per month or more. Raftelis is proposing that the City retains its existing non-residential tier definitions.

The first tier for both residential and non-residential customers was based on the available local groundwater during the last rate study. The total groundwater production spread on all the users resulted in an allocation of five kgal per month per residential dwelling unit and non-residential account.

3.6.3.3. Unit Cost Definitions

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

- Supply
- Base Delivery
- Peaking

Supply costs are costs related to the cost of purchasing and producing water. The City has three sources of water, each incurring different costs, as shown in Table 3-21. The City wishes to provide the minimum 5 kgal of water to each residential unit and non-residential account for essential use; however, because of quality considerations, groundwater alone cannot provide the 5 kgal per account. Water from the BWTP will be used to meet this requirement. Since this is incremental water required from BWTP, only the incremental operating cost is considered along with the fixed cost based on the treatment capacity at BWTP. The incremental variable cost of BWTP is \$325 per ac-ft. BWTP's fixed cost of \$3.1 million, based on the treatment capacity of 16 mgd, results in \$173 per ac-ft for a net cost of \$498/ac-ft or \$1.14 per kgal. The resultant unit cost shown on Line 8 of Table 3-21 is \$1.74 per kgal. It should be noted that both residential and non-residential accounts benefit from this least cost water.

Table 3-21: Allocation of Water Supply

Line No.	Sources			Least Cost Water	RBWTP	Brentwood WTP	Total	
1	Sales Capacity at Source (kgal)			509,092	545,397	2,226,065	3,280,554	
2	Production Costs at Source			\$961,187	\$2,938,968	\$10,120,077	\$14,020,232	
3	Unit Cost by Source, \$/kGal			\$1.89	\$5.39	\$4.55		
4	Actual Addn Sales, Tier 1 Requirements, kgal			922,740				
5	Total Sales, kgal			1,431,832	545,397	1,303,325		
6	Marginal Cost of BWTP			\$1,534,408	\$2,938,968	\$8,585,669	\$13,059,045	
7	Adjusted Cost			\$2,495,595	\$2,938,968	\$8,585,669	\$14,020,232	
8	Unit Cost (\$/kgal)			\$1.74	\$5.39	\$6.59	\$4.27	
9	Unit Cost (\$/AF)			\$567.90	\$1,755.79	\$2,146.40	\$1,392.51	
	Sources (after transfers)			Least Cost Water	RBWTP	Brentwood WTP	Total	
10	Sales (kgal)			1,431,832	545,397	1,303,325	3,280,554	
11	Cost			\$2,495,595	\$2,938,968	\$8,585,669	\$14,020,232	
12	Unit Cost (\$/kgal)			\$1.74	\$5.39	\$6.59	\$4.27	

	Account	Usage (kgal)	Least-Cost Water	RBWTP	Brentwood WTP	Total	Unit Cost	
13	Residential	22,648	2,575,963	1,358,860	517,602	699,501	2,575,963	\$3.79
14	Non-Residential	1,216	694,698	72,972	27,796	593,930	694,698	\$6.03
15	Hydrant	0	9,893	0	0	9,893	9,893	\$6.59
16	TOTAL	23,864	3,280,554	1,431,832	545,397	1,303,325	3,280,554	\$4.27

		Usage (kgal)	Least-Cost Water	RBWTP	Brentwood WTP	Total	Unit Cost	
18	Residential							
19	Tier 1	5	1,174,264	1,174,264	0	0	1,174,264	\$1.74
20	Tier 2	14	959,379	184,596	517,602	257,182	959,379	\$5.01
21	Tier 3	20	226,581	0	0	226,581	226,581	\$6.59
22	Tier 4	21+	215,738	0	0	215,738	215,738	\$6.59
23	Subtotal Residential		2,575,963	1,358,860	517,602	699,501	2,575,963	\$3.79
24	Non-Residential							
25	Tier 1	5	47,077	47,077	0	0	47,077	\$1.74
26	Tier 2	6+	647,621	25,895	27,796	593,930	647,621	\$6.34
27	Subtotal Non-Residential		694,698	72,972	27,796	593,930	694,698	\$6.03
28	Hydrant		9,893	0	0	9,893	9,893	\$6.59
29	TOTAL		3,280,554	1,431,832	545,397	1,303,325	3,280,554	\$4.27

Each source of supply is allocated to each customer class based on the proportional amount of water usage in each class. Within each customer class, each available supply is allocated to each tier based on the use in each tier, with priority given to the lower tiers. For example, the residential class is allocated 1,358,860 kgal of the least-cost water. This principle applies to the non-residential customer class as well.

Base Delivery costs are the operating and capital costs associated with delivering water to all customers at a constant average rate of use – also known as serving customers under average daily demand conditions. Therefore, base delivery costs are spread over all units of water irrespective of customer class or tiers. Based on Table 3-17, the delivery or base unit cost is \$1.35 per kgal.

Peaking or extra-capacity costs represent costs incurred to meet customer peak demands in excess of base use (or average daily demand). Total extra capacity costs are comprised of maximum day and maximum hour demands. The peaking costs are distributed to each tier and class using peaking factors derived from customer use data. Table 3-22 shows the peaking unit cost for each customer class and tier, which is calculated by dividing the total peaking (max day plus max hour) costs for each class and tier from Table 3-18, by the total usage in each class and tier from Table 3-16.

Table 3-22: Peaking Cost Calculation

Customer Class	Monthly Tier (kgal)	Peaking Costs	Usage (kgal)	Unit Cost
Residential				
Tier 1	5	\$96,927	1,174,264	\$0.08
Tier 2	14	\$228,895	959,379	\$0.24
Tier 3	20	\$89,416	226,581	\$0.39
Tier 4	21+	\$105,629	215,738	\$0.49
Non-Residential				
Tier 1	5	\$4,844	47,077	\$0.10
Tier 2	6+	\$183,074	647,621	\$0.28
Hydrant		\$9,609	9,893	\$0.97

Table 3-23 shows the proposed commodity rate for FY 2024 for each customer class, which is the sum of the three previously discussed rate components. The Supply component is from Table 3-21, the Base Delivery component is from Table 3-17, and the Peaking component is from Table 3-22.

Table 3-23: Proposed Commodity Rate

Customer Class	Monthly Tier (kgal)	Supply Supply	Base Delivery	Peaking	Total Rate
Residential					
Tier 1	5	\$1.74	\$1.35	\$0.08	\$3.18
Tier 2	14	\$5.01	\$1.35	\$0.24	\$6.60
Tier 3	20	\$6.59	\$1.35	\$0.39	\$8.33
Tier 4	21+	\$6.59	\$1.35	\$0.49	\$8.43
Subtotal Residential					
Non-Residential					
Tier 1	5	\$1.74	\$1.35	\$0.10	\$3.20
Tier 2	6+	\$6.34	\$1.35	\$0.28	\$7.98
Subtotal Non-Residential					
Hydrant		\$6.59	\$1.35	\$0.97	\$8.91
Non-Potable					\$1.08

3.6.3.4. Non-Potable Water

Non-potable water rates are calculated to recover costs associated with providing non-potable water service. Table 3-24 shows the calculation for the City’s retail non-potable water customers.

Table 3-24: Non-Potable Water Rate Calculation

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Operating Expenses	\$520,812	\$575,329	\$598,564	\$620,562	\$640,287
Capital Expenses	\$0	\$0	\$0	\$0	\$0
Total Expenses	\$520,812	\$575,329	\$598,564	\$620,562	\$640,287
Non-Potable Usage (kgal)	484,299	487,254	488,440	489,834	491,233
Non-Potable Rate (\$/kgal)	\$1.08	\$1.19	\$1.23	\$1.27	\$1.31

3.6.4. 5-Year Proposed Monthly Water Rates

Table 3-25 shows the proposed rates for the next five years. These rates are effective on July 1 of each fiscal year. The City reserves the right to pass through costs that are not within the City’s control, such as water purchase costs, electrical costs, chemical costs, etc. to the proposed rates when such an action is deemed necessary. The financial plan has built-in projected increases in these costs. However, if those increases exceed the projected amount, the additional costs may be recovered through the rates.

Table 3-25: Proposed Monthly Water Rates

	Current	July 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027	
Monthly Base Rate							
Meter Size							
5/8" or 3/4"	\$27.61	\$28.16	\$30.00	\$31.95	\$34.03	\$36.25	
1"	\$39.03	\$41.24	\$43.93	\$46.79	\$49.84	\$53.08	
1 1/2"	\$67.61	\$73.91	\$78.72	\$83.84	\$89.29	\$95.10	
2"	\$101.90	\$113.13	\$120.49	\$128.33	\$136.68	\$145.57	
3"	\$210.52	\$237.31	\$252.74	\$269.17	\$286.67	\$305.31	
4"	\$295.65	\$420.31	\$292.65	\$293.65	\$294.65	\$295.65	
6"	\$753.55	\$858.20	\$913.99	\$973.40	\$1,036.68	\$1,104.07	
Commodity Rate (\$/kgal)							
Residential Monthly (kgal)							
Tier 1	5	\$3.28	\$3.18	\$3.39	\$3.62	\$3.86	\$4.12
Tier 2	14	\$6.31	\$6.60	\$7.03	\$7.49	\$7.98	\$8.50
Tier 3	20	\$7.41	\$8.33	\$8.88	\$9.46	\$10.08	\$10.74
Tier 4	21+	\$7.64	\$8.43	\$8.98	\$9.57	\$10.20	\$10.87
Non-Residential							
Tier 1	5	\$3.39	\$3.20	\$3.41	\$3.64	\$3.88	\$4.14
Tier 2	6+	\$6.87	\$7.98	\$8.50	\$9.06	\$9.65	\$10.28
Hydrant		\$6.87	\$8.91	\$9.49	\$10.11	\$10.77	\$11.48
Non-Potable		\$1.60	\$1.08	\$1.19	\$1.23	\$1.27	\$1.31

3.7. Water Bill Impacts

Table 3-26 shows the impacts of an average residential customer with a 1-inch meter using an average 10 kgal of water monthly.

Table 3-26: Residential Water Monthly Rate Impacts

Residential	Usage (kgal)	Current Bill	Proposed Bill	Difference	\$ Difference	% Bills at or below
Average	10	\$86.98	\$90.14	3.6%	\$3.16	65.2%

4. Wastewater Rates

The following subsections present the findings and recommendations of the wastewater rate study, including system background information, study assumptions, financial plan, cost-of-service analysis, rate design, and projected customer impacts.

4.1. Wastewater System Background

The City wastewater system collects, treats, and disposes of wastewater from over 20,800 connections as of FY 2023. Wastewater is treated at the City’s Wastewater Treatment Plant (WWTP), which has a current capacity of 5.0 million gallons per day (MGD). The WWTP is an extended aeration/activated sludge facility. Its treatment system includes preliminary screening and grit removal, oxidation ditches, and denitrification basins providing biological treatment, secondary clarification, tertiary filtration, chlorine disinfection, dechlorination, and a cascade aeration system.² Treated effluent, if not recycled, is discharged into Marsh Creek. In addition to the treatment plant, the wastewater system includes approximately 200 miles of sewer mains and lateral connections.

4.2. Wastewater Account and Usage Assumptions

Table 4-1 shows that the majority of the City’s wastewater accounts are residential customers. Both the number of accounts and dwelling units are shown for multi-family residential customers, as residential customers are assessed a base and variable charge per dwelling unit but are charged a lateral maintenance fee per account. For single-family residential customers, each dwelling unit corresponds to a single account.

Table 4-1: Projected Wastewater Accounts by Customer Class

Customer Accounts	Actual FY 2022	Projected FY 2023	Budgeted FY 2024	Projected FY 2025	Projected FY 2026	Projected FY 2027	Projected FY 2028
SFR (units)	19,993	20,235	20,502	20,681	20,754	20,839	20,925
MFR (accounts)	72	73	74	75	75	75	76
MFR (units)	2,200	2,227	2,256	2,276	2,284	2,293	2,303
Auto Sales and Repair	20	20	21	21	21	21	21
Barber & Beauty Shop	11	11	11	11	12	12	12
Bakery	2	2	2	2	2	2	2
Car Washes	6	6	6	6	6	6	6
Gas Stations	17	17	18	18	18	18	18
Grocery Stores	12	12	12	12	12	12	12
Hotels without Restaurants	3	3	3	3	3	3	3
Institutions, Churches, HOAs	49	49	50	50	50	51	51
Laundromats	2	2	2	2	2	2	2
Laundry, Commercial	1	1	1	1	1	1	1
Office Buildings, Banks	113	114	115	116	117	117	118
Restaurants	85	86	87	87	88	88	89
Retail Stores	93	94	95	96	96	97	97
Schools	36	36	37	37	37	38	38
Other Commercial	65	66	67	67	67	68	68
Mixed Use	2	2	2	2	2	2	2
TOTAL ACCOUNT	20,581	20,830	21,105	21,290	21,365	21,452	21,540

² 2015 Urban Water Management Plan.

The wastewater accounts are projected to increase by approximately 435 accounts from FY 2024 to FY 2028, based on the City’s General Plan population growth rates, and are typically driven by new residential and nonresidential development, as shown in Table 4-2.

Table 4-2: Wastewater Account Growth

Fiscal Year	Account Growth
2023	1.2%
2024	1.3%
2025	0.9%
2026	0.4%
2027	0.4%
2028	0.4%

Table 4-3 shows the projected billed wastewater flow over the study period by customer class. The revenue calculated for each of the fiscal years in the Financial Plan is a function of the number of dwelling units/accounts, billed wastewater flow, and existing rates. Note that billed wastewater flow for residential customers is based on monthly water usage during the two lowest production winter months when irrigation water is typically not used, and indoor water makes its way to the treatment plant and is capped at 7 kgal per dwelling unit per month. Non-residential billed wastewater flow is based on actual monthly water use since nonresidential customers typically have separate “irrigation only” water service, and water usage does not fluctuate seasonally. Although billed wastewater flow is projected to increase due to account growth, wastewater generation per account is assumed to stay constant throughout the study period since wastewater flow is generated by “indoor” use and does not tend to fluctuate as would “outdoor” or irrigation usage.

Table 4-3: Projected Billed Wastewater Flow by Customer Class, kgal

Billed Water Use	Actual FY 2022	Budgeted FY 2023	Budgeted FY 2024	Projected FY 2025	Projected FY 2026	Projected FY 2027	Projected FY 2028
SFR	1,145,264	1,159,122	1,174,422	1,184,703	1,188,891	1,193,746	1,198,640
MFR	109,569	110,895	112,359	113,342	113,743	114,207	114,676
Auto Sales and Repair	2,055	2,080	2,107	2,126	2,133	2,142	2,151
Barber & Beauty Shop	677	685	694	700	703	706	709
Bakery	213	216	218	220	221	222	223
Car Washes	13,093	13,251	13,426	13,544	13,592	13,647	13,703
Gas Stations	18,090	18,309	18,551	18,713	18,779	18,856	18,933
Grocery Stores	15,256	15,441	15,644	15,781	15,837	15,902	15,967
Hotels without Restaurants	4,468	4,522	4,582	4,622	4,638	4,657	4,676
Institutions, Churches, HOAs	15,820	16,011	16,223	16,365	16,423	16,490	16,557
Laundromats	3,726	3,771	3,821	3,854	3,868	3,884	3,900
Laundry, Commercial	88	89	90	91	91	92	92
Office Buildings, Banks	20,684	20,934	21,211	21,396	21,472	21,560	21,648
Restaurants	45,400	45,949	46,556	46,963	47,129	47,322	47,516
Retail Stores	21,947	22,213	22,506	22,703	22,783	22,876	22,970
Schools	19,950	20,191	20,458	20,637	20,710	20,795	20,880
Other Commercial	14,716	14,894	15,091	15,223	15,277	15,339	15,402
Mixed Use	691	699	709	715	717	720	723
TOTAL BILLED FLOW	1,451,707	1,469,273	1,488,667	1,501,699	1,507,007	1,513,162	1,519,366

4.3. Inflationary and Other Assumptions

This subsection describes the assumptions used in projecting operating and capital expenses as well as reserve coverage requirements that determine the overall revenue adjustments required to ensure the financial stability of the City’s wastewater enterprise. Revenue adjustments represent the average increase in wastewater rates for the City as a whole. Note that rate changes for individual classes will depend on the cost of service.

As with the water rate study, non-rate revenue and O&M projections are based on the City’s FY 2024 projections and projected budgetary increases in FY 2025 through FY 2028. The City uses different inflation factors that are indicative of industry increases for different expenditures within the budget, such as personnel, supplies, or fuel, to capture the impact of market forces over time. On average, the O&M costs are increasing at approximately 6 percent per year.

4.4. Wastewater Enterprise Financial Plan

This subsection of the report provides a discussion of the O&M and capital expenditures, capital improvement financing plan, debt service requirements, and revenue adjustments required to ensure the financial stability of the wastewater enterprise.

4.4.1. Revenue Requirement

A utility’s yearly revenue requirement is the amount of yearly revenue needed to operate, maintain, and ensure fiscal solvency. The revenue requirement includes O&M expenses, rate funded capital expenditures, debt service payments, and reserve funding.

4.4.1.1. O&M Expenses

The City’s wastewater enterprise’s projected O&M expenses are shown in Table 4-4. The Wastewater Financial Plan study period is from FY 2024 to FY 2028. O&M expenses include the cost of wastewater collection, wastewater treatment, billing, and providing lateral maintenance. Table 4-4 summarizes the projected O&M expenses by function.

Table 4-4: Projected Wastewater Enterprise O&M Expenses

	Budgeted FY 2024	Projected FY 2025	Projected FY 2026	Projected FY 2027	Projected FY 2028
Collection	\$3,382,876	\$3,755,002	\$3,926,215	\$4,090,700	\$4,241,368
Treatment	\$7,451,701	\$8,736,141	\$9,117,555	\$9,478,856	\$9,810,965
Utility Billing	\$1,126,916	\$1,183,929	\$1,232,390	\$1,280,597	\$1,322,346
Lateral Maintenance	\$384,016	\$400,829	\$416,848	\$432,948	\$447,344
TOTAL O&M EXPENSES	\$12,345,509	\$14,075,900	\$14,693,008	\$15,283,101	\$15,822,023

4.4.1.2. Capital Improvement Program

Table 4-5 shows the City’s wastewater enterprise rate-funded CIP for FY 2024 through FY 2028, which totals approximately \$5.1 million.

Table 4-5: Detailed Wastewater Enterprise Capital Improvement Plan – Inflated

Capital Improvement Plan (CIP)	Budgeted FY 2024	Budgeted FY 2025	Budgeted FY 2026	Budgeted FY 2027	Budgeted FY 2028
Fund #590 - Wastewater					
80466.00 Transfer to 2015 Lease Rev Bond	\$71,147	\$70,243	\$67,261	\$64,385	\$56,171
80562.00 Transfer to Water Capital Proj - Corp Yard	\$0	\$400,000	\$0	\$0	\$0
80562.00 Transfer to Water Capital Proj - WWTP Admin bldg	\$0	\$1,875,000	\$0	\$0	\$0
Water and WW Laboratory	\$510,000	\$1,290,000	\$0	\$0	\$0
Anaergia Organics	\$0	\$0	\$243,379	\$243,379	\$243,379
Total Wastewater CIP	\$581,147	\$3,635,243	\$310,640	\$307,764	\$299,550

4.4.1.3. Debt Service

The City has debt service associated with an existing SRF loan, which was used to finance an initial WWTP expansion, as well as a planned debt issuance for the WWTP Phase II expansion and recycled water projects. Table 4-6 shows the City’s debt service payments associated with the wastewater enterprise through FY 2028. These schedules were provided by City staff. The financial plan does not include any additional debt issuances. The wastewater treatment plant note was paid off in FY 2023.

Table 4-6: Wastewater Enterprise Debt Service Payments

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Wastewater Treatment Plant Note					
Principal	\$0	\$0	\$0	\$0	\$0
Interest	\$0	\$0	\$0	\$0	\$0
Total Wastewater Treatment Plant Note	\$0	\$0	\$0	\$0	\$0
Wastewater Treatment Plant Expansion II					
Principal	\$0	\$0	\$494,602	\$501,032	\$507,546
Interest	\$0	\$0	\$246,821	\$240,042	\$233,174
Total Wastewater Treatment Plant Expansion II	\$0	\$0	\$741,424	\$741,074	\$740,719
Non-Potable Storage Facility					
Principal	\$118,761	\$119,948	\$121,148	\$122,359	\$123,583
Interest	\$41,311	\$40,123	\$38,924	\$37,712	\$36,489
Total Non-Potable Storage Facility	\$160,071	\$160,071	\$160,071	\$160,071	\$160,071
Citywide Non-Potable Water Distribution System					
Principal	\$0	\$90,603	\$91,509	\$92,425	\$93,349
Interest	\$31,204	\$30,307	\$29,401	\$28,486	\$27,562
Total Citywide Non-Potable Water Distribution System	\$31,204	\$120,910	\$120,910	\$120,911	\$120,911
TOTAL EXISTING DEBT SERVICE	\$191,275	\$280,982	\$1,022,406	\$1,022,056	\$1,021,702

4.4.1.4. Proposed Financial Plan and Revenue Adjustment

The proposed wastewater revenue adjustments help ensure adequate revenue to fund operating expenses, capital expenditures, and compliance with bond covenants. The Financial Plan model assumes the revenue adjustment occurs on July 1 of each year. The proposed revenue adjustments would enable the City to execute the CIP shown in Table 4-5 and meet its debt service coverage requirements over the study period. Without these adjustments, the City would not be able to make debt coverage in FY 2029, just past the rate-setting period, and would have to delay necessary capital projects.

Table 4-7 shows the proposed wastewater enterprise revenue adjustments for FY 2024 through FY 2028. These increases are needed to finance the operating and capital expenses and reserve funding, as well as meeting the debt coverage requirements for the SRF loans.

Table 4-7: Proposed Wastewater Revenue Adjustments

Fiscal Year	Effective Date	Revenue Increase
FY 2024	July 1, 2023	2.0%
FY 2025	July 1, 2024	2.0%
FY 2026	July 1, 2025	2.0%
FY 2027	July 1, 2026	2.0%
FY 2028	July 1, 2027	2.0%

Table 4-8 shows the City’s wastewater enterprise cash flow detail over the next five years.

Table 4-8: Proposed Wastewater Enterprise Cash Flow

	Budgeted FY 2024	Projected FY 2025	Projected FY 2026	Projected FY 2027	Projected FY 2028
Revenue from Existing Rates	\$16,048,529	\$16,189,020	\$16,246,245	\$16,312,593	\$16,379,474
Additional Revenue Required from Rates					
Fiscal Year	Revenue Adjustment	Month Effective			
FY 2024	2.0%	July	\$320,971	\$323,780	\$324,925
FY 2025	2.0%	July		\$330,256	\$331,423
FY 2026	2.0%	July			\$338,052
FY 2027	2.0%	July			\$339,432
FY 2028	2.0%	July			\$346,221
					\$347,641
					\$354,593
Total Additional Revenue from Rates	\$320,971	\$654,036	\$994,400	\$1,344,682	\$1,704,789
Total Rate Revenue	\$16,369,500	\$16,843,057	\$17,240,645	\$17,657,275	\$18,084,263
Current Services	\$39,981	\$41,916	\$43,545	\$45,044	\$46,391
Other Revenue	\$236,283	\$244,570	\$252,015	\$259,835	\$267,925
Standby Charges	\$50,973	\$50,463	\$49,959	\$49,459	\$48,964
Operating Transfers	\$0	\$0	\$0	\$0	\$0
Interest Income	\$487,347	\$391,963	\$363,026	\$344,417	\$321,289
TOTAL REVENUES	\$17,184,084	\$17,571,969	\$17,949,190	\$18,356,031	\$18,768,833
O&M Expenses (excluding Depreciation)					
Collection	\$3,382,876	\$3,755,002	\$3,926,215	\$4,090,700	\$4,241,368
Treatment	\$7,451,701	\$8,736,141	\$9,117,555	\$9,478,856	\$9,810,965
Utility Billing	\$1,126,916	\$1,183,929	\$1,232,390	\$1,280,597	\$1,322,346
Lateral Maintenance	\$384,016	\$400,829	\$416,848	\$432,948	\$447,344
Existing and Proposed Debt Service	\$191,275	\$280,982	\$1,022,406	\$1,022,056	\$1,021,702
Proposed Debt Service	\$0	\$0	\$0	\$0	\$0
Proposed SRF Debt Service	\$0	\$0	\$0	\$0	\$0
Rate Funded Capital Projects	\$581,147	\$3,635,243	\$310,640	\$307,764	\$299,550
Transfer from Operating to Capital R&R	\$11,579,321	\$1,700,438	\$2,725,188	\$2,820,573	\$2,884,081
TOTAL EXPENSES	\$24,697,252	\$19,692,562	\$18,751,241	\$19,433,493	\$20,027,355
Net Income	(\$7,513,168)	(\$2,120,593)	(\$802,051)	(\$1,077,463)	(\$1,258,522)

Table 4-9 shows the calculated debt coverage for the City’s wastewater enterprise. The City’s debt service payments associated with the wastewater enterprise are split between the wastewater rate fund and the

development impact fee fund. To calculate debt coverage ratios for the wastewater enterprise, total revenue (including development impact fee revenue) and total debt service payments are included. The wastewater enterprise’s debt coverage requirement is 110 percent. With the proposed increases, the City meets and exceeds its debt coverage requirement throughout the study period.

Table 4-9: Wastewater Enterprise Debt Coverage Calculation

	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Projected Wastewater Revenue	\$17,184,084	\$17,571,969	\$17,949,190	\$18,356,031	\$18,768,833
Projected O&M Expenses, less depreciation	\$12,345,509	\$14,075,900	\$14,693,008	\$15,283,101	\$15,822,023
Total Debt Service (for coverage)	\$191,275	\$280,982	\$1,022,406	\$1,022,056	\$1,021,702
Calculated Debt Coverage	2530%	1244%	318%	301%	288%
Required Debt Coverage	110%	110%	110%	110%	110%

The next four figures display the Wastewater Enterprise Financial Plan in graphical format. Figure 4-1 shows the modeled revenue adjustments (blue bars) for the next five years on the left-hand axis and the calculated and required debt coverage requirements shown by the green and red lines respectively on the right-hand axis. The green line, representing debt coverage calculations with proposed increases is above the required debt coverage as shown by the red line. Without the proposed increases, the calculated coverage would drop to just above the requirement in FY 2028 and below the requirement in FY 2029.

Figure 4-1: Proposed Wastewater Enterprise Revenue Adjustments and Debt Coverage Ratio

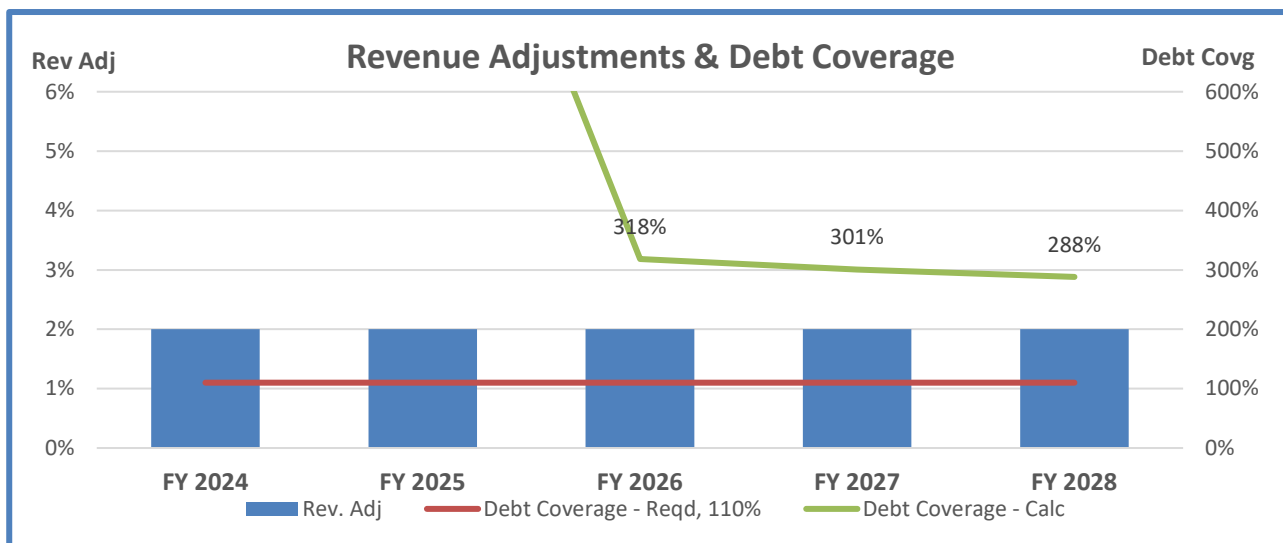


Figure 4-2 graphically illustrates the Wastewater Enterprise Financial Plan – it compares existing and proposed revenues with projected expenses. The expenses (O&M, debt service, capital costs, and reserves transfer) are shown by the stacked bars, and total revenues at existing and proposed rates are shown by the horizontal blue and orange lines, respectively.

Figure 4-2: Proposed Wastewater Enterprise Financial Plan

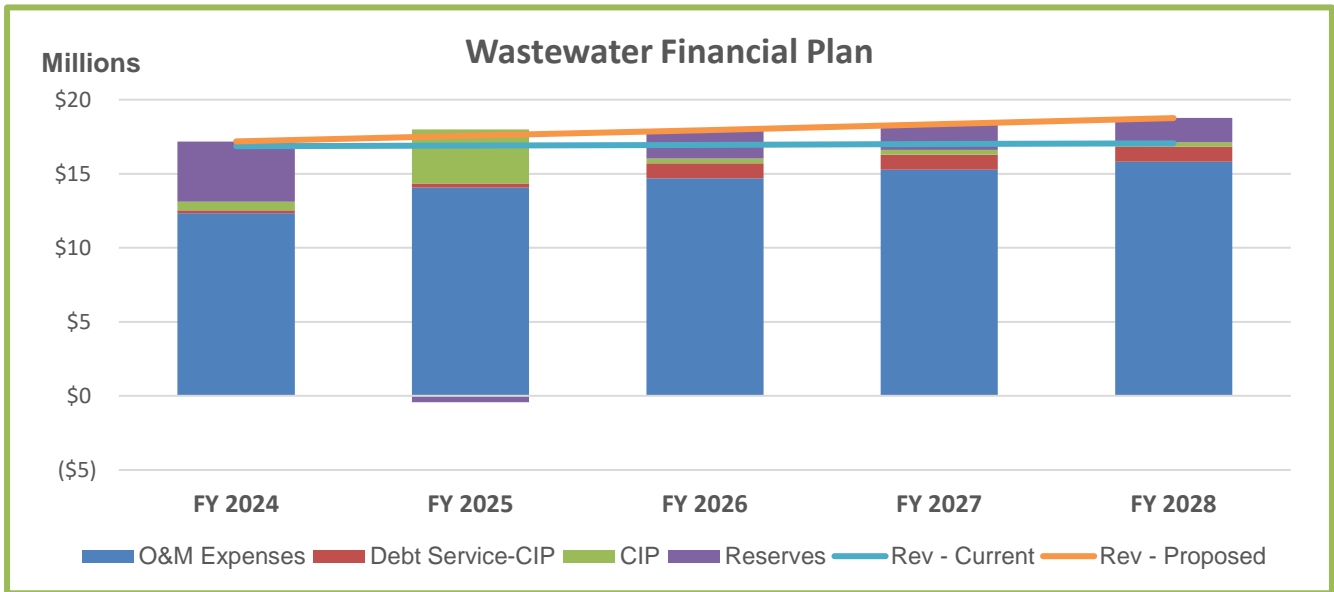


Figure 4-3 summarizes the projected CIP to be funded by wastewater rates.

Figure 4-3: Projected Wastewater Enterprise CIP and Funding Sources

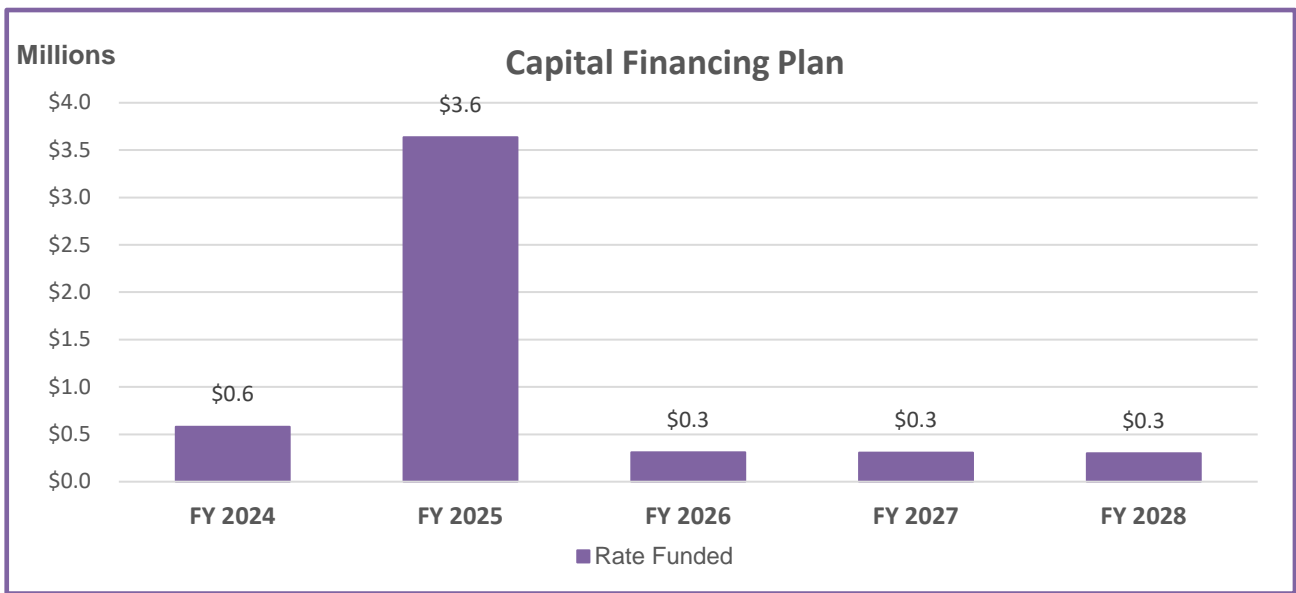


Figure 4-4 displays the resulting fund balance for the wastewater utility. The red line represents the total current target, which is equal to 30 percent of annual operating expenses and debt service payments, based on Budget and Fiscal Policy 2.7.3, adopted April 25, 2017.

Figure 4-4: Wastewater Enterprise Total Cash Balance

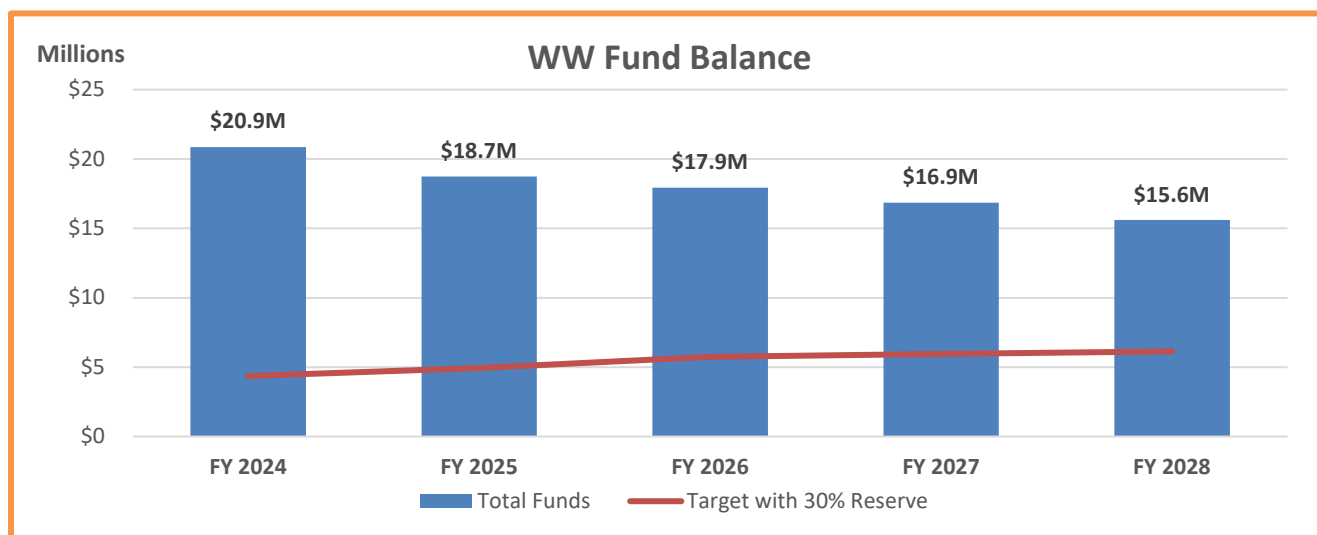


Table 4-10 shows the projected cash balance for the wastewater enterprise. This table corresponds with Figure 4-4.

Table 4-10: Wastewater Enterprise Projected Cash Balance

WW Fund	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Beginning Balance	\$28,367,621	\$20,854,452	\$18,733,860	\$17,931,808	\$16,854,345
Net Cash Flow	(\$7,513,168)	(\$2,120,593)	(\$802,051)	(\$1,077,463)	(\$1,258,522)
Change in Payables/Receivables					
Use of Reserves	\$0	\$0	\$0	\$0	\$0
Ending Balance	\$20,854,452	\$18,733,860	\$17,931,808	\$16,854,345	\$15,595,823
<i>Interest Income</i>	<i>\$487,347</i>	<i>\$391,963</i>	<i>\$363,026</i>	<i>\$344,417</i>	<i>\$321,289</i>

4.5. Wastewater Cost-of-Service Analysis

The total revenue requirement is, by definition, the net cost of providing service. This cost-of-service is then used as the basis to develop unit rates for the wastewater parameters and to allocate costs to the various user classes. The concept of proportionate allocation to user classes implies that allocations should take into consideration the quantity of wastewater a user contributes as well as the strength (i.e., treatment requirements) of the wastewater.

The cost-of-service analysis and rate calculations consist of the following steps:

1. Determination of the total costs to be recovered from rates (cost-of-service)
2. Determination of the wastewater loadings for each customer class, to ensure costs are allocated to each class proportionately
3. Allocation of the cost-of-service to the loading parameters- Flow, Biochemical Oxygen Demand (BOD) and Total Suspended Solids (TSS)
4. Calculation of unit costs for the three parameters and the costs to serve the various user classes based on their loadings
5. Calculation of rates for each user class

This section of the report discusses the allocation of operating and capital costs to the Flow, BOD, and TSS parameters, the determination of unit rates, and the calculation of user class cost responsibility.

In this study, wastewater rates were calculated for FY 2024, and accordingly FY 2024 revenue requirements are used in the cost allocation process.

4.5.1. Costs-of-Service to be Allocated

The annual cost-of-service to be recovered from wastewater rates (i.e., revenue requirement) includes O&M expenses (Table 4-4Error! Reference source not found.), costs associated with annual renewal and replacements, and other capital-related costs (Table 4-5). O&M expenses include costs directly related to the collection, treatment, and disposal of wastewater and maintenance of system facilities. Renewals and replacements represent the annual recurring capital outlay for minor system improvements and purchase of equipment.

The total FY 2024 net cost-of-service to be recovered from the City's wastewater users, as shown on the last line in Table 4-11, is estimated at \$16.4 million, of which \$11.5 million are operating costs and the remaining \$4.9 million are net capital costs including debt service costs. The cost-of-service analysis is based on the need to generate revenues adequate to meet this estimated revenue requirement. As part of the cost-of-service analysis, revenues from sources other than wastewater rates and charges are deducted from the appropriate cost elements. Additional deductions are made for interest income and other non-operating income during FY 2024. Adjustments are also made for transfers from reserves.

Table 4-11: Allocation of Wastewater Revenue Requirements

	FY 2024		
	Operating	Capital	Total
Revenue Requirements			
O&M Expenses	\$12,345,509		\$12,345,509
Existing and Proposed Debt Service		\$191,275	\$191,275
Rate Funded Capital Projects		\$581,147	\$581,147
Transfer from Operating to Capital R&R		\$11,579,321	\$11,579,321
Total Revenue Requirements	\$12,345,509	\$12,351,743	\$24,697,252
Revenue Offsets			
Current Services	\$39,981		\$39,981
Other Revenue	\$236,283		\$236,283
Standby Charges	\$50,973		\$50,973
Interest Income	\$487,347		\$487,347
Total Revenue Offsets	\$814,584	\$0	\$814,584
Adjustments			
Transfer to (from) reserves	\$0	(\$7,513,168)	(\$7,513,168)
Total Adjustments	\$0	(\$7,513,168)	(\$7,513,168)
Cost-of-Service to be Recovered from Rates	\$11,530,925	\$4,838,575	\$16,369,500

To allocate the cost-of-service to the various user classes in proportion to their flow and strength contributions, costs first need to be allocated to selected wastewater cost causation parameters. The following subsection describes the allocation of the operating and capital cost-of-service amounts to the parameters of Flow, BOD, and TSS.

4.5.2. Cost Allocation to Wastewater Cost Causation Parameters

The cost-of-service allocations in this study are based on Raftelis' experience with secondary/tertiary treatment plants and are consistent with the revenue program guidelines of the Water Environment Federation (WEF).

The three main cost causation parameters are Flow, BOD, and TSS. BOD and TSS constitute the strength components of the wastewater discharge. Additional parameters include infiltration and inflow, customers, and laterals. Costs are assigned based on the parameters that dictate the design of each process. The allocation of costs to the three main parameters involves:

- Detailed breakdown and functionalization of O&M costs.
- Itemization of the capital costs by functions such as collection, treatment, outfall, etc.
- Allocation of the functional costs to the wastewater cost causation parameters.

In the absence of a detailed breakdown of fixed assets by process, the WWTP costs are allocated to flow, BOD, and TSS at 50 percent, 25 percent, and 25 percent, respectively. This allocation is representative of other similar treatment plants. Pipelines, outfall, and pumping stations costs are all allocated to flow. Similarly, operating costs identified with the collection system are allocated to infiltration and inflow (I&I) and wastewater flow, and operating treatment costs are allocated in the same manner as the fixed asset costs. Costs that could not be specifically identified were categorized as general costs. General costs are ultimately reallocated based on the proportions of other costs (see Table 4-14 below). Costs of lateral maintenance are allocated to laterals and costs of utility billing to customers. The allocation of O&M and capital costs is shown in Appendix B.

4.5.3. Unit Cost-of-Service

The next step of the cost-of-service analysis is to calculate unit costs for Flow, BOD, and TSS. The unit costs of service are developed by dividing the total annual costs allocated to each parameter by the total annual loadings for each parameter. Raftelis determined the total billed residential wastewater flow based on City data for the lowest two winter water production months, when most usage is typically "indoor" and generates wastewater to be treated, and estimated the non-residential flow at 100 percent of the water use since separate irrigation meters measure the "outdoor" use that does not generate wastewater. The remaining influent was assumed to be infiltration and inflow (I&I) that comes from storm or irrigation runoff or groundwater leakage into the pipes. Raftelis calculated an I&I of just under 10 percent of the total plant influent based on the estimated wastewater flow from customers. The net plant loadings (total influent less I&I) provide a basis for determining unit costs.

The strength of different types of non-residential customers is based on data from the City of Los Angeles and the County Sanitation Districts of Los Angeles County (LACSD). Table 4-12 shows the calculation of the units of service for I&I, residential and non-residential customers using the method described above.

Table 4-12: Mass Balance

		WW Flow (MG/yr)	BOD (lbs/yr)	TSS (lbs/yr)
Total Plant Influent		1,474.76	3,446,091	4,406,074
Less: I&I	9.9%	146.00	243,688	243,688
Net Plant Influent		1,328.76	3,202,403	4,162,386
Non-Residential		179.33	596,408	452,588
Residential		1,149.43	2,605,995	3,709,798

To verify the validity of the assumptions made, the net calculated strength for a residential account is compared against the expected flow and strength from a residential customer. The City serves 22,461 residential units in FY 2023. The calculated loading for each residential unit is:

- Flow 44 gal/capita/day*
- BOD 272 mg/L
- TSS 387 mg/L

**Based on an average density of 3.2 persons per household from the 2021 American Community Survey 5-Year Estimates for the City of Brentwood*

The residential and non-residential wastewater loadings are used in Table 4-13 to develop the FY 2024 units of service. These units of service are then used in Table 4-14 to determine the unit costs for each of the wastewater parameters. These unit costs are then used along with the loadings to develop the cost to be collected from the different customer classes. Note that general costs are reallocated based on the proportions of the other costs. Since the majority of the collection system costs are fixed, to ensure fairness and revenue stability, a portion of the costs allocated to flow are moved to the fixed category under customers. The resultant fixed revenue, which also covers the City’s fixed costs that are not dependent upon water volume, is 40 percent of the total rate revenue, which compares with the current fixed rate revenue of 35 percent.

Table 4-13: Units of Service

Customer Class	WW Flow (kgal)	BOD (lbs/yr)	TSS (lbs/yr)	Units	Accounts	Bills/Year
Residential WW	1,286,781	2,917,402	4,153,105	22,758	20,576	273,094
SFR (capped at 7 kgal/mo)	1,182,635	2,681,281	3,816,972	20,502	20,502	246,022
MFR (capped at 7 kgal/mo)	104,146	236,121	336,133	2,256	74	27,072
Non-Residential Rate Classes						
Low Strength	30,496	21,992	30,492	43	43	517
Medium Low Strength	90,183	124,651	117,623	378	378	4,542
Medium Strength	4,761	11,865	5,194	5	5	62
Medium High Strength	81	454	461	1	1	12
High Strength	56,177	445,318	304,792	101	101	1,212
TOTAL	1,468,478	3,521,683	4,611,667	23,287	21,105	279,439

Table 4-14: Development of Unit Costs

	I&I	WW Flow	BOD	TSS	Customer	Laterals	General	TOTAL
Operating Expenses	\$312,807	\$6,326,870	\$1,740,005	\$1,740,005	\$1,052,560	\$358,678	\$0	\$11,530,925
Capital Expenses	\$189,832	\$2,511,749	\$439,981	\$439,981	\$0	\$95,875	\$1,161,158	\$4,838,575
Total Cost of Service	\$502,639	\$8,838,619	\$2,179,986	\$2,179,986	\$1,052,560	\$454,552	\$1,161,158	\$16,369,500
Allocation of General Cost	\$38,377	\$674,829	\$166,442	\$166,442	\$80,363	\$34,705	(\$1,161,158)	\$0
Allocated Cost of Service	\$541,015	\$9,513,448	\$2,346,428	\$2,346,428	\$1,132,923	\$489,258	\$0	\$16,369,500
Adjustments to Fixed Charges	\$0	(\$4,317,987)			\$4,317,987			\$0
Adjusted Cost of Service	\$541,015	\$5,195,462	\$2,346,428	\$2,346,428	\$5,450,909	\$489,258	\$0	\$16,369,500
Unit of Service	21,105	1,468,478	3,521,683	4,611,667	279,439	21,105		
Units	accounts	kgal WW	lbs/yr	lbs/yr	bills/yr	Accounts		
Unit Cost	\$2.14	\$3.538	\$0.666	\$0.509	\$19.51	\$1.93		
	per month	per kgal WW	per lb	per lb	per month	per month		

4.6. Wastewater Rate Derivation

4.6.1. Existing Rate Structure and Rates

The current wastewater rate structure consists of a base charge, a variable charge, and a lateral maintenance fee. Customers are currently billed monthly. The base charge is levied per dwelling unit for residential customers and per account for non-residential customers. The lateral maintenance fee is levied per account for residential customers only.

Residential customers are subject to a monthly variable charge per unit (kgal) of water used in the two lowest winter months subject to a cap of 7 kgal/mo. Residential monthly billed flow is recalculated each July. Variable charges for new residential customers are based on the citywide residential average wastewater usage. A maximum charge currently caps monthly residential wastewater bills at \$67.64 per month.

Non-residential customers are subject to a monthly variable charge per unit (kgal) of monthly water usage. Non-residential customers fall into one of five strength classes: low, medium low, medium, medium high, and high. Existing rates and fees are shown in Table 4-15.

Table 4-15: Existing Monthly Wastewater Rates

	FY 2023 (Current Rates)
Monthly Base Charge (per dwelling unit)	\$16.92
Monthly Lateral Maintenance Fee (per account)	\$3.33
Residential Variable Charge per unit (\$/kgal)*	\$6.77
Residential Monthly Maximum Charge	\$67.64
Non-Residential Variable Charge (\$/kgal of actual water use)	
Low Strength	\$5.33
Medium Low Strength	\$6.06
Medium Strength	\$6.66
Medium High Strength	\$13.64
High Strength	\$15.08

*Residential users' variable charge is based on water usage during two lowest-use winter months. It is capped at 7 kgal/mo.

4.6.2. Proposed Rates

During the 2018 rate study, the non-residential customers were consolidated into broader strength categories recognizing that wastewater strength can vary widely day-to-day and measurement of strength is not very accurate. Table 4-16 shows each of the five consolidated non-residential customer classes defined by combined strength (the sum of BOD and TSS in mg/L).

Table 4-16: Consolidated Non-Residential Wastewater Customer Classes

Non-Residential Class	Combined Strength (mg/L)
Low Strength	0 - 250
Medium Low Strength	251 - 400
Medium Strength	401 - 800
Medium High Strength	801 - 1,400
High Strength	> 1,400

Table 4-17 shows the proposed wastewater rates for the next five years. Rates are adjusted by the cost-of-service for FY 2024 and then by two percent on July 1 through the rate setting period, FY 2028.

Table 4-17: Proposed Monthly Wastewater Rates

	July 1, 2023	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027
Monthly Base Charge (per dwelling unit)	\$19.51	\$19.91	\$20.31	\$20.72	\$21.14
Monthly Lateral Maintenance Fee (per account)	\$4.07	\$4.16	\$4.25	\$4.34	\$4.43
Residential Variable Charge per unit (\$/kgal)*	\$6.70	\$6.84	\$6.98	\$7.12	\$7.27
Residential Monthly Maximum Charge (capped 7 kgal/mo)	\$70.48	\$71.95	\$73.42	\$74.90	\$76.46
Non-Residential Variable Charge (\$/kgal of actual water use)					
Low Strength	\$4.53	\$4.63	\$4.73	\$4.83	\$4.93
Medium Low Strength	\$5.13	\$5.24	\$5.35	\$5.46	\$5.57
Medium Strength	\$5.76	\$5.88	\$6.00	\$6.12	\$6.25
Medium High Strength	\$10.16	\$10.37	\$10.58	\$10.80	\$11.02
High Strength	\$11.60	\$11.84	\$12.08	\$12.33	\$12.58

*Residential users' variable charge is based on water usage during two lowest production winter months. Capped at 7 kgal/mo.

4.7. Wastewater Bill Impacts

Table 4-18 shows the monthly bill impact of the proposed rates on a residential customer billed the residential average of 4 kgal per month.

Table 4-18: Average Residential Wastewater Monthly Rate Impacts

	Monthly Usage (kgal)	Current Monthly Bill	Proposed Monthly Bill	Difference (\$)	Difference %	% of Bills At or Below
Average	4	\$47.33	\$50.38	\$3.05	6.4%	44%

5. Drought Surcharge

As part of the study, Raftelis calculated the demand reduction surcharge to recover the revenue shortfall that occurs as a result 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 loss of 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 5-1 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 shows the increase in commodity rates that need to be applied to all usage including the tiers for each percentage reduction in usage. A magnified version of this table is presented in Appendix C. Note that the actual reduction achieved under each drought stage is lower than the target.

Table 5-1: Projected Water Demand by Percent Usage Reduction

Usage Data (kgal)	Monthly Tier	Proposed Rates	FY 2024	% Reduction	10% Reduction	% Reduction	20% Reduction	% Reduction	30% Reduction	% Reduction	40% Reduction	% Reduction	50% Reduction
Residential													
Tier 1	5	\$3.18	1,174,264	-2.0%	1,150,779	-7.0%	1,092,066	-10.0%	1,056,838	-15.0%	998,125	-20.0%	939,411
Tier 2	14	\$6.60	959,379	-12.0%	844,254	-25.0%	719,534	-30.0%	671,565	-45.0%	527,659	-55.0%	431,721
Tier 3	20	\$8.33	226,581	-20.0%	181,265	-30.0%	158,607	-50.0%	113,291	-70.0%	67,974	-85.0%	33,987
Tier 4	21+	\$8.43	215,738	-30.0%	151,017	-50.0%	107,869	-75.0%	53,935	-90.0%	21,574	-100.0%	0
Subtotal Residential			2,575,963	-10%	2,327,314	-19%	2,078,076	-26%	1,895,628	-37%	1,615,331	-45%	1,405,119
Non-Residential													
Tier 1	5	\$3.20	47,077	-1%	46,779	-5.0%	44,723	-8.0%	43,311	-10.0%	42,369	-10.0%	42,369
Tier 2	6+	\$7.98	647,621	-5%	615,240	-10.0%	582,859	-15.0%	550,478	-20.0%	518,097	-25.0%	485,716
Subtotal Non-Residential			694,698	-5%	662,019	-10%	627,582	-15%	593,788	-19%	560,466	-24%	528,085
Hydrant		\$8.91	9,893	0%	9,893	0%	9,893	0%	9,893	0%	9,893	0%	9,893
Total Potable Water (kgal)			3,280,554		2,999,227		2,715,551		2,499,310		2,185,690		1,943,097
Total Potable Water (AF)			10,068		9,205		8,334		7,671		6,708		5,964
% Total Reduction					-9%		-17%		-24%		-33%		-41%

The next step is to estimate the water supply cost savings that result when there is a reduction in demand. The City has a take-or-pay contract with CCWD; therefore, the City would continue to take its full allotment from CCWD. Proportional reduction in supply from BWTP and groundwater is used to ensure water quality. 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. Table 5-2 shows the estimated cost savings in the water supply costs for each stage due to the reduction in usage. The total supply assumes a 12 percent water loss from the water usage shown in Table 5-1.

Table 5-2: Estimated Cost Savings by Percent Usage Reduction

	FY 2024	10% Reduction	20% Reduction	30% Reduction	40% Reduction	50% Reduction
SUPPLY (AF)						
Groundwater Wells	1,775	1,623	1,344	704	234	0
CCWD Randall-Bold Treatment Plant	1,902	1,902	1,902	1,902	1,902	1,902
Surface Water	7,763	6,935	6,225	6,111	5,487	4,875
<i>Surface Water - Rock Slough</i>	5,434	4,855	4,358	4,278	3,841	3,413
<i>Surface Water - Old River</i>	2,329	2,080	1,867	1,833	1,646	1,462
Total Potable Supply	11,440	10,460	9,471	8,717	7,623	6,777
FIXED COST (\$)						
Groundwater Wells	\$0					
CCWD Randall-Bold Treatment Plant (1)	\$2,842,965					
Surface Water	\$3,097,331					
TOTAL FIXED COSTS	\$5,940,296	\$5,940,296	\$5,940,296	\$5,940,296	\$5,940,296	\$5,940,296
VARIABLE COST (\$/AF)						
Groundwater Wells	\$456	\$456	\$456	\$456	\$456	\$456
Surface Water	\$325	\$325	\$325	\$325	\$325	\$325
Surface Water - Rock Slough	\$282	\$282	\$282	\$282	\$282	\$282
Surface Water - Old River	\$587	\$587	\$587	\$587	\$587	\$587
TOTAL VARIABLE COSTS	\$6,226,291	\$5,579,030	\$4,956,348	\$4,585,127	\$3,935,641	\$3,401,903
TOTAL WATER SUPPLY COSTS	\$12,166,587	\$11,519,326	\$10,896,643	\$10,525,422	\$9,875,936	\$9,342,198
Cost Savings		\$647,261	\$1,269,944	\$1,641,164	\$2,290,650	\$2,824,388

(1) Take-or-pay contract.

The final step is to calculate the drought surcharge, shown in Table 5-3. First, the projected potable water revenue is calculated by multiplying the demand projections from Table 5-1 for each level of reduction in use or scenario and the proposed water rates in FY 2024. The revenue shortfall is determined by comparing this revenue for each scenario with the FY 2024 revenues. Next, we add the estimated cost savings from Table 5-2 for each scenario. The total shortfall is divided by the projected demand in each scenario to arrive at a uniform dollar increase per unit of water for each scenario. Table 5-3 shows the proposed surcharge that will be effective July 1, 2023. Surcharges for subsequent years would increase by the overall revenue percentage increase of 6.5% shown in Table 3-7. Rates for intermediate conservation goals may be determined by linearly prorating the increases per unit.

Table 5-3: Drought Surcharge by Percent Usage Reduction

	FY 2024	10% Reduction	20% Reduction	30% Reduction	40% Reduction	50% Reduction
Projected Potable Variable Revenue	\$19,178,966	\$17,162,016	\$15,334,702	\$13,811,009	\$11,762,816	\$10,219,536
Revenue Shortfall		(\$2,016,951)	(\$3,844,264)	(\$5,367,958)	(\$7,416,150)	(\$8,959,430)
Cost Savings		\$647,261	\$1,269,944	\$1,641,164	\$2,290,650	\$2,824,388
Net Revenue Shortfall to be Recovered		(\$1,369,690)	(\$2,574,321)	(\$3,726,793)	(\$5,125,500)	(\$6,135,042)
% Revenue Shortfall		8%	17%	27%	44%	60%
\$ Increase per unit - July 1, 2023		\$0.46	\$0.95	\$1.50	\$2.35	\$3.16

APPENDIX A:

Water Cost-of-Service Tables



Table A-1: Allocation of Functionalized O&M Expenses to Cost Causation Components – Water

O&M Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Supply (Surface Water)	100%									100%
Production (Wells)	100%									100%
Treatment		48%	52%							100%
Distribution		22%	24%	44%	10%					100%
Utility Billing								100%		100%
Transfer to Capital R&R		36%	37%	18%	6%		1%		2%	100%

O&M Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Supply (Surface Water)	\$12,090,971	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$12,090,971
Production (Wells)	\$2,503,519	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,503,519
Treatment	\$0	\$1,090,869	\$1,199,956	\$0	\$0	\$0	\$0	\$0	\$0	\$2,290,824
Distribution	\$0	\$1,094,220	\$1,220,477	\$2,230,526	\$505,025	\$0	\$0	\$0	\$0	\$5,050,248
Utility Billing	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,309,529	\$0	\$2,309,529
Transfer to Capital R&R	\$0	\$977,032	\$987,766	\$490,392	\$151,322	\$0	\$19,924	\$0	\$59,861	\$2,686,296
TOTAL O&M EXPENSES	\$14,594,490	\$3,162,121	\$3,408,198	\$2,720,918	\$656,347	\$0	\$19,924	\$2,309,529	\$59,861	\$26,931,388
TOTAL O&M Allocation, %	54.2%	11.7%	12.7%	10.1%	2.4%	0.0%	0.1%	8.6%	0.2%	100%

Table A-2: Allocation of Functionalized Capital Expenses to Cost Causation Components – Water

Capital Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Land									100%	100%
Well		100%								100%
Reservoir		43%	47%		10%					100%
Distribution		22%	24%	44%	10%					100%
Transmission		43%	47%		10%					100%
Buildings									100%	100%
Machinery & Equipment							100%			100%
Vehicles									100%	100%
Pumps		48%	52%							100%
Treatment Plant		48%	52%							100%
Non-Potable										

Capital Allocation	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Land	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$62,556	\$62,556
Well	\$0	\$4,925,469	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,925,469
Reservoir	\$0	\$4,470,940	\$4,970,486	\$0	\$1,049,047	\$0	\$0	\$0	\$0	\$10,490,474
Distribution	\$0	\$14,062,805	\$15,685,436	\$28,666,486	\$6,490,525	\$0	\$0	\$0	\$0	\$64,905,252
Transmission	\$0	\$5,566,622	\$6,188,591	\$0	\$1,306,135	\$0	\$0	\$0	\$0	\$13,061,348
Buildings	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$3,436,693	\$3,436,693
Machinery & Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$1,164,664	\$0	\$0	\$1,164,664
Vehicles	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Pumps	\$0	\$1,191,739	\$1,310,913	\$0	\$0	\$0	\$0	\$0	\$0	\$2,502,653
Treatment Plant	\$0	\$26,896,087	\$29,585,696	\$0	\$0	\$0	\$0	\$0	\$0	\$56,481,783
TOTAL ASSETS	\$0	\$57,113,662	\$57,741,123	\$28,666,486	\$8,845,707	\$0	\$1,164,664	\$0	\$3,499,249	\$157,030,892
Total Asset Allocation, %	0%	36.4%	36.8%	18.3%	5.6%	0.0%	0.7%	0.0%	2.2%	100%

Table A-3: Derivation of Service Units – Water

	Monthly Tiers (kgal)	Annual Use (kgal)	Average Daily Use (kgal/day)	Maximum Day Requirements			Maximum Hour Requirements			No. of Fire Meters (Equiv.)	No. of Meters (Equiv.)	No. of Bills (No.)
				Capacity Factor	Total Capacity (kgal/day)	Extra Capacity (kgal/day)	Capacity Factor	Total Capacity (kgal/day)	Extra Capacity (kgal/day)			
Residential												
Tier 1	5	1,174,264	3,217	1.06	3,410	193	2.02	6,496	3,085			
Tier 2	14	959,379	2,628	1.52	3,995	1,367	2.90	7,610	3,615			
Tier 3	20	226,581	621	1.98	1,229	608	3.77	2,341	1,112			
Tier 4	21+	215,738	591	2.26	1,336	745	4.30	2,544	1,209			
Non-Residential												
Tier 1	5	47,077	129	1.12	144	15	2.13	275	131			
Tier 2	6+	647,621	1,774	1.65	2,928	1,153	3.14	5,576	2,649			
Hydrant		9,893	27	3.68	100	73	7.01	190	90			
TOTAL		3,280,554				4,154		11,891	0	34,663	261,803	

Table A-4: Unit Cost Calculation – Water

	Supply	Base Delivery	Max Day	Max Hour	Fire	Pumping	Meter	Customer	General	TOTAL
Operating Expenses	\$14,020,232	\$3,037,699	\$3,274,094	\$2,613,856	\$630,521	\$0	\$19,140	\$2,218,654	\$57,506	\$25,871,702
Capital Expenses	\$0	\$1,336,855	\$1,351,542	\$670,994	\$207,051	\$0	\$27,261	\$0	\$81,907	\$3,675,609
Total Cost of Service	\$14,020,232	\$4,374,554	\$4,625,635	\$3,284,851	\$837,572	\$0	\$46,401	\$2,218,654	\$139,412	\$29,547,311
Allocation of General Cost		\$39,633	\$41,908	\$29,761	\$7,588	\$0	\$420	\$20,101	(\$139,412)	\$0
Allocation of Public Fire Protection Cost					(\$845,160)		\$845,160			\$0
Allocation of Peaking Cost to Meter			(\$4,247,465)	(\$3,016,296)			\$7,263,761			\$0
Total Adjusted Cost of Service	\$14,020,232	\$4,414,187	\$420,079	\$298,315	\$0	\$0	\$8,155,742	\$2,238,755	\$0	\$29,547,311
Unit of Service	3,280,554	3,280,554	4,154	11,891			34,663	261,803		
Unit	kgal	kgal	kgal/day	kgal/day			equiv meters	bills		
Unit Cost	\$4.27	\$1.35	\$101.12	\$25.09			\$19.61	\$8.55		

APPENDIX B:

Wastewater Cost-of-Service Tables



Table B-1: Allocation of Functionalized O&M and Capital Expenses to Cost Causation Components – Wastewater

O&M Categories	I&I	Flow	BOD	TSS	Customer	Laterals	General	TOTAL
Collection	9.9%	90.1%						100.0%
Treatment		50.0%	25.0%	25.0%				100.0%
Utility Billing					100.0%			100.0%
Lateral Maintenance						100.0%		100.0%
Collection Depreciation	9.9%	90.1%						100.0%
Treatment Depreciation		50.0%	25.0%	25.0%				100.0%

O&M Categories	I&I	Flow	BOD	TSS	Customer	Laterals	General	Total
Collection	\$334,905	\$3,047,972	\$0	\$0	\$0	\$0	\$0	\$3,382,876
Treatment	\$0	\$3,725,850	\$1,862,925	\$1,862,925	\$0	\$0	\$0	\$7,451,701
Utility Billing	\$0	\$0	\$0	\$0	\$1,126,916	\$0	\$0	\$1,126,916
Lateral Maintenance	\$0	\$0	\$0	\$0	\$0	\$384,016	\$0	\$384,016
TOTAL O&M EXPENSES	\$334,905	\$6,773,822	\$1,862,925	\$1,862,925	\$1,126,916	\$384,016	\$0	\$12,345,509
% allocation	2.7%	54.9%	15.1%	15.1%	9.1%	3.1%	0.0%	100.0%

Assets Categories	I&I	Flow	BOD	TSS	Customer	Laterals	General	TOTAL
Land							100.0%	100.0%
Treatment		50.0%	25.0%	25.0%				100.0%
Collection	9.9%	85.1%				5.0%		100.0%
Buildings							100.0%	100.0%
Machinery & Equipment							100.0%	100.0%
Recycled Water							100.0%	100.0%

Assets Categories	I&I	Flow	BOD	TSS	Customer	Laterals	General	TOTAL
Land	\$0	\$0	\$0	\$0	\$0	\$0	\$97,376	\$97,376
Treatment	\$0	\$18,264,540	\$9,132,270	\$9,132,270	\$0	\$0	\$0	\$36,529,081
Collection	\$3,940,166	\$33,869,509	\$0	\$0	\$0	\$1,989,983	\$0	\$39,799,658
Buildings	\$0	\$0	\$0	\$0	\$0	\$0	\$1,061,610	\$1,061,610
Machinery & Equipment	\$0	\$0	\$0	\$0	\$0	\$0	\$23,158	\$23,158
Recycled Water	\$0	\$0	\$0	\$0	\$0	\$0	\$22,918,942	\$22,918,942
TOTAL ASSETS	\$3,940,166	\$52,134,049	\$9,132,270	\$9,132,270	\$0	\$1,989,983	\$24,101,086	\$100,429,824
% allocation	3.9%	51.9%	9.1%	9.1%	0.0%	2.0%	24.0%	100.0%

Table B-2: Derivation of Service Units – Wastewater

Customer Class	WW Flow (kgal)	BOD (lbs/yr)	TSS (lbs/yr)	Units	Accounts	Bills/Year
Residential WW	1,286,781	2,917,402	4,153,105	22,758	20,576	273,094
SFR (capped at 7 kgal/mo)	1,182,635	2,681,281	3,816,972	20,502	20,502	246,022
MFR (capped at 7 kgal/mo)	104,146	236,121	336,133	2,256	74	27,072
Non-Residential Rate Classes						
Low Strength	30,496	21,992	30,492	43	43	517
Medium Low Strength	90,183	124,651	117,623	378	378	4,542
Medium Strength	4,761	11,865	5,194	5	5	62
Medium High Strength	81	454	461	1	1	12
High Strength	56,177	445,318	304,792	101	101	1,212
TOTAL	1,468,478	3,521,683	4,611,667	23,287	21,105	279,439

Table B-3: Unit Cost Calculation – Wastewater

	I&I	WW Flow	BOD	TSS	Customer	Laterals	General	TOTAL
Operating Expenses	\$312,807	\$6,326,870	\$1,740,005	\$1,740,005	\$1,052,560	\$358,678	\$0	\$11,530,925
Capital Expenses	\$189,832	\$2,511,749	\$439,981	\$439,981	\$0	\$95,875	\$1,161,158	\$4,838,575
Total Cost of Service	\$502,639	\$8,838,619	\$2,179,986	\$2,179,986	\$1,052,560	\$454,552	\$1,161,158	\$16,369,500
Allocation of General Cost	\$38,377	\$674,829	\$166,442	\$166,442	\$80,363	\$34,705	(\$1,161,158)	\$0
Allocated Cost of Service	\$541,015	\$9,513,448	\$2,346,428	\$2,346,428	\$1,132,923	\$489,258	\$0	\$16,369,500
Adjustments to Fixed Charge:	\$0	(\$4,317,987)			\$4,317,987			\$0
Adjusted Cost of Service	\$541,015	\$5,195,462	\$2,346,428	\$2,346,428	\$5,450,909	\$489,258	\$0	\$16,369,500
Unit of Service	21,105	1,468,478	3,521,683	4,611,667	279,439	21,105		
Units	accounts	kgal WW	lbs/yr	lbs/yr	bills/yr	Accounts		
Unit Cost	\$2.14	\$3.538	\$0.666	\$0.509	\$19.51	\$1.93		
	per month	per kgal WW	per lb	per lb	per month	per month		

Table B-4: Allocation of Cost to Customer Class – Wastewater

Customer Class	I&I	WW Flow	BOD	TSS	Customer	Laterals	General	TOTAL
Residential WW	\$527,462	\$4,552,617	\$1,943,808	\$2,113,110	\$5,327,149	\$477,001		\$14,941,147
SFR	\$525,559	\$4,184,149	\$1,786,485	\$1,942,085	\$4,799,063	\$475,279		\$13,712,620
MFR	\$1,904	\$368,468	\$157,323	\$171,025	\$528,086	\$1,722		\$1,228,527
Non-Residential								
Low Strength	\$1,104	\$107,894	\$14,653	\$15,514	\$10,082	\$998		\$150,246
Medium Low Strength	\$9,702	\$319,065	\$83,052	\$59,847	\$88,594	\$8,774		\$569,035
Medium Strength	\$131	\$16,845	\$7,906	\$2,643	\$1,200	\$119		\$28,844
Medium High Strength	\$26	\$287	\$303	\$235	\$240	\$24		\$1,115
High Strength	\$2,589	\$198,753	\$296,706	\$155,079	\$23,644	\$2,342		\$679,113

APPENDIX C:

Projected Water Demand Based on Reduction Level



Table 5-1: Projected Water Demand by Percent Usage Reduction

Usage Data (kgal)		Proposed Rates	FY 2024	% Reduction	10% Reduction	% Reduction	20% Reduction	% Reduction	30% Reduction	% Reduction	40% Reduction	% Reduction	50% Reduction
Residential													
Tier 1	5	\$3.18	1,174,264	-2.0%	1,150,779	-7.0%	1,092,066	-10.0%	1,056,838	-15.0%	998,125	-20.0%	939,411
Tier 2	14	\$6.60	959,379	-12.0%	844,254	-25.0%	719,534	-30.0%	671,565	-45.0%	527,659	-55.0%	431,721
Tier 3	20	\$8.33	226,581	-20.0%	181,265	-30.0%	158,607	-50.0%	113,291	-70.0%	67,974	-85.0%	33,987
Tier 4	21+	\$8.43	215,738	-30.0%	151,017	-50.0%	107,869	-75.0%	53,935	-90.0%	21,574	-100.0%	0
Subtotal Residential			2,575,963	-10%	2,327,314	-19%	2,078,076	-26%	1,895,628	-37%	1,615,331	-45%	1,405,119
Non-Residential													
Tier 1	5	\$3.20	47,077	-1%	46,779	-5.0%	44,723	-8.0%	43,311	-10.0%	42,369	-10.0%	42,369
Tier 2	6+	\$7.98	647,621	-5%	615,240	-10.0%	582,859	-15.0%	550,478	-20.0%	518,097	-25.0%	485,716
Subtotal Non-Residential			694,698	-5%	662,019	-10%	627,582	-15%	593,788	-19%	560,466	-24%	528,085
Hydrant		\$8.91	9,893	0%	9,893	0%	9,893	0%	9,893	0%	9,893	0%	9,893
Total Potable Water (kgal)			3,280,554		2,999,227		2,715,551		2,499,310		2,185,690		1,943,097
Total Potable Water (AF)			10,068		9,205		8,334		7,671		6,708		5,964
% Total Reduction					-9%		-17%		-24%		-33%		-41%