CITY OF

San Diego

Water Financial Plan, Cost of Service, and Rate Study

Final Report / March 31, 2023

RAFTELIS

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March 31, 2023

Ms. Lisa Celaya
Executive Assistant Director
City of San Diego
9192 Topaz Way
San Diego, CA 92123

Subject: Water Financial Plan, Cost of Service, and Rate Study Report

Dear Ms. Celaya,

Raftelis is pleased to provide this Water Financial Plan, Cost of Service and Rate Study Report (Report) for the City of San Diego (City).

The major objectives of the study include the following:

- Develop a financial plan forecast which maintained the financial health of the utility. This forecast was developed to ensure that revenue from rates and other sources meet annual operating expenses, payments on existing and proposed debt service, provide funding for the capital improvement program, and satisfy debt service coverage and reserve targets.
- Develop a comprehensive cost of service analysis which allocated the cost to provide service to each customer class.
- Develop cost of service rates which meet the City's policy objectives and comply with legal and statutory requirements.
- Develop a rate model for use by the City

The Report summarizes the key findings and recommendations related to the development of the financial plan for the water utility, the cost of service analysis and the development of the water rates.

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

Sincerely,

Todd Cristiano

Todd Cristiano
Senior Manager

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Executive Summary

Introduction

The City of San Diego (City) retained Raftelis to conduct a comprehensive financial planning, cost of service, and rate design study for its water utility. The City's overall objectives for this study included:

- Develop a multi-year financial plan, FY 2024 through FY 2025 (study period), for the Water Fund to ensure that revenues from rates, fees and charges, are sufficient to fund annual operating expenses, the capital improvement program net of bond and loan proceeds and meet the City's reserve and debt service coverage requirements.
- Undertake a comprehensive cost of service analysis for the water utility to determine the costs of serving the various customer classes for the study period.
- Design rates for the Study period which reflect cost justified revenue recovery from each customer class.
- Develop a comprehensive rate model for the City's future financial planning and rate analysis.
- Comply with Proposition 218, Proposition 26, California Government Code Section 66013, the California Urban Water Conservation Council (CUWCC) Best Management Practices, and other regulatory requirements.
- Provide appropriate education and public outreach to the City Council, the general public, and other stakeholders to ensure successful implementation of current and upcoming rate cases.

Where appropriate, Raftelis applied industry best practices of cost causation methodologies supported by the American Water Works Association (AWWA) *Manual M1: Principles of Water, Rates, Fees, and Charges (7th Edition)* in the development and design of the proposed water rates.

Study Findings and Conclusions

FINANCIAL PLAN

Projected water sales revenues at existing rates will be inadequate to meet the water utility's revenue requirements throughout the study period. Table 1 illustrates the recommended rate revenue adjustments. These adjustments are required to pay for future water utility operating expenses, fund the capital improvement program, provide adequate reserves, and satisfy debt service coverage requirements throughout the study period. In addition, rate revenue should be sufficient to fund the purchased water costs from the San Diego County Water Authority (CWA), the City's wholesale water provider. The increases necessary to cover CWA costs are shown below as "Pass-Through" increases.

Table 1: Projected Rate Revenue and CWA Water Pass-Through Adjustments

Description	FY 2024	FY 2025
Rate Revenue Increase	6.6%	4.3%
Water Purchases Pass-Through Increase	3.6%	4.4%
Total Annual Increase	**10.2%**	**8.7%**
Compounded Increase	**10.2%**	**19.8%**

COST OF SERVICE ANALYSIS

The cost of service analysis applies a methodology that distributes the test year[1] revenue requirement to customer classes based on the principle of cost causation. Cost causation is the process of assigning costs to functional areas in the system and allocating those costs based on the operating function or design parameter of that facility. This allocation process considers the volume, the rate of use (average or above average), and the number and meter size of customers within the class. Those allocated costs are proportionately distributed to customer classes based on their demand characteristics. In other words, those who cause the cost, pay the cost.

The cost of service by customer class is shown in Table 2 for the test year FY 2024. This table compares the cost to provide service to each class to the revenues by customer under the status quo scenario in which all rates are increased in an across-the-board (ATB) fashion by 10.2%, shown in Table 1. The cost of service by customer class compared to the projected revenues under the status quo scenario is shown in the last two columns of Table 2. As indicated, the results of the cost of service analysis results in a shifting of costs among the customer classes reflecting the changes in cost components and customer class usage characteristics from the prior cost of service study supporting the City's existing rates.

Table 2: Cost of Service Summary

	FY 24 Status Quo - ATB		FY 24 Cost of Service		Change from Status Quo	
Customer Class	Revenue	Percent	Revenue	Percent	Dollars	Percent
Single Family Residential	$258,327,829	42.5%	$238,829,066	39.3%	($19,498,762)	-7.5%
Multi-Family Residential	$135,308,920	22.3%	$141,000,440	23.2%	$5,691,520	4.2%
Comm / Industrial / Outside City	$132,638,783	21.8%	$139,991,490	23.0%	$7,352,707	5.5%
Irrigation	$74,103,413	12.2%	$79,438,790	13.1%	$5,335,378	7.2%
Temp Construction	$3,259,918	0.5%	$3,481,200	0.6%	$221,282	6.8%
Private Fire Protection	$3,733,452	0.6%	$4,631,328	0.8%	$897,876	24.0%
Total	**$607,372,314**	**100%**	**$607,372,314**	**100%**	**$0**	**0%**

RATE DESIGN

In the development of schedules of water rates for each customer class, a basic consideration is to establish charges to the customers in the class commensurate with the cost of providing service to the customers in the class. The cost of service analysis serves as the basis of determining the cost to serve each class based on their particular service requirements[2]. The City's customer classes have been developed to capture groups of customers that have similar service characteristics.

The City has the following customer classes: single family residential, multi-family residential, commercial/industrial/outside City, irrigation, temporary construction meters, and private fire protection. Most of the City's customers are billed bimonthly with a small number billed monthly. The City's current rate structure consists of a base fee which varies by meter size and a volume rate which varies by class. The single family residential volume rate is a 4-tiered structure. The multi-family, commercial, and irrigation classes have a uniform rate which varies by class. Tables 3 through 5 show the comparison of current rates to the cost of service rates for the study period. The fixed charges shown are monthly. The bimonthly fixed charge is twice the monthly amount. The tier breakpoints for bimonthly single family rates are double the monthly tier breakpoints. For example, tier 1 for a customer billed monthly is 0 to 4 hundred cubic feet (hcf). The tier 1 breakpoint for a bimonthly single family customer is 0 to 8 hcf or 2x the monthly threshold. This study proposes to adjust those breakpoints as shown in Table 4.

[1] Test year refers to the year selected in the financial plan to develop cost of service and design rates.
[2] Customer class service parameters include average and peak demands, number of customers and equivalent ¾" meters.

Table 3: Comparison of Current and Proposed Fixed Charges
FY 2023 – FY 2025
$ per monthly bill

Meter Size	Current FY 2023	Status Quo FY 2024	Cost of Service FY 2024	FY 2025
Adopted:	Jan. 2023	Nov. 2023	Nov. 2023	Jan. 2025
5/8", 3/4"	$27.77	$29.60	$25.15	$27.33
1"	$36.77	$39.19	$40.66	$44.19
1.5"	$57.37	$61.16	$79.43	$86.32
2"	$83.11	$88.59	$125.97	$136.89
3"	$143.59	$153.07	$288.83	$313.87
4"	$229.83	$244.99	$482.71	$524.56
6"	$443.47	$472.74	$1,118.64	$1,215.63
8"	$700.86	$747.12	$1,715.80	$1,864.57
10"	$1,002.01	$1,068.14	$3,259.10	$3,541.69
12"	$1,859.13	$1,981.84	$4,112.18	$4,468.74
16"	$3,232.34	$3,445.67	$6,051.01	$6,575.68

Table 4: Comparison of Current and Proposed Commodity Rates
FY 2023 – FY 2025
$ per hcf

Customer Class	Tier Breakpoints		Current FY 2023	Status Quo FY 2024	Cost of Service FY 2024	FY 2025
Adopted:	Current	Proposed	Jan. 2023	Nov. 2023	Nov. 2023	Jan. 2025
Single Family Residential						
Tier 1	0 to 8	0 to 10	$5.55	$5.92	$6.40	$6.95
Tier 2	9 to 24	11 to 22	$6.22	$6.63	$7.24	$7.87
Tier 3	25 to 36	Above 22	$8.88	$9.47	$9.12	$9.91
Tier 4	Above 36		$12.49	$13.31		
Multi-Family Residential			$6.72	$7.16	$7.52	$8.17
Commercial / Industrial / Outside City			$6.55	$6.99	$7.33	$7.97
Irrigation			$7.45	$7.94	$8.62	$9.37
Temp Construction			$7.57	$8.07	$8.26	$8.98

Table 5: Comparison of Current and Proposed Private Fire Service Fees
FY 2023 – FY 2025
$ per monthly bill

Fireline Size	Current FY 2023	Status Quo FY 2024	Cost of Service FY 2024
Adopted:	Jan. 2023	Nov. 2023	Nov. 2023
1"	$4.13	$4.40	$2.32
1.5"	$4.13	$4.40	$3.15
2"	$6.40	$6.82	$4.59
3"	$24.77	$26.41	$9.75
4"	$31.67	$33.76	$18.64
6"	$46.78	$49.87	$50.56
8"	$66.07	$70.43	$105.63
10"	$85.35	$90.98	$188.45
12"	$101.85	$108.58	$303.25
16"	$165.16	$176.06	$644.10
20"	$205.64	$219.21	$1,156.81

Revisions to Final Report

As part of the rate study process, the City's Independent Budget Analyst (IBA) engaged with Stantec to review the Draft Rate Study Report dated November 11, 2022. Stantec suggested four changes, which were all accepted by the City and Raftelis and incorporated into this final report. The changes included:

1. Revision of the methodology used to develop peaking factors used to allocate costs,
2. Review of new data provided by the San Diego Fire-Rescue Department to update assumptions regarding required fire flows,
3. Adjust the standard AWWA meter capacity ratios using information on the City's actual meters in service,
4. Recover full CWA fixed costs in the City's fixed charges.

This report also includes an update to the City's forecasted water purchase costs based on the latest available information from the San Diego County Water Authority (CWA).

Introduction

Study Background

The City's water system serves the City and the cities of Del Mar, Coronado and Imperial Beach, providing water to retail, wholesale, and recycled water customers. The water system's service area covers 404 square miles, including 325 square miles of the City, and a population of approximately 1.4 million people as of January 1, 2020.

The City, through its Public Utilities Department (PUD), operates the water system as a self-supporting enterprise, with revenues and expenditures accounted for separately from other enterprise and General Fund activities. The City and PUD are tasked to protect the long-term interests of water customers with respect to rate pricing, service quality and reliability of essential services, including system reliability during instances of highest possible demand. To achieve this objective, the PUD must consider the need for the water system to remain financially viable and provide reliable, safe, and secure water services to its consumers at all times. Promoting economic efficiency and long-term investment in facilities are factors that the PUD must consider in system planning and ratemaking.

The City retained Raftelis to complete a comprehensive water financial plan, a cost of service analysis, and propose a rate structure to recover the cost of service from the various classes of customers.

Report Organization

This report contains the following sections:

- ***Executive Summary***. Summarizes the study results for the water financial plan, cost of service analysis and rate design.
- ***Introduction and Background***. Provides an overview and purpose of the study as well as key components of the study process.
- ***Financial Plan***. Details the development of the financial plan, discussion of operating expenses, capital expenditures, debt service, reserve requirements, debt service coverage, and additional bonds test requirements.
- ***Cost of Service Analysis***. Details the process for functionalizing, allocating, and distributing the revenue requirement to customer classes.
- ***Rate Design***. Details the process for allocating the revenue requirement allocated to each class to the fixed charge fee and volumetric rate to calculate the rates for each customer class, including the calculation of the tiered volumetric rates for the single family residential customer class.

The City's financial operations are reported on a fiscal year basis. The fiscal years are the twelve month periods ending June 30 of each year. In this report the fiscal years are shown as FY XXXX.

Rate Setting Process

The rate setting process involves three steps: first, a revenue requirement is established which represents the total level of revenue required to recover the utility's necessary operating and capital expenditures; second, this revenue requirement is attributed to customer classes based on the design and operation of the water system and the

demand placed on that system by customer classes; finally, rates are designed which recover customer class cost of service.

REVENUE REQUIREMENTS

The revenue requirements analysis determines the overall level of revenue required to support the utility's required operating and capital costs. The revenue requirement is then allocated to customer classes in proportion to the demands they place on the water system in the cost of service analysis. The methodology used in the study to establish the revenue requirement is consistent with industry practice as established by the American Water Works Association (AWWA) in the Seventh Edition of the *Manual of Water Supply Practices M1, Principles of Water Rates, Fees, and Charges.* This methodology involves developing a multi-year financial plan, which identifies the revenue requirement in each year. The revenue requirement from a single year, called a "test-year" is then used as the basis for the cost of service analysis and rate design.

COST OF SERVICE ANALYSIS

The second step of the rate setting process, the cost of service analysis, attributes the total revenue requirement to customer classes based on each class's use of the water system. Each customer class places a different level of demand on the system – demands that the City's water system is designed and operated to meet. The revenue requirement developed is a function of meeting the demands of City customer classes. In other words, customer class demands are cost drivers and the cost of service analysis establishes the nexus between how the system is designed and operated and how different types of customers are using the system. The cost of service analysis involves three primary steps: *cost functionalization*, which relates the revenue requirement to the major operating functions of the water system; *cost allocation*, which relates these functional costs to demand components which represent the types of demand that drive these functional costs; and *cost distribution*, which attributes the allocated costs by demand component to each customer class in proportion to that class's share of demand.

The cost of service analysis involved analyzing the characteristics of each customer class such as demand factors or different delivery costs, service characteristics and demand patterns. This analysis included a review of such matters as system operations and water usage data—e.g., capacity (maximum day and maximum hour demands)[3], commodity (average day demand), number of customers, customer service[4], equivalent meter size, and public fire protection services[5]. The impact that these matters have on system operations determined how the costs were allocated among the various customer classes. By calculating the cost of service for each customer class in this step, we ensure that the rates calculated in the next step proportionately allocate the system's costs to the customer classes.

RATE DESIGN

As noted above, the financial plan determines the test year revenue requirement, and the cost of service analysis allocates the revenue requirement to customer classes. In the rate design step, we allocate each customer class cost of service to the monthly fixed charge and volumetric charge for each customer class. Next, we decide whether to use a uniform or tiered rate structure for each customer class. Finally, we calculate the uniform rate or tiered rates

[3] The term "capacity " refers to the system's ability to supply water to all delivery points at the time when demanded. A system's facilities are built and operated at the size necessary to meet water demand at the time of the highest demand on the system -- a peak demand event. The costs to size the system to meet peak demand include operating and capital costs for facilities to meet peak demand, including treatment, storage, distribution and transmission costs. Both the operating costs and the capital assets-related costs for the system facilities sized to meet peak demand are allocated to each customer classes based upon the class's projected peak demand.

[4] For example, the single family residential customer class uses a greater percentage of the City's customer support services than the percentage of water consumed by the single family residential customer class.

[5] This refers to the need to increase the size of transmission and distribution lines to provide public fire protection requirements.

for each customer class. For each customer class, the amount collected through the fixed charge and the volumetric rate(s) must equal the revenue requirement for the customer class.

Reliance on City Provided Data

During this project, the City (and/or its representatives) provided Raftelis with a variety of technical information, including cost and revenue data. Raftelis reviewed the data provided for reasonableness but did not independently assess or test for the accuracy of such data – historic or projected. Raftelis has relied on this data in the formulation of our findings and subsequent recommendations, as well as in the preparation of this report. Raftelis also relied on cost allocation data provided by the City needed to complete the cost of service analysis.

There are often differences between actual and projected data. Some of the assumptions used for projections in this report will not be realized, and unanticipated events and circumstances may occur. Therefore, there are likely to be differences between the data or results projected in this report and actual results achieved, and those differences may be material. As a result, Raftelis takes no responsibility for the accuracy of data or projections provided by or prepared on behalf of the City, nor do we have any responsibility for updating this report for events occurring after the date of this report.

In conducting the cost of service analysis, Raftelis reviewed the books, records, agreements, capital improvement programs, customer sales, and financial projections for the City's water system. The documents, information and data were provided to the consultant by the City. Raftelis also conferred with City staff, including finance, planning, and engineering staff.

In the study, Raftelis made rate calculations using the best estimates of the City's expected costs, planned capital improvements, and future customer demands. Making such calculations in advance is normal for public water providers because providers need to recover revenue matched to public budgets adopted in advance of their fiscal periods. For this reason, and others, achieving mathematical exactitude in rate calculations is impossible. Instead, there are methods and techniques available to water providers that yield reasonable proportionality between the costs incurred to provide water service and the demand for that service. These methods and techniques are broadly referred to as "cost-of-service principles".

Financial Plan

Introduction

The City accounts for the operation of its water utility system through an enterprise fund known as the Water Utility Fund (Water Fund) that is managed by the Public Utilities Department. The Water Fund is a self-supporting enterprise fund. This means that the cost of annual water operations and maintenance (O&M) expenses, capital projects, debt service, and reserve requirements is met through cash inflows from water rates, capacity fees, miscellaneous revenues, and the proceeds from external debt financing. Some of the expenses incurred by the City of San Diego to provide recycled water service are also included in water utility expenses.

The water system operates in an area subject to strict regulatory oversight by Federal and State agencies such as the U.S. Environmental Protection Agency (USEPA), California Division of Drinking Water (DDW), California Department of Public Health (DPH), and the San Diego County Air Pollution Control District. The water system must comply with a multitude of laws including, but not limited to, the Safe Drinking Water Act. Complying with these regulations and resulting mandates contributes to a large share of the cost burden on the system.

Financial Plan and Revenue Requirement

For the first step in the study, we analyzed the water system's past revenues and projected expenses to determine the total revenue requirement for the water system in the test year. The total revenue requirement is the total receipts that the City must recover from its rates to pay all operating, capital, debt and reserve expenses during the test year. In preparing the financial plan and calculating the total revenue requirement, Raftelis reviewed the books, records, agreements, capital improvement programs, debt and reserve policies, customer sales, and financial projections for the City's water system.

For the purposes of this study, water utility financial information has been subdivided into two primary sub-funds; operating and capital. Separate financial forecasts have been made for the operating and capital sub-funds for the study period to determine the adequacy of revenues under existing rates to meet revenue requirements.

Operating Fund

The operating fund tracks financial activities associated with annual operating revenues and revenue requirements.

BEGINNING FUND BALANCE

The total beginning fund balance for FY 2024 is projected to be $381.7 million which consists of $166.4 million of operating reserves and $215.3 million of unrestricted reserves discussed later in this report.

REVENUES

Revenue of the water utility is derived primarily from water sales revenue. Water sales from existing rates represent approximately 85% of total revenue. Water sales are expected to average 156,305 acre-feet, which is a reduction of five thousand acre feet from FY 2022 levels, due to additional conservation in response to drought mandates in the region. The only projected growth rate is for the number of accounts of 0.25% per year with no changes in the use per capita per account.

Annual revenue adjustments are a combination of rate revenue adjustments and water pass through adjustments. The rate revenue adjustments are required to meet annual departmental needs, while the water pass-through increases are needed to recover increasing costs passed on by the CWA over which the City has no control. The water pass-through costs are passed directly to the customer. The proposed rates are intended to recover these expenses; however, if water purchase costs are greater than expected, the City may need to implement additional rate increases to recover pass through costs which exceed these projections.

Other water revenue includes potable water sales to California American Water (CalAmerican) which Cal American resells to its customers and the sale of wholesale reclaimed water to three different wholesale accounts. Other operating revenue includes miscellaneous service charges, new water charges, property leases and rentals, and averages $17.4 million annually. Table 6 summarizes the annual sources of revenue for the study period.

Table 6: Revenue Summary ($ millions)

Description	FY 2024	FY 2025
Rate Revenue		
Revenue from Existing Rates	$551.4	$551.7
Revenue from Rate Adjustments	$24.3	$49.1
Subtotal Rate Revenue	**$575.6**	**$600.7**
Pass-Through Revenue		
Fixed Pass-Through Revenue	$1.0	$5.2
Commodity Pass-Through Revenue	$18.6	$40.4
Subtotal Pass-Through Revenue	**$19.6**	**$45.6**
Total Rate Revenue	**$595.2**	**$646.3**
Recycled Water/Pure Water Credits	$0.0	$0.0
Other Water Sales	$42.1	$44.6
Other Operating Revenues	$17.3	$17.4
Operating Revenue	**$654.7**	**$708.4**
Subtotal Non-Operating Revenues	$34.4	$34.4
Interest Earning on Operating Fund	$6.8	$5.8
Total Revenues	**$695.9**	**$748.6**

REVENUE REQUIREMENTS

Revenue requirements of the water utility include O&M, debt service, transfers to the capital improvement fund, and funding reserves.

Operation and Maintenance Expenses

O&M consists of the cost of personnel and materials to treat and distribute clean potable water that meets all state and federal requirements 100% of the time. Since these costs are an annual obligation of the water utility, they must be met from annual water sales revenue. Purchased water supply costs are the largest component of O&M expenses, averaging 52% of total expenses over the study period. Purchased water unit costs are projected to increase 3% per year.

Personnel costs consist of salaries and wages and fringe benefits and total $111 million in FY 2024. The COS does not project for the potential impacts of any future Memorandum of Understandings (MOU) with Recognized Employee Organizations (REOs), except for the 3.05% assumed by the San Diego City Employees' Retirement System actuaries. Personnel costs average 41% of total non-water purchase operating expenses over the study period.

Remaining O&M expenses include supplies, contracts, IT, energy and utilities, transfers out to other funds (which includes transfers to the Water Enterprise Asset Management Water Inventory and to record the cash impacts of an asset transfers from other funds), capital expenses for equipment outlay, and miscellaneous debt expenses such as bond-arbitrage rebate expenses and capital lease payments. Debt service obligations, including bond, commercial paper, State Revolving Fund loans (SRF Loans) and Water Infrastructure Finance Innovation Act (WIFIA) loan payments are not considered an O&M expense and are discussed in the following Debt Service section. Table 7 summarizes the operation and maintenance expenses for the study period.

Table 7: Operation and Maintenance Expense Summary ($ millions)

Description	FY 2024	FY 2025	% of Total	% of Total Non-Water Purchases
Purchased Water Supply Costs				
Fixed Costs	$83.6	$87.9	14.6%	
Variable Costs	$211.4	$233.0	37.7%	
Subtotal Purchased Water Supply Cos	**$295.0**	**$320.8**	**52.3%**	
Personnel Costs				
Salaries	$66.4	$72.7	11.8%	24.8%
Fringe	$44.6	$47.4	7.8%	16.4%
Subtotal Personnel Costs	$111.0	$120.1	19.6%	41.1%
All Other O&M				
Supplies	$19.2	$19.8	3.3%	6.9%
Contracts	$101.7	$111.4	18.1%	37.9%
Information Technology	$15.8	$21.2	3.1%	6.6%
Energy and Utilities	$15.7	$16.5	2.7%	5.7%
Other Expenses	$0.5	$0.5	0.1%	0.2%
Transfers Out	$0.5	$0.5	0.1%	0.2%
Contingencies	$0.0	$0.0	0.0%	0.0%
Capital Expenses	$3.5	$2.2	0.5%	1.0%
Debt Expenses	$0.0	$0.0	0.0%	0.0%
Subtotal All Other O&M	$156.8	$172.0	27.9%	58.5%
Capital Related O&M				
Recycled Water (Teriarity Filters)	$0.9	$0.9	0.2%	0.3%
Subtotal Capital Related O&M	$0.9	$0.9	0.2%	0.3%
Subtotal O&M - Excluding Purchased	$268.8	$293.1	**47.7%**	**100.0%**
Total Operating Expenses	**$563.8**	**$613.9**	**100.0%**	

Debt Service

The water utility currently makes debt service payments for revenue bonds, commercial paper, SRF loans and the WIFIA loan. Existing and proposed debt in FY 2024 totals $114 million. Proposed subordinate debt payments from commercial paper and new revenue bonds begin in FY 2024. The payments begin in FY 2024 at $19.5 million. Table 8 summarizes the existing and proposed debt service for the study period.

Table 8: Existing and Pending Debt Service Summary ($ millions)

Debt Summary	FY 2024	FY 2025	Total
Summary of Debt by Type			
Existing Debt			
Revenue Bonds	$80.1	$82.1	$162.2
SRF Loans	$8.0	$10.1	$18.1
WIFIA	$6.3	$11.5	$17.7
CP Refinancing	$0.0	$0.0	$0.0
Total Existing Debt	**$94.3**	**$103.8**	**$198.1**
Proposed Debt			
Commercial Paper	$1.5	$3.7	$5.2
Refinance CP - Revenue Bond	$0.0	$0.0	$0.0
New Revenue Bonds	$18.0	$18.0	$36.0
Total Proposed Debt	**$19.5**	**$21.6**	**$41.1**
Total Existing and Proposed Debt	**$113.8**	**$125.4**	**$239.2**
Summary of Debt by Lien			
Existing Debt			
Senior	$30.3	$32.5	$62.8
Subordinate	$64.0	$71.3	$135.3
Total Existing Debt	**$94.3**	**$103.8**	**$198.1**
Proposed Debt			
Senior	$0.0	$0.0	$0.0
Subordinate	$19.5	$21.6	$41.1
Total Proposed Debt	**$19.5**	**$21.6**	**$41.1**
Total Existing and Proposed Debt	**$113.8**	**$125.4**	**$239.2**

PAYGO Capital Transfers

Transfers of cash to the capital sub-fund are used to partially fund the City's water capital improvement program. The use of cash to fund capital improvements is referred to as pay-as-you-go or "PAYGO" funding. These transfers vary each year based on the number of projects funded and the type of funding used for each project. Net transfers to assist in funding the CIP total $122.7 million over the study period. The City aims for an 80/20 debt to PAYGO capital ratio.

TARGET RESERVES

The City maintains four different types of reserves for the Water Fund: Emergency Operating, Emergency Capital, Rate Stabilization, and Secondary Purchase reserves. The City's reserve policy requires minimum balances based on the following requirements:

- ***Emergency operating***: 70 days of O&M excluding contingencies, water purchases, and debt service
- ***Emergency capital:*** $5,000,000
- ***Rate stabilization***: 5% of prior year operating revenue
- ***Secondary purchase***: 6% of annual water purchases budget

The ending reserves balance for FY 2024 is projected to be $294.7 million

FINANCIAL PLAN SUMMARY

Projected water sales revenue under existing rates is inadequate to meet revenue requirements and sustain minimum reserves throughout the study period. Table 9 shows the cash flow summary including the annual rate revenue adjustments, water purchases pass-through adjustments, reserve levels and debt service coverage.

Table 9: Operating Sub-Fund Financial Plan ($millions)

Description	FY 2024	FY 2025
Fund Balance		
Beginning Balance	$381.7	$294.3
Less: Reserves	$166.4	$159.4
Unrestricted Beginning Fund Balance	**$215.3**	**$135.0**
Sources of Funds		
Rate Revenues	$575.6	$600.7
Water Purchases Pass-Thru	$19.6	$45.6
Recycled Water/Pure Water Credits	$0.0	$0.0
Water Sales	$42.1	$44.6
Operating Income	$17.3	$17.4
Non-Operating Income	$34.4	$34.4
All Other Income	$6.8	$5.8
Total Sources of Funds	**$695.9**	**$748.6**
Uses of Funds		
Operation and Maintenance Expense	$563.8	$613.9
Existing Debt Service	$94.3	$103.8
Proposed Debt Service	$19.5	$21.6
Interest Earnings on Debt Reserve	($0.0)	($0.0)
PAYGO Transfers	$105.7	$17.0
Total Uses of Funds	**$783.2**	**$756.3**
Change in Fund Balance	*($87.4)*	*($7.7)*
Ending Balance	**$127.9**	**$127.2**
Target Reserves	$166.4	$159.4
Net Unrestricted Ending Balance	*$294.3*	*$286.6*
Annual Rate Revenue Adjustment	6.6%	4.3%
Water Purchase Pass-Thru Increases	3.6%	4.4%
Total Adjustment	**6.6%**	**4.3%**
Debt Service Coverage		
Senior Debt Service Coverage	5.2	5.4
Aggregrate Debt Service Coverage	1.4	1.4
Revenue Adjustments		
City Share of Increase	6.6%	4.3%
Months Effective	8	6
Water Purchase Share of Increase	3.6%	4.4%
Months Effective	8	6
Total Increase	10.2%	8.7%

Capital Fund

The capital fund tracks financial activities associated with funding the capital improvement program.

SOURCES OF FUNDS

Sources include cash transfers from the operating fund, revenue bond and commercial paper proceeds, grants, State Revolving Fund (SRF) loans, and the Water Infrastructure Finance Innovation Act (WIFIA) loan. Rate and capacity fee funded projects total $153 million for the study period. Of this amount, revenue from rates will fund approximately $6 million of Pure Water Program projects and $147 million will fund the baseline capital improvement program. Total funding for the study period is projected at $833 million. Table 10 shows the funding sources for the capital improvement program over the study period.

Table 10: Capital Sources of Funds ($ millions)

Description	FY 2024	FY 2025	Total	% of Total
Source of Funds for Pure Water Program CIP				
WIFIA Loan	$210.9	$114.5	$325.4	
Commercial Paper/Revenue Bonds	$0.0	$0.0	$0.0	
SRF Loans	$0.0	$0.0	$0.0	
Cash	$7.4	($1.8)	$5.6	
Grants	$0.0	$0.0	$0.0	
Total Source for Pure Water Program CIP	**$218.3**	**$112.7**	**$331.1**	**39.7%**
Source of Funds for Baseline Program CIP				
Commercial Paper/Revenue Bonds	$70.0	$102.0	$172.0	
SRF Loans	$79.4	$103.8	$183.2	
Grants	$0.0	$0.0	$0.0	
Capacity Fees / Cash	$114.1	$33.2	$147.3	
Total Source Baseline Program CIP	**$263.5**	**$239.0**	**$502.5**	**60.3%**
Grand Total Sources of Funds for CIP	**$481.8**	**$351.7**	**$833.6**	**100.0%**

USES OF FUNDS

Anticipated capital improvement expenditures total $828.9 million for FY 2024 and FY 2025. Projects include both expansion and repair and replacement projects. Pure Water projects total $331.1 million for the study period and represent 40% anticipated spending in these years. The Pure Water Program represents a significant capital improvement program of the City's Water System and Wastewater System. The City expects that upon full implementation projected in 2035, that the facilities will produce 83 mgd of locally controlled water. The program is broken into multiple phases. The Pure Water Program is being funded by both the water and wastewater funds. The costs included in this study represent the proportion of costs incurred to benefit the water system only and do not include any wastewater related costs. Per the agreement with the metropolitan wastewater system and it's participating agencies, metropolitan wastewater system pays for costs associated up to secondary treatment of wastewater, which is the level of treatment required for ocean discharge. Based on the construction estimates, that is currently assumed to be 38% of the total project costs. Costs will be trued-up at the end of the project based on the final project costs. The City also splits costs between the wastewater system and the water system for Advanced Metering Infrastructure, or AMI which has a 70% Water, 30% wastewater split. This allocation is based on how many total reads for all customer classes are required to develop water and wastewater bills, and apportioning costs to the water and wastewater funds based on their respective reads required to generate their billings. Table 11 summarizes the capital improvement program by asset category.

Table 11: Capital Improvement Program Summary ($ millions)

Description	FY 2024	FY 2025	Total
Pure Water	$218.3	$112.7	$331.1
Transmission Pipelines	$101.1	$85.5	$186.7
Pipelines	$133.0	$106.8	$239.8
Storage Facilities	$10.5	$17.5	$28.0
Water Treatment Plant	$6.6	$10.7	$17.3
Pump Stations	$5.6	$6.7	$12.3
SDG&E Relocation Advance	$0.0	$0.0	$0.0
Groundwater Projects	$0.0	$0.0	$0.0
Recycled Water	$0.0	$0.0	$0.0
Miscellaneous Projects	$4.0	$9.7	$13.7
Total	**$479.3**	**$349.6**	**$828.9**

Cost of Service Analysis

Introduction

The purpose of a cost of service analysis is to allocate the water utility revenue requirement to each customer class in direct proportion to the demands they impose on the utility. In conducting the cost of service analysis, Raftelis employed the "base-extra capacity method" of cost allocation as published by the American Water Works Association in the Seventh Edition of the *Manual of Water Supply Practices M1, Principles of Water Rates, Fees, and Charges.* Raftelis reviewed historical City data regarding customer bills and water consumption and City projections of future customer consumption. Raftelis also conferred with City staff, including finance, planning and engineering staff to gather data and information used in the cost of service analysis.

A cost of service analysis involves the following steps:

6. **Cost Functionalization:** O&M and capital expenses are categorized by their function in the system, which include supply, treatment, distribution, transmission, customer service, etc.

7. **Cost Component Allocation:** Functionalized costs are then allocated to cost causation components based on their burden on the system. The cost causation components include commodity, demand, meter and services, customer service, amongst others. The functionalized revenue requirement (from Step 1) is allocated to the cost causation components and results in the total revenue requirement for each cost causation component.

8. **Development of Units of Service:** Each class has unit demand characteristics that determine their share of costs in later steps. These units include annual water use, maximum day and maximum hour water use, number of monthly bills, and number of ¾" equivalent meters.

9. **Unit Cost Determination:** The revenue requirement for each cost causation component is divided by the appropriate units of service to determine the unit cost for each cost causation component. The unit cost for a given cost component is the same for all customer classes, ensuring that each customer class is allocated their proportionate share of costs.

10. **Revenue Requirement Distribution:** The unit cost is utilized to distribute the revenue requirement for each cost causation component to customer classes based on each customer class's individual service units.

FY 2024 Test Year Revenue Requirement

The FY 2024 test year revenue requirement is $602 million and consists of water purchases, operation and maintenance expense, existing and proposed debt service, interest earnings, rate funded capital, changes in cash reserves and includes offsets for wholesale water sales, recycled water credits, other operating revenues, and other non-operating income.

The revenue requirement also includes a mid-year adjustment, to account for a mid-fiscal year implementation of the new rates anticipated to be made effective in November of 2024 partially through the City's fiscal year (July 1 to June 30). The expenses and forecasted customer accounts and water use described in this report correspond to

the full fiscal year. Therefore, the test year revenue requirement must include an adjustment that represents the revenue that is foregone by implementing the rate increase on some day other than the first day of the fiscal year. The amount of the mid-year adjustment is determined by calculating the additional amount of revenue that the proposed FY 2024 revenue increase (10.2%) would recover in the months of July through October. This amount is added to the cash revenue requirements to determine the test year revenue requirement.

Table 12: FY 2024 Test Year Revenue Requirement

Description	Operating	Capital	Total
Expenses			
Purchased Water	$295,016,900	$0	$295,016,900
O&M	$268,751,975	$0	$268,751,975
Existing Debt Service		$94,347,911	$94,347,911
Proposed Debt Service		$19,470,581	$19,470,581
Rate Funded Capital		$105,667,481	$105,667,481
Change in Cash Reserves	($72,692,299)	($14,671,763)	($87,364,062)
Subtotal Expenses	$491,076,576	$204,814,209	$695,890,785
Mid-Year Rate Adjustment		$12,130,105	$12,130,105
Subtotal Before Revenue Offsets	$491,076,576	$216,944,314	$708,020,890
Revenue Offsets			
Other Water Sales	$42,139,981	$0	$42,139,981
Other Operating Revenues	$17,349,687	$0	$17,349,687
Non-Operating Revenues	$31,894,700	$2,473,100	$34,367,800
Interest Earnings	$6,760,234	$30,874	$6,791,107
Subtotal Revenue Offsets	$98,144,602	$2,503,974	$100,648,575
Total Revenue Requirement	$392,931,974	$214,440,341	$607,372,314

The underlying principle in cost allocation is to convert the test year revenue requirement into costs that best reflect the cost associated with demands placed on the system. Those costs are proportionately allocated to customer classes based on their respective customer demand and customer service characteristics to determine class cost of service—the portion of the total revenue requirement to be recovered from each customer class through the fixed charge and volumetric rates. Customer demand characteristics include average day demand maximum day demand and maximum hour demand. Customer service characteristics include the number of accounts and the number of equivalent meters. The first step in allocating costs to cost components is to functionalize the revenue requirement by dividing the total revenue requirement into various operating and capital cost categories. Costs assigned to these functional cost categories will then be allocated to the cost components.

Functional Cost Categories

Water systems are comprised of several facilities (unit processes or functions) that are designed and operated to collect, treat, store, and distribute water to customers. The separation of costs into functional cost categories provides a means for distributing costs to customer classes based on their respective demands on the system.

The O&M revenue requirement can be functionalized into cost categories based on the line item descriptions in the budget. O&M function cost categories include expenses for day-to-day operations and management during the applicable year. Table 13 shows the FY 2024 O&M revenue requirement allocated to functional categories. The allocation of O&M to functional cost categories was determined by City staff through discussions led by the Deputy Director of Finance. The basic premise supporting the functionalization process for O&M is to assign a cost to the function associated with the costs. Raftelis provided guidance on this approach but ultimately relied on the City's best judgement in assigning the O&M costs to the functional cost categories.

Table 13: Functionalization of O&M Expenses

O&M Function	Total
Raw Water Reservoirs	$11,789,679
CWA Supply - Volume	$213,633,329
CWA Supply - Fixed	$78,134,207
Water Treatment Plants	$36,501,468
Pumping	$14,088
Treated Storage	$7,214
Transmission	$24,033,892
Distribution	$24,033,892
Pure Water	$18,038,601
Billing	$6,774,475
Meters and Services	$37,272,308
Infrastructure Indirect (1)	$38,919,746
Recycled Water	$835,284
Fire Hydrants	$937,078
Non-Operating	$151,315
Total	**$491,076,576**

(1) Engineering and long-range planning costs related to multiple functions

Table 14 shows the FY 2024 capital cost revenue requirements allocated to the functional cost categories based on the proportionate value of assets. The value of water system assets provides a reasonable basis for allocating the expenses in the capital cost categories to the cost components. Annual capital improvement program costs vary significantly from year to year as well as project types. Allocating the test year capital costs on a project by project basis alone may result in a distribution of cost allocations which fluctuates significantly from year to year. Therefore, Raftelis allocated the capital cost categories based on the value of existing assets, plus project additions from the City's capital improvement program.

The value of system assets is based on the new replacement cost of existing assets, escalated from original cost using the Construction Cost Index published by the Engineering News Record. The inflated value of the projects in the capital plan from FY 2024 to FY 2028 is added to the existing assets to determine the total system value by function. These functional values are used to proportional allocate the test year capital costs as shown in Table 14.

Table 14: Functionalization of Capital Costs

Capital Function	Total
Groundwater Projects	$134,755
Pipelines	$108,451,207
SDG&E Relocation Advance	$740,941
Pump Stations	$5,306,771
Pure Water	$16,044,861
Recycled Water	$2,528,768
Storage Facilities	$34,648,091
Transmission Pipelines	$12,814,716
Water Treatment Plant	$26,720,828
Fire Hydrants	$1,806,624
Meters	$787,515
Miscellaneous Projects	$6,253,173
AMI	$706,063
Total	**$216,944,314**

Cost Components

Once costs have been separated into cost categories by function, they can be further allocated to cost components. Allocating costs to cost components provides a means of assigning the functionalized expenses based on the design and functional parameters that characterize each water system expense. Cost components correspond to the unique demand characteristics of the customer classes to recover costs from the customers who cause the utility to incur them.

The allocation methodology used in this study is the Base-Extra Capacity Methodology, which is the most common allocation methodology employed for water utilities throughout California and the United States. This methodology incorporates the following standard cost components: Base, Max Day, Max Hour, Meters and Services, Billing, and Fire Protection. This study also incorporates additional components to specifically allocate the various charges from the City's wholesale water provider to the volume and fixed charges; these components are CWA Supply-Volume and CWA Supply-Fixed. Finally, the Customers cost component is included in order to allocate a portion of the distribution system on a per customer basis. As discussed in more detail in the Rate Design section below, the expenses in the Meters, Billing, Fire Protection, Customers, and CWA Supply-Fixed components (Customer Cost Components) are recovered through the monthly service charge paid by each customer. In contrast, the CWA Supply-Volume, Base, Max Day, and Max Hour cost components (Volume Cost Components) are recovered through the volumetric rate charged to each customer class.

VOLUME COST COMPONENTS AND SYSTEM DEMAND FACTORS

The City's Water System is designed and operated to meet not only the average water demands of customers but also their maximum daily and hourly demands. The Base-Extra Capacity method for allocating the functional cost categories to the cost components of Base, Max Day Extra Capacity, and Max Hour Extra Capacity recognizes that above-average demand on a system imposes greater costs, including capital asset costs and operating expenses. This methodology focuses on average and above-average demand and their impact on the size of the system's operations and facilities used to meet that demand. Average (Base) demand is the annual water usage of customers expressed on a daily basis. Base costs vary directly with the quantity of water consumed under average day load

conditions. Above-average (Max Day and Max Hour) water demands are demands on the system when customers use water at levels above their average usage. Max Day and Max Hour costs are costs incurred to meet water demands that exceed average levels of water usage by customers. These Max Day and Max Hour expenses are incurred to allow the water system to meet water usage variations and the highest possible peak demand that could be imposed on the water system. Max Day and Max Hour expenses are incurred over time and are necessary to allow the water system to meet demand above average demand.[6]

A customer's water use may be below-average, average or above-average when measured each billing cycle. A customer with above-average demand uses water at an above-average rate during the billing cycle which places above-average demand on the system. Further, each customer class demonstrates recognized patterns of average and peak demand.

This methodology defines the incremental extra costs (maximum day and hour extra capacity costs) to upsize the system from the size necessary to meet above average use to maximum above-average capacity as separate from the system's costs to meet average demand by allocating these incremental extra costs to the different cost components. Where appropriate, this separation allows the system to recover a larger portion of the incremental costs to meet above-average demand from customers when they place above-average demand on the system.

The cost components Base, Max Day Extra Capacity, and Max Hour Extra Capacity are terms of art in the water utility industry that refer to how large a water system must be designed, built and operated to meet demand. Max Day and Max Hour do not refer to a specific day or hour in a billing cycle when usage is above average. For example, Max Hour demand is the highest possible demand placed on the system. Max Hour demand on the system is extremely rare and likely only occurs once or twice a decade. However, to guarantee uninterrupted service, components of the water system must be built at Max Hour size. This means that all facilities in the system are sized large enough and operated in a manner to deliver uninterrupted service at the estimated highest level of demand possible under the most extreme circumstances.

The City's incremental costs (above Base costs) to design, build and operate upsized facilities to meet above-average demand are a significant portion of the cost of service. To allocate the cost categories to the customer classes, we first allocated portions of each cost category to the Base, Max Day Extra Capacity and Max Hour Capacity cost components depending on the function associated with the cost category. The Base cost component includes costs that would be incurred if the system only needed to be built and operated at Base Size to meet average demand. The Base cost component incudes, among other costs, the O&M and Capital costs of the system that are associated with building and operating the portion of the system's facilities used to meet average demand.

[6] The water system does not incur a substantial portion of the incremental costs to build and operate the system at Max Hour size at the precise (and relatively rare) moment that the system is called on to meet highest possible (Max Hour) demand. The incremental costs to upsize the system to meet Max Day and Max Hour demand are not incurred at the precise hour that any one customer uses water at an above-average rate. Instead, the water system's costs to build the system at Max Hour size were incurred over the years that the system was built and expanded—long before any actual instance of highest possible demand or the precise hour of a single customer's above-average demand. Similarly, the costs for the City to operate and maintain the system built to meet peak demand are relatively stable in times of regular and peak demand.

The Max Day and Max Hour Extra Capacity components provide a means for allocating functionalized costs incurred to support maximum day and hour demand. These components are calculated using demand factors for the entire system.

Table 15 shows the calculation of these factors from daily water production and purchase data provided by the City. The Max Day demand factors shown in Column C of the second table are calculated by dividing the maximum day flow for each year by the corresponding average day amount. These three annual factors are averaged to derive the 1.43 factor used to allocate costs. Raftelis estimated max hour production by multiplying the maximum day use for each year by a factor of 1.5, a calculation described in the City's Water Facility Design Guidelines and commonly used by City engineers to estimate system sizing when planning to meet the maximum possible demand.

The figures 1.43 and 2.15 are peak demand to average demand ratios which provide a means for allocating functionalized costs to the cost components. The Max Day Extra Capacity cost component includes costs - *above Base costs* - that the City incurs to build and operate the system sized at Max Day Size - 1.43 times larger than the system would be to meet average demand. The Max Hour Extra Capacity cost component includes costs - *above Base and Max Day costs* - that the City incurs to build and operate the system at Max Hour size - 2.15 times larger than the system would be to meet average demand.

Table 15: System Demand Factors

Annual Production		
	A	B
Year	Total Demand (MG)	Annual Avg. Day (MG)
FY 2022	60,872	166.77
FY 2021	58,563	160.45
FY 2020	55,307	151.52
FY 2019	56,345	154.37
Average	**57,772**	**158.28**

Max Day Production			
	A	B	C
Year	Max Day Occurance	Max Day Flow (MGD)	Ratio of Max Day to Annual Average Day
FY 2022	7/20/2021	219.96	1.32
FY 2021	9/11/2020	231.90	1.45
FY 2020	8/24/2019	227.58	1.50
FY 2019	8/17/2018	225.70	1.46
Average		**226.28**	**1.43**

Max Hour Production Estimate			
	A	B	C
Year	Ratio of Max Hour to Annual Max Day	Max Hour Flow (MGD)	Ratio of Max Hour to Annual Average Day
FY 2022	1.50	329.94	1.98
FY 2021	1.50	347.84	2.17
FY 2020	1.50	341.37	2.25
FY 2019	1.50	338.55	2.19
Average	**1.50**	**339.43**	**2.15**

The ratio of Max Day and Base demand is used to allocate costs between the Base and Max Day Extra Capacity cost components for cost categories that meet maximum day demands, including capital and operating costs associated with facilities like treatment plants and transmission mains. The 1.47 ratio indicates that approximately 69.8% of the capacity of facilities designed and operated for Max Day demand is used to meet Base demand. Accordingly, 30.2% is used to meet Max Day demand.

Average Day Percentage: 1.0 ÷ 1.43 = 69.8%
Maximum Day Percentage: 0.43 ÷ 1.43 = 30.2%

The Max Hour ratio is used to allocate costs for facilities that operate or are designed to meet Max Hour demand. These facilities include treated storage, pumping, and a portion of distribution mains. This ratio indicates 46.6% of the capacity of facilities designed and operated for Max Hour demand is needed for Base demand, 20.1% is required to meet Max Day demand, and the remaining 33.3% is for Max Hour demand.

Average Day Percentage: 1.0 ÷ 2.15 = 46.6%
Maximum Day Percentage: (1.43 – 1.0) ÷ 2.15 =20.1%
Maximum Hour Percentage: (2.15 – 1.43) ÷ 2.15 = 33.3%

Functional O&M cost categories are generally allocated to the cost components that best reflect the design or functional parameter associated with each category of expense. For example, the variable portion of water supply expenses are allocated to the Supply cost component because source of supply facilities are designed to meet average day demands. Pumping is used to meet Base and extra capacity (Max Day and Max Hour) demand. Therefore, the Pumping cost category is allocated to the average day, maximum day extra capacity, and maximum hour extra capacity cost components.

CUSTOMER COST COMPONENTS

The Meters cost component is used for costs which vary based on the capacity of customers water meter, which represents the potential demand that customer can place on the water system.

All fixed charges associated with water purchases are allocated to the CWA Supply-Fixed cost component. These charges are allocated to each wholesale customer of SCDWA, including San Diego, on a fixed basis; therefore, it is reasonable for the City to allocate this charge to its customers in the same way.

The Billing cost component includes costs for billing, customer service, collections and customer accounting.

The Fire Protection cost component captures direct fire protection costs, primarily associated with repair and maintenance of the valves, mains, and hydrants.

Table 16 and Table 17 show the functional allocation of the O&M and capital cost categories to the cost components.

Table 16: Functionalized O&M Cost Categories Allocated to Cost Components

O&M Expense Functional Cost Allocations									
		Volume-Related				Customer-Related			
Functional Component	Total	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire
Raw Water Reservoirs	100.0%		100.0%						
CWA Supply - Volume	100.0%	100.0%							
CWA Supply - Fixed	100.0%	0.0%				100.0%			
Water Treatment Plants	100.0%		69.8%	30.2%					
Pumping	100.0%		46.6%	20.1%	33.3%				
Treated Storage	100.0%		46.6%	20.1%	33.3%				
Transmission	100.0%		69.8%	30.2%					
Distribution	100.0%		46.6%	20.1%	33.3%				
Pure Water	100.0%		100.0%						
Billing	100.0%							100.0%	
Meters and Services	100.0%						100.0%		
Infrastructure Indirect (1)	100.0%		73.0%	20.0%	6.9%				
Recycled Water	100.0%		100.0%						
Fire Hydrants	100.0%								100.0%
Non-Operating	100.0%		100.0%						

O&M Expenses Alllocated to Cost Components									
		Volume-Related				Customer-Related			
Functional Component	Total	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire
Raw Water Reservoirs	$11,789,679	$0	$11,789,679	-	-	-	-	-	-
CWA Supply - Volume	$213,633,329	$213,633,329	$0	-	-	-	-	-	-
CWA Supply - Fixed	$78,134,207	$0	$0	-	-	78,134,207	-	-	-
Water Treatment Plants	$36,501,468	$0	$25,488,800	$11,012,668	-	-	-	-	-
Pumping	$14,088	$0	$6,558	$2,834	$4,696	-	-	-	-
Treated Storage	$7,214	$0	$3,358	1,451	2,405	-	-	-	-
Transmission	$24,033,892	$0	$16,782,751	$7,251,141	-	-	-	-	-
Distribution	$24,033,892	$0	$11,188,501	$4,834,094	$8,011,297	-	-	-	-
Pure Water	$18,038,601	$0	$18,038,601	-	-	-	-	-	-
Billing	$6,774,475	$0	$0	-	-	-	-	6,774,475	-
Meters and Services	$37,272,308	$0	$0	-	-	-	37,272,308	-	-
Infrastructure Indirect	$38,919,746	$0	$28,424,527	7,791,065	2,704,154	-	-	-	-
Recycled Water	$835,284	$0	$835,284	-	-	-	-	-	-
Fire Hydrants	$937,078	$0	$0	$0	$0	-	-	-	937,078
Non-Operating	$151,315	$0	$151,315	$0	$0	-	-	-	-
Total Gross O&M Revenue Requirement	**$491,076,576**	**$213,633,329**	**$112,709,373**	**$30,893,253**	**$10,722,551**	**$78,134,207**	**$37,272,308**	**$6,774,475**	**$937,078**
Percent of Total	*100.0%*	*43.5%*	*23.0%*	*6.3%*	*2.2%*	*15.9%*	*7.6%*	*1.4%*	*0.2%*

(1) Related to multiple functions, allocation based on all other base, max day, max hour costs

Table 17: Functionalized Capital Costs Categories Allocated to Cost Components

Capital Cost Percentage Allocations									
		Volume-Related				Customer-Related			
Functional Component	Total	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire
Groundwater Projects	100%		100.0%						
Pipelines	100%		46.6%	20.1%	33.3%				
SDG&E Relocation Advance (1)	100%		46.6%	20.1%	33.3%				
Pump Stations	100%		46.6%	20.1%	33.3%				
Pure Water	100%		100.0%						
Recycled Water	100%		100.0%						
Storage Facilities	100%		46.6%	20.1%	33.3%				
Transmission Pipelines	100%		69.8%	30.2%					
Water Treatment Plant	100%		69.8%	30.2%					
Fire Hydrants	100%								100.0%
Meters	100%						100.0%		
Miscellaneous Projects	100%	0.0%	54.9%	19.9%	23.6%	0.0%	0.4%	0.3%	0.9%
AMI	100%							100.0%	

Capital Costs Allocated to Cost Components									
		Volume-Related				Customer-Related			
Functional Component	Total	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire
Groundwater Projects	$134,755	-	$134,755	$0	$0	$0	$0	$0	$0
Pipelines	$108,451,207	-	$50,487,304	$21,813,501	$36,150,402	$0	$0	$0	$0
SDG&E Relocation Advance (1)	$740,941	-	$344,930	$149,030	$246,980	$0	$0	$0	$0
Pump Stations	$5,306,771	-	$2,470,462	$1,067,386	$1,768,924	$0	$0	$0	$0
Pure Water	$16,044,861	-	$16,044,861	$0	$0	$0	$0	$0	$0
Recycled Water	$2,528,768	-	$2,528,768	$0	$0	$0	$0	$0	$0
Storage Facilities	$34,648,091	-	$16,129,730	$6,968,997	$11,549,364	$0	$0	$0	$0
Transmission Pipelines	$12,814,716	-	$8,948,454	$3,866,261	$0	$0	$0	$0	$0
Water Treatment Plant	$26,720,828	-	$18,659,025	$8,061,802	$0	$0	$0	$0	$0
Fire Hydrants	$1,806,624	-	$0	$0	$0	$0	$0	$0	$1,806,624
Meters	$787,515	-	$0	$0	$0	$0	$787,515	$0	$0
Miscellaneous Projects	$6,253,173	-	$3,435,333	$1,244,365	$1,475,528	$0	$23,373	$20,955	$53,619
AMI	$706,063	-	$0	$0	$0	$0	$0	$706,063	$0
Total Gross Capital Revenue Req.	**$216,944,314**	**-**	**$119,183,623**	**$43,171,342**	**$51,191,198**	**$0**	**$810,888**	**$727,019**	**$1,860,243**
Percent of Total	*100.0%*	*0.0%*	*54.9%*	*19.9%*	*23.6%*	*0.0%*	*0.4%*	*0.3%*	*0.9%*

(1) SDG&E Relocation Advance costs include work for pipelines, transmission pipelines storage and pump stations.

Table 18 summarizes the allocated non-rate revenues. Most capital related revenues are allocated proportionally to capital expenses using the percentages shown in the final row of Table 17; the exception is Grant Assistance, which is fully allocated to the base component. Operating related revenues are allocated similarly; revenues associated with other water sales are allocated fully to the Base component, while all others are based on the percentages in the final row of Table 16.

Table 18: Summary of Non-Rate Revenue Allocated to Cost Components

		Volume-Related				Customer-Related			
Non-Rate Revenue Item	Total	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire
Operations Related Items									
Other Water Sales	$42,139,981	$0	$42,139,981	$0	$0	$0	$0	$0	$0
Other Operating Revenue	$17,349,687	$7,395,384	$3,901,681	$1,069,437	$371,185	$2,704,786	$1,465,262	$409,513	$32,439
Non-Operating Revenues	$31,894,700	$13,875,170	$7,320,308	$2,006,471	$696,414	$5,074,702	$2,420,782	$439,992	$60,862
Interest Earnings	$6,760,234	$2,940,908	$1,551,574	$425,281	$147,608	$1,075,607	$513,096	$93,258	$12,900
Subtotal	**$98,144,602**	**$24,211,462**	**$54,913,544**	**$3,501,190**	**$1,215,207**	**$8,855,095**	**$4,399,140**	**$942,764**	**$106,201**
Capital Related Items									
Non-Operating Revenues	$2,473,100	$0	$2,149,821	$142,761	$169,281	$0	$2,681	$2,404	$6,152
Interest Earnings	$30,874	$0	$16,961	$6,144	$7,285	$0	$115	$103	$265
Subtotal	**$2,503,974**	**$0**	**$2,166,782**	**$148,904**	**$176,566**	**$0**	**$2,797**	**$2,508**	**$6,416**

Table 19 summarizes the allocated revenue requirement from the analysis of operating costs, capital costs, and non-rate revenues discussed in the sections above. The total revenue requirement will be distributed to customer classes based on their proportionate share of total customer service characteristics.

Table 19: Allocated Revenue Requirement

Cost of Service by Component	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire	Total
Operating Cost Revenue Requireme	$213,633,329	$112,709,373	$30,893,253	$10,722,551	$78,134,207	$37,272,308	$6,774,475	$937,078	$491,076,576
Capital Cost Revenue Requirement	$0	$119,183,623	$43,171,342	$51,191,198	$0	$810,888	$727,019	$1,860,243	$216,944,314
Gross Revenue Requirement from R	$213,633,329	$231,892,997	$74,064,596	$61,913,750	$78,134,207	$38,083,197	$7,501,494	$2,797,321	$708,020,890
Operating Non-Rate Revenue Offset	$24,211,462	$54,913,544	$3,501,190	$1,215,207	$8,855,095	$4,399,140	$942,764	$106,201	$98,144,602
Capital Non-Rate Revenue Offsets	$0	$2,166,782	$148,904	$176,566	$0	$2,797	$2,508	$6,416	$2,503,974
Total Non-Rate Revenue Offsets	$24,211,462	$57,080,326	$3,650,094	$1,391,773	$8,855,095	$4,401,937	$945,271	$112,617	$100,648,575
Total Allocated Revenue Requireme	$189,421,867	$174,812,671	$70,414,501	$60,521,977	$69,279,112	$33,681,260	$6,556,222	$2,684,704	$607,372,314

Units of Service

The next step of the cost of service analysis is to determine the units of service that will be used to assign costs to each customer class. Each customer class has unique system use characteristics that are quantified and used to assign costs, ensuring that each class pays their share of costs in proportion to the impacts their water use characteristics place on the water system.

CUSTOMER CLASSES

As discussed above, the purpose of cost of service analysis is to relate the costs incurred by the water utility to provide service to customers in proportion to the demands they place on the water system. That said, determining the cost to serve each individual customer is not practical because it would involve isolating the individual components of the water system that are used only to serve that customer. This would also ignore the diversity and economies of scale which come from having many customers with varying demand profiles. Water utilities have networked systems, built to serve the varying demands of many customers, rather than each customer individually. Accordingly, it is appropriate to group customers into classes based on similar demand characteristics and develop rates around the average embedded cost to serve the class, which is comprised of customers with comparable demands.

In addition, it is also common to establish cost of service within a class. The most common approach to doing so involves the use of tiered rates which vary based on the amount of water consumed. Tiered rates effectively create sub-classes within a class which recognize the difference in demand characteristics of customers within a class based on the volumes they use. In this case, cost of service is established for the class first based on the class demand characteristics, then allocated within the class to each tier. In this way, the class as a whole pays its proportionate share of costs, with the sub-classes picking up their proportionate share of total class cost of service. The City employs both approaches within its water rate structure. Multi-family residential (MFR), commercial/industrial/outside city, irrigation, temporary construction, and private fire protection all have rates designed around their class cost of service. Single Family Residential (SFR) customers have tiered rates, which reflect cost of service by tier, within the SFR class.

The City's current rate structure consists of a fixed service fee which varies by meter size and a volume commodity rate for each unit of water usage (measured in number of hundred cubic feet (hcf) of water consumed during the billing cycle). The multi-family residential[7], commercial/industrial/outside city, irrigation, and temporary construction customer classes have a uniform commodity rate. The SFR class has a 4-tier increasing block structure which applies a higher unit rate to volumes which enter each successive tier. SFR customers are generally billed bi-monthly, with a small number billed monthly. All other classes are generally billed monthly, with a small number billed bi-monthly. The tiers widths and the fixed charges are reflective of each respective billing period (e.g., a bi-monthly bill has twice the fixed charge of a monthly bill).

CUSTOMER UNITS OF SERVICE

Customer units include the number of monthly and number of ¾" equivalent meters for each customer class and are used to develop the City's monthly or bi-monthly base charges. Table 20 shows a forecast of the number of accounts by customer class for FY 2024.

[7] Individual residences in a multi-family residential complex do not have separate water accounts with the City that are billed at the Multi-Family commodity rate. Therefore, the complex as a whole is a single account billed at the multi-family residential rate whether it has 400 units or 10 units.

Table 20: FY 2024 Accounts

Meter Size	SFR	MFR	Commercial	Irrigation	Construction
5/8", 3/4"	206,488	16,063	6,161	1,061	-
1"	20,417	4,536	2,503	1,429	-
1.5"	803	5,353	3,421	1,684	-
2"	107	4,264	4,522	3,667	462
3"	-	257	238	72	38
4"	-	260	271	38	-
6"	-	84	138	15	-
8"	-	40	68	5	-
10"	-	5	38	1	-
12"	-	-	1	-	-
16"	-	-	-	-	-
Total	**227,815**	**30,862**	**17,361**	**7,972**	**500**

Table 21 shows the meter equivalent ratio calculation. The capacity of a customer's water meter is representative of the potential demand that customer can have on the City's water system. As indicated, larger meters have access to more capacity than smaller meters, whether they use it or not. Equivalent meter ratios allow for the allocation of the fixed cost of providing this capacity to customers based on their potential demand. Equivalent meter units in this study are based on AWWA-rated hydraulic capacities[8] and are calculated to represent the potential demand on the water system relative to a base meter size. AWWA capacity ratios are calculated by dividing the capacity of each meter size by the capacity of a 3/4-inch meter, the base meter size in this study. For example, the capacity of a 1" meter is divided by the capacity of a ¾" (50/30) to derive the 1" meter capacity ratio of 1.67.

Table 21: Equivalent Meter Ratio

Meter Size	Max Capacity (gpm)	Meter Ratio
5/8", 3/4"	30	1.00
1"	50	1.67
1.5"	100	3.33
2"	160	5.33
3"	370	12.33
4"	620	20.67
6"	1,440	48.00
8"	2,210	73.67
10"	4,200	140.00
12"	5,300	176.67
16"	7,800	260.00

[8] Raftelis reviewed a sample of meters in service for the type (turbine, compound, disk, etc) could be readily identified. For some meter sizes, the City uses several different types of meters that have different safe operating capacities. In these cases, the Max Capacity in Table 21 is the average capacity of each type weighted by the number meters in the sample.

The capacity equivalent ratio developed in Table 21 is multiplied by the number of accounts to determine the number of equivalent meter units. For example, 20,417 1" SFR are multiplied by the capacity equivalent factor of approximately 1.67 to derive 34,028 ¾" capacity equivalent meters.

Table 22: FY 2024 Equivalent Meters

Meter Size	SFR	MFR	Commercial	Irrigation	Construction
5/8", 3/4"	206,488	16,063	6,161	1,061	-
1"	34,028	7,560	4,172	2,382	-
1.5"	2,677	17,843	11,403	5,613	-
2"	571	22,741	24,117	19,557	2,464
3"	-	3,170	2,935	888	469
4"	-	5,373	5,601	785	-
6"	-	4,032	6,624	720	-
8"	-	2,947	5,009	368	-
10"	-	700	5,320	140	-
12"	-	-	177	-	-
16"	-	-	-	-	-
Total	**243,764**	**80,429**	**71,519**	**31,515**	**2,933**

FIRE PROTECTION

Water systems provide two types of fire protection: public fire protection for firefighting (i.e. fire hydrants) and private fire protection (i.e. fire lines for private structures with sprinkler systems for fire suppression). The benefits of private fire protection accrue to those customers with private fire connections. These costs are recovered by the City's private fire line charge. Public fire protection is designed to protect property and accrues to property owners within the City's service area. Put differently, public fire protection is a property related service, similar to domestic water service. Accordingly, as described below, the City recovers the cost of providing public fire protection in its fixed service charges.

Raftelis performed a fire demand analysis to determine fire protection maximum day and hour units, which are used to determine the total cost to provide fire protection service (public and private) and analyzed the number of public fire hydrants and private fire connections in order to allocate the total fire cost between the two. The City provided Raftelis with a count of fire hydrants and private fire line connections.

Based on a review of data provided by the San Diego Fire-Rescue Department, this study assumes that the water system could need to support fighting ten simultaneous fires at a sample of development types. The Max Day and Max Hour capacity requirements represent a peak demand, similar to the Max Day demand costs for other classes determined above.

Table 23 shows a methodology[9] used to calculate units of service associated with fire protection based on assumptions regarding the duration and water use rate associated with typical fires.

[9] Per the AWWA Manual M1.

Table 23: Fire Protection Requirement

Development Type	Fire Demand (gpm)	Incidents	GPM for All Events	Duration (minutes)	Max Day (gpd)	Max Hour (gpd)
Single Family	1,500	5	7,500	60	450,000	10,800,000
Condos/Apartments	3,000	2	6,000	90	540,000	8,640,000
Commercial	4,000	2	8,000	90	720,000	11,520,000
Industrial	6,000	1	6,000	300	1,800,000	8,640,000
		10	**27,500**		**3,510,000**	**39,600,000**
				hcf requirement:	*4,692*	*52,937*

PUBLIC AND PRIVATE FIRE CONNECTIONS

Table 24 shows the calculation of equivalent fire demand associated with public fire hydrants and private fire lines. Each connection size has a fire flow demand factor similar to the hydraulic capacity factor of a water meter. The diameter of the connection (in inches) is divided by 6" and raised to the 2.63 power to determine the fire meter ratio.[10] The ratio is multiplied by the number of connections at each size to calculate equivalent fire demand. Private fire connections are calculated as equivalent to a 6" connection, the standard for public fire hydrants.

Table 24: Private Fire Equivalent Connections

Connection Size	Count	Fire Meter Ratio	Equivalent 6"
3/4"	0	0.00	0.00
1"	0	0.01	0.00
1.5"	4	0.03	0.10
2"	88	0.06	4.89
3"	20	0.16	3.23
4"	1,619	0.34	557.35
6"	2,304	1.00	2,304.00
8"	1,765	2.13	3,761.26
10"	186	3.83	712.81
12"	32	6.19	198.09
16"	8	13.19	105.53
20"	2	23.72	47.45
Total	**6,028**		**7,695**

Table 25 develops a percentage to allocate total fire demand between public and private fire connections. The private fire equivalents developed above are compared to the City's 24,737 public fire hydrants to estimate that 23.7% of fire protection capacity should be allocated to private fire customers.

[10] Hazen-Williams equation and AWWA Manual M1

Table 25: Allocation Between Public and Private Fire

Allocation Between Public and Private Fire				
Fire Connections	Equivalent Connections	% of Equivalent Connections	Max Day Fire Flow	Max Hour Fire Flow
Private Fire Equivalent Connections	7,695	23.7%	1,113	12,560
Public Fire Equivalent Connections	24,737	76.3%	3,579	40,378
Total Fire Connections	**32,432**	**100.0%**	**4,692**	**52,937**

WATER USAGE AND DEMAND

The volume related cost components are allocated based on volumetric units expressed in the number of hcf (about 748 gallons), as well as Max Day Extra Capacity and Max Hour Extra Capacity customer characteristics:

- Base: a unit represents a single hcf of water billed.
- Max Day Extra Capacity: a unit represents the additional capacity (hcf per day) needed above the average amount to meet the demand on the hypothetical maximum use day. This is represented in hcf per day.
- Max Hour Extra Capacity: a unit represents the additional capacity above the maximum day amount needed to meet the hypothetical highest hourly demand experienced by the system. This is represented in hcf per day.

The City provided Raftelis with a complete data set of every bill issued to its retail customers. This data provided the basis for determining the total amount of water sold to each customer class and the first step of determining maximum day and maximum hour extra capacity units of service using demand factors.

CUSTOMER CLASS DEMAND FACTORS

The units of service for the Max Day and Max Hour extra capacity functional cost categories are calculated using unique customer class demand factors (identified as the Max Day Factor and the Max Hour Factor in Table 22). Each class has unique Max Day and Max Hour demand factors. Through the class units of service process and using unique customer class demand factors, we distribute the incremental costs to build and operate the system to handle peak demand (the Max Day and Max Hour Extra Capacity functional cost components) to the customer classes based on each class's historic peaking behavior.

Class demand factors are developed to reflect the estimated demand placed on the system by each class and are expressed as a ratio of the average daily demand for each class. If the estimated daily demand for a class on the hypothetical maximum day of demand is estimated at 60,000 hcf per day, and the average annual daily demand for the class is 40,000 hcf per day, the demand factor (or Max Day demand factor) is 1.5. If the estimated daily demand from the class is 100,000 hcf per day on a day of a Max Hour event, then the Max Hour demand factor is 2.5.

Table 26 provides an example of the demand factor calculation for the SFR class in FY 2019. Because the City bills SFR customers primarily on a bi-monthly basis, the data must first be normalized to remove the effects of cycle billing. If a larger number of customers is billed in a particular cycle, the monthly demand factor analysis can be skewed to apply additional weight to those months. To do this, Raftelis sorted the individual billing data according to the City's billing cycles: even, odd, and monthly. The total amount of water billed (Line 4) and number of bills issued in each month (Line 8) was determined from this data, as shown below. This information is used to calculate the average water use per read for each month (Line 9). To derive the normalized monthly use, these averages were applied to the number of average monthly reads (Line 10). The normalized monthly use is shown on Line 11.

Table 26: Demand Factor Calculation Example

Line	Calculation Note	FY 2019 Billing Data	July	August	September	October	November	December	January	February	March	April	May	June	Total
		Sum of Use													
1	*From Data*	Even	374,636	2,232,673	302,629	2,191,866	366,562	1,710,025	330,308	1,301,067	121,324	1,522,995	169,679	1,940,579	12,564,343
2	*From Data*	Odd	1,539,272	662,556	1,594,916	517,457	1,457,362	408,961	1,189,466	249,334	1,007,323	289,323	1,302,076	104,563	10,322,609
3	*From Data*	Month	4,846	5,087	5,880	4,570	4,882	3,672	3,429	3,061	3,499	3,837	4,061	4,355	51,179
4		**Total**	1,918,754	2,900,316	1,903,425	2,713,893	1,828,806	2,122,658	1,523,203	1,553,462	1,132,146	1,816,155	1,475,816	2,049,497	22,938,131
		Count of Reads													
5	*From Data*	Even	23,107	102,501	17,616	106,505	23,457	100,636	24,230	99,833	9,843	114,413	11,445	113,181	746,767
6	*From Data*	Odd	78,510	26,756	75,052	23,265	78,378	23,178	78,260	18,450	83,181	18,385	83,255	7,972	594,642
7	*From Data*	Month	495	488	488	490	489	488	488	488	489	482	487	487	5,859
8		**Total**	102,112	129,745	93,156	130,260	102,324	124,302	102,978	118,771	93,513	133,280	95,187	121,640	1,347,268
9	*= 8/4*	**Average Use per Read**	18.79	22.35	20.43	20.83	17.87	17.08	14.79	13.08	12.11	13.63	15.50	16.85	
10	*= avg of 9*	**Average Monthly Reads**	112,272												
11	*= 9 * 10*	**Normalized Monthly Use**	2,109,674	2,509,733	2,294,023	2,339,130	2,006,610	1,917,232	1,660,680	1,468,463	1,359,262	1,529,892	1,740,714	1,891,662	22,827,073
		Demand Factor Calculation													
12	*Max of 11*	Maximum Monthly Normalized Use			2,509,733										
13	*Avg of 11*	Average Monthly Normalized Use			1,902,256										
14	*= 12 / 13*	Ratio of Max to Average			1.32										
15	*From Data*	System Factor			1.11										
16	*= 14 * 15*	**SFR FY 2019 Demand Factor**			**1.46**										

The demand factor is calculated by dividing the water use in the maximum month by the water use in the average month. This ratio is then scaled up by a factor that relates the average daily use in the maximum month for the entire system to the system's maximum daily use. This process was repeated for each customer class and for FY 2020, FY 2021, and FY 2022. The yearly demand factors for each class were averaged to determine the test year max day demand factor used in this study, as shown in Table 27. The use of a multi-year average normalizes the demand factors, which can fluctuate from year to year based on weather conditions and other factors.

Table 27: Class Max Day Demand Factors

Customer Class	FY 2019	FY 2020	FY 2021	FY 2022	AVG
SFR	1.46	1.46	1.52	1.34	1.45
MFR	1.42	1.58	1.60	1.72	1.58
Commercial	1.42	1.72	1.53	1.31	1.50
Irrigation	2.16	2.25	1.96	1.88	2.06
Construction	1.92	2.24	1.89	1.57	1.90

The final class maximum day demand factor is multiplied by 1.5 to estimate the maximum hour demand factor in accordance with the City's Water Facility Design Guidelines discussed above.

Using customer class demand factors, the units of service for each of the functional cost components were calculated as shown in Table 28. The Max Day Factor and Max Hour Factor are multiplied by the number of hcf for average day to obtain the Max Hour and Max Day Total Capacity units of service. Max Day extra capacity units are the result of subtracting average day use from Max Day total use; Max Hour extra capacity units are the result of subtracting Max Day total capacity units from Max Hour total capacity units.

Table 28: Extra Capacity Unit Calculation

	Base		Maximum Day			Maximum Hour		
Customer Class	Annual Use (HCF)	Average Day Use (HCF)	Demand Factor	Total Capacity (HCF/Day)	Extra Capacity (HCF/Day)	Demand Factor	Total Capacity (HCF/Day)	Extra Capacity (HCF/Day)
Single Family Residential	22,955,136	62,891	1.45	91,008	28,117	2.17	136,512	45,504
Multi-Family Residential	15,668,578	42,928	1.58	67,839	24,912	2.37	101,759	33,920
Comm / Industrial / Outside City	16,330,962	44,742	1.50	66,890	22,148	2.24	100,335	33,445
Irrigation	8,170,353	22,385	2.06	46,124	23,740	3.09	69,186	23,062
Temp Construction	320,812	879	1.90	1,673	794	2.86	2,510	837
Public Fire Protection				3,579	3,579		40,378	36,799
Private Fire Protection				1,113	1,113		12,560	11,447
Total Units of Service	**63,445,841**			**278,227**	**104,403**		**463,240**	**185,013**

UNITS OF SERVICE SUMMARY

Table 29 summarizes the customer class units of service shown in the Tables above.

Table 29: Units of Service Summary

Customer Class	Volume			Customer		
	Annual Use (HCF)	Max Day Extra Capacity (HCF/Day)	Max Hour Extra Capacity (HCF/Day)	Equivalent Meters x12	Monthly Bills	Equivalent Hydrants
Single Family Residential	22,955,136	28,117	45,504	2,925,164	2,733,780	
Multi-Family Residential	15,668,578	24,912	33,920	965,152	370,344	
Comm / Industrial / Outside City	16,330,962	22,148	33,445	858,232	208,332	
Irrigation	8,170,353	23,740	23,062	378,180	95,664	
Temp Construction	320,812	794	837	35,192	6,000	
Public Fire Protection		3,579	36,799			24,737
Private Fire Protection		1,113	11,447		72,336	7,695
Total Units of Service	**63,445,841**	**104,403**	**185,013**	**5,161,920**	**3,486,456**	**32,432**

Unit Costs

The next step is to calculate the unit cost for each functional cost component. The unit cost is the quotient of the allocated revenue requirement by cost component from Table 19 divided by the units of service for each from Table 29.

Table 30: Unit Costs

Cost Component	Cost	Units of Service		Unit Cost
CWA Supply - Volume	$189,421,867	63,445,841	HCF	$2.99
Base	$174,812,671	63,445,841	HCF	$2.76
Max Day Extra Capacity	$70,414,501	104,403	HCF/day	$674.45
Max Hour Extra Capacity	$60,521,977	185,013	HCF/hr	$327.12
CWA Supply - Fixed	$69,279,112	5,161,920	Eq. Meters x 12	$13.42
Meters and Services	$33,681,260	5,161,920	Eq. Meters x 12	$6.52
Billing	$6,556,222	3,486,456	No. of Bills	$1.88
Direct Public Fire	$2,684,704	N/A		
Total	**$607,372,314**			

Distribution of Costs to Customer Classes

The customer class units of service in Table 29 are multiplied by the unit costs in The next step is to calculate the unit cost for each functional cost component. The unit cost is the quotient of the allocated revenue requirement by cost component from Table 19 divided by the units of service for each from Table 29.
Table 30 to determine the distributed cost of service to customer classes.

Table 31: Distribution of Total Revenue Requirement to Customer Classes

Customer Class	CWA Supply - Volume	Base	Max Day Extra Capacity	Max Hour Extra Capacity	CWA Supply - Fixed	Meters and Services	Billing	Direct Public Fire	Preliminary Total
Single Family Residential	$68,534,118	$63,248,411	$18,963,768	$14,885,445	$39,259,184	$19,086,543	$5,140,828		$229,118,297
Multi-Family Residential	$46,779,602	$43,171,717	$16,801,685	$11,095,906	$12,953,489	$6,297,567	$696,426		$137,796,391
Comm / Industrial / Outside City	$48,757,197	$44,996,789	$14,937,562	$10,940,660	$11,518,495	$5,599,919	$391,765		$137,142,387
Irrigation	$24,393,143	$22,511,818	$16,011,120	$7,544,126	$5,075,626	$2,467,605	$179,895		$78,183,333
Temp Construction	$957,807	$883,936	$535,722	$273,679	$472,319	$229,626	$11,283		$3,364,372
Public Fire Protection	$0	$0	$2,413,803	$12,037,700				$2,684,704	$17,136,207
Private Fire Protection	$0	$0	$750,840	$3,744,461			$136,027		$4,631,328
Total Allocated Rev. Req.	**$189,421,867**	**$174,812,671**	**$70,414,501**	**$60,521,977**	**$69,279,112**	**$33,681,260**	**$6,556,222**	**$2,684,704**	**$607,372,314**

Reallocation of Public Fire Protection Costs

The customer class revenue requirement for single family residential, multi-family, and commercial includes the reallocated public fire protection costs. Public Fire is reallocated among the customer classes to reflect the shared benefit of this service. Table 32 shows this distributed cost, which is allocated to the customer classes in proportion to their equivalent meters and recovered in the monthly fixed charge. This charge is appropriate to recover from the City's customers on this basis because the fire protection services are provided to each property. Public fire hydrants and their associated capacity in the water system are used to provide a direct benefit to individual properties in the event of a fire requiring their use. It is a reasonable assumption that locations with a large water meter are larger than others and would require more firefighting effort to control a fire event.

Table 32: Public Fire Reallocation

Customer Class	Preliminary Total	Reallocation of Public Fire	Total
Single Family Residential	$229,118,297	$9,710,770	$238,829,066
Multi-Family Residential	$137,796,391	$3,204,049	$141,000,440
Comm / Industrial / Outside City	$137,142,387	$2,849,103	$139,991,490
Irrigation	$78,183,333	$1,255,457	$79,438,790
Temp Construction	$3,364,372	$116,828	$3,481,200
Public Fire Protection	$17,136,207	($17,136,207)	$0
Private Fire Protection	$4,631,328	$0	$4,631,328
Total Allocated Rev. Req.	**$607,372,314**	**$0**	**$607,372,314**

Comparison of FY 2024 Cost of Service to Revenue Status Quo

Table 33 compares the final allocated revenue requirement by class to the amount of revenue that would be recovered from each class under the status quo scenario. If all rates were simply increased by an equal percentage amount in an across-the-board (ATB) fashion (10.2%, as described in the Financial Plan section above), the Commercial, Irrigation, Construction, and Private Fire Protection customer classes would pay more than their allocated share of costs. The cost of service by customer class compared to the projected revenues under the status quo scenario is shown in the last two columns of Table 33. As indicated, the results of the cost of service analysis results in a shifting of costs among the customer classes reflecting the changes in cost components and customer class usage characteristics from the prior cost of service study supporting the City's existing rates.

Table 33: Customer Class Cost of Service vs. Revenue under Across the Board Rate Increase

	FY 24 Status Quo - ATB		FY 24 Cost of Service		Change from Status Quo	
Customer Class	Revenue	Percent	Revenue	Percent	Dollars	Percent
Single Family Residential	$258,327,829	42.5%	$238,829,066	39.3%	($19,498,762)	-7.5%
Multi-Family Residential	$135,308,920	22.3%	$141,000,440	23.2%	$5,691,520	4.2%
Comm / Industrial / Outside City	$132,638,783	21.8%	$139,991,490	23.0%	$7,352,707	5.5%
Irrigation	$74,103,413	12.2%	$79,438,790	13.1%	$5,335,378	7.2%
Temp Construction	$3,259,918	0.5%	$3,481,200	0.6%	$221,282	6.8%
Private Fire Protection	$3,733,452	0.6%	$4,631,328	0.8%	$897,876	24.0%
Total	**$607,372,314**	**100%**	**$607,372,314**	**100%**	**$0**	**0%**

Rate Design

Introduction

The revenue requirements and cost of service analysis described in the preceding sections of this report provide a basis for the design of a water rate structure. Setting rates involves the development of rate schedules for each customer class. The rate schedules must establish rates that are sufficient to recover the annual revenue requirement determined for each customer class. The proposed rates are calculated directly from the results of the cost of service analysis.

In this section of the study, we first allocated the portions of each customer class's revenue requirement to be recovered through the fixed monthly charge (fixed charge) and the commodity charge calculated using variable rates. Next, for each customer class and for each tier of the single-family residential customer class, we calculated the variable commodity rate to be used to calculate the commodity charge for the billing cycle. Finally, we analyzed the impact of the proposed changes in the monthly fee and commodity rates on the customer classes.

Fixed Charge

The fixed monthly is the same for all customer classes and is based on meter size. The fixed charge recovers portions of fixed cost elements such as meter maintenance and services, meter reading, customer billing and collections, customer service, and maintenance. Additionally, a portion of the fixed charges levied by SDCWA are recovered in the City fixed charge. This structure is one way the City charges customers who require more capacity. For example, customers with a 4" meter expect to be able to use more water (at a higher flow capacity) than customers are with a ¾" meter. Consequently, the City's water system must maintain assets sized accordingly and capable of providing customers the level of service expected from their meter connection when the tap turns on. Table 34 shows the calculation of each component of the fixed charge based on the cost components from Table 31.

Table 34: Fixed Charge Components

Rate Component	Total Cost	Billable Units		Rate
CWA Supply - Fixed	$69,279,112	5,161,920	Eq. Meters x12	$13.42
Meters and Services	$33,681,260	5,161,920	Eq. Meters x12	$6.52
Billing	$6,556,222	3,486,456	Bills	$1.88
Fire Protection	$17,136,207	5,161,920	Eq. Meters x12	$3.32
Private Fire Capacity	$4,495,301	7,695	Fire Eq. Meters	$48.68

Table 35 shows the buildup of the fixed charge for each meter size. The Billing and Customers rate components are the same for all customers. The CWA Supply-Fixed, Meters and Services, and Public Fire Protection rate components scale with the size of the meter according to the meter capacity ratios developed in Table 21. Each component for each meter size is then added to develop the final monthly fee.

Table 35: Fixed Charge - $ per monthly bill

Meter Size	Meter Ratio	Rate Components				COS Total
		CWA Supply - Fixed	Meters and Services	Billing and Collection	Public Fire Protection	
5/8", 3/4"	1.00	$13.42	$6.52	$1.88	$3.32	$25.15
1"	1.67	$22.37	$10.87	$1.88	$5.53	$40.66
1.5"	3.33	$44.74	$21.75	$1.88	$11.07	$79.43
2"	5.33	$71.58	$34.80	$1.88	$17.71	$125.97
3"	12.33	$165.53	$80.47	$1.88	$40.94	$288.83
4"	20.67	$277.37	$134.85	$1.88	$68.61	$482.71
6"	48.00	$644.22	$313.20	$1.88	$159.35	$1,118.64
8"	73.67	$988.69	$480.67	$1.88	$244.55	$1,715.80
10"	140.00	$1,878.97	$913.49	$1.88	$464.76	$3,259.10
12"	176.67	$2,371.08	$1,152.74	$1.88	$586.49	$4,112.18
16"	260.00	$3,489.51	$1,696.49	$1.88	$863.13	$6,051.01

Commodity Rate

The City's commodity charge for all customers is based on rate charged per hundred cubic feet. It is calculated to recover costs associated with the CWA Supply-Volume, Base, Max Day, and Max Hour cost components. These costs include fixed and variable costs that are incurred by the City's water systems while meeting customer average rate of use and peak demand use. The commodity rate is developed by customer class. The following sections explain the development of the rate associated with each of the four volume related cost components. Each of these components are added together to develop the proposed uniform commodity rate per hcf by customer class.

CWA SUPPLY RATE COMPONENT

Table 36 shows the calculation of the rate to recover costs from the CWA Supply-Volume cost component. The costs for each customer class were previously shown in Table 31. The Billable Units are the total amount of water, measured in hcf, forecasted to be sold in FY 2024. The rate is calculated by the dividing the cost for each class by the billable units. This rate recovers a portion of the costs of the City to purchase water from SDCWA and is charged equally to all classes.

Table 36: Supply Rate Component Calculation

Customer Class	Cost	Billable Units	Rate
Single Family Residential	$68,534,118	22,955,136	$2.99
Multi-Family Residential	$46,779,602	15,668,578	$2.99
Commercial / Industrial / Outside City	$48,757,197	16,330,962	$2.99
Irrigation	$24,393,143	8,170,353	$2.99
Temp Construction	$957,807	320,812	$2.99
Total	**$189,421,867**	**63,445,841**	**$2.99**

BASE RATE COMPONENT

Table 37 shows the calculation of the rate to recover costs from the Base cost component. The Billable Units are the total amount of water, measured in hcf, forecasted to be sold in FY 2024. The rate is calculated by the dividing the cost for each class by the billable units. This represents the portion of the rate charged to recover the cost to deliver water at an average rate of demand and is applied equally to the rate being developed for all classes.

Table 37: Base Rate Component Calculation

Customer Class	Cost	Billable Units	Rate
Single Family Residential	$63,248,411	22,955,136	$2.76
Multi-Family Residential	$43,171,717	15,668,578	$2.76
Commercial / Industrial / Outside City	$44,996,789	16,330,962	$2.76
Irrigation	$22,511,818	8,170,353	$2.76
Temp Construction	$883,936	320,812	$2.76
Total	**$174,812,671**	**63,445,841**	**$2.76**

DEMAND RATE COMPONENT

Table 38 shows the calculation of the rate to recover costs from the Max Day Extra Capacity and Max Hour Extra Capacity cost components, which are added together in this table. The Billable Units are the total amount of water, measured in hcf, forecasted to be sold in FY 2024. The rate is calculated by the dividing the cost for each class by the billable units.

This rate includes the City's incremental costs (above Base costs) to build the system larger than the system would need to be built to meet average demand (the Max Day Extra Capacity and Max Hour Extra Capacity cost components). Since these costs were allocated to the customer classes in proportion to their demand in Table 31, the rates are different for each class. Customer classes with a higher demand factor pay a higher rate for demand costs.

Table 38: Demand Rate Component Calculation

Customer Class	Cost	Billable Units	Rate
Single Family Residential	$33,849,213	22,955,136	$1.47
Multi-Family Residential	$27,897,591	15,668,578	$1.78
Commercial / Industrial / Outside City	$25,878,222	16,330,962	$1.58
Irrigation	$23,555,247	8,170,353	$2.88
Temp Construction	$809,402	320,812	$2.52
Total	**$111,989,674**	**63,445,841**	

Tiered Rate Structures

The City currently has a four tier commodity rate structure for the SFR class. Our conclusion based on an examination of the City's detailed customer billing records is that the data support a transition to a three tier structure for the SFR class. To be clear, it is possible to develop cost justified structures under either a three or four tier approach if the cost to serve each tier is determined using based on analysis of the demand characteristics by

tier. This involves first establishing cost of service for the SFR class, then allocating that cost between the tiers, such that the rates will recover cost of service both by class and within the class. A detailed explanation of this process is provided in the next section of this report.

The multi-family residential, commercial/industrial/outside city, irrigation, temporary construction customer classes have a uniform commodity rate. A tiered rate structure is appropriate for SFR customers because it recognizes the diversity of demands within the class especially with regard to differences in indoor and outdoor water usage. A tiered structure recognizes these differences, charging higher rates for usage which contribute to the need for a larger, more expensive water system to support max day and max hour demand.

That said, relative to the SFR class, the non-SFR classes are far more heterogeneous. For example, the average usage for a 400-unit apartment complex will be higher than the average usage for a 10 unit complex; the average hcf usage for a university will be many times higher than average usage amount for a daycare; and the average usage for a dry cleaner will be higher than the average hcf usage for the convenient store next door. In other words, customers in these classes other than the single family residential class vary considerably in size which makes it impractical and inequitable to use a fixed increasing-block tiered rate structure for these customer classes. When a customer class is not relatively homogenous, using tiered rates cannot serve the purpose of allowing the City to recover a larger portion of the incremental costs to meet maximum day and hour extra capacity demand from these customers.

To apply a tier structure to the non-SFR classes would result in certain customer being charges for maximum day and hour extra capacity costs, even if their demand is relatively consistent. For example, a department store may average 10,000 hcf of usage per billing cycle. In a tiered rate structure like the one used for the single family residential class, the department store will be required to pay for 9,982 hcf, or over 99% of its water, at the tier 4 rate. However, forcing a department store to pay the highest tiered rate for 99% of its water does not achieve the City's purpose of passing the incremental cost of above-average usage to customers with above-average usage in a billing cycle because the City would be charging higher tiered rates for usage that, for the department store, is not above-average and therefore did not contribute to the City's incremental costs to create capacity in the system to meet above-average demand.

Due to extreme variations in the size and operations of the customers in the Multi-family, Commercial/Industrial, Temporary Construction and Irrigation customer classes, a tiered rate structure for these classes would be inequitable. As discussed above, the purpose of allocating the expenses associated with extra capacity to separate cost components (Max Day and Max Hour as opposed to Base) is to allow the system to recover a larger portion of the City's incremental costs to meet above-average demand from customers only when they place above-average demand on the system. Tiered rates should only be applied to a class when it serves this purpose. For these reasons, we recommend maintaining the uniform rate for these classes.

The use of a uniform rate for the non-single family residential customer classes this does not mean that customers in the non-single family residential customer classes do not pay their portion of the City's costs to create capacity in the system to meet above-average demand. In the Cost of Service section above, unique customer class demand factors were used to allocate more of the costs to upsize the system (the Max Day and Max Hour cost components) to the customer classes who demonstrate the most max day and max hour demand. Through this process, the classes with higher max day and max hour demand (irrigation and temporary construction) are allocated proportionally higher amounts from the max day and max hour costs than the classes that demonstrate less max day and max hour demand (commercial/industrial/outside the city). This explains why the uniform rates for the

irrigation and temporary construction customer classes are higher than the rate for the commercial/ industrial/outside the city customer class.

TIERED RATE STRUCTURE FOR THE SINGLE FAMILY RESIDENTIAL CUSTOMER CLASS

After the City chose to use a tiered rate structure for the single family residential customer class, the next step was to set the consumption levels for the three tiers. The amount of hcf at which a customer is charged at the next tier's rate is commonly called the tier breakpoint. Raftelis set the tier breakpoints for the single family residential customer class by performing a detailed analysis of customer usage patterns from 2018 through 2021.

The breakpoint between Tier 1 and Tier 2 is set at 10 hcf per bimonthly period, which accounts for 50% of all water billed to the SFR class. This amount was determined using a recommendation from the California Department of Water Resources (DWR)[11] that "water suppliers achieve an indoor water use efficiency standard of … 47 gallons [per person] per day by 2025." According to the latest available Census data, the average household size in the City of San Diego is 2.69 persons[12]. This suggests that a reasonable estimate for indoor water use is 5 hcf per month, or 10 hcf per bi-monthly period.[13]

The Tier 2/Tier 3 break point is 22 hcf, which is average use for bills issued during the summer months, representing an average amount of outdoor usage. Tier 3 includes all water use above 22 hcf per bimonthly period. The tier breakpoints for SFR customers billed monthly are half of these values.

CALCULATION OF THREE TIER SFR COMMODITY RATES

As described above, the purpose of a tiered rate structure is to recover max day and max hour costs from customers who place these demands on the water system. The required calculations are conceptually the same as the process for allocating these costs between the customer classes as described in the Cost of Service section and uniform rate calculation for other customer classes above. First, units of service (billed water use and demand factors) must be determined for each tier of water use. Second, maximum day and hour costs must be allocated to each tier. Finally, a rate must be developed based on the allocated cost and the billable units.

The demand factors presented here were derived using the same methodology described in the Units of Service section, and the extra capacity units for Max Day and Max hour using the same process as shown in Table 28. The Max Day Allocation and Max Hour Allocation are the resulting percentage distribution of the Max Day Extra Capacity Units and the Max Hour Extra Capacity Units.

[11] https://water.ca.gov/News/News-Releases/2021/Nov-21/State-Agencies-Recommend-Indoor-Residential-Water-Use-Standard
[12] 2020 ACS Data Table 25010 for the San Diego place.
[13] 47 gallons per person per day * 2.69 persons per household * 30 days per month = 3,792 gallons per month or 5.07 hcf

Table 39: SFR Tier Cost Allocations

Description	Base		Maximum Day			Maximum Hour			Allocations	
	Annual Use (HCF)	Average Day Use (HCF)	Demand Factor	Total Capacity (HCF/Day)	Extra Capacity (HCF/Day)	Demand Factor	Total Capacity (HCF/Day)	Extra Capacity (HCF/Day)	Maximum Day	Maximum Hour
Tier 1	11,297,672	30,953	1.04	32,114	1,162	1.56	48,172	16,057	7.1%	40.6%
Tier 2	6,878,932	18,846	1.26	23,834	4,988	1.90	35,751	11,917	30.7%	30.1%
Tier 3	4,778,532	13,092	1.77	23,207	10,115	2.66	34,811	11,604	62.2%	29.3%
Total	22,955,136				16,265			39,578		

Table 40 shows the calculation of the demand rate component of each tier. The total SFR max day extra capacity component cost, $19.9 million, is reallocated to each tier using the Max Day Allocation calculated in Table 39; the same step is repeated for Max Hour costs. It is important to note that the total demand costs allocated to the three proposed tiers within the SFR class is the same as the total SFR peaking costs previously calculated in Table 31. Regardless of the tier breakpoint definitions or unique tier demand factors, the tiered rates are calculated to recover exactly 100% of the entire class cost.

Table 40: Demand Rate Calculation

Description	MD Share	MD Cost	MH Share	MH Cost	Total Cost	Billable Units	Rate
Tier 1	7.1%	$1,354,749	40.6%	$6,039,210	$7,393,958	11,297,672	$0.65
Tier 2	30.7%	$5,815,412	30.1%	$4,482,081	$10,297,493	6,878,932	$1.50
Tier 3	62.2%	$11,793,608	29.3%	$4,364,154	$16,157,762	4,778,532	$3.38
Total	**100.0%**	**$18,963,768**	**100.0%**	**$14,885,445**	**$33,849,213**	**22,955,136**	**$1.47**

Table 41 summarizes the SFR tiered rates and uniform rates for other classes. The total commodity rate for each tier is the sum of each of the rate components.

Table 41: Tiered Commodity Rates - $ per hcf

Customer Classes	Bimonthly Tier Widths (HCF) [1]	Rate Components			
		Supply	Base	Max Day & Max Hour	COS Total
Single Family Residential					
Tier 1	0 to 10	$2.99	$2.76	$0.65	$6.40
Tier 2	11 to 22	$2.99	$2.76	$1.50	$7.24
Tier 3	Above 22	$2.99	$2.76	$3.38	$9.12
Multi-Family Residential		$2.99	$2.76	$1.78	$7.52
Commercial / Industrial / Outside City		$2.99	$2.76	$1.58	$7.33
Irrigation		$2.99	$2.76	$2.88	$8.62
Temp Construction		$2.99	$2.76	$2.52	$8.26
[1] Monthly bills' tier thresholds are 50% of bimonthly thresholds.					

Private Fire Protection Rates

Private fire protection rates recover the cost of the system capacity available to deliver water during a fire event. This enables recognition of the portion of water system infrastructure available to provide stand-by ready to serve service. The rate components were derived in Table 34. The customer cost component is the same for each meter size and is the same charge applied to all other retail meters. The fire capacity component is scaled according to the equivalent fire demand ratios shown in Table 21.

Table 42: Monthly Private Fire Service Fees - $ per monthly bill

Connection Size	Meter Ratio	Rate Components		COS Total
		Private Fire Capacity	Billing	
1"	0.01	$0.44	$1.88	$2.32
1.5"	0.03	$1.27	$1.88	$3.15
2"	0.06	$2.71	$1.88	$4.59
3"	0.16	$7.86	$1.88	$9.75
4"	0.34	$16.76	$1.88	$18.64
6"	1.00	$48.68	$1.88	$50.56
8"	2.13	$103.75	$1.88	$105.63
10"	3.83	$186.57	$1.88	$188.45
12"	6.19	$301.37	$1.88	$303.25
16"	13.19	$642.22	$1.88	$644.10
20"	23.72	$1,154.93	$1.88	$1,156.81

Rate Forecast

Table 43, Table 44, and Table 45 provide a forecast of rates through the study period. The rates shown in the first column are those which took effect January 1, 2023. The second column provides a status quo scenario in which all rates are increased by 10.2% according to the financial plan. The Cost of Service FY 2024 rates are those developed above. In FY 2025, each rate is increased by 8.7% which is the required percentage revenue increases identified in the financial plan. It has been assumed that the proposed FY 2024 rates will be effective on bills issued on or after November 1, 2023 and the proposed FY 2025 rates will be effective on bills issued on or after January 1, 2025.

Table 43: Comparison of Current and Proposed Fixed Charges - $ per monthly bill

Meter Size	Current FY 2023	Status Quo FY 2024	Cost of Service FY 2024	FY 2025
Adopted:	Jan. 2023	Nov. 2023	Nov. 2023	Jan. 2025
5/8", 3/4"	$27.77	$29.60	$25.15	$27.33
1"	$36.77	$39.19	$40.66	$44.19
1.5"	$57.37	$61.16	$79.43	$86.32
2"	$83.11	$88.59	$125.97	$136.89
3"	$143.59	$153.07	$288.83	$313.87
4"	$229.83	$244.99	$482.71	$524.56
6"	$443.47	$472.74	$1,118.64	$1,215.63
8"	$700.86	$747.12	$1,715.80	$1,864.57
10"	$1,002.01	$1,068.14	$3,259.10	$3,541.69
12"	$1,859.13	$1,981.84	$4,112.18	$4,468.74
16"	$3,232.34	$3,445.67	$6,051.01	$6,575.68

Table 44: Comparison of Current and Proposed Commodity Rates - $ per hcf

Customer Class	Tier Breakpoints		Current FY 2023	Status Quo FY 2024	Cost of Service FY 2024	FY 2025
Adopted:	Current	Proposed	Jan. 2023	Nov. 2023	Nov. 2023	Jan. 2025
Single Family Residential						
Tier 1	0 to 8	0 to 10	$5.55	$5.92	$6.40	$6.95
Tier 2	9 to 24	11 to 22	$6.22	$6.63	$7.24	$7.87
Tier 3	25 to 36	Above 22	$8.88	$9.47	$9.12	$9.91
Tier 4	Above 36		$12.49	$13.31		
Multi-Family Residential			$6.72	$7.16	$7.52	$8.17
Commercial / Industrial / Outside City			$6.55	$6.99	$7.33	$7.97
Irrigation			$7.45	$7.94	$8.62	$9.37
Temp Construction			$7.57	$8.07	$8.26	$8.98

Table 45: Comparison of Current and Proposed Private Fire Service Fees - $ per monthly bill

Fireline Size	Current FY 2023	Status Quo FY 2024	Cost of Service FY 2024	FY 2025
Adopted:	Jan. 2023	Nov. 2023	Nov. 2023	Jan. 2025
1"	$4.13	$4.40	$2.32	$2.52
1.5"	$4.13	$4.40	$3.15	$3.42
2"	$6.40	$6.82	$4.59	$4.99
3"	$24.77	$26.41	$9.75	$10.60
4"	$31.67	$33.76	$18.64	$20.26
6"	$46.78	$49.87	$50.56	$54.94
8"	$66.07	$70.43	$105.63	$114.79
10"	$85.35	$90.98	$188.45	$204.79
12"	$101.85	$108.58	$303.25	$329.54
16"	$165.16	$176.06	$644.10	$699.95
20"	$205.64	$219.21	$1,156.81	$1,257.11