North Coast County Water District
Water Rate Study

November 17, 2021

HF&H Consultants, LLC

NORTH COAST COUNTY WATER DISTRICT
2400 FRANCISCO BOULEVARD
PACIFICA, CA 94044

WATER RATE STUDY

November 17, 2021

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November 17, 2021

Ms. Adrianne Carr
General Manager
North Coast County Water District
2400 Francisco Boulevard
Pacifica, California 94044

Subject: Water Rate Update

Dear Ms. Carr:

HF&H is pleased to submit this report. The report is organized beginning with determining how much projected revenue is needed from rates during the next five years (FY 2021-22 through FY 2025-26). The report describes how the revenue requirement (expenses) is apportioned between the residential and non-residential customers. The report concludes with a discussion of the rate design that is appropriate for each class to ensure that customers are paying their proportionate share.

The report reflects input from the Finance Committee, Board and District staff in refining the budgeted expenses and rates. The resulting rate adjustments are necessary for several reasons: (1) the previous cost-of-service study occurred in 2016. Changes in consumption patterns necessitates revisiting rates to ensure current rates are proportionate to the cost of service. (2) the cost of water that the District relies on from the San Francisco Public Utilities Commission (SFPUC) projects to rise precipitously; and, (3) the District has planned an expansion of its capital improvements program to make necessary upgrades to its primary water storage tanks and headquarters building.

Please contact us if you have any questions.

Very truly yours,

HF&H CONSULTANTS, LLC

Rick Simonson, Senior Vice President
Gabe Sasser, Senior Associate

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ACRONYMS

FY	fiscal year
BP	Refers to breakpoint, as in water consumption tier breakpoint.
COS	cost-of-service
HCF	hundred cubic feet of metered water sold; 748 gallons; a cube of water 4.6 feet on edge
GCD	gallons per capita per day
GPD	gallons per day
MG	million gallons
MGD	million gallons per day
PAYGo	Refers to a method of paying for capital projects on a pay-as-you-go basis, rather than through long-term debt issuance.
Service charge	Refers to the District's fixed bi-monthly charge per account based on the size of the service or meter; the official title is "supply and distribution charge." For ease of discussion, the term "service charge" is used in this report.
SFPUC	San Francisco Public Utilities Commission
SFR	single-family residential
Volumetric charge	Refers to the District's charge per HCF which varies depending on the amount of water use during the billing period; the official title is "water usage charge." For ease of discussion, the terms "volumetric charge" or "volumetric rate" are used in this report.
WSCP	Water Shortage Contingency Plan

ACKNOWLEDGEMENTS

Board of Directors
- Thomas Piccolotti, Board President
- Jack Burgett, Vice President
- Joshua Cosgrove, Director
- Ron Ash, Director
- Anne De Jarnatt, Director

District Staff
- Adrianne Carr, General Manager
- Stephanie Dalton, Management Analyst II

HF&H Consultants, LLC
- Rick Simonson, Senior Vice President
- Gabe Sasser, Senior Associate

LIMITATIONS

This document was prepared solely for North Coast County Water District in accordance with the contract between the District and HF&H and is not in intended for use by any other party for any other purpose.

In preparing this study, we relied on information and instructions from the District, which we consider accurate and reliable and did not independently verify.

Rounding differences caused by stored values in electronic models may exist.

This document represents our understanding of relevant laws, regulations, and court decisions but should not be relied upon as legal advice. Questions concerning the interpretation of legal authorities referenced in this document should be referred to a qualified attorney.

NORTH COAST COUNTY WATER DISTRICT

WATER RATE STUDY

EXECUTIVE SUMMARY

The Executive Summary presents the findings and recommendations in this report. The report was reviewed with District staff, which requested further analysis of an alternative that would transition the rate adjustments over multiple years. That alternative is summarized at the conclusion of the Executive Summary. The body of the report documents the rates that were part of the original study.

STUDY OBJECTIVES

The District undertook this rate study to meet the following key objectives.

1. **Provide revenue sufficiency and financial stability –** Ensure revenue from future rates is able to continue covering costs without depleting reserves and maintaining necessary debt service coverage requirements. Revenue requirement projections are increasing with expanded capital program expenses to upgrade aging infrastructure.

2. **Maintain adequate reserves to meet District policies –** Confirm future rates will continue to generate revenues that will keep the District's reserve balance in line with its target threshold to have sufficient reserves on hand for operational cash flow, debt service payments, unplanned emergency, retirement funding liability, and capital improvement funding, in that order.

3. **Rate payer equity.** Revisit allocation of District's costs to verify each customer class pays their proportionate share of expenses. Each customer within each customer class must pay their proportionate share of expenses via consumption and service capacity.

FINDINGS AND RECOMMMENDATIONS

In preparing this water rate update, the following findings were made.

1. **Rates require realignment.** The cost-of-service revenue requirement projections for FY 2021-22 indicate that total rate revenues generated from current volumetric rates and fixed service charges cover the cost of service. No additional revenue is necessary in FY 2021-22 to cover District costs. However, adjustments are needed to realign individual rates to reflect the proportional benefits each customer class receives.

2. **Small annual rate revenue increases will keep the District's reserve balance on pace with its growing reserve targets.** Annual increases of 3% from FY 2022-23 through FY 2025-26 will maintain the District's strong reserves position.

3. **Operating cost increases.** Operating and Maintenance (O&M) expenses within the District's control, such as for personnel, are increasing generally at the rate of inflation. No increase in headcount has been assumed.

4. **Capital cost increases and future debt issuance.** The District's five-year capital plan assumes $44 million in project costs. More than $33 million of this total is attributed to four projects and will be funded through bond proceeds. Two separate issuances during the five-year period are anticipated.

5. **Cost of purchased water.** The District is entirely reliant on the San Francisco Public Utilities Commission (SFPUC) for its potable water supply. The cost of water, $4.10 per Hundred Cubic Foot (HCF), has remained constant since the previous study; however, in May 2021 the SFPUC provided their most-recent projections which increase the cost of water to $5.37 per HCF, by FY 2025-26.

6. **Projected revenue increases.** The present rate study projected increasing revenue to generate additional overall revenue to cover the recent cost increases and projected revenue shortfall with the prospective issuance of new debt. Comparing the revenue required to cover the cost of service, including projected SFPUC rate increases, with the revenue from current rates indicates the need for the following revenue increases:

   February 2022* - 0%
   July 2022 – 3.0%
   July 2023 – 3.0%
   July 2024 – 3.0%
   July 2025 – 3.0%

   * While no revenue increase is needed for February 2022, the volumetric rates will need to be adjusted to realign with the cost-of-service analysis. As a result, customers will experience varying levels of adjustments to their bill, based on their level of consumption and customer class the account is billed under.

7. **Revenue changes by customer class and by charge. Table ES-1** compares the revenue from current rates with the cost-of-service for FY 2021-22. This figure

indicates how much revenue is needed from volumetric and service charges[1] to generate the same level of revenue needed in FY 2021-22. This figure also indicates the comparison of volumetric revenue adjustments needed from the residential[2] class (a decrease of 0.4%) and the commercial[3] class (an increase of 0.9%). Service charge rates will remain the same. The proposed rates, effective February 1, 2022, were derived to generate the necessary revenue based on the cost-of-service analysis.

Table ES-1. Current Rate Revenue Compared With the Cost-of-Service (FY 2021-22)

Components of Rate Structure	Current Revenue [1] (no rate increase)		Cost of Service		Difference COS Minus Current	
Volumetric						
Residential	$6,317,137		$6,291,175		($25,962)	-0.4%
Commercial	$3,017,408		$3,043,371		$25,962	0.9%
	$9,334,545	67%	$9,334,545	67%	$0	0.0%
Service/Meter Charges	$4,584,708	33%	$4,584,708	33%	$0	0.0%
	$13,919,254	100%	$13,919,254	100%	$0	0.0%

[1]Based on Projected FY 2021-22 Water Use at Current Rates

8. **Service Charge rates. Table ES-2** shows the current and cost-of-service service charge rates, during the five-year planning period. The proposed service charges effective February 1, 2022 are the same, and then increase 3% annually, effective July 1 of 2022, 2023, 2024, and 2025.

[1] As noted in the Glossary, the District's volumetric and service charges are officially titled Water Usage and Supply and Distribution Charges, respectively. The shorter terms are used in this report for ease of discussion.

[2] Throughout this report, the term, "residential" will be used to refer to the Single Family Residential customer class.

[3] The commercial class includes multi-unit residences, irrigation customers, public customers, temporary meters, and recycled water customers, except when the recycled water customer class is identified separately. The cost-of-service analysis considered commercial and recycled water customers as one customer class.

Table ES-2. Current and Cost-of-Service-Based Bi-Monthly Service Charges

Meter Size	Current Charge per Account	Proposed FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
	% Increase	*0.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
	effective date	*2/1/2022*	*7/1/2022*	*7/1/2023*	*7/1/2024*	*7/1/2025*
5/8"	$53.48	$53.48	$55.08	$56.73	$58.43	$60.18
3/4"	$58.87	$58.87	$60.64	$62.46	$64.33	$66.26
1"	$74.97	$74.97	$77.22	$79.54	$81.93	$84.39
1 1/2"	$96.36	$96.36	$99.25	$102.23	$105.30	$108.46
2"	$155.65	$155.65	$160.32	$165.13	$170.08	$175.18
3"	$588.64	$588.64	$606.30	$624.49	$643.22	$662.52
4"	$749.39	$749.39	$771.87	$795.03	$818.88	$843.45
6"	$1,124.12	$1,124.12	$1,157.84	$1,192.58	$1,228.36	$1,265.21
8"	$1,552.33	$1,552.33	$1,598.90	$1,646.87	$1,696.28	$1,747.17
10"	$2,087.73	$2,087.73	$2,150.36	$2,214.87	$2,281.32	$2,349.76
12"	$2,623.13	$2,623.13	$2,701.82	$2,782.87	$2,866.36	$2,952.35

9. **Volumetric Charge rate changes. Table ES-3** shows the current and cost-of-service volumetric rates, during the five-year planning period. The residential volumetric rates are tiered; the commercial and recycled water rates are uniform charges. The sizes of the residential tiers are based on residential billing data, which indicates lower levels of consumption due to continued improvements in water use efficiency. The sizes of the proposed tiers were reduced compared to the current tiers to reflect current customer demand patterns.

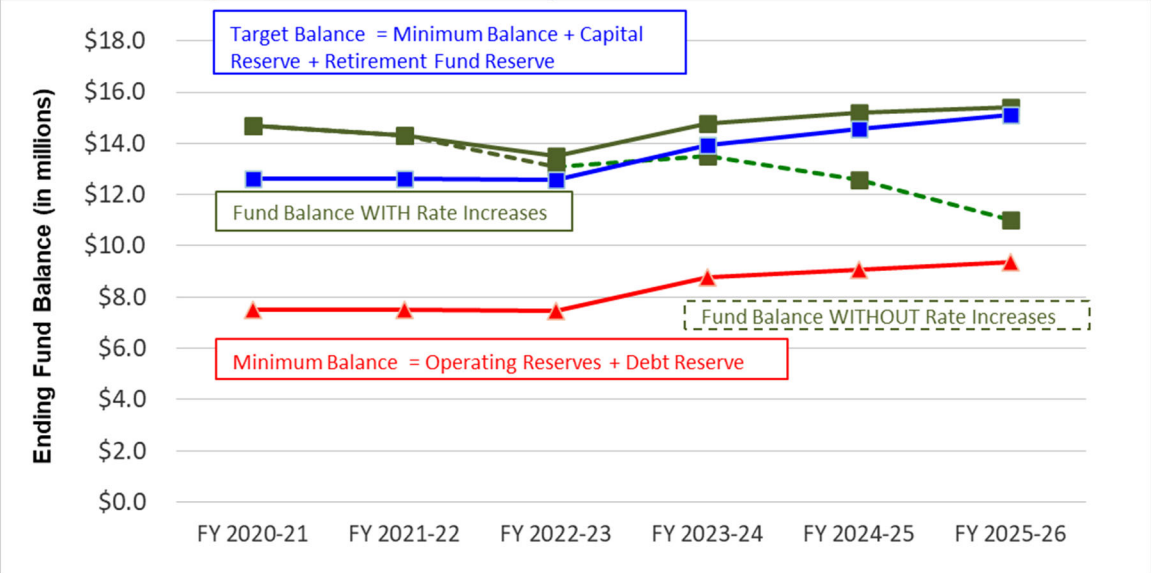
Table ES-3. Current and Cost-of-Service-Based Bi-Monthly Volumetric Rates

Customer Class	Current Tier Size	$/HCF	Customer Class	Proposed Tier Size	Proposed FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
				% Change	*varies*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
				effective date	*2/1/2022*	*7/1/2022*	*7/1/2023*	*7/1/2024*	*7/1/2025*
Residential			**Residential**						
Tier 1	0-5 HCF	$6.60	Tier 1	0-5 HCF	$6.09	$6.27	$6.46	$6.65	$6.85
Tier 2	6-10 HCF	$7.86	Tier 2	6-9 HCF	$9.19	$9.47	$9.75	$10.04	$10.34
Tier 3	11-19 HCF	$13.53	Tier 3	10-13 HCF	$12.45	$12.82	$13.20	$13.60	$14.01
Tier 4	Over 19 HCF	$22.72	Tier 4	Over 13 HC	$15.32	$15.78	$16.25	$16.74	$17.24
Commercial		$8.49	**Commercial**		$8.56	$8.81	$9.08	$9.35	$9.63
Recycled Water		$7.50	**Recycled Water**		$7.70	$7.93	$8.17	$8.42	$8.67

10. **Reserve Fund Balance[4] (Figure ES-1).** With the recommended rates in **Tables ES-2** and **ES-3**, the District's reserve fund balance (solid green line) will be above the target balance (solid blue line), which covers the operating and capital requirements.

[4] The fund balance includes reserves for operations, capital, debt, emergency, and retirement.

Figure ES-1. Year End Projected Reserve Fund Balances



11. **Debt coverage ratio.** With the recommended revenue increases, the District's debt service coverage[5] is higher than the required 1.20 ratio in FY 2021-22. In subsequent years, the coverage ratio stays above the required minimum despite the introduction of additional debt service associated with debt-financing the headquarters upgrades and the replacement of three aging storage tanks during the next five years.

    FY 2021-22 –2.85
    FY 2022-23 – 2.83
    FY 2023-24 – 1.76
    FY 2024-25 – 1.73
    FY 2025-26 – 1.61

12. **Pass-through adjustments to volumetric rates.** The cost of SFPUC water is the single largest component of the District's revenue requirements. Because the District has no control over the SFPUC's wholesale water rate, this cost is simply passed through to the District's customers. The SFPUC provides projections of its future wholesale water rates, which are built into the rate projections in this study:

    February 2022 - $4.10 per HCF
    July 2022 – $4.32 per HCF
    July 2023 – $4.65 per HCF

[5] Debt service coverage is the amount of rate revenue available to pay debt service after operating expenses have been paid. The minimum required revenue coverage is 1.20 times the amount of annual debt service after operating expenses have been paid from rate revenue.

July 2024 – $4.92 per HCF
July 2025 – $5.37 per HCF

The SFPUC updates its projections each year as part of the rate-making process legally prescribed in the wholesale Water Supply Agreement. California Government Code Section 53756 authorizes water suppliers to adjust their rates in response to changes in pass-through costs. We recommend that the District incorporate annual pass-through adjustments in its residential and commercial rates. Recycled water rates would change in relation to pass-through adjustments to commercial rates to maintain a ratio of 90% of the commercial rate charged.

13. **Implement Water Shortage Revenue Stabilization Factors.** Water Shortage Revenue Stabilization Factors are designed to offset the amount of revenue shortfall caused by conservation during specific Board-adopted, water shortage stages. The Board of Directors can choose to implement the Water Shortage Revenue Stabilization Factors during declared water shortage emergencies. The Water Shortage Revenue Stabilization Factors are designed to align with the District's six water shortage levels in the District's adopted Water Shortage Contingency Plan and are applied to the volumetric rates to ensure that there are sufficient revenues to fund the District's obligations.

Table ES-4. Water Shortage Revenue Stabilization Factors by WSCP-Defined Water Shortage Stage and Customer Class

Class	Stage 1 Up to 10% Reduction	Stage 2 Up to 20% Reduction	Stage 3 Up to 30% Reduction	Stage 4 Up to 40% Reduction	Stage 5 Up to 50% Reduction	Stage 6 Greater than 50% Reduction
Residential	1.021	1.071	1.134	1.214	1.322	1.448
Commercial/Recycled Water	1.024	1.081	1.154	1.252	1.392	1.533

To be applied to the non-shortage rates in effect at the time of the shortage declaration

IMPLEMENTATION

After adjusting rates effective February 1, 2022 to realign the rates to reflect the proportional benefits each customer class receives, the District should monitor its rates before implementing subsequent rate increases. Several factors influence the accuracy of the projections. For example, the cost of SFPUC water is subject to annual adjustment by the SFPUC. In addition, customer demand is subject to water supply availability, which cannot be precisely projected.

Each year the District should determine how much, if any, pass-through adjustment is required as soon as the SFPUC submits its updated wholesale rates, which is typically in April or May of each year. The wholesale rate used for the projections in this study

should be compared with the updated rate and the difference either added to or subtracted from the District's volumetric rates.

1. INTRODUCTION

Since 2001, HF&H Consultants, LLC has assisted the North Coast County Water District (District) with its water rates and capacity charges. Most recently in 2016, HF&H performed a five-year water rate update, recommending implementation of proposed rates each year. Due in large part to wholesale water costs remaining less than modeled projections, the District did not have to implement the approved, maximum rates as recommended by the study. In 2021, the District requested HF&H to perform a new five-year cost-of-service rate study. The purpose of this report is to document the analysis and summarize our assumptions, findings, and recommendations.

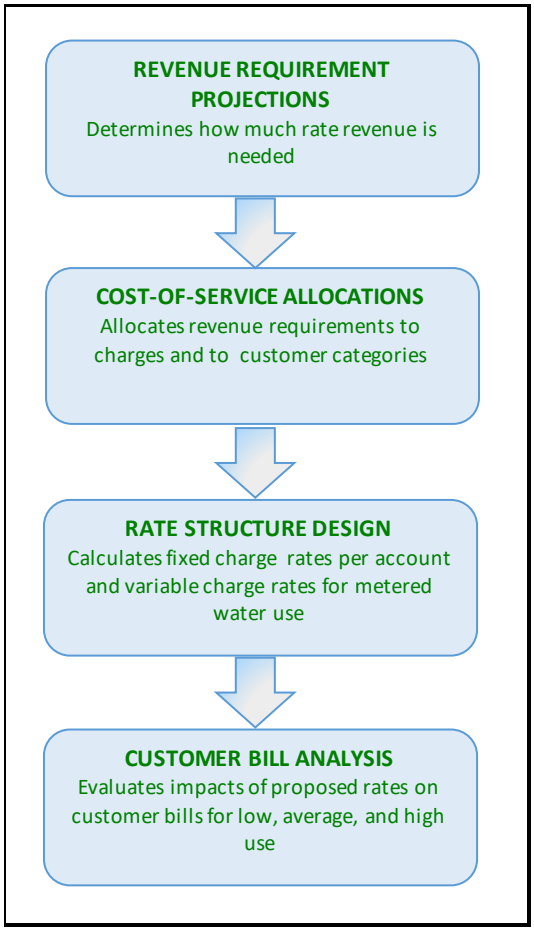
The report is organized to explain the how the revenue requirements are determined over the next five years. As part of the documentation, this report includes a copy of the spreadsheet model that was used to derive rates.

STUDY PURPOSE

The purpose of this study is to conduct a cost-of-service analysis that will determine rates that proportionally recover the cost of providing the District's water service. Toward that end, the cost-of-service analysis determined how much revenue should be generated by each component of the rate structures so that rate payers within each customer class are charged for their proportionate shares of the cost of providing service. The cost-of-service analysis is tailored specifically to the District's customer classes and the rate structures.

STUDY PROCESS

The rate study was conducted following industry standards and practices promulgated by the American Water Works Association[6] and the Water Environment Federation.[7] A comprehensive rate study involves the four steps shown in the adjacent diagram.



[6] *Principles of Water Rates, Fees, and Charges*. American Water Works Association Manual M1. 2017.
[7] *Financing and Charges for Wastewater Systems*. Water Environment Federation Manual of Practice 27. 2018.

Revenue requirements were projected for a five-year planning period based on operations, maintenance, capital expenses, and contributions to reserves. The cost-of-service analysis allocates the projected expenses among the customer classes in proportion to their use of the systems. Rates are then designed so that rate payers are charged equitably. The impact on customers is then determined by comparing bills under the proposed rates with bills under the current rates.

REPORT ORGANIZATION

This report describes each of the four rate-making steps for the District's water rates. A glossary of technical terms and acronyms is provided following the Table of Contents. An appendix contains a copy of portions of the rate model that are not included in the body of the report text as tables and figures.

2. REVENUE REQUIREMENT PROJECTIONS

The revenue requirement analysis began with the FY 2021-22 budgeted O&M and capital expenditures. Revenue requirements for each fiscal year were then projected over a five-year planning period, through FY 2025-26. Revenue increases needed to cover the projected revenue requirements were then determined. Through comparison with projected revenue from current rates. Annual surpluses and deficits were then applied to the reserve funds. Rates were then increased to cover expenses and maintain operating and capital reserves.

ASSUMPTIONS AND PROJECTIONS

The District's FY 2021-22 budget served as the basis for determining the revenue requirement. The operating and maintenance expenses were projected through FY 2025-26 using appropriate escalation factors. Capital expenses were projected based on the District's current capital improvement program. Projects were separated into categories depending on whether they are funded from cash on a pay-as-you-go basis or from bond proceeds. In addition to the District's budgeted expenses, the revenue requirement includes transfers to the Operating and Capital Improvement Reserves.

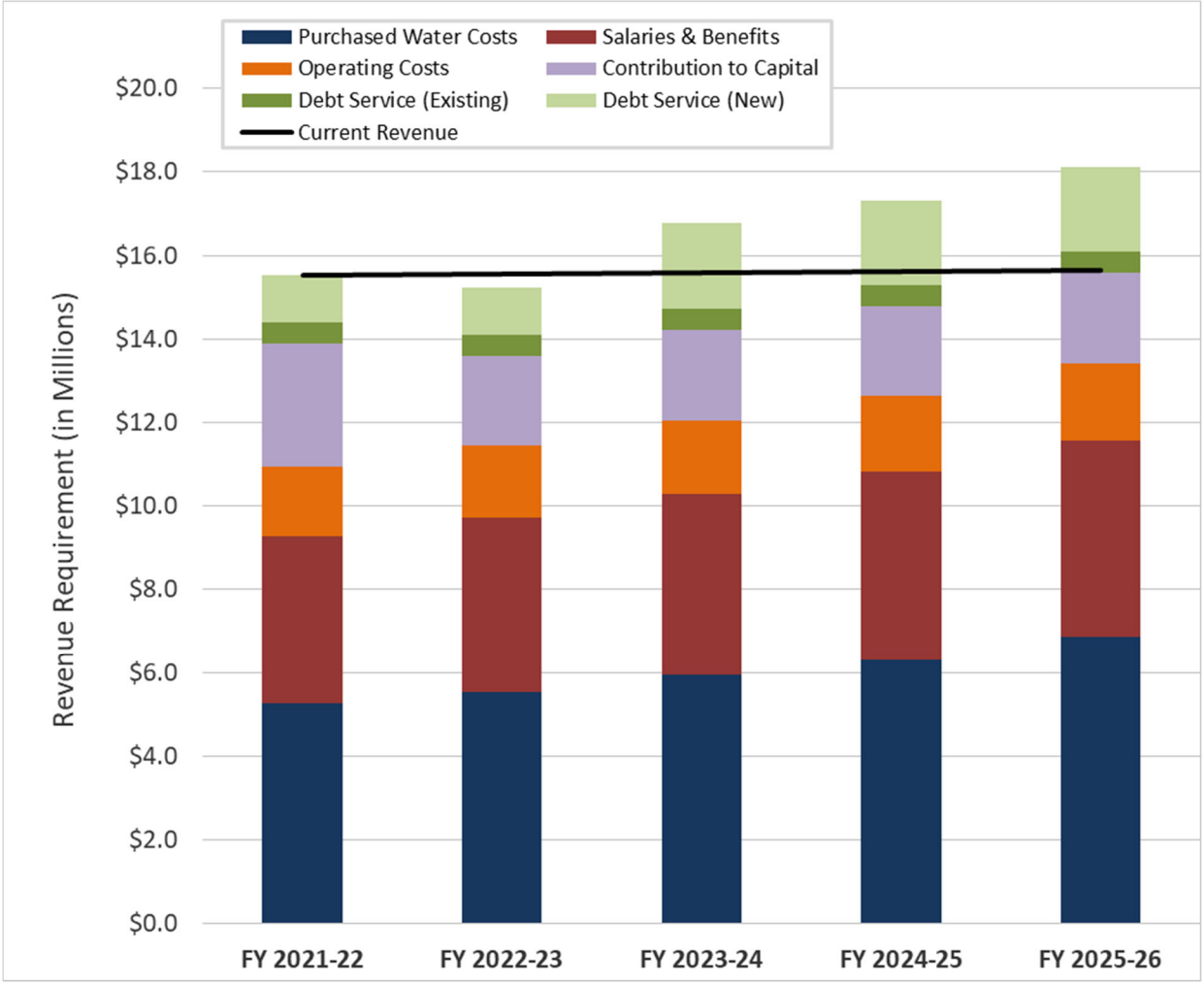
The assumptions shown in **Table 2-1** were used to project expenses through FY 2025-26.

Table 2-1. Modeling Assumptions

		Budget	Projected			
		FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
a	General Inflation	Per Budget	2.0%	2.0%	2.0%	2.0%
b	Utilities	Per Budget	5.0%	5.0%	5.0%	5.0%
c	Salary Increases	Per Budget	2.0%	2.0%	2.0%	2.0%
d	Pension	Per Budget	7.0%	7.0%	7.0%	7.0%
e	SFPUC Water Rate per HCF	$4.10	$4.32	$4.65	$4.92	$5.37
f	SFPUC Purchases (HCF)	1,137,860	1,146,155	1,154,451	1,162,746	1,171,042
g	Assumed Losses	10.8%	10.8%	10.8%	10.8%	10.8%
h	Liability Insurance	Per Budget	5.0%	5.0%	5.0%	5.0%
i	Interest on Earnings	1.0%	1.0%	1.0%	1.0%	1.0%
j	Non-rate Revenues	Per Budget	1.0%	1.0%	1.0%	1.0%
k	% Cutbacks due to Conserv.	0.0%	0.0%	0.0%	0.0%	0.0%
l	Growth in Accounts	0.0%	0.2%	0.2%	0.2%	0.3%
m	Construction Cost Inflation	Per Budget	3.0%	3.0%	3.0%	3.0%
n	Benefit Increases	Per Budget	7.0%	7.0%	7.0%	7.0%
o	Change in Residential Consumption	0.0%	0.7%	0.7%	0.7%	0.7%
p	Change in Commercial Consumption	0.0%	0.7%	0.7%	0.7%	0.7%
q	Change in Recycled Water Consumption	0.0%	0.7%	0.7%	0.7%	0.7%

The resulting revenue requirement projections are shown in **Figure 2-1** as stacked bars. In addition, the revenue from current rates is shown as a solid black line.

Figure 2-1. Revenue Requirement Projections



The expenditure categories are as follows:

SFPUC Water Purchases

The San Francisco Public Utilities Commission (SFPUC) provides nearly all of the District's water at a cost set by the SFPUC. The cost of SFPUC water depends on the SFPUC's rates, which are set by the SFPUC and are out of the District's control, and the amount of water purchased. The District's customers are very efficient water users. Their per capita water use is among some of the lowest in the State.

Projections of future water purchase expenses relied on SFPUC rates and future demand. SFPUC rates are projected to increase from the current rate of $4.10 per HCF to $5.37 per HCF by FY 2025-26, an average annual increase of 7.7%. It's worth noting during the previous 2016 study, SFPUC projected rates would increase from $4.10 to $5.50 by FY 2020-21. However, rates remained static as of FY 2016-17. It's possible the wholesale water

rate projections don't fully materialize, but the model conservatively follows information provided by SFPUC.

Water purchase projections assume future demand will increase slightly, due to growth. Projections of demand in FY 2021-22 (1,137,860) rely on an initial volume of water based on the three-year average of February 2017 through January 2020 water purchases. The District contracted with EKI to conduct a study of future demand from 2025-2045. Projections of water purchases for FY 2025-26 (1,171,042 HCF) align with the 2025 water purchase volume from this demand study. Projections of water purchases in years two through four of the study rely on interpolation between these figures, assuming a constant rate of growth.

Operating and Other Expenses

O&M and other expenses are projected to gradually increase during the projection period. These expenses are within the District's direct control and have been held to low annual increases. Collectively, these expenses are represented by the red (Salaries & Benefits) and orange (Operating Costs) portions of the revenue requirement.

Capital Improvements

The District's five-year capital plan assumes $44.0 million in project costs. More than $33 million of this total is attributed to four projects. The District has planned repair and/or replacement of three storage tanks: Sheila, Fassler, and Royce, and plans to upgrade its headquarters building. While the District plans to fund these projects through additional debt issuance, it will fund the remaining $11.0 million of its capital improvements program on a pay-as-you-go (PAYGo) basis. These PAYGo projects reflect the District's need to renew and replace its infrastructure to keep pace with depreciation. Without these expenditures, service levels will be affected, which could lead to service interruptions, water quality violations, and other unacceptable conditions. The District anticipates spending approximately $2.1 million annually for PAYGo capital projects.

Existing Debt Service

The District's existing debt service includes approximately $516,000 in annual payments for a 2012-issued bond. Payments extend through the five-year period of the study, ending in 2028.

Proposed Debt Service

The District plans to issue two separate issuances of debt (totaling approximately $33.0 million in the five-year period) to fund construction projects associated with upgrading its headquarters building and three of its storage tanks: Sheila, Fassler, and Royce. Our model assumes bond proceeds in FY 2021-22 of $20,572,000 and in FY 2023-24 of $12,965,000. As a result, the District's total debt service will increase from $516,000 to $1.64 million in FY 2021-22 and to $2.54 million by FY 2023-24.

Rates need to generate sufficient revenue to cover the District's annual expenditures and to maintain adequate reserves.

RESERVE FUNDS

Reserves are required to stabilize rates and to provide for contingencies. Reserves can be drawn on in years when the District experiences above average costs and augmented during years when costs are below average. The District's reserves are used for operating and capital purposes. Each of these purposes has its own requirements that lead to minimum and optimum target balance. Rates must be set so that the fund balance achieves the target balance.

Operating Reserve Component

The operating component of the reserves provides working capital for month-to-month O&M expenditures. With sufficient working capital, the District can operate without cash flow constraints. The District's approved reserve policy is six months of operating expenses. This meets our recommendation of a minimum operating reserve that is equal to at least 1.5 times the bill frequency (or three months in the District's case), which is the equivalent of one quarter of one year's O&M expenditures. The District's Reserves should never drop below this minimum balance.

Capital Improvement Reserve Component

The capital improvement component of the reserves provides working capital for the District's capital improvement program. The fund balance needs to be sufficient to at least pay contractors without delays caused by cash flow limitations. The fund balance can be larger so that the District can fund larger construction projects on a pay-as-you-go basis, thereby eliminating financing costs.

The District's approved policy requires a reserve threshold using the combined sum of the five-year average of previous annual capital improvement expenses and the projection of three months' worth of budgeted PAYGo projects.

Debt Reserve Component

The purpose of a debt reserve is to provide funding to avoid defaulting on the loan if the District failed to make a loan payment. The District has an approved policy of 1.2 times the annual debt service payment.

Retirement Fund Reserve Component

The District currently has a $326,000 target balance for making annual payments to fund Other-Post Employment Benefits (OPEB), such as health care and dental care. The annual amount to be contributed is established by the Board based on the actual costs to fund these expenses on a PAYGo basis.

REVENUE INCREASES

Revenue increases were derived to cover the District's costs and to fund its reserves. **Table 2-2** summarizes the projected revenue from current rates, annual revenue requirements, annual variances, and the rate increases necessary to cover the District's costs.

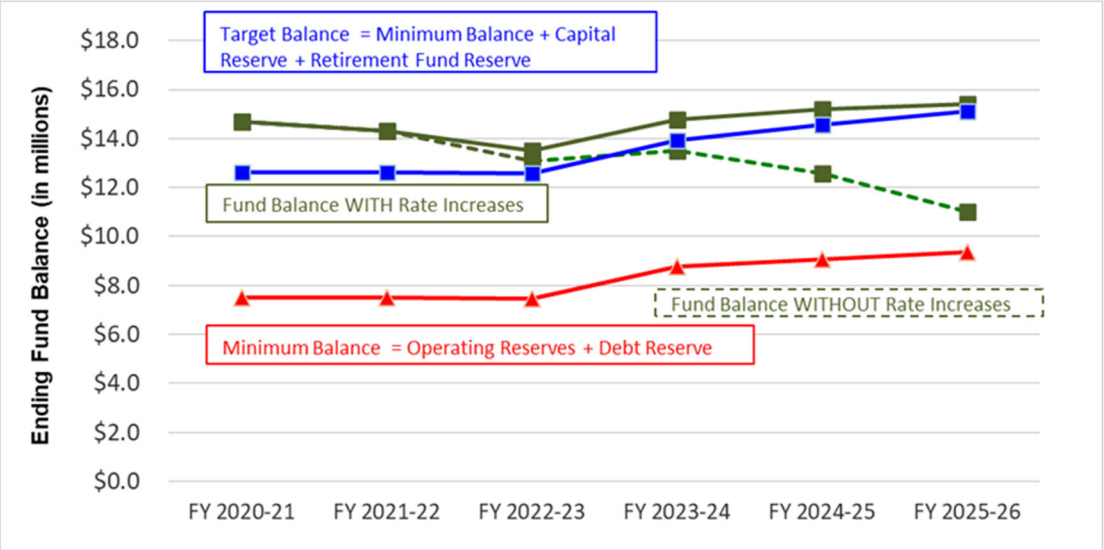
Table 2-2. Rate Increase Calculations

		FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
Revenue From Current Rates	a	$13,919,254	$13,930,257	$13,941,260	$13,952,263	$13,966,018
Revenue Requirement		$15,528,152	$15,236,419	$16,765,046	$17,323,381	$18,118,141
Less: Non-Operating Revenue		($1,608,899)	($1,624,148)	($1,639,550)	($1,655,107)	($1,670,818)
Net Revenue Requirement	b	$13,919,254	$13,612,270	$15,125,495	$15,668,275	$16,447,323
Revenue Shortfall	c = a - b	$0	$317,987	($1,184,235)	($1,716,011)	($2,481,305)
Rate Increase Necessary	c ÷ a	**0.0%**	**3.1%**	**3.1%**	**3.1%**	**3.1%**

Rate increases accounted for rate revenue, growth, and future revenue requirements. The projected revenue from current rates increases due to growth in consumption that was identified in the District's Demand Study and factors in population growth stated in the District's Urban Water Management Plan. The revenue requirement (shown in greater detail in **Figure 2-1**) increases significantly in FY 2021-22 to fund capital improvements and the increased cost of purchased water. When the revenue from current rates is compared with the net revenue requirements (i.e., revenue requirement less non-operating revenue), there is a deficit variance that requires revenue increases.

For purposes of rate setting, the following combined reserve target balances were established. The red line labeled "Minimum Balance" (triangle symbols) represents the target balance for the operating reserve and bond reserve components of the reserves. The blue line labeled "Target Balance" (square symbols) is the sum of the minimum balance plus the capital reserve, emergency reserve, and retirement fund reserve components. **Figure 2-2** provides an overview of the District's reserves in relation to the established Minimum Balance and Target Balance lines.

Figure 2-2. Projected Reserve Fund Balance at Year End



The dashed green line shows what the fund balance would be without the projected revenue increases. The fund balance would drop approximately $3.6 million over the five-year period, and would end on a downward trajectory in FY 2025-26, on course to be less than the minimum balance by FY 2026-27. The solid green line showing the reserve balance with revenue increases is projected to drop initially as the District uses reserves to fund capital improvements. However, with the prescribed rate increases, this fund balance projection follows the target balance line during the three final years of the study period.

Revenue increases are achieved by increasing rates. In years when rates are not being restructured to align with the cost of service, rates would be increased by the same percentage to generate the required revenue increase. For example, a 3.0% revenue increase would be achieved with a 3.0% across-the-board increase in the current service charges and residential and commercial volumetric charges. In the current rate study, however, rates are being restructured to align with the cost of service. As a result, different percentage adjustments in the volume charges will occur. The derivation of these rate adjustments is explained in the next section of this report.

3. COST-OF-SERVICE ANALYSIS

METHODOLOGY

A Cost-of-Service (COS) analysis determines the unit cost of the services provided to the District's water customers. Each customer class is charged the same unit cost for its share of the services that it requires. In this way, the total revenue requirement is proportioned between the fixed service charges and the volumetric charges; the volumetric charges are further proportioned among the customer classes. This methodology is consistent with industry standards promulgated by the American Water Works Association[8] and referred to as the "base/extra capacity method."

The District provides demand services and customer services to water customers. Demand services include the costs related to meeting average and peak levels of demand. Customer services include the costs related to customer accounts and the capacity that customers require. The cost-of-service analysis performed in this study also follows the "base/extra capacity method."

The analytical procedure contains the following steps:

1. **Cost classification** - Costs in the FY 2021-22 revenue requirement are classified into the service categories related to providing for customer demands and for customer service. FY 2021-22 costs are used for the cost-of-service analysis because they are the most recent budget year.
2. **Cost allocation** - The classified costs are allocated to the functions associated with each service. For demand services, the functions are levels of service that comprise average day, maximum day, and maximum hour demands. For customer services, the functions are customer accounts and customer capacity.

The classifications of major costs are summarized as follows:

Demand services

- Base day – non-seasonal daily demand based on winter water use.
- Average day – average daily demand utilizing base supply plus a small portion for peaking beyond winter water use levels.
- Maximum day – peaking on the maximum day: peak supply, transmission mains to distribution storage, booster pumps.
- Maximum hour – peak hour on the maximum day: a portion of distribution storage, distribution mains to customers, hydrants, conservation programs.

[8] *Principles of Water Rates, Fees, and Charges.* Manual M1. American Water Works Association. 2017.

Customer services

- Accounts: meter reading, billing, accounting, customer service, fire services.
- Capacity: a portion of distribution storage, distribution mains to customers, hydrants, conservation programs.

Composite services

- Indirect allocations for costs that are not directly related to either the demand or customer service functions: reserves transfers, debt service.

Working with District staff, the individual line items in the revenue requirements were classified into either the demand or customer service categories. Certain costs, however, are not directly related to either demand or customer services. Such costs are considered to be composite in function and are allocated based on a composite of the direct allocations to the demand and customer service categories.

ALLOCATION FACTORS

Within the demand service function, allocations are made to varying levels of service ranging from average day demand to the highest level of peak demand for outdoor water use and irrigation during the peak hour of the peak day. With these allocations, rates can be designed to proportionately charge customers based on their demands.

Table 3-1 summarizes the flows by customer class for each of the service levels and the corresponding load factors. The majority of the District's services are related to meeting customer demands that can vary from low, base demands with very little seasonal fluctuation for irrigation or tourism to high, peak demands that can be over 2.2 times the base demand.

Table 3-1. Estimated Demands and Load Factors By Service Level

	Base Non-Seasonal Day	Average Day	Maximum Day	Maximum Hour
Flow (HCF/Day)				
Residential	1,759	1,897	2,570	3,726
Commercial[1]	826	978	1,398	2,027
Total	2,585	2,875	3,968	5,754
Load Factors				
Ratio of Flows to Average Day				
Residential	0.93	1.00	1.35	1.96
Commercial[1]	0.84	1.00	1.43	2.07
Total	0.90	1.00	1.38	2.00
Ratio of Flows to Base Non-Seasonal Day				
Residential	1.00	1.08	1.46	2.12
Commercial[1]	1.00	1.18	1.69	2.45
Total	1.00	1.11	1.54	2.23

[1]Commercial flows include Recycled Water consumption

The service levels are defined as follows:

1. **Base Day (Non-Seasonal)** – The average winter demand (2,585 HCF) when seasonal peaking is minimal based on customer billing data for February 2018 to January 2019. The base day demand was derived for each customer class from the District's customer billing data for February 2018 through January 2019, using the lowest two month period of metered consumption.
2. **Average Day** – The flow on the average day (2,875 HCF) is 1.11 times the base day system-wide flow (2,585 HCF). For residential customers, average day flow (1,897 HCF) is about 8.0% (1.08 times) more flow than base winter water use. For non-residential customers, the average day is 1.18 times base winter water use, which is presumably due to irrigation for parks and schools.
3. **Maximum Day** – The flow on the maximum day of the year is based on District data, which indicates that maximum day flow (3,968 HCF) is 1.54 times the base winter flow. The maximum day flow is 1.38 times the average day flow, as reported by EKI in the District's 2021-published demand study. For design purposes, facilities such as transmission pipelines, pump stations, and treatment plants are designed to meet maximum day flows; a flow of two times average day flow is used to design these facilities. The District's data shows that its maximum day is 1.38 times the average day, which is less than the design criterion.
4. **Maximum Hour** – The maximum hourly flow is estimated to be two times the maximum day flow based on engineering design criteria used for sizing infrastructure. The value must be estimated for lack of data. The maximum hour is therefore 2.23 times the base winter demand. For design purposes, facilities such as distribution pipelines and storage reservoirs are designed to meet maximum hour flows; a flow of four times average day flow is used to design these facilities.

The District's data shows that its maximum day is 1.38 times the average day, which is also slightly less than the design criterion.

Service levels need to increase to accommodate increasing levels of peak demands, which include irrigation, tourism, and other seasonal water uses. Providing for higher service levels requires larger infrastructure. In a cost-of-service analysis, the cost of the infrastructure is allocated to the corresponding level of service. The allocation factors are shown in **Table 3-2.**

The allocation factors are calculated using load factors from **Figure 3-1.** The load factors represent how much higher average day, maximum day, and maximum hour flows are compared with the minimal flows. The load factors indicate how much additional capacity is required to supply higher levels of service. For example, the average day load factor for the system is 1.11. Of that total 1.11 load, 0.11 is related to the average day peak, which is 10.1% of the total average day load. For purposes of allocating costs associated with meeting average day demands, 10.1% is allocated to the average day service and 89.9% is allocated to the base day service.

Table 3-2. Base/Extra Capacity Allocation Factors

	Base Day	Avg. Day	Max. Day	Max. Hour	
Residential Load Factors	**1.00**	**1.08**	**1.46**	**2.12**	
Base (Non-seasonal Avg)	100.0%				100.0%
Avg Day	92.7%	7.3%			100.0%
Max Day	68.4%	5.4%	26.2%		100.0%
Max Hour	47.2%	3.7%	18.1%	31.0%	100.0%
Commercial Load Factors	**1.00**	**1.18**	**1.69**	**2.45**	
Base (Non-seasonal Avg)	100.0%				100.0%
Avg Day	84.4%	15.6%			100.0%
Max Day	59.1%	10.9%	30.0%		100.0%
Max Hour	40.7%	7.5%	20.7%	31.0%	100.0%
Total Load Factors	**1.00**	**1.11**	**1.54**	**2.23**	
Base (Non-seasonal Avg)	100.0%				100.0%
Avg Day	89.9%	10.1%			100.0%
Max Day	65.1%	7.3%	27.5%		100.0%
Max Hour	44.9%	5.1%	19.0%	31.0%	100.0%

Note: factors shown are rounded, percentages reflect actual ratios of non-rounded figures.

Table 3-3 summarizes the District's major operating and capital expenses according to the services they provide. The expenses are listed in order from their source at the SFPUC master meter to the District through the transmission pipelines, pumps, storage tanks, and distribution mains to the customer meters. The expenses are classified based on the associated service level and the corresponding allocation factors are shown.

Table 3-3. Services Provided By District Facilities

Operating and Capital Expenses	Demand Service Levels				Customer Accounts	Total
	Non-Peaking Base (1.93 mgd or 2585 hcf)	Peaking				
		Average Day (2.15 mgd or 2875 hcf)	Maximum Day (2.97 mgd or 3968 hcf)	Maximum Hour (4.3 mgd or 10,962 hcf)		
Source of Supply						
SFPUC service charge					100%	100%
SFPUC purchased water	90%	10%				100%
BAWSCA debt service					100%	100%
Transmission pipelines						
12" diameter and larger	65%	7%	28%			100%
Pump stations	65%	7%	28%			100%
Purification/water quality	65%	7%	28%			100%
Potable water storage tanks	45%	5%	19%	50%		100%
Distribution pipelines						
Under 12" diameter	45%	5%	19%	50%		100%
Customer service						
Admin, Metering & Billing					100%	100%

Flow rates are based on CY 2018 - HCF customer demands.
Mgd = million gallons per day. Mg = million gallons Hcf = hundred cubic feet. 1 hcf is a cube 4.6 feet on edge.

Table 3-3 allocation factors were used to apportion the revenue requirement in **Table 3-4.** In this figure the revenue requirement for FY 2021-22 is allocated to the four demand related service categories ($9,334,545) and the customer accounts category ($4,584,708). The next step in the cost-of-service analysis is to allocate each of the demand related expenses between the residential and commercial customer classes.[9] In doing this, the capital and O&M components are kept separate, which is needed for subsequent rate design.

[9] The customer accounts expenses are recovered through the District's service charges, which are independent of customer classes.

Table 3-4. Cost-of-Service Allocations

	FY 2021-22 Budget	Allocation Factor	Base Nonseasonal	Average Day	Maximum Day	Maximum Hour	Customer Accounts
O&M Expenses							
110- Plant							
Salaries & Benefits	$293,500	Average Day	$263,810	$29,690	$0	$0	$0
SFPUC Purchased Water							
Quantity Charge	$4,665,225	Average Day	$4,193,292	$471,933	$0	$0	$0
Service Charge	$200,443	Customer	$0	$0	$0	$0	$200,443
Utilities	$275,000	Max Day	$179,117	$20,159	$75,725	$0	$0
Supplies & Equipment	$102,700	Max Day	$66,892	$7,528	$28,280	$0	$0
Fees	$100,000	Average Day	$89,884	$10,116	$0	$0	$0
120 - Distribution							
Salaries & Benefits	$1,360,800	Max Day	$886,335	$99,752	$374,713	$0	$0
Utilities	$45,000	Max Hour	$20,214	$2,275	$8,546	$13,966	$0
Supplies & Equipment	$151,530	Max Hour	$68,067	$7,661	$28,776	$47,027	$0
Recycle Water Ops.	$7,000	Max Hour Only	$0	$0	$0	$7,000	$0
Fees	$17,000	Average Day	$15,280	$1,720	$0	$0	$0
130 - Admin							
Salaries & Benefits	$2,382,580	Customer	$0	$0	$0	$0	$2,382,580
Utilities	$26,000	Customer	$0	$0	$0	$0	$26,000
Supplies & Equipment	$126,160	Customer	$0	$0	$0	$0	$126,160
Fees	$70,510	Customer	$0	$0	$0	$0	$70,510
Rebate program	$65,000	Max Hour Only	$0	$0	$0	$65,000	$0
General & Administrative	$680,150	Customer	$0	$0	$0	$0	$680,150
Subtotal - O&M Expenses	**$10,568,597**		**$5,782,890**	**$650,833**	**$516,039**	**$132,992**	**$3,485,843**
	100.0%	*O&M Composite*	*54.7%*	*6.2%*	*4.9%*	*1.3%*	*33.0%*
Capital Expenses							
BAWSCA D/S	$388,512	Customer	$0	$0	$0	$0	$388,512
PAYGo Projects	$2,154,676	PAYGo Composite	$804,546	$90,547	$309,355	$401,552	$548,676
Existing Debt Service	$514,475	Customer	$0	$0	$0	$0	$514,475
Future Debt Service - Syst. Imprvr	$597,449	Debt Svc Comp - Syst. Imp	$389,139	$43,795	$164,515	$0	$0
Future Debt Service - HQ Building	$532,331	Debt Svc Comp - Bldg	$0	$0	$0	$0	$532,331
Subtotal - Capital Expenses	$4,187,443		$1,193,684	$134,343	$473,870	$401,552	$1,983,994
	100.0%	*Cap Composite*	*28.5%*	*3.2%*	*11.3%*	*9.6%*	*47.4%*
Subtotal - O&M and Capital	**$14,756,040**		**$6,976,574**	**$785,176**	**$989,910**	**$534,544**	**$5,469,837**
	100.0%	*Exp Composite*	*47.3%*	*5.3%*	*6.7%*	*3.6%*	*37.1%*
Non-Operating Revenue							
Fire Standby	($58,939)	Customer	$0	$0	$0	$0	($58,939)
Water Connections	($25,000)	Customer	$0	$0	$0	$0	($25,000)
Renewal of Service	($21,000)	Customer	$0	$0	$0	$0	($21,000)
Late Charges	($70,000)	Customer	$0	$0	$0	$0	($70,000)
Miscellaneous Revenues	($50,000)	Customer	$0	$0	$0	$0	($50,000)
Lease Revenues	($238,960)	Customer	$0	$0	$0	$0	($238,960)
Taxes & Assessments	($1,070,000)	Customer & Usage	($109,390)	($109,390)	($109,390)	($109,390)	($632,440)
Transmission & Storage	($75,000)	Customer	$0	$0	$0	$0	($75,000)
	($1,608,899)		($109,390)	($109,390)	($109,390)	($109,390)	($1,171,339)
Transfer to/(from) Reserves	$772,112	Exp Composite	$365,050	$41,084	$51,797	$27,970	$286,210
Total Revenue Requirement	**$13,919,254**		**$7,232,234**	**$716,871**	**$932,317**	**$453,124**	**$4,584,708**
						$9,334,545	$4,584,708
						Volumetric	*Service*

The allocation factors for costs classified as Customer Service are either 100% customer account or capacity allocations. **Table 3-5** summarizes the allocation factors for the demand and customer service costs, as previously identified in **Table 3-3**. The Customer

and Usage allocation factor applies to taxes and assessments revenues only. These revenues reimburse the District. The allocations to customer and demand service costs roughly approximate the District's 60%/40% ratio of fixed costs versus variable consumption-based costs.

In addition, the figure below shows the composite allocations. The O&M and Capital composite allocations are based on subtotals of the O&M and Capital costs that were directly allocated to either the demand or customer service categories. The PAYGo composite is based on the subtotals of capital projects specifically funded through PAYGo. The expense composite allocates revenue requirements for any necessary reserve transfers based on the subtotals of all O&M, capital costs, including future debt service.

There are two separate debt service composite allocations. The first debt service composite allocates system improvement costs associated with the three large storage tank projects. While these projects are intended to be funded through debt issuance, the costs are allocated to volumetric rates so that customers placing demand on the system are paying for the costs to maintain the storage which serves this demand. The expense composite is based on the combined subtotal of all directly classified costs. The second debt service composite allocates debt service payments for the headquarters building to customer service. In this manner, all customers will share the cost of the District's updated administration facilities.

Table 3-5. Cost-of-Service Allocation Factors

System-Wide Allocation Factors	Base	Average Day	Maximum Day	Maximum Hour	Customer Accounts	Total
Base Day	100.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Average Day	89.9%	10.1%	0.0%	0.0%	0.0%	100.0%
Max Day	65.1%	7.3%	27.5%	0.0%	0.0%	100.0%
Max Hour	44.9%	5.1%	19.0%	31.0%	0.0%	100.0%
Max Hour Only	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Customer	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Customer & Usage	10.2%	10.2%	10.2%	10.2%	59.1%	100.0%
O&M Composite	54.7%	6.2%	4.9%	1.3%	33.0%	100.0%
PAYGo Composite	37.3%	4.2%	14.4%	18.6%	25.5%	100.0%
Debt Svc Composite ·	65.1%	7.3%	27.5%	0.0%	0.0%	100.0%
Debt Svc Composite ·	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
Exp Composite	47.3%	5.3%	6.7%	3.6%	37.1%	100.0%

The expenses that are allocated to Demand Service Levels are recovered from the District's volumetric charges. Certain portions of the costs are allocated to the Customer Accounts category, which are recovered from the District's fixed service charges. **Table 3-5** provides a detailed breakdown of the expenses and cost-of-service allocations.

The allocations to individual classes are proportioned in **Table 3-6** to the classes' flows in each category of service. For example, the residential class is allocated 68.04% of the base costs based on the fact that residential flow is 1,758 HCF of the total 2,585 HCF base flow.

Table 3-6. Customer Class Cost-of-Service Allocations for Demand Service Levels

Volumetric Cost of Service	Base	Average Day	Maximum Day	Maximum Hour	Total
Volumetric Revenue Requirement					
Capital	$1,558,734	$175,427	$525,667	$429,522	$2,689,351
O&M incl. SFPUC and other	$5,673,500	$541,443	$406,649	$23,602	$6,645,194
	$7,232,234	$716,871	$932,317	$453,124	$9,334,545
Units of Service (HCF)					
Residential	1,759	1,897	2,570	3,726	
Commercial	826	978	1,398	2,027	
	2,585	2,875	3,968	5,754	
Proportional Allocation Factors					
Residential	68.04%	65.97%	64.76%	64.76%	
Commercial	31.96%	34.03%	35.24%	35.24%	
	100.00%	100.00%	100.00%	100.00%	
Cost of Service					
Residential					
Capital	$1,060,594	$115,736	$340,446	$278,178	$1,794,953
O&M incl. SFPUC and other	$3,860,361	$357,209	$263,365	$15,286	$4,496,221
	$4,920,955	$472,945	$603,811	$293,464	$6,291,175
Commercial					
Capital	$498,141	$59,692	$185,221	$151,344	$894,397
O&M incl. SFPUC and other	$1,813,138	$184,234	$143,285	$8,316	$2,148,973
	$2,311,279	$243,926	$328,506	$159,660	$3,043,371
	$7,232,234	$716,871	$932,317	$453,124	$9,334,545
Unit Cost of Service ($/HCF)	$ 2,798.29	$ 249.31	$ 234.96	$ 78.75	$ 0.22
Revenue Requirement Allocations					
Residential	$4,920,955	$472,945	$603,811	$293,464	$6,291,175
Commercial	$2,311,279	$243,926	$328,506	$159,660	$3,043,371
	$7,232,234	$716,871	$932,317	$453,124	$9,334,545

The residential class is allocated $6,291,175 of the total demand related expenses and the commercial class is allocated $3,043,371. These customer class allocations and the expense attributable to customer accounts are compared with the estimated revenue from current rates in **Table 3-7.**

Table 3-7. Current Rate Revenue Compared With the Cost-of-Service

Components of Rate Structure	Current Revenue [1] (no rate increase)		Cost of Service		Difference COS Minus Current	
Volumetric						
Residential	$6,317,137		$6,291,175		($25,962)	-0.4%
Commercial	$3,017,408		$3,043,371		$25,962	0.9%
	$9,334,545	67%	$9,334,545	67%	$0	0.0%
Service/Meter Charges	$4,584,708	33%	$4,584,708	33%	$0	0.0%
	$13,919,254	100%	$13,919,254	100%	$0	0.0%

[1]Based on Projected FY 2021-22 Water Use at Current Rates

The comparison of revenue from current rates with the revenue requirement indicates the following:

- Service charges should remain at current rates.
- Total revenue generated by volumetric rates need to decrease 0.4% for residential customers and increase 0.9% for commercial customers to align with the cost-of-service.

Rates need to be designed to generate each class's share of the revenue requirement related to volumetric charges. The next section provides the recommended modifications to the service charge and volumetric charges needed to meet the cost-of-service.

4. RATE DESIGN

This section discusses the design of volumetric charge for residential and non-residential customers and the fixed service charges, which are independent of customer class.

CURRENT RATES

The District's rate payers pay the sum of two charges for water service on a bi-monthly basis: a fixed service (meter) charge based on the size of the service connection plus a volumetric charge based on metered water use during the prior bi-monthly billing period. Current rates are summarized in **Tables 4-1** and 4**-2**.

The service charges are the same regardless of customer class. In other words, the charge for a meter of a given size is the same for all meters of that size regardless of which class of customer is served.

Table 4-1. Current Bi-monthly Service Charges

Meter Size	Charge per Account
5/8"	$53.48
3/4"	$58.87
1"	$74.97
1 1/2"	$96.36
2"	$155.65
3"	$588.64
4"	$749.39
6"	$1,124.12
8"	$1,552.33
10"	$2,087.73
12"	$2,623.13

The volumetric charges vary depending on the customer class. Single-family residential customers pay tiered consumption charges also referred to as "increasing block rates." Residential customers pay rates for each range of consumption (tier or block); the rate in each tier increases as consumption increases. The total volumetric charge is the sum of the consumption in each tier multiplied by the respective rate in each tier. The current residential increasing block rates comprise four tiers.

Table 4-2. Current Bi-monthly Volumetric Rates

Customer Class	Current Tier Size	$/HCF
Residential		
Tier 1	1-5 HCF	$6.60
Tier 2	6-10 HCF	$7.86
Tier 3	11-19 HCF	$13.53
Tier 4	Over 19 HCF	$22.72
Commercial		$8.49
Recycled Water		$7.50

Commercial (including multi-family residential customers) customers' volumetric rates are uniform and do not increase with increasing use the way they do for the single-family residential customers. Recycled water volumetric rates are also uniform.

WATER USAGE CHARGES

The District has separate volumetric charge[10] structures for residential and non-residential customers. Residential volumetric charges are tiered, which is appropriate because of the variation in demands within a comparatively homogeneous class of customers. The tiered rate structure corresponds to levels of service that range from low, essential needs to high, discretionary needs. The rate for each tier is set to reflect the cost of providing for the amount of peaking that is required. Calculating the tiered rates for residential customers needs to ensure that the rates reflect the cost of providing service across the range of tiers.

Non-residential volumetric charges are uniform, which is appropriate because this class comprises commercial and municipal uses that are very heterogeneous but whose water uses – which vary considerably – are less discretionary compared to residential water use. Calculating the uniform rate for commercial customers is less complex than tiered rate calculations but needs to be integrated with the calculation of recycled water rates, which are based on contractual terms.

Residential Volumetric Charges

The use of four tiers has been in place for the District's residential customers for several years. The number of tiers and the location of the breakpoints between tiers is determined by evaluation of the District's historical water consumption, as discussed previously in Section 3**.** Each breakpoint was calculated utilizing the total residential daily demand consumption divided by the number of accounts, 12,038, as shown in **Table 4-3**.

[10] The official title is "water usage charge." For ease of discussion, the terms "volumetric charge" or "volumetric rate" are used in this report.

Table 4-3. Residential Tier Breakpoint Calculation

	Base Non-Seasonal Day	Average Day	Maximum Day	Maximum Hour
Residential Daily Volume	1,759	1,897	2,570	3,726
Bi-Monthly Volume (60 days)	105,514	113,820	154,193	223,580
Accounts	12,038	12,038	12,038	12,038
Flow Per Account (HCF bimonthly)	**8.77**	**9.46**	**12.81**	**18.57**

This calculated the Average Day Tier breakpoint of 9.46 HCF (1,897 HCF per day x 60 days ÷12,038 accounts) and the Maximum Day Tier breakpoint of 12.81 HCF (2,570 HCF per day x 60 days ÷12,038 accounts). Since the District bills customers based on whole number increments only, the Average Day Tier breakpoint was set to 9 HCF and the Maximum Day Tier breakpoint was rounded up to 13 HCF. All consumption above the 13 HCF is assumed to be maximum hour peaking demand and billed at the maximum hour tiered rate.

Having breakpoints at 9 HCF for both tiers of base day and average day consumption would eliminate the need for four total tiers. However, in working with District staff, the decision was made instead to follow previous practice, with the first tier maintained the tier breakpoint of 5 HCF. This location represents a demand of 62 gallons per day (GPD), which is in line with the average inside water use per capita in the state, 55 gallons per day, as stated in Senate Bill 606/Assembly Bill 1668. In effect, a demand this low represents inside water use for a household of slightly more than one person, approximately half the household size in the District of 2.3.

Maintaining the first breakpoint at 5 HCF creates a first tier for ultra-low water use. If all households were this size, the District would require approximately half as much infrastructure capacity (5 HCF/9.46 HCF = 0.53). Hence, the cost of providing service to ultra-low customers could exclude approximately half of the capital cost. It is noted that in **Figure 3-4** nearly half of the capital costs ($1.98 million divided by $4.18 million equals 0.47) is already allocated to the service charge. It was therefore concluded that the rate for Tier 1 would include only the O&M component because the capital cost for ultra-low water use is already recovered by the service charge. **Table 4-4** shows that the capital component is distributed across the flows for Tiers 2, 3 and 4 only.

After setting these breakpoints, volumetric rates were calculated as shown in **Table 4-4**.

Table 4-4. Residential Volumetric Rates – FY 2021-22

Residential Volumetric Rates	Tier 1	Tier 2	Subtotal T1/T2	Tier 3	Tier 4	Total
Demand Condition	Base	Average Day		Maximum Day	Maximum Hour	
Tier Structure						
Volume per tier (HCF)	0-5	6-9	0-9	10-13	Over 13	Total
HCF by Tier	313,164	193,721	506,885	83,461	102,059	692,405
Revenue Requirement by Tier						
O&M incl. SFPUC and other			$4,217,571	$263,365	$15,286	$4,496,221
HCF in Tiers 1, 2, 3, and 4			692,405	185,520	102,059	
O&M Cost Increment	**$6.09**	**$6.09**	**$6.09**	**$1.42**	**$0.15**	
Capital			$1,176,329	$340,446	$278,178	$1,794,953
HCF in Tiers 2, 3, and 4			379,241	185,520	102,059	
Capital Cost Increment	**$0.00**	**$3.10**	**$3.10**	**$1.84**	**$2.73**	
	$0	$0	$5,393,900	$603,811	$293,464	$6,291,175
Rate Increments						
Base/Avg Day						
O&M incl. SFPUC and other	$6.09	$6.09		$6.09	$6.09	
Capital	$0.00	$3.10		$3.10	$3.10	
Maximum Day						
O&M incl. SFPUC and other				$1.42	$1.42	
Capital				$1.84	$1.84	
Maximum Hour						
O&M incl. SFPUC and other					$0.15	
Capital					$2.73	
Total Rate per Tier	**$6.09**	**$9.19**		**$12.45**	**$15.32**	

Table 4-5 compares the breakpoints and rates for the current and cost-of-service-based tiers for single-family residential accounts. The percentage increases differ from tier to tier. For example, the Tier 1 rate decreases 7.7% (from $6.60 to $6.09 per HCF) on February 1, 2022 and the Tier 2 rate increases 16.9% (from $7.86 to $9.19 per HCF). The differing percentage increases occur as a result of re-aligning the rates with the cost-of-service. After the rate adjustment effective February 1, 2022, to re-align the rates with the cost-of-service, the projected increases in subsequent years can be made across-the-board without making further adjustments to the rate structure for the cost-of-service, which should remain fairly stable during the rate projection period.

Table 4-5. Comparison of Current and COS-Based Residential Tiers

Customer Class	Current Tier Size	$/HCF	Customer Class	Proposed Tier Size	Proposed FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
				% Change	*varies*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
				effective date	*2/1/2022*	*7/1/2022*	*7/1/2023*	*7/1/2024*	*7/1/2025*
Residential			**Residential**						
Tier 1	0-5 HCF	$6.60	Tier 1	0-5 HCF	$6.09	$6.27	$6.46	$6.65	$6.85
Tier 2	6-10 HCF	$7.86	Tier 2	6-9 HCF	$9.19	$9.47	$9.75	$10.04	$10.34
Tier 3	11-19 HCF	$13.53	Tier 3	10-13 HCF	$12.45	$12.82	$13.20	$13.60	$14.01
Tier 4	Over 19 HCF	$22.72	Tier 4	Over 13 HC	$15.32	$15.78	$16.25	$16.74	$17.24
Commercial		$8.49	**Commercial**		$8.56	$8.81	$9.08	$9.35	$9.63
Recycled Water		$7.50	**Recycled Water**		$7.70	$7.93	$8.17	$8.42	$8.67

The size of Tier 1 is the same for both the existing and proposed structures. Tiers 2, 3, and 4 for the proposed tiers do not include as much water as the existing tiers because of increased efficiency. For an average household, the size of Tiers 1 and 2 cover inside water use with a small allowance for discretionary outside water use.

Tiers 3 and 4 correspond to higher levels of service for irrigation and other seasonal water uses. Tier 3 demand corresponds to maximum day peaking, which occurs in the summer for irrigation. Tier 4 is the highest level of service for peak hour demands when the system is at its highest output. The proposed tiers are compressing from their existing sizes to reflect the effects of conservation. As less peaking demand is placed on the system a greater portion of consumption is reported in Tiers 1 and 2.

Commercial Volumetric Charges

The commercial volumetric charge is a uniform rate. For FY 2021-22, the volumetric charge is derived by dividing the volumetric portion of the commercial revenue requirement in **Figure 3-5** by the projected commercial water use. The District also supplies recycled water for irrigation at a contractual rate equal to 90% of the commercial rate. The 10% reduction reflects the fact that recycled water quality limits the use of recycled water to irrigation. This limitation reduces the value of the recycled water. The cost reduction is allocated to other commercial water users who may be future users of recycled water. When this adjustment is made, the commercial uniform volumetric charge is $8.56 per HCF and the uniform recycled water volumetric charge is $7.70 per HCF.

Pass-Through Adjustment

The cost of SFPUC water is the single largest component of the District's revenue requirements. Because the District has no control over the SFPUC's wholesale water rate, this cost is simply passed through to the District's customers. The SFPUC provides projections of its future wholesale water rates, which are built into the rate projections in this study. The SFPUC updates its projections each year as part of the rate-making process legally prescribed in the wholesale Water Supply Agreement. California Government

Code Section 53756 authorizes water suppliers to adjust their rates in response to changes in pass-through costs. We recommend that the District incorporate annual pass-through adjustments in its volumetric rates.

Each year the District should determine how much, if any, pass-through adjustment is required as soon as the SFPUC submits its updated wholesale rates, which is typically in April or May each year. The wholesale rate used for the projections in this study should be compared with the updated rate and the difference either added or subtracted from the District's volumetric rates for residential and commercial customers. The wholesale rates per HCF used in this study[11] are as follows:

FY 2021-22 – $4.10
FY 2022-23 – $4.32
FY 2023-24 – $4.65
FY 2024-25 – $4.92
FY 2025-26 – $5.37

For example, if the updated SFPUC rate for FY 2022-23 is $4.42, the $0.10 difference should be added to the volumetric rates charged to residential and commercial water customers. If the updated SFPUC rate is less than the foregoing rates, the difference should be subtracted from the District's volumetric rates. In other words, the adjustment should be made in either direction.

Recycled water rates would change in relation to pass-through adjustments to commercial rates to maintain a ratio of 90% of the commercial volumetric rate charged. In the example above, if the volumetric rates increased by $0.10, commercial water rates would increase from $9.25 to 9.35 per HCF in FY 2022-23. However, recycled water rates would increase by $0.10, from $8.32 to $8.42, so that the new recycled rate would continue to be equal to 90% of the commercial volumetric rate.

FIXED CHARGES

Figure 3-4 indicated that the revenue from fixed charges can remain at the current amount of $4,584,708. No change is needed in the fixed charge structure, which is graduated from smallest to largest meter sizes based on the nominal capacity of meters.

Supply and Distribution Charges

The District's existing service charges[12] align with the current cost-of-service and generate the required revenue for FY 2021-22. However, in accordance with **Figure 2-2**, annual

[11] Rates included in letter from SFPUC to Nicole Sandkulla RE: Fiscal Year 2021-22 Wholesale Water Rates Notice, dated May 7, 2021.
[12] The official title is "supply and distribution charge." For ease of discussion, the term "service charge" is used in this report.

increases are necessary in future years. **Table 4-6** summarizes the current and proposed service charges, during the five-year planning period.

Table 4-6. Current and Proposed Bi-monthly Service Charges Per Account

Meter Size	Current Charge per Account	Proposed				
		FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
	% Increase	*0.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
	effective date	*2/1/2022*	*7/1/2022*	*7/1/2023*	*7/1/2024*	*7/1/2025*
5/8"	$53.48	$53.48	$55.08	$56.73	$58.43	$60.18
3/4"	$58.87	$58.87	$60.64	$62.46	$64.33	$66.26
1"	$74.97	$74.97	$77.22	$79.54	$81.93	$84.39
1 1/2"	$96.36	$96.36	$99.25	$102.23	$105.30	$108.46
2"	$155.65	$155.65	$160.32	$165.13	$170.08	$175.18
3"	$588.64	$588.64	$606.30	$624.49	$643.22	$662.52
4"	$749.39	$749.39	$771.87	$795.03	$818.88	$843.45
6"	$1,124.12	$1,124.12	$1,157.84	$1,192.58	$1,228.36	$1,265.21
8"	$1,552.33	$1,552.33	$1,598.90	$1,646.87	$1,696.28	$1,747.17
10"	$2,087.73	$2,087.73	$2,150.36	$2,214.87	$2,281.32	$2,349.76
12"	$2,623.13	$2,623.13	$2,701.82	$2,782.87	$2,866.36	$2,952.35

The bi-monthly service charge is payable whether or not any water is used during the billing period and irrespective of the amount of water, if any, used.

Portable Meters

The charges for portable water meters for construction and other temporary situations are the same as the service charges above in **Figure 4-6**.

Fire Protection Service

The charges for all private fire protection service connections, which include all structures that have a fire service line are increasing at the same percentages as described above and summarized in **Findings and Recommendations Section of the Executive Summary (Item #6)**. **Table 4-7** summarizes the current and proposed bi-monthly fire protection service charges.

Table 4-7. Current and Proposed Bi-monthly Fire Protection Charges

Meter Size	Current Rates	Proposed Bi-monthly Rates				
		2/1/2022	7/1/2022	7/1/2023	7/1/2024	7/1/2025
	% Change	*0.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
2" or Less	$12.00	$12.00	$12.36	$12.73	$13.11	$13.51
4"	$37.52	$37.52	$38.65	$39.80	$41.00	$42.23
6"	$75.03	$75.03	$77.28	$79.60	$81.99	$84.45
8"	$150.06	$150.06	$154.56	$159.20	$163.97	$168.89

WATER SHORTAGE REVENUE STABILIZATION FACTORS

During prolonged shortages, customers are required to conserve or even ration their water use. These shortages can include locally declared water shortages caused by facility operations, State mandated reductions, or natural disasters including droughts. The magnitude of the water savings can significantly reduce water sales revenue from quantity charges.

During shortages, costs do not decrease in direct proportion to decreases in water use because typically over 60% of the costs are fixed regardless of how much water is supplied. In the District's case, 61% of costs are fixed and the remaining 39% of costs vary in proportion to water use. Hence, a 15% reduction in water use by customers may only reduce costs about 5.8% (i.e., 15% of the 39% of costs that vary in proportion to water use). With the revised cost-of-service based rates, the District will receive 33% of its revenue from fixed charges and the remaining 67% of revenue will come from water use charges (volumetric rates). Therefore a 15% reduction in water sales results in a 10.0% reduction in revenue (i.e., 15% of 67% of the revenue from volumetric rates). This means that, in a year-long 15% shortage, 94.1% of the costs are incurred while only 90.0% of the revenue is received, which is a 4.1% revenue shortfall.

Reserves may be able to cover the revenue shortfall during brief rationing periods. For longer or more severe rationing periods, temporary volumetric rate increases are needed to offset this revenue shortfall in order to maintain service levels. On average, the temporary volumetric rate increases are designed to be revenue neutral. In other words, customers will pay increased volumetric rates, which when multiplied by their reduced demand, will generate only enough water use charge revenue to cover costs.

The District proposes to use Water Shortage Revenue Stabilization Factors to make the temporary volumetric rate adjustments that are needed during official water shortage emergencies declared by the Board of Directors to offset the revenue shortfalls caused by conservation. Although the Water Shortage Revenue Stabilization Factors are designed to be revenue neutral, they must be implemented in compliance with the Proposition 218 protest process.

Water Shortage Contingency Plan Levels

The District's Water Shortage Contingency Plan (WSCP), adopted in June 2021, was developed to serve as a flexible framework of planned response measures to mitigate future water supply shortages. During shortages, the District requests shared contributions from all its customers towards meeting water use reduction goals during periods of water shortage. The WSCP also directs the District to focus its water conservation efforts on reducing discretionary water uses such as outdoor irrigation, while attempting to preserve uses that are essential to health and safety and minimize economic and other impacts to its customers.

Consistent with state requirements the District's WSCP is based on the six shortage levels shown in **Table 4-8**. During a water shortage, the District will implement a range of actions to reduce water use and help ensure that demand for water does not exceed supply. Such actions may include public outreach campaigns, water efficiency customer assistance and rebate programs, operational changes, and prohibitions and restrictions on some uses. In the more severe stages of shortage, the District will also implement water rationing and require mandatory water reductions.

The District has planned demand-reduction actions and other actions for each shortage level in the WSCP, and the District calculated corresponding reductions that could be achieved for each level. **Table 4-8** lists the estimated percentage reductions that will be achieved when implementing the demand reduction actions and other actions specified in the WSCP for each shortage level. As can be seen in the table, for a shortage level up to 10% (Stage 1), the District's planned actions result in a 5% reduction in water use, and the actions for a shortage of up to 20% (Stage 2) result in a 15% reduction in water use.

Table 4-8. Water Use Reductions Required for Each Stage of the District's WSCP

	Water Shortage Contingency Plan-Required Reductions Based on District-Declared Drought Stage					
	Stage 1 Up to 10% Reduction	**Stage 2** Up to 20% Reduction	**Stage 3** Up to 30% Reduction	**Stage 4** Up to 40% Reduction	**Stage 5** Up to 50% Reduction	**Stage 6** Over 50% Reduction
WSCP-Estimated Water Use Reduction	5%	15%	25%	35%	45%	53%

As described further below, 2018 water consumption data was analyzed to determine the reduction requirement for both residential and commercial customer classes for each shortage level in the WSCP to meet the overall water savings assumed at that level.

Methodology

Since the passage of Proposition 218, recurrent water shortages have led an increasing number of water suppliers to adopt revenue stabilization adjustments that do not trigger the Proposition 218 protest process each time an adjustment is made. This is accomplished by including the Water Shortage Revenue Stabilization Factor Adjustment procedure in the Proposition 218 notice at the time rates are adopted in compliance with Proposition 218. The notice describes the process, which rate payers have the right to protest. Barring a majority protest, the adjustment process is adopted as part of the rate increase and can be implemented as needed during the term of the adopted rate increases.

The adjustment process includes factors by which quantity (volumetric) charge rates are adjusted in alignment with the reduction stages in the WSCP. The factors are only applied to the quantity (volumetric) charge rates and not to the service charge rates to capture a customer's changes in water demand. As part of the recommended revenue stabilization

factors, it is proposed that the shortage reductions will vary by customer class. Each class' reduction will be determined by reducing "outdoor" water use (seasonal water use) 2.5 times more than "indoor" (average winter water use) water use. It is assumed that seasonal "outdoor" water demand is primarily for irrigation, which is a lower beneficial use than non-seasonal "indoor" demand, which is primarily related to health and safety needs. In the District's case, all water consumption by non-single family residential customers is counted as commercial/recycled water consumption in the figures that follow.

Analysis

Based on calendar year 2018 metered consumption data, the resulting reductions are summarized in **Table 4-9.** The reductions shown represent the customer class reductions required to achieve the reduction associated with each shortage stage. The customer class reductions are greater or less than the overall average for each stage depending on how much of each class' water demand is seasonal.

Table 4-9. Required Water Use Reductions by Class for Each Drought Shortage Stage as Described in the District's WSCP

Class	Stage 1 Up to 10% Reduction	Stage 2 Up to 20% Reduction	Stage 3 Up to 30% Reduction	Stage 4 Up to 40% Reduction	Stage 5 Up to 50% Reduction	Stage 6 Greater than 50% Reduction
Residential	5%	14%	24%	34%	43%	52%
Commercial/Recycled Water	5%	16%	27%	37%	48%	56%

Table 4-10 shows the calculation of each customer class' respective shortage reduction required during each shortage stage. The annual demand for each class is separated into indoor and outdoor water use where indoor water use is defined as the period from March through April multiplied times 6 to get the annualized indoor water use over 12 months. Subtracting indoor water use from the total annual water use determines the seasonal outdoor water use.

The percentage reductions for each customer class required to achieve the overall reduction for a particular stage are derived so that outdoor consumption is reduced 2.5 times indoor consumption. In a Stage 1 shortage, a 4.3% reduction in indoor water use and a 10.9% reduction in outdoor water use are required to achieve an overall 5% reduction. Applying the same reduction factors to each class results in different overall reductions for the class based on the relative proportions of their indoor and outdoor water use.

To achieve the 5% Stage 1 reduction, residential, commercial, and recycled water customers, are required to conserve 5%. However, in Stages 2, 3, 4, 5, and 6, commercial and recycled water customers are required to conserve a larger percentage than single

family customers. This is because commercial and recycled water customers have higher seasonal use compared to residential customers, as a result of lower residential irrigation demand and seasonal commercial demand driven by tourism. Note that the reduction required in Stage 6 is so great that all outdoor water use is eliminated. In the example shown in **Table 4-10**, a 53% reduction is assumed, requiring indoor water use to be cut back 47.7%, which is a 2.1-to-1.0 relationship, not 2.5-to-1.0.

Table 4-10. Calculation of Shortage Reductions by Stage and Customer Class

5% Stage 1 Reduction (up to 10% reduction)									
	Baseline Annual Demand (HCF)			Reductions					
Class	Total	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Total	Total
Residential	692,405	641,874	50,531	4.3%	10.9%	27,865	5,484	33,350	5%
Commercial/Recycled Water	357,114	301,476	55,638	4.3%	10.9%	13,088	6,038	19,126	5%
Total	1,049,519	943,350	106,169	4.3%	10.9%	40,953	11,523	52,476	**5.0%**
15% Stage 2 Reduction (up to 20% reduction)									
	Baseline Annual Demand (HCF)			Reductions					
Class	Total	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Total	Total
Residential	692,405	641,874	50,531	13.0%	32.6%	83,596	16,453	100,049	14%
Commercial/Recycled Water	357,114	301,476	55,638	13.0%	32.6%	39,264	18,115	57,379	16%
Total	1,049,519	943,350	106,169	13.0%	32.6%	122,860	34,568	157,428	**15.0%**
25% Stage 3 Reduction (up to 30% reduction)									
	Baseline Annual Demand (HCF)			Reductions					
Class	Total	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Total	Total
Residential	692,405	641,874	50,531	21.7%	54.3%	139,327	27,421	166,748	24%
Commercial/Recycled Water	357,114	301,476	55,638	21.7%	54.3%	65,439	30,192	95,632	27%
Total	1,049,519	943,350	106,169	21.7%	54.3%	204,766	57,613	262,380	**25.0%**
35% Stage 4 Reduction (up to 40% reduction)									
	Baseline Annual Demand (HCF)			Reductions					
Class	Total	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Total	Total
Residential	692,405	641,874	50,531	30.4%	76.0%	195,058	38,389	233,447	34%
Commercial/Recycled Water	357,114	301,476	55,638	30.4%	76.0%	91,615	42,269	133,884	37%
Total	1,049,519	943,350	106,169	30.4%	76.0%	286,673	80,659	367,332	**35.0%**
45% Stage 5 Reduction (up to 50% reduction)									
	Baseline Annual Demand (HCF)			Reductions					
Class	Total	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Total	Total
Residential	692,405	641,874	50,531	39.1%	97.7%	250,789	49,358	300,147	43%
Commercial/Recycled Water	357,114	301,476	55,638	39.1%	97.7%	117,791	54,346	172,137	48%
Total	1,049,519	943,350	106,169	39.1%	97.7%	368,579	103,704	472,284	**45.0%**
53% Stage 6 Reduction (greater than 50% reduction)									
	Baseline Annual Demand (HCF)			Reductions					
Class	Total	Indoor	Outdoor	Indoor	Outdoor	Indoor	Outdoor	Total	Total
Residential	692,405	641,874	50,531	47.7%	100.0%	306,241	50,531	356,772	52%
Commercial/Recycled Water	357,114	301,476	55,638	47.7%	100.0%	143,835	55,638	199,473	56%
Total	1,049,519	943,350	106,169	47.7%	100.0%	450,076	106,169	556,245	**53.0%**

The service charges are fixed and generate about 33% of the total rate revenue regardless of shortages. The remaining 67% of revenue is generated by the volumetric rates. In

deriving the Water Shortage Revenue Stabilization Factors, the factors will only apply to the volumetric rates because fluctuations in water use correlate with fluctuations in variable costs. Each customer class has its own set of Water Shortage Revenue Stabilization Factors corresponding to its reduction in each stage of shortage.

The formula for the Water Shortage Revenue Stabilization Factors comprises conservation and variable cost components. The conservation component adjusts to account for the required reduction in water demand. The variable cost component adjusts to account for the portion of variable costs that is covered by the quantity charges. The Water Shortage Revenue Stabilization Factors are the product of the conservation component multiplied by the variable cost component. Each component is defined as follows:

Water Shortage Revenue Stabilization Factor = Conservation Component multiplied times Variable Cost Component, where

Conservation Component = $1/(1 - a)$, where

a = required percentage reduction, which varies by customer class.

Variable Cost Component = $(b - (c * a))/b$, where

a = required percentage reduction, which varies by customer class;

b = percentage of revenue from total service charges and volumetric rates for all customer classes that is attributable to volumetric rates, an amount that is 67% based on the cost-of-service analysis; and

c = percentage of total revenue requirement covered by service charges and volumetric rates that varies based on fluctuations in demand, an amount that is currently 39%.[13]

The following example illustrates how the formula determined the 1.021 Water Shortage Revenue Stabilization Factor in **Table 4-11** for the residential customer class in a Stage 1 shortage in which an overall conservation goal of 5% if required.

Conservation Component: $1/(1 - a) = 1/(1 - 0.0482) = 1.0506$, where

a = required percentage reduction is 4.82% for the residential customer class (see **Table 4-10**, where a rounded 5% is shown).

Variable Cost Component: $(b - (c * a))/b = (0.67 - (0.39 * 0.0482))/0.67 = 0.9719$, where

[13] The cost of SFPUC water is the largest example of a variable cost, which varies with water demand.

a = 4.82% reduction for residential customers in a Stage 1 shortage.

b = 67% of total rate revenue is generated by quantity charges; and

c = 39% of revenue requirement is related to variable costs.

Water Shortage Revenue Stabilization Factor = 1.0506 * 0.9719 = 1.021, as it is shown in **Table 4-11**.

The residential quantity charge rates in effect under non-shortage conditions would be multiplied by 1.021 to derive the quantity charge rates to be in effect during a Stage 1 water shortage. **Table 4-11** shows the Water Shortage Revenue Stabilization Factors that would be applied to the rates that would normally be in effect absent declared shortages.

Table 4-11. Water Shortage Revenue Stabilization Factors by WSCP-Defined Water Shortage Stage and Customer Class

Class	Stage 1 Up to 10% Reduction	Stage 2 Up to 20% Reduction	Stage 3 Up to 30% Reduction	Stage 4 Up to 40% Reduction	Stage 5 Up to 50% Reduction	Stage 6 Greater than 50% Reduction
Residential	1.021	1.071	1.134	1.214	1.322	1.448
Commercial/Recycled Water	1.024	1.081	1.154	1.252	1.392	1.533

To be applied to the non-shortage rates in effect at the time of the shortage declaration

Implementation

The recommended Water Shortage Revenue Stabilization Factors in **Table 4-11** are implemented only during periods of declared water shortage emergencies. Once a mandatory shortage is declared, the Board of Directors has discretion to enact Water Shortage Revenue Stabilization Adjustments corresponding to the level of shortage reduction implemented using the factors provided in **Table 4-10**. The adjustments can go in either direction from stage to stage depending on whether the level of reduction is increasing or decreasing during the shortage. At least 30 days prior to making the adjustment, notice must be provided to rate payers, which can be included in the customer's bills. No protest process is required. These adjustments would be temporary, and rates would return to the regular schedule at the conclusion of the water shortage emergency.

They act similarly to the pass-through adjustment for the cost of SFPUC purchased water, which was incorporated into the Proposition 218 notice in the last rate increase. The pass-through adjustment allows the District to adjust volumetric rates to track any difference between the SFPUC rates that were included in the model and the actual rates adopted each year by SFPUC. The pass-through adjustment can also be made by providing 30-day

notice in the customer bills without triggering the need for a Proposition 218 protest process.

5. CUSTOMER BILL IMPACTS

RESIDENTIAL BILLS

Table 5-1 tabulates the current and proposed bills for residential customers with a 5/8" service. The bills are calculated from 0 to 30 HCF. At 0 HCF, only the service charge is shown. From 1 HCF and higher the bi-monthly demand is shown in both HCF and GPD. The color changes highlight the four tiers. The dollar difference compares the proposed bills with the current bills.

Table 5-1. Current and Proposed Residential Bill Comparison

Bi-Monthly Demand		Residential Bi-Monthly Bills (5/8" Service)		
HCF	Gal/Day	Current	Proposed FY 2021-22	Difference
0	0	$53.48	$53.48	$0.00
1	12	$60.08	$59.57	($0.51)
2	25	$66.68	$65.66	($1.02)
3	37	$73.28	$71.75	($1.53)
4	50	$79.88	$77.84	($2.04)
5	62	$86.48	$83.93	($2.55)
6	75	$94.34	$93.12	($1.22)
7	87	$102.20	$102.31	$0.11
8	100	$110.06	$111.50	$1.44
9	112	$117.92	$120.69	$2.77
10	125	$125.78	$133.14	$7.36
11	137	$139.31	$145.59	$6.28
12	150	$152.84	$ 158.04	$5.20
13	162	$166.37	$ 170.49	$4.12
14	175	$179.90	$ 185.81	$5.91
15	187	$193.43	$ 201.13	$7.70
16	199	$206.96	$ 216.45	$9.49
17	212	$220.49	$ 231.77	$11.28
18	224	$234.02	$ 247.09	$13.07
19	237	$247.55	$ 262.41	$14.86
20	249	$270.27	$ 277.73	$7.46
21	262	$292.99	$ 293.05	$0.06
22	274	$315.71	$ 308.37	($7.34)
23	287	$338.43	$ 323.69	($14.74)
24	299	$361.15	$ 339.01	($22.14)
25	312	$383.87	$ 354.33	($29.54)
26	324	$406.59	$ 369.65	($36.94)
27	337	$429.31	$ 384.97	($44.34)
28	349	$452.03	$ 400.29	($51.74)
29	362	$474.75	$ 415.61	($59.14)
30	374	$497.47	$ 430.93	($66.54)

NON-RESIDENTIAL BILLS

Table 5-2 tabulates the current and proposed bills for commercial customers receiving potable water with a 1" service. This size of service is common for this customer class. The average commercial bill is 60 HCF.

Table 5-2. Current and Proposed Commercial Bill Comparison

Bi-Monthly Demand		Commercial Bi-Monthly Bills (1" Service)		
HCF	Gal/Day	Current	Proposed FY 2021-22	Difference $
0	0	$74.97	$74.97	$0.00
10	125	$159.87	$160.57	$0.70
20	249	$244.77	$246.17	$1.40
30	374	$329.67	$331.77	$2.10
40	499	$414.57	$417.37	$2.80
50	623	$499.47	$502.97	$3.50
60	748	$584.37	$588.57	$4.20
70	873	$669.27	$674.17	$4.90
80	997	$754.17	$759.77	$5.60
90	1122	$839.07	$845.37	$6.30
100	1247	$923.97	$930.97	$7.00
120	1496	$1,093.77	$1,102.17	$8.40

Table 5-3 tabulates the current and proposed bills for recycled water customer with a 1" service.

Table 5-3. Current and Proposed Recycled Water Bill Comparison

Bi-Monthly Demand		Recycled Water Bi-Monthly Bills (1" Service)		
HCF	Gal/Day	Current	Proposed FY 2021-22	Difference $
0	0	$74.97	$74.97	$0.00
10	125	$149.97	$151.97	$2.00
20	249	$224.97	$228.97	$4.00
30	374	$299.97	$305.97	$6.00
40	499	$374.97	$382.97	$8.00
50	623	$449.97	$459.97	$10.00
60	748	$524.97	$536.97	$12.00
70	873	$599.97	$613.97	$14.00
80	997	$674.97	$690.97	$16.00
90	1122	$749.97	$767.97	$18.00
100	1247	$824.97	$844.97	$20.00
120	1496	$974.97	$998.97	$24.00

Table 5-4 compares the District's current and proposed residential volumetric rates to some of its neighboring water suppliers. The number of tiers and water use within each tier differs between jurisdictions. The breakpoints indicate when a customer begins paying the next tier's rate, which differ amongst the jurisdictions.

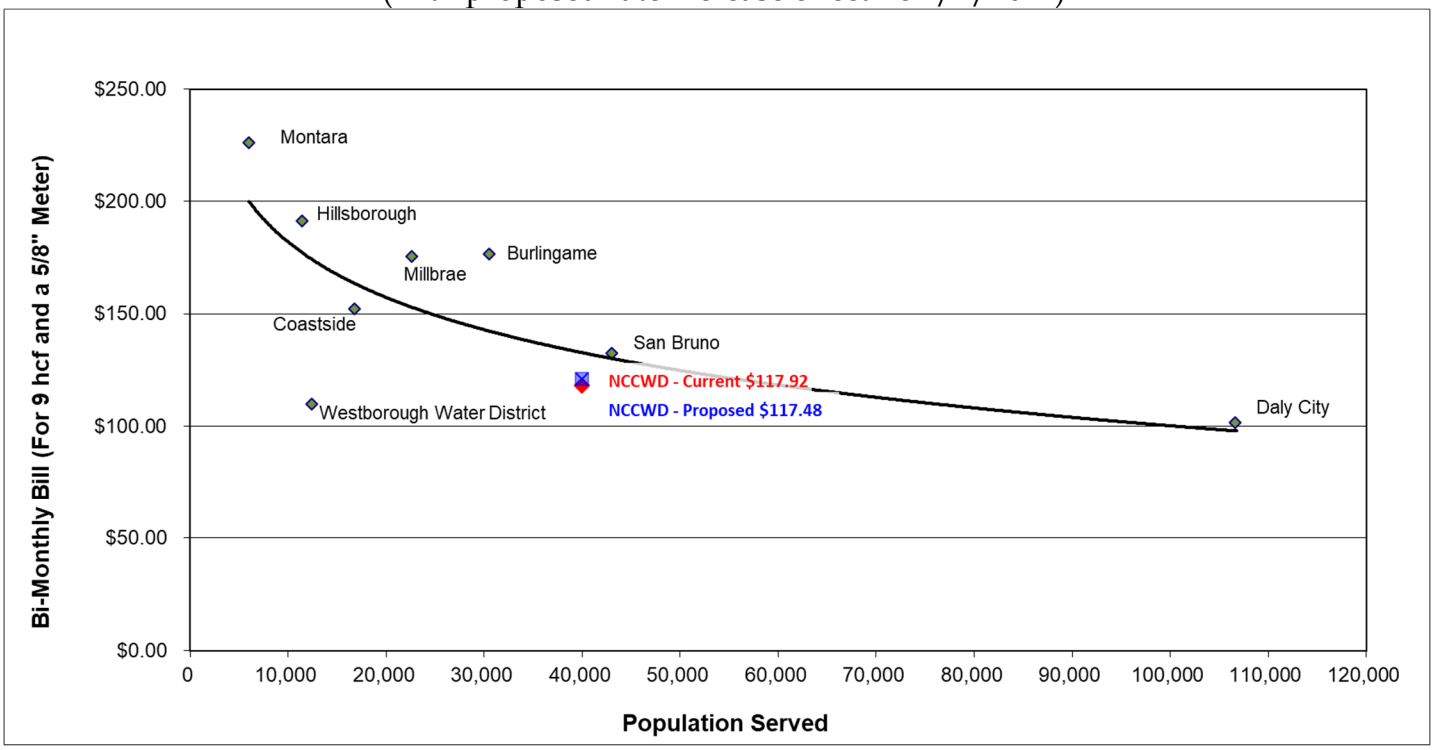
Table 5-4. Comparison of Residential Volumetric Rates with Other Jurisdictions

Rates per Tier ($/HCF)								
	NCCWD						San	Daly
	Current	Proposed	Burlingame	Coastside	Hillsborough	Montara	Bruno	City
Tier 1	$6.60	$6.09	$9.79	$9.65	$5.98	$8.36	9.01	$6.24
Tier 2	$7.86	$9.19	$10.98	$14.12	$7.59	$11.17	10.78	$8.26
Tier 3	$13.53	$12.45	$12.18	$17.08	$10.43	$13.94	14.33	$11.40
Tier 4	$22.72	$15.32	$13.38		$15.92	$19.53		
Tier 5			$14.58					
Breakpoints (Bi-monthly HCF)								
BP #1	5	5	5	8	20	6	20	26
BP #2	10	9	11	16	44	13	40	52
BP #3	19	13	21		70	27		
BP #4			32					

Figure 5-1 compares average residential bills (service charge and volumetric charge) for the District with some of its neighboring water suppliers based on the average customer water use of 9 HCF during a bi-monthly billing period. The bi-monthly bills are plotted against the population served. In this way, economies of scale can be accounted for because larger agencies often have lower costs per customer.

The curved dark line is a trend line. The trend line drops from left to right indicating the effect of economies of scale. The District's current and proposed bills fall below the trend line.

Figure 5-1. Comparison of Residential Bi-Monthly Bills with Other Jurisdictions
(with proposed rate increase effective 2/1/2022)

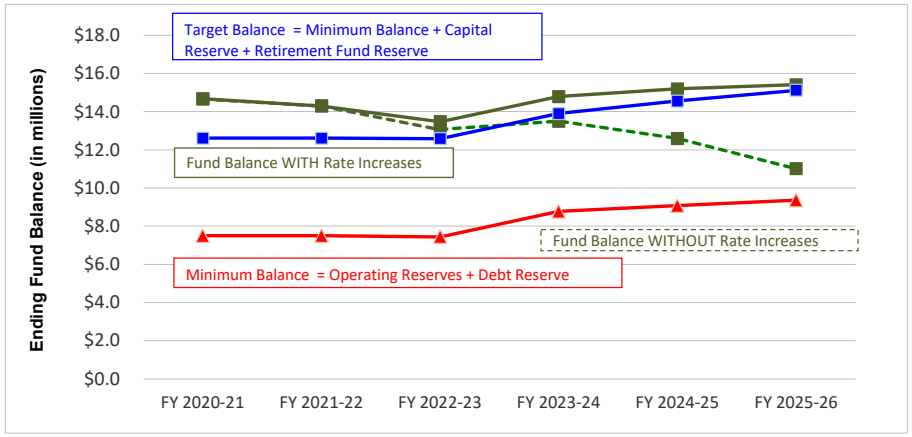


We note that the rates for other agencies are based on currently available published sources. All rates shown have been updated at least within the last three calendar years. Any proposed rate increases that have not yet been implemented are not shown.

APPENDIX A. RATE MODEL

North Coast County Water District
Water Rate Study
Table 1A. Summary

Fiscal Year:	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	**Notes**
Rate Increases	*eff. date*	*2/1/2022 COS Adjs*	*7/1/2022*	*7/1/2023*	*7/1/2024*	*7/1/2025*	
Service Charge Rate Increase		**0.0%**	*3.0%*	*3.0%*	*3.0%*	*3.0%*	
Residential Volumetric Rate Increase		**-0.4%**	*3.0%*	*3.0%*	*3.0%*	*3.0%*	
Commercial Volumetric Rate Increase		**0.9%**	*3.0%*	*3.0%*	*3.0%*	*3.0%*	
		0.0%	**3.0%**	**3.0%**	**3.0%**	**3.0%**	
Revenue Increases		**0.0%**	**3.1%**	**3.1%**	**3.1%**	**3.1%**	Growth + Rate Increases; To Tables 3, 4
Debt Coverage Ratio	7.97	2.85	2.83	1.76	1.73	1.61	



North Coast County Water District
Water Rate Study
Table 1B. General

	Assumptions	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Source	Notes
a	General Inflation	2.0%	2.0%	2.0%	2.0%	2.0%	NCCWD	To Table 2
b	Utilities	5.0%	5.0%	5.0%	5.0%	5.0%	NCCWD	To Table 2
c	Salary Increases	2.0%	2.0%	2.0%	2.0%	2.0%	NCCWD	To Table 2
d	Pension	7.0%	7.0%	7.0%	7.0%	7.0%	NCCWD	To Table 2
e	SFPUC Water Rate per HCF	$4.10	$4.32	$4.65	$4.92	$5.37	NCCWD email 5/7/2021	To Table 2
	SFPUC Purchases (HCF)	1,137,860	1,146,155	1,154,451	1,162,746	1,171,042	Projected 2025 Demand per EKI Study	To Table 2, 6a
	Assumed Losses	10.8%	10.8%	10.8%	10.8%	10.8%	Calculated Losses CY 2019 Demand (EKI Study) versus District Meter Consumption	To Table 2
f	Liability Insurance	5.0%	5.0%	5.0%	5.0%	5.0%	NCCWD	To Table 2
g	Interest on Earnings	1.0%	1.0%	1.0%	1.0%	1.0%	NCCWD	To Table 4
h	Non-rate Revenues	1.0%	1.0%	1.0%	1.0%	1.0%	NCCWD	To Table 2
i	% Cutbacks due to Conserv.	0%	0%	0%	0%	0%	NCCWD _ Executive Order B-29-15	To Tables 2,3
j	Growth in Accounts	0.00%	0.24%	0.24%	0.24%	0.30%	NCCWD 2020 UWMP, Table 3-2	To Table 3A
k	Construction Cost Inflation	3%	3%	3%	3%	3%	NCCWD / HF&H estimate	To Table 5
l	Benefit Increases	7.0%	7.0%	7.0%	7.0%	7.0%	NCCWD	To Table 2
m	Change in Residential Consumption	0.0%	0.7%	0.7%	0.7%	0.7%		To Table 6a
n	Change in Commercial Consumption	0.0%	0.7%	0.7%	0.7%	0.7%		To Table 6a
o	Change in Recycled Water Consumption	0.0%	0.7%	0.7%	0.7%	0.7%		To Table 6a

Target Fund Balances

Operating Fund

Purpose	For O&M cash flow during the year
Funding priority	Highest.
Minimum balance	Cannot go negative
Target balance	Three months of operating expenses
District Policy	Six months of operating expenses

Capital Improvement Fund

Purpose	To be used for replacement of Equipment/ Facilities
Funding priority	Low
Minimum balance	Cannot go negative
Target balance	Average annual expenditure increased by Assumption (12) above
District Policy	Previous 5 years actual avg annual CIP + 3 mo's budgeted CIP PAYGo

Bond Fund

Purpose	For acquisition and construction of facilities and infrastructure for new customers.
Funding priority	As needed

List of Model Worksheets

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Table 6b. Service (Meter) Charge Revenue Calculation
Table 7. Debt Service Schedule and Debt Coverage
Table 8. Loading Factors
Table 9. Allocations

	A	B	C	E	F	G	H	I	J	K
44		Minimum balance	Cannot go negative							
45		Target balance	100% of all deposited funds							
46		District Policy	1.2 x annual debt service							
47										
48		Retirement Fund								
49		Purpose	Fund retiree benefits							
50		Funding priority	When possible							
51		Minimum balance	Cannot go negative							
52		Target balance	$326,000							
53										
54		Emergency Reserve								
55		Purpose	For emergent, unplanned projects brought on by natural disasters or failure of critical system elements							
56		Funding priority	When possible							
57		Minimum balance	Cannot go negative							
58		Target balance	Three months operating expenses							
59		Dsitrict Policy	Three months operating expenses							
60										
61		Drought Contingency Fund								
62		Purpose	For additional cash flow when drought creates reduction of revenue							
63		Funding priority	Low							
64		Minimum balance	Cannot go negative							
65		Target balance	$500,000							

North Coast County Water District
Water Rate Study
Table 2. Revenue Requirement

Account #		Table 1B Factors		Estimated FY 2020-21	Budgeted FY 2021-22	Projected FY 2022-23	Projected FY 2023-24	Projected FY 2024-25	Projected FY 2025-26	Notes
SFPUC Water Purchases										
	Quantity Charge	e		$5,011,065	$4,665,225	$4,951,390	$5,368,195	$5,720,711	$6,288,493	From Table 1B
	Service Charge			$200,443	$200,443	$200,443	$200,443	$200,443	$200,443	4% of Qty. Charge
	BAWSCA Surcharge			$431,172	$388,512	$388,512	$388,512	$388,512	$388,512	Per BAWSCA February 2021 agenda packet
	Subtotal, SFPUC Water Purchases			$ 5,642,680	$ 5,254,179	$ 5,540,345	$ 5,957,150	$ 6,309,665	$ 6,877,448	
	Annual Change				*-6.9%*	*5.4%*	*7.5%*	*5.9%*	*9.0%*	
Salaries & Benefits										
5111	Regular Salary		c	$ 1,836,000	$ 2,032,000	$2,072,640	$2,114,093	$2,156,375	$2,199,502	
5112	Overtime		c	40,700	38,000	$38,760	$39,535	$40,326	41,132	
5113	Duty		c	64,000	66,000	$67,320	$68,666	$70,040	71,441	
5114	Temporary Employment		c	-	-	-	-	-	-	
5640	Payroll Taxes		c	143,000	150,100	$153,102	$156,164	$159,287	162,473	
5641	Workers Compensation		l	50,000	50,000	$53,500	$57,245	$61,252	65,540	
5642	Health Insurance		c	335,000	373,300	$380,766	$388,381	$396,149	404,072	
5642A	Retiree Health Insurance		d	326,000	326,000	$348,820	$373,237	$399,364	427,319	
5643	Employee Retirement		d	680,000	759,000	$812,130	$868,979	$929,808	994,894	
5644	Retiree COLA Benefit		d	97,000	97,100	$103,897	$111,170	$118,952	127,278	
5645	Director's Health Insurance		l	111,000	115,000	$123,050	$131,664	$140,880	150,742	
5646	Life Insurance		l	14,000	15,880	$16,992	$18,181	$19,454	20,815	
5647	Employee Welfare		l	500	500	$535	$572	$613	655	
5940	Directors Fees		l	10,000	14,000	$14,980	$16,029	$17,151	18,351	
	Subtotal, Salaries & Benefits			$3,707,200	$4,036,880	$4,186,492	$4,343,917	$4,509,649	$4,684,215	
	Annual Change				*8.9%*	*3.7%*	*3.8%*	*3.8%*	*3.9%*	
O & M										
5230	Utilities	b	i	$349,000	$346,000	$363,300	$381,465	$400,538	$420,565	
5312	Lab		a	25,000	25,000	$25,500	26,010	26,530	27,061	
5314	Regulatory Fees/Other Services - Misc.		a	100,000	105,000	$107,100	109,242	111,427	113,655	
5315	Contract Services		a	12,000	12,000	$12,240	12,485	12,734	12,989	
5350	Tools & Equipment		a	14,000	14,000	$14,280	14,566	14,857	15,154	
5410	Meters		a	-	-	-	-	-	-	
5411	Asphaltic Materials		a	2,000	-	$0	-	-	-	
5412	Operating Supplies		a	6,500	6,500	$6,630	6,763	6,898	7,036	
5420	Inventory		a	60,000	60,000	$61,200	62,424	63,672	64,946	
5513	Payment Center Fees	a	i	500	510	$520	531	541	552	
5514	On-line Payment Fees		a	70,000	70,000	$71,400	72,828	74,285	75,770	
5621	Printing & Office Supplies		a	13,500	11,530	$11,761	11,996	12,236	12,480	
5623	Telephone		a	20,500	20,000	$20,400	20,808	21,224	21,649	
5624	Janitor & Gardener		a	21,000	22,000	$22,440	22,889	23,347	23,814	
5627	Postage		a	2,000	40,000	$40,800	41,616	42,448	43,297	
5628	General Manager's Expenses		a	2,000	5,000	$5,100	5,202	5,306	5,412	
5629	Vehicle Maintenance		a	20,000	20,000	$20,400	20,808	21,224	21,649	
5631	Office Building Maintenance		a	-	5,000	5,100	5,202	5,306	5,412	
5632	Fuel		a	37,000	37,100	$37,842	38,599	39,371	40,158	
5635	Staff Training		a	4,000	5,000	$5,100	5,202	5,306	5,412	
5650	Office Equipment		a	15,000	15,000	$15,300	15,606	15,918	16,236	
5655	Office Equipment Lease		a	8,000	8,000	$8,160	8,323	8,490	8,659	
5661	Uniforms & Safety Equip.		a	13,000	15,200	$15,504	15,814	16,130	16,453	
5670	Repairs & Maintenance		a	115,000	65,000	$66,300	67,626	68,979	70,358	
5675	Flushing		a	-	-	-	-	-	-	
5725	BMP Compliance		a	65,000	65,000	$66,300	67,626	68,979	70,358	
5730	Misc. Supplies		a	6,000	6,060	$6,181	6,305	6,431	6,560	
	Recycle Water Operations		a	7,000	7,000	$7,140	7,283	7,428	7,577	
5735	Emergency Repairs		a	-	-	-	-	-	-	
	Subtotal, O & M			$988,000	$985,900	$1,015,998	$1,047,217	$1,079,605	$1,113,214	
	Annual Change				*-0.2%*	*3.1%*	*3.1%*	*3.1%*	*3.1%*	
Non-Operating Expenditures										
5620	Advertising		a	$4,000	$5,000	$5,100	$5,202	$5,306	$5,412	
5522	Bad Debt Write-Off		a	25,000	25,000	$25,500	26,010	26,530	27,061	

North Coast County Water District
Water Rate Study
Table 2. Revenue Requirement

Account #		Table 1B Factors	Estimated FY 2020-21	Budgeted FY 2021-22	Projected FY 2022-23	Projected FY 2023-24	Projected FY 2024-25	Projected FY 2025-26	Notes
5523	Bad Debt Recovery	a	-	-	-	-	-	-	
5622	Utilities	a	20,000	20,400	$20,808	21,224	21,649	22,082	
5625	Meetings & Conferences	a	1,500	1,500	$1,530	1,561	1,592	1,624	
5626	Dues & Membership	a	45,000	45,000	$45,900	46,818	47,754	48,709	
5626A	BAWSCA Dues	a	75,000	78,750	$80,325	81,932	83,570	85,242	
5630	Insurance	f	75,000	80,000	$84,000	88,200	92,610	97,241	
5637	Billing	a	75,000	75,000	$76,500	78,030	79,591	81,182	
5680	Engineering Fees	a	10,000	10,000	$10,200	10,404	10,612	10,824	
5681	Legal Fees	a	70,000	70,000	$71,400	72,828	74,285	75,770	
5682	Auditing & Accounting Fees	a	21,000	21,000	$21,420	21,848	22,285	22,731	
5683	Misc. Professional Fees	a	265,000	172,500	$175,950	179,469	183,058	186,720	
5685	Water Education	a	10,000	10,000	$10,200	10,404	10,612	10,824	
5687	Water Conservation	a	15,000	25,000	$25,500	26,010	26,530	27,061	
5720	Taxes & Assessments	a	3,000	3,000	$3,060	3,121	3,184	3,247	
5730	Miscellaneous Expense	a	5,000	3,000	$3,060	3,121	3,184	3,247	
5731	Books & Publications	a	-	-	-	-	-	-	
5732	License & Certifications	a	700	700	$714	728	743	758	
5733	Meals	a	1,000	1,000	$1,020	1,040	1,061	1,082	
5734	Travel & Lodging	a	500	500	$510	520	531	541	
5735	Employee Rec Dinner & Awards	a	1,500	1,800	$1,836	1,873	1,910	1,948	
5941	Director's Election	a	-	25,000	25,500	26,010	26,530	27,061	
5942	Director's Conv. & Travel	a	3,000	6,000	$6,120	6,242	6,367	6,495	
	Subtotal, Non-Operating Expenditures		$726,200	$680,150	$696,153	$712,596	$729,494	$746,862	
	Annual Change			*-6.3%*	*2.4%*	*2.4%*	*2.4%*	*2.4%*	
	Total Expenses		$ 11,064,080	$ 10,957,109	$ 11,438,987	$ 12,060,880	$ 12,628,413	$ 13,421,739	
	Annual Change			*-1.0%*	*4.4%*	*5.4%*	*4.7%*	*6.3%*	
Debt Service									
5800	CSCDA RBP 2012 C		$516,525	$514,475	$512,975	$519,075	$511,900	$513,325	From Table 7
	FY 2021-22 Debt Issuance		$0	$1,129,780	$1,129,780	$1,129,780	$1,129,780	$1,129,780	From Table 7
	FY 2023-24 Debt Issuance		$0	$0	$0	$900,635	$898,612	$898,621	From Table 7
	Subtotal, Debt Service		$516,525	$1,644,255	$1,642,755	$2,549,490	$2,540,291	$2,541,726	
	Annual Change			*218.3%*	*-0.1%*	*55.2%*	*-0.4%*	*0.1%*	
Non-Rate Revenues									
4210	Fire Standby		($58,200)	($58,939)	($58,939)	($58,939)	($58,939)	($58,939)	
4230	Water Connections		(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	(25,000)	
4240	Renewal of Service	h	(23,000)	(21,000)	(21,210)	(21,422)	(21,636)	(21,853)	
4260	Late Charges	h	0	(70,000)	(70,700)	(71,407)	(72,121)	(72,842)	
4870	Miscellaneous Revenues	h	(50,000)	(50,000)	(50,500)	(51,005)	(51,515)	(52,030)	
4910	Lease Revenues	h	(232,000)	(238,960)	(241,350)	(243,763)	(246,201)	(248,663)	
4930	Taxes & Assessments	h	(800,000)	(1,070,000)	(1,080,700)	(1,091,507)	(1,102,422)	(1,113,446)	
4980	Transmission & Storage	h	(75,000)	(75,000)	(75,750)	(76,508)	(77,273)	(78,045)	
4977	Gain on Sale of Assets	h	0	0	0	0	0	0	Future years per District input
	Subtotal, Revenue		($1,263,200)	($1,608,899)	($1,624,148)	($1,639,550)	($1,655,107)	($1,670,818)	
Other Transfers to/(from)									
	Transfer to/(from) Capital Improvement Fund		$0	$2,154,676	$2,154,676	$2,154,676	$2,154,676	$2,154,676	From Table 4
	Transfer to/(from) Operating Fund		$0	$772,112	$0	$0	$0	$0	From Table 4
	Transfer to/(from) Retirement Fund (GASB 45)		$0	$0	$0	$0	$0	$0	From Table 4
	Transfer to/(from) Capital Improvement - Depreciation			$0	$0	$0	$0	$0	To Table 4
	Transfer to/(from) Emergency Reserve		$0	$0	$0	$0	$0	$0	From Table 4
	Total Transfers		$0	$2,926,788	$2,154,676	$2,154,676	$2,154,676	$2,154,676	
	Annual Change				*-26.4%*	*0.0%*	*0.0%*	*0.0%*	
	Net Revenue Requirement		**$ 10,317,405**	**$ 13,919,254**	**$ 13,612,270**	**$ 15,125,495**	**$ 15,668,275**	**$ 16,447,323**	To Table 3
	Annual Change			*34.9%*	*-2.2%*	*11.1%*	*3.6%*	*5.0%*	

North Coast County Water District
Water Rate Study
Table 3a. Revenue Increase

	Months in first FY	Projected FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Notes
Service Charge Revenue @ Current Rates		$4,584,708	$4,584,708	$4,584,708	$4,584,708	$4,584,708	From Table 6b
Volumetric Charge Revenue @ Current Rates		$9,334,545	$9,334,545	$9,334,545	$9,334,545	$9,334,545	From Table 6a
Revenue from Growth		$0	$11,003	$22,007	$33,010	$46,764	From Table 1B
Revenue from Current Rates		$13,919,254	$13,930,257	$13,941,260	$13,952,263	$13,966,018	
Net Revenue Requirement		$13,919,254	$13,612,270	$15,125,495	$15,668,275	$16,447,323	From Table 2
Operating Surplus/(Shorfall)		**$0**	**$317,987**	**($1,184,235)**	**($1,716,011)**	**($2,481,305)**	To Table 4
Service Charge Revenue							
Annual Increases		**0.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	
		February 1, 2022	*July 1, 2022*	*July 1, 2023*	*July 1, 2024*	*July 1, 2025*	
Revenue from Current Rates		$4,584,708	$4,595,712	$4,606,715	$4,617,718	$4,631,472	a
Revenue from Rate Adjustments							
FY 2021-22	5	$0	$0	$0	$0	$0	
FY 2022-23	12		$137,871	$138,201	$138,532	$138,944	
FY 2023-24	12			$142,347	$142,687	$143,112	
FY 2024-25	12				$146,968	$147,406	
FY 2025-26	12					$151,828	
Subtotal, Revenue from Rate Increases		$0	$137,871	$280,549	$428,187	$581,291	b
Adjusted Service Charge Revenue		$4,584,708	$4,733,583	$4,887,264	$5,045,905	$5,212,763	c = a + b
Volumetric Charge Revenue							
Service Charge Increases		**0.0%**	**3.0%**	**3.0%**	**3.0%**	**3.0%**	
		February 1, 2022	*July 1, 2022*	*July 1, 2023*	*July 1, 2024*	*July 1, 2025*	
Revenue from Current Rates		$9,334,545	$9,334,545	$9,334,545	$9,334,545	$9,334,545	d
Annual Increases							
FY 2021-22	5	$0	$0	$0	$0	$0	
FY 2022-23	12		$280,036	$280,036	$280,036	$280,036	
FY 2023-24	12			$288,437	$288,437	$288,437	
FY 2024-25	12				$297,091	$297,091	
FY 2025-26	12					$306,003	
Subtotal, Revenue from Rate Increases		$0	$280,036	$568,474	$865,564	$1,171,568	e
Adjusted Service Charge Revenue		$9,334,545	$9,614,582	$9,903,019	$10,200,110	$10,506,113	f = d + e
Adjusted Service Charge Revenue		$4,584,708	$4,733,583	$4,887,264	$5,045,905	$5,212,763	c
Adjusted Volumetric Charge Revenue		$9,334,545	$9,614,582	$9,903,019	$10,200,110	$10,506,113	f
Total Rate Revenue		$13,919,254	$14,348,165	$14,790,283	$15,246,015	$15,718,876	
Net Revenue Requirements		$13,919,254	$13,612,270	$15,125,495	$15,668,275	$16,447,323	
Net Transfer (From)/To Reserves		**$0**	**$735,894**	**($335,212)**	**($422,260)**	**($728,447)**	To Table 4
Overall Revenue Increase		**0.0%**	**3.1%**	**3.1%**	**3.1%**	**3.1%**	

North Coast County Water District
Water Rate Study
Table 3b. Commodity Revenue at Current Rates and Projected FY 2021-22 Water Use/Sales

	Annual Water Use (hcf)	Rates ($/hcf)	Annual Revenue
	Current Tiers		
Residential			
Tier 1	313,164	$6.60	$2,066,882
Tier 2	211,063	$7.86	$1,658,955
Tier 3	133,809	$13.53	$1,810,436
Tier 4	34,369	$22.72	$780,864
Subtotal	692,405		$6,317,137
Commercial			
	342,478	$8.49	$2,907,638
Subtotal	342,478		$2,907,638
Recycled Water			
	14,636	$7.50	$109,770
Subtotal	14,636		$109,770
Total	**1,049,519**		**$9,334,545**

	A	B	C	D	E	F	G	H	I	J
1	**North Coast County Water District**									
2	**Water Rate Study**									
3	**Table 4. Reserves**									
4										
5			**Table**		**Budgeted**			**Projected**		
6			**1B**	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	**Notes**
8	***Reserve Funds With Rate Increases***			*July 31 balances*						
10	**OPERATING Reserve**									
11	Beginning Balance				$9,301,285	$9,164,131	$8,433,526	$8,179,297	$7,834,607	
12	Surplus/(Deficit)				$0	$735,894	($335,212)	($422,260)	($728,447)	From Table 3
13	**Transfers (To)/From**									
14	Revenue Requirements				$772,112					To Table 2
15	Capital Improvement Fund				($1,000,000)	($100,000)	$0	$0	$0	From Below
16	Bond Fund				$0	($1,450,000)	$0	$0	$0	From Below
17	Retirement Fund				$0	$0	$0	$0	$0	From Below
18	Emergency Reserve				$0	$0	$0	$0	$0	From Below
19	Subtotal				$9,073,397	$8,350,026	$8,098,313	$7,757,037	$7,106,160	
20	Estimated Interest Earnings		g		$90,734	$83,500	$80,983	$77,570	$71,062	
21	**Ending Balance**			**$9,301,285**	**$9,164,131**	**$8,433,526**	**$8,179,297**	**$7,834,607**	**$7,177,222**	FY 202-21 Ending balance as of 3/2021; includes customer deposit,
22	*Minimum Balance (6 mo. operations)*				*$5,532,040*	*$5,478,555*	*$5,719,494*	*$6,030,440*	*$6,314,207*	accrued PTO; excludes OPEB.
23	**CAPITAL IMPROVEMENT FUND**									
24	Beginning Balance				$1,658,967	$1,389,014	($196,310)	$1,306,300	$2,010,887	
25	**Expenses**									
26	PAYGo-Funded Projects				($3,438,382)	($3,840,000)	($665,000)	($1,470,000)	($1,360,000)	From Table 5
27	**Transfers (To)/From**									
28	Revenue Requirements				$2,154,676	$2,154,676	$2,154,676	$2,154,676	$2,154,676	To Table 2
29	Operating Reserve				$1,000,000	$100,000				To Above
30	Subtotal				$1,375,261	($196,310)	$1,293,367	$1,990,977	$2,805,563	
31	Estimated Interest Earnings		g		$13,753	$0	$12,934	$19,910	$28,056	
32	**Ending Balance**			**$1,658,967**	**$1,389,014**	**($196,310)**	**$1,306,300**	**$2,010,887**	**$2,833,619**	
33	*Target Balance*		*k*		*$2,014,949*	*$2,080,187*	*$1,950,295*	*$2,143,262*	*$2,280,166*	Previous 5 years actual avg annual CIP + 3 mo's budgeted CIP PAYGo
34	**BOND FUND**									
35	Beginning Balance				$627,090	$633,361	$2,104,195	$2,125,236	$2,146,489	
36	**Expenses**									
37	Bond Funded Projects				$0	$0	$0	$0	$0	From Table 5
38	**Transfer (To)/From Operating Reserve**					$1,450,000				To Above
39	Subtotal				$627,090	$2,083,361	$2,104,195	$2,125,236	$2,146,489	
40	Estimated Interest Earnings		g		$6,271	$20,834	$21,042	$21,252	$21,465	
41	**Ending Balance**			**$627,090**	$633,361	$2,104,195	$2,125,236	$2,146,489	$2,167,954	
42	*Target Balance (1.2 x 1 yr debt service pymt)*			$524,575	$1,973,106	$1,971,306	$3,059,388	$3,048,350	$3,050,071	
43	**RETIREMENT FUND (OPEB)**									
44	Beginning Balance				$326,000	$329,260	$332,553	$335,878	$339,237	
45	**Transfers (To)/From**									
46	Revenue Requirements									To Table 2
47	Operating Reserve									To Above
48	Subtotal				$326,000	$329,260	$332,553	$335,878	$339,237	
49	Estimated Interest Earnings		g		$3,260	$3,293	$3,326	$3,359	$3,392	
50	**Ending Balance**			**$326,000**	$329,260	$332,553	$335,878	$339,237	$342,629	
51	*Target Balance*				*$326,000*	*$326,000*	*$326,000*	*$326,000*	*$326,000*	Per Board policy of annual amount approved.
52										
53	Estimated Interest Revenue				$114,017	$107,626	$118,284	$122,091	$123,974	To Table 7

	A	B	C	D	E	F	G	H	I	J
1	**North Coast County Water District**									
2	**Water Rate Study**									
3	**Table 4. Reserves**									
4										
5			**Table**		**Budgeted**			**Projected**		
6			**1B**	**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	**Notes**
54	**EMERGENCY FUND**									
55	Beginning Balance				$2,757,676	$2,785,253	$2,813,105	$2,841,236	$2,869,649	
56	**Transfers (To)/From**									
57		Revenue Requirements								To Table 2
58		Operating Reserve								To Above
59		Subtotal			$2,757,676	$2,785,253	$2,813,105	$2,841,236	$2,869,649	
60		Estimated Interest Earnings	g		$27,577	$27,853	$28,131	$28,412	$28,696	
61		**Ending Balance**		**$2,757,676**	$2,785,253	$2,813,105	$2,841,236	$2,869,649	$2,898,345	
62		*Target Balance (3 mo. operations)*			*$2,766,020*	*$2,739,277*	*$2,859,747*	*$3,015,220*	*$3,157,103*	
63										
64				**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	
65		***Total Reserves Without Increase***		*$14,671,018*	*$14,301,019*	*$13,064,982*	*$13,504,127*	*$12,597,520*	*$11,020,001*	
66		***Total Reserves with Increase***		*$14,671,018*	*$14,301,019*	*$13,487,069*	*$14,787,948*	*$15,200,868*	*$15,419,769*	
67		***Minimum Balance***		*$7,505,145*	*$7,505,145*	*$7,449,860*	*$8,778,881*	*$9,078,790*	*$9,364,277*	*Op + Bond Reserve*
68		***Target Balance***		*$12,612,114*	*$12,612,114*	*$12,595,324*	*$13,914,923*	*$14,563,271*	*$15,127,547*	*Minimum + OPEB + Capital Reserve*
69										

North Coast County Water District
Water Rate Study
Table 5. CIP

Note: values reflected in future years have been escalated at 3% annually from current year dollars.

Project Name	CIP Project No.	Account No.	Project Type	Budgeted FY 2020-21	Projected FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	Allocation Factor	Funding Source
Groundwater Study	WS.3 - WS.6	1116-611	Potable Water Supply	$ 50,000	$ 75,000	$ -	$ -	$ -	$ -	Max Hour Only	PAYGo
Recycled Water Study	--	--	Recycled Water	$ -	$ 50,000	$ -	$ -	$ -	$ -	Max Hour Only	PAYGo
Hydraulic Model Update	--	--	Potable Water Supply	$ 135,000	$ -	$ -	$ -	$ -	$ -	Average Day	PAYGo
Optional Tasks: Water Master Plan Update	--	--	*Potable Water Supply*	$ -	$ 95,000	$ -	$ -	$ -	$ -	Average Day	PAYGo
San Pedro Creek Diversion Repair	WS.1	1116-610B	Potable Water Supply	$ -	$ -	$ 110,000	$ -	$ -	$ -	Average Day	PAYGo
Seismic Study Improvements	--	--	Potable Water Supply	$ -	$ -	$ 100,000	$ 100,000	$ -	$ -	Average Day	PAYGo
Christen Hill Tank - Consultant/Inspector	--	1935-103B	Potable Water Storage	$ -	$ -	$ -	$ -	$ -	$ -	Max Day	PAYGo
Christen Hill Tank - Gate Improvement	--	1935-103C	Potable Water Storage	$ 50,000	$ 50,000	$ -	$ -	$ -	$ -	Max Day	PAYGo
Fassler Tank Design and Construction	--	--	Potable Water Storage	$ -	$ 200,000	$ 415,000	$ -	$ -	$ -	Max Day	PAYGo
				$ -	$ -	$ -	$ 6,480,000	$ -	$ -	Max Day	Debt-Financed
Second Royce Tank Design and Construction	--	--	Potable Water Storage	$ -	$ -	$ -	$ -	$ 625,000	$ 5,860,000	Max Day	Debt-Financed
Repair/Replacement of Tank Vents	--	--	Potable Water Storage	$ 100,000	$ 25,000	$ -	$ -	$ -	$ -	Max Day	PAYGo
Sheila Tank Design and Construction	T.10	1117-135	Potable Water Storage	$ 415,000	$ 75,000	$ -	$ -	$ -	$ -	Max Day	PAYGo
				$ -	$ 550,000	$ 4,220,000	$ -	$ -	$ -	Max Day	Debt-Financed
Tank Hatch Intrusion Alarms - 10 Hatches	--	--	Potable Water Storage	$ 39,000	$ -	$ -	$ -	$ -	$ -	Max Day	PAYGo
21" Pipeline Inspection	--	--	Potable Piping Improvements	$ 55,000	$ 55,000	$ -	$ 65,000	$ -	$ -	Max Hour	PAYGo
Balboa Pipeline Replacement Inspection	--	1117-145	Potable Piping Improvements	$ 40,000	$ -	$ -	$ -	$ -	$ -	Max Hour	PAYGo
Fittings for Potable Hose System	--	1117-182B	Potable Piping Improvements	$ -	$ -	$ -	$ -	$ -	$ -	Max Hour	PAYGo
Loop at Everglades Dr Pipeline Replacement	PL.15A	--	Potable Piping Improvements	$ 200,000	$ 390,000	$ 2,670,000	$ -	$ -	$ -	Max Hour	PAYGo
Shoreside Levee Pipeline Replacement	PL.10A	--	Potable Piping Improvements	$ 45,000	$ 360,000	$ -	$ -	$ -	$ -	Max Hour	PAYGo
Highway 1 Crossing - Manor Dr	PL.2A	1117-146	Potable Piping Improvements	$ 40,000	$ -	$ -	$ -	$ -	$ -	Max Hour	PAYGo
Annual Main Replacement Program	--	--	Potable Piping Improvements	$ -	$ -	$ -	$ -	$ 1,000,000	$ 1,000,000	Max Hour	PAYGo
Advanced Metering Infrastructure Study	--	--	Miscellaneous	$ -	$ 50,000	$ -	$ -	$ -	$ -	Customer	PAYGo
Two-Way Radio System Upgrade	--	--	Miscellaneous	$ -	$ 25,000	$ -	$ -	$ -	$ -	Customer	PAYGo
Vehicle Purchase - Backhoe	--	--	Miscellaneous	$ 125,000	$ -	$ -	$ -	$ -	$ -	Customer	PAYGo
Vehicle Purchase - General	--	1119-122B	Miscellaneous	$ 70,000	$ 30,000	$ -	$ -	$ -	$ -	Customer	PAYGo
Vehicle Replacement - Pickup Trucks	--	--	Miscellaneous	$ 70,000	$ 35,000	$ -	$ 35,000	$ -	$ 35,000	Customer	PAYGo
Computer Upgrades/SCADA, Office	--	1118-172B	Buildings	$ 25,000	$ 20,000	$ -	$ -	$ -	$ -	Customer	PAYGo
Francisco Building Repairs	--	1118-112B	Buildings	$ -	$ -	$ -	$ -	$ -	$ -	Customer	PAYGo
Francisco District Headquarters Upgrades	O.3	--	Buildings	$ 61,000	$ 1,353,382	$ -	$ -	$ -	$ -	Customer	PAYGo
				$ -	$ -	$ 7,901,000	$ 7,901,000	$ -	$ -	Customer	Debt-Financed
Redundant Off-Site SCADA System at Gypsy Hill	--	1915-103B	Buildings	$ 32,000	$ 10,000	$ -	$ -	$ -	$ -	Customer	PAYGo
Annual Flushing and Dead-End Blow-Offs	A.3	1117-145	Annual Projects	$ 10,000	$ 10,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	Customer	PAYGo
Annual Valve Exercise Program	A.5	1117-145	Annual Projects	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	$ 5,000	Customer	PAYGo
Easement Protection (Annual)	A.6	1117-165	Annual Projects	$ 10,000	$ 10,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	Customer	PAYGo
Emergency Repairs	--	1117-145	Annual Projects	$ 50,000	$ 50,000	$ 55,000	$ 55,000	$ 55,000	$ 60,000	Customer	PAYGo
Fire Hydrant Replacement Program	A.4	1117-170	Annual Projects	$ 30,000	$ 120,000	$ 120,000	$ 35,000	$ 35,000	$ 35,000	Customer	PAYGo
Meter Replacement Program	A.2	1117-169	Annual Projects	$ 95,000	$ 95,000	$ 65,000	$ 65,000	$ 70,000	$ 70,000	Customer	PAYGo
Pressure Regulator Station Upgrades	A.1	1117-183B	Annual Projects	$ 100,000	$ 210,000	$ 215,000	$ 220,000	$ 220,000	$ 70,000	Max Day	PAYGo
Recycled Water	--	1116-201B	Annual Projects	$ 20,000	$ 20,000	$ 25,000	$ 25,000	$ 25,000	$ 25,000	Max Hour Only	PAYGo
Reservoir Fence Maintenance	A.6	1117-113	Annual Projects	$ 10,000	$ 10,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	Max Hour	PAYGo
Reservoir Site Paving	A.7	1117-112	Annual Projects	$ 10,000	$ 10,000	$ 15,000	$ 15,000	$ 15,000	$ 15,000	Max Hour	PAYGo

	FY 2020-21	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	
PAYGo	1,892,000	3,438,382	3,840,000	665,000	1,470,000	1,360,000	12,665,382
Debt-Financed	-	550,000	12,121,000	14,381,000	625,000	5,860,000	33,537,000
Grand Total	**1,892,000**	**3,988,382**	**15,961,000**	**15,046,000**	**2,095,000**	**7,220,000**	46,202,382

	A	B	C	D	E	F	G
1	**North Coast County Water District**						
2	**Water Rate Study**						
3	**Table 6a. Volumetric Charge Revenue**			Current Tiers w/ Consumption from:		**CY 2018 - HCF**	
4							
5							
6	**Projected**				**Projected**		
7	**Demand (HCF)**		**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**
8							
9	**Residential**						
10	Tier 1		313,164	315,447	317,730	320,013	322,296
11	Tier 2		193,721	195,134	196,546	197,958	199,371
12	Tier 3		83,461	84,069	84,678	85,286	85,895
13	Tier 4		102,059	102,803	103,547	104,291	105,035
14	Subtotal		692,405	697,453	702,501	707,549	712,597
15	**Commercial**						
16			342,478	344,975	347,472	349,968	352,465
17	Subtotal		342,478	344,975	347,472	349,968	352,465
18	**Recycled Water**						
19			14,636	14,743	14,849	14,956	15,063
20	Subtotal		14,636	14,743	14,849	14,956	15,063
21	**Total Demand (HCF)**		**1,049,519**	**1,057,170**	**1,064,822**	**1,072,473**	**1,080,125**
22							
23							
24	**Rates**	**Current**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**
25	**Residential**						
26			***COS Rate***	***3.0%***	***3.0%***	***3.0%***	***3.0%***
27	Tier 1	$6.60	$6.09	$6.27	$6.46	$6.65	$6.85
28	Tier 2	$7.86	$9.19	$9.47	$9.75	$10.04	$10.34
29	Tier 3	$13.53	$12.45	$12.82	$13.21	$13.60	$14.01
30	Tier 4	$22.72	$15.32	$15.78	$16.25	$16.74	$17.24
31							
32	**Commercial**		***COS Rate***	***3.0%***	***3.0%***	***3.0%***	***3.0%***
33		$8.49	$8.56	$8.81	$9.08	$9.35	$9.63
34							
35	**Recycled Water**		***COS Rate***	***3.0%***	***3.0%***	***3.0%***	***3.0%***
36		$7.50	$7.70	$7.93	$8.17	$8.42	$8.67
37							
38	**Revenue**		**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**
39	months effective		5	12	12	12	12
40	**Residential**						
41	Tier 1		$2,000,335	$1,978,705	$2,052,817	$2,129,595	$2,209,132
42	Tier 2		$1,630,004	1,847,077	1,916,258	1,987,929	2,062,175
43	Tier 3		$1,091,667	1,078,062	1,118,441	1,160,272	1,203,606
44	Tier 4		2,004,096	1,622,189	1,682,948	1,745,892	1,811,098
45	Subtotal		$6,726,102	$6,526,033	$6,770,464	$7,023,687	$7,286,011
46	**Commercial**						
47			$2,917,227	$3,040,578	$3,154,462	$3,272,443	$3,394,664
48	**Recycled Water**						
49			$110,999	$116,947	$121,327	$125,865	$130,566
50	**Total Revenue**		**$9,754,328**	**$9,683,558**	**$10,046,253**	**$10,421,995**	**$10,811,240**
51							
52			to Table 1	to Table 1	to Table 1	to Table 1	to Table 1

North Coast County Water District
Water Rate Study
Table 6b. Service (Meter) Charge Revenue Calculation

Meter Report		2/10/2021										
	Commercial	Residential	Irrigation	Public	Multi Unit	Portable	Recycled Water	Unassigned Class	Subtotal	Fire	Total
5/8"	281	10,770	53	32	157	5		679	11,977	40	12,017
3/4"	16	257	4	2	46			16	341	2	343
1"	56	482	14	18	52		1	16	639	172	811
1.5"	24		11	8	37			7	87	1	88
2"	22	2	16	24	23		2	5	94		94
3"	1				6	9		17	33		33
4"			1	2	1		3	1	8	1	9
6"	1			4					5		5
8"				1					1		1
10"									-		-
12"									-		-
	401	11,511	99	91	322	14	6	741	13,185	216	14,162
unknown	3				2			1	6		6

North Coast County Water District
Water Rate Study
Table 6b. Service (Meter) Charge Revenue Calculation

Annual Meter Count		Projected				
	Current	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
5/8"	11,977	11,977	12,006	12,035	12,063	12,100
3/4"	341	341	342	343	343	344
1"	639	639	641	642	644	646
1.5"	87	87	87	87	88	88
2"	94	94	94	94	95	95
3"	33	33	33	33	33	33
4"	8	8	8	8	8	8
6"	5	5	5	5	5	5
8"	1	1	1	1	1	1
10"	0	0	0	0	0	0
12"	0	0	0	0	0	0
	13,185	13,185	13,217	13,248	13,280	13,320

Bi-monthly Service Charges		Projected				
	Current	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26
	Proposed Change	*0.0%*	*3.0%*	*3.0%*	*3.0%*	*3.0%*
	Eff. Date	*2/1/2022*	*7/1/2022*	*7/1/2023*	*7/1/2024*	*7/1/2025*
5/8"	$53.48	$53.48	$55.08	$56.74	$58.44	$60.19
3/4"	$58.87	$58.87	$60.64	$62.46	$64.33	$66.26
1"	$74.97	$74.97	$77.22	$79.54	$81.92	$84.38
1.5"	$96.36	$96.36	$99.25	$102.23	$105.30	$108.45
2"	$155.65	$155.65	$160.32	$165.13	$170.08	$175.19
3"	$588.64	$588.64	$606.30	$624.49	$643.22	$662.52
4"	$749.39	$749.39	$771.87	$795.03	$818.88	$843.45
6"	$1,124.12	$1,124.12	$1,157.84	$1,192.58	$1,228.36	$1,265.21
8"	$1,552.33	$1,552.33	$1,598.90	$1,646.87	$1,696.27	$1,747.16
10"	$2,087.73	$2,087.73	$2,150.36	$2,214.87	$2,281.32	$2,349.76
12"	$2,623.13	$2,623.13	$2,701.82	$2,782.88	$2,866.36	$2,952.36

Annual Revenue		Projected					
	Current	FY 2021-22	FY 2022-23	FY 2023-24	FY 2024-25	FY 2025-26	
5/8"	$3,843,180	$3,843,180	$3,967,975	$4,096,824	$4,229,856	$4,369,822	
3/4"	120,448	120,448	$124,359	128,397	132,567	136,953	
1"	287,435	287,435	$296,769	306,405	316,355	326,823	
1.5"	50,300	50,300	$51,933	53,620	55,361	57,193	
2"	87,787	87,787	$90,637	93,580	96,619	99,816	
3"	116,551	116,551	$120,335	124,243	128,277	132,522	
4"	35,971	35,971	$37,139	38,345	39,590	40,900	
6"	33,724	33,724	$34,819	35,949	37,117	38,345	
8"	9,314	9,314	$9,616	9,929	10,251	10,590	
10"	0	0	$0	0	0	0	
12"	0	0	$0	0	0	0	
	$4,584,708	**$4,584,708**	**$4,733,583**	**$4,887,292**	**$5,045,992**	**$5,212,964**	To Table 2
	To Table 3						

	A	B	C	D	E	F	G	H
1	**North Coast County Water District**							
2	**Water Rate Study**							
3	**Table 7. Debt Service Schedule and Debt Coverage**							
5		**FY 2020-21**	**FY 2021-22**	**FY 2022-23**	**FY 2023-24**	**FY 2024-25**	**FY 2025-26**	**Notes**
7	**CSCDA Pooled Revenue and Bond Program Series 2012C (matures 10/2028)**							
8	Principal	$395,000	$405,000	$420,000	$440,000	$445,000	$460,000	
9	Interest	$121,525	$109,475	$92,975	$79,075	$66,900	$53,325	
10		$516,525	$514,475	$512,975	$519,075	$511,900	$513,325	To Table 2
11	**Debt Financing**							
12	1st Loan Start:	FY 2021-22						
13	Bond Proceeds	$20,572,000						
14	Bond Issuance Cost	1.5%						
15	Loan Amount	$20,880,580						
16	Payment Term (years)	30						
17	Interest Rate	3.5%	2021	2022	2023	2024	2025	
18	Principal		$402,450	$416,659	$431,370	$446,600	$462,368	
19	Interest		$727,329	$713,120	$698,410	$683,180	$667,412	
20		$0	$1,129,780	$1,129,780	$1,129,780	$1,129,780	$1,129,780	To Table 2
22	2nd Loan Start:	FY 2023-24						
23	Bond Proceeds	$12,965,000						
24	Bond Issuance Cost	1.5%						
25	Loan Amount	$13,159,475						
26	Payment Term (years)	30						
27	Interest Rate	5.5%	2021	2022	2023	2024	2025	
28	Principal		$0	$0	$179,296	$187,269	$197,833	
29	Interest		$0	$0	$721,339	$711,342	$700,788	
30			$0	$0	$900,635	$898,612	$898,621	
32	**Total Debt Service**	**$516,525**	**$1,644,255**	**$1,642,755**	**$2,549,490**	**$2,540,291**	**$2,541,726**	**To below**
34	**Debt Coverage**							
35	Revenue							
36	Water Service & Volumetric Charges	$13,919,254	$13,919,254	$14,348,165	$14,790,283	$15,246,015	$15,718,876	From Table 3
37	Fire Standby	$58,200	$58,939	$58,939	$58,939	$58,939	$58,939	From Table 3
38	Water Connections	$25,000	$25,000	$25,000	$25,000	$25,000	$25,000	From Table 3
39	Renewal of Service	$23,000	$21,000	$21,210	$21,422	$21,636	$21,853	From Table 3
40	Late Charges	$0	$70,000	$70,700	$71,407	$72,121	$72,842	From Table 3
41	Lease Revenues	$232,000	$238,960	$241,350	$243,763	$246,201	$248,663	From Table 3
42	Taxes & Assessments	$800,000	$1,070,000	$1,080,700	$1,091,507	$1,102,422	$1,113,446	From Table 3
43	Miscellaneous Revenues	$50,000	$50,000	$50,500	$51,005	$51,515	$52,030	From Table 3
44	Storage & Transmission	$75,000	$75,000	$75,750	$76,508	$77,273	$78,045	From Table 4
45	Estimated Interest Earnings	$0	$114,017	$107,626	$118,284	$122,091	$123,974	From Table 4
46	Total Revenue	$15,182,454	$15,642,170	$16,079,939	$16,548,118	$17,023,213	$17,513,669	
47	Expenses							
48	SFPUC Water Purchases	$5,642,680	$5,254,179	$5,540,345	$5,957,150	$6,309,665	$6,877,448	From Table 2
49	Salaries & Benefits	$2,604,200	$2,854,780	$2,921,645	$2,990,530	$3,061,525	$3,134,723	From Table 2
50	O & M	$988,000	$985,900	$1,015,998	$1,047,217	$1,079,605	$1,113,214	From Table 2
51	Pension /Health/GASB 45 Benefits	$1,103,000	$1,182,100	$1,264,847	$1,353,386	$1,448,123	$1,549,492	From Table 2
52	Non-Operating Expenditures	$726,200	$680,150	$696,153	$712,596	$729,494	$746,862	From Table 2
53	Total Expenses	$11,064,080	$10,957,109	$11,438,987	$12,060,880	$12,628,413	$13,421,739	
55	**Net Operating Cash Flow**	**$4,118,374**	**$4,685,061**	**$4,640,952**	**$4,487,238**	**$4,394,799**	**$4,091,930**	
56	**Debt Service**	**$516,525**	**$1,644,255**	**$1,642,755**	**$2,549,490**	**$2,540,291**	**$2,541,726**	**From Above**
57	Coverage Ratio	7.97	2.85	2.83	1.76	1.73	1.61	Minimum 1.2x

North Coast County Water District
Water Rate Study
Table 8. Loading Factors

FACTORS

	Base Non-Seasonal Day	Average Day	Maximum Day	Maximum Hour
Flow (HCF/Day)				
Residential	1,759	1,897	2,570	3,726
Commercial[1]	826	978	1,398	2,027
Total	2,585	2,875	3,968	5,754
Load Factors				
Ratio of Flows to Average Day				
Residential	0.93	1.00	1.35	1.96
Commercial[1]	0.84	1.00	1.43	2.07
Total	0.90	1.00	1.38	2.00
Ratio of Flows to Base Non-Seasonal Day				
Residential	1.00	1.08	1.46	2.12
Commercial[1]	1.00	1.18	1.69	2.45
Total	1.00	1.11	1.54	2.23

[1]Commercial flows exclude Recycled Water consumption

	Base Day	Avg. Day	Max. Day	Max. Hour	
Residential Load Factors	**1.00**	**1.08**	**1.46**	**2.12**	
Base (Non-seasonal Avg)	100.0%				100.0%
Avg Day	92.7%	7.3%			100.0%
Max Day	68.4%	5.4%	26.2%		100.0%
Max Hour	47.2%	3.7%	18.1%	31.0%	100.0%
Commercial Load Factors	**1.00**	**1.18**	**1.69**	**2.45**	
Base (Non-seasonal Avg)	100.0%				100.0%
Avg Day	84.4%	15.6%			100.0%
Max Day	59.1%	10.9%	30.0%		100.0%
Max Hour	40.7%	7.5%	20.7%	31.0%	100.0%
Total Load Factors	**1.00**	**1.11**	**1.54**	**2.23**	
Base (Non-seasonal Avg)	100.0%				100.0%
Avg Day	89.9%	10.1%			100.0%
Max Day	65.1%	7.3%	27.5%		100.0%
Max Hour	44.9%	5.1%	19.0%	31.0%	100.0%

Flow Per Account (HCF bimonthly)					Accounts
	Base Day	Avg. Day	Max. Day	Max. Hour	
Residential	9	9	13	19	12,038
Commercial	53	63	90	131	932
Total					

CY 2018 - HCF

	Total	Base	Seasonal	Max. Bill Period	Max Summer Bill
Total Water	1,049,519	943,350	106,169	193,636	
(less) Residential	(692,405)	(641,874)	(50,531)	(123,427)	
Commercial	357,114	301,476	55,638	70,209	
(less) Golf Course Water	(6,723)	(96)	(6,627)	(3,058)	
Commercial Adjusted	350,391	301,380	49,011	67,151	

	Total	Base	Seasonal	Max. Bill Period	Max Summer Bill
Commercial Adjusted	350,391	301,380	49,011	67,151	1,119
Residential	692,405	641,874	50,531	123,427	2,057
Total Water Adjusted	1,042,796	943,254	99,542	190,578	3,176

Peak Day vs. Avg. Day	
Residential	1.08
Non-Resi	1.14
Total	1.10

Note
Maximum Day:Avg Day ratio provided by EKI demand study based on CY 2019 data
Max Hour :Max Day ratio provided by EKI Deman study based on CY 2019 data

North Coast County Water District
Water Rate Study
Table 9. Allocations

	FY 2021-22 Budget	Allocation Factor	Base Nonseasonal	Average Day	Maximum Day	Maximum Hour	Customer Accounts
O&M Expenses							
110- Plant							
Salaries & Benefits	$293,500	Average Day	$263,810	$29,690	$0	$0	$0
SFPUC Purchased Water							
Quantity Charge	$4,665,225	Average Day	$4,193,292	$471,933	$0	$0	$0
Service Charge	$200,443	Customer	$0	$0	$0	$0	$200,443
Utilities	$275,000	Max Day	$179,117	$20,159	$75,725	$0	$0
Supplies & Equipment	$102,700	Max Day	$66,892	$7,528	$28,280	$0	$0
Fees	$100,000	Average Day	$89,884	$10,116	$0	$0	$0
120 - Distribution							
Salaries & Benefits	$1,360,800	Max Day	$886,335	$99,752	$374,713	$0	$0
Utilities	$45,000	Max Hour	$20,214	$2,275	$8,546	$13,966	$0
Supplies & Equipment	$151,530	Max Hour	$68,067	$7,661	$28,776	$47,027	$0
Recycle Water Ops.	$7,000	Max Hour Only	$0	$0	$0	$7,000	$0
Fees	$17,000	Average Day	$15,280	$1,720	$0	$0	$0
130 - Admin							
Salaries & Benefits	$2,382,580	Customer	$0	$0	$0	$0	$2,382,580
Utilities	$26,000	Customer	$0	$0	$0	$0	$26,000
Supplies & Equipment	$126,160	Customer	$0	$0	$0	$0	$126,160
Fees	$70,510	Customer	$0	$0	$0	$0	$70,510
Rebate program	$65,000	Max Hour Only	$0	$0	$0	$65,000	$0
General & Administrative	$680,150	Customer	$0	$0	$0	$0	$680,150
Subtotal - O&M Expenses	**$10,568,597**		**$5,782,890**	**$650,833**	**$516,039**	**$132,992**	**$3,485,843**
	100.0%	*O&M Composite*	*54.7%*	*6.2%*	*4.9%*	*1.3%*	*33.0%*
Capital Expenses							
BAWSCA D/S	$388,512	Customer	$0	$0	$0	$0	$388,512
PAYGo Projects	$2,154,676	PAYGo Composite	$804,546	$90,547	$309,355	$401,552	$548,676
Existing Debt Service	$514,475	Customer	$0	$0	$0	$0	$514,475
Future Debt Service - Syst. Imp	$597,449	Debt Svc Composite - Syst. Imp	$389,139	$43,795	$164,515	$0	$0
Future Debt Service - HQ Build	$532,331	Debt Svc Composite - Bldg	$0	$0	$0	$0	$532,331
Subtotal - Capital Expenses	$4,187,443		$1,193,684	$134,343	$473,870	$401,552	$1,983,994
	100.0%	*Cap Composite*	*28.5%*	*3.2%*	*11.3%*	*9.6%*	*47.4%*
Subtotal - O&M and Capital	**$14,756,040**		**$6,976,574**	**$785,176**	**$989,910**	**$534,544**	**$5,469,837**
	100.0%	*Exp Composite*	*47.3%*	*5.3%*	*6.7%*	*3.6%*	*37.1%*
Non-Operating Revenue							
Fire Standby	($58,939)	Customer	$0	$0	$0	$0	($58,939)
Water Connections	($25,000)	Customer	$0	$0	$0	$0	($25,000)
Renewal of Service	($21,000)	Customer	$0	$0	$0	$0	($21,000)
Late Charges	($70,000)	Customer	$0	$0	$0	$0	($70,000)
Miscellaneous Revenues	($50,000)	Customer	$0	$0	$0	$0	($50,000)
Lease Revenues	($238,960)	Customer	$0	$0	$0	$0	($238,960)
Taxes & Assessments	($1,070,000)	Customer & Usage	($109,390)	($109,390)	($109,390)	($109,390)	($632,440)
Transmission & Storage	($75,000)	Customer	$0	$0	$0	$0	($75,000)
	($1,608,899)		($109,390)	($109,390)	($109,390)	($109,390)	($1,171,339)
Transfer to/(from) Reserves	$772,112	Exp Composite	$365,050	$41,084	$51,797	$27,970	$286,210
Total Revenue Requirement	**$13,919,254**		**$7,232,234**	**$716,871**	**$932,317**	**$453,124**	**$4,584,708**
						$9,334,545	$4,584,708
						Volumetric	*Service*

	FY 2021-22 Budget	Allocation Factor	Base Nonseasonal	Average Day	Maximum Day	Maximum Hour	Customer Accounts
Revenue Requirement Recap							
Capital (plus transfer to reserv	$4,959,555		$1,558,734	$175,427	$525,667	$429,522	$2,270,204
O&M incl. SFPUC and other	$8,959,698		$5,673,500	$541,443	$406,649	$23,602	$2,314,504
	$13,919,254		$7,232,234	$716,871	$932,317	$453,124	$4,584,708
Distribution by Functional Components							
Capital	100%		31%	4%	11%	9%	46%
O&M incl. SFPUC and other	100%		63%	6%	5%	0%	26%
	100%		52%	5%	7%	3%	33%

System-Wide Allocation Factors	Base	Average Day	Maximum Day	Maximum Hour	Customer Accounts	Fire	Total
Volumetric Allocations							
Base Day	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
Average Day	89.9%	10.1%	0.0%	0.0%	0.0%	0.0%	100.0%
Max Day	65.1%	7.3%	27.5%	0.0%	0.0%	0.0%	100.0%
Max Hour	44.9%	5.1%	19.0%	31.0%	0.0%	0.0%	100.0%
Max Hour Only	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
Customer	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Customer & Usage	10.2%	10.2%	10.2%	10.2%	59.1%	0.0%	100.0%
Fire	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
O&M Composite	54.7%	6.2%	4.9%	1.3%	33.0%	0.0%	100.0%
PAYGo Composite	37.3%	4.2%	14.4%	18.6%	25.5%	0.0%	100.0%
Debt Svc Composite - Syst. Ir	65.1%	7.3%	27.5%	0.0%	0.0%	0.0%	100.0%
Debt Svc Composite - Bldg	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
Exp Composite	47.3%	5.3%	6.7%	3.6%	37.1%	0.0%	100.0%

Volumetric Cost of Service	Base	Average Day	Maximum Day	Maximum Hour	Total
Volumetric Revenue Requirement					
Capital	$1,558,734	$175,427	$525,667	$429,522	$2,689,351
O&M incl. SFPUC and other	$5,673,500	$541,443	$406,649	$23,602	$6,645,194
	$7,232,234	$716,871	$932,317	$453,124	$9,334,545
Units of Service (HCF)					
Residential	1,759	1,897	2,570	3,726	
Commercial	826	978	1,398	2,027	
	2,585	2,875	3,968	5,754	
Proportional Allocation Factors					
Residential	68.04%	65.97%	64.76%	64.76%	
Commercial	31.96%	34.03%	35.24%	35.24%	
	100.00%	100.00%	100.00%	100.00%	
Cost of Service					
Residential					
Capital	$1,060,594	$115,736	$340,446	$278,178	$1,794,953
O&M incl. SFPUC and other	$3,860,361	$357,209	$263,365	$15,286	$4,496,221
	$4,920,955	$472,945	$603,811	$293,464	$6,291,175
Commercial					
Capital	$498,141	$59,692	$185,221	$151,344	$894,397
O&M incl. SFPUC and other	$1,813,138	$184,234	$143,285	$8,316	$2,148,973
	$2,311,279	$243,926	$328,506	$159,660	$3,043,371
	$7,232,234	$716,871	$932,317	$453,124	$9,334,545
Unit Cost of Service ($/HCF)	$ 2,798.29	$ 249.31	$ 234.96	$ 78.75	$ 0.22

Volumetric Cost of Service	Base	Average Day	Maximum Day	Maximum Hour	Total	Annual HCF	Avg. Cost Per HCF
Revenue Requirement Allocations							
Residential	$4,920,955	$472,945	$603,811	$293,464	$6,291,175		
Commercial	$2,311,279	$243,926	$328,506	$159,660	$3,043,371	355,650	$8.56
	$7,232,234	$716,871	$932,317	$453,124	$9,334,545		

Components of Rate Structure	Current Revenue[1] (no rate increase)		Cost of Service		Difference COS Minus Current	
Volumetric						
Residential	$6,317,137		$6,291,175		($25,962)	-0.4%
Commercial	$3,017,408		$3,043,371		$25,962	0.9%
	$9,334,545	67%	$9,334,545	67%	$0	0.0%
Service/Meter Charges	$4,584,708	33%	$4,584,708	33%	$0	0.0%
	$13,919,254	100%	$13,919,254	100%	$0	0.0%

[1]Based on Projected FY 2021-22 Water Use at Current Rates

[2]Based on 2-Bond Issuance Scenario of CIP Funding

Residential Volumetric Rates	Tier 1	Tier 2	Subtotal T1/T2	Tier 3	Tier 4	Total
Demand Condition	Base	Average Day		Maximum Day	Maximum Hour	
Tier Structure						
Volume per tier (HCF)	0-5	6-9	0-9	10-13	Over 13	Total
HCF by Tier	313,164	193,721	506,885	83,461	102,059	692,405
Revenue Requirement by Tier						
O&M incl. SFPUC and other			$4,217,571	$263,365	$15,286	$4,496,221
HCF in Tiers 1, 2, 3, and 4			692,405	185,520	102,059	
O&M Cost Increment	**$6.09**	**$6.09**	**$6.09**	**$1.42**	**$0.15**	
Capital			$1,176,329	$340,446	$278,178	$1,794,953
HCF in Tiers 2, 3, and 4			379,241	185,520	102,059	
Capital Cost Increment	**$0.00**	**$3.10**	**$3.10**	**$1.84**	**$2.73**	
	$0	$0	$5,393,900	$603,811	$293,464	$6,291,175
Rate Increments						
Base/Avg Day						
O&M incl. SFPUC and other	$6.09	$6.09		$6.09	$6.09	
Capital	$0.00	$3.10		$3.10	$3.10	
Maximum Day						
O&M incl. SFPUC and other				$1.42	$1.42	
Capital				$1.84	$1.84	
Maximum Hour						
O&M incl. SFPUC and other					$0.15	
Capital					$2.73	
Total Rate per Tier	**$6.09**	**$9.19**		**$12.45**	**$15.32**	

APPENDIX B. REVENUE STABILIZATION FACTORS MODEL

Water Use Data

Read Month	2018 Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	2019 Jan	Total (CF)	Total (HCF)	Notes:
Residential															
Single Family	52,149	55,702	51,277	56,122	53,922	65,786	57,641	66,901	56,464	63,642	55,654	57,145			
Subtotal, Res	52,149	55,702	51,277	56,122	53,922	65,786	57,641	66,901	56,464	63,642	55,654	57,145	692,405	6,924	To Tables tab, Residential Annual Baseline Demand
Commerical															
Recycled Water	365	0	166	0	1,898	0	6,103	0	3,623	0	2,481	0			
Commercial	37,115	13,152	36,928	13,706	40,484	18,954	45,152	19,987	42,848	20,618	40,882	12,652			
Subtotal, Comm	37,480	13,152	37,094	13,706	42,382	18,954	51,255	19,987	46,471	20,618	43,363	12,652	357,114	3,571	To Tables tab, Commercial Annual Baseline Demand
Other													0	0	
	89,629	68,854	88,371	69,828	96,304	84,740	108,896	86,888	102,935	84,260	99,017	69,797	1,049,519	10,495	

	Mar	Apr	Non-Seasonal Avg (CF)	
Residential				
Single Family	55,702	51,277		
Subtotal, Res	55,702	51,277	53,490	To Tables tab, annualize to calculate Residential Indoor Baseline Annual Demand
Commerical				
Recycled Water	0	166		
Commercial	13,152	36,928		
Subtotal, Comm	13,152	37,094	25,123	To Tables tab, annualize to calculate Commercial Indoor Baseline Annual Demand
Other	0	0	0	
	68,854	88,371	78,613	

	B	C	D	E	F	G	H	I	J	K
1										
2	**Calendar Year 2018 Water Use Data**									
3	**Ratio of outdoor reduction to indoor reduction =**				**2.50**	**to 1.00**				
4	**5% Stage 1 Reduction (up to 10% reduction)**									
5		**Baseline Annual Demand (HCF)**			**Reductions**					
6	**Class**	**Total**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Total**	**Total**
7	**Residential**	692,405	641,874	50,531	4.3%	10.9%	27,865	5,484	33,350	5%
8	**Commercial**	357,114	301,476	55,638	4.3%	10.9%	13,088	6,038	19,126	5%
9	**Total**	1,049,519	943,350	106,169	4.3%	10.9%	40,953	11,523	52,476	**5.0%**
10										
11	**15% Stage 2 Reduction (up to 20% reduction)**									
12		**Baseline Annual Demand (HCF)**			**Reductions**					
13	**Class**	**Total**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Total**	**Total**
15	**Residential**	692,405	641,874	50,531	13.0%	32.6%	83,596	16,453	100,049	14%
16	**Commercial**	357,114	301,476	55,638	13.0%	32.6%	39,264	18,115	57,379	16%
17	**Total**	1,049,519	943,350	106,169	13.0%	32.6%	122,860	34,568	157,428	**15.0%**
18										
19	**25% Stage 3 Reduction (up to 30% reduction)**									
20		**Baseline Annual Demand (HCF)**			**Reductions**					
21	**Class**	**Total**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Total**	**Total**
23	**Residential**	692,405	641,874	50,531	21.7%	54.3%	139,327	27,421	166,748	24%
24	**Commercial**	357,114	301,476	55,638	21.7%	54.3%	65,439	30,192	95,632	27%
25	**Total**	1,049,519	943,350	106,169	21.7%	54.3%	204,766	57,613	262,380	**25.0%**
26										
27	**35% Stage 4 Reduction (up to 40% reduction)**									
28		**Baseline Annual Demand (HCF)**			**Reductions**					
29	**Class**	**Total**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Total**	**Total**
31	**Residential**	692,405	641,874	50,531	30.4%	76.0%	195,058	38,389	233,447	34%
32	**Commercial**	357,114	301,476	55,638	30.4%	76.0%	91,615	42,269	133,884	37%
33	**Total**	1,049,519	943,350	106,169	30.4%	76.0%	286,673	80,659	367,332	**35.0%**
34										

	B	C	D	E	F	G	H	I	J	K
35	**45% Stage 5 Reduction (up to 50% reduction)**									
36		**Baseline Annual Demand (HCF)**			**Reductions**					
37	**Class**	**Total**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Total**	**Total**
38	**Residential**	692,405	641,874	50,531	39.1%	97.7%	250,789	49,358	300,147	43%
39	**Commercial**	357,114	301,476	55,638	39.1%	97.7%	117,791	54,346	172,137	48%
40	**Total**	1,049,519	943,350	106,169	39.1%	97.7%	368,579	103,704	472,284	**45.0%**
41										
42	**53% Stage 6 Reduction (greater than 50% reduction)**									
43		**Baseline Annual Demand (HCF)**			**Reductions**					
44	**Class**	**Total**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Indoor**	**Outdoor**	**Total**	**Total**
46	**Residential**	692,405	641,874	50,531	47.7%	100.0%	306,241	50,531	356,772	52%
47	**Commercial**	357,114	301,476	55,638	47.7%	100.0%	143,835	55,638	199,473	56%
48	**Total**	1,049,519	943,350	106,169	47.7%	100.0%	450,076	106,169	556,245	**53.0%**
49										

	Class	Stage 1 Up to 10% Reduction	Stage 2 Up to 20% Reduction	Stage 3 Up to 30% Reduction	Stage 4 Up to 40% Reduction	Stage 5 Up to 50% Reduction	Stage 6 Greater than 50% Reduction
50							
51							
52							
53							
54	**Residential**	5%	14%	24%	34%	43%	52%
55	**Commercial**	5%	16%	27%	37%	48%	56%

57 Ratio of outdoor reduction to indoor reduction = 2.50 to 1.00

58

59 Rev. Stabilization Factors =1/(1-a) *(b-(c*a))/b

60 varies a = assumed percentage of reduction in water usage

61 67% b = proportion of revenue from volumetric rates, from model

62 39% c = proportion of water utility expenses that are variable

63 (see calculation to the right)

64

Water Expenses	
Water Purchases	$4,665,225
BAWSCA Surcharge	$388,512
Utilities	$346,000
	$5,399,737
FY 2021-22 Reve Req.	$13,919,254
	39%

	Class	Stage 1 Up to 10% Reduction	Stage 2 Up to 20% Reduction	Stage 3 Up to 30% Reduction	Stage 4 Up to 40% Reduction	Stage 5 Up to 50% Reduction	Stage 6 Greater than 50% Reduction
Residential		1.021	1.071	1.134	1.214	1.322	1.448
Commercial		1.024	1.081	1.154	1.252	1.392	1.533

To be applied to the non-shortage rates in effect at the time of the shortage declaration

	Stage 1 Up to 10% Reduction	Stage 2 Up to 20% Reduction	Stage 3 Up to 30% Reduction	Stage 4 Up to 40% Reduction	Stage 5 Up to 50% Reduction	Stage 6 Greater than 50% Reduction
WSCP-Estimated Water Use Reduction	5%	15%	25%	35%	45%	53%