

Alameda County Water District

Water Cost of Service and Rate Update Study

Final Report / December 06, 2021



December 6, 2021

Jonathan Wunderlich
Director of Finance
Alameda County Water District
43885 S. Grimmer Blvd.
Fremont, CA 94538

Subject: 2021 Cost of Service & Rate Update Study

Dear Mr. Wunderlich,

Raftelis is pleased to provide this 2021 Water Rate Update Study Report (Report) for the Alameda County Water District (District). The contents of this Report include an updated Cost of Service analysis, the calculated water rates proposed to be effective March 1, 2022, and the calculated Emergency Stage Rates (to be used in a Board declared Water Shortage Emergency).

The major objectives of the study include the following:

1. Conduct a water Cost of Service analysis in order to comply with Proposition 218;
2. Calculate updated water rates effective March 1, 2022 proposed to be effective March 1, based on the Cost of Service analysis and the District's policies and objectives;
3. Update water shortage emergency stage rates to ensure sufficient collection of revenues during periods of reduced water demand due to a water shortage emergency; and
4. Conduct a customer impact analysis for the proposed rates.

This Report summarizes the key findings and recommendations related to the District's internal financial plan, the Cost of Service analysis conducted by Raftelis, and the proposed water rates and water shortage emergency stage rates. It has been a pleasure working with you, and we thank you, Sydney Oam, Martin Koran, and other District staff for the support provided during this study.

Sincerely,

Handwritten signature of Kevin Kostiuk in black ink.

Kevin Kostiuk
Manager, Raftelis

Handwritten signature of Jonathan Jordan in black ink.

Jonathan Jordan
Staff Consultant, Raftelis

Handwritten signature of Sanjay Gaur in black ink.

Sanjay Gaur
Sub-Consultant

445 Figueroa Street, Suite 1925
Los Angeles, CA 90071

www.raftelis.com

Table of Contents

TABLE OF CONTENTS	I
LIST OF TABLES.....	III
LIST OF FIGURES	III
LIST OF APPENDICES.....	IV
1. EXECUTIVE SUMMARY.....	1
1.1. STUDY BACKGROUND	1
1.2. PROPOSED RATES	1
1.2.1. Fixed Bi-Monthly Service Charges	1
1.2.2. Commodity Rates	2
1.3. CUSTOMER IMPACT ANALYSIS	3
1.4. WATER SHORTAGE EMERGENCY STAGE RATES	5
2. INTRODUCTION.....	6
2.1. STUDY BACKGROUND	6
2.2. KEY INFORMATION USED IN THE STUDY	7
2.3. LEGAL FRAMEWORK	7
2.3.1. California Constitution – Article XIII D, Section 6 (Prop 218)	7
2.3.2. California Constitution – Article X, Section 2	8
2.3.3. Cost-Based Rate-Setting Methodology	8
3. BASE YEAR UNITS OF SERVICE AND REVENUES.....	10
3.1. BASE YEAR REVENUES.....	10
3.2. BASE YEAR CASHFLOW.....	12
4. COST OF SERVICE.....	14
4.1. REVENUE REQUIREMENT.....	14
4.2. ALLOCATION OF EXPENSES TO COST COMPONENTS	16
4.3. PRELIMINARY ALLOCATION OF REVENUE REQUIREMENT TO COST COMPONENTS.....	18
4.4. EQUIVALENT METERS	20
4.5. ALLOCATION OF FIRE PROTECTION COSTS	20
4.6. UNIT COSTS.....	21
4.7. FINAL ALLOCATION OF REVENUE REQUIREMENT TO COST COMPONENTS	24

5.	WATER RATE DESIGN.....	27
5.1.	EXISTING RATE STRUCTURES AND RATES.....	27
5.2.	PROPOSED BI-MONTHLY SERVICE CHARGE	27
5.3.	COMMODITY RATES	30
5.4.	PRIVATE FIRE CHARGE	32
5.5.	REVENUE COMPARISON OF CURRENT AND PROPOSED WATER CHARGES	33
6.	PROPOSED MARCH 1, WATER RATES & CUSTOMER IMPACT ANALYSIS.....	34
6.1.	PROPOSED RATES	34
6.1.1.	Fixed Bi-Monthly Service Charges	34
6.1.2.	Commodity Rates	35
6.2.	CUSTOMER IMPACT ANALYSIS	35
7.	WATER SHORTAGE EMERGENCY STAGE RATES	38
7.1.	WATER SHORTAGE EMERGENCY STAGE RATES BACKGROUND	38
7.2.	DERIVATIONS OF STAGE RATES	39
7.3.	PROPOSED STAGE RATES.....	42
7.4.	PROCESS FOR ACTIVATING WATER SHORTAGE EMERGENCY STAGE RATES 44	
7.5.	WATER SHORTAGE EMERGENCY STAGE RATES CUSTOMER IMPACT ANALYSIS	45

List of Tables

Table 1-1: Proposed Bi-Monthly Meter Service Charge	2
Table 1-2: Proposed Fire Service Charge	2
Table 1-3: Proposed Commodity Rates	3
Table 1-4: Proposed Stage Rates for Rate Increases.....	5
Table 3-1: Base Year Bi-Monthly Service Accounts & Charges by Meter Size, and Revenue.....	11
Table 3-2: Water Consumption, Commodity Rate, and Total Revenue	11
Table 3-3: Base Year Bi-Monthly Fire Service Accounts, Charges, and Revenue	12
Table 3-4: Base Water Rate Revenue	12
Table 3-5: Base Year Revenue & Expense Budget and Cashflow	13
Table 4-1: Revenue Requirement Determination	15
Table 4-2: System-Wide Peaking Factors	16
Table 4-3: Allocation of O&M Expenses to Cost Causation Components	17
Table 4-4: Allocation of Assets to Cost Causation Component	18
Table 4-5: Allocation of Revenue Offsets to Cost Components	19
Table 4-6: Preliminary Allocation of Costs to Cost Components	19
Table 4-7: Equivalent Meters Units.....	20
Table 4-8: Derivation of Potential Flow to Private and Public Fire Connections	21
Table 4-9: Calculation of Cost Causation Components Units of Service	23
Table 4-10: Calculation of Fire Service Capacity	24
Table 4-11: Final Cost of Service Allocation to Cost Components	26
Table 5-1: Derivation of Bi-Monthly Meter Service Charge.....	28
Table 5-2: Calculation of Cost of Service Bi-Monthly Meter Service Charge	29
Table 5-3: Comparison of Cost of Service and Current Bi-Monthly Service Charges.....	30
Table 5-4: Commodity Rate Derivation	31
Table 5-5: Inside and Outside Commodity Rates	31
Table 5-6: Rate Comparison of Current and Proposed Commodity Rates.....	32
Table 5-7: Derivation of Bi-Monthly Private Fire Service Charges	32
Table 5-8: Rate Comparison of Current and Cost of Service Private Fire Service Charge.....	33
Table 5-9: Comparison of Proposed and Current Revenue.....	33
Table 6-1: Proposed Bi-Monthly Meter Service Charge	34
Table 6-2: Proposed Fire Service Charge	35
Table 6-3: Proposed Commodity Rates	35
Table 7-1: Water Shortage Emergency Stages and Usage Reductions (Effective March 1, 2022).....	39
Table 7-2: Projected Consumption Charge Revenue by Stage.....	39
Table 7-3: Projected Variable Water Supply Cost Savings by Stage.....	41
Table 7-4: Derivation of Unit Stage Rates.....	41
Table 7-5: Proposed Stage Rates for Rate Increases.....	43
Table 7-6: Comparison of Proposed and Current Stage Rates.....	43

List of Figures

Figure 1-1: Single Family Residential Customer Bill Impacts.....	3
Figure 1-2: Commercial Customer Sample Bill Impacts	4
Figure 6-1: Single Family Residential Customer Bill Impacts.....	36
Figure 6-2: Commercial Customer Sample Bill Impacts	36
Figure 7-1: Sample SFR Bi-Monthly Bills with Stage 2 Water Shortage	46

List of Appendices

APPENDIX A: Summarized ACWD Financial Model

APPENDIX B: Detailed Functionalization and Allocation of O&M Expenses to Cost Components

1. Executive Summary

1.1. Study Background

The District retained Raftelis Financial Consultants, Inc. (Raftelis) to conduct a Cost of Service and water rate study. Rate changes proposed effective March 1, 2022 incorporate the updated Cost of Service analysis. District staff utilized the existing Financial Planning Model (FPM) and updated the FPM's assumptions and data inputs to generate the financial plan results presented in this study. Raftelis provided assistance in updating the water shortage emergency stage rates for implementation if the District Board declares a water shortage emergency, incorporating any updates to the District's source water costs to ensure sufficient rate revenue recovery in periods of reduced water sales, due to potential drought or other water shortage emergencies.

The major objectives of the study include the following:

1. Conduct a Cost of Service analysis that develop the cost to serve customers in each class, per Proposition 218 and industry standards;
2. Calculate updated water rates proposed to be effective March 1, 2022 in a manner that reflects the District's policies and objectives;
3. Update water shortage emergency stage rates to ensure collection of sufficient revenues during periods of reduced water demand; and
4. Conduct a customer impact analysis for the proposed rates.

This Report provides detail of the study and includes results for the District's Cost of Service analysis, water rates, and stage rates.

1.2. Proposed Rates

Raftelis conducted a comprehensive Cost of Service rate study for the District. The results and findings are documented in Section 4 of this Report. This study maintains the current basic rate structure of fixed charges and a uniform commodity rate. There are minor changes due to a modest increase in extra capacity costs recovered through fixed service charges and correspondingly less through commodity charges compared to current rates; consistent with direction provided at a series of Board workshops. The proposed revenue adjustment of two percent (2%) based on the District's financial plan is applied uniformly across all rates and charges to derive the proposed rates to be effective March 1, 2022. Tables 1-1, 1-2, and 1-3 show current rates, rate updates based on the Cost of Service analysis, and proposed rates with the 2% revenue increase applied.

1.2.1. Fixed Bi-Monthly Service Charges

The proposed bi-monthly service charge rates for regular water service are shown in Table 1-1. Table 1-2 shows the proposed fire service charges for customers with fire connections for private fire suppression systems (about 2,400 commercial or multi-family residential properties). The proposed fire service charges apply to all customers with private fire service connections. The rates for the current and proposed bi-monthly service charges and fire service charges are calculated based on the meter size and diameter of the fireline serving a property, respectively. All rates are rounded up to the nearest whole penny.

Table 1-1: Proposed Bi-Monthly Meter Service Charge

Line No.	Meter Size	Current Bi-Monthly Meter Service Charge	Cost of Service Bi-Monthly Meter Service Charge	Proposed Bi-monthly Meter Service Charge
	(A)	(B)	(C)	(D)
1	Effective Date	3/1/2020		3/1/2022
2	5/8-inch	\$56.61	\$57.78	\$58.94
3	3/4-inch	\$56.61	\$57.78	\$58.94
4	1-inch	\$87.29	\$92.32	\$94.18
5	1 1/2-inch	\$163.97	\$178.67	\$182.25
6	2-inch	\$255.99	\$282.29	\$287.95
7	3-inch	\$547.39	\$610.42	\$622.64
8	4-inch	\$976.81	\$1,093.98	\$1,115.87
9	6-inch	\$2,464.48	\$2,769.17	\$2,824.56
10	8-inch	\$4,304.88	\$4,841.57	\$4,938.41
11	10-inch	\$6,451.99	\$7,259.37	\$7,404.57

Table 1-2: Proposed Fire Service Charge

Line No.	Fire Line Pipe Diameter	Current Private Fire Service Charge	Cost of Service Private Fire Service Charge	Proposed Private Fire Service Charge
	(A)	(B)	(C)	(D)
1	Effective Date	3/1/2020		3/1/2022
2	3/4-inch	\$71.01	\$7.77	\$7.93
3	1-inch	\$71.01	\$7.95	\$8.12
4	2-inch	\$71.01	\$9.77	\$9.97
5	4-inch	\$71.01	\$21.04	\$21.46
6	6-inch	\$75.81	\$46.63	\$47.57
7	8-inch	\$80.61	\$90.77	\$92.59
8	10-inch	\$85.41	\$157.17	\$160.32
9	12-inch	\$90.21	\$249.20	\$254.19

1.2.2. Commodity Rates

The proposed variable commodity, or volumetric, water rates are shown in Table 1-3. Volumetric rates are charged for each unit (CCF¹) of water. All rates are rounded up to the tenth of a cent.

¹ CCF stands for Centum Cubic Foot, also referred to HCF or hundred cubic feet. One hundred cubic feet of water is equal to approximately 748 gallons.

Table 1-3: Proposed Commodity Rates

Line No.	Customer Type	Current Commodity Rate	Cost of Service Commodity Rate	Proposed Commodity Rate
	(A)	(B)	(C)	(D)
1	Effective Date	3/1/2020		3/1/2022
2	Inside District	\$4.596	\$4.506	\$4.596
3	Outside District	\$5.285	\$5.149	\$5.253

1.3. Customer Impact Analysis

It is important to understand how the proposed rates will impact the District's customers. All customers, at every meter size, will experience an increase in the fixed service charge. Note that customer bill impacts will vary with each customers' meter size and volumetric water use. Figure 1-1 shows the water bills for typical Single-Family Residential (SFR) customers with a ¾-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bi-monthly water bills under the current rates are illustrated by the blue bars and the bi-monthly water bills assuming the proposed March 1, 2022 rates are shown by the grey bars. The dollar and percentage impact at each usage level is detailed in the embedded table. There is no change to the proposed, uniform water commodity rate and therefore the dollar impact is uniform across all levels of use.

Figure 1-1: Single Family Residential Customer Bill Impacts

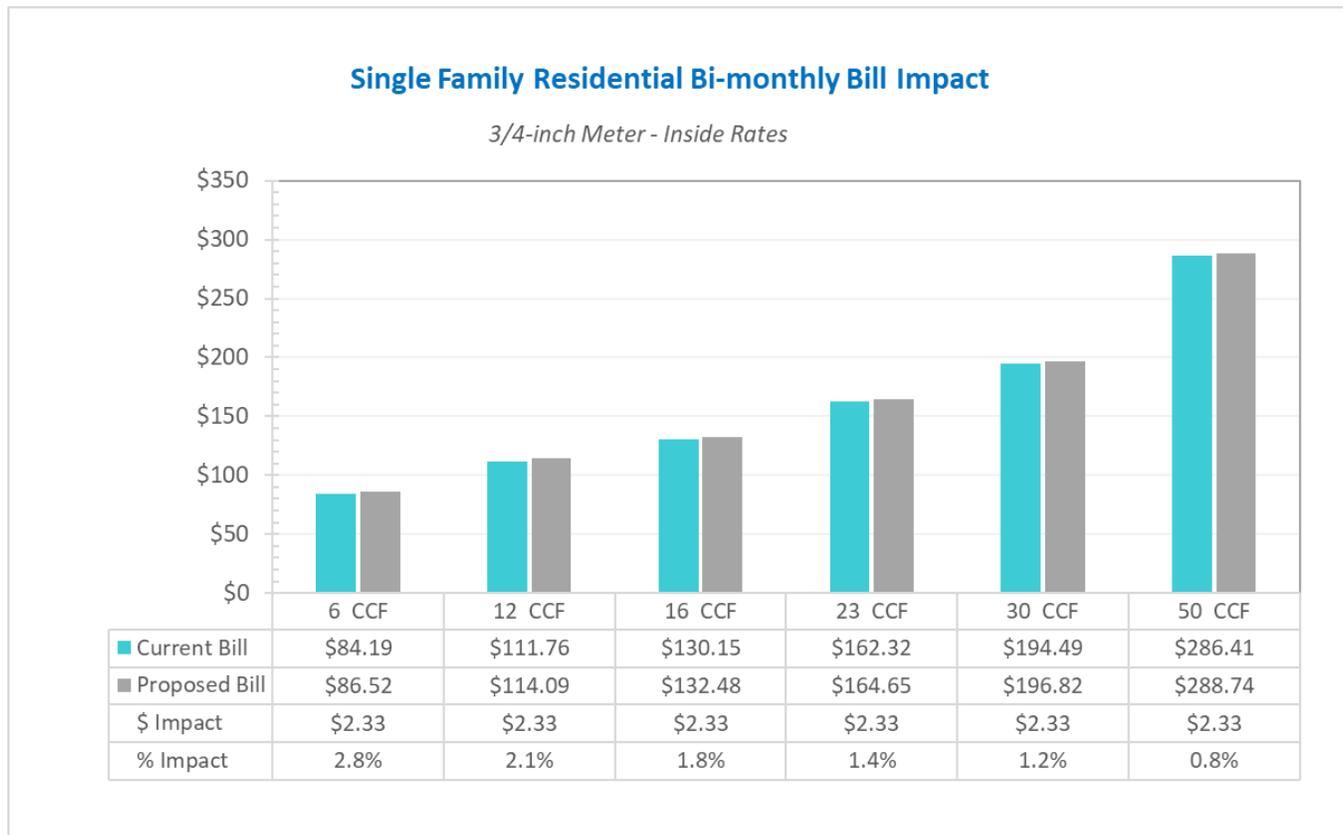
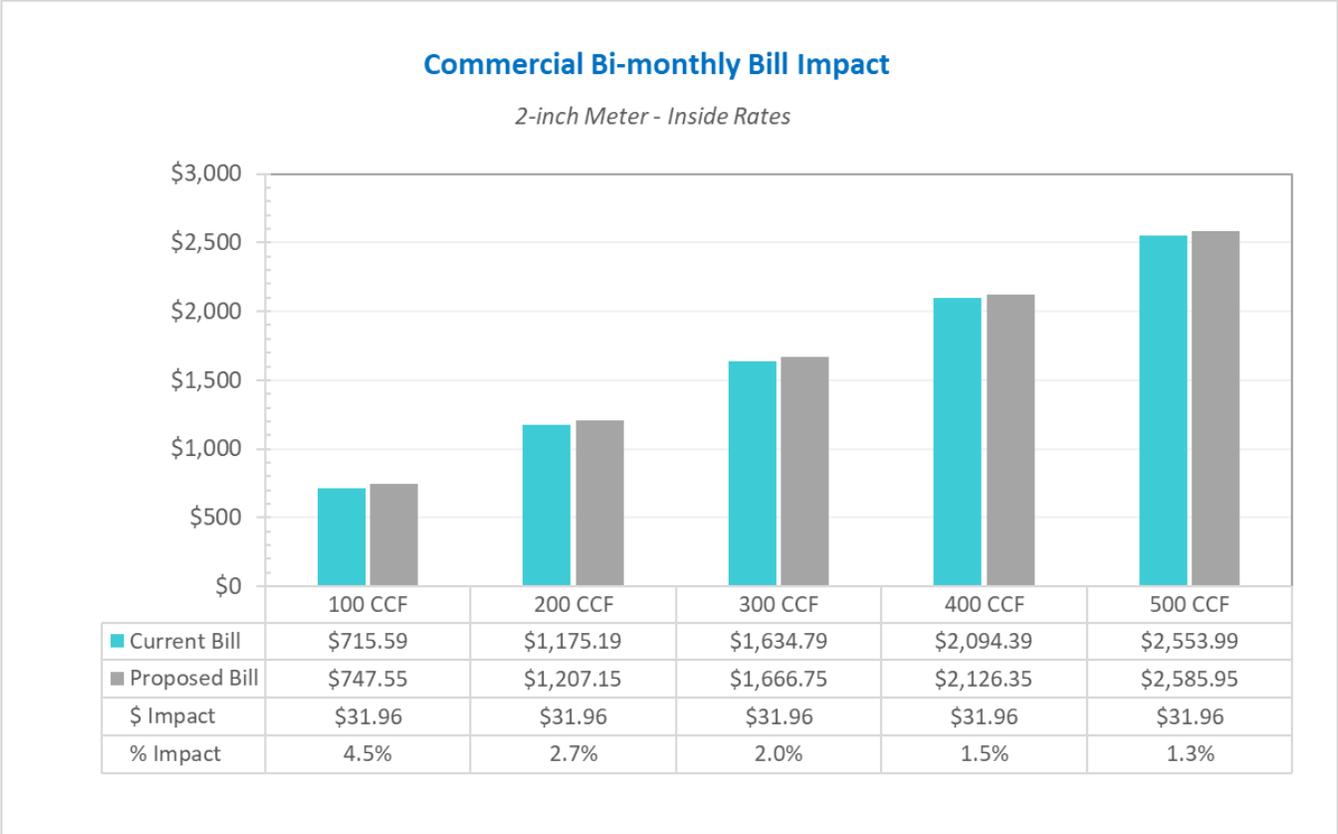


Figure 1-2 shows the water bills for commercial customers with a 2-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bi-monthly water bills under the current rates are illustrated by the blue bars and the bi-monthly water bills assuming the proposed March 1, 2022 rates are shown by the grey bars. The dollar and percentage impact at each usage level is detailed in the embedded table. There is no change to the proposed, uniform water commodity rate and therefore the dollar impact is uniform across all levels of use.

Figure 1-2: Commercial Customer Sample Bill Impacts



1.4. Water Shortage Emergency Stage Rates

Table 1-4 shows the proposed stage rates. The Inside District and Outside District consumption charges at each water shortage emergency stage are determined by adding the calculated unit stage rate in Line 5 to the proposed consumption charges (Table 1-3) shown in Line 2 and 3. This represents the total commodity rate charged, per CCF of water delivered, at each stage. All stage rates are rounded up to the tenth of a cent

Table 1-4: Proposed Stage Rates for Rate Increases

Line No.	Water Shortage Emergency Stage	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6
1	Reduction in Water Demand	0%	10%	15%	20%	25%	30%	40%	50%	Up to 60%
2	Projected Water Sales	38,730 AF	34,857 AF	32,920 AF	30,984 AF	29,047 AF	27,111 AF	23,238 AF	19,365 AF	16,654 AF
3										
4	Effective March 1, 2022	Proposed Rates								
5	Unit Stage Rate	\$0.000	\$0.496	\$0.787	\$1.115	\$1.486	\$1.920	\$3.000	\$4.443	\$5.852
6	Consumption Charge (Inside District)	\$4.596	\$5.092	\$5.383	\$5.711	\$6.082	\$6.516	\$7.596	\$9.039	\$10.448
7	Consumption Charge (Outside District)	\$5.253	\$5.749	\$6.040	\$6.368	\$6.739	\$7.173	\$8.253	\$9.696	\$11.105

2. Introduction

2.1. Study Background

The Alameda County Water District (ACWD or District) provides water services to more than 357,000 residents through more than 85,000 water meter connections in Fremont, Union City, Newark, and a portion of southern Hayward. The District operates and maintains approximately 900 miles of transmission and distribution pipeline system, 13 reservoirs and tanks, a surface water treatment facility with 26.0 million gallons per day (MGD) capacity (another surface water treatment facility with 7 MGD capacity is temporarily decommissioned due to lower water demands that continue since the last drought), a desalination facility with 12.5 MGD capacity, and a blending facility with 48 MGD capacity.

The District currently has three primary water supply sources: San Francisco Public Utilities Commission (SFPUC), local rainwater runoff and percolation, and the State Water Project (SWP). The SWP and SFPUC supplies are imported into the District service area through the South Bay Aqueduct and Hetch Hetchy Aqueduct, respectively. Local supplies include fresh groundwater from the Niles Cone Groundwater Basin (underlying the District service area), desalinated brackish groundwater from portions of the groundwater basin previously impacted by seawater intrusion, and surface water from the Del Valle Reservoir. The primary source of recharge for the Niles Cone Groundwater Basin is the percolation of runoff from the Alameda Creek watershed. A portion of ACWD's SWP supplies is also used for local groundwater percolation. Infiltration of rainfall and applied water also contribute to local groundwater recharge.

The District treats the source water supplies to meet and surpass all state and federal drinking water standards before being supplied to customers. The District treats SWP and local surface water from Del Valle Reservoir at its surface water treatment plant. The Newark Desalination Facility treats brackish groundwater to remove salts and other impurities, and the Blending Facility blends treated San Francisco water with local fresh groundwater (with higher hardness) to provide a blended supply with lower overall hardness.

The District's mission is to provide a reliable supply of high-quality water to its customers at a reasonable price. To fulfill this mission, the District will:

- » Provide prompt, courteous, and responsive customer service.
- » Ensure that sound, responsible financial management practices are observed in the conduct of District business.
- » Plan, design, and operate facilities efficiently, effectively, and safely, bearing in mind the District's responsibility to be a good neighbor and a good steward of the environment.
- » Promote ethical behavior in the conduct of District affairs and facilitate the public's involvement in the planning and development of District policy.
- » Recruit and retain a qualified, productive workforce and maintain a workplace environment where diversity and excellence are valued and where creativity, teamwork, and open communication are actively encouraged.

The provision of clean, safe, and reliable drinking water is capital and labor-intensive operation. To ensure that the District continues to fulfill its mission of providing a reliable supply of high-quality water, it must provide consistent and ongoing infrastructure operations and maintenance and assure the adequate management of its water resources, including the importation of water when required.

The District retained Raftelis Financial Consultants, Inc. (Raftelis) to conduct a Cost of Service and water rate study. Rates proposed in Fiscal Year (FY)² 2022 incorporate the updated Cost of Service analysis results. District staff utilized the existing Financial Planning Model (FPM) and updated the FPM's assumptions and data inputs to generate the financial plan results presented in this study. **Appendix A** shows a summary of the Districts FY 2022 and FY 2023 Budget and Financial Plan. Raftelis provided assistance in updating the water shortage emergency stage rates for implementation on March 1, 2022, incorporating any updates to the District's source water costs to ensure sufficient rate revenue recovery in periods of reduced water sales, due to potential drought or other water shortage emergencies.

The major objectives of the study include the following:

1. Conduct a Cost of Service analysis that develop the cost to serve customers in each class, per Proposition 218 and industry standards;
2. Calculate updated water rates to be effective March 11, 2022 in a manner that reflects the District's policies and objectives;
3. Update water shortage emergency stage rates to ensure collection of sufficient revenues during periods of reduced water demand; and
4. Conduct a customer impact analysis for the proposed rates.

This Report provides detail of the study and includes results for the District's Cost of Service analysis, water rates, and stage rates.

2.2. Key Information Used in the Study

The study utilized the following key information provided by the District:

1. FY 2020 Adopted Budget
2. Policy direction provided at a series of Board workshops in calendar year 2020 and 2021
3. Bi-Monthly billing data extracts for all water accounts in FY 2020
4. Public Hydrant and Private Fireline Data
5. Adjustments to costs and revenue based on updated, and best available, information

2.3. Legal Framework

Raftelis does not practice law, nor does it provide legal advice. The below discussion provides a general overview of Raftelis' understanding as rate practitioners and is labeled "legal framework" for literary convenience only. The District should consult with its legal counsel for clarification and/or specific guidance

2.3.1. CALIFORNIA CONSTITUTION – ARTICLE XIII D, SECTION 6 (PROP 218)

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

1. A property-related charge (such as water and recycled water rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property-related service.
2. Revenues derived by the charge shall not be used for any purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional Cost of service attributable to the parcel.

² Note, this report will refer to fiscal years as those beginning July 1 and ending June 30 of the selected year.

4. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of the property.
5. A written notice of the proposed charge shall be mailed to the record owner of each parcel at least 45 days prior to the public hearing when the agency considers all written protests against the charge.

As stated in AWWA's Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1, 7th edition (M1 Manual), "water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." Proposition 218 requires that water rate-setting methodology must be sound and that there must be a nexus between the costs of providing a service and the rates charged. This study follows industry-standard rate-setting methodologies set forth by the M1 Manual, in alignment with Proposition 218 requirements, by developing cost-based rates that do not exceed the proportionate cost of providing water services.

2.3.2. CALIFORNIA CONSTITUTION – ARTICLE X, SECTION 2

Article X, Section 2 of the California Constitution (established in 1976) states the following:

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

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

2.3.3. COST-BASED RATE-SETTING METHODOLOGY

As stated in the M1 Manual, "the costs of water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." The four major steps to develop utility rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility are discussed below.

Calculate Revenue Requirement

The rate-making process starts by determining the test year (rate-setting year) revenue requirement. The revenue requirement should sufficiently fund the utility's operations and maintenance (O&M), debt service, capital expenses, and other identified costs with funding to reserves (positive cash) or use of reserves (negative cash), all based on a multi-year financial plan.

Cost of Service Analysis (COS)

The annual cost of providing water service is distributed among customer classes commensurate with their service requirements. A COS analysis involves the following:

1. Functionalize costs. Examples of functions include storage, treatment, and distribution.
2. Allocate functionalized costs to cost components. Examples of cost components include supply, base delivery, peaking, and meter servicing.
3. Distribute the cost components. Distribute cost components, using unit costs, to customer classes in proportion to the burden they place on the water system.

Rate Design and Calculations

Rates do more than simply recover costs. Within the legal framework and industry standards, properly designed rates should support and optimize a blend of various utility objectives, such as promoting water conservation, affordability for essential needs, and revenue stability, among other objectives. Rates may also act as a public information tool in communicating these objectives to customers.

Rate Adoption

Rate adoption is the last step of the rate-making process and is part of the procedural requirements of Proposition 218. Raftelis documents the rate study results in this Report to serve as the District's administrative record and a public information tool about the proposed changes, the rationale and justifications behind the changes, and their expected financial impacts.

Government Code §54999.7(c) requires that water and wastewater agencies must conduct a Cost of Service study at minimum every ten years. Raftelis conducted a comprehensive Cost of Service rate study for the District in Section 5 and has documented the results and findings in this Report. The proposed revenue adjustment of two percent (2%) based on the District's financial plan is applied uniformly across all rates and charges to derive the proposed rates to be effective March 1, 2022.

3. Base Year Units of Service and Revenues

This section of the Report details the derivation of the base year revenues based on FY 2020³ (base year) water rates and units of service. Units of service include total water consumption, consumption patterns (including “peaking” or extra capacity costs⁴), customer accounts, and meter sizes. The District elected to use FY 2020 as the allocation year to account for anomalous changes in subsequent years to water consumption patterns brought on by the COVID-19 pandemic and the current statewide water shortage emergency declaration.

3.1. Base Year Revenues

Base year rates are the currently effective water rates, approved in February 2019 and implemented on March 1, 2020. These rates were developed in the 2018 Water Rate Update Study. The District's current rate structure has a fixed and variable component for all customers and is differentiated between Inside and Outside District customers. The current rates are comprised of:

Fixed charges recovering customer service, billing, meter servicing, and peaking costs:

- » Bi-Monthly Service charges by meter size
- » Bi-Monthly Private Fire Service charges for customers with private fireline connections

Consumption-based charges recovering all remaining water system costs:

- » Uniform consumption charges by ccf of water usage

Table 3-1 shows the current meter service charges and the annual revenue recovered from the meter service charge. Column B shows the number of accounts, and Column C shows the bi-monthly service charge at each meter size. Annual service charge revenue is calculated by multiplying current bi-monthly service charges, the number of accounts, and six billing periods for each meter size.

³ The current water rates have not changed since March 1, 2020 (FY 2020).

⁴ System capacity is the system’s ability to supply water to all delivery points at the time when demanded. The time of greatest demand is known as peak demand. Both the operating and capital costs incurred to accommodate peak flows are generally allocated to each customer class based upon the relative demand during the peak day and peak hour event. Collectively, maximum day and maximum hour costs are known as peaking costs.

Table 3-1: Base Year Bi-Monthly Service Accounts & Charges by Meter Size, and Revenue

Line No.	Meter Size	Accounts by Meter Size	Bi-Monthly Service Charge
	(A)	(B)	(C)
1	5/8 inch	22,105	\$56.61
2	3/4 inch	50,091	\$56.61
3	1 inch	5,768	\$87.29
4	1-1/2 inch	2,252	\$163.97
5	2 inch	2,908	\$255.99
6	3 inch	224	\$547.39
7	4 inch	111	\$976.81
8	6 inch	60	\$2,464.48
9	8 inch	26	\$4,304.88
10	10 inch	3	\$6,451.99
11	Total	83,548	\$37,286,259

Table 3-2 shows the base year water consumption, commodity rate⁵, and total commodity rate revenue. The commodity revenues are calculated using billed demand in CCF (Column B) multiplied by the consumption charge (Column A).

Table 3-2: Water Consumption, Commodity Rate, and Total Revenue

Line No.	Total Water Consumption	Consumption Charge	Total Consumption Revenue
	(A)	(B)	(C)
1	16,874,629	\$4.596	\$77,555,794

Table 3-3 shows the base year private fire accounts, bi-monthly fire service charge by meter size, and the total private fire service charge revenue. The fire service charges are calculated to recover the costs associated with private fire service capacity in the water distribution system. The charge includes a component for the fire service capacity (fire service charge) and a charge for the detector meter (meter service charge). District engineering staff confirmed the meter on the detector is a small diameter with equivalent demand equal to a 5/8-inch or 3/4-inch water meter, and therefore an equivalent demand of 1⁶. The total charge for fire service includes the billed fire service charge and the meter service charge of a 5/8-inch potable meter. Annual fire service charge revenue (Line 9) is calculated by multiplying the total bi-monthly private fire service charges, the number of accounts, and six billing periods for each fireline size.

⁵ The commodity rate for outside District Customers is \$5.285.

⁶ A demand ratio of 1.00 reflects the base meter size which for the District is a 5/8" and 3/4" meter.

Table 3-3: Base Year Bi-Monthly Fire Service Accounts, Charges, and Revenue

Line No.	Fireline Size	Number of Accounts	Private Fire Service	Detector Check Charge	Total Fire Line Service Charge
	(A)	(B)	(C)	(D)	(E)
1	3/4 inch	4	\$14.40	\$56.61	\$71.01
2	1 inch	1	\$14.40	\$56.61	\$71.01
3	2 inch	163	\$14.40	\$56.61	\$71.01
4	4 inch	420	\$14.40	\$56.61	\$71.01
5	6 inch	747	\$19.20	\$56.61	\$75.81
6	8 inch	910	\$24.00	\$56.61	\$80.61
7	10 inch	156	\$28.80	\$56.61	\$85.41
8	12 inch	10	\$33.60	\$56.61	\$90.21
9	Total	2,411			\$1,115,791

Table 3-4 summarizes the calculated revenues from base year units of service and rates.

Table 3-4: Base Water Rate Revenue

Line No.	Description	FY 2020 Revenue
	(A)	(B)
1	Bi-monthly Meter Service Charge Revenue	\$37,286,259
2	Bi-monthly Private Fire Service Charge Revenue	\$1,115,791
3	Annual Commodity Rate Revenue	\$77,555,794
4	Total Water Rate Revenue	\$115,957,844

3.2. Base Year Cashflow

The base year rate revenues derived in this section match the base year revenue requirement, which is designed to be revenue-neutral and serves as the basis for the Cost of Service analysis in Section 4. Table 3-5 shows the base year cash flow, using the District's FY 2020 budgeted non-rate revenues, operating expenses, and the calculated water revenues using actual FY 2020 units of service.

Table 3-5: Base Year Revenue & Expense Budget and Cashflow

Line No.	Description	Total
	(A)	(B)
1	Revenues	
2	Water Revenue	\$115,957,844
3	Ground Water Revenue	\$510,800
4	1% Tax Allocation	\$6,386,300
5	State Water Contract Tax	\$4,472,100
6	Interest Revenue	\$2,116,200
7	Debt Proceeds (Advanced Metering Infrastructure)	\$0
8	Customer Jobs Revenue	\$4,244,100
9	Grants, Reimbursements	\$12,433,100
10	Other Revenue	\$832,000
11	Total Revenue	\$146,952,444
12		
13	Expenses	
14	Source of Supply	\$38,634,574
15	Pumping	\$2,084,542
16	Water Treatment	\$17,079,370
17	Transmission & Distribution	\$15,835,013
18	Administrative and General Expenses	\$28,704,300
19	Debt Service	\$6,377,406
20	Capital Projects FY 2020 Budget	\$33,484,600
21	Customer Jobs Expense	\$4,244,120
22	Total Expenses	\$146,443,926
23		
24	Net Annual Cashflow	\$508,517

4. Cost of Service

A Cost of Service (COS) analysis distributes a utility's revenue requirement, or annualized revenues from rates, to each customer class. This is done by allocating the District's revenue requirement to the water system **cost causation components**. The cost causation components include:

1. Water supply
2. Base (average) delivery costs
3. Peaking costs (maximum day and maximum hour)
4. Meter service
5. Billing and customer service
6. Fire protection
7. General and administrative costs

Peaking costs are divided into maximum day and maximum hour demand. The maximum day demand is the maximum amount of water used in a single day in a year. The maximum hour demand is the maximum hour usage on the maximum usage day. Both maximum day and maximum hour peaking demand are used to calculate peaking unit rates. Different facilities, such as distribution and storage facilities, are designed to meet the peaking demands of customers. Extra capacity costs include the O&M and capital costs associated with meeting peak customer demand. This method is consistent with the AWWA M1 Manual and is used in the water industry when performing Cost of Service analyses.

4.1. Revenue Requirement

The first step in the Cost of Service analysis process is determining the revenue requirement based on the District's estimated costs. The revenue requirement includes O&M expenses, debt service, rate funded capital project costs, net cash to reserves, and non-rate revenues. Table 4-1 shows the District's base year revenue requirement for FY 2020 (note that this matches the revenues shown in Table 3-4). The total revenue required from water rates is shown on Line 25. Line 24 shows the operating and capital revenue requirements before the application of revenue offsets (subtracting Line 18). Revenue offsets are non-rate revenues from the FY 2020 budget, as shown in lines 10 - 17. Revenue offsets are subtracted from other (non-rate) revenues and adjusted for the annual cash balance to arrive at the rate revenue requirement. Raftelis calculated the revenue requirement using the FY 2020 budget, which includes water purchases, O&M expenses, capital expenses, existing debt service, and changes in cash balances. The adjustments (lines 21 and 22) shown as negative values are subtracted (therefore added as a result of subtracting a negative number) to arrive at the revenue required from District rates. The total revenue required from rates is the revenue-neutral amount that the District's fixed service charges and volumetric rates are designed to collect in FY 2020. Raftelis annualized the FY 2020 rates (effective March 1, 2020) to calculate revenue within the revenue requirement determination. The adjustment for cash balance was calculated in Table 3-5.

Table 4-1: Revenue Requirement Determination

Line No.	Description	Operating	Capital	Total
	(A)	(B)	(C)	(D)
1	Revenue Requirement			
2	O&M Expenses	\$102,337,800		\$102,337,800
3	Existing Debt Service		\$6,377,406	\$6,377,406
4	Proposed Debt Service		\$0	\$0
5	Rate Funded Capital Projects		\$33,484,600	\$33,484,600
6	Customer Jobs Revenue		\$4,244,120	\$4,244,120
7	Total - Revenue Requirement	\$102,337,800	\$44,106,126	\$146,443,926
8				
9	Less: Revenue Offsets			
10	Ground Water Revenue	\$510,800		\$510,800
11	1% Tax Allocation	\$6,386,300		\$6,386,300
12	State Water Contract Tax	\$4,472,100		\$4,472,100
13	Interest Revenue	\$2,116,200		\$2,116,200
14	Debt Proceeds		\$0	\$0
15	Customer Jobs Revenue		\$4,244,100	\$4,244,100
16	Grants, Reimbursements		\$12,433,100	\$12,433,100
17	Other Revenue	\$832,000		\$832,000
18	Total Revenue Offsets	\$14,317,400	\$16,677,200	\$30,994,600
19				
20	Less Adjustments			
21	Adjustment for Cash Balance	(\$508,517)		(\$508,517)
22	Total - Less Adjustments	(\$508,517)	\$0	(\$508,517)
23				
24	Revenue Requirement - Prior to Applying Revenue Offsets	\$102,846,317	\$44,106,126	\$146,952,444
25	Revenue Requirement from Rates	\$88,528,917	\$27,428,926	\$115,957,844

4.2. Allocation of Expenses to Cost Components

In a Cost of Service analysis expenses are functionalized and then allocated to the water system cost causation components. Table 4-2 shows the identified system-wide peaking factors⁷. The system-wide peaking factors are used to derive the cost component allocation bases (i.e., percentages) shown in columns C through E. Functionalized expenses are then allocated to the cost components using the allocation bases shown in column A. To understand the interpretation of the percentages shown in columns B through F, we must first establish Base as the average daily demand during the year – which is therefore a factor of 1.00. If the Base allocation is used to allocate an expense, it means that the costs associated with that expense are to meet average daily demand (base) related costs.

Expenses that are allocated to the cost causation components using the Maximum Day bases attribute 61% (1.00/1.65) of the demand (and therefore costs) to base (average daily demand) use and the remaining 39% to maximum day (peaking) use. Expenses allocated using the maximum hour bases assume 40% (1.00/2.48) of costs are due to base demands, 26% due to max day ((1.65-1.00)/2.48) and 33% ((2.48-1.65)/2.48) are due to max hour costs. Collectively the maximum day and hour cost components are known as peaking costs. These allocation bases are used to assign O&M Functions to the cost causation components.

Table 4-2: System-Wide Peaking Factors

Line No.	Description	Factor	Base	Max Day	Max Hour	Total
	(A)	(B)	(C)	(D)	(E)	(F)
1	Base	1.00	100%	0%	0%	100%
2	Max Day	1.65	61%	39%	0%	100%
3	Max Hour	2.48	40%	26%	33%	100%

Table 4-3 shows the allocation of the District's O&M expenses to the cost causation components. The peaking allocation percentages are used to allocate certain functionalized costs to each cost causation component. The allocation basis is selected based on the type of cost for each line item and the proportion of those costs associated with each cost causation component (max day, max hour, general, customer, etc.). For example, Transmission & Distribution, line 4, is allocated using the max hour basis. This is because the distribution system must be sized and operated to meet max hour demands. Certain cost bases have a one-to-one relationship to the cost causation components – such as supply – and therefore are easily allocated to the cost component with the same name. Line 11 shows the resulting totals of the allocation of all expenses to the cost causation components. A complete table detailing all the allocation of the O&M line items can be found in **Appendix B**. Line 13 shows the total percentage allocated to each cost component, excluding Admin and General. Admin and General are indirect costs which support other direct system components and are therefore allocated pro-rata to the cost components. The Operating portion of the revenue requirement is allocated to the cost causation components using the allocation shown in Line 13.

⁷ Peaking Factors were provided by District Staff and sourced from the January 2011 “ACWD 2011-2020 Engineering Report”.

Table 4-3: Allocation of O&M Expenses to Cost Causation Components

Line No.	Asset Functions	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
1	Supply	Supply	100%	0%	0%	0%	0%	0%	0%	0%	100%
2	Pumping	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	100%
3	Treatment	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	100%
4	Transmission & Distribution	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	100%
5	Reservoir/Storage	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	100%
6	Customer Billing	Customer	0%	0%	0%	0%	100%	0%	0%	0%	100%
7	Meter Service	Meters	0%	0%	0%	0%	0%	100%	0%	0%	100%
8	Hydrants	Fire Protection	0%	0%	0%	0%	0%	0%	100%	0%	100%
9	Admin & General	Admin & General	0%	0%	0%	0%	0%	0%	0%	100%	100%
10											
11	Total O&M		\$36,182,653	\$19,533,266	\$12,696,623	\$4,913,978	\$2,317,800	\$868,014	\$225,065	\$25,600,400	\$102,337,800
12											
13	% Allocation Without Admin and General		47%	25%	17%	6%	3%	1%	0%		

The District's functionalized assets, from the fixed asset database are allocated to the same cost causation components as the O&M expenses. This approach to determine capital cost allocation is used to represent future re-investment in the built system and a proxy for future project costs. Assets need to be refurbished and replaced over time. Correspondingly, capital expenses over time should correlate to the asset base and mix of infrastructure. This ensures that the allocations to the cost causation components, and ultimately the rates, remain relatively stable over time.

Raftelis, with the assistance of District staff, functionalized the capital assets and then allocated them to the cost causation components. The asset value was derived using ENR CCI for the San Francisco area with the replacement cost less depreciation (RCLD) as the method to derive total system value. Table 4-4 shows a summary of the allocation of the District's capital assets to the cost causation components. The resulting total asset allocation is derived in the same manner as the O&M allocation in Table 4-3. Raftelis functionalized the District's assets (Lines 1 - 7) and then allocated the value to the cost causation components (Lines 9 - 15). Part of the District's revenue requirement includes rate-funded capital. This capital portion of the revenue requirement is allocated to the cost causation components using the asset allocation shown in Line 18. Like the O&M expense allocation, Line 18 shows the total percentage allocated to each cost component, excluding Admin and General. This reflects the fact that general and administrative costs support the other functions in proportion to their share of costs.

Table 4-4: Allocation of Assets to Cost Causation Component

Line No.	Asset Function	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
1	General Plant	Admin & General	0%	0%	0%	0%	0%	0%	0%	100%	100%
2	Maintenance Equipment	Admin & General	0%	0%	0%	0%	0%	0%	0%	100%	100%
3	Pumping Plant	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	100%
4	Source of Supply	Supply	100%	0%	0%	0%	0%	0%	0%	0%	100%
5	Transmission & Distribution	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	100%
6	Water Treatment Plant	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	100%
7	Fire	Fire Protection	0%	0%	0%	0%	0%	0%	100%	0%	100%
8											
9	General Plant		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$32,645,028	\$32,645,028
10	Maintenance Equipment		\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$2,310,100	\$2,310,100
11	Pumping Plant		\$0	\$5,629,980	\$3,659,487	\$0	\$0	\$0	\$0	\$0	\$9,289,468
12	Source of Supply		\$51,406,775	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$51,406,775
13	Transmission & Distribution		\$0	\$134,040,224	\$87,126,145	\$110,583,185	\$0	\$0	\$0	\$0	\$331,749,554
14	Water Treatment Plant		\$0	\$99,243,511	\$64,508,282	\$0	\$0	\$0	\$0	\$0	\$163,751,793
15	Fire		\$0	\$0	\$0	\$0	\$0	\$0	\$1,842,075	\$0	\$1,842,075
16	Total		\$51,406,775	\$238,913,715	\$155,293,915	\$110,583,185	\$0	\$0	\$1,842,075	\$34,955,128	\$592,994,792
17											
18	% Allocation Without Admin and General		9.2%	42.8%	27.8%	19.8%	0.0%	0.0%	0.3%		

4.3. Preliminary Allocation of Revenue Requirement to Cost Components

Table 4-5 shows the allocation of the revenue offsets to the cost components. The revenue offsets are allocated based on the operating, capital, or O&M allocation percentages. Groundwater Revenues, 1% Tax Allocation, and State Water Contract Tax revenues are allocated exclusively to the water supply cost component. Interest revenue is solely allocated to base delivery. Customer Jobs Revenues and Grants are allocated based on total allocated percentages of the asset list in Table 4-4. Other Revenues are allocated based on the total allocated percentage of the functionalized and allocated expense budget in Table 4-3.

Table 4-5: Allocation of Revenue Offsets to Cost Components

Line No.	Revenue Offset	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)
1	Ground Water Revenue	Water Supply	(\$510,800)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$510,800
2	1% Tax Allocation	Water Supply	(\$6,386,300)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$6,386,300
3	State Water Contract Tax	Water Supply	(\$4,472,100)	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$4,472,100
4	Interest Revenue	Base Delivery		(\$2,116,200)				\$0			\$2,116,200
5	Debt Proceeds	Capital	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
6	Customer Jobs Revenue	Capital	(\$390,968)	(\$1,817,028)	(\$1,181,068)	(\$841,026)	\$0	\$0	(\$14,010)	\$0	\$4,244,100
7	Grants, Reimbursements	Capital	(\$1,145,341)	(\$5,322,987)	(\$3,459,942)	(\$2,463,789)	\$0	\$0	(\$41,041)	\$0	\$12,433,100
8	Other Revenue	O&M	(\$392,299)	(\$211,783)	(\$137,659)	(\$53,278)	(\$25,130)	(\$9,411)	(\$2,440)	\$0	\$832,000
9	Total Revenue Offset		(\$13,297,807)	(\$9,467,998)	(\$4,778,669)	(\$3,358,093)	(\$25,130)	(\$9,411)	(\$57,491)	\$0	\$30,994,600

Table 4-6 shows a preliminary allocation of costs based on the revenue requirement determined in Table 4-1. Line 1 allocates the operating revenue requirement to the cost components by distributing the total amount to the cost components using the percentages shown in Table 4-3. The total amount was calculated with total operating revenue requirement less any revenue offsets, as shown in Line 24 of Table 4-1. Similarly, Line 2 allocates the capital revenue requirement (Column C of Table 4-1) to the cost components using the asset allocation percentages shown in Line 19 of Table 4-4. Line 3 subtracts the allocated revenue offsets shown in Table 4-5. Line 4 shows the preliminary allocation of revenue requirement to the cost components. Note, the allocated amount to the Admin & General cost component is zero as it was apportioned pro-rata using the percentages in Line 13 of Table 4-3 and Line 18 of Table 4-4.

Table 4-6: Preliminary Allocation of Costs to Cost Components

Line No.	Cost Allocation	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Private Fire	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
1	O&M Expenses	O&M	\$48,493,338	\$26,179,210	\$17,016,486	\$6,585,896	\$3,106,402	\$1,163,345	\$301,641	\$0	\$0	\$102,846,317
2	Capital Expenses	Capital	\$4,063,069	\$18,883,171	\$12,274,061	\$8,740,232	\$0	\$0	\$145,593	\$0	\$0	\$44,106,126
3	Revenue Offset		-\$13,297,807	-\$9,467,998	-\$4,778,669	-\$3,358,093	-\$25,130	-\$9,411	-\$57,491	\$0	\$0	-\$30,994,600
4	Total Cost of Service		\$39,258,600	\$35,594,382	\$24,511,879	\$11,968,034	\$3,081,272	\$1,153,934	\$389,743	\$0	\$0	\$115,957,844

4.4. Equivalent Meters

Equivalent meter units (EMUs) are used to allocate meter-related costs appropriately and equitably. Larger meters can impose greater demands on the system and are more expensive to install, maintain, service, and replace than smaller meters. The capacity ratio is based on a meter’s maximum operating hydraulic capacity and is calculated to represent the potential demand on the water system compared to a base meter size. A ratio of hydraulic capacity is calculated by dividing larger meter capacities by the base meter capacity based on the maximum safe operating flow rates in gallons per minute (gpm) at each size and type. The base meter used in the study is the 3/4" meter⁸, which is the most common meter size in the Districts' water system.

Table 4-7 shows the total EMUs. The number of annual equivalent meters is calculated by multiplying the count of meters at each size (Column B) by their respective capacity ratio (Column C) and then summing the total number of equivalents at each meter size (Column D). These totals are used as the denominator in developing unit costs for the rate components of the bi-monthly fixed service charges.

Table 4-7: Equivalent Meters Units

Line No.	Meter Size	Total Meters	Capacity Ratios	Equivalent Meters
	(A)	(B)	(C)	(D)
1	5/8 inch	22,105	1.00	22,105
2	3/4 inch	50,091	1.00	50,091
3	1 inch	5,768	1.67	9,613
4	1-1/2 inch	2,252	3.33	7,507
5	2 inch	2,908	5.33	15,509
6	3 inch	224	11.67	2,613
7	4 inch	111	21.00	2,331
8	6 inch	60	53.33	3,200
9	8 inch	26	93.33	2,427
10	10 inch	3	140.00	420
11	Total - Meters	83,548		115,816

4.5. Allocation of Fire Protection Costs

Water systems provide two types of fire protection: public fire protection for firefighting, which is generally visible as hydrants on the street, and private fire protection that provide fire flows to building sprinkler systems for fire suppression within private improvements. Raftelis uses the potential flow of public hydrants and private firelines to determine the share of total fire costs responsible for each.

Table 4-8 shows the steps to allocate costs between public & private fire protection. Like the hydraulic capacity factor of a water meter, different fire connection sizes have a potential fire flow demand factor. The count of connections (Column B) of a specific size is multiplied by the fire flow demand factor (Column C) to derive total equivalent fire demand units (Column D). The Hazen-Williams equation is used to calculate equivalent potential demand by raising the diameter of the pipeline to the power of 2.63⁹. Line 10 summarizes the equivalent potential demand through

⁸ The 5/8" meter is harmonized with the 3/4" meter and so also has a ratio of 1.00

⁹ Hazen-Williams equation via AWWA M1 Manual

private fire connections. Note that potential demand from fire connections is based on fireline diameter and will vary from potable demand based on meter size. Line 14 shows the equivalent potential demand through public hydrant connections. Line 15 summarizes the potential fire demand (known as equivalent demand) of all fire connections, both public (hydrant) and private. The resulting percentage of potential fire demand, and therefore costs, for public fire and private fire costs, is shown in Lines 16 and 17. The percentages of equivalent potential demand are calculated by dividing the equivalent potential demand (Line 10 or Line 14) by the total potential demand (Line 15). The analysis calculates that 72 percent of fire capacity, and therefore costs, relate to public fire and will be recovered on the bi-monthly fixed charges. The remaining 28 percent is attributable to private fire service and will be recovered through private fire service charges.

The District factors in the costs associated with maintaining the public fire hydrant water system facilities and the water used to fight fires into the water commodity and service charges. This approach to allocating costs related to public fire service has been confirmed by SB 1386, which added section 53750.5 to the Government Code effective January 1, 2021.

Table 4-8: Derivation of Potential Flow to Private and Public Fire Connections

Line No.	Fire Line Size	Number of Lines	Potential Demand per Connection	Equivalent Potential Demand
	(A)	(B)	(C)	(D)
1	Private Fire			
2	3/4"	4	0.47	2
3	1"	1	1.00	1
4	2"	163	6.19	1,009
5	4"	420	38.32	16,094
6	6"	747	111.31	83,149
7	8"	910	237.21	215,858
8	10"	156	426.58	66,546
9	12"	10	689.04	6,890
10	Total Fire Lines	2,411		389,550
11				
12	Public Hydrant Size			
13	6"	8,794	111.31	978,868
14	Total Public Hydrants	8,794		978,868
15	Total Potential Fire Demand			1,368,418
16	Percent Allocated to Public Fire Protection			72%
17	Percent Allocated to Private Fire Protection			28%

4.6. Unit Costs

The goal of a Cost of Service analysis is to distribute the revenue requirement to classes of customers. Unit costs for each component are calculated, which starts by assessing the total water demanded, meter count (number of accounts/bills), or equivalent service units for each cost component.

Table 4-9 shows the derivation of the units of service. Actual FY 2020 water use, which was nearly 16.9 million units, is divided by 365 days to determine daily use (Column B). The max day and max hour demands are calculated by multiplying the average daily use by the max day or max hour peaking factor. This results in the total capacity, with max day extra-capacity calculated by subtracting the average daily use from the total capacity for the max day (Column D minus Column B = Column E). Max hour extra capacity (Column H) is calculated by subtracting max day total capacity (Column D) from the total capacity during max hour (Column G). The flow unit of CCF/Day is used for both max day and max hour calculations. The values shown are rounded to the nearest CCF. Column I summarizes the total number of meter or fireline equivalents and customers for potable water (Table 4-7) and private fire (Table 4-8).

Table 4-9: Calculation of Cost Causation Components Units of Service

Line No.	Units of Service	Annual Use (hcf)	Average Daily Use (hcf/day)	Max Day			Max Hour			Number of Equivalent Meters/Lines	Number of Customers
				System Wide Capacity Factor	Total Capacity (hcf/day)	Extra Capacity (hcf/day)	System Wide Capacity Factor	Total Capacity (hcf/day)	Extra Capacity (hcf/day)		
		(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)
1	All Customer Classes	16,874,629	46,232	1.65	76,283	30,051	2.48	114,424	38,141	115,816	83,548
2										Potable	Potable
3	Fire Only									389,550	2,411
4										Fire Service	Fire Service

Table 4-10 shows the calculated public and private fire service capacity. Line 1 assumes a conceivable fire in the District service area that lasts four hours, and requires fire flow of 4,250 gallons per minute (GPM), as shown in Line 2. This duration and flow requirement is based on the District's mixture of customer base, which includes a significant number of industrial and commercial customers. Line 4 shows that 72 percent of the District's fire costs are allocated to Public Fire (Table 4-8). Max day capacity demanded by fire service is determined by converting 4,250 GPM to gallons per hour, then multiplying it by the four-hour duration of a typical fire. This is then converted and presented to CCF per day in Line 5, Column B. A similar calculation is done for the max hour capacity, multiplying the max day capacity by 24 hours less the capacity already allocated to Max Day. This is converted and presented in CCF per day in Line 5; Column C. Public Fire is allocated 72 percent of each of those capacities. The values for max day and max hour total extra capacity are calculated by adding the total fire service capacity in Line 8 to the respective max day and max hour extra capacities shown in Table 4-9.

Table 4-10: Calculation of Fire Service Capacity

Line No.	Fire Estimate	Max Day	Max Hour
	(A)	(B)	(C)
1	Hours for Fire	4	4
2	Gals/minute	4,250	
3			
4	Cost to Public Fire	72%	72%
5	Capacity Demanded for Fire (CCF/day)	1,364	6,818
6	Public Fire	975	4,877
7	Private Fire	388	1,941
8	Total Fire Extra Capacity	1,364	6,818
9	Total Extra Capacity - Fire and Potable (CCF/day)	31,414	44,959
10	% of Extra Capacity - Public	3%	11%
11	% of Extra Capacity - Private	1%	4%

4.7. Final Allocation of Revenue Requirement to Cost Components

The Cost of Service can now be completed by making final adjustments shown in Table 4-11. Line 1 shows the preliminary allocation in costs to the cost components in Table 4-6. Line 3 reallocates public fire extra capacity costs to the potable meter capacity component. The amount of peaking costs adjusted for public fire is calculated by multiplying the max day and max hour allocated costs in Line 1 by the max day and max hour extra capacity percentages found in Line 10 of Table 4-10. Line 4 reallocates private fire extra-capacity costs from the max day and max hour to the private fire cost component. The percentage of peaking costs allocated to private fire is calculated by multiplying the max day and max hour allocated costs on Line 1 by the percentage of private fire extra capacity shown in Line 11 of Table 4-10. Line 5, reallocates most potable demand related extra capacity (max day and max hour) costs to the meter component to be recovered through the bi-monthly fixed service charge. Peaking costs, along with base delivery costs and fixed water system costs to meet average demand, are generally considered as fixed water system costs. To balance between affordability and revenue stability, it is a common practice that some amount of the peaking costs are recovered in the fixed service charge, along with customer-related costs, public fire costs, and meter-related costs. The final Cost of Service allocation to the cost components is shown in Line 6.

Utilizing the final Cost of service (Line 6) as the numerator and the units of service derived in Table 4-7 and Table 4-9 as the denominators (Line 8) allows us to derive unit costs in Line 11. The total Cost of service is divided by the respective units of service to calculate the unit cost of each cost component. Meter costs are divided by total meter equivalencies (Table 4-7) multiplied by six bi-monthly bills to determine a cost per equivalent meter. Annual customer costs are divided by the estimated number of annual bi-monthly bills, from the number of meters in Table 3-1 and number of firelines in Table 3-3. Private fire costs are divided by total equivalent private fire demand from Table 4-8 to determine a cost per equivalent demand for private fire connections. The unit costs are used to distribute the cost components to fixed service charges and variable commodity rates. A revenue offset is applicable to Inside District customers only and consists of the 1% Tax Allocation & State Water Contract Tax credits paid through property taxes. The offset amount is shown in the table as a reduction to the water supply cost component for Inside District customers, and the amount of the offset (\$0.64) is the additional costs of serving Outside District customers.

With the District's expenses allocated to the cost causation components, rates can be derived to collect the total amount shown in Column L. This is discussed in detail in **Section 5**.

Table 4-11: Final Cost of Service Allocation to Cost Components

Line No.	Cost Allocation	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Potable Meter Capacity	Fire Hydrants	Private Fire	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(K)	(L)
1	Total Cost of Service	\$39,258,600	\$35,594,382	\$24,511,879	\$11,968,034	\$3,081,272	\$1,153,934	\$0	\$389,743	\$0	\$0	\$115,957,844
2												
3	Allocation of Public Fire to Meter Capacity			(\$761,070)	(\$1,298,228)			\$2,449,041	(\$389,743)			\$0
4	Allocation of Private Fire			(\$302,875)	(\$516,642)					\$819,518		\$0
5	Allocation of Extra Capacity to Meter			(\$22,625,972)	(\$9,797,247)			\$32,423,219				\$0
6	Total Adjusted Cost of Service	\$39,258,600	\$35,594,382	\$821,961	\$355,917	\$3,081,272	\$1,153,934	\$34,872,260	\$0	\$819,518	\$0	\$115,957,844
7												
8	Unit of Service	16,874,629	16,874,629	16,874,629	16,874,629	85,959	118,227	115,816		389,550		
9	Unit	\$/CCF	\$/CCF	\$/CCF	\$/CCF	customers	equivalent	equivalent		equivalent		
10						and fire)	meters	potable meters		demand		
11	Unit Cost	\$2.33	\$2.11	\$0.05	\$0.02	\$35.85	\$9.76	\$301.10		\$2.10		
12	Unit	\$/CCF	\$/CCF	\$/CCF	\$/CCF	billed	per year	per year		per equivalent		
13						annually				connection		
14	Outside Rate Increase	\$0.64				\$5.97	\$1.63	\$50.18				
15						billed	(per meter)	(per meter)				
16						Bi-Monthly						

5. Water Rate Design

This section will determine the water rates based on the updated Cost of Service (Section 4). The rates developed in this section will be referred to as the Cost of Service rates in Section 6 to avoid confusion with the proposed rates. Proposed rates for March 1, 2022, will incorporate the updated Cost of Service rates and include the District's proposed two percent (2%) revenue adjustment.¹⁰

5.1. Existing Rate Structures and Rates

The District rate structure has two components, a commodity rate, and a service charge. The current rates are shown in Section 3.1. The District currently uses a uniform commodity rate structure for all potable customers. The volumetric component of a customer's water bill is calculated based on the number of units of water delivered to a property, measured in hundred cubic feet (CCF). The service charge component is a fixed charge that is dependent on meter size. Additionally, the District provides water to a small subset of outside-District customers. These outside customers do not contribute to the collected property tax revenue within District boundaries. These customers pay a higher commodity rate by not receiving the benefit of this non-rate revenue source.

The District also provides water to private fireline customers. Private fire rates are shown in Table 3-3. These customers are charged a fixed bi-monthly service charge. There is no charge for water used in such services for extinguishing accidental fires.

Raftelis discussed and worked with District staff to refine the existing rate structure. An effort was made to minimize changes to the customer rate structure, commodity rate, and bill impacts while updating the Cost of Service analysis presented in Section 4.

5.2. Proposed Bi-Monthly Service Charge

The District will retain its schedule of bi-monthly fixed charges, by meter size. Table 5-1 shows the derivation of the components for the base meter size (3/4-inch). There are three cost components that comprise the total proposed bi-monthly fixed charge: 1) customer billing, 2) meter service, and 3) potable meter capacity. The customer billing component recovers costs associated with meter reading, customer billing, as well as customer service costs. These costs are the same for all meter sizes as it costs the District the same to provide billing and customer services to any account, regardless of meter size. The meter service cost component recognizes the fact that the District incurs fixed costs related to maintaining/replacing meters, absent any water use. These costs generally increase as meter size increases, as it takes less time and resources to maintain, repair, and replace smaller meters compared to a larger meter. The potable meter capacity cost component collects extra capacity related costs through the meter service charge for potable customers and recognizes that larger meter sizes can draw more capacity than smaller meters. This charge is only distributed to the potable accounts and does not apply to fire service metered accounts.

¹⁰ Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report. Fixed rates shown in this report are rounded up to the nearest cent. Commodity rates shown in this section are rounded to the nearest tenth of a cent.

Table 5-1: Derivation of Bi-Monthly Meter Service Charge

Line No.	Description	Charge Basis
	(A)	(B)
1	Customer Service Charge Component	Per Account
2	Customer Service Costs (Annual)	\$3,081,272
3	Number of Annual Bills (Potable and Fire)	515,754
4	Bi-monthly Customer Service Charge	\$5.97
5		
6	Meter Service Charge Component	Per Equivalent Meter
7	Meter Service Costs (Annual)	\$1,153,934
8	Number of Annual Meters (Both potable and fire)	709,364
9	Bi-monthly Meter Service Charge	\$1.63
10		
11	Potable Meter Capacity	Per Equivalent Meter
12	Potable Meter Capacity Costs (Annual)	\$34,872,260
13	Number of Annual Meters (Potable only)	694,898
14	Bi-monthly Potable Meter Capacity Charge	\$50.18

Table 5-2 shows the derivation of the total bi-monthly fixed charge for each meter size. The meter service and potable meter capacity charge components are based on the number of equivalent meters for each meter size. The potential capacity demanded is proportional to the potential flow through each meter size (Column B) as established by the AWWA hydraulic capacity ratios, shown in Column C. The ratios show the potential flow through each meter size compared to the flow through a 3/4-inch meter. The meter service component for larger meters shown are calculated by multiplying the capacity ratio by the bi-monthly meter service charge, derived in Table 5-1. Potable meter capacity (Column H) is calculated by multiplying the capacity ratio by the bi-monthly potable meter capacity cost (per equivalent), as derived in Table 5-1. Allocating capacity costs by meter size is a common way to reliably recover the fixed cost of operating the utility. The customer billing, meter service, and potable meter capacity components are combined to yield the total proposed fixed charge by meter size

Table 5-2: Calculation of Cost of Service Bi-Monthly Meter Service Charge

Line No.	Meter Size	Hydraulic Capacity (gpm)	Hydraulic Capacity Meter Ratio	Number of Meters	Equivalent Meters	Customer Billing	Meter Service	Potable Meter Capacity	Cost of Service Bi-Monthly Meter Service Charge
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
1	5/8 inch	20	1.00	22,105	22,105	\$5.97	\$1.63	\$50.18	\$57.78
2	3/4 inch	30	1.00	50,091	50,091	\$5.97	\$1.63	\$50.18	\$57.78
3	1 inch	50	1.67	5,768	9,613	\$5.97	\$2.71	\$83.64	\$92.32
4	1-1/2 inch	100	3.33	2,252	7,507	\$5.97	\$5.42	\$167.28	\$178.67
5	2 inch	160	5.33	2,908	15,509	\$5.97	\$8.68	\$267.64	\$282.29
6	3 inch	350	11.67	224	2,613	\$5.97	\$18.98	\$585.47	\$610.42
7	4 inch	630	21.00	111	2,331	\$5.97	\$34.16	\$1,053.85	\$1,093.98
8	6 inch	1,600	53.33	60	3,200	\$5.97	\$86.76	\$2,676.44	\$2,769.17
9	8 inch	2,800	93.33	26	2,427	\$5.97	\$151.83	\$4,683.77	\$4,841.57
10	10 inch	4,200	140.00	3	420	\$5.97	\$227.74	\$7,025.66	\$7,259.37

Table 5-3 compares the Cost of Service derived Service Charges with the current Service Charges.

Table 5-3: Comparison of Cost of Service and Current Bi-Monthly Service Charges

Line No.	Current Bi-Monthly Meter Service Charge	Cost of Service Bi-Monthly Meter Service Charge	Difference (\$)	Difference (%)
	(A)	(B)	(C)	(D)
1	\$56.61	\$57.78	\$1.17	2%
2	\$56.61	\$57.78	\$1.17	2%
3	\$87.29	\$92.32	\$5.03	6%
4	\$163.97	\$178.67	\$14.70	9%
5	\$255.99	\$282.29	\$26.30	10%
6	\$547.39	\$610.42	\$63.03	12%
7	\$976.81	\$1,093.98	\$117.17	12%
8	\$2,464.48	\$2,769.17	\$304.69	12%
9	\$4,304.88	\$4,841.57	\$536.69	12%
10	\$6,451.99	\$7,259.37	\$807.38	13%

5.3. Commodity Rates

The District has a uniform commodity rate that applies to all potable customers. The term commodity rate is often used interchangeably with a volumetric rate. Table 5-4 shows the commodity rate derivation. There are four cost components of the commodity rate: supply, base delivery, max day, and max hour. The total volumetric rate is the summation of the unit rates for each cost component, less revenue offsets. Water supply costs are associated with obtaining and treating water for delivery. Base delivery costs are the operating and capital costs associated with delivering water to all customers through the distribution system at a constant average rate of use, also known as serving customers under average daily demand conditions. Peaking (Max Day and Max Hour) costs, or extra capacity costs, are costs incurred to meet customer peak demands in excess of base use (or in excess of average daily demand). For the portion of extra capacity peaking costs collected through the volumetric rate, peaking costs are distributed proportional to water use as the District has a single uniform commodity rate applied to each unit of consumption. A revenue offset is applicable to Inside District customers only and consists of the 1% Tax Allocation & State Water Contract Tax credits paid through property taxes.

Table 5-4: Commodity Rate Derivation

Line No.	Description	Charge Basis
	(A)	(B)
1	Water Supply Costs	\$50,117,000
2	Total Water Units/HCF	16,874,629
3	Unit Cost/HCF	\$2.97
4		
5	Base Delivery	\$35,594,382
6	Total Water Units	16,874,629
7	Unit Cost/HCF	\$2.11
8		
9	Max Day Costs	\$821,961
10	Total Water Units	16,874,629
11	Unit Cost/HCF	\$0.05
12		
13	Max Hour Costs	\$355,917
14	Total Water Units	16,874,629
15	Unit Cost/HCF	\$0.02
16		
17	Revenue Offset	(\$10,858,400)
18	Total Water Units	16,874,629
19	Unit Cost/HCF	-\$0.64

Table 5-5 shows the summed commodity rates for inside and outside customers. Water supply, base supply, max day, and max hour unit costs are derived in Table 5-4. Outside District customers do not contribute to the collected property tax; therefore no revenue offset is allocated to the Outside District commodity rate. Lines 17-19 of Table 5-4 detail the revenue offset of property taxes that apply to Inside District customers.

Table 5-5: Inside and Outside Commodity Rates

Line No.	Customer Class	Water Supply	Base Delivery	Max Day	Max Hour	Revenue Offset	Cost of Service Commodity Rate
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
1	Inside	\$2.970	\$2.109	\$0.049	\$0.021	(\$0.643)	\$4.506
2	Outside	\$2.970	\$2.109	\$0.049	\$0.021	\$0.000	\$5.149

Table 5-6 shows a rate comparison of current and proposed commodity (\$/CCF) rates. Rates are rounded to the nearest one-tenth of a penny.

Table 5-6: Rate Comparison of Current and Proposed Commodity Rates

Line No.	Customer Class	Current Commodity Rate	Cost of Service Commodity Rate	Difference (\$)	Difference (%)
	(A)	(B)	(C)	(D)	(E)
1	Inside	\$4.596	\$4.506	(\$0.090)	-2%
2	Outside	\$5.285	\$5.149	(\$0.136)	-3%

5.4. Private Fire Charge

Table 5-7 shows the derivation of private fire charges. The total amount associated with private fire protection is shown on Line 6, Column J of Table 4-10. The equivalent potential demand for private fire customers is shown in Table 4-8. The unit rate per equivalent connection for private fire (Table 4-11, Row 11, Column J) is calculated by dividing private fire costs by the total potential demand. The private fire component (Column E) is calculated by dividing the unit rate by the number of bills per year (six bi-monthly bills per year) and multiplying it by potential demand in Row C per fireline diameter. The customer billing amount was detailed in Lines 1-4 of Table 5-1. Private fire customers receive separate bills for the service and are charged the same amount as potable customers for billing costs. The fire meter component is the last cost component for the private fire rate. The District periodically performs maintenance on the fireline detector check. This portion of the cost component accounts for the additional expense the detector meter imposes on the District. District engineering staff confirmed the meter on the detector is a small meter with equivalent demand equal to a 5/8-inch or 3/4-inch water meter, which has an equivalent demand of 1. This cost component is charged per billing period, as derived in Lines 7-9 of Table 5-1 and is the same as it is for potable water service with a 5/8" or 3/4" meter.

Table 5-7: Derivation of Bi-Monthly Private Fire Service Charges

Line No.	Fire Line Size	Number of Connections	Potential Demand	Equivalent Demand	Private Fire	Customer Billing	Fire Meter on Detector	Cost of Service Private Fire Service
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)
1	3/4 inch	4	0.47	1.9	\$0.16	\$5.97	\$1.63	\$7.77
2	1 inch	1	1.00	1.0	\$0.35	\$5.97	\$1.63	\$7.95
3	2 inch	163	6.19	1,009	\$2.17	\$5.97	\$1.63	\$9.77
4	4 inch	420	38.32	16,094	\$13.44	\$5.97	\$1.63	\$21.04
5	6 inch	747	111.31	83,149	\$39.03	\$5.97	\$1.63	\$46.63
6	8 inch	910	237.21	215,858	\$83.17	\$5.97	\$1.63	\$90.77
7	10 inch	156	426.58	66,546	\$149.57	\$5.97	\$1.63	\$157.17
8	12 inch	10	689.04	6,890	\$241.60	\$5.97	\$1.63	\$249.20

Table 5-8 shows a comparison of current and Cost of Service private fire charges.

Table 5-8: Rate Comparison of Current and Cost of Service Private Fire Service Charge

Line No.	Fire Line Size	Current Private Fire Service Charge	Cost of Service Private Fire Service Charge	Difference (\$)	Difference (%)
	(A)	(B)	(C)	(D)	(E)
1	3/4 inch	\$71.01	\$7.77	(\$63.24)	-89%
2	1 inch	\$71.01	\$7.95	(\$63.06)	-89%
3	2 inch	\$71.01	\$9.77	(\$61.24)	-86%
4	4 inch	\$71.01	\$21.04	(\$49.97)	-70%
5	6 inch	\$75.81	\$46.63	(\$29.18)	-38%
6	8 inch	\$80.61	\$90.77	\$10.16	13%
7	10 inch	\$85.41	\$157.17	\$71.76	84%
8	12 inch	\$90.21	\$249.20	\$158.99	176%

5.5. Revenue Comparison of Current and Proposed Water Charges

Table 5-9 shows the differences between this Cost of Service analysis (and resulting Cost of Service rates) and the current rates and revenue recovery based on the District’s prior Cost of Service study. The total revenue collected from rates remains the same as intended, as shown in Line 4.

Table 5-9: Comparison of Proposed and Current Revenue

Line No.	Rate Component	Proposed	Current	Difference
	(A)	(B)	(C)	(D)
1	Fixed Charge	\$38,997,509	\$37,286,259	\$1,711,250
2	Private Fire	\$929,474	\$1,115,791	(\$186,317)
3	Volumetric Revenue	\$76,030,860	\$77,555,794	(\$1,524,933)
4	Total	\$115,957,844	\$115,957,844	\$0

6. Proposed March 1, Water Rates & Customer Impact Analysis

This section¹¹ calculates the proposed rates by applying the proposed two percent revenue adjustment to the Cost of Service rates derived in Section 5. The proposed revenue adjustment is based on the District's financial plan. Appendix A shows proposed revenue adjustments for the rates proposed to be effective March 1, 2022 presented below.

6.1. Proposed Rates

6.1.1. Fixed Bi-Monthly Service Charges

The proposed bi-monthly service charges and proposed bi-monthly fire service charges are shown in Table 6-1, and Table 6-2, respectively. The proposed charges increase the Cost of Service rates by two percent beginning March 1, 2022. The proposed fire service charges apply to all customers with private fire service connections. The rates for the current and proposed bi-monthly service charges and fire service charges are calculated based on the meter size and diameter of the fireline serving a property, respectively. All rates are rounded up to the nearest whole penny.

Table 6-1: Proposed Bi-Monthly Meter Service Charge

Line No.	Meter Size	Current Bi-Monthly Meter Service Charge	Cost of Service Bi-Monthly Meter Service Charge	Proposed Bi-Monthly Meter Service Charge
	(A)	(B)	(C)	(D)
1	Effective Date	3/1/2020		3/1/2022
2	5/8-inch	\$56.61	\$57.78	\$58.94
3	3/4-inch	\$56.61	\$57.78	\$58.94
4	1-inch	\$87.29	\$92.32	\$94.18
5	1 1/2-inch	\$163.97	\$178.67	\$182.25
6	2-inch	\$255.99	\$282.29	\$287.95
7	3-inch	\$547.39	\$610.42	\$622.64
8	4-inch	\$976.81	\$1,093.98	\$1,115.87
9	6-inch	\$2,464.48	\$2,769.17	\$2,824.56
10	8-inch	\$4,304.88	\$4,841.57	\$4,938.41
11	10-inch	\$6,451.99	\$7,259.37	\$7,404.57

¹¹ Numbers shown in the tables of this section are rounded. Therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown in this report. Fixed rates shown in this report are rounded up to the nearest cent. Commodity rates shown in this section are rounded to the nearest tenth of a cent.

Table 6-2: Proposed Fire Service Charge

Line No.	Fire Line Pipe Diameter	Current Private Fire Service Charge	Cost of Service Private Fire Service Charge	Proposed Private Fire Service Charge
	(A)	(B)	(C)	(D)
1	Effective Date	3/1/2020		3/1/2022
2	3/4-inch	\$71.01	\$7.77	\$7.93
3	1-inch	\$71.01	\$7.95	\$8.12
4	2-inch	\$71.01	\$9.77	\$9.97
5	4-inch	\$71.01	\$21.04	\$21.46
6	6-inch	\$75.81	\$46.63	\$47.57
7	8-inch	\$80.61	\$90.77	\$92.59
8	10-inch	\$85.41	\$157.17	\$160.32
9	12-inch	\$90.21	\$249.20	\$254.19

6.1.2. Commodity Rates

The proposed variable commodity, or volumetric, water rates are shown in Table 6-3. Volumetric rates are charged for each unit (CCF) of water. All rates are rounded up to the thousandth dollar (a tenth of a cent). The proposed rates increase the Cost of Service rates by two percent beginning March 1, 2022.

Table 6-3: Proposed Commodity Rates

Line No.	Customer Type	Current Commodity Rate	Cost of Service Commodity Rate	Proposed Commodity Rate
	(A)	(B)	(C)	(D)
1	Effective Date	3/1/2020		3/1/2022
2	Inside District	\$4.596	\$4.506	\$4.596
3	Outside District	\$5.285	\$5.149	\$5.253

6.2. Customer Impact Analysis

It is important to understand how the proposed rates will impact the District's customers. All customers, at every meter size, will experience an increase in the fixed service charge. Note that customer bill impacts will vary with each customers' meter size.

Figure 6-1 shows the water bills for typical Single-Family Residential (SFR) customers with a 3/4-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bi-monthly water bills under the current rates are illustrated by the blue bars and the bi-monthly water bills assuming the proposed March 1, 2022 rates are shown by the grey bars. The dollar and percentage impact at each usage level is detailed in the embedded table. There is no change to the proposed, uniform water commodity rate and therefore the dollar impact is uniform across all levels of use.

Figure 6-1: Single Family Residential Customer Bill Impacts

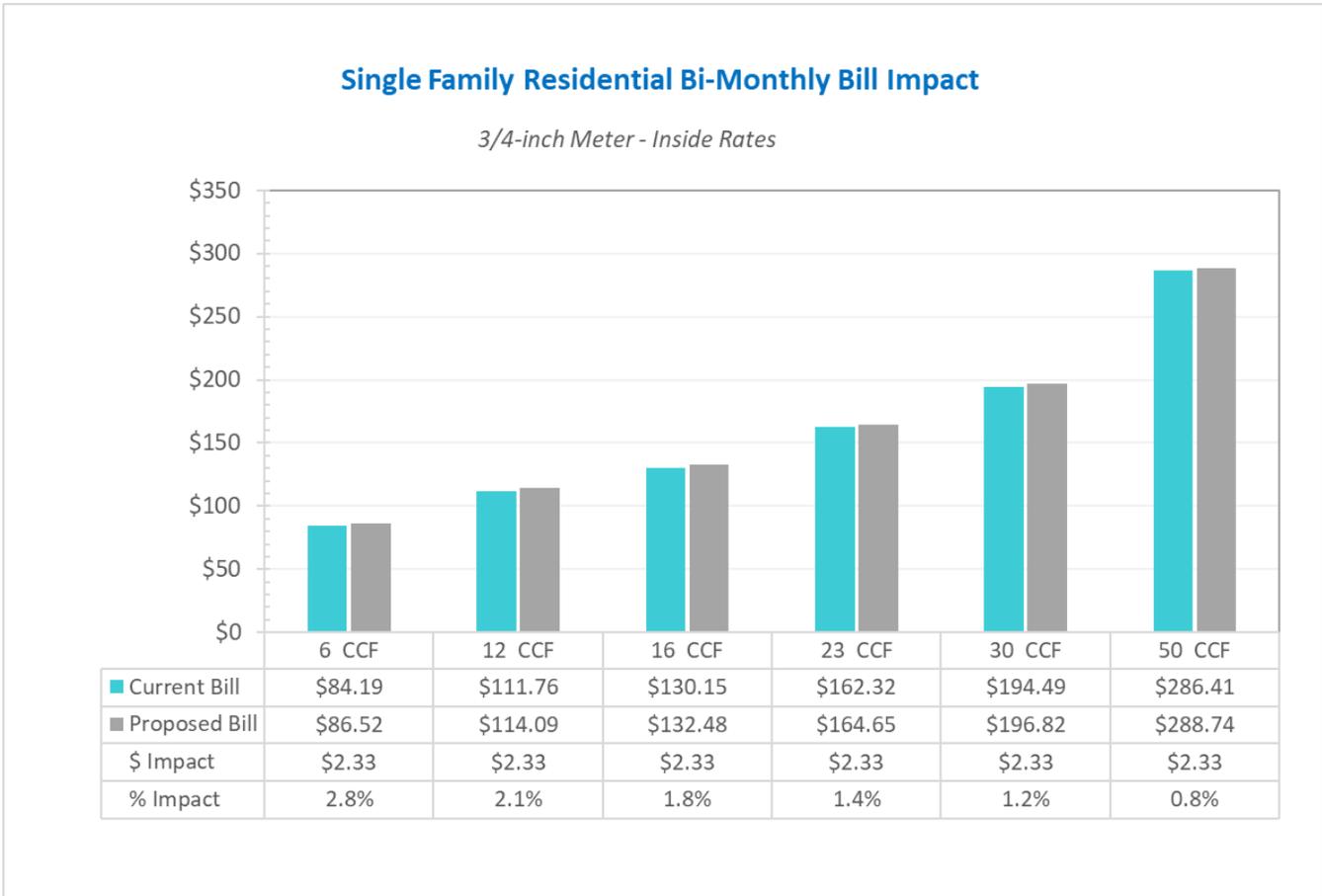


Figure 6-2 shows the water bills for commercial customers with a 2-inch meter for a bi-monthly billing period at various water consumption levels under current and proposed rates. The bi-monthly water bills under the current rates are illustrated by the blue bars and the bi-monthly water bills assuming the proposed March 1, 2022 rates are shown by the grey bars. The dollar and percentage impact at each usage level is detailed in the embedded table. There is no change to the proposed, uniform water commodity rate and therefore the dollar impact is uniform across all levels of use.

Figure 6-2: Commercial Customer Sample Bill Impacts

Commercial Bi-Monthly Bill Impact

2-inch Meter - Inside Rates



7. Water Shortage Emergency Stage Rates

7.1. Water Shortage Emergency Stage Rates Background

This section documents the development of water shortage emergency stage rates (stage rates) to be implemented only during water shortage emergency situations (the District first adopted stage rates in 2019, but has not implemented them because it has not experienced a water shortage emergency during that time). This section provides an overview of the water shortage emergency stages, corresponding revenue impacts, stage rate calculations, and a summary of proposed commodity rates, at each stage, effective March 1, 2022. The process for activating stage rates is described in detail. The stage rates calculated in this section are separate, supplemental charges that are independent from the commodity rates derived in Section 6.

Water shortage emergencies can have significant impacts on an agency's financial stability. Depending upon water supply sources, fixed and variable costs, and other revenue sources, water sales reductions can have a significant effect on revenues. Raftelis recommends that the District utilize stage rates as part of a cohesive and fiscally sound response to water shortage emergencies. Stage rates are a mechanism to maintain revenue stability and achieve debt coverage requirements during a water shortage emergency.

The District wished to update the stage rates using the existing methodology. With District direction, Raftelis updated the uniform \$/CCF stage rates under six different water shortage emergency stages. The percent reduction in water demand during each water shortage emergency stage is defined in the District's Water Shortage Contingency Plan from its updated 2020 Urban Water Management Plan (UWMP) and is summarized below in Table 7-1. District staff has added additional stages to include possible Statewide water conservation water reduction targets, shown as the divisions of Stages 2a & 2b and 3a & 3b. Stage 0 represents normal baseline water demand conditions. During Stage 0, no stage rates are in effect. For stage rates to be implemented, each water shortage emergency stage must attain District Board adoption, and customers must be given 30 days advance notice prior to implementation.

Table 7-1 shows projected water sales (in CCF and acre feet (AF)). Stage 0 water sales for FY 2020 were determined in Table 3-2. Water sales for Stage 1 through Stage 6 are determined by decreasing Stage 0 sales by the corresponding demand reduction percentage shown.

Table 7-1: Water Shortage Emergency Stages and Usage Reductions (Effective March 1, 2022)

Line No.	Water Shortage Emergency Stage	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6
1	Reduction in Water Demand	0%	10%	15%	20%	25%	30%	40%	50%	Up to 60%
2	Projected Water Sales (CCF)	16,870,614	15,183,552	14,340,022	13,496,491	12,652,960	11,809,430	10,122,368	8,435,307	7,254,364
3	Projected Water Sales (AF)	38,730	34,857	32,920	30,984	29,047	27,111	23,238	19,365	16,654
4	Projected Water Supply (AF)*	42,143	37,929	35,822	33,715	31,607	29,500	25,286	21,072	18,122

7.2. Derivations of Stage Rates

Stage rates are designed to recover the projected net revenue impact experienced during each water shortage emergency stage. To calculate unit stage rates, Raftelis utilized the following steps:

1. Determine the lost commodity rate revenue at each stage of reduction.
2. Account for variable water supply cost savings which offsets a portion of the reduced revenue.
3. Divide the net revenue loss at each stage by the respective estimated sales volume in that stage.

The projected water sales revenues are calculated using proposed consumption charges and the reduction of estimated water sales (**Table 7-1**) at each stage. Table 7-2 shows the total consumption charge revenue at each stage, calculated by multiplying projected water sales at each stage by the proposed consumption charge. Table 7-2 displays the revenue reduction (labeled as Projected Revenue Loss) at each stage relative to Stage 0, which is the first of two components required later to determine the net revenue reduction at each stage.

Table 7-2: Projected Consumption Charge Revenue by Stage

Line No.	Projected Consumption Charge Revenue By Stage	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6
1	Reduction in Water Demand	0%	10%	15%	20%	25%	30%	40%	50%	Up to 60%
2	Projected Water Sales (CCF)	16,870,614	15,183,552	14,340,022	13,496,491	12,652,960	11,809,430	10,122,368	8,435,307	7,254,364
3	March 1, 2022 Consumption Charge	\$4.596	\$4.596	\$4.596	\$4.596	\$4.596	\$4.596	\$4.596	\$4.596	\$4.596
4	Base Revenue	\$77,537,341	\$69,783,607	\$65,906,740	\$62,029,873	\$58,153,006	\$54,276,139	\$46,522,405	\$38,768,670	\$33,341,057
5	Projected Revenue Loss	\$0	\$7,753,734	\$11,630,601	\$15,507,468	\$19,384,335	\$23,261,202	\$31,014,936	\$38,768,670	\$44,196,284

Water supply cost savings represents the second component used to determine net revenue reduction at each stage. As water sales decrease by stage, the District's variable water supply costs will also decrease, resulting in a partial offset of the loss in commodity charge revenue at each stage.

Table 7-3 outlines the determination of the reduction in purchased water supply variable costs as water demand is reduced at each stage. The total water supply required at each stage was determined previously in Table 7-1. Projected variable water supply costs in Table 7-3 are determined by multiplying the unit rate for each supply source by the corresponding AF supplied for each stage. Projected water supply cost savings represent the reduction in variable water supply costs at each stage relative to Stage 0 variable water supply costs. For example, to determine the water supply cost savings in Stage 1 Line 11, Stage 1 column costs (\$18,178,497) is subtracted from the Line 11 Stage 0 column costs (\$18,411,597) to yield the water supply cost savings.

Table 7-4 shows the derivation of the proposed stage rates. Net revenue loss in each stage can then be determined by subtracting the projected water supply cost savings (from Table 7-3) from the projected commodity charge revenue loss (Table 7-2). Unit stage rates are then determined by dividing the net revenue loss at each stage by the corresponding projected water sales in CCF (from Table 7-1). The unit stage rate is therefore designed to recover the anticipated reduction in net revenues during each water shortage emergency stage.

Table 7-3: Projected Variable Water Supply Cost Savings by Stage

Line No.	Water Shortage Emergency Stage	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6	
1	Reduction in Water Demand	0%	10%	15%	20%	25%	30%	40%	50%	Up to 60%	
2	Projected Water Supply	42,143	37,929	35,822	33,715	31,607	29,500	25,286	21,072	18,122	
3											
4	Projected Water Supply By Source										
5	SFPUC - Min	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	
6	Groundwater - Min	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	8,602 AF	
7	Desal Water - Min	8,470 AF	8,470 AF	8,470 AF	8,470 AF	8,470 AF	8,470 AF	8,083 AF	3,868 AF	918 AF	
8	Lake Del Valle	5,800 AF	5,800 AF	5,800 AF	5,800 AF	5,800 AF	3,827 AF	0 AF	0 AF	0 AF	
9	SWP	10,670 AF	6,456 AF	4,349 AF	2,241 AF	134 AF	0 AF	0 AF	0 AF	0 AF	
10											
11	Projected Variable Water Supply Costs	\$18,411,597	\$18,178,497	\$18,061,947	\$17,945,397	\$17,828,847	\$17,821,424	\$17,761,942	\$17,114,664	\$16,661,570	
12	Projected Water Supply Costs Savings	\$0	\$233,100	\$349,650	\$466,200	\$582,750	\$590,173	\$649,656	\$1,296,933	\$1,750,027	

Table 7-4: Derivation of Unit Stage Rates

Line No.	Derivation of Unit Stage Rates	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6
1	Reduction in Water Demand	0%	10%	15%	20%	25%	30%	40%	50%	Up to 60%
2										
3	Projected Revenue Loss	\$0	\$7,753,734	\$11,630,601	\$15,507,468	\$19,384,335	\$23,261,202	\$31,014,936	\$38,768,670	\$44,196,284
4	Projected Water Supply Cost Savings	\$0	\$233,100	\$349,650	\$466,200	\$582,750	\$590,173	\$649,656	\$1,296,933	\$1,750,027
5	Net Revenue Loss	\$0	\$7,520,634	\$11,280,951	\$15,041,268	\$18,801,585	\$22,671,029	\$30,365,281	\$37,471,737	\$42,446,257
6										
7	Projected Water Sales (CCF)	16,870,614	15,183,552	14,340,022	13,496,491	12,652,960	11,809,430	10,122,368	8,435,307	7,254,364
8										
9	Unit Stage Rate (\$/CCF)	\$0.000	\$0.496	\$0.787	\$1.115	\$1.486	\$1.920	\$3.000	\$4.443	\$5.852

7.3. Proposed Stage Rates

Table 7-5 shows the proposed stage rates. Reduction in water demand and projected water sales were previously shown in Table 7-1. The unit stage rates were calculated in Table 7-4. The Inside District and Outside District consumption charges at each water shortage emergency stage are determined simply by adding the unit stage rate to the proposed consumption charges (Table 6-3). This represents the effective dollar amount each customer will be charged per CCF of water delivered during each stage declaration. All stage rates are rounded up to the nearest tenth of a cent.

Table 7-5: Proposed Stage Rates for Rate Increases

Line No.	Water Shortage Emergency Stage	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6
1	Reduction in Water Demand	0%	10%	15%	20%	25%	30%	40%	50%	Up to 60%
2	Projected Water Sales	38,730 AF	34,857 AF	32,920 AF	30,984 AF	29,047 AF	27,111 AF	23,238 AF	19,365 AF	16,654 AF
3										
4	Effective March 1, 2022	Proposed Rates								
5	Unit Stage Rate	\$0.000	\$0.496	\$0.787	\$1.115	\$1.486	\$1.920	\$3.000	\$4.443	\$5.852
6	Consumption Charge (Inside District)	\$4.596	\$5.092	\$5.383	\$5.711	\$6.082	\$6.516	\$7.596	\$9.039	\$10.448
7	Consumption Charge (Outside District)	\$5.253	\$5.749	\$6.040	\$6.368	\$6.739	\$7.173	\$8.253	\$9.696	\$11.105

Table 7-6 shows a comparison of the Prior and Proposed Stage Rates, with and without the consumption charge. Each stage's total consumption and stage rate charge was calculated with commodity rates for an Inside customer in March 2022.

Table 7-6: Comparison of Proposed and Current Stage Rates

Line No.	Water Shortage Emergency Stage	Stage 0	Stage 1	Stage 2a	Stage 2b	Stage 3a	Stage 3b	Stage 4	Stage 5	Stage 6
1	Prior (FY 2020) Stage Rates	\$0.000	\$0.493	N/A	\$1.109	N/A	\$1.905	N/A	\$4.412	N/A
2	March 1, 2022 Stage Rates	\$0.000	\$0.496	\$0.787	\$1.115	\$1.486	\$1.920	\$3.000	\$4.443	\$5.852
3	Difference	\$0.000	\$0.003	N/A	\$0.006	N/A	\$0.015	N/A	\$0.031	N/A

7.4. Process for Activating Water Shortage Emergency Stage Rates

Water Code Section 350 and Section 31026 authorizes ACWD's Board to declare a water shortage emergency when it determines that ordinary water demands cannot be met without depleting water supplies to the extent that there would be insufficient water for human consumption, sanitation, and fire protection. On an annual basis, staff assesses imported and local water supplies, current & forecasted demand, and production constraints as follows:

Beginning each December, staff compiles projected supplies and compares them to projected demands. The comparison is called the "Water Supply Outlook" and is typically presented at Board Committee meetings to keep the Board informed of water supply conditions. The following process is used:

1. Assess Current Year Supply Volumes
 - a. Determine available water from the SWP
 - b. Determine available water from the SFPUC
 - c. Determine volumes of local groundwater and surface water available
2. Assess current and forecasted demand
 - a. Use most recent UWMP patterns, and make refinements based on recent actual demands and projected near-term development projects coming online
3. Optimize ACWD production
 - a. ACWD optimizes production from various facilities to meet demands, water quality, available supplies, and reduce cost
4. Monthly re-assess supplies, demands, and production schedules until the final SWP allocation is known or if conditions significantly change

If dry conditions persist, ACWD will arrange the Semitropic Groundwater Banking accounts to return previously banked water to supplement supplies. To the extent that there are no constraints on the conveyance of water, ACWD will return Semitropic supplies sufficient to meet Water Production Targets and maintain the Niles Cone Groundwater levels above-identified thresholds (per the District's Urban Water Management Plan). If additional supplies are needed, ACWD also will seek dry-year transfer supplies. The Water Supply Outlook typically becomes finalized around April or May, when the majority of rainfall has occurred, and final allocations are received from the SWP and SFPUC. In extremely dry conditions, demands could be projected to exceed supplies even with supplemental supplies such as Semi-tropic withdrawal and dry year transfers. In such cases, ACWD may draw on local groundwater storage from the Niles Cone Groundwater Basin. While the dry-year storage is intended to be used during dry periods, it may not be sufficient for an extended dry period: the groundwater system requires replenishment from freshwater sources, without which saltwater intrusion would occur.

According to its adopted UWMP, ACWD limits the use of local groundwater dry-year storage to no more than 10,000 AF/year. The ACWD UWMP may trigger 10% shortage conditions earlier in water shortage emergencies but helps prevent the need to trigger 20% or more drastic shortage conditions in longer water shortage emergencies. The long-term critical minimum operating levels, as measured in ACWD's two primary indicator monitoring wells, are +15 feet Mean Sea Level (MSL) for the Above Hayward Fault sub-basin and 0 feet MSL for the Below Hayward Fault (BHF) sub-basin. However, a short-term level of -5 feet MSL at the BHF indicator well is the expected worst case for a multi-year critical drought and represents the minimum temporary operating elevation that can occur without inducing long-term damage to the groundwater basin provided it is a temporary and an end-of-drought endpoint. The UWMP protects the sub-basins from long-term damage from potential saltwater intrusion from the

neighboring San Francisco Bay (specific for the Below Hayward Fault sub-basin) and maintains the production capacity of the District's and local private well owners' wells.

If demands cannot be met within this framework of assessing all available water supplies, optimizing ACWD production, and determining water demand, the Board would consider declaring a water shortage emergency, which can only be declared by the Board at a properly noticed public hearing in accordance with Water Code Sections 350 et seq. and Water Code Sections 31026 et seq. The Ordinance that declares a water shortage emergency would specify the emergency stage, authorize specified water use restrictions and the appropriate stage rate, and take any other necessary actions. Following Board adoption of a water shortage emergency stage ordinance, the District would provide customers with 30 days advance notice of stage rate implementation.

Stage rates have been developed based on the water shortage emergency stages defined in the District's Water Shortage Contingency Plan, which is established in its 2020 UWMP.

The proposed stage rates were calculated to recover the lost revenue from reduced water use during a water shortage emergency. District operating costs could increase or decrease during a water shortage emergency, depending on its cause. However, for purposes of the analysis, the District assumed minor cost reduction from lower water delivery costs.

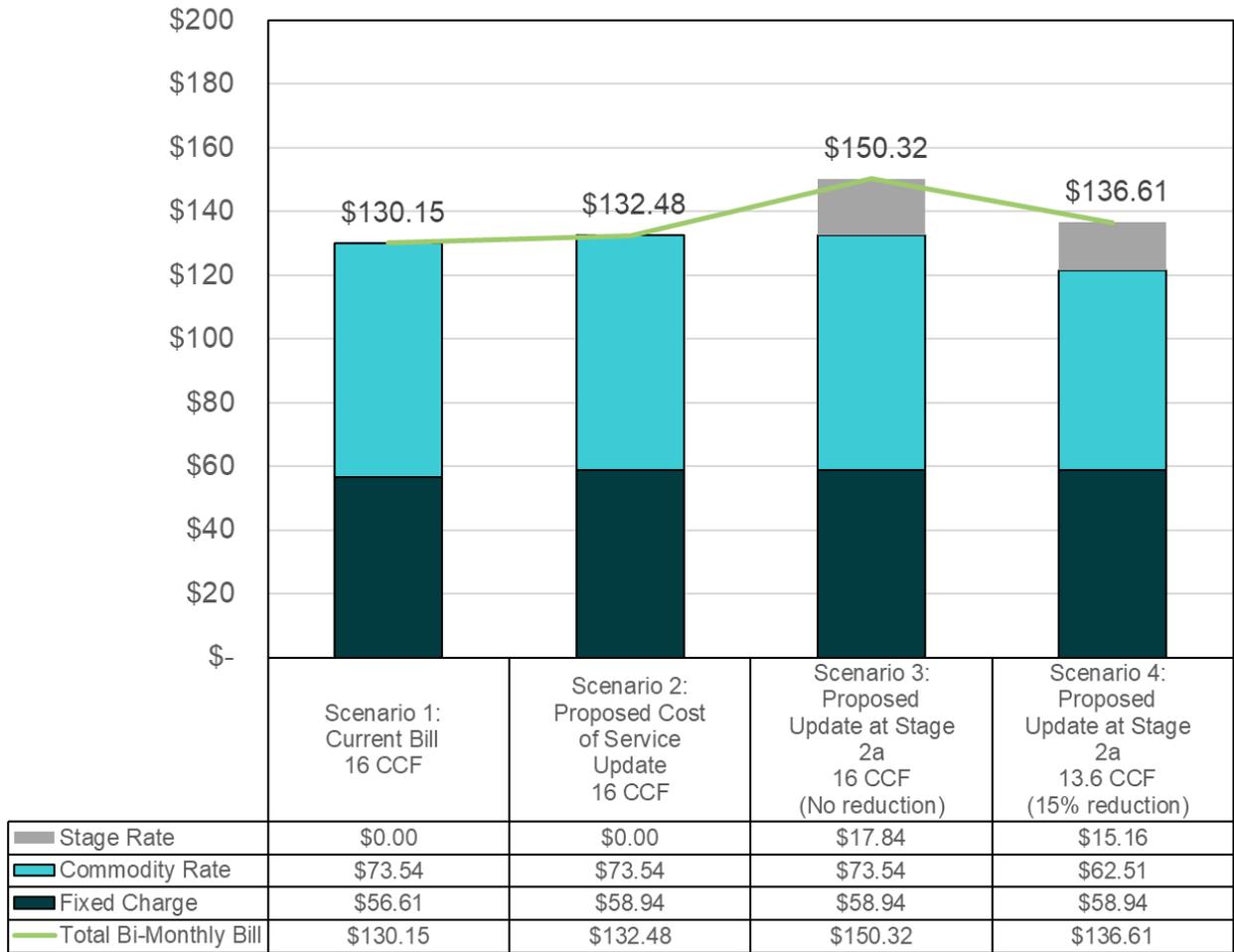
7.5. Water Shortage Emergency Stage Rates Customer Impact Analysis

Figure 7-1 shows a sample bi-monthly bill for a District customer with a 3/4-inch meter under four different scenarios:

1. Bi-Monthly usage of 16 CCF charged at current rates
2. Bi-Monthly usage of 16 CCF charged at proposed effective March 1, 2022 rates with no water shortage (Stage 0)
3. Bi-Monthly usage of 16 CCF charged at proposed effective March 1, 2022 rates under Stage 2a emergency water shortage (15% demand reduction, but no customer conservation)
4. Bi-Monthly usage of 13.6 CCF charged at proposed effective March 1, 2022 rates under Stage 2a emergency water shortage (20% demand reduction and 15% customer conservation)

Each scenario is represented by a stacked bar in Figure 7-1 below. Note that scenarios 1 and 2 are identical to the sample bi-monthly bills at 16 CCF of usage shown previously in Figure 6-1. Scenario 3 shows that a customer with a 3/4" meter consuming 16 CCF per bi-monthly billing period will see an \$17.84 increase in the bi-monthly bill during a declared Stage 2 water emergency shortage relative to no water shortage (Scenario 2). The \$17.84 represents additional revenue collected when Stage 2a unit rates are in effect. Scenario 4 demonstrates that the same sample customer can avoid such a bill increase during a declared Stage 2a water shortage emergency by reducing bi-monthly water usage by 15% from 16 CCF to 13.6 CCF.

Figure 7-1: Sample SFR Bi-Monthly Bills with Stage 2 Water Shortage



1. Appendix A

This Appendix summarizes the revenues, operations and maintenance (O&M) expenses, capital expenditures, reserve policies, and debt coverage requirements that determine the District Board of Directors-approved FY 2022 revenue adjustment. The District provided Raftelis the FY 2022 and FY 2023 budgets as the baseline for future projections. This financial plan summary utilizes the Financial Planning Model (FPM) developed by Raftelis for the District's 2015 and 2018 Water Rate Studies. District staff provided Raftelis with an FPM model updated with the most recent financial information available at the time of analysis, including FY 2022 budget, the adopted Capital Improvement Program (CIP), and Board direction provided at Financial Workshops from August through October of 2021. The financial plan includes updated water supply costs, a five-year billed water demand forecast, as well as revised assumptions associated with cost escalations, projected account growth, and CalPERS pension/OPEB advance funding options.

The FPM utilized the following foundational information provided by the District¹:

1. FY 2020 and FY 2021 Actual revenues and expenses
2. FY 2022 Budgeted revenues and expenses
3. FY 2023 cost escalation factors
4. District reserve policies
5. Adopted CIP
6. Water supply cost projections
7. Beginning fund balances as of July 1, 2021
8. Bi-monthly billing data extracts for all water accounts in FY 2021
9. Direction regarding supplemental funding for Pension/OPEB liabilities
10. Updated Costs for the Delta Conveyance Project

Table A-1 shows the inflationary factors used for revenue and expense projections.

Table A-1: Cost Escalation Factors

Line No.	Cost Escalation Factors	FY 2023	Inflation Factor Basis
1	General	3%	Staff Input
2	Salary	3%	Staff Input
3	Benefits	4%	Staff Input
4	CalPERS (Normal Cost %)	12%	CalPers Normal Cost Percentage
5	Medical	1%	Staff Input
6	OPEB	3%	Staff Input
7	Utilities	5%	Energy Inflation Estimate
8	Capital Inflation	3%	ENR CCI 20-year average
9	SFPUC Water Cost (%)	5%	SFPUC Staff Projection (FY 2021)
10	Interest Earnings	1%	Historical Performance
11	Non-Rate Revenues	Staff discretion	Based on Projections

Table A-2 shows the projected number of water connections by meter size for each fiscal year. The number of connections each year is projected to increase by 639 connections, spread across the 5/8-inch, 1-inch, and 2-inch meter sizes. District policy states that all residential fireline accounts shall be billed based on the smallest meter capable of providing adequate service, absent the fire sprinkler system for any residential fire line accounts. The total

¹ Based on data available to the District as of December 2021.

number of water accounts and the shift in account totals at each meter size in FY 2022 reflect this policy's implementation for the total number of accounts.

Table A-2: Actual and Projected Account Totals by Meter Size

Line No.	Meter Size	FY 2020	FY 2021	FY 2022	FY 2023
	Inches	Actuals	Actuals	Projected	Projected
1	5/8	22,105	22,023	22,483	22,943
2	3/4	50,091	50,736	50,246	50,246
3	1	5,768	6,161	6,806	6,961
4	1 1/2	2,252	1,778	1,778	1,778
5	2	2,908	2,920	2,944	2,968
6	3	224	231	231	231
7	4	111	117	117	117
8	6	60	62	62	62
9	8	26	26	26	26
10	10	3	3	3	3
11	Total	83,548	84,057	84,696	85,335

Table A-3 shows the total water demanded (actuals and projections) for FY 2020 through FY 2023. Projections are based on normal conditions. Due to current drought conditions, the District may declare a water shortage emergency and expect demand levels to decline consistent with the declared emergency.

Table A-3: Actual and Projected Water Demand

Line No.	Description	FY 2020	FY 2021	FY 2022	FY 2023
		Actuals	Actuals	Projected	Projected
1	Total Billed Demand in AF	38,730	40,824	39,274	39,213
2	Total Billed Demand in MGD	35	36	35	35

1.1. Projected Revenues

Table A-4 summarizes actual revenues for FY 2020 & FY 2021, budgeted revenues for FY 2022, and projected revenues FY 2023, respectively. Total revenues include both rate revenues and non-rate revenues.

Line 1 shows rate revenues, which is inclusive of the proposed March 1, 2022 revenue adjustment (FY 2023 Projected column), projected water use, and account growth shown in Tables A-2 and A-3. Lines 2-7 are non-rate, miscellaneous revenues which offset (reduce) total water costs. The miscellaneous revenue sources are property taxes, other revenues (primarily the equity buy-in portion of the connection fees and grants for capital projects), interest revenues, etc. In addition to the ad valorem property tax revenues received from the Alameda County Assessor (County), the District receives an override property tax amount that helps pay for the groundwater portion of both the fixed and variable costs of SWP water purchased by the District. The District projects such costs annually and requests that the County collect the projected amount. The annual request to the County is adjusted for the prior year over or under collections of tax revenue and actual prior year's State Water Project expenses. Customer jobs revenue include developers' payments for capital expenditures, benefitting specific development projects. Other revenues include revenues from fire line service charges, backflow testing charges, account establishment charges, the buy-in component of facilities connection charges, fire flow testing, lease of property, scrap sales, sales of fixed

assets, grants, reimbursements, licenses/permits, late bill payment fees, residential service line insurance, and other minor miscellaneous revenues.

Table A-4: Projected Revenues

Line No.	Revenues	FY 2020	FY 2021	FY 2022	FY 2023
		Actuals	Actuals	Budget	Projected
1	Water Revenues (From Rates)	\$112,622,905	\$120,050,246	\$117,356,605	\$120,487,030
2	Groundwater Replenishment Revenues	\$539,257	\$498,758	\$578,688	\$587,887
3	State Water Contract Tax	\$5,594,473	\$5,581,306	\$6,089,504	\$5,923,590
4	Ad Valorem Property Tax (1%)	\$6,883,716	\$6,952,806	\$7,189,201	\$7,433,634
5	Interest revenues	\$2,338,176	\$2,330,941	\$1,731,875	\$1,706,854
6	Customer Jobs Revenue	\$3,271,635	\$1,438,633	\$940,000	\$1,230,000
7	Other Revenues	\$13,468,372	\$14,943,253	\$15,016,316	\$7,998,531
8	Total	\$144,718,533	\$151,795,943	\$148,902,189	\$145,367,526

1.2. Expenses

Table A-5 summarizes actual, budgeted, and projected O&M expenses. FY 2023 projects from the District's FY 2022 budget values and inflation factors discussed in Table A-1. Note that the CalPERS/OPEB costs for advance funding are in addition to CalPERS and OPEB costs included in the District's O&M budget. The District is planning to continue its advance funding of CalPERS pension and OPEB liabilities to achieve full funding by June 30, 2032.

Table A-5: Actual and Projected O&M Expenses

Line No.	O&M Category	FY 2020	FY 2021	FY 2022	FY 2023
		Actuals	Actuals	Budget	Projected
1	Source of Supply	36,823,601	41,910,490	44,903,496	43,622,034
2	Pumping	1,574,042	1,874,514	2,483,944	2,527,793
3	Water Treatment	15,423,107	14,799,748	17,185,868	17,541,927
4	Transmission & Distribution	14,902,754	15,086,404	14,489,075	15,353,230
5	Customer Accounts	1,983,256	4,550,740	5,440,770	5,583,628
6	Administrative & General	17,112,198	17,746,641	16,067,364	17,115,636
7	Expense Projects	1,343,848	4,512,464	4,103,998	5,032,296
8	Other O&M Expenses	82,500	0	1,000,000	2,000,000
9	Pension/OPEB Additional Funding	5,975,000	5,505,916	5,865,710	5,015,455
10	Total O&M Expenses	95,220,307	105,986,918	111,540,225	113,792,000

1.3. Debt Service

Table A-6 shows the annual debt service associated with the two existing revenue bonds. The District issued the 2015 Water Revenue Bonds to execute critical capital projects, including seismic hardening of significant water mains and storage facilities, replacing aging infrastructure, improving water supply reliability, and improving water quality and production reliability. Additionally, the District plans to partially fund AMI project costs with additional debt issues, totaling \$19.5M. Total annual debt service is determined by summing the current and proposed debt service.

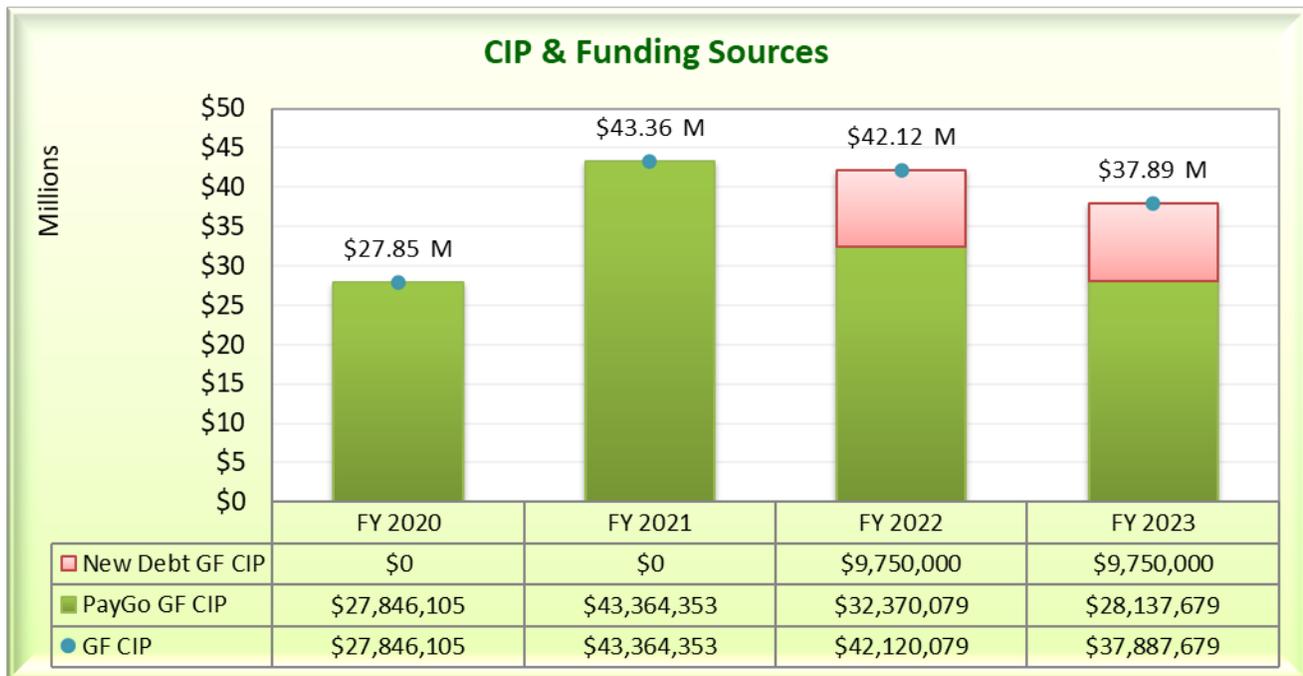
Table A-6: Annual Debt Service

Line No.	Description	FY 2020	FY 2021	FY 2022	FY 2023
1	Current Debt	\$6,377,406	\$5,529,281	\$5,478,531	\$5,423,031
2	Proposed Debt	\$0	\$0	\$0	\$1,102,486
3	Total Debt Service	\$6,377,406	\$5,529,281	\$5,478,531	\$6,525,517

1.4. Capital Improvement Program

The District has programmed approximately \$151 Million in Capital expenditures between FY 2020 and FY 2023. Figure A-1 graphically summarizes the projected capital expenditures funded by the General Fund over the four year horizon. The District plans to fund its capital projects over the period with the combination of PAYGO funding and proceeds from new borrowings. The figure below only shows capital expenditures associated with the General Fund and excludes CIP associated with the Facilities Improvement Fund, funded using Facilities Connection Charges.

Figure A-1: Capital Expenditures and Funding Sources



1.5. Proposed Financial Plan

Table A-7 shows the proposed financial plan, incorporating the increases in rate revenues consistent with the proposed adjustments (Section 6), projected revenues (Table A-4), O&M expenses (Table A-5), annual debt service payments (Table A-6), and capital improvement projects (Figure A-1). The financial plan shows the annual cash flow and projects the District’s debt coverage ratio and projected ending General Fund (shown as GF in the table) balance through FY 2023.

Although the net general fund cash balance shows a deficit in FY 2021 through FY 2023 due to the planned expenditures in capital facilities during those years, the overall reserve account balance will remain above the target

General Fund balance. Additionally, the debt coverage ratio exceeds the target debt coverage ratio of 200% in FY 2023. In summary, the proposed revenue adjustment of 2% (effective March 1, 2022) ensures financial sufficiency and solvency for the District to meet projected expenditures and financial obligations, including debt service, debt coverage, and reserve targets while funding CIP projects. Available reserves will be expended in future years as demonstrated in Figure A-4.

Table A-7: Actual and FY 2023 Projected Financial Plan

Line No.	Description	FY 2020	FY 2021	FY 2022	FY 2023
		Actuals	Actuals	Budget	Projected
1	Revenues				
2	Revenue from Water Rates	\$112,622,905	\$120,050,246	\$117,356,605	\$120,487,030
3	Groundwater Replenishment Revenues	\$539,257	\$498,758	\$578,688	\$587,887
4	State Water Contract Tax	\$5,594,473	\$5,581,306	\$6,089,504	\$5,923,590
5	Ad Valorem Property Tax (1%)	\$6,883,716	\$6,952,806	\$7,189,201	\$7,433,634
6	Interest revenues	\$2,338,176	\$2,330,941	\$1,731,875	\$1,706,854
7	Customer Jobs Revenue	\$3,271,635	\$1,438,633	\$940,000	\$1,230,000
8	Other Revenues	\$13,468,372	\$14,943,253	\$15,016,316	\$7,998,531
9	Total Revenues	\$144,718,533	\$151,795,943	\$148,902,189	\$145,367,526
10					
11	Expenses				
12	Water Related Supply Costs	\$34,140,237	\$34,907,581	\$35,378,833	\$36,181,420
13	Pension/OPEB Additional Funding	\$5,975,000	\$5,505,916	\$5,865,710	\$5,015,455
14	Other O&M Expenses	\$55,105,070	\$65,573,420	\$70,295,683	\$72,595,125
15	Total Expenses	\$95,220,307	\$105,986,918	\$111,540,225	\$113,792,000
16					
17	Net Revenues	\$49,498,226	\$45,809,025	\$37,361,964	\$31,575,527
18					
19	Rate Funded CIP				
20	PayGo	\$27,846,105	\$43,364,353	\$32,370,079	\$28,137,679
21	Total Rate Funded CIP	\$27,846,105	\$43,364,353	\$32,370,079	\$28,137,679
22					
23	Debt Service				
24	Existing Debt Service	\$6,377,406	\$5,529,281	\$5,478,531	\$5,423,031
25	New Debt Service	\$0	\$0	\$0	\$1,102,486
26	Total Debt Service	\$6,377,406	\$5,529,281	\$5,478,531	\$6,525,517
27					
28	Net Cash Balance	\$15,274,715	(\$3,084,609)	(\$486,646)	(\$3,087,670)
29					
30	Debt Coverage w/o 1% Tax Rev	796%	776%	588%	413%
31	Debt Coverage w/o Tax Rev & SWP Tax	708%	675%	476%	322%
32	Target Debt Coverage Ratios	200%	200%	200%	200%
33					
34	Beginning GF Balances	\$107,571,386	\$123,822,311	\$123,948,646	\$123,462,000
35	Ending GF Balances	\$123,822,311	\$123,948,646	\$123,462,000	\$120,374,330
36	Target GF Balances	\$62,981,060	\$65,260,185	\$62,388,994	\$63,330,357
37	Debt Coverage Ratio	904%	901%	719%	527%

Figure A-2 illustrates the operating financial plan. Reserve funding includes general fund transfers reserves and cash funded CIP expenses.

Figure A-2: Operating Financial Plan

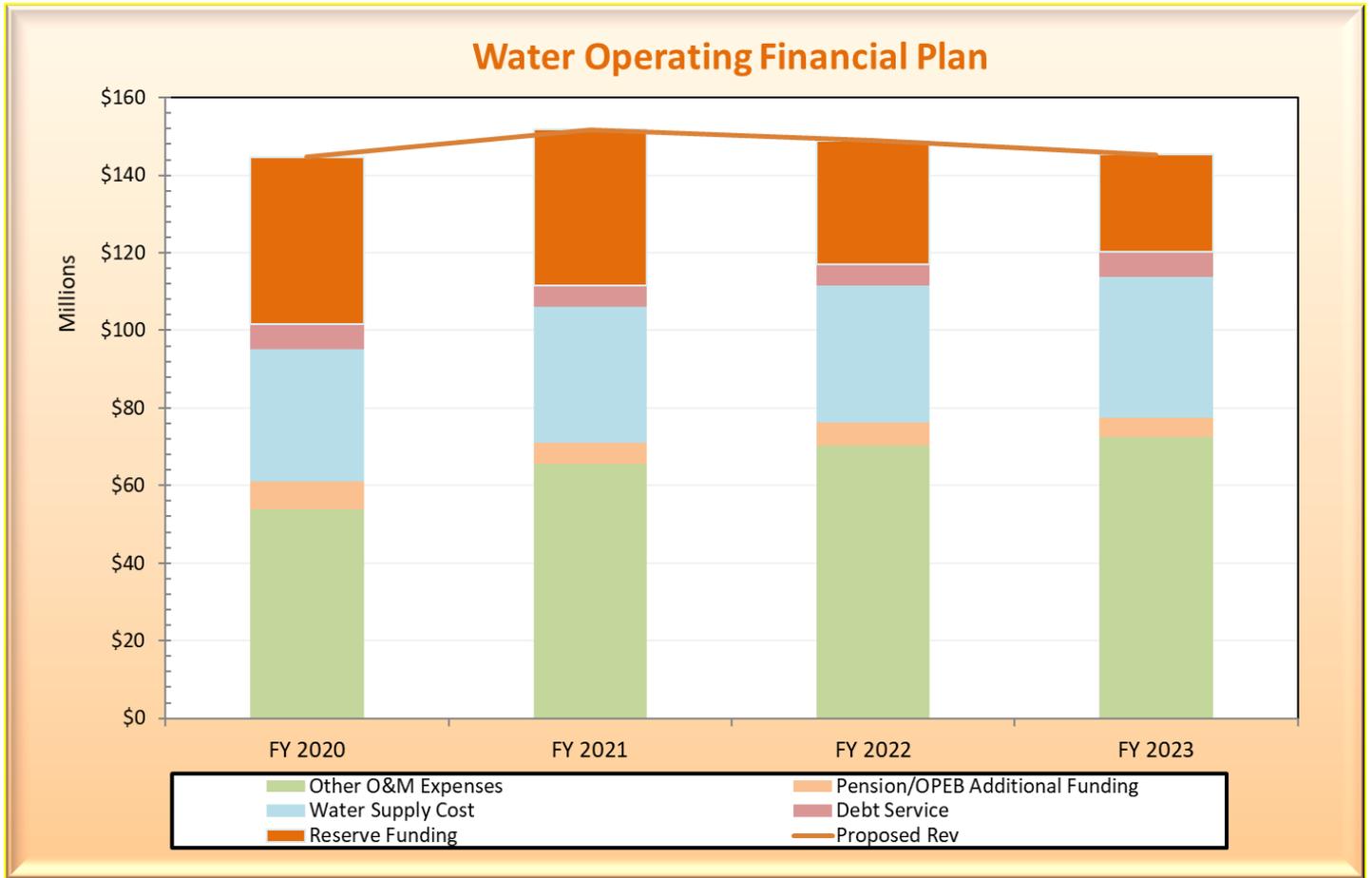


Figure A-3 illustrates how proposed revenues will ensure that the District's projected debt coverage exceeds its 200% debt coverage target set by the District Board in its financial policies. The proposed adjustments bolster the District's projected debt coverage in FY 2023 and assist the District in maintaining its credit rating.

Figure A-3: Projected Debt Coverage Ratios

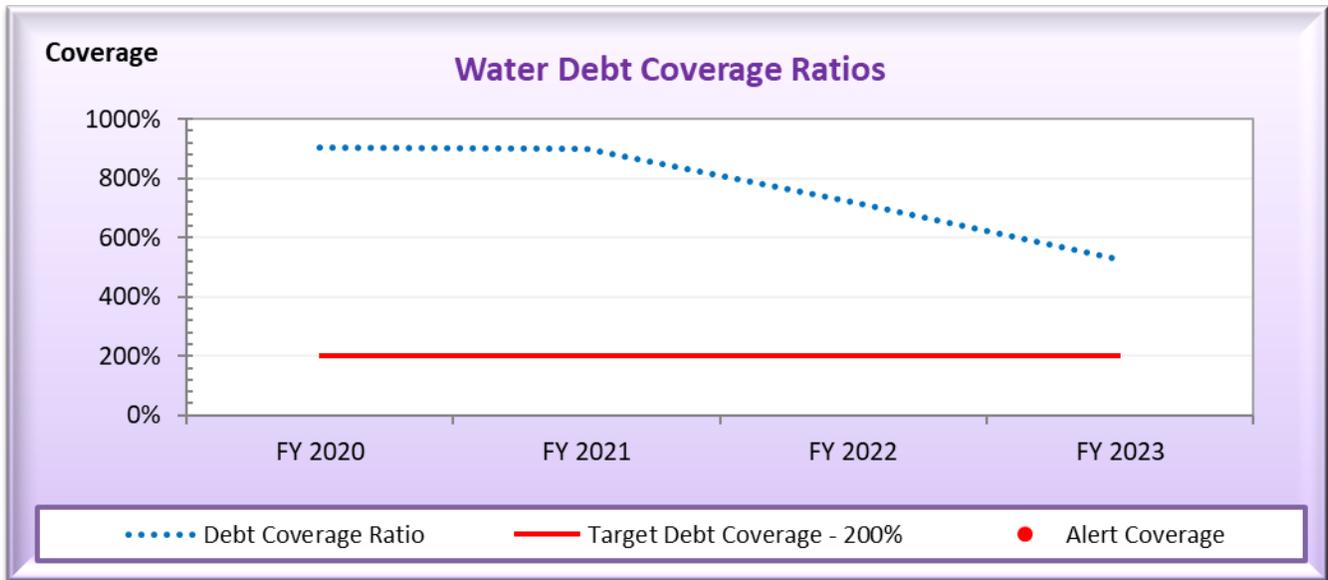
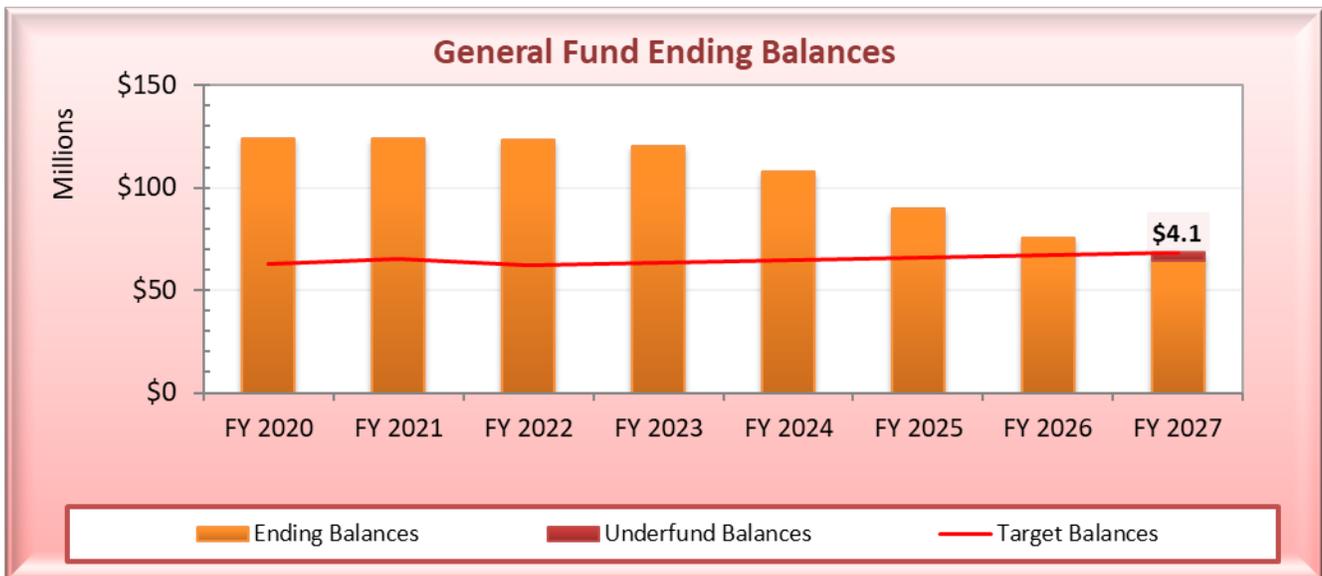


Figure A-4 includes an additional four years of projections from the District’s FPM and shows that while projected General Fund ending balances exceed the minimum target balances in the current year under the proposed financial plan, those balances will be spent down over several years. It is common for an agency to exceed its minimum reserve target in providing risk protection against volatile water sales and water supply conditions as well as other unknown risks and unforeseen conditions, and to limit the risk of significant future rate increases. With the revenue adjustments in the proposed financial plan, the District will maintain its reserves in FY 2023.

Figure A-4: Projected Fund Ending Balances



Line No.	O&M Functions	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Backflow Service Admin	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(J)	(K)
22	Purchased Water-Other	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	-\$220,800
23	Subtotal - Source of Supply	Supply	\$35,396,553	\$1,962,437	\$1,275,584	\$0	\$0	\$0	\$0	\$0	\$0	\$38,634,574
24												
25	Pumping											
26	Operation of Prod Wells	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$25,235
27	Operation of Booster Pumps	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$7,389
28	Operation of Desal Supply	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$16,993
29	Maintenance of Booster Pumps	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$1,635,732
30	Maintenance of SCADA System	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$399,193
31	Subtotal - Pumping		\$0	\$1,263,359	\$821,183	\$0	\$0	\$0	\$0	\$0	\$0	\$2,084,542
32												
33	Water Treatment											
34	Operation of Blending Facility	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$802,775
35	Oper of Water Treatment Plant #1	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$250,916
36	Oper of Water Treatment Plant #2	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$5,919,937
37	Operation of Desalination Facility	Max Day	\$0.00	\$0.61	\$0.39	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,004,515
38	Operations Tech Support	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$1,348,134
39	Maintenance of Blending Facility	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$589,394
40	Maint of Water Treatment Plant #1	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$250,288
41	Maint of Water Treatment Plant #2	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$2,172,505
42	Maintenance of Desalination Plant	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$1,430,304
43	Laboratory Services	Max Day	0%	61%	39%	0%	0%	0%	0%	0%	0%	\$3,310,602
44	Subtotal - Water Treatment		\$0	\$10,351,134	\$6,728,237	\$0	\$0	\$0	\$0	\$0	\$0	\$17,079,370
45												
46	Transmission & Distribution											
47	Engineering of Distrib System	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$2,406,037
48	Operation of Distrib System	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$2,751,009

Line No.	O&M Functions	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Backflow Service Admin	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(J)	(K)
49	Maintenance of Reservoirs	Max Hour	\$0.00	\$0.40	\$0.26	\$0.33	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$1,048,366
50	Maintenance of Mains	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$2,067,451
51	Maintenance of Cathodic Stations	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$41,340
52	Maintenance of Service Lines	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$1,438,977
53	Maintenance of Meters	Meters	0%	0%	0%	0%	0%	100%	0%	0%	0%	\$868,014
54	Maintenance of Fire Hydrants	Fire Protection	0%	0%	0%	0%	0%	0%	100%	0%	0%	\$225,065
55	Maintenance of Backflow Preventers	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$461,026
56	Maintenance of Distribution System	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$2,130,836
57	Maintenance - Facilities Engineering	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$2,106,659
58	Maintenance of Regulator Stations	Max Hour	0%	40%	26%	33%	0%	0%	0%	0%	0%	\$290,233
59	Subtotal - Transmission & Distribution	\$0.00	\$0	\$5,956,337	\$3,871,619	\$4,913,978	\$0	\$868,014	\$225,065	\$0	\$0	\$15,835,013
60												
61	Subtotal - O&M Expenses - FY 2020 Budget	\$0.00	\$35,396,553	\$19,533,266	\$12,696,623	\$4,913,978	\$0	\$868,014	\$225,065	\$0	\$0	\$73,633,500
62												
63												
64	Delta Conveyance	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	\$786,100
65	Customer Accounts	Customer	0%	0%	0%	0%	100%	0%	0%	0%	0%	\$2,317,800
66	Administrative and General	Admin & General	0%	0%	0%	0%	0%	0%	0%	0%	100%	\$17,124,900
67	OPEB Advanced Funding	Admin & General	0%	0%	0%	0%	0%	0%	0%	0%	100%	\$1,217,000
68	Pension Advanced Funding	Admin & General	0%	0%	0%	0%	0%	0%	0%	0%	100%	\$5,975,000
69	Expense Transfer - Equipment & Overheads	Admin & General	0%	0%	0%	0%	0%	0%	0%	0%	100%	\$0
70	Expense Projects	Admin & General	0%	0%	0%	0%	0%	0%	0%	0%	100%	\$1,283,500

Line No.	O&M Functions	Allocation Basis	Water Supply	Base Delivery	Max Day	Max Hour	Customer Billing	Meter Service	Fire Hydrants	Backflow Service Admin	Admin & General	Total
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)	(J)	(J)	(K)
71	Subtotal A&G/Exp Proj Expenses	\$0.00	\$786,100	\$0	\$0	\$0	\$2,317,800	\$0	\$0	\$0	\$25,600,400	\$28,704,300
72												
73	Total O&M		\$36,182,653	\$19,533,266	\$12,696,623	\$4,913,978	\$2,317,800	\$868,014	\$225,065	\$0	\$25,600,400	\$102,337,800
74												
75												
76	O&M Allocated to Cost Components		\$36,182,653	\$19,533,266	\$12,696,623	\$4,913,978	\$2,317,800	\$868,014	\$225,065	\$0	\$25,600,400	\$102,337,800
77												
78	% Allocation With General		35%	19%	12%	5%	2%	1%	0%	0%	25%	
79	% Allocation Without Admin and General		9%	43%	28%	20%	0%	0%	0%	0%		