YORBA LINDA
Water District

2021 Rate Study Report

Report / April 6, 2021

RAFTELIS

Yorba Linda Water District

RAFTELIS

April 6, 2021

Mrs. Delia Lugo
Finance Manager
Yorba Linda Water District
1717 E Miraloma Ave
Placentia, CA 92870

Subject: Yorba Linda Water District 2021 Rate Study Report

Dear Mrs. Lugo:

Raftelis is pleased to provide this 2021 Rate Study Report (Study) to the Yorba Linda Water District (District) to develop water and sewer rates in compliance with the requirements of Proposition 218 and District objectives. This Report contains:

- The development of a long-term financial plan for the Water and Sewer Enterprise Funds to ensure financial sufficiency for operating and capital obligations.
- A cost-of-service analysis and the development of five-year water and sewer rates that meet the Proposition 218 requirements and District objectives.

It has been a pleasure working with you, and we thank you and the District staff for the support provided during this Study process.

Sincerely,
RAFTELIS

Sanjay Gaur
Vice President

445 S Figueroa St, Suite 1925
Los Angeles, CA 90071
www.raftelis.com

Table of Contents

1. EXECUTIVE SUMMARY 1
1.1. INTRODUCTION 1
1.2. RESERVE POLICY 1
1.3. FINANCIAL PLANS 2
1.4. PROPOSED 5-YEAR WATER AND SEWER RATES 4
1.5. PROPOSED WATER DROUGHT RATES 6
1.6. CUSTOMER IMPACTS 6
2. INTRODUCTION 8
2.1. BACKGROUND 8
2.2. KEY INFORMATION USED IN THE STUDY 8
2.3. FINANCIAL PLAN ASSUMPTIONS 9
3. LEGAL FRAMEWORK AND RATE SETTING METHODOLOGY 10
3.1. CALIFORNIA CONSTITUTION - ARTICLE XIII D, SECTION 6 (PROPOSITION 218) 10
3.1.1. California Constitution – Article X, Section 2 10
3.2. COST-BASED RATE-SETTING METHODOLOGY 11
4. WATER FINANCIAL PLAN AND RATES 13
4.1. WATER FINANCIAL PLAN 13
4.1.1. Current Water Revenues 13
4.1.2. Water O&M Expenses 17
4.1.3. Water Capital Improvement Plan (CIP) 20
4.1.4. Water Debt Service 20
4.1.5. Status Quo Water Financial Plan 20
4.1.6. Proposed Water Financial Plan 23

4.2. WATER COST OF SERVICE ANALYSIS 25
4.2.1. Proportionality 25
4.2.2. Water Cost of Service Analysis 26
4.3. WATER RATE DESIGN 40
4.3.1. Proposed Monthly Fixed Service Charge 40
4.3.2. Proposed Water Use Charges 42
4.3.3. Five Year Water Rate Schedule 43
4.4. WATER CUSTOMER IMPACT ANALYSIS 45
4.5. WATER DROUGHT RATE DEVELOPMENT 45
4.5.1. Water Shortage Stages and Purpose of Drought Rates 45
4.5.2. Financial Impacts of Drought 46
4.5.3. Proposed 5-year Drought Rates 47
5. SEWER FINANCIAL PLAN AND RATES 49
5.1. SEWER FINANCIAL PLAN 49
5.1.1. Current Sewer Revenues 49
5.1.2. Sewer O&M Expenses 50
5.1.3. Sewer CIP Funding 51
5.1.4. Sewer Debt Service 51
5.1.5. Status Quo Sewer Financial Plan 51
5.1.6. Proposed Sewer Financial Plan 53
5.2. SEWER COST OF SERVICE ANALYSIS 56
5.2.1. determine Units of Service 56
5.2.2. Functionalize and Allocate O&M and Capital Costs 56
5.2.3. Determine Revenue Requirement and Allocate Revenue Requirement to Cost Components 59
5.2.4. Calculate Sewer Unit Cost of Service 60
5.2.5. Calculate Sewer Cost by Customer Class 60
5.3. SEWER RATE DEVELOPMENT 61
5.3.1. Proposed Rates 61
5.4. SEWER CUSTOMER IMPACT ANALYSIS 62

List of Tables

Table 1-1: District's Reserve Policy 2
Table 1-2: Proposed Annual Revenue Adjustments for Water, Sewer Funds 2
Table 1-3: Proposed Five-Year Sewer Rates 4
Table 1-4: Proposed Five-Year Monthly Water Rates 5
Table 1-5: Proposed Water Drought Rates 6
Table 1-6: Sewer Monthly incremental Customer Impact Analysis 7
Table 2-1: Inflationary Assumptions 9
Table 4-1: Current Water Monthly Charges and Number of Water Meters 14
Table 4-2: Current Private Fire Service Charges and Number of Private Firelines 14
Table 4-3: Current PFAS Fees and Number of Water Meters 15
Table 4-4: Current Water Volumetric Charge and Projected Water Use 15
Table 4-5: Revenues from Current Water Rates Summary 16
Table 4-6: Projected Revenues for Water Fund (Without Revenue Adjustments) 16
Table 4-7 Projected Water Sales and Water Purchases by Source of Water Supply 17
Table 4-8: Projected Water Supply Costs 18
Table 4-9: Projected Water O&M Expenses 19
Table 4-10: Status Quo Water Financial Plan 21
Table 4-11: Proposed Annual Water Revenue Adjustments 23
Table 4-12: Proposed Water Financial Plan 25
Table 4-13: FY 2021 Revenue Requirement 27
Table 4-14: Water System Peaking Factors 28
Table 4-15: Allocation of Extra Capacity Functional Costs to Cost Causation Categories 29
Table 4-16: Water Usage Peaking 29
Table 4-17: O&M and Capital Allocation to Cost Causation Components 30
Table 4-18: Functionalized Water Capital Assets 30
Table 4-19: Percent Allocation of Salary Related Expenses to Cost Causation Components 31
Table 4-20: Dollar Allocation of Salaries and Benefits to Cost Causation Components 31
Table 4-21: Allocation of O&M Costs to Cost Causation Components 32
Table 4-22: Asset Allocation to Cost Causation Components 32
Table 4-23: Allocation of Revenue Requirement to Cost Causation Components 34
Table 4-24: Summary Revenue Requirement Allocated to Cost Causation Components 35
Table 4-25: General Cost Reallocation 35
Table 4-26: FY 2021 Allocated Revenue Requirements after General Cost Reallocation 36
Table 4-27: Public and Private Fire Demands 36
Table 4-28: Allocation of Peaking Costs to Fire Protection 37
Table 4-29: Reallocated FY 2021 Revenue Requirements 37
Table 4-30: Meter Ratios and Equivalent Meter Units 38
Table 4-31: FY 2021 Unit Cost of Service Calculations 39
Table 4-32: Development of Unit Monthly Fixed Service Charge 40
Table 4-33: FY 2021 Revised Monthly Fixed Service Charges before Proposed Revenue Adjustment 40
Table 4-34: FY 2021 COS Monthly Fixed Service Charges 41
Table 4-35: FY 2021 COS Capital Finance Charges 41
Table 4-36: Development of Private Fire Service Charges 42
Table 4-37: FY 2021 Private Fire Charges before Proposed Revenue Adjustment 42
Table 4-38: Water Use Cost Component Descriptions 43
Table 4-39: FY 2021 Revised COS Water Usage Rate 43
Table 4-40: Revised FY 2021 Water Usage Rates (Before Revenue Adjustments) 43

Table 4-41: Five-Year Proposed Water Rates 44
Table 4-42: FY 2022 Estimated Loss Revenues due to Reduced Water Sales by Stages 46
Table 4-43: FY 2022 Estimated Variable Water Supply Cost Savings Calculations 47
Table 4-44: FY 2022 Incremental Drought Rates on Water Usage Rates 47
Table 4-45: Proposed 5-year Incremental Drought Rates 48
Table 5-1: Current District Sewer Rates 49
Table 5-2: Projected Sewer Revenues from Current Rates 50
Table 5-3: Projected Current Sewer Revenues 50
Table 5-4: Projected Sewer O&M Expenses 50
Table 5-5: Status Quo Sewer Financial Plan 52
Table 5-6: Proposed Sewer Revenue Adjustments 53
Table 5-7: Proposed Sewer Financial Plan 55
Table 5-8: Sewer Units of Service 56
Table 5-9: Functionalization of O&M Costs 57
Table 5-10: Functionalization of Sewer Assets 57
Table 5-11: Allocations of Sewer Functions to Cost Components 58
Table 5-12: Allocations of Functionalized O&M Expenses to Cost Components 58
Table 5-13: Allocations of Functionalized Sewer Assets to Cost Components 58
Table 5-14: FY 2021 Sewer Revenue Requirement from Current District Rates 59
Table 5-15: FY 2021 Revenue Requirement Allocation to Cost Components 60
Table 5-16: Calculations of Sewer Unit Cost of Service 60
Table 5-17: Allocation of Sewer Revenue Requirements to Customer Classes 61
Table 5-18: Revised COS Single-Family Residential Rates for FY 2021 61
Table 5-19: Revised COS Master Metered Rate for FY 2021 61
Table 5-20: Proposed Commercial Sewer Rate for FY 2021 62
Table 5-21: 5-year Proposed Sewer Rates 62
Table 5-22: Revised COS Sewer Customer Impacts 62
Table 5-23: Impacts from Proposed Sewer Rates 63

List of Figures

Figure 1-1: Water Financial Plan 3
Figure 1-2: Sewer Financial Plan 3
Figure 1-3: Typical Monthly Residential Customer Bill Impacts 6
Figure 4-1: Projected Annual Water CIP-Funding 20
Figure 4-2: Status Quo Water Financial Plan 23
Figure 4-3: Proposed Water Financial Plan 24
Figure 4-4: Cost of Service Process 26
Figure 4-5: Typical Residential Customer Bill Impacts 45
Figure 4-6: YLWD Water Conservation Stages 46
Figure 5-1: Projected Annual Sewer CIP Funding 51
Figure 5-2: Status Quo Sewer Financial Plan 53
Figure 5-3: Proposed Sewer Financial Plan 54

Glossary

Terms	Descriptions
AF	Acre foot / Acre feet
AWWA	American Water Works Association
BPP	Basin Pumping Percentage
CCF	Hundred cubic feet = 100 cubic feet = 748 gallons
COS	Cost of Service
CIP	Capital Improvement Plan
DU	Dwelling unit
EMU	Equivalent meter unit
FY	Fiscal Year ending (July 1 – June 30)
G & A	General and Administrative
GPCD	Gallons per capita per day
GPM	Gallons per minute
M1 Manual	*M1 Manual, Principles of Water Rates, Fees, and Charges, 7th edition* published by AWWA
MD	Max day peaking factor
MFR	Multi-family residential
MGD	Million gallons per day
MH	Max hour peaking factor
MWD	Metropolitan Water District of Southern California
MWDOC	Municipal Water District of Orange County
OCWD	Orange County Water District
O&M	Operations and maintenance
SFR	Single-family residential
T & D	Transmission and Distribution

This page intentionally left blank to facilitate two-sided printing.

1. Executive Summary

1.1. Introduction

In September 2020, the Yorba Linda Water District (District) engaged Raftelis to conduct a water and sewer rate study and provide this written 2021 Rate Study Report (Report), which included the preparation of a long-term financial plan. The District pursued a rate study to establish financially sound utilities planning and to set rates and charges that are based on the costs to serve each customer.

The District provides water service to over 24,000 residential and commercial accounts located in the City of Yorba Linda and portions of Brea, Anaheim, and Placentia. The District's existing water rate structure consists of a monthly base fee, which increases with meter size, and a uniform water usage charge based on the units of water usage within a billing period. The existing sewer rate structure consists of a monthly base fee based on customer class rather than meter size. In addition, Commercial accounts will have a sewer usage rate above 7 ccf each month.

The major objectives of the Study include:

- Developing a long-term financial plan for the water and sewer utilities to ensure financial sufficiency for the operating requirements and capital obligations of each utility
- Conducting cost-of-service analyses and designing water and sewer rates
- Developing a five-year rate schedule
- Analyzing customer impacts of the proposed rates
- Developing drought rates to offset financial loss during drought conditions
- Producing an administrative record that demonstrates the nexus between the District's costs of service and proposed rates to meet the requirements of Proposition 218 and District objectives.

This Report describes the long-term financial plans, rates, and customer impact analyses. For purposes of the analysis set out in this Report, the terms "rate(s)" and "charge(s)" may be used interchangeably. Note that the Rate Study (Study) led to the Rate Study Report (Report).

1.2. Reserve Policy

A reserve policy provides guidelines for sound financial management to maintain financial solvency and mitigate financial risks associated with revenue instability, volatile capital costs, and emergencies. Adopting and adhering to a sustainable reserve policy enhances financial transparency and helps achieve or maintain a certain credit rating for future debt issues. Reserves can offset fluctuations in costs of providing services and mitigate fiscal emergencies such as natural disasters, asset failures, pandemics, and provide stability in the case of legislative and regulatory changes. Capital reserves set funds aside for replacement of capital assets and to fund new capital projects.

Table 1-1 provides the District's current reserve policy. The reserve policy affects revenue needs as this Report seeks to achieve minimum reserve targets.

Table 1-1: District's Reserve Policy

Reserve Targets	Description	Water	Water FY 2021	Sewer	Sewer FY 2021
Operations	O&M Expenses	90 days	$7.923M	90 days	$763K
Capital	Current FY CIP	100%	$3.443M	100%	$737K
Rate Stabilization	Water Sales (WS)	5%	$1.033M		
Emergency	Capital Assets	5%	$11.486M	5%	$3,006K
Conservation		$104,911	$0.105M		
Employee Liability		$260,554	$0.261M	$45,980	$46K
MWD Contingency	Assumed 100% WS from MWD	100%	$20.05M		
	FY 2021 Targets		**$44.308M**		**$4.552M**

1.3. Financial Plans

One of the Study's major objectives is to develop a long-term financial plan ensuring financial sufficiency for each utility. Raftelis developed a long-term financial plan model incorporating the known and forecasted cost increases for operating and capital expenditures. The results were presented to and discussed with the District's Board of Directors. The proposed five-year revenue adjustments are shown in Table 1-2. Revenue adjustments represent increases to the annual gross rate revenues of each utility.

Table 1-2: Proposed Annual Revenue Adjustments for Water, Sewer Funds

Fiscal Year Ending	Effective Month	Water	Sewer	New Water Debt
2022	July	9%	15%	
2023	July	9%	15%	$15M
2024	July	9%	15%	
2025	July	9%	15%	
2026	July	9%	3.5%	

All proposed financial plans (water and sewer) are summarized in the figures below. **Figure 1-1** shows the overview of the proposed water financial plan with four charts. The first chart (top left) shows the proposed revenue adjustments and the debt coverage for the Water Fund as proposed in **Table 1-2**. The second chart (top right) shows the financial plan in which the red line represents the current revenues, the green line represents the proposed revenues, and the stacked bars represent the operating and capital expenses, including debt service. The capital plan chart (bottom left) includes a new debt issue in Fiscal Year (FY) 2023 to finance several of the planned Capital Improvement Projects (CIP) into FY 2025. The last chart (bottom right) shows the projected Water Fund ending balances for the study period with the proposed revenue adjustments. Similarly, **Figure 1-2** shows the financial plan for the Sewer Fund.

Figure 1-1: Water Financial Plan

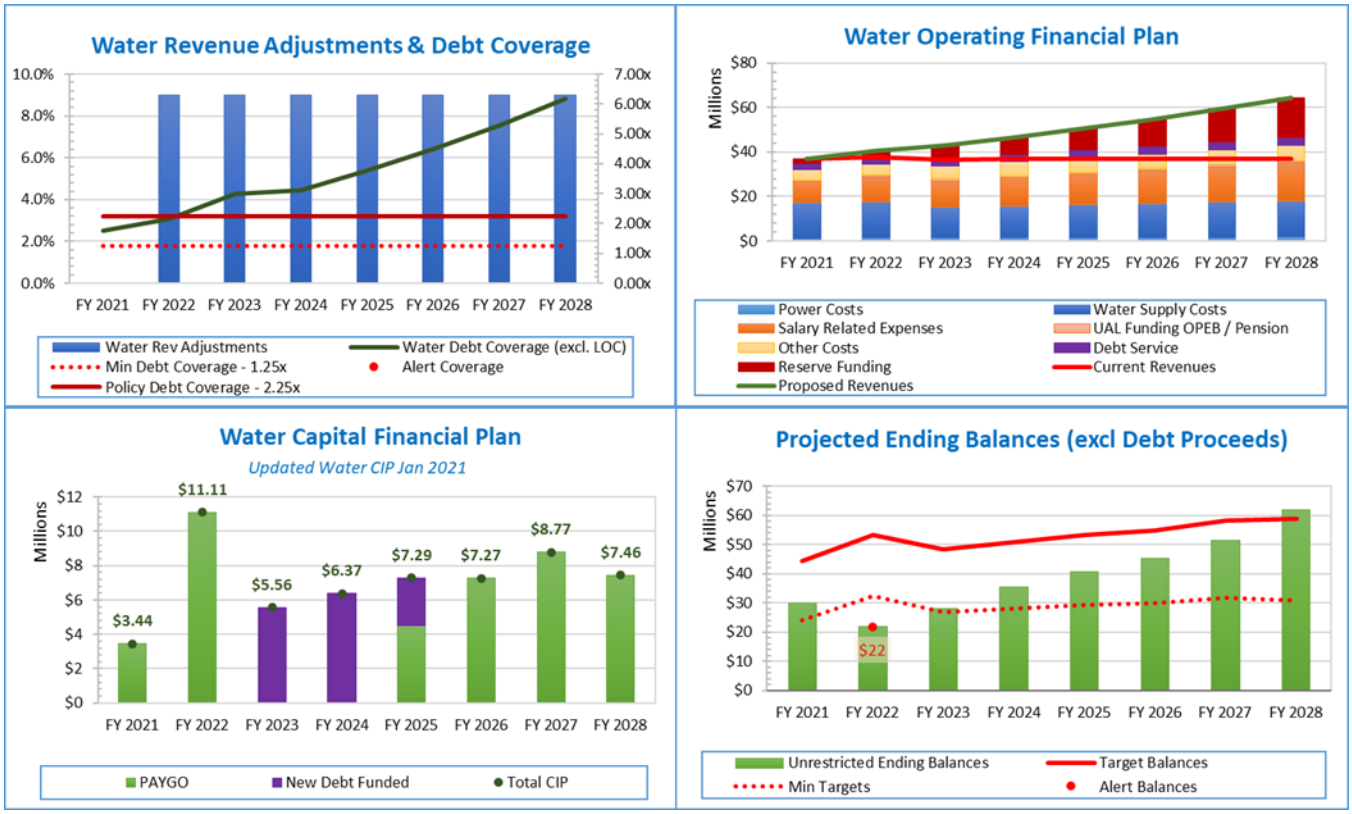
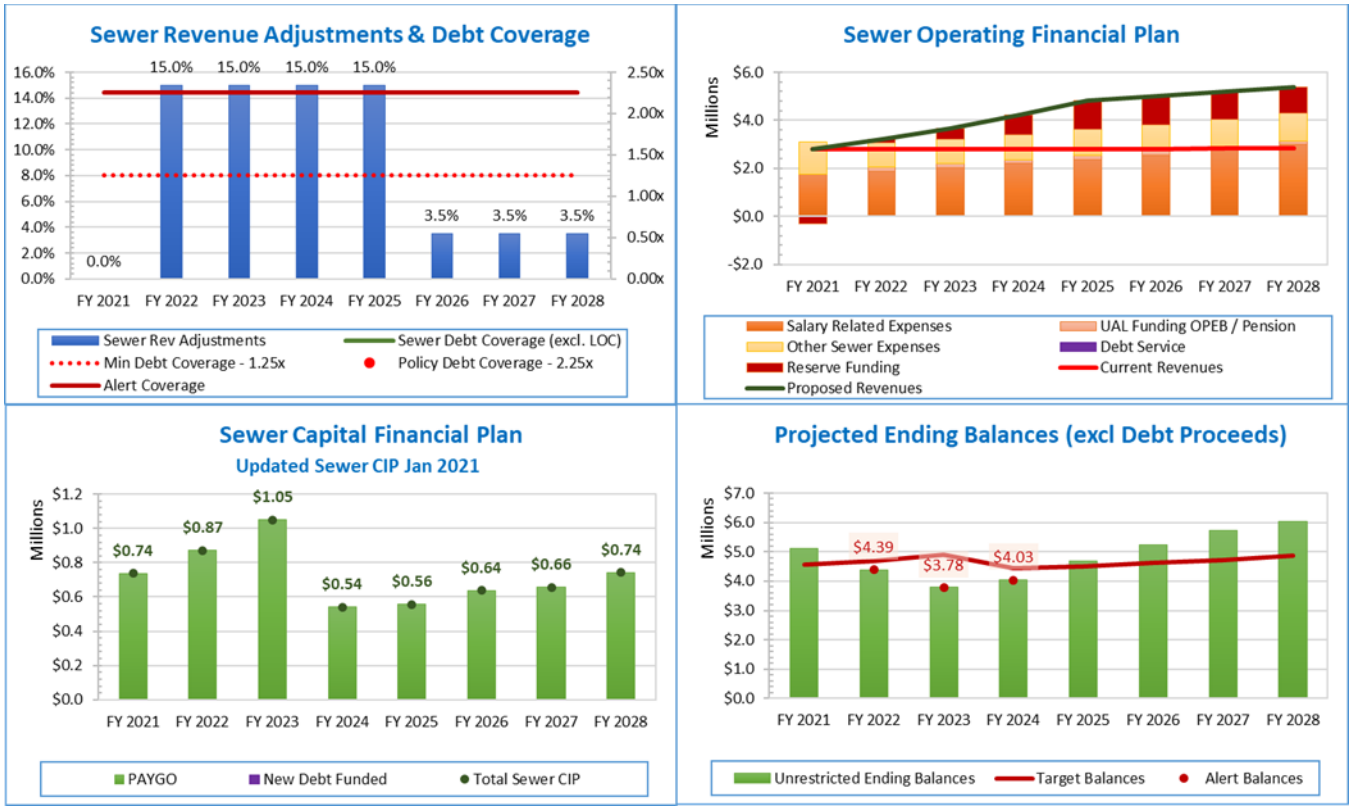


Figure 1-2: Sewer Financial Plan



1.4. Proposed 5-Year Water and Sewer Rates

Raftelis performed a cost-of-service analysis using revenue requirements for FY 2021 (known as the test year) to calculate fair and equitable rates where users pay rates that are proportional to their cost of service. The calculated rates are then increased by the proposed revenue adjustments to determine the proposed rates from FY 2022 through FY 2026. Detailed cost-of-service analyses are included in Sections **4.2** and **5.2** of the Report. **Table 1-3** and **Table 1-4** summarize the proposed rates for the next five years for water and sewer services. Note that the calculated numbers are rounded up to the nearest whole penny.

Table 1-3: Proposed Five-Year Sewer Rates

Monthly Sewer Service Charge	Current	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Effective Date		**Jul 1, 2021**	**Jul 1, 2022**	**Jul 1, 2023**	**Jul 1, 2024**	**Jul 1, 2025**
Residential	$8.10	$9.55	$10.99	$12.64	$14.54	$15.05
Master Metered	$7.62	$9.19	$10.57	$12.16	$13.99	$14.48
Commercial	$8.10	$9.55	$10.99	$12.64	$14.54	$15.05
Sewer Usage Rates (for commercial accts only)						
Tier 1 (0-7 ccf)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Tier 2 (8+ ccf)	$0.52	$0.37	$0.43	$0.50	$0.58	$0.61

Table 1-4: Proposed Five-Year Monthly Water Rates

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
	Current	Jul 1, 2021	Jul 1, 2022	Jul 1, 2023	Jul 1, 2024	Jul 1, 2025
Monthly Service Charges (by Meter Size)						
5/8	$22.26	$27.65	$30.14	$32.86	$35.82	$39.05
3/4	$22.26	$27.65	$30.14	$32.86	$35.82	$39.05
1	$37.18	$43.13	$47.02	$51.26	$55.88	$60.91
1 1/2	$74.14	$81.80	$89.17	$97.20	$105.95	$115.49
2	$118.67	$128.21	$139.75	$152.33	$166.04	$180.99
3	$259.84	$275.19	$299.96	$326.96	$356.39	$388.47
4	$467.59	$491.77	$536.03	$584.28	$636.87	$694.19
6	$1,039.15	$1,242.10	$1,353.89	$1,475.75	$1,608.57	$1,753.35
Capital Finance Charges (by Meter Size) assessed on the Property Roll[1]						
5/8		$5.67	$6.19	$6.75	$7.36	$8.03
3/4		$5.67	$6.19	$6.75	$7.36	$8.03
1		$9.46	$10.32	$11.25	$12.27	$13.38
1 1/2		$18.91	$20.62	$22.48	$24.51	$26.72
2		$30.24	$32.97	$35.94	$39.18	$42.71
3		$66.14	$72.10	$78.59	$85.67	$93.39
4		$119.03	$129.75	$141.43	$154.16	$168.04
6		$302.31	$329.52	$359.18	$391.51	$426.75
Private Fire (by Fireline Diameter)						
4	$16.00	$7.85	$8.56	$9.34	$10.19	$11.11
6	$35.00	$20.57	$22.43	$24.45	$26.66	$29.06
8	$59.00	$42.54	$46.37	$50.55	$55.10	$60.06
10	$94.00	$75.56	$82.37	$89.79	$97.88	$106.69
PFAS Impact Fee[2] (by Meter Size)						
5/8	$3.40	$3.40				
3/4	$3.40	$3.40				
1	$5.66	$5.66				
1 1/2	$11.32	$11.32				
2	$18.12	$18.12				
3	$39.66	$39.66				
4	$71.40	$71.40				
6	$181.32	$181.32				
Water Usage Rate ($/ccf)	$2.86	$2.64	$2.88	$3.14	$3.43	$3.74

[1] Capital Finance Charges are assessed on the property roll on an annual basis. The charges shown in **Table 1-4** are monthly. For example, in FY 2022, a 5/8" meter will be assessed at $68.04 ($5.67 x 12 months).
[2] The PFAS Impact Fee will be temporarily in place from February 2021 – December 2021.

1.5. Proposed Water Drought Rates

California has faced a water shortage in the past and may at some point soon declare a drought state of emergency once again. In the case that drought stages become active, updated rates have been proposed to address the reductions to the water supply, mandatory demand reductions, and to address potential revenue shortfalls that may occur. The proposed drought rates at various stages are shown in **Table 1-5**. The incremental drought rates in the table offset the revenue loss (net of water cost savings) from an overall reduction in water sales. The details of the drought rate calculations are shown in section **4.5.**

Table 1-5: Proposed Water Drought Rates

Drought Stages	Stage Description	Sales / Demand Reduction	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Water Usage Rates			$2.64 /ccf	$2.88 /ccf	$3.14 /ccf	$3.43 /ccf	$3.74 /ccf
% Increase				9%	9%	9%	9%
No Drought	No Shortage	0%	$0.00 /ccf	$0.00 /ccf	$0.00 /ccf	$0.00 /ccf	$0.00 /ccf
1	Minimum Shortage	10%	$0.12 /ccf	$0.14 /ccf	$0.16 /ccf	$0.18 /ccf	$0.20 /ccf
2	Moderate Shortage	20%	$0.26 /ccf	$0.29 /ccf	$0.32 /ccf	$0.35 /ccf	$0.39 /ccf
3	Severe Shortage	35%	$0.55 /ccf	$0.60 /ccf	$0.66 /ccf	$0.73 /ccf	$0.80 /ccf
4	Critical Shortage	50%	$1.01 /ccf	$1.11 /ccf	$1.22 /ccf	$1.34 /ccf	$1.47 /ccf

1.6. Customer Impacts

Figure 1-3 shows bill impacts for the typical Single-family residential (SFR) home with a 1-inch meter under the proposed water and sewer rates. Note that the Capital Finance Charge is not reflected in the below impact as it will be assessed on the property roll.

Figure 1-3: Typical Monthly Residential Customer Bill Impacts

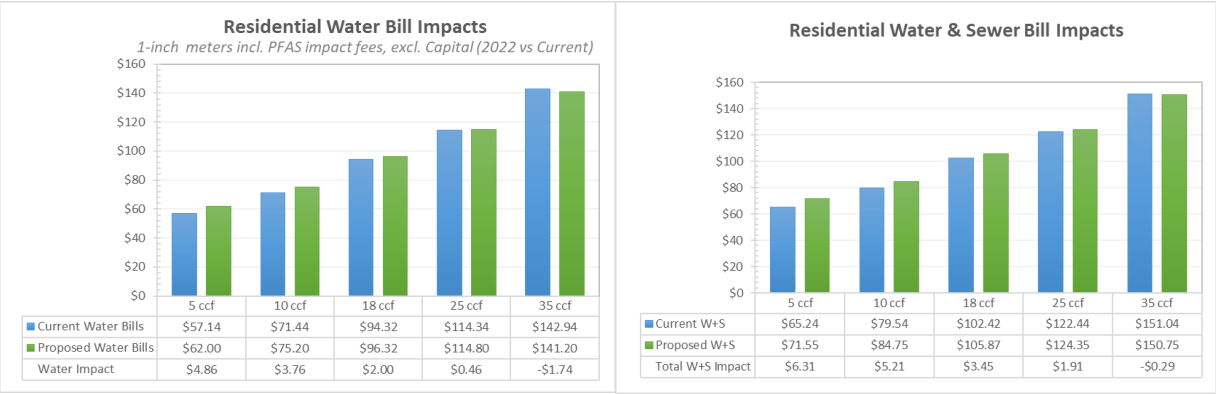


Table 1-6 shows average sewer customer bill impacts by class.

Table 1-6: Sewer Monthly incremental Customer Impact Analysis

Monthly Rate Impacts	Jul 1, 2021	Jul 1, 2022	Jul 1, 2023	Jul 1, 2024	Jul 1, 2025
Residential	$1.45	$1.44	$1.65	$1.90	$0.51
Master Metered	$1.57	$1.38	$1.59	$1.83	$0.49
Commercial	$1.45	$1.44	$1.65	$1.90	$0.51

The rates calculated in this study for water and sewer services follow industry standard principles of equitable cost-of-service allocations compliant with Proposition 218. The remainder of this Report details financial plan development, cost-of-service analyses, and rate calculations for the District's water and sewer services.

2. Introduction

2.1. Background

In September 2020, the Yorba Linda Water District (District) engaged Raftelis to conduct a water and sewer rate study and provide a written 2021 Rate Report (Report), which includes the preparation of a long-term financial plan. The District pursued a rate study to help establish financially sound utility planning and to set rates and charges that are based on the costs to serve each customer.

The District provides water service to over 24,000 residential and commercial accounts located in the City of Yorba Linda and portions of the Cities of Brea, Anaheim, and Placentia. The District's existing water rate structure consists of a monthly base fee, which increases with meter size, and a uniform water usage charge based on the units of water usage within a billing period.

The District currently utilizes two sources of water supply: groundwater from Orange County Water District (OCWD) and imported water from Municipal Water District of Orange County (MWDOC). The District provides sewer collection service to over 25,000 accounts. The District currently has two sets of monthly base fees and volumetric rates for its Commercial customers.

The major objectives of the Study include:

- Developing a long-term financial plan for the water and sewer utilities to ensure financial sufficiency for the operating requirements and capital obligations of each utility
- Conducting cost-of-service analyses and designing water and sewer rates
- Developing a five-year rate schedule
- Analyzing customer impacts of the proposed rates
- Developing Drought Rates to offset financial loss during drought conditions
- Producing an administrative record that demonstrates the nexus between the District's costs of service and proposed rates to meet the requirements of Proposition 218 and District objectives.

This Report describes the long-term financial plans, rates, and customer impact analyses. For purposes of the analysis set out in this Report, the terms "rate(s)" and "charge(s)" may be used interchangeably. Note that the Rate Study (Study) led to the Rate Study Report (Report).

2.2. Key Information Used in the Study

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

1. FY 2021 operating budgets for the Water and Sewer Funds in October 2020, with mid-year adjustments provided in January 2021
2. Estimated CIP expenditures for the next 10 years, as provided by District staff in January 2021
3. Current debt service obligations provided by District staff in October 2020
4. Beginning Fund balances as of July 1, 2020 (FY 2021) provided by District staff in October 2020
5. Water Conservation Ordinance provided by District Staff in February 2021 detailing the water conservation stages[3]

[3] https://www.ylwd.com/community/conservation-ordinance

2.3. Financial Plan Assumptions

Raftelis worked closely with District staff to forecast revenues and expenses as part of developing the financial plan. **Table 2-1** lists the annual inflation factors for each of the District's cost categories. Personnel costs include salary, health benefits, and life insurance. Chemicals and utilities are listed separately due to their unique escalation factors. Water supply costs are listed separately as well. Escalation factors are based on long-term inflationary indices, discussions with District staff, and professional judgment.

Table 2-1: Inflationary Assumptions

Escalation Factors	Annual FY 2022 – FY 2028
General	2.0%
Personnel	8.0%
Chemicals	2.0%
Utilities	5.0%
Reserve Interest Rate	1.0%
Capital	3.0%
Water loss	8.0%
OCWD Water Cost	2.0%
MWD/MWDOC Fixed Cost	3.0%
MWDOC Variable Cost	5.0%
Normal Basin Pumping Percentage (BPP)	75%

3. Legal Framework and Rate Setting Methodology

3.1. California Constitution - Article XIII D, Section 6 (Proposition 218)

Proposition 218, the applicable portion of which is set out in the California Constitution as Article XIII D, was enacted in 1996 to ensure that public agency utility service rates, fees, and charges are reasonable and proportional to the cost of providing the applicable service(s). The principal requirements for application of such rates, fees, and charges, as they relate to public water and wastewater services, are as follows:

1. A property-related rate/fee/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 rate/fee/charge shall not be used for any purpose other than that for which it was imposed.
3. The amount of the rate/fee/charge imposed upon any parcel shall not exceed the proportional cost of service attributable to the parcel.
4. No rate/fee/charge may be imposed for a service unless that service is actually used or immediately available to the owner of property.
5. No rate/fee/charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance, or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.
6. 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 the American Water Works Association's (AWWA) *M1 Manual, Principles of Water Rates, Fees, and Charges, 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 rates/fees/charges cannot be "arbitrary and capricious," meaning that the rate-setting methodology must be sound and that there must be a nexus between the costs and the rates charged. This Report follows industry standard rate-setting methodologies set forth by the *M1 Manual*, adhering to Proposition 218 requirements by developing rates that do not exceed the proportionate cost of providing the corresponding services.

3.1.1. CALIFORNIA CONSTITUTION – ARTICLE X, SECTION 2

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

In addition, Section 106 of the California Water Code declares that the highest priority use of water is for domestic purposes, with irrigation water secondary.

3.2. 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." To develop utility service rates that comply with the requirements of Proposition 218 and industry standards while meeting other goals and objectives of the service provider, Raftelis carries out a detailed analysis in four major steps, as discussed below.

Step 1: Calculate Revenue Requirement

The rate-making process starts by determining the test year (rate-setting year) revenue requirement, which for this Study is FY 2021. The revenue requirement should sufficiently fund the utility's operations and maintenance (O&M), debt service, capital expenses, and target reserve balances based on a long-term financial plan.

Step 2: Cost-of-Service Analysis

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

1. ***Functionalize costs.*** Examples of water system functions are supply, treatment, transmission, distribution, storage, meter servicing, and customer billing and collection.
2. ***Allocate functionalized costs to cost causation components.*** Water system cost causation components include base, maximum day, maximum hour[4], conservation, public fire protection, meter service, and customer servicing and billing costs.
3. ***Distribute cost causation components, using unit costs, to rate components and customers in proportion to their demands on the water system capacity.*** For water utilities, this is described in AWWA's *M1 Manual*.

A cost-of-service analysis considers both the average quantity of water consumed (base costs) and the peak rate at which it is consumed (peaking costs or capacity costs as identified by maximum day and maximum hour demands).[5] Peaking costs are costs that are incurred during peak times of consumption. There are additional costs associated with designing, constructing, operating, and maintaining facilities to meet peak demands. These peak demand costs need to be allocated to those imposing such costs on the utility. In other words, not all customer classes share the same responsibility for extra-capacity related costs.

Step 3: Rate Design and Calculations

[4] Maximum day and maximum hour costs are collectively referred to as "peaking costs" or "extra-capacity costs".

[5] System capacity is the system's ability to supply water to all delivery points at the time when demanded. Coincident peaking factors are calculated for each customer class at the time of greatest system demand. The time of greatest demand is known as peak demand. Both the operating costs and capital asset related costs incurred to accommodate the peak flows are generally allocated to each customer class based upon the class' relative demands during the peak month, day, and hour event.

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 affordability for essential needs and revenue stability among other objectives.

Step 4: Rate Adoption

Rate adoption is the last step of the rate-making process to comply with Proposition 218. Raftelis documents the rate study results in this Report to serve as the District's administrative record and a public education tool concerning the proposed changes, the rationale and justifications behind the changes, and their anticipated financial impacts.

4. Water Financial Plan and Rates

The financial plan assesses the long-term financial health of the Water Fund based on projected revenues, O&M expenses, CIP funding, and debt service payments. The primary results of the financial plan include a cashflow summary and the rate revenue requirement, the latter being the key factor driving rate development. The long-term financial plan horizon spans FY 2021 through FY 2028.

4.1. Water Financial Plan

4.1.1. CURRENT WATER REVENUES

Table 4-1 through **Table 4-5** show the existing water rates and structure. The charges for potable water service include:

- **Water Monthly Service Charge:** Meter size-based fixed charge effective as of August 1, 2020, shown in **Table 4-1**
- **Private Fire Service Charge:** Fireline diameter-based fixed charge, effective prior to July 2018, shown **Table 4-2**.
- **PFAS Impact Fee:** Meter size-based fixed charge, effective February 2021 through Dec 2021, shown in **Table 4-3**
- **The PFAS** fee projected revenues in **Table 4-3** are calculated for FY 2021 and FY 2022 for each meter size then summed to arrive at the projected annual revenues. An example for the 5/8-inch meter is as follows:

$$For\ FY\ 2021: \$3.40\ \times 26\ \text{Meters} \times 5\ months = \$442$$
$$For\ FY\ 2022: \$3.40\ \times 26\ \text{Meters} \times 6\ months = \$530$$

- **Table 4-3 The PFAS fee** is to recover a portion of the financial impacts due to lower OCWD BPP during the construction of facilities to address the new PFAS requirements. Lower OCWD BPP results in increased purchase from MWDOC and overall higher water supply costs.
- **Water Usage Rate:** Use-based rate assessed as dollars per hundred cubic feet (ccf) effective February 2021, shown in **Table 4-4.**

Table 4-1 lists the monthly charge by meter size and the projected number of accounts corresponding to each meter size across the study period. The projected revenues from the monthly charges are calculated by multiplying the current meter charge by the corresponding number of accounts and then multiplying by 12 billing periods. An example for 5/8-inch meters is as follows:

$$\$22.26\ \times 26\ \times 11\ months + \$21.20\ \times 26\ \times 1\ month\ = \$6{,}387$$

Note: since the current charges were effective one month into the fiscal year one bill period at the previous charge was included. This calculation is performed for each meter size and then summed to arrive at the projected annual fixed revenue for each fiscal year in **Table 4-1.**

Table 4-1: Current Water Monthly Charges and Number of Water Meters

Meter Size	Prior Rates	Current Rates	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026 – FY 2028
5/8	$21.20	$22.26	26	26	26	26	26	26
3/4	$21.20	$22.26	5,602	5,602	5,602	5,602	5,602	5,602
1	$35.41	$37.18	18,049	18,076	18,104	18,124	18,144	18,160
1 1/2	$70.61	$74.14	602	603	603	603	603	603
2	$113.02	$118.67	1,108	1,113	1,113	1,113	1,113	1,113
3	$247.47	$259.84	7	8	8	8	8	8
4	$445.32	$467.59	3	3	3	3	3	3
6	$989.67	$1,039.15	1	1	1	1	1	1
Projected Revenues			$11,674,146	$11,743,821	$11,756,313	$11,765,236	$11,774,160	$11,781,298

The projected current private fire service revenues in **Table 4-2** are calculated for each fireline size then summed to arrive at projected annual revenues. An example for the 2-inch private fire service is as follows:

$$For\ FY\ 2021: \$16.00 \times 114 \times 12\ months = \$21{,}888$$

Table 4-2: Current Private Fire Service Charges and Number of Private Firelines

Meter Size	Current Rates	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026 – FY 2028
2	$16.00	114	114	114	114	114	114
3	$35.00	137	137	137	137	137	137
4	$59.00	95	95	95	95	95	95
6	$94.00	5	5	5	5	5	5
Projected Revenues		$152,328	$152,328	$152,328	$152,328	$152,328	$152,328

The PFAS fee projected revenues in **Table 4-3** are calculated for FY 2021 and FY 2022 for each meter size then summed to arrive at the projected annual revenues. An example for the 5/8-inch meter is as follows:

$$For\ FY\ 2021: \$3.40 \times 26 \times 5\ months = \$442$$
$$For\ FY\ 2022: \$3.40 \times 26 \times 6\ months = \$530$$

Note: the EMUs vary slightly between FY 2021 and FY 2022. Therefore, the EMUs for FY 2021 were multiplied for the 5 month period from February through June and the EMUs for FY 2022 were multiplied for the remaining 6 months to arrive at the totals shown in **Table 4-3.**

Table 4-3: Current PFAS Fees and Number of Water Meters

Meter Size	PFAS Fees	FY 2021	FY 2022
		5 months (Feb – June)	6 months (Jul – Dec)
5/8	$3.40	26	26
3/4	$3.40	5,602	5,602
1	$5.66	18,049	18,076
1 1/2	$11.32	602	603
2	$18.12	1,108	1,113
3	$39.66	7	8
4	$71.40	3	3
6	$181.32	1	1
Projected Revenues		**$745,275**	**$896,098**

The volumetric rates and projected water use are shown for each customer class in **Table 4-4.** The volumetric charge for each class is calculated by multiplying the respective volumetric rate by annual use. Water usage revenue for FY 2021 and FY 2022 is calculated as follows:

$$FY\ 2021: (\$2.80\ x\ 71\% + \$2.80\ x\ 29\%) \times 7{,}380{,}219 = \$20{,}792{,}042$$
$$FY\ 2022: \$2.86 \times 7{,}380{,}219 = \$21{,}107{,}426$$

Table 4-4: Current Water Volumetric Charge and Projected Water Use

Water Rates	Prior Rate	Current Rates	FY 2021	FY 2022 - FY 2028
Effective Date	7/1/2019	2/1/2021		
Single-family Residential	$2.80	$2.86	5,565,510	5,565,510
Irrigation	$2.80	$2.86	517,779	517,779
Commercial	$2.80	$2.86	1,291,334	1,291,334
Construction	$2.80	$2.86	5,596	5,596
Total Usage (ccf)	$2.80	$2.86	7,380,219	7,380,219
Projected Current Water Usage Revenues			**$20,792,042**	**$21,107,426**

Note: 71% of water demand is expected to occur during the period from July to the end of January, while 29% of demand occurs in the final 5 months. from **Table 4-5** provides an annual summary of the monthly fixed charges for water service, monthly private firelines and volumetric water charges. The amounts in the summary are calculated in **Table 4-1, Table 4-2,** and **Table 4-4.**

Table 4-5: Revenues from Current Water Rates Summary

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026 – FY 2028
Monthly Service Charges	$11,674,146	$11,743,821	$11,756,313	$11,765,236	$11,774,160	$11,781,298
Private Fire	$152,328	$152,328	$152,328	$152,328	$152,328	$152,328
Water Usage Charge	$20,792,042	$21,107,426	$21,107,426	$21,107,426	$21,107,426	$21,107,426
Total Current Water Rev from Rates, excl. PFAS Fees	$32,618,516	$33,003,575	$33,016,068	$33,024,991	$33,033,914	$33,041,053

Table 4-6 summarizes revenues from current water rates across the study period, with projected revenue for each charge type corresponding to those in **Table 4-4** and **Table 4-5. Table 4-6** projects total District revenues across the study period assuming zero revenue adjustments (no increase to gross rate revenues). The total existing rate revenue is presented on Line 3 of Table 4-6.

Table 4-6: Projected Revenues for Water Fund (Without Revenue Adjustments)

		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**REVENUES**								
2	**OPERATING REVENUES**								
3	Revenues from Current Rates	$32,618,516	$33,003,575	$33,016,068	$33,024,991	$33,033,914	$33,041,053	$33,041,053	$33,041,053
4	Proposed Rev Adjustments	$0	$0	$0	$0	$0	$0	$0	$0
5	PFAS Impact Fee	$745,002	$895,771	$0	$0	$0	$0	$0	$0
6	Other Operating Rev	$824,650	$832,897	$841,225	$849,638	$858,134	$866,715	$875,383	$884,136
7	**SUBTOTAL OPERATING REVENUES**	$34,188,168	$34,732,242	$33,857,293	$33,874,628	$33,892,048	$33,907,768	$33,916,435	$33,925,189
8	**NON-OPERATING REVENUES**								
9	Property Tax	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000
10	Investment Income	$175,000	$244,468	$162,946	$95,464	$363	-$117,433	-$262,301	-$429,139
11	Other Non-Operating Revenue	$601,646	$607,662	$613,739	$619,876	$626,075	$632,336	$638,659	$645,046
12	**SUBTOTAL NON-OPERATING REVENUES**	$2,726,646	$2,802,131	$2,726,685	$2,665,341	$2,576,438	$2,464,903	$2,326,359	$2,165,907
13	**TOTAL REVENUES**	$36,914,814	$37,534,373	$36,583,978	$36,539,969	$36,468,487	$36,372,671	$36,242,794	$36,091,096

4.1.2. WATER O&M EXPENSES

4.1.2.1. Purchased Water Supply Costs

Table 4-7 and **Table 4-8** show the expected purchase quantities and unit price of water by source and projected water purchase expenses. The quantity purchased from each water source is calculated using projected water sales, estimated system water loss, and projected basin pumping percentage (estimated for water to be pumped from OCWD basins).

Table 4-7 Projected Water Sales and Water Purchases by Source of Water Supply

	Unit	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Water Sales	ccf	7,380,219	7,380,219	7,380,219	7,380,219	7,380,219	7,380,219	7,380,219	7,380,219
	AF	16,943	16,943	16,943	16,943	16,943	16,943	16,943	16,943
Water loss		8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%
Water Purchases	AF	18,416	18,416	18,416	18,416	18,416	18,416	18,416	18,416
Projected OCWD BPP		48.70%	49.10%	75.00%	75.00%	75.00%	75.00%	75.00%	75.00%
Quantity Purchased	AF								
OCWD BPP		8,969	9,042	13,812	13,812	13,812	13,812	13,812	13,812
MWDOC		9,447	9,374	4,604	4,604	4,604	4,604	4,604	4,604
Jul - Dec	58.62%	5,538	5,494	2,699	2,699	2,699	2,699	2,699	2,699
Jan - Jun	41.38%	3,910	3,879	1,905	1,905	1,905	1,905	1,905	1,905

Table 4-8 shows variable and fixed water supply costs by source. Variable rates are assessed in dollars per acre foot while fixed charges are flat monthly or annual charges. Additionally, Municipal Water District of Orange County (MWDOC) rates change on a calendar-year basis whereas the District operates on a fiscal-year basis. Thus, the MWDOC charges are identified as January through June of the current calendar year and July through December of the previous calendar year. The variable unit costs are multiplied by the projected quantity purchased from each source to calculate the variable water supply costs from each.

Table 4-8: Projected Water Supply Costs

Water Supply Costs		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Variable Unit Costs									
OCWD RA	$ / AF	$487.00	$496.74	$506.67	$516.81	$527.14	$537.69	$548.44	$559.41
MWD Tier 1 Treated									
Jul - Dec	$ / AF	$1,078.00	$1,104.00	$1,159.20	$1,217.16	$1,278.02	$1,341.92	$1,409.01	$1,479.47
Jan - Jun	$ / AF	$1,104.00	$1,159.20	$1,217.16	$1,278.02	$1,341.92	$1,409.01	$1,479.47	$1,553.44
Variable Water Supply Costs									
OCWD RA		$4,367,687	$4,491,632	$6,998,164	$7,138,127	$7,280,890	$7,426,508	$7,575,038	$7,726,539
MWD Tier 1 Treated		$10,285,918	$10,562,707	$5,447,368	$5,719,737	$6,005,724	$6,306,010	$6,621,310	$6,952,376
Subtotal Water Variable Costs		**$14,653,605**	**$15,054,339**	**$12,445,532**	**$12,857,864**	**$13,286,614**	**$13,732,518**	**$14,196,348**	**$14,678,914**
Fixed Costs									
OCWD Annex		$521,476	$531,906	$542,544	$553,395	$564,462	$575,752	$587,267	$599,012
Connection Fee		$308,660	$317,920	$327,457	$337,281	$347,400	$357,822	$368,556	$379,613
Capacity Fee		$213,777	$220,190	$226,796	$233,600	$240,608	$247,826	$255,261	$262,919
Readiness-to-Serve		$285,375	$293,936	$302,754	$311,837	$321,192	$330,828	$340,753	$350,975
Subtotal Water Fixed Costs		**$1,329,288**	**$1,363,952**	**$1,399,551**	**$1,436,112**	**$1,473,662**	**$1,512,227**	**$1,551,836**	**$1,592,519**
Projected Water Supply Costs		**$15,982,893**	**$16,418,291**	**$13,845,084**	**$14,293,977**	**$14,760,275**	**$15,244,745**	**$15,748,185**	**$16,271,433**

4.1.2.2. Water O&M Expenses

Table 4-9 restates the water supply costs (from **Table 4-8**) and the budgeted and projected O&M expenses using the inflation factors assumed in **Table 2-1**. PFAS O&M and UAL Funding OPEB lines are provided by District staff based on their current estimates of future financial obligations with respect to these costs.

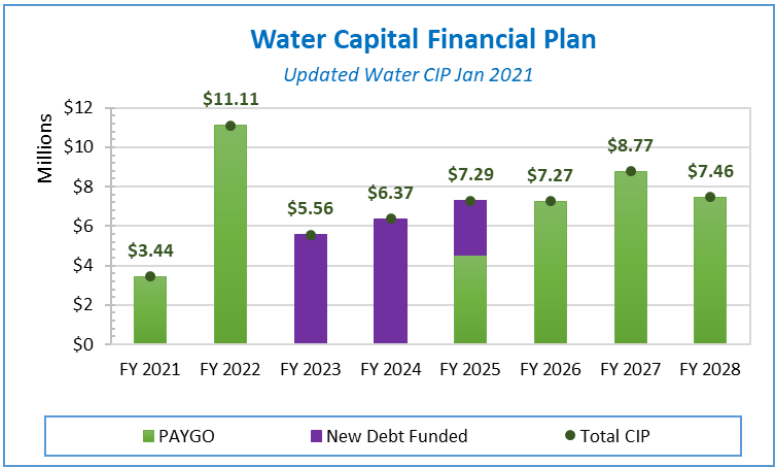
Table 4-9: Projected Water O&M Expenses

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Power	$1,222,191	$1,283,301	$1,347,466	$1,414,839	$1,485,581	$1,559,860	$1,637,853	$1,719,745
Water Supply Fixed Costs	$1,329,288	$1,363,952	$1,399,551	$1,436,112	$1,473,662	$1,512,227	$1,551,836	$1,592,519
Water Supply Variable Costs	$14,653,605	$15,054,339	$12,445,532	$12,857,864	$13,286,614	$13,732,518	$14,196,348	$14,678,914
Salary Related Expenses	$10,156,647	$10,969,179	$11,846,713	$12,794,450	$13,818,006	$14,923,447	$16,117,322	$17,406,708
UAL Funding OPEB / Pension	$0	$924,226	$924,226	$924,226	$924,226	$924,226	$924,226	$924,226
Supplies and Services	$4,651,466	$4,959,410	$4,713,760	$4,813,454	$4,915,413	$5,019,695	$5,126,362	$5,235,476
PFAS O&M	$0	$0	$819,467	$1,245,591	$1,270,503	$1,295,913	$1,321,831	$1,348,268
Other Non-Operating Expenses	$117,994	$120,354	$122,761	$125,216	$127,721	$130,275	$132,880	$135,538
Total Water O&M Expenses	**$32,131,191**	**$34,674,760**	**$33,619,476**	**$35,611,753**	**$37,301,725**	**$39,098,161**	**$41,008,660**	**$43,041,395**

4.1.3. WATER CAPITAL IMPROVEMENT PLAN (CIP)

The annual Water CIP, shown in **Figure 4-1**, was provided by District staff in January 2021 and is utilized as part of the financial plan. A 3% capital escalation factor is used to project future costs inclusive of construction cost inflation. A combination of cash funding (Pay As You Go or PAYGO (green bars)) and new debt financing (purple bars) is required to implement the projected Water CIP.

Figure 4-1: Projected Annual Water CIP-Funding



4.1.4. WATER DEBT SERVICE

4.1.4.1. Current Debt Service

The Water Fund currently has two outstanding debts: 2012A series and 2017A series. Annual payments are approximately $2.7M per year, which includes principal and interest.

4.1.4.2. Proposed Debt Service for Water CIP

The District plans to finance its water CIP with one new debt issue of approximately $15M in December 2022 (FY 2023). The projected annual debt service payment for the new debt is estimated at approximately $765,289 per year, assuming a 30-year term, 3% interest rate, and 2% issuance cost.

4.1.5. STATUS QUO WATER FINANCIAL PLAN

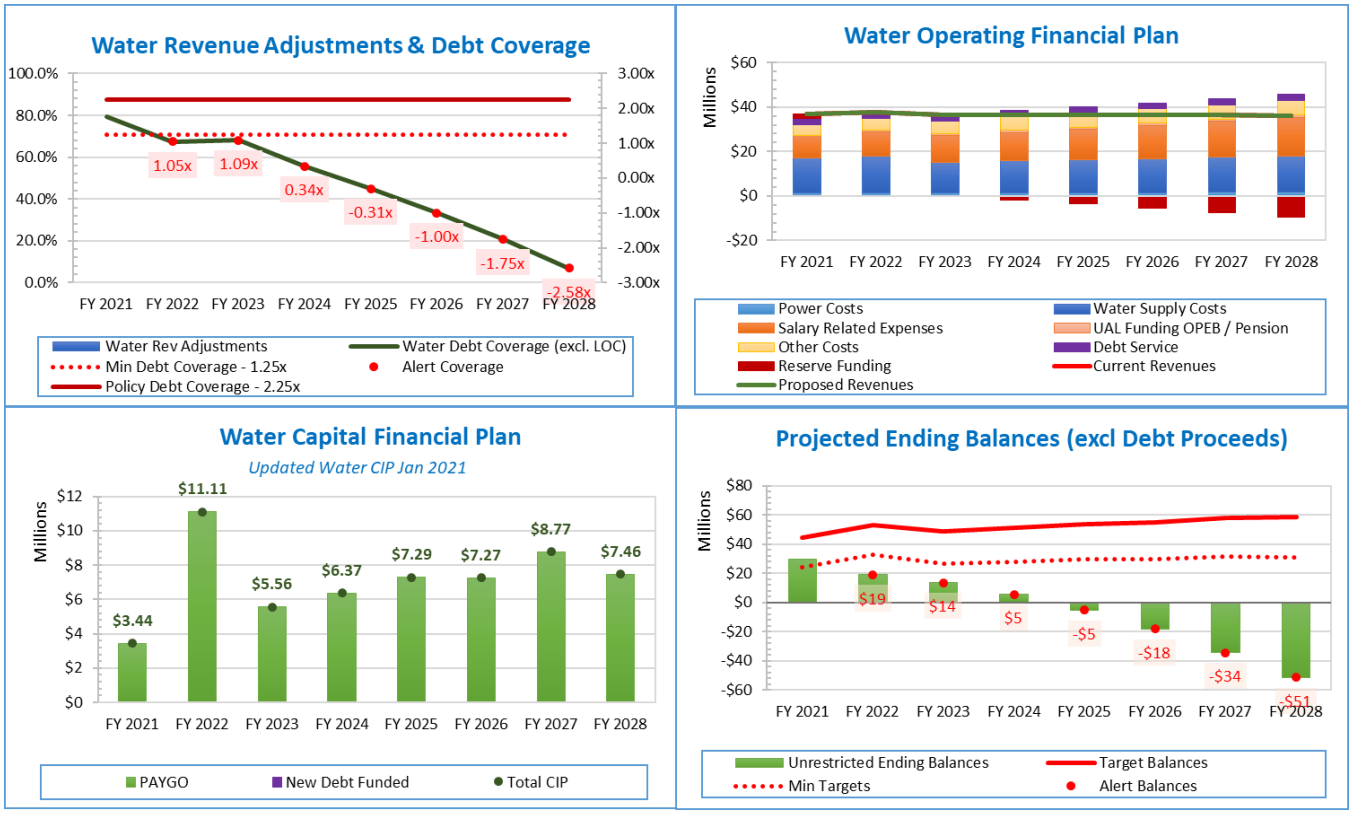
Table 4-10 summarizes the status quo financial plan with no revenue increases or new debt issuance. The cash flow incorporates the revenues from current rates and non-rate revenues (**Table 4-6**), water supply costs (**Table 4-8**), O&M expenses (**Table 4-9**), capital improvement projects (**Table 4-1**), and annual debt service payments to project the debt coverage ratio and projected ending balances. All projections shown in the table are based upon the District's current rate structure and do not include revenue adjustments. Under the "status-quo" financial plan scenario, the District would generate negative cashflow every year of the study period. Beginning in FY 2021, revenues generated from rates and other miscellaneous revenues will be inadequate to sufficiently recover operating expenses, capital expenditures, and debt obligations as well as to maintain adequate reserves. The District's coverage ratio will fall below the minimum of 1.25 (per debt covenant requirements) in FY 2022.

Table 4-10: Status Quo Water Financial Plan

			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**REVENUES**									
2	**OPERATING REVENUES**									
3	Revenues from Current Rates		$32,618,516	$33,003,575	$33,016,068	$33,024,991	$33,033,914	$33,041,053	$33,041,053	$33,041,053
4	Proposed Rev Adjustments		$0	$0	$0	$0	$0	$0	$0	$0
5	PFAS Impact Fee		$745,002	$895,771	$0	$0	$0	$0	$0	$0
6	Other Operating Rev		$824,650	$832,897	$841,225	$849,638	$858,134	$866,715	$875,383	$884,136
7	**SUBTOTAL OPERATING REVENUES**		**$34,188,168**	**$34,732,242**	**$33,857,293**	**$33,874,628**	**$33,892,048**	**$33,907,768**	**$33,916,435**	**$33,925,189**
8	**NON-OPERATING REVENUES**									
9	Property Tax		$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000
10	Investment Income		$175,000	$244,468	$162,946	$95,464	$363	-$117,433	-$262,301	-$429,139
11	Other Non-Oper Rev		$601,646	$607,662	$613,739	$619,876	$626,075	$632,336	$638,659	$645,046
12	**SUBTOTAL NON-OPERATING REVENUES**		**$2,726,646**	**$2,802,131**	**$2,726,685**	**$2,665,341**	**$2,576,438**	**$2,464,903**	**$2,326,359**	**$2,165,907**
13	**TOTAL REVENUES**		**$36,914,814**	**$37,534,373**	**$36,583,978**	**$36,539,969**	**$36,468,487**	**$36,372,671**	**$36,242,794**	**$36,091,096**
14	**EXPENSES**									
15	Power		$1,222,191	$1,283,301	$1,347,466	$1,414,839	$1,485,581	$1,559,860	$1,637,853	$1,719,745
16	Water Supply Fixed Costs		$1,329,288	$1,363,952	$1,399,551	$1,436,112	$1,473,662	$1,512,227	$1,551,836	$1,592,519
17	Water Supply Variable Costs		$14,653,605	$15,054,339	$12,445,532	$12,857,864	$13,286,614	$13,732,518	$14,196,348	$14,678,914
18	Salary Related Expenses		$10,156,647	$10,969,179	$11,846,713	$12,794,450	$13,818,006	$14,923,447	$16,117,322	$17,406,708
19	UAL Funding OPEB / Pension		$0	$924,226	$924,226	$924,226	$924,226	$924,226	$924,226	$924,226
20	Supplies and Services		$4,651,466	$4,959,410	$4,713,760	$4,813,454	$4,915,413	$5,019,695	$5,126,362	$5,235,476
21	PFAS O&M		$0	$0	$819,467	$1,245,591	$1,270,503	$1,295,913	$1,321,831	$1,348,268
22	Other Non-Operating Expenses		$117,994	$120,354	$122,761	$125,216	$127,721	$130,275	$132,880	$135,538
23	**TOTAL EXPENSES**		**$32,131,191**	**$34,674,760**	**$33,619,476**	**$35,611,753**	**$37,301,725**	**$39,098,161**	**$41,008,660**	**$43,041,395**
24	**NET REVENUES**		**$4,783,624**	**$2,859,613**	**$2,964,502**	**$928,216**	**-$833,238**	**-$2,725,490**	**-$4,765,866**	**-$6,950,300**
25	**DEBT SERVICE**									
26	Current Debt Service		$2,729,381	$2,728,919	$2,724,681	$2,726,331	$2,723,581	$2,717,331	$2,722,206	$2,694,456
27	Proposed Debt Service		$0	$0	$0	$0	$0	$0	$0	$0
28	LOC Interest Payments		$0	$0	$0	$0	$0	$0	$0	$0
29	LOC Principal Payments		$0	$0	$0	$0	$0	$0	$0	$0
30	**TOTAL DEBT SERVICE**		**$2,729,381**	**$2,728,919**	**$2,724,681**	**$2,726,331**	**$2,723,581**	**$2,717,331**	**$2,722,206**	**$2,694,456**
31	**CAPITAL EXPENDITURES**									
32	PAYGO		$3,443,289	$11,111,021	$5,563,890	$6,374,204	$7,291,046	$7,268,648	$8,773,896	$7,461,030
33	LOC Funded		$0	$0	$0	$0	$0	$0	$0	$0
34	New Debt Funded		$0	$0	$0	$0	$0	$0	$0	$0
35	**TOTAL CAPITAL EXPENDITURES**		**$3,443,289**	**$11,111,021**	**$5,563,890**	**$6,374,204**	**$7,291,046**	**$7,268,648**	**$8,773,896**	**$7,461,030**
36	**NET CASH CHANGES**		**-$1,389,046**	**-$10,980,327**	**-$5,324,069**	**-$8,172,319**	**-$10,847,865**	**-$12,711,470**	**-$16,261,969**	**-$17,105,786**
37	**BEGINNING UNRESTRICTED BALANCES**		$31,326,019	$29,936,972	$18,956,645	$13,632,576	$5,460,257	-$5,387,609	-$18,099,079	-$34,361,047
38	**ENDING UNRESTRICTED BALANCES**		**$29,936,972**	**$18,956,645**	**$13,632,576**	**$5,460,257**	**-$5,387,609**	**-$18,099,079**	**-$34,361,047**	**-$51,466,833**
39	**MIN TARGETS**		**$24,257,626**	**$32,568,309**	**$26,760,971**	**$28,062,531**	**$29,396,079**	**$29,816,638**	**$31,792,968**	**$30,981,324**
40	**TARGET BALANCES**		**$44,308,148**	**$53,320,188**	**$48,550,444**	**$50,941,479**	**$53,418,973**	**$55,040,677**	**$58,278,209**	**$58,790,827**
41	Operations	90 days of O&M	$7,922,759	$8,549,941	$8,289,734	$8,780,980	$9,197,686	$9,640,642	$10,111,724	$10,612,947
42	Capital	100% Current FY CIP	$3,443,289	$11,111,021	$5,563,890	$6,374,204	$7,291,046	$7,268,648	$8,773,896	$7,461,030
43	Rate Stabilization	5% of Water Sales	$1,039,602	$1,055,371	$1,055,371	$1,055,371	$1,055,371	$1,055,371	$1,055,371	$1,055,371
44	Emergency	5% of Capital Assets	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511
45	Conservation	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911
46	Employee Liability	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554
47	MWD Contingency	100% of WS if on 100% MWD	$20,050,523	$20,751,880	$21,789,474	$22,878,947	$24,022,895	$25,224,039	$26,485,241	$27,809,504
48	Debt Coverage (excl. LOC)		1.75x	1.05x	1.09x	.34x	-.31x	-1.00x	-1.75x	-2.58x
49	Min Debt Coverage		1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x
50	Policy Debt Coverage		2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x

The top right graph in **Figure 4-2** graphically shows the operating financial plan represented in **Table 4-10.** In the upper right graph, District costs are represented by the sum of the stacked bars. Note that debt service is small relative to other costs; therefore, is difficult to visualize in **Figure 4-2**. The District would use reserves to fund a revenue shortfall, as shown by the red bars below the x-axis. As indicated in **Table 4-10** and **Figure 4-2** (bottom right graph), ending reserve balances become negative starting in FY 2025.

Figure 4-2: Status Quo Water Financial Plan



4.1.6. PROPOSED WATER FINANCIAL PLAN

Raftelis developed a long-term financial plan model incorporating the known and forecasted cost increases for operating requirements and capital expenditures. The results were presented to and discussed with the District's Board of Directors. The proposed annual revenue adjustments for the Water Fund, as well as the planned future debt issuance, are shown in **Table 4-11**.

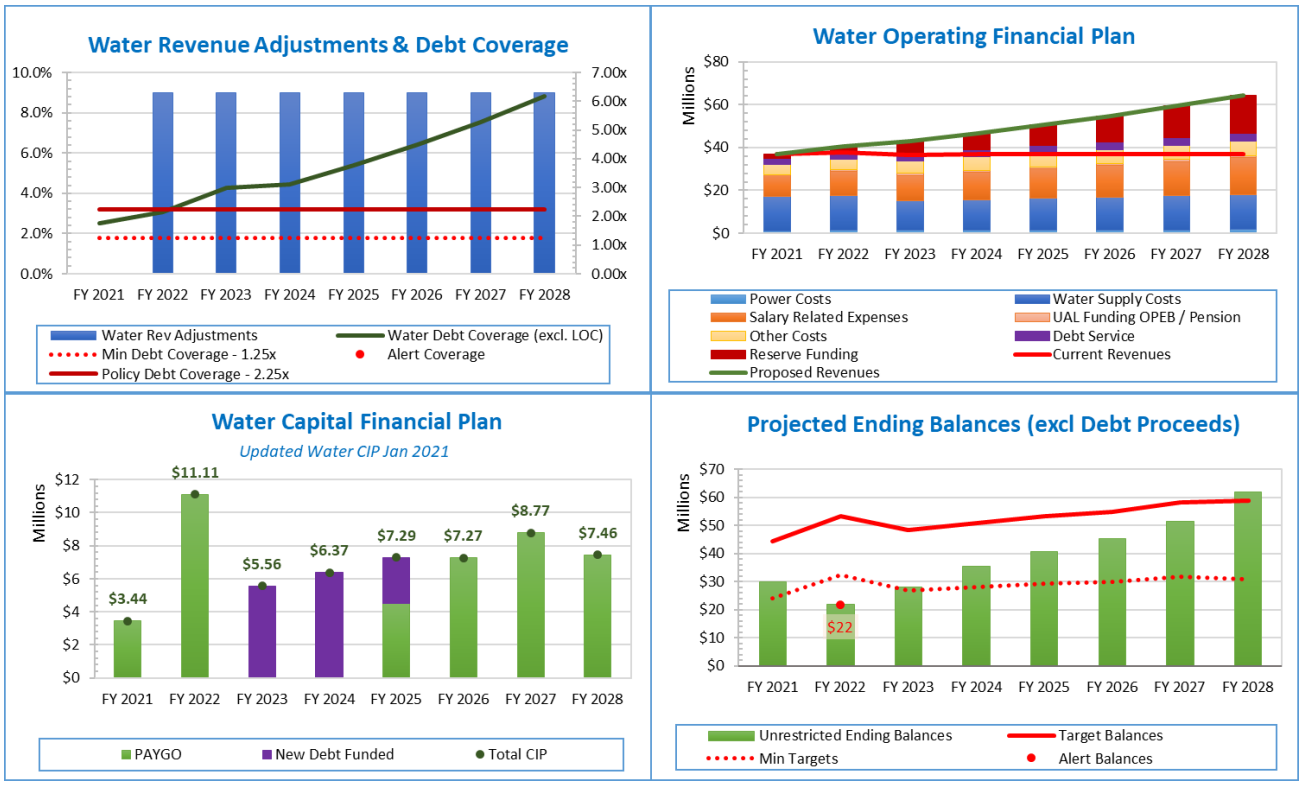
Table 4-11: Proposed Annual Water Revenue Adjustments

Fiscal Year	Effective	Water	New Water Debt
2022	July	9%	
2023	July	9%	$15M
2024	July	9%	
2025	July	9%	
2026	July	9%	

The graph in the top right of **Figure 4-3** shows the operating financial plan represented in **Table 4-12** with revenue adjustments (top left) showing sufficient debt coverage. District costs are represented by the sum of the stacked bars. The capital improvement plan (bottom left) is partially funded by issuing debt in FY 2023. Ending reserve balances, shown in the bottom right chart, achieve minimum targets (red dotted line in bottom right chart) in all

but one year. By FY 2028 the District will achieve its reserve target, which includes the Water Contingency Reserve.

Figure 4-3: Proposed Water Financial Plan



The revenue adjustments in **Table 4-11** are incorporated into Raftelis' recommended financial plan in **Table 4-12.** Under this proposed financial plan scenario, the District's financial position is greatly improved compared to the "status quo" plan described in **Table 4-10.** Starting in FY 2023 the projected cashflow is positive and minimum reserve targets are met. Equally critical, ending reserve balances will be at, or close to, target reserve values and the District meets its debt covenant obligations in each year.

Table 4-12: Proposed Water Financial Plan

			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**REVENUES**									
2	**OPERATING REVENUES**									
3	Revenues from Current Rates		$32,618,516	$33,003,575	$33,016,068	$33,024,991	$33,033,914	$33,041,053	$33,041,053	$33,041,053
4	Proposed Rev Adjustments		$0	$2,970,322	$6,210,322	$9,743,330	$13,596,152	$17,796,702	$22,372,100	$27,359,284
5	PFAS Impact Fee		$745,002	$895,771	$0	$0	$0	$0	$0	$0
6	Other Operating Rev		$824,650	$832,897	$841,225	$849,638	$858,134	$866,715	$875,383	$884,136
7	**SUBTOTAL OPERATING REVENUES**		**$34,188,168**	**$37,702,564**	**$40,067,615**	**$43,617,959**	**$47,488,200**	**$51,704,470**	**$56,288,535**	**$61,284,473**
8	**NON-OPERATING REVENUES**									
9	Property Tax		$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000	$1,950,000
10	Investment Income		$175,000	$259,394	$250,193	$317,979	$380,617	$430,582	$485,385	$568,275
11	Other Non-Oper Rev		$601,646	$607,662	$613,739	$619,876	$626,075	$632,336	$638,659	$645,046
12	**SUBTOTAL NON-OPERATING REVENUES**		**$2,726,646**	**$2,817,057**	**$2,813,932**	**$2,887,855**	**$2,956,692**	**$3,012,918**	**$3,074,044**	**$3,163,321**
13	**TOTAL REVENUES**		**$36,914,814**	**$40,519,621**	**$42,881,547**	**$46,505,814**	**$50,444,891**	**$54,717,389**	**$59,362,579**	**$64,447,794**
14	**EXPENSES**									
15	Power		$1,222,191	$1,283,301	$1,347,466	$1,414,839	$1,485,581	$1,559,860	$1,637,853	$1,719,745
16	Water Supply Fixed Costs		$1,329,288	$1,363,952	$1,399,551	$1,436,112	$1,473,662	$1,512,227	$1,551,836	$1,592,519
17	Water Supply Variable Costs		$14,653,605	$15,054,339	$12,445,532	$12,857,864	$13,286,614	$13,732,518	$14,196,348	$14,678,914
18	Salary Related Expenses		$10,156,647	$10,969,179	$11,846,713	$12,794,450	$13,818,006	$14,923,447	$16,117,322	$17,406,708
19	UAL Funding OPEB / Pension		$0	$924,226	$924,226	$924,226	$924,226	$924,226	$924,226	$924,226
20	Supplies and Services		$4,651,466	$4,959,410	$4,713,760	$4,813,454	$4,915,413	$5,019,695	$5,126,362	$5,235,476
21	PFAS O&M		$0	$0	$819,467	$1,245,591	$1,270,503	$1,295,913	$1,321,831	$1,348,268
22	Other Non-Operating Expenses		$117,994	$120,354	$122,761	$125,216	$127,721	$130,275	$132,880	$135,538
23	**TOTAL EXPENSES**		**$32,131,191**	**$34,674,760**	**$33,619,476**	**$35,611,753**	**$37,301,725**	**$39,098,161**	**$41,008,660**	**$43,041,395**
24	**NET REVENUES**		**$4,783,624**	**$5,844,861**	**$9,262,071**	**$10,894,061**	**$13,143,167**	**$15,619,228**	**$18,353,919**	**$21,406,399**
25	**DEBT SERVICE**									
26	Current Debt Service		$2,729,381	$2,728,919	$2,724,681	$2,726,331	$2,723,581	$2,717,331	$2,722,206	$2,694,456
27	Proposed Debt Service		$0	$0	$382,644	$765,289	$765,289	$765,289	$765,289	$765,289
28	LOC Interest Payments		$0	$0	$0	$0	$0	$0	$0	$0
29	LOC Principal Payments		$0	$0	$0	$0	$0	$0	$0	$0
30	**TOTAL DEBT SERVICE**		**$2,729,381**	**$2,728,919**	**$3,107,326**	**$3,491,620**	**$3,488,870**	**$3,482,620**	**$3,487,495**	**$3,459,745**
31	**CAPITAL EXPENDITURES**									
32	PAYGO		$3,443,289	$11,111,021	$0	$0	$4,529,141	$7,268,648	$8,773,896	$7,461,030
33	LOC Funded		$0	$0	$0	$0	$0	$0	$0	$0
34	New Debt Funded		$0	$0	$5,563,890	$6,374,204	$2,761,906	$0	$0	$0
35	**TOTAL CAPITAL EXPENDITURES**		**$3,443,289**	**$11,111,021**	**$5,563,890**	**$6,374,204**	**$7,291,046**	**$7,268,648**	**$8,773,896**	**$7,461,030**
36	**NET CASH CHANGES**		**-$1,389,046**	**-$7,995,079**	**$6,154,745**	**$7,402,441**	**$5,125,156**	**$4,867,959**	**$6,092,528**	**$10,485,624**
37	**BEGINNING UNRESTRICTED BALANCES**		$31,326,019	$29,936,972	$21,941,893	$28,096,638	$35,499,079	$40,624,235	$45,492,194	$51,584,722
38	**ENDING UNRESTRICTED BALANCES**		**$29,936,972**	**$21,941,893**	**$28,096,638**	**$35,499,079**	**$40,624,235**	**$45,492,194**	**$51,584,722**	**$62,070,346**
39	**MIN TARGETS**		**$24,257,626**	**$32,568,309**	**$26,760,971**	**$28,062,531**	**$29,396,079**	**$29,816,638**	**$31,792,968**	**$30,981,324**
40	**TARGET BALANCES**		**$44,308,148**	**$53,320,188**	**$48,550,444**	**$50,941,479**	**$53,418,973**	**$55,040,677**	**$58,278,209**	**$58,790,827**
41	Operations	90 days of O&M	$7,922,759	$8,549,941	$8,289,734	$8,780,980	$9,197,686	$9,640,642	$10,111,724	$10,612,947
42	Capital	100% Current FY CIP	$3,443,289	$11,111,021	$5,563,890	$6,374,204	$7,291,046	$7,268,648	$8,773,896	$7,461,030
43	Rate Stabilization	5% of Water Sales	$1,039,602	$1,055,371	$1,055,371	$1,055,371	$1,055,371	$1,055,371	$1,055,371	$1,055,371
44	Emergency	5% of Capital Assets	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511	$11,486,511
45	Conservation	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911	$104,911
46	Employee Liability	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554	$260,554
47	MWD Contingency	100% of WS if on 100% MWD	$20,050,523	$20,751,880	$21,789,474	$22,878,947	$24,022,895	$25,224,039	$26,485,241	$27,809,504
48	Debt Coverage (excl. LOC)		1.75x	2.14x	2.98x	3.12x	3.77x	4.48x	5.26x	6.19x
49	Min Debt Coverage		1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x
50	Policy Debt Coverage		2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x

4.2. Water Cost of Service Analysis

This rate Study conforms to the principles set forth in the *American Water Works Association M1 Manual.*

4.2.1. PROPORTIONALITY

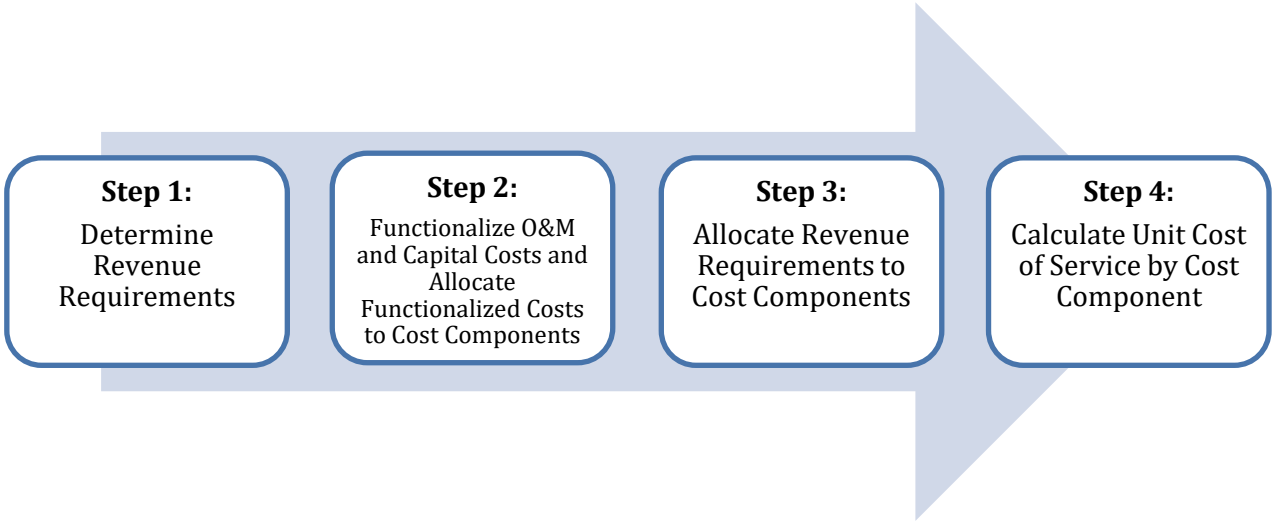
As stated in the *M1 Manual*, the AWWA Rates and Charges Subcommittee agrees with the requirements of Proposition 218 that "the costs of water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." An agency's revenue requirements are, by definition, the total cost of providing the applicable service. This cost is then used as the basis to develop unit costs, by cost component, to allocate costs to the various customer classes in proportion to the water services rendered.

The concept of proportionality requires that cost allocations consider both the average quantity of water consumed (base) and the peak rate at which it is consumed (known as peaking or extra capacity). A water system is designed to meet peak demands. The additional costs associated with designing, constructing, and maintaining facilities to meet these peak demands must be allocated to those customers whose usage requires facilities to upsize in response to peak demand. In allocating the costs of service, the industry standard as promulgated by AWWA's *M1 Manual* is to group customers with similar system demands into common rate blocks.

4.2.2. WATER COST OF SERVICE ANALYSIS

A cost-of-service analysis distributes a utility's revenue requirements (costs) to each customer class. **Figure 4-4** provides a general overview of a cost-of-service analysis. Each step shown below will be described in greater detail in the context of the District's service costs.

Figure 4-4: Cost of Service Process



4.2.2.1. Step 1 – Determine Revenue Requirement

The revenue requirement is the amount of (annual) revenue the utility must generate to meet its estimated annual operating expenses, debt service, capital expenses, and reserve funding. The revenue requirement from rates is shown in **Table 4-13**, line 7. Non-rate revenues (i.e., revenue offsets) are subtracted from the revenue requirement in line 7 to obtain the net revenue requirement from current rates in line 16. This amount is the same value (after subtracting Line 6) as current rate revenue on line 3 of **Table 4-12**. The current rates were not implemented for the full FY 2021; thus, the adjustment for annualized current rate revenues (line 6) is added to the requirements.

Table 4-13: FY 2021 Revenue Requirement

	Current Revenue Requirements	Source Table(s)	FY 2021
1	**REVENUE REQUIREMENTS**		
2	O&M Expenses	**Table 4-12** and **Table 4-13**	$32,131,191
3	Debt Service	**Table 4-12**	$2,729,381
4	Rate Funded CIP	**Table 4-12**	$3,443,289
5	Reserve Funding w/o Revenue Adjustment	**Table 4-11**	($1,389,046)
6	Annualized Current Year Rate Revenue		$361,885
7	**Subtotal Revenue Requirements**		**$37,276,699**
8	Less Other Revenue Offset		
9	PFAS Impact Fee	**Table 4-12**	$745,002
10	Other Operating Revenues	**Table 4-12**	$824,650
11	Property Tax	**Table 4-12**	$1,950,000
12	Investment Income	**Table 4-12**	$175,000
13	Other Non-Operating Revenues	**Table 4-12**	$601,646
14	**Subtotal Other Revenue Offset**		**$4,296,298**
15			
16	**Net Revenue Requirement (Excluding Revenue Adjustments)**	[7] - [15]	**$32,980,401**

4.2.2.2. Step 2 - Functionalize O&M and Capital Costs and Allocate Functionalized Costs to Cost Components

Raftelis utilized the base-extra capacity method, described in AWWA's *M1 Manual*, which consists of several cost causation components. Functionalization of costs allows a more robust allocation of costs to cost causation components, which include:

- ***Water supply costs*** are direct costs incurred to produce or obtain water (raw water purchases).
- ***Base fixed costs*** are the operating and capital costs of the water system associated with serving customers at a constant, or average, rate of use.
- ***Extra capacity costs,*** or peaking costs, represent the costs incurred to meet customer peak demands for water in excess of average day usage. Total extra capacity costs are subdivided into costs associated with maximum day and maximum hour demands. The maximum day demand is the maximum amount of water used in a single day in a year. The maximum hour (**max hour**) demand is the maximum usage in an hour on the maximum usage day (**max day**). Various facilities are designed to meet customer peaking needs. For example, transmission lines or reservoirs (storage) are designed to meet max day requirements. Both must be designed larger than they would be if the same amount of water were being used at a constant rate throughout the year. The cost associated with constructing a larger line or reservoir is based on systemwide peaking factors. For example, if the max day factor is 2.0, then certain system facilities must be designed at least twice as large as required to meet average daily demand. In this case, half of the cost would be allocated to base (or average day demand) and the other half allocated to max day. The calculation of the max hour and max day demands is explained below.
- ***Billing and customer service costs*** include costs such as meter reading, billing, collections, and customer accounting.
- ***Meter servicing costs*** include maintenance and capital costs associated with servicing meters. These costs are assigned based on meter size or equivalent meter capacity.
- ***General and administrative costs*** represent all other service and administrative costs that do not serve a specific function (indirect costs).

» ***Conservation*** includes costs associated with conservation programs and services offered to District customers.

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

After functionalizing expenses, the next step is to allocate the functionalized expenses to cost causation components. To do so, we must first identify systemwide peaking factors. The systemwide peaking factors are used to derive the cost component allocation bases (i.e., percentages). Functionalized expenses are then allocated to the cost causation components using these allocation bases. To understand the interpretation of the percentages, we first establish the base use as the average daily demand during the year.

The base demand is assigned a value of 1.0. The max day and max hour values in **Table 4-14** are extracted from the District's 2005 Water Master Plan[6] and are relative to the average day demand of 1.00.

Table 4-14: Water System Peaking Factors

	Potable Water	Peaking Factors
1	Average Day Demand	1.00
2	Max Day Demand	1.50
3	Max Hour Demand	2.55

To determine the relative proportion of costs to assign to supply, base delivery, maximum day, and maximum hour, allocations are calculated based on the factors in **Table 4-14.** Cost components that are solely related to providing average day demand (ADD) are allocated entirely to base delivery. Cost components that are designed to meet max day peaks, such as reservoirs and transmission facilities, are allocated to both base delivery and max day factors.

The max day factor of the District's system is 1.5, which means that max day demand is expected to be 150% of the average day capacity. Calculating the max day allocation of functional costs to the cost causation components results in the following:

$$Base\ Fixed\ Allocation = \frac{Base\ Fixed}{Max\ Day} = \frac{1}{1.5} \approx 66.7\%$$

$$Max\ Day\ Allocation = 1 - Base/Max\ Day \approx 33.3\%$$

Facilities designed for max hour peaks, such as distribution system facilities, are allocated similarly. The max hour factor is 2.55, so max hour facilities are designed to provide 255% of the average day capacity. The allocation of max hour facilities is shown below:

$$Base\ Fixed\ Alloction = \frac{Base}{Max\ Hour} = \frac{1}{2.55} \approx 39.2\%$$

[6] Page 7-7, Section 7.6

$$Max\ Day\ Allocation = \frac{Max\ Day - Base}{Max\ Hour} = \frac{1.5 - 1.00}{2.55} \approx 19.6\%$$

$$Max\ Hour\ Allocation = 1 - 39.2\% - 19.6\% \approx 41.2\%$$

The results of the allocation are presented below in **Table 4-15**.

Table 4-15: Allocation of Extra Capacity Functional Costs to Cost Causation Categories

	Peaking Factor	Base	Max Day	Max Hour
Base	1.00	100%		
Max Day	1.50	66.7%	33.3%	
Max Hour	2.55	39.2%	19.6%	41.2%

The peaking factors are applied to the estimated water usage during FY 2021 in **Table 4-16** to estimate demand peaking levels. As shown, the Annual Usage is 7,380,219 ccf, this results in average daily usage of 20,220 ccf/day (base usage). The Max Day factor of 1.50 and Max Hour factor of 2.55 is applied to the base to calculate 30,330 ccf/day and 51,560 ccf/day, respectively. The percentages from **Table 4-15** are also applied to the operating and capital improvement expenses in **Table 4-17** to allocate costs among base, max day, and max hour cost components. This will be utilized in allocating functionalized expenses to cost components.

Table 4-16: Water Usage Peaking

Water Usage	FY 2021	Units
Annual Usage	7,380,219	ccf
Average Daily Usage	**20,220**	**ccf / day**
Max Day Factor	1.50	
Max Day Demand	30,330	ccf / day
Extra Capacity Max Day	**10,110**	**ccf / day**
Max Hour Factor	2.55	
Max Hour Demand	51,560	ccf / day
Extra Capacity Max Hour	**21,231**	**ccf / day**

Table 4-17: O&M and Capital Allocation to Cost Causation Components

	Functions	Water Supply	Base	Max Day	Max Hour	Billing & CS	Meters	Conservation	General	Total
1	Source of Supply	100.0%							0.0%	100.0%
2	Storage		66.7%	33.3%					0.0%	100.0%
3	Pumping		39.2%	19.6%	41.2%				0.0%	100.0%
4	Treatment		66.7%	33.3%					0.0%	100.0%
5	Transmission		66.7%	33.3%					0.0%	100.0%
6	Distribution		39.2%	19.6%	41.2%				0.0%	100.0%
7	T&D		39.2%	19.6%	41.2%				0.0%	100.0%
9	Meter Service						100.0%		0.0%	100.0%
10	Billing & CS					100.0%			0.0%	100.0%
11	Conservation							100.0%	0.0%	100.0%
12	General & Admin								100.0%	100.0%

Table 4-18: Functionalized Water Capital Assets

Asset Class	RCLD	Source of Supply	Storage	Pumping	Treatment	T&D	Meter Service	Billing & CS	General & Admin	Total
Source of Supply	$5,766,921	100.0%							0.0%	100.0%
Pumping Plant	$22,381,037			100.0%					0.0%	100.0%
Transmission and Distribution. Plant	$187,792,880					100.0%			0.0%	100.0%
Water Treatment Plant	$1,234,061				100.0%				0.0%	100.0%
General Plant	$12,555,312								100.0%	100.0%
Total Water Asset Values	**$229,730,212**	**$5,766,921**	**$0**	**$22,381,037**	**$1,234,061**	**$187,792,880**	**$0**	**$0**	**$12,555,312**	**$229,730,212**
% of Assets		2.51%	0%	9.74%	0.54%	81.74%	0%	0%	5.47%	
% of Assets for Salary expenses			0%	9.99%	0.55%	83.85%	0%	0%	5.61%	

Table 4-18 displays the distribution of assets across several functions, using RCLD valuation of the District's water assets. Raftelis allocated salary related expenses first to water functions as shown in **Table 4-19** using the functionalized water capital as approximates and estimated personnel allocated to billing & customer service of 8.2%. The last line in **Table 4-18** shows a percentage breakdown for salary expenses. This line is used to

calculate the percentage to allocate for salary related expenses, shown in **Table 4-19** below. The functionalized salary-related expenses were further allocated to cost components as shown in **Table 4-20** using allocation factors from **Table 4-17.**

Table 4-19: Percent Allocation of Salary Related Expenses to Cost Causation Components

Salary Related Expenses	% allocation calculation (Rounded from Table 4-18)	%	FY 2021
Pumping	9.99% x (1-8.2%)	8.94%	$908,354
Treatment	0.55% x (1-8.2%)	0.49%	$50,085
T&D	83.85% x (1-8.2%)	75.04%	$7,621,739
Billing & CS	8.2%	8.20%	$832,845
General & Admin	5.61% x (1-8.2%)	7.32%	$743,624
Total Salary Related Expenses			$10,156,647

Table 4-20: Dollar Allocation of Salaries and Benefits to Cost Causation Components

Salary Related Expenses	Base	Max Day	Max Hour	Billing & CS	General	Total
Pumping	$356,217	$178,109	$374,028	$0	$0	$908,354
Treatment	$33,390	$16,695	$0	$0	$0	$50,085
T&D	$2,988,917	$1,494,459	$3,138,363	$0	$0	$7,621,739
Billing & CS	$0	$0	$0	$832,845	$0	$832,845
General & Admin	$0	$0	$0	$0	$743,624	$743,624
Total Salary Related Expenses	**$3,378,525**	**$1,689,262**	**$3,512,391**	**$832,845**	**$743,624**	**$10,156,647**

The O&M cost allocation total in **Table 4-21** utilizes the percentages from **Table 4-17** to distribute the expenses across the various cost causation components. **Table 4-22** below utilizes the percentages from **Table 4-17** to distribute the capital costs across the various cost causation components.

Table 4-21: Allocation of O&M Costs to Cost Causation Components

	Functions	FY 2021	Water Supply	Base	Max Day	Max Hour	Billing & CS	Meters	Conservation	General	Total
1	Source of Supply	$17,205,084	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2	Pumping	$908,354	0.0%	39.2%	19.6%	41.2%	0.0%	0.0%	0.0%	0.0%	100.0%
3	Treatment	$50,085	0.0%	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
4	T&D	$7,621,739	0.0%	39.2%	19.6%	41.2%	0.0%	0.0%	0.0%	0.0%	100.0%
5	Meter Service	$528,780	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
6	Billing & CS	$1,169,794	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
7	Conservation	$0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
8	General & Admin	$4,647,355	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
9	**Total**	**$32,131,191**	**$17,205,084**	**$3,378,525**	**$1,689,262**	**$3,512,391**	**$1,169,794**	**$528,780**	**$0**	**$4,647,355**	**$32,131,191**
10	Total Allocation %		53.5%	10.5%	5.3%	10.9%	3.6%	1.6%	0%	14.5%	100%

Table 4-22: Asset Allocation to Cost Causation Components

	Functions	RCLD	Water Supply	Base	Max Day	Max Hour	Billing & CS	Meters	Conservation	General	Total
1	Source of Supply	$5,766,921	100.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
2	Pumping	$22,381,037	0.0%	39.2%	19.6%	41.2%	0.0%	0.0%	0.0%	0.0%	100.0%
3	Treatment	$1,234,061	0.0%	66.7%	33.3%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%
4	T&D	$187,792,880	0.0%	39.2%	19.6%	41.2%	0.0%	0.0%	0.0%	0.0%	100.0%
5	Meter Service	$0	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	100.0%
6	Billing & CS	$0	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	0.0%	0.0%	100.0%
7	Conservation	$0	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	0.0%	100.0%
8	General & Admin	$12,555,312	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%	100.0%	100.0%
9	**Total**	**$229,730,212**	**$5,766,921**	**$83,243,852**	**$41,621,926**	**$86,542,201**	**$0**	**$0**	**$0**	**$12,555,312**	**$229,730,212**
10	**% Allocation w/ WS**		2.5%	36.2%	18.1%	37.7%	0.0%	0.0%	0.0%	5.5%	100%
11	**% Allocation w/o WS & General**		0%	39.4%	19.7%	40.9%					100%

4.2.2.3. Step 3 – Allocate Revenue Requirements to Cost Causation Components

Table 4-23 shows the calculation of the revenue requirement in **Table 4-13** paired with the corresponding allocation percentages for each line. For example, O&M expenses are allocated to the cost causation categories according to **Table 4-21** while capital costs are allocated according to **Table 4-22**.

Table 4-23 summarizes the revenue requirement by cost component. **Table 4-24** summarizes allocation of the revenue requirement to cost-causative components.

Table 4-23: Allocation of Revenue Requirement to Cost Causation Components

	Current Revenue Requirements	FY 2021 ($)	Water Supply	Base	Max Day	Max Hour	Billing & CS	Meters	General
1	**REVENUE REQUIREMENTS**								
2	O&M Expenses	$32,131,191	$17,205,084	$3,378,525	$1,689,262	$3,512,391	$1,169,794	$528,780	$4,647,355
3	Debt Service	$2,729,381	$0	$1,074,719	$537,360	$1,117,302	$0	$0	$0
4	Rate Funded CIP	$3,443,289	$0	$1,355,827	$677,913	$1,409,548	$0	$0	$0
5	Reserve Funding w/o Rev Adjustment	-$1,389,046	-$2,169,555	$176,668	$88,334	$183,668	$61,170	$27,651	$243,017
6	Annualized Current Year Rate Revenue	$361,885	$0	$81,913	$40,956	$85,158	$28,362	$12,820	$112,676
7	**Subtotal Revenue Requirements**	**$37,276,699**	**$15,035,529**	**$6,067,651**	**$3,033,826**	**$6,308,068**	**$1,259,326**	**$569,251**	**$5,003,048**
8	**Less Other Revenue Offset**								
9	PFAS Impact Fee	$745,002	$745,002	$0	$0	$0	$0	$0	$0
10	Other Operating Rev	$824,650	$0	$186,660	$93,330	$194,056	$64,630	$29,214	$256,761
11	Property Tax	$1,950,000	$0	$441,383	$220,691	$458,871	$152,826	$69,082	$607,147
12	Investment Income	$175,000	$0	$39,611	$19,806	$41,181	$13,715	$6,200	$54,488
13	Other Non-Oper Rev	$601,646	$0	$136,183	$68,091	$141,579	$47,152	$21,314	$187,327
14	**Subtotal Other Revenue Offset**	**$4,296,298**	**$745,002**	**$803,836**	**$401,918**	**$835,686**	**$278,323**	**$125,810**	**$1,105,723**
15	**Net Revenue Requirement excl. Rev Adjustments**	$32,980,401	$14,290,526	$5,263,816	$2,631,908	$5,472,382	$981,003	$443,441	$3,897,325

Table 4-24: Summary Revenue Requirement Allocated to Cost Causation Components

	Cost Categories	Allocation of Revenue Requirement
1	Water Supply	$14,290,526
2	Base Fixed	$5,263,816
3	Max Day	$2,631,908
4	Max Hour	$5,472,382
5	Billing & CS	$981,003
6	Meters & Services	$443,441
7	Conservation	$0
8	General	$3,897,325
9	**Total**	**$32,980,401**

General costs are reallocated to the cost causation categories, as shown in **Table 4-25.** Each category's proportional share of the District's general and administrative costs is calculated by dividing that category's cost in column B by the total cost shown in column B, line 9. Most of the water supply costs are direct costs from wholesale purchases; therefore, general cost allocation is excluded from this cost component. The resulting allocation of general and administrative costs are shown in **Table 4-25**, column D.

Table 4-25: General Cost Reallocation

	Cost Component	Allocation of Revenue Requirement	General Cost Reallocation		
		A	(B)	C = B / B9	D = A8 x C
1	Water Supply	$14,290,526			
2	Base Fixed	$5,263,816	$5,263,816	35.6%	$1,386,833
3	Max Day	$2,631,908	$2,631,908	17.8%	$693,417
4	Max Hour	$5,472,382	$5,472,382	37.0%	$1,441,783
5	Billing & CS	$981,003	$981,003	6.6%	$258,460
6	Meters & Services	$443,441	$443,441	3.0%	$116,831
7	Conservation	$0	$0	0.0%	$0
8	General	$3,897,325		(100.0%)	-$3,897,325
9	**Total**	**$32,980,401**	**$14,792,550**		**$0**

The resulting reallocated revenue requirement is shown in **Table 4-26**, column C. These allocations are used to develop cost component unit costs of service in step 4.

Table 4-26: FY 2021 Allocated Revenue Requirements after General Cost Reallocation

	Cost Categories	Revenue Requirement Prior to General Cost Reallocation	General Cost Reallocation	Reallocated Revenue Requirement
		A	B	C = A +B
1	Water Supply	$14,290,526		$14,290,526
2	Base Fixed	$5,263,816	$1,386,833	$6,650,649
3	Max Day	$2,631,908	$693,417	$3,325,324
4	Max Hour	$5,472,382	$1,441,783	$6,914,166
5	Billing & CS	$981,003	$258,460	$1,239,463
6	Meters & Services	$443,441	$116,831	$560,272
7	Conservation	$0	$0	$0
8	General	$3,897,325	-$3,897,325	$0
9	**Total**	**$32,980,401**	**$0**	**$32,980,401**

The water system is designed to meet peak demand plus fire protection. Thus a portion of peak demand is designed for meeting fire protection. Public fire protection costs are peaking costs and will be recovered through rates as public fire protection benefits all users within the water system. Private fire protection costs are recovered through private fire service charges. **Table 4-27** shows the calculations of fire demand units for both private and public fire protection services. The fire demand factor (Column C) is based on the Hazen-Williams equation for flow through pressure conduits. The flow demand is dependent on the diameter of the fire line raised to the power of 2.63. For example, to calculate the fire demand units for 6" fire lines you would calculate 6^2.63 = 111.31 (Fire demand factor), then multiply this factor by 137 (# of meters) to arrive at 15,250. Repeat these steps for each fire line size and multiply the sum by 12 billing periods to calculate the total fire demand units of 531,426 (column F).

Table 4-27: Public and Private Fire Demands

Fire Service	# of meters	Fire Demand Factor	Fire Demand Units	Fire Demand %	Fire Demand Units
A	B	C = A^2.63	D = B x C	E	F = D x 12
Private Fire			**44,286**	**9%**	**531,426**
4	114	38.32	4,368		
6	137	111.31	15,250		
8	95	237.21	22,535		
10	5	426.58	2,133		
Public Hydrants			**446,913**	**91%**	
6	4,015	111.31	446,913		

Table 4-28 shows the allocated peaking costs (max day and max hour) for public and private fire protection. Revenue requirements (Line 1) shows the revenue requirements that must then be divided by the extra capacity demand (line 2) to arrive at the unit cost of service (line 3 and 4, by ccf and thousands of gallons respectively). **Max day** is calculated by the following: 1,500 gpm (gallons per minute) x 2 hours (duration) x 60/1000 (conversion to kgal per hour) = 180. **Max hour** is 1,500 x 60/1000 x 24 – Max day = 1,980. Note: the fire demand (line 5) is calculated using 1,500 gpm, which the District provided to Raftelis. The unit cost of service is then multiplied by

the fire demand (line 5) to arrive at fire protection costs (line 6). The fire demand % from **Table 4-27** is then applied to fire protection costs (line 6) to receive the allocation amounts (line 7 & 8).

Table 4-28: Allocation of Peaking Costs to Fire Protection

	Allocation of Peaking Costs to Fire		Max Day	Max Hour	Notes
1	Revenue Requirements		$3,325,324	$6,914,166	Table 4-25, [C3] and [C4]
2	Extra capacity demand	ccf / day	10,110	21,231	Table 4-16
3	Unit Cost of service	$ / ccf	$328.92	$325.67	[1] / [2]
4	Unit Cost of service	$ / kgal	$439.73	$435.38	[3] x 1000 / 748
5	Fire Demand	kgal	180 kgal	1,980 kgal	1,500 gpm for 2 hrs
6	**Fire Protection Costs**		**$79,151**	**$862,060**	**[4] x [6]**
7	Private Fire	9%	$7,136	$77,722	9% x [7]
8	Public Hydrants	91%	$72,015	$784,339	91% x [7]

Table 4-29 shows the reallocated revenue requirements for the fire lines. Shown in column B are the amounts from **Table 4-28** that are allocated to private fire. These have been removed from the revenue requirements as they will have a separate charge. The revenue requirements allocated to public hydrants are not removed due to the service being of public benefit.

Table 4-29: Reallocated FY 2021 Revenue Requirements

	Cost Categories	Revenue Requirement	Fire Protection Allocation	Reallocated Net Revenue Requirement
		A	B	C = A + B
1	Water Supply	$14,290,526		$14,290,526
2	Base Fixed	$6,650,649		$6,650,649
3	Max Day	$3,325,324	($7,136)	$3,318,188
4	Max Hour	$6,914,166	(77,722)	$6,836,444
5	Billing & CS	$1,239,463		$1,239,463
6	Meters & Services	$560,272		$560,272
11	Private Fire		$84,858	$84,858
12	**Total**	**$32,980,401**		**$32,980,401**

4.2.2.4. Step 4 – Calculate Unit Cost of Service

In Step 4, we develop unit costs for each cost component. The unit costs are developed by dividing the total cost for each cost component by the total annual service units attributable to the cost component.

Table 4-30 illustrates the meter ratios using the meter hydraulic capacity as listed in Table B-1 of AWWA's *M1 Manual*. These ratios define meter sizes in terms of their equivalent capacity to 3/4-inch meters. For example, a 1-inch meter has the equivalent capacity of 1.67 3/4-inch meters (column C, line 3). Using these ratios allows costs to be distributed equitably across different meter sizes. To derive the total equivalent meter units (EMUs) served by the District, we multiply the total meters at each meter size by their respective meter capacity ratios. The resulting EMUs are shown in column E. Total meters at each size are shown in column A. The table also lists the total annual bills for all meters in each meter size (column D), which is the number of meters multiplied by 12 months. Total bills and EMUs are the units of service for the unit costs by cost component.

Table 4-30: Meter Ratios and Equivalent Meter Units

Units of Service Meter Size	FY 2021 # of meters	Capacity gpm	AWWA Ratio	FY 2021	
				Bills	EMUs
	A	B	C = B / B3	D = A x 12	E = D x C
5/8	26	20	1.00	312	312
3/4	5,602	30	1.00	67,224	67,224
1	18,049	50	1.67	216,588	360,980
1 1/2	602	100	3.33	7,224	24,080
2	1,108	160	5.33	13,296	70,912
3	7	350	11.67	84	980
4	3	630	21.00	36	756
6	1	1,600	53.33	12	640
Total Water Meters	**25,398**			**304,776**	**525,884**

Raftelis worked closely with District staff and the District's Board of Directors to design the water rate structures that meet District objectives and meet California regulatory requirements. As shown in **Table 4-31**, certain costs such as power, water supply, private fire, billing, and customer service (CS), and meters are recovered through their respective water rate components. Some costs, however, are recovered across two different rate components. The District Board instructed Raftelis to collect a portion of peaking costs from Capital Finance Charges to recover at least the current debt service payments. The remaining peaking costs are recovered through the meter capacity component of the monthly service charges. The Board also made the decision to collect approximately $3.4M, which is equal to the CIP for FY 2021, of the base fixed costs as part of the average fixed cost to deliver water to the end user. The remainder of the base costs is recovered by the monthly service charges as part of the meter capacity component. **Table 4-31**, line 11 calculates the unit cost of service for each rate component using the equivalent meter units in **Table 4-30**, fire demand units (FDUs) in **Table 4-27**, projected water sales (ccf) in Table 4-4, and annualized customer bills (bills).

Table 4-31: FY 2021 Unit Cost of Service Calculations

	Cost Categories	FY 2021 Net Revenues from Rates	Monthly Service Charges		Water Usage Rates			Private Fire Charges	Capital Finance Charges
		A	B	C	D	E	F	G	H
1	Power	$1,222,191				$1,222,191			
2	Water Supply Fixed Costs	$1,329,288			$1,329,288				
3	Water Supply Variable Costs	$11,739,047			$11,739,047				
4	Base	$6,650,649		$3,207,360			$3,443,289		
5	Peaking	$10,154,632		$7,425,251					$2,729,381
6	Billing & CS	$1,239,463	$1,239,463						
7	Meters	$560,272		$560,272					
8	Private Fire	$84,858						$84,858	
9	Total	$32,980,401	$1,239,463	$11,192,884	$13,068,335	$1,222,191	$3,443,289	$84,858	$2,729,381
10	Units of Service		304,776 bills	525,884 EMUs	7,380,219 ccf	7,380,219 ccf	7,380,219 ccf	531,426 FDUs	525,884 EMUs
11	Unit Cost of Service		$4.07	$21.29	$1.78	$0.17	$0.47	$0.16	$5.20

4.3. Water Rate Design

4.3.1. PROPOSED MONTHLY FIXED SERVICE CHARGE

Fixed charges are designed to recover costs related to customer billing, meter servicing, and extra capacity costs. Meter servicing costs are for such items as meter testing, repairs, and replacement. **Table 4-32** derives the unit cost for billing and customer service in column B and capacity in column C. **Table 4-33** sums the billing and customer service and capacity charges to derive the fixed cost per meter size prior to the proposed revenue adjustment (column E). The unit cost in **Table 4-32** (column C, row 3) is multiplied by the capacity ratio in **Table 4-33** (column B) to derive the meter-based capacity charge in column D of **Table 4-33**. **Table 4-34** presents the fixed charges by meter size after shown utilizing revised COS.

Table 4-32: Development of Unit Monthly Fixed Service Charge

Line No.	Fixed Charge Components	Billing & Customer Service	Capacity
	A	B	C
1	Revenue Requirements	$1,239,463	$11,192,884
2	Annual Units of Service (Table 4-29)	304,776 bills	525,884 EMUs
3	**Monthly Unit Cost** ([1] / [2] rounded up)	**$4.07**	**$21.29**

Table 4-33: FY 2021 Revised Monthly Fixed Service Charges before Proposed Revenue Adjustment

Meter Size	# of Meters	Capacity Ratios	Billing & CS	Capacity	Revised COS
	A	B (Table 4-30, C)	C (Table 4-32)	D = $21.29 x B	E = C + D
5/8	26	1.00	$4.07	$21.29	**$25.36**
3/4	5,602	1.00	$4.07	$21.29	**$25.36**
1	18,049	1.67	$4.07	$35.48	**$39.55**
1 1/2	602	3.33	$4.07	$70.97	**$75.04**
2	1,108	5.33	$4.07	$113.55	**$117.62**
3	7	11.67	$4.07	$248.38	**$252.45**
4	3	21.00	$4.07	$447.09	**$451.16**
6	1	53.33	$4.07	$1,135.47	**$1,139.54**

Table 4-34: FY 2021 COS Monthly Fixed Service Charges

Meter Size	Current Fixed Charge	Revised COS
5/8	$22.26	**$25.36**
3/4	$22.26	**$25.36**
1	$37.18	**$39.55**
1 ½	$74.14	**$75.04**
2	$118.67	**$117.62**
3	$259.84	**$252.45**
4	$467.59	**$451.16**
6	$1,039.15	**$1,139.54**

Table 4-35 shows the distribution of capital finance charges by meter size that were derived in **Table 4-31**. Capital finance charges recovered via property tax statements will be collected semiannually rather than monthly.

Table 4-35: FY 2021 COS Capital Finance Charges

Meter Size	# of Meters	Capacity Ratios	Monthly Capital Finance Charges	Annual Capital Finance Charges
	A	B (**Table 4-29**, C)	C = $5.20 x B	D = C x 12
5/8	26	1.00	$5.20	$62.40
3/4	5,602	1.00	$5.20	$62.40
1	18,049	1.67	$8.67	$104.04
1 1/2	602	3.33	$17.34	$208.08
2	1,108	5.33	$27.74	$332.88
3	7	11.67	$60.67	$728.04
4	3	21.00	$109.20	$1,310.40
6	1	53.33	$277.34	$3,328.08

Table 4-36 shows the development of private fire service charges. Revenue requirements (Line 1) are from **Table 4-31** and Annual Units of Service for column A is from **Table 4-27** while column B is calculated. The EMU amount of 530,096 is the combination of 525,884 EMUs (Water Meter Service, Table 4-32) and 4,212 EMUs from 351 private fire services. The 4,212 EMUs is included because the private fire services are typically attached to a 5/8" meter flow detector, which must also have services and replacements. The combined count of 530,096 will ensure the private fire service charge incorporates its responsible share of the $560,272 revenue requirement.

Table 4-36: Development of Private Fire Service Charges

Line No.	Fixed Charge Components	Private Fire Demand A	Meter Service B
1	Revenue Requirements	$84,858	$560,272
2	Annual Units of Service	531,426 FDUs	530,096 EMUs[7]
3	**Monthly Unit Cost** ([1] / [2], rounded up)	**$0.16**	**$1.06**

Table 4-37 shows the breakdown of the different components for private fire charges. Fire capacity (Column D) is calculated by multiplying monthly unit cost of private fire demand (from **Table 4-36**, column A) by fire demand factor (column B). The revised COS in column E is calculated by adding Column B and D together.

Table 4-37: FY 2021 Private Fire Charges before Proposed Revenue Adjustment

Private Fire Service	# of Meters A	Fire Demand Factors B (Table 4-26)	Private Fire Capacity Component C (Table 4-36)	Fire Line D = $0.16 x B	Revised COS E = C + D
4	114	38.32	$1.06	$6.14	**$7.20**
6	137	111.31	$1.06	$17.81	**$18.87**
8	95	237.21	$1.06	$37.96	**$39.02**
10	5	426.58	$1.06	$68.26	**$69.32**

4.3.2. PROPOSED WATER USE CHARGES

Water use charges are volumetric rates ($/ccf) that recover the cost components shown in **Table 4-38**. The unit costs and breakdown by category in **Table 4-39** and **Table 4-40. Table 4-39** values are directly from **Table 4-31**. The summation shown in **Table 4-39** is the combined unit costs for the revised FY 2021 period.

[7] 525,884 EMUs + 4,212 EMUs from 351 private fire services assumed with a 5/8 meter for flow detection, which also require meter services and meter replacements

Table 4-38: Water Use Cost Component Descriptions

Cost Component	Description
Power	Recovers Power Related Costs
Water Supply	Recovers Water Supply Related Costs
Delivery	Recover a portion of Base Costs to meet average demand

Table 4-39: FY 2021 Revised COS Water Usage Rate

	Cost Categories	Water Usage Rates		
		Water Supply	*Power*	*Delivery*
		A	*B*	*C*
1	Power		$1,222,191	
2	Water Supply Fixed Costs	$1,329,288		
3	Water Supply Variable Costs	$11,739,047		
4	Base			$3,443,289
5	**Total**	**$13,068,335**	**$1,222,191**	**$3,443,289**
6	Units of Service	7,380,219 ccf	7,380,219 ccf	7,380,219 ccf
7	**Unit Cost of Service**	**$1.78**	**$0.17**	**$0.47**

Table 4-40: Revised FY 2021 Water Usage Rates (Before Revenue Adjustments)

Water Usage Rate Components	Revised COS FY 2021 Rates
Water Supply	$1.78
Power	$0.17
Delivery	$0.47
Total	**$2.42 / ccf**

4.3.3. FIVE YEAR WATER RATE SCHEDULE

Table 4-41 contains the breakdown of the proposed five-year water rates through FY 2026. Calculations for the revised COS analysis are shown in **Table 4-33**. A rate adjustment of 9% each fiscal year is recommended through the end of FY 2026. The PFAS Impact Fee is not calculated as part of the cost of service for water. It will be

implemented only during the period of Feb 1, 2021 to Dec 31, 2021 to mitigate the financial impact during the construction period.

Table 4-41: Five-Year Proposed Water Rates

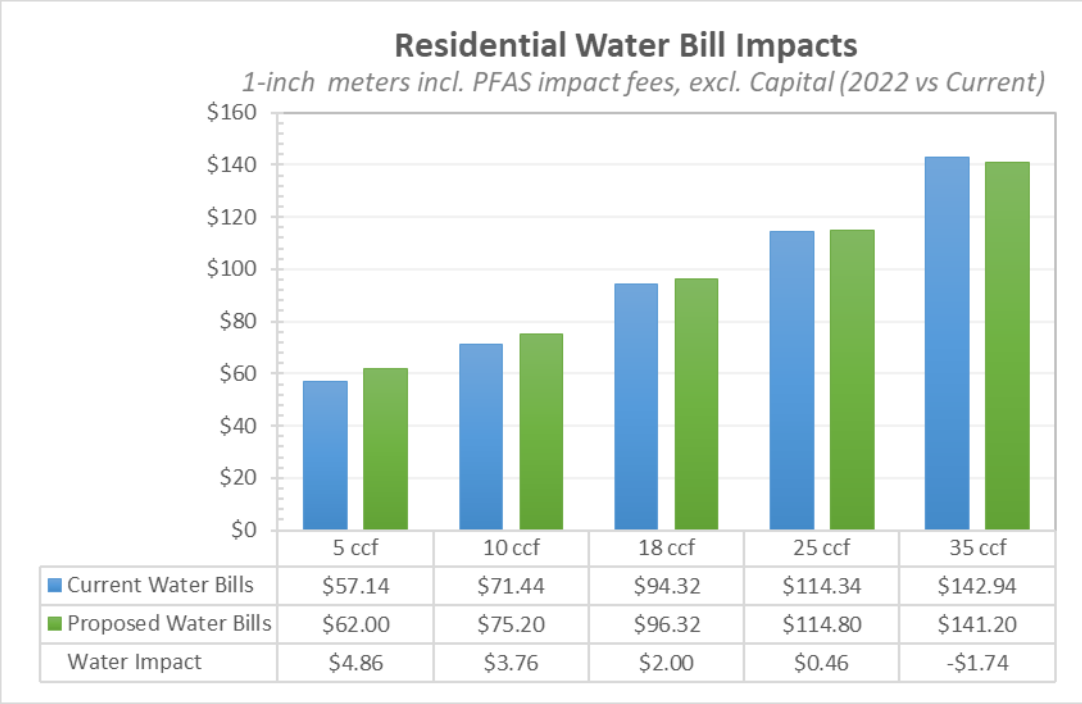
5-year Rate Schedule Revenue Adjustments	FY 2021	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
			9%	9%	9%	9%	9%
Monthly Service Charges	**Current**	**Revised COS**	**7/1/2021**	**7/1/2022**	**7/1/2023**	**7/1/2024**	**7/1/2025**
5/8	$22.26	$25.36	$27.65	$30.14	$32.86	$35.82	$39.05
3/4	$22.26	$25.36	$27.65	$30.14	$32.86	$35.82	$39.05
1	$37.18	$39.55	$43.13	$47.02	$51.26	$55.88	$60.91
1 1/2	$74.14	$75.04	$81.80	$89.17	$97.20	$105.95	$115.49
2	$118.67	$117.62	$128.21	$139.75	$152.33	$166.04	$180.99
3	$259.84	$252.45	$275.19	$299.96	$326.96	$356.39	$388.47
4	$467.59	$451.16	$491.77	$536.03	$584.28	$636.87	$694.19
6	$1,039.15	$1,139.54	$1,242.10	$1,353.89	$1,475.75	$1,608.57	$1,753.35
Capital Finance Charges[8]							
5/8		$5.20	$5.67	$6.19	$6.75	$7.36	$8.03
3/4		$5.20	$5.67	$6.19	$6.75	$7.36	$8.03
1		$8.67	$9.46	$10.32	$11.25	$12.27	$13.38
1 1/2		$17.34	$18.91	$20.62	$22.48	$24.51	$26.72
2		$27.74	$30.24	$32.97	$35.94	$39.18	$42.71
3		$60.67	$66.14	$72.10	$78.59	$85.67	$93.39
4		$109.20	$119.03	$129.75	$141.43	$154.16	$168.04
6		$277.34	$302.31	$329.52	$359.18	$391.51	$426.75
Private Fire							
4	$16.00	$7.20	$7.85	$8.56	$9.34	$10.19	$11.11
6	$35.00	$18.87	$20.57	$22.43	$24.45	$26.66	$29.06
8	$59.00	$39.02	$42.54	$46.37	$50.55	$55.10	$60.06
10	$94.00	$69.32	$75.56	$82.37	$89.79	$97.88	$106.69
PFAS Impact Fee							
5/8	$3.40	$3.40	$3.40				
3/4	$3.40	$3.40	$3.40				
1	$5.66	$5.66	$5.66				
1 1/2	$11.32	$11.32	$11.32				
2	$18.12	$18.12	$18.12				
3	$39.66	$39.66	$39.66				
4	$71.40	$71.40	$71.40				
6	$181.32	$181.32	$181.32				
Water Usage Rate ($/ccf)	$2.86	$2.42	$2.64	$2.88	$3.14	$3.43	$3.74

[8] Capital Finance Charges are assessed on the property roll on an annual basis. The charges shown in **Table 4-41** are monthly. For example, in FY 2022, a 5/8" meter will be assessed at $68.04 ($5.67 x 12 months).

4.4. Water Customer Impact Analysis

Before implementing new rates, it is critical to evaluate how the proposed rate structure will impact District customers. **Table 4-5** shows the estimated bill impacts under the proposed FY 2022 rates for a typical residential customer with a 1-inch meter with usage ranging from 5 ccf to 35 ccf. Note, the Water bill excludes the Capital Finance Charges, which will be collected in the property tax rolls for each parcel. For a residential customer with a 1-inch meter the Capital Finance Charge will add $9.46 to their cost of water service, on a monthly basis.

Figure 4-5: Typical Residential Customer Bill Impacts



	5 ccf	10 ccf	18 ccf	25 ccf	35 ccf
Current Water Bills	$57.14	$71.44	$94.32	$114.34	$142.94
Proposed Water Bills	$62.00	$75.20	$96.32	$114.80	$141.20
Water Impact	$4.86	$3.76	$2.00	$0.46	-$1.74

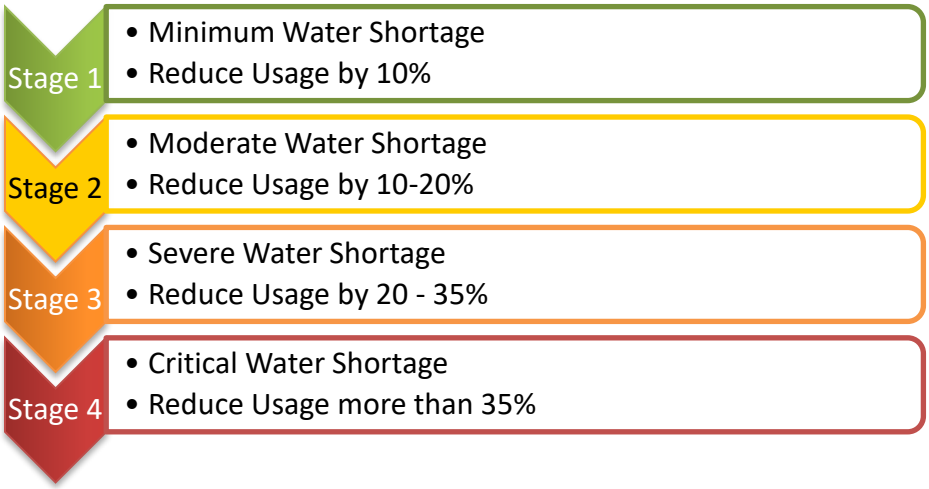
4.5. Water Drought Rate Development

4.5.1. WATER SHORTAGE STAGES AND PURPOSE OF DROUGHT RATES

The District's water conservation ordinance consists of permanent year-round restrictions- focused on the prevention of water waste- and four "Water Supply Shortage" stages as shown in **Figure 4-6.** These stages impose increasing restrictions on water use to allow the District to meet all health and safety guidelines in the face of water supply shortages. While permanent restrictions based on the conservation ordinance will be in effect all the time, the District enters and exits stages based on Metropolitan Water District of Southern California's (MWD) declared "water condition alert."

When Governor Edmund G Brown Jr rescinded the drought state of emergency for most of California, the District Board of Directors voted unanimously to lift drought penalties on April 29, 2016.

Figure 4-6: YLWD Water Conservation Stages



In the case that drought stages are activated, alternative rates would be enforced to ensure full recovery of revenue requirements for the District. A significant portion of the water system is based on fixed costs and cannot be recovered with significant decreases in water sales. If water use declines to a lower level, this may risk the District's ability to maintain financial sufficiency. For this reason, drought rates have been developed to ensure that District operations are financially sufficient for its fixed operating and capital expenditure costs.

4.5.2. FINANCIAL IMPACTS OF DROUGHT

4.5.2.1. Estimated Lost Revenues due to Reduced Water Sales

The financial impact at each drought stage is shown in **Table 4-42**. Rates are developed with a projected water usage amount during the study period. If these projections fail to materialize due to a water shortage, there will be a significant shortfall in revenue. As can be seen in the table, as water sales decline relative to the baseline demand (No Drought), the projected revenue loss grows. To curtail these losses during a shortage the District will need to increase the water usage rate. As can be seen from **Table 4-42,** each stage calls for a larger reduction in water use, and as a result, a larger increase in the usage rates will be necessary.

Table 4-42: FY 2022 Estimated Loss Revenues due to Reduced Water Sales by Stages

Drought Stages	0 No Drought	1 Minimum Shortage	2 Moderate Shortage	3 Severe Shortage	4 Critical Shortage
Water Sales Reduction	**0%**	**10%**	**20%**	**35%**	**50%**
Projected Water Sales	7,380,219 ccf	6,642,197 ccf	5,904,175 ccf	4,797,142 ccf	3,690,110 ccf
Water Usage Rate	$2.64 /ccf	$2.64 /ccf	$2.64 /ccf	$2.64 /ccf	$2.64 /ccf
Projected Usage Rev	$19,483,778	$17,535,400	$15,587,023	$12,664,456	$9,741,889
Revenue Loss		**$1,948,378**	**$3,896,756**	**$6,819,322**	**$9,741,889**

4.5.2.2. Estimated Lost Revenues due to Reduced Water Sales

When water sales are reduced, the revenue shortfall is offset to some degree as some purchased water costs for the year are avoided. For example, in **Table 4-43**, the quantity of water sales (Line 1 & 2) declines, which results in a reduction in variable water supply costs (Line 15). The cost savings at stage 1 is $1,204,892 (Line 16) compared to the "No Drought" scenario. The "No Drought" scenario assumes normal sales for FY 2022 and normal BPP at 75% instead of the temporary reduced BPP due to PFAS.

Table 4-43: FY 2022 Estimated Variable Water Supply Cost Savings Calculations

	Drought Stages		No Drought	Stage 1	Stage 2	Stage 3	Stage 4
1	Water Sales	ccf	7,380,219	6,642,197	5,904,175	4,797,142	3,690,110
2		AF	16,943	15,248	13,554	11,013	8,471
3	Water loss		8%	8%	8%	8%	8%
4	Normal BPP		75%	75%	75%	75%	75%
5	**Quantity Purchased**		18,416 AF	16,574 AF	14,733 AF	11,970 AF	9,208 AF
6	OCWD BPP		13,812 AF	12,431 AF	11,050 AF	8,978 AF	6,906 AF
7	MWDOC		4,604 AF	4,144 AF	3,683 AF	2,993 AF	2,302 AF
8	July – December	58.6%	2,699 AF	2,429 AF	2,159 AF	1,754 AF	1,349 AF
9	January – June	41.4%	1,905 AF	1,715 AF	1,524 AF	1,238 AF	953 AF
10	**Variable Water Supply Unit Costs**						
11	**OCWD RA**		$497 /AF	$497 /AF	$497 /AF	$497 /AF	$497 /AF
12	**MWD Tier 1 Treated**						
13	July – December		$1,104 /AF	$1,104 /AF	$1,104 /AF	$1,104 /AF	$1,104 /AF
14	January - June		$1,159 /AF	$1,159 /AF	$1,159 /AF	$1,159 /AF	$1,159 /AF
15	Variable Water Supply Costs (At Stage)		$12,048,915	$10,844,024	$9,639,132	$7,831,795	$6,024,458
16	Variable Water Supply Costs (No Drought)		$12,048,915	$12,048,915	$12,048,915	$12,048,915	$12,048,915
17	**Water Supply Cost Savings**		**N/A**	**-$1,204,892**	**-$2,409,783**	**-$4,217,120**	**-$6,024,458**

4.5.2.3. Net Financial Costs of Drought and Drought Rates

Table 4-44 combines the financial impact of drought from revenue loss in **Table 4-42** and water supply cost savings in **Table 4-43** to derive drought rates for FY 2022. The net impact shown in Line 3 is then divided by the projected water sales at each shortage to calculate the uniform incremental drought rate for the District at each Drought Stage.

Table 4-44: FY 2022 Incremental Drought Rates on Water Usage Rates

	Drought Stages Shortage Description Water Sales Reduction	1 Minimum Shortage 10%	2 Moderate Shortage 20%	3 Severe Shortage 35%	4 Critical Shortage 50%
1	Revenue Loss	$1,948,378	$3,896,756	$6,819,322	$9,741,889
2	Water Supply Cost Savings	-$1,204,892	-$2,409,783	-$4,217,120	-$6,024,458
3	**Net Revenue Loss**	**$743,486**	**$1,486,973**	**$2,602,202**	**$3,717,432**
4	Sales subject to Drought Cost Recovery	6,642,197 ccf	5,904,175 ccf	4,797,142 ccf	3,690,110 ccf
5	**Uniform Incremental Drought Rates**	**$0.12 /ccf**	**$0.26 /ccf**	**$0.55 /ccf**	**$1.01 /ccf**

4.5.3. PROPOSED 5-YEAR DROUGHT RATES

The proposed five-year drought rates are shown in **Table 4-45.** The process shown in **Table 4-42** through **Table 4-44** is repeated for each fiscal year of the rate setting period. As the shortage increases, the incremental costs will increase to recover the revenue loss. The drought rates shown are calculated assuming the proposed water rates in this Study are implemented in each fiscal year as planned.

Table 4-45: Proposed 5-year Incremental Drought Rates

Drought Stages		Sales Reduction	Drought Rates ($/ccf)				
Water Usage Rates (No Shortage)			FY 2022 $2.64 /ccf	FY 2023 $2.88 /ccf	FY 2024 $3.14 /ccf	FY 2025 $3.43 /ccf	FY 2026 $3.74 /ccf
% Increase				9%	9%	9%	9%
No Drought	No Shortage	0%	$0.00 /ccf	$0.00 /ccf	$0.00 /ccf	$0.00 /ccf	$0.00 /ccf
Stage 1	Minimum Shortage	10%	$0.12 /ccf	$0.14 /ccf	$0.16 /ccf	$0.18 /ccf	$0.20 /ccf
Stage 2	Moderate Shortage	20%	$0.26 /ccf	$0.29 /ccf	$0.32 /ccf	$0.35 /ccf	$0.39 /ccf
Stage 3	Severe Shortage	35%	$0.55 /ccf	$0.60 /ccf	$0.66 /ccf	$0.73 /ccf	$0.80 /ccf
Stage 4	Critical Shortage	50%	$1.01 /ccf	$1.11 /ccf	$1.22 /ccf	$1.34 /ccf	$1.47 /ccf

5. Sewer Financial Plan and Rates

5.1. Sewer Financial Plan

The financial plan provides long-term financial projections for the Sewer Fund based on projected revenues, O&M expenses, wastewater CIP, and debt service payments. The financial plan includes a cashflow summary and the rate revenue requirement, the latter being the key factor driving rate development. The long-term financial plan timeframe spans FY 2021 through FY 2029.

5.1.1. CURRENT SEWER REVENUES

The current District wastewater rates and rate structure were effective as of July 1, 2020. **Table 5-1** shows the current monthly charge for each customer class along with the commercial usage charge. Single-family residential (SFR) pays a fixed monthly charge while master metered accounts pay a fixed charge per dwelling unit ($/DU). Commercial customers are assessed a fixed charge per account ($/account) that covers flows up to 7 ccf and a sewer flow charge assessed on a 90% return factor[9]. The current rates in **Table 5-1** are multiplied by the respective units of service in **Table 5-2** to calculate the total wastewater rate revenues in **Table 5-3**. Note that charges assessed per account or dwelling unit are multiplied by 12 months (number of billing periods per year) to estimate the respective revenues. For example, in FY 2021 the number of accounts are multiplied by their respective service charge, and multiplied by 12, to yield the service charge revenue for the year of $2,565,105. Usage quantity is listed as the annual amounts so multiplication by billing periods is not necessary. These current wastewater rate revenues are listed in the top line of **Table 5-3**, with non-rate revenues listed below. The non-rate revenues are projected based on inflationary assumptions from **Table 2-1.**

Table 5-1: Current District Sewer Rates

	Effective July 1, 2020
Sewer Monthly Service Charge	
Residential	$8.10
Master Metered ($/DU)	$7.62
Commercial	$8.10
Commercial Sewer Usage Rates ($/ccf)	
Tier 1 (0 – 7 ccf)	$0.00
Tier 2 (8+ ccf)	$0.52

[9] A return to sewer factor means that 90% of water use is assumed to enter the sewer collection system.

Table 5-2: Projected Sewer Revenues from Current Rates

Sewer Revenues	Current Rate	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026 – FY 2028
Sewer Monthly Service Charge							
Residential	$8.10	24,305	24,313	24,324	24,345	24,366	24,383
Master Metered (per DU)	$7.62	1,553	1,557	1,557	1,557	1,557	1,557
Commercial	$8.10	624	625	625	625	625	625
Commercial Usage Rates ($/ccf)							
Tier 1 (0-7 ccf)	$0.00	4,715	4,715	4,715	4,715	4,715	4,715
Tier 2 (8+ ccf)	$0.52	250,773	250,773	250,773	250,773	250,773	250,773
Projected Revenues							
Sewer Monthly Service Charge		$2,565,105	$2,566,346	$2,567,415	$2,569,456	$2,571,497	$2,573,150
Commercial Usage Rates		$130,402	$130,402	$130,402	$130,402	$130,402	$130,402
Current Sewer Rate Revenues		**$2,695,507**	**$2,696,748**	**$2,697,817**	**$2,699,858**	**$2,701,899**	**$2,703,552**

Table 5-3: Projected Current Sewer Revenues

		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**SEWER REVENUES**								
2	**OPERATING REVENUES**								
3	Revenues from Current Rates	$2,695,507	$2,695,507	$2,696,748	$2,697,817	$2,699,858	$2,701,899	$2,703,552	$2,703,552
4	Proposed Rev Adjustments	$0	$404,326	$869,701	$1,405,225	$2,022,211	$2,189,137	$2,361,767	$2,539,053
5	Other Operating Rev	$40,545	$40,950	$41,360	$41,774	$42,191	$42,613	$43,039	$43,470
6	**SUBTOTAL OPERATING REVENUES**	**$2,736,052**	**$3,140,784**	**$3,607,809**	**$4,144,816**	**$4,764,260**	**$4,933,649**	**$5,108,358**	**$5,286,074**
7	**NON-OPERATING REVENUES**								
8	Property Tax	$0	$0	$0	$0	$0	$0	$0	$0
9	Investment Income	$50,000	$47,536	$40,878	$39,081	$43,640	$49,668	$54,779	$58,808
10	Other Non-Oper Rev	$19,200	$19,392	$19,586	$19,782	$19,980	$20,179	$20,381	$20,585
11	**SUBTOTAL NON-OPERATING REVENUES**	**$69,200**	**$66,928**	**$60,464**	**$58,862**	**$63,620**	**$69,848**	**$75,161**	**$79,393**
12	**TOTAL SEWER REVENUES**	**$2,805,252**	**$3,207,712**	**$3,668,273**	**$4,203,678**	**$4,827,880**	**$5,003,497**	**$5,183,518**	**$5,365,467**

5.1.2. SEWER O&M EXPENSES

Table 5-4 lists the projected wastewater O&M expenses for the study period. The FY 2021 budgeted O&M expenses are escalated based on the inflationary assumptions in **Table 2-1**.

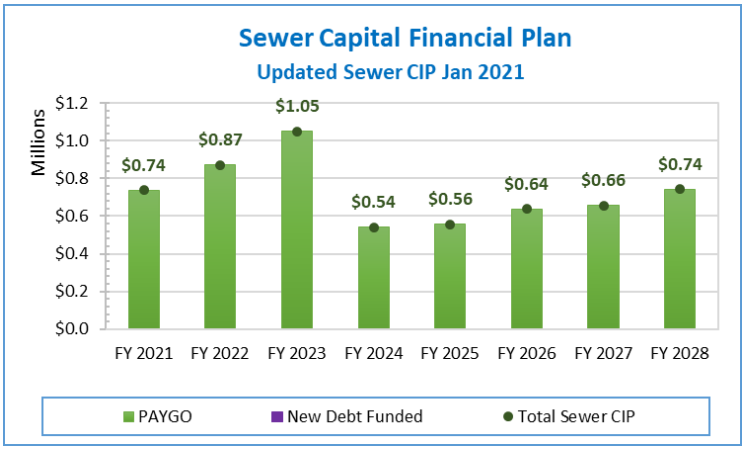
Table 5-4: Projected Sewer O&M Expenses

Sewer O&M Expenses Summary	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
Salary Related Expenses	$1,738,874	$1,877,984	$2,028,223	$2,190,480	$2,365,719	$2,554,976	$2,759,375	$2,980,124
UAL Funding OPEB / Pension	$0	$163,099	$163,099	$163,099	$163,099	$163,099	$163,099	$163,099
Supplies and Services	$1,323,233	$982,065	$1,002,617	$1,023,626	$1,045,102	$1,067,059	$1,089,507	$1,112,459
Other Non-Operating Expenses	$32,895	$33,553	$34,224	$34,908	$35,607	$36,319	$37,045	$37,786
Total Sewer O&M Expenses	**$3,095,002**	**$3,056,701**	**$3,228,163**	**$3,412,114**	**$3,609,527**	**$3,821,453**	**$4,049,026**	**$4,293,469**

5.1.3. SEWER CIP FUNDING

The District provided Raftelis the annual sewer CIP expenses that are incorporated into the financial plan. The annual expenses are shown in **Figure 5-1**. Raftelis escalates the yearly expenses by 3% per year to account for projected construction cost inflation. Wastewater operations will generate enough revenue to finance the projected CIP entirely through cash funded/PAYGO (green bars).

Figure 5-1: Projected Annual Sewer CIP Funding



5.1.4. SEWER DEBT SERVICE

5.1.4.1. Net Financial Costs of Drought and Drought Rates

The District currently has no outstanding debt for the Sewer Fund.

5.1.5. STATUS QUO SEWER FINANCIAL PLAN

Table 5-5 summarizes the status quo wastewater financial plan without revenue increases. The cash flow incorporates the revenues from current rates and non-rate revenues (**Table 5-3**), O&M expenses (**Table 5-4**), and capital improvement projects to project the ending balances. All projections shown in the table are based upon the District's current rate structure and do not include rate adjustments.

Under the "status-quo" financial plan scenario, the District will generate negative cashflow every year of the study period. Revenues generated from rates and other miscellaneous revenues will be inadequate to sufficiently recover operating expenses, capital expenditures, and to maintain adequate reserves starting in FY 2022.

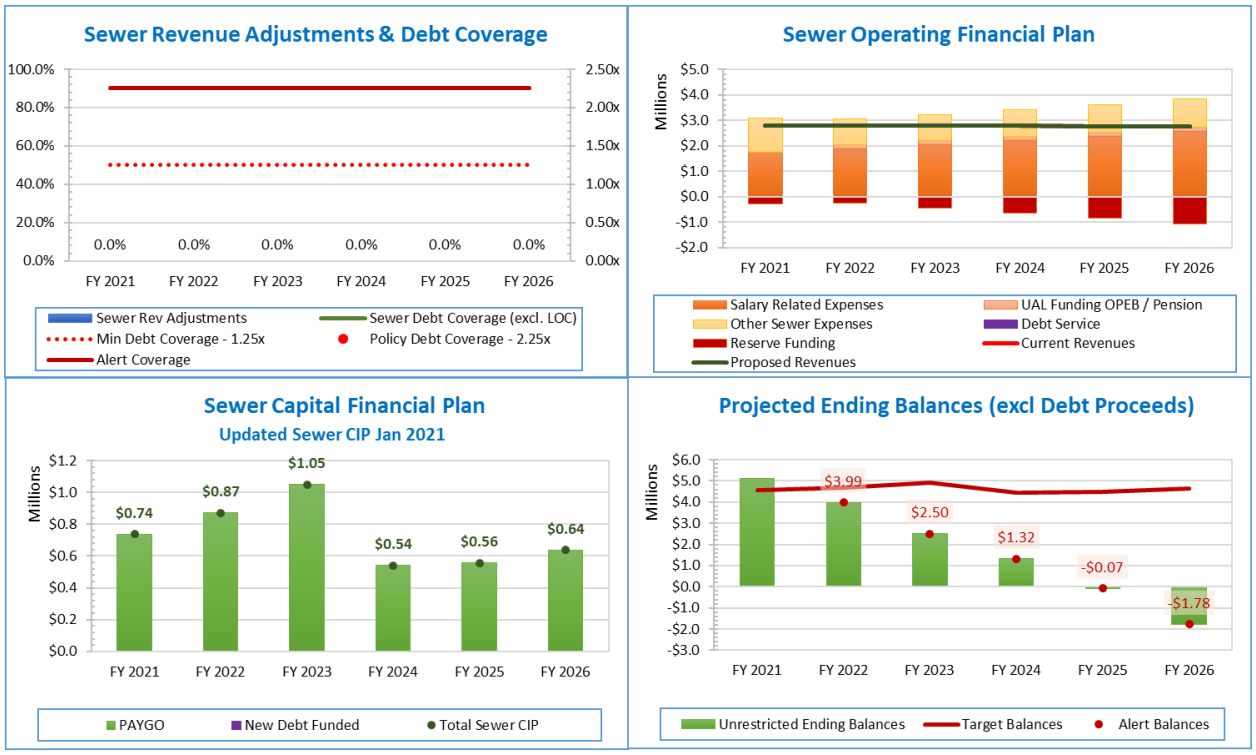
Table 5-5: Status Quo Sewer Financial Plan

			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**SEWER REVENUES**									
2	**OPERATING REVENUES**									
3	Revenues from Current Rates		$2,695,507	$2,695,507	$2,696,748	$2,697,817	$2,699,858	$2,701,899	$2,703,552	$2,703,552
4	Proposed Rev Adjustments		$0	$0	$0	$0	$0	$0	$0	$0
5	Other Operating Rev		$40,545	$40,950	$41,360	$41,774	$42,191	$42,613	$43,039	$43,470
6	**SUBTOTAL OPERATING REVENUES**		**$2,736,052**	**$2,736,458**	**$2,738,108**	**$2,739,590**	**$2,742,049**	**$2,744,512**	**$2,746,591**	**$2,747,021**
7	**NON-OPERATING REVENUES**									
8	Property Tax		$0	$0	$0	$0	$0	$0	$0	$0
9	Investment Income		$50,000	$45,504	$32,424	$19,109	$6,245	-$9,265	-$27,615	-$49,042
10	Other Non-Oper Rev		$19,200	$19,392	$19,586	$19,782	$19,980	$20,179	$20,381	$20,585
11	**SUBTOTAL NON-OPERATING REVENUES**		**$69,200**	**$64,896**	**$52,010**	**$38,891**	**$26,225**	**$10,914**	**-$7,234**	**-$28,457**
12	**TOTAL SEWER REVENUES**		**$2,805,252**	**$2,801,354**	**$2,790,117**	**$2,778,482**	**$2,768,274**	**$2,755,427**	**$2,739,357**	**$2,718,564**
13										
14	**SEWER EXPENSES**									
15	Salary Related Expenses		$1,738,874	$1,877,984	$2,028,223	$2,190,480	$2,365,719	$2,554,976	$2,759,375	$2,980,124
16	UAL Funding OPEB / Pension		$0	$163,099	$163,099	$163,099	$163,099	$163,099	$163,099	$163,099
17	Supplies and Services		$1,323,233	$982,065	$1,002,617	$1,023,626	$1,045,102	$1,067,059	$1,089,507	$1,112,459
18	Other Non-Operating Expenses		$32,895	$33,553	$34,224	$34,908	$35,607	$36,319	$37,045	$37,786
19	**TOTAL SEWER EXPENSES**		**$3,095,002**	**$3,056,701**	**$3,228,163**	**$3,412,114**	**$3,609,527**	**$3,821,453**	**$4,049,026**	**$4,293,469**
20	**NET REVENUES**		**-$289,750**	**-$255,347**	**-$438,045**	**-$633,632**	**-$841,253**	**-$1,066,026**	**-$1,309,669**	**-$1,574,905**
21										
22	**SEWER DEBT SERVICE**									
23	Current Debt Service		$0	$0	$0	$0	$0	$0	$0	$0
24	Proposed Debt Service		$0	$0	$0	$0	$0	$0	$0	$0
25	**TOTAL SEWER DEBT SERVICE**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
26	**SEWER CAPITAL EXPENDITURES**									
27	PAYGO		$737,000	$872,410	$1,050,291	$540,900	$557,127	$637,601	$656,729	$744,074
28	New Debt Funded		$0	$0	$0	$0	$0	$0	$0	$0
29	**TOTAL SEWER CAPITAL EXPENDITURES**		**$737,000**	**$872,410**	**$1,050,291**	**$540,900**	**$557,127**	**$637,601**	**$656,729**	**$744,074**
30	**NET CASH CHANGES**		**-$1,026,750**	**-$1,127,757**	**-$1,488,336**	**-$1,174,532**	**-$1,398,380**	**-$1,703,627**	**-$1,966,397**	**-$2,318,978**
31	**BEGINNING UNRESTRICTED BALANCES**		$6,141,057	$5,114,307	$3,986,550	$2,498,213	$1,323,682	-$74,698	-$1,778,325	-$3,744,723
32	**ENDING UNRESTRICTED BALANCES**		**$5,114,307**	**$3,986,550**	**$2,498,213**	**$1,323,682**	**-$74,698**	**-$1,778,325**	**-$3,744,723**	**-$6,063,701**
33	**TARGET BALANCES**		**$4,552,336**	**$4,678,302**	**$4,898,461**	**$4,434,427**	**$4,499,332**	**$4,632,061**	**$4,707,303**	**$4,854,922**
34	Operations	90 days	$763,151	$753,707	$795,985	$841,343	$890,020	$942,276	$998,390	$1,058,664
35	Capital	100%	$737,000	$872,410	$1,050,291	$540,900	$557,127	$637,601	$656,729	$744,074
36	Emergency	5%	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205
37	Employee Liability	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980

1	Debt Coverage (excl. LOC)		#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
2	Min Debt Coverage		1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x
3	Policy Debt Coverage		2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x

The top right graph in **Figure 5-2** shows the operating financial plan represented in **Table 5-5** with no revenue adjustments (top left graph). District costs are represented by the stacked bars. Note that there is no current wastewater debt service. The District would use reserves to fund revenue shortfalls, as shown by the red bars below the x-axis. The capital improvement plan is shown in the bottom left. The bottom right graph illustrates that the ending fund balance goes negative by FY 2025, failing to meet target balances starting in FY 2022.

Figure 5-2: Status Quo Sewer Financial Plan



5.1.6. PROPOSED SEWER FINANCIAL PLAN

Raftelis developed a long-term financial plan model incorporating the known and forecasted cost increases for operating and capital expenditures. The results were presented to and discussed with the District Board of Directors. The proposed revenue adjustments for the Sewer Fund are shown in **Table 5-6**.

Table 5-6: Proposed Sewer Revenue Adjustments

Fiscal Year	Effective	Sewer
2022	July	15%
2023	July	15%
2024	July	15%
2025	July	15%
2026	July	3.5%
2027	July	3.5%
2028	July	3.5%

These revenue adjustments are incorporated into Raftelis' recommended financial plan. Under this proposed financial plan scenario, the District's projected cashflow is positive in all future years of the study period. Equally critical, ending reserve balances will be near or above target in each year.

The top right graph in **Figure 5-3** shows the operating financial plan represented in **Table 5-7.** District costs are represented by the stacked bars. The District uses reserves to fund the modest shortfall in FY 2021, as shown by the red bars below the x-axis in that year. The capital improvement plan is shown in the bottom left and is projected to be fully funded as PAYGO. As indicated in the bottom right graph of **Figure 5-3**, ending reserve balances remain positive and, on average, close to or above the target.

Figure 5-3: Proposed Sewer Financial Plan

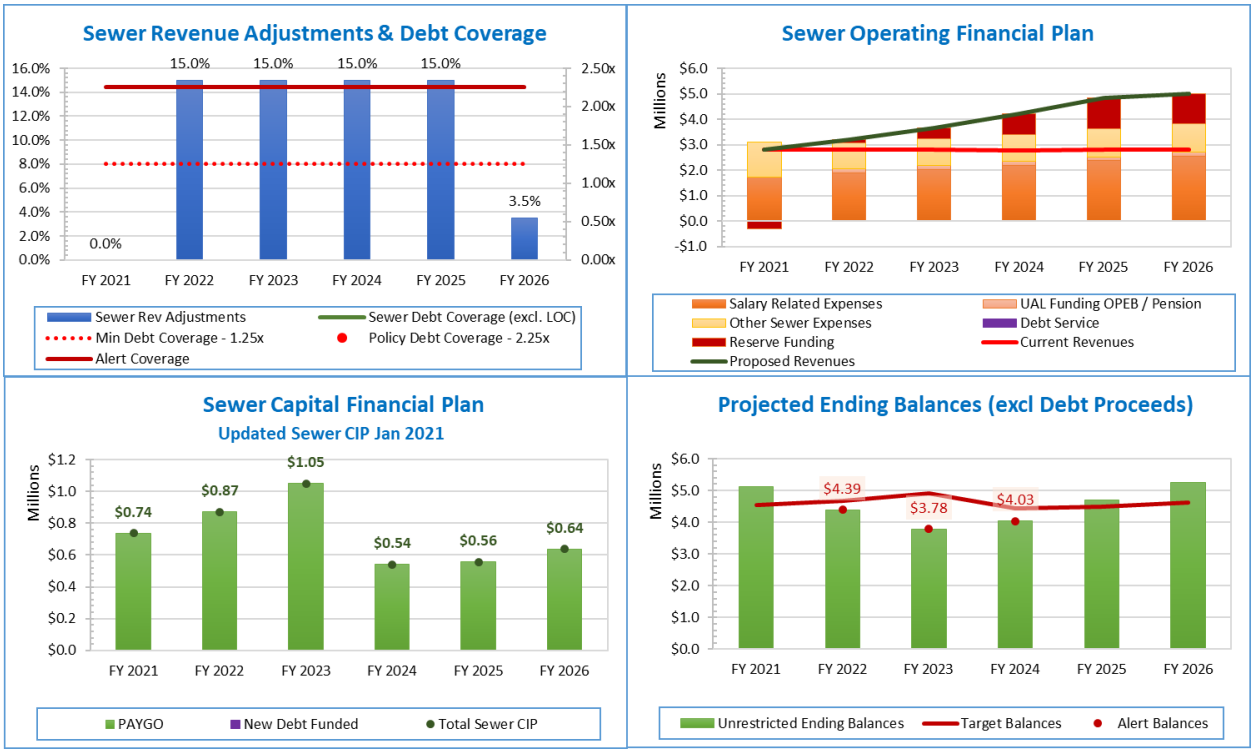


Table 5-7: Proposed Sewer Financial Plan

			FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	**SEWER REVENUES**									
2	**OPERATING REVENUES**									
3	Revenues from Current Rates		$2,695,507	$2,695,507	$2,696,748	$2,697,817	$2,699,858	$2,701,899	$2,703,552	$2,703,552
4	Proposed Rev Adjustments		$0	$404,326	$869,701	$1,405,225	$2,022,211	$2,189,137	$2,361,767	$2,539,053
5	Other Operating Rev		$40,545	$40,950	$41,360	$41,774	$42,191	$42,613	$43,039	$43,470
6	**SUBTOTAL OPERATING REVENUES**		**$2,736,052**	**$3,140,784**	**$3,607,809**	**$4,144,816**	**$4,764,260**	**$4,933,649**	**$5,108,358**	**$5,286,074**
7	**NON-OPERATING REVENUES**									
8	Property Tax		$0	$0	$0	$0	$0	$0	$0	$0
9	Investment Income		$50,000	$47,536	$40,878	$39,081	$43,640	$49,668	$54,779	$58,808
10	Other Non-Oper Rev		$19,200	$19,392	$19,586	$19,782	$19,980	$20,179	$20,381	$20,585
11	**SUBTOTAL NON-OPERATING REVENUES**		**$69,200**	**$66,928**	**$60,464**	**$58,862**	**$63,620**	**$69,848**	**$75,161**	**$79,393**
12	**TOTAL SEWER REVENUES**		**$2,805,252**	**$3,207,712**	**$3,668,273**	**$4,203,678**	**$4,827,880**	**$5,003,497**	**$5,183,518**	**$5,365,467**
13										
14	**SEWER EXPENSES**									
15	Salary Related Expenses		$1,738,874	$1,877,984	$2,028,223	$2,190,480	$2,365,719	$2,554,976	$2,759,375	$2,980,124
16	UAL Funding OPEB / Pension		$0	$163,099	$163,099	$163,099	$163,099	$163,099	$163,099	$163,099
17	Supplies and Services		$1,323,233	$982,065	$1,002,617	$1,023,626	$1,045,102	$1,067,059	$1,089,507	$1,112,459
18	Other Non-Operating Expenses		$32,895	$33,553	$34,224	$34,908	$35,607	$36,319	$37,045	$37,786
19	**TOTAL SEWER EXPENSES**		**$3,095,002**	**$3,056,701**	**$3,228,163**	**$3,412,114**	**$3,609,527**	**$3,821,453**	**$4,049,026**	**$4,293,469**
20	**NET REVENUES**		**-$289,750**	**$151,011**	**$440,110**	**$791,564**	**$1,218,353**	**$1,182,044**	**$1,134,493**	**$1,071,998**
21										
22	**SEWER DEBT SERVICE**									
23	Current Debt Service		$0	$0	$0	$0	$0	$0	$0	$0
24	Proposed Debt Service		$0	$0	$0	$0	$0	$0	$0	$0
25	**TOTAL SEWER DEBT SERVICE**		**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**	**$0**
26	**SEWER CAPITAL EXPENDITURES**									
27	PAYGO		$737,000	$872,410	$1,050,291	$540,900	$557,127	$637,601	$656,729	$744,074
28	New Debt Funded		$0	$0	$0	$0	$0	$0	$0	$0
29	**TOTAL SEWER CAPITAL EXPENDITURES**		**$737,000**	**$872,410**	**$1,050,291**	**$540,900**	**$557,127**	**$637,601**	**$656,729**	**$744,074**
30	**NET CASH CHANGES**		**-$1,026,750**	**-$721,399**	**-$610,181**	**$250,665**	**$661,226**	**$544,443**	**$477,764**	**$327,924**
31	**BEGINNING UNRESTRICTED BALANCES**		$6,141,057	$5,114,307	$4,392,908	$3,782,727	$4,033,391	$4,694,617	$5,239,061	$5,716,824
32	**ENDING UNRESTRICTED BALANCES**		**$5,114,307**	**$4,392,908**	**$3,782,727**	**$4,033,391**	**$4,694,617**	**$5,239,061**	**$5,716,824**	**$6,044,749**
33	**TARGET BALANCES**		**$4,552,336**	**$4,678,302**	**$4,898,461**	**$4,434,427**	**$4,499,332**	**$4,632,061**	**$4,707,303**	**$4,854,922**
34	Operations	90 days	$763,151	$753,707	$795,985	$841,343	$890,020	$942,276	$998,390	$1,058,664
35	Capital	100%	$737,000	$872,410	$1,050,291	$540,900	$557,127	$637,601	$656,729	$744,074
36	Emergency	5%	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205	$3,006,205
37	Employee Liability	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980	$45,980

		FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028
1	Debt Coverage (excl. LOC)	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A	#N/A
2	Min Debt Coverage	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x	1.25x
3	Policy Debt Coverage	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x	2.25x

5.2. Sewer Cost of Service Analysis

This section discusses the allocation of O&M expenses and capital costs to sewer functions, cost components, the determination of unit costs, and rate calculation by customer class. The proposed Sewer utility costs of service are developed consistent with guidelines detailed in the Water Environment Federation's (WEF) *Manual of Practice No. 27, Financing and Charges for Sewer Systems.*

The sewer cost-of-service analysis consists of 4 major steps, as outlined below:

1. Functionalize O&M and capital costs into functions: pumping (lift), collection, billing, customer service, and general & administration
2. Determine revenue requirements and allocate the revenue requirements in each function to cost components: flow, billing and customer service, and general
3. Calculate the unit cost of service by dividing the total cost of each cost component in Step 2 by units of service
4. Calculate the sewer rates by customer class using unit cost of service and corresponding respective service level

5.2.1. DETERMINE UNITS OF SERVICE

The next step is to determine the units of service for each cost component. The units of service by cost component and by class is shown in **Table 5-8**. The number of dwelling units presented under "# of Units", total annual bills under "# of bills", and the last three right columns describe the annual flow. For the residential class, estimated annual flows in ccf (2,041,620) are calculated through multiple steps. Gallons per capita per day (gpcd) flow (55) is multiplied by the average household size (3.06), which is then converted to ccf/month (multiplied by 365/12/748.05). This results in the sewer flow per month of approximately 7 ccf, which is then multiplied by the number of dwelling units (24,305). This is then converted to an annual basis by multiplying by 12 billing periods. An identical calculation is performed for the master metered class assuming a slightly smaller average household size. For the commercial class, the previous annual usage is projected to remain flat. The usage summed is utilized for the Units of Service with the base flow being tier 1 usage and "extra sewer flow" being the tier 2 usage. This is in addition to the fixed charge based on # of bills.

Table 5-8: Sewer Units of Service

Estimated Sewer Flows	GPCD[10]	Household Size	Est. sewer flow per month	# of Units	# of bills	Est. base sewer flow (ccf)	Extra sewer flow (ccf)	Total sewer flow (ccf)
Residential	55	3.06	7 ccf	24,305	291,660	2,041,620		2,041,620
Master Metered	55	2.50	6 ccf	1,553	18,636	111,816		111,816
Commercial			7 ccf	624	7,488	4,715	250,773	255,488
Total				26,482	317,784	2,158,151	250,773	2,408,924

5.2.2. FUNCTIONALIZE AND ALLOCATE O&M AND CAPITAL COSTS

Raftelis functionalized the Sewer Fund's O&M expenses and asset database for the O&M and capital cost allocations, respectively. Raftelis reviewed sewer O&M expenses line by line to determine the most appropriate

[10] Gallons per capita per day assumes indoor use of 55 gallons per capita per day, consistent with State water efficiency standards for residential indoor water use (SB x7-7).

system function. **Table 5-9** and **Table 5-10** summarize the functionalized O&M costs for the Sewer Fund for FY 2021, the test year.

Table 5-9: Functionalization of O&M Costs

	FY 2021	Pumping	Collection	Gen & Admin	Billing	Customer Service
Salary Related Expenses	$1,738,874		50.0%	0.0%	40.0%	10.0%
UAL Funding OPEB / Pension	$0		50.0%	0.0%	40.0%	10.0%
Supplies and Services						
Board election	$6,335			100.0%		
Communications	$37,134			100.0%		
Contractual services	$66,878			100.0%		
Data processing	$41,457					100.0%
District activities	$6,941			100.0%		
Dues and memberships	$15,075			100.0%		
Fees and permits	$160,565			100.0%		
Insurance	$50,708			100.0%		
Maintenance	$180,820		100.0%			
Materials	$75,800		100.0%			
Noncapital equipment	$48,691			100.0%		
Office expense	$5,572			100.0%		
Professional services	$482,272			100.0%		
Training	$14,832			100.0%		
Travel and conferences	$5,630			100.0%		
Uncollectible accounts	$1,470				100.0%	
Utilities	$28,913		100.0%			
Vehicle expense	$94,140			100.0%		
Other Non-Operating Expenses	$32,895			100.0%		
Total Sewer O&M Expenses	**$3,095,002**	**$0**	**$1,154,970**	**$1,027,668**	**$697,020**	**$215,344**

The fixed asset database was provided and functionalized by District staff. Raftelis calculated the asset replacement cost valued as Replacement Cost Less Depreciation (RCLD).

Table 5-10: Functionalization of Sewer Assets

	Asset Class	RCLD	Pumping	Collection	Gen & Admin	Billing	Customer Service
2-1500	Pumping Plant	$216,222	100.0%				
2-1520	Transmission and Distrib. Plant	$0		100.0%			
2-1850	Transmission and Distrib. Plant	$55,511,012		100.0%			
2-1960	Transmission and Distrib. Plant	$3,748,048		100.0%			
2-2120	General Plant	$0			100.0%		
2-2200	General Plant	$648,809			100.0%		
Total Sewer Asset Values		**$60,124,091**	**$216,222**	**$59,259,060**	**$648,809**	**$0**	**$0**

Each of the wastewater functions were allocated to the following cost components: flow, billing and customer service, and general based on District data. This is presented in **Table 5-11**.

Table 5-11: Allocations of Sewer Functions to Cost Components

Functions	Flow	Billing & CS	General
Pumping	100.0%		
Collection	100.0%		
Gen & Admin			100.0%
Billing		100.0%	
Customer Service		100.0%	

Table 5-12 uses the allocation factors from **Table 5-11** to allocate all costs to the cost components.

Table 5-12: Allocations of Functionalized O&M Expenses to Cost Components

Functions	FY 2021	Flow	Billing & CS	General
Pumping	$0	100.0%	0.0%	0.0%
Collection	$1,154,970	100.0%	0.0%	0.0%
Gen & Admin	$1,027,668	0.0%	0.0%	100.0%
Billing	$697,020	0.0%	100.0%	0.0%
Customer Service	$215,344	0.0%	100.0%	0.0%
Total Sewer O&M Expenses	**$3,095,002**	**$1,154,970**	**$912,364**	**$1,027,668**
Total Allocation %	100%	37.3%	29.5%	33.2%

Table 5-13 uses the allocation factors in **Table 5-11** and asset values in **Table 5-10** to allocate capital costs to the cost components.

Table 5-13: Allocations of Functionalized Sewer Assets to Cost Components

Functions	Asset Value by RCLD	Flow	Billing & CS	General
Pumping	$216,222	100.0%	0.0%	0.0%
Collection	$59,259,060	100.0%	0.0%	0.0%
Gen & Admin	$648,809	0.0%	0.0%	100.0%
Billing	$0	0.0%	100.0%	0.0%
Customer Service	$0	0.0%	100.0%	0.0%
Total Sewer O&M Expenses	**$60,124,091**	**$59,475,282**	**$0**	**$648,809**
Total Allocation %	100%	98.9%	0%	1.1%

5.2.3. DETERMINE REVENUE REQUIREMENT AND ALLOCATE REVENUE REQUIREMENT TO COST COMPONENTS

The revenue requirement is the amount of annual revenue the utility must generate to meet its estimated annual operating expenses, capital expenses, and reserve funding. Note that determining the revenue requirement is the first step shown in the Water System cost-of-service analysis, but the fifth step shown in the Sewer System cost-of-service analysis. The process, however, is the same. The net revenue requirement from current District rates is shown in **Table 5-14**, line 13. Non-rate revenues (i.e., revenue offsets) on line 12, are subtracted from the revenue requirement to determine the net revenue requirement from current District rates in line 13, which is the same value as current rate revenue in **Table 5-3**, line 3.

Table 5-14: FY 2021 Sewer Revenue Requirement from Current District Rates

	Current Revenue Requirements	FY 2021	Allocation Factors
1	**REVENUE REQUIREMENTS**		
2	O&M Expenses	$3,095,002	O&M
3	Debt Service	$0	Capital
4	Rate Funded CIP	$737,000	Capital
5	Reserve Funding w/o Revenue Adjustment	($1,026,750)	Capital
6	**SUBTOTAL REVENUE REQUIREMENTS**	**$2,805,252**	
7	**OTHER REVENUES OFFSETS**		
8	Other Operating Revenue	$40,545	Capital
9	Property Tax	$0	Capital
10	Investment Income	$50,000	Capital
11	Other Non-Operating Revenue	$19,200	Capital
12	**SUBTOTAL OTHER REVENUES OFFSETS**	**$109,745**	
13	**NET REVENUE REQUIREMENTS FROM CURRENT RATES** (Without Revenue Adjustment)	**$2,695,507**	

Table 5-15 allocates the revenue requirement in **Table 5-14** to the wastewater cost components using the allocation percentages in **Table 5-11**.

Table 5-15: FY 2021 Revenue Requirement Allocation to Cost Components

Current Rev Requirements	FY 2021	Flow	Billing & CS	General
Revenue Requirements				
O&M Expenses	$3,095,002	$1,154,970	$912,364	$1,027,668
Debt Service	$0	$0	$0	$0
Rate Funded CIP	$737,000	$729,047	$0	$7,953
Reserve Funding w/o Revenue Adjustment	($1,026,750)	($1,015,670)	$0	($11,080)
Subtotal Revenue Requirements	**$2,805,252**	**$868,347**	**$912,364**	**$1,024,541**
Less Other Revenue Offset				
Other Operating Revenue	$40,545	$40,107	$0	$438
Property Tax	$0	$0	$0	$0
Investment Income	$50,000	$49,460	$0	$540
Other Non-Operating Revenue	$19,200	$18,993	$0	$207
Subtotal Other Revenue Offset	**$109,745**	**$108,561**	**$0**	**$1,184**
Net Revenue Requirement (Excluding Revenue Adjustments)	**$2,695,507**	**$759,786**	**$912,364**	**$1,023,357**

5.2.4. CALCULATE SEWER UNIT COST OF SERVICE

The allocated net revenue requirements of each cost component from **Table 5-15** are listed in line 1 of **Table 5-16**. These are divided by the appropriate units of service in line 2 to arrive at the unit cost of service in line 4.

Table 5-16: Calculations of Sewer Unit Cost of Service

	Unit Cost Calculations	Flow A	Billing & CS B	General C
1	Revenue Requirements (Table 5-15)	**$759,786**	**$912,364**	**$1,023,357**
2	Units of Service (Table 5-8)	2,408,924	317,784	317,784
3	Units	Ccf / year	bills	bills
4	**Unit Cost of Service ([1] / [2])**	**$0.32**	**$2.87**	**$3.22**

5.2.5. CALCULATE SEWER COST BY CUSTOMER CLASS

The unit costs of service from **Table 5-16** are presented in line 1 of **Table 5-17**. The units of service in columns A through D are broken out by customer class. These values are from **Table 5-8**. Each customer class' units of service (line 4) is multiplied by the respective unit cost of service (line 1) to arrive at the customer class revenue requirements in lines 5, 8 and 11. The total revenue requirement by class in column D is used to calculate rates in the next section.

Table 5-17: Allocation of Sewer Revenue Requirements to Customer Classes

		Flow	Billing & CS	General	Total
		A	B	C	D
1	**Unit Cost of Service**	**$0.32**	**$2.87**	**$3.22**	
2		per ccf	per bill	per bill	
3	Residential (7 ccf)				
4	Units of Service	2,041,620	291,660	291,660	291,660
5	**Residential Rev Requirements**	**$643,937**	**$837,361**	**$939,230**	**$2,420,528**
6	Master Metered (6 ccf)				
7	Units of Service	111,816	18,636	18,636	18,636
8	**Master Metered Rev Requirements**	**$35,267**	**$53,504**	**$60,013**	**$148,785**
9	Commercial (7 ccf)				
10	Units of Service	255,488	7,488	7,488	
11	**Commercial Rev Requirements**	**$80,582**	**$21,498**	**$24,114**	**$126,194**

5.3. Sewer Rate Development

5.3.1. PROPOSED RATES

The proposed rate derivation for each customer class is shown in **Table 5-18 t**hrough **Table 5-20**. Each table calculates rates by dividing the FY 2021 customer class revenue requirement in **Table 5-17** by the respective unit of service to arrive at a service charge for SFR and Master Metered customers and a flow rate and service charge for commercial customers. Service charge calculations for SFR are as follows:

$$For\ SFR\text{: } [7 \text{ x } \$.315] \text{ (Column A)} + \$2.87 \text{ (Column B)} + \$3.22 \text{ (Column C)} = \$8.30$$

Table 5-18: Revised COS Single-Family Residential Rates for FY 2021

	FY 2021	Residential	Notes
1	Revenue Requirements before Revenue Adjustment	**$2,420,528**	From **Table 5-17**
2	Units of Service (monthly bills)	291,660	From **Table 5-17**
3	**Monthly Bill**	**$8.30**	[1]/[2], rounded up to the nearest cent

The Master Metered rates have been modified to account for the average number of people per household. The proposed Master Metered residential rate is lower than the SFR rate due to the lower household density for Master Metered customers. Smaller households generate less wastewater flow on average, which allocates less costs to Master Metered, resulting in a lower rate.

Table 5-19: Revised COS Master Metered Rate for FY 2021

	FY 2021	Master Metered	Notes
1	Revenue Requirements before Revenue Adjustment	$148,785	From **Table 5-17**
2	Units of Service (monthly bills)	18,636	**Table 5-17**
3	**Monthly Bill**	**$7.99**	[1]/[2], rounded up to the nearest cent

The Commercial service charge is the same as SFR as the same base flow (7 ccf) is assumed for the monthly charge. Due to the anticipated higher usage from Commercial accounts, there is a usage charge above 7 ccf per billing period. **Table 5-20** shows the breakdown of the monthly service charge as well as the usage tiers for Commercial accounts.

Table 5-20: Proposed Commercial Sewer Rate for FY 2021

Commercial	FY 2021
Billing & CS	$2.87
General	$3.22
Base Flow Charges	$2.21[11]
Commercial Monthly Sewer Service Charges	**$8.30**
Commercial Flow Rate	
Tier 1 (0-7 ccf)	$0.00 (included in Service Charge)
Tier 2 (8+ ccf)	$0.32 per ccf

After accounting for the proposed revenue adjustments in **Table 5-6**, the final FY 2022 through FY 2026 rates are presented in Table 5-21.

Table 5-21: 5-year Proposed Sewer Rates

	Current	Revised COS	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Effective Date			7/1/2021	7/1/2022	7/1/2023	7/1/2024	7/1/2025
Proposed Rev Adjustments			15%	15%	15%	15%	3.5%
Monthly Sewer Service Charges							
Residential	$8.10	$8.30	$9.55	$10.99	$12.64	$14.54	$15.05
Master Metered	$7.62	$7.99	$9.19	$10.57	$12.16	$13.99	$14.48
Commercial	$8.10	$8.30	$9.55	$10.99	$12.64	$14.54	$15.05
Commercial Sewer Usage Rates ($/ccf)							
Tier 1 (0-7 ccf)	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00	$0.00
Tier 2 (8+ ccf)	$0.52	$0.32	$0.37	$0.43	$0.50	$0.58	$0.61

5.4. Sewer Customer Impact Analysis

Table 5-22 shows the impact on each customer class revenue once adjustments are made. The Commercial class faces a significant drop due to the reduction in flow rates. Monthly customer bill impacts for sewer service is shown in **Table 5-23**. Commercial bills impacts assume accounts use no more than 7 ccf per billing period.

Table 5-22: Revised COS Sewer Customer Impacts

FY 2021	Current Revenues	Revised COS Revenues	Impact %
Residential	$2,362,446	$2,420,528	2.46%
Master Metered	$142,006	$148,785	4.77%
Commercial	$191,055	$126,194	-33.95%
Total	$2,695,507	$2,695,507	0.00%

[11] $0.32 / ccf x 7 ccf = $2.21

Table 5-23: Impacts from Proposed Sewer Rates

Monthly Rate Impacts	Jul 1, 2021	Jul 1, 2022	Jul 1, 2023	Jul 1, 2024	Jul 1, 2025
Residential	$1.45	$1.44	$1.65	$1.90	$0.51
Master Metered	$1.57	$1.38	$1.59	$1.83	$0.49
Commercial	$1.45	$1.44	$1.65	$1.90	$0.51
Commercial Use Rate ($/ccf)	($0.15)	$0.11	$0.18	$0.21	$0.18