

# CHANNEL ISLANDS BEACH COMMUNITY SERVICES DISTRICT

## Water & Sewer Financial Plan and Cost of Service Study

Final Report / July 7, 2021







July 7, 2021

Mr. Pete Martinez  
General Manager  
Channel Islands Beach CSD  
353 Santa Monica Drive  
Channel Islands Beach, CA 93035

**Subject: Combined Water & Sewer Financial Plan and Cost of Service Study Report**

Dear Mr. Martinez,

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to present this water and sewer financial plan and cost of service study (Study) to the Channel Islands Beach Community Services District (District). We are confident that the cost of service analysis, result in fair and equitable rates for the District's customers and comply with the requirements of Proposition 218.

The Study involved a comprehensive review of the District's finances, including operating and capital expenditures, revenue, customer classifications and rate structures.

It was a pleasure working with you and we wish to express our thanks to you, Mr. Pete Martinez, Ms. CJ Dillion, and participating District staff members for the support and cooperation extended throughout the Study. If you have any questions, please call me at (213) 262-9308.

Sincerely,

A handwritten signature in blue ink, appearing to read 'Steve Gagnon'.

**Steve Gagnon**  
*Senior Manager*

A handwritten signature in blue ink, appearing to read 'Mihaela Coopersmith'.

**Mihaela Coopersmith**  
*Senior Consultant*

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# 1. Introduction

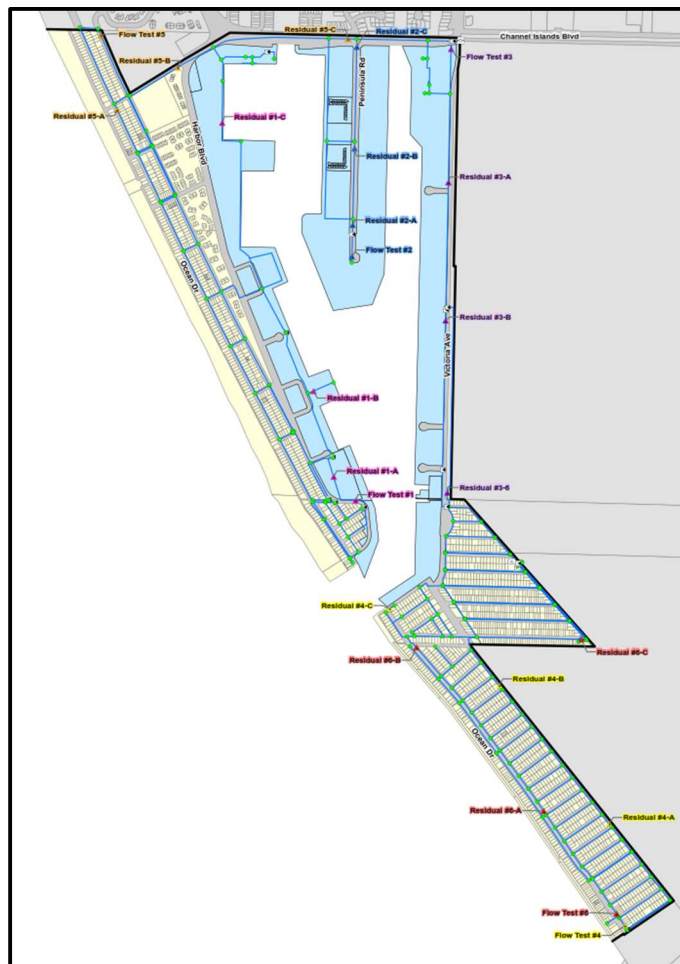
## 1.1. Study Background

The District engaged Raftelis Financial Consultants (Raftelis) to conduct a comprehensive water and sewer rate study and cost of services analysis update (Study) to the previous study Raftelis completed for the District in 2016. The Study’s primary impetus included developing equitable rates which comply with Proposition 218. The study period is FY 2022 through FY 2026.

### 1.1.1. WATER ENTERPRISE BACKGROUND

The District serves potable water to two distinct sets of customers – Harbor Customers (shown by the light blue shaded area in Figure 1-1 and Non-Harbor Customers shown by the light yellow shading in Figure 1-1).

Figure 1-1: District Service Area<sup>1</sup>



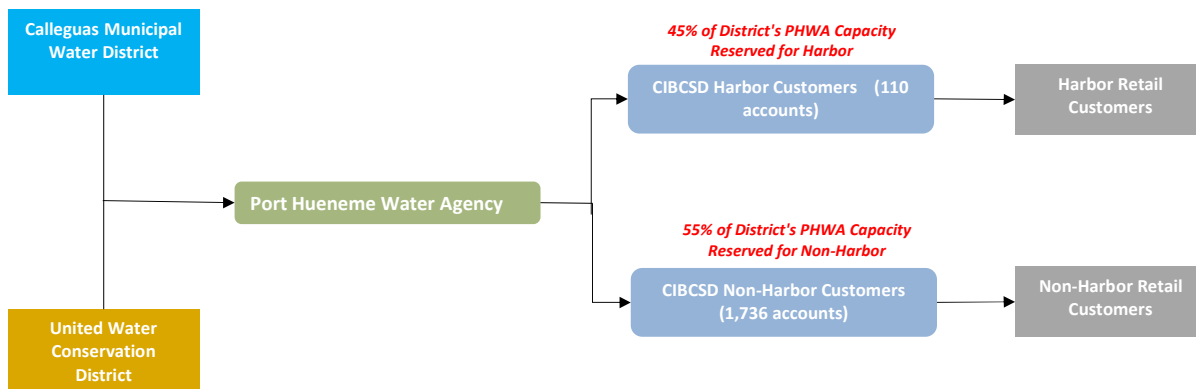
<sup>1</sup> Figure adopted from Infrastructure Review performed by Kennedy Jenks Consultants, February 2010

The District receives the entirety of its water supply via the Port Hueneme Water Agency (PHWA), a joint powers authority formed by the District, City of Port Hueneme, and the Naval Base Ventura County. Historically, PHWA received the bulk of its supply from Fox Canyon groundwater via United Water Conservation District (United), imported State Water from Calleguas Municipal Water District (Calleguas) served as a supplementary source during periods of high demand. However, as a result of recent reductions in groundwater allocations from Fox Canyon, PHWA has been more reliant on imported water from Calleguas than in the past.

PHWA has a water treatment plant capacity of 6,900, of which approximately 15% (or 1,035 AF) is owned by the District. Of the District’s capacity in PHWA, 45% is reserved for Harbor Customers, per the District’s agreement with the Harbor<sup>2</sup> (Harbor Agreement). The remaining 55% of the District’s PHWA capacity is reserved for Non-Harbor Customers. Figure 1-2 shows the District’s water supply chain from the source to the end user.

As part of the 1996 Harbor Agreement, the revenue collected from Harbor customers can never exceed their proportional share of water use. For example, if Harbor customers accounted for 40% of all water purchases in a given year, the District could collect up to 40% of its revenue from Harbor customers.

**Figure 1-2: District Water Supply Diagram**



### 1.1.2. SEWER ENTERPRISE BACKGROUND

The District’s sewer service area is comprised of the Non-Harbor Customers (shown as the yellow parcels in Figure 1-1) and approximately 300 additional customers who receive sewer service only. While the Sewer Enterprise’s current revenues can cover operating costs, the District has identified significant capital needs over the Study period, which is a main driver for the Enterprise’s revenue requirement.

The District owns and maintains the sewage collection system in the Non-Harbor areas. The City of Oxnard owns and maintains the collection systems within the Channel Islands Harbor. Wastewater collected within the Channel Islands Harbor, by the City of Oxnard is conveyed to the District’s collection system. At the District’s northeast border, the collected effluent is measured and fed into the City of Oxnard’s collection system where it is eventually treated at the Oxnard Wastewater Treatment

<sup>2</sup> Water Service Agreement between the County of Ventura and the Channel Islands Beach Community Services District, executed October 22, 1996.

Plant. The City of Oxnard charges the District by the quantity and strength of the measured effluent, which contains sewage from both Harbor and Non-Harbor Customers. Harbor Customers are billed by the City of Oxnard for sewer service; 90% of the sewer rate revenue collected by the City of Oxnard from Harbor Customers is remitted to the District as a reimbursement for sewage conveyance and treatment costs for their portion of the District's total effluent.

## 1.2. Study Objectives

The major objectives of the Study include the following:

- Develop financial plans and propose revenue adjustments for the Water and Sewer Enterprises to ensure financial sufficiency, by meeting operation and maintenance (O&M) costs, ensure sufficient funding of District financial reserves, and fund capital projects.
- Conduct a cost-of-service analysis for the Water and Sewer Enterprises.
- Develop fair and equitable water and sewer rates compliant with Proposition 218 that adequately recover costs, while promoting revenue stability.

## 1.3. Process

This report was prepared using principles established by the American Water Works Association (AWWA). The AWWA “Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices Manual M1” (the “M1 Manual”) establishes commonly accepted professional standards for cost of service studies. The M1 Manual's principles of rate structure design and the objectives of the Study are described below.

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

After determining a utility's revenue requirement, the next step is determining the cost of service. Utilizing a public agency's approved budget, financial reports, operating data, and capital improvement plans, a rate study generally categorizes (functionalizes) system costs (e.g., treatment, storage, pumping, etc.), including operating and maintenance and asset costs, among major operating functions to determine the cost of service.

After the asset values and operating costs are properly categorized by function, these functionalized costs are allocated first to cost causation components, and then distributed to the various customer classes (e.g., single-family residential, multi-family residential, irrigation, and commercial) by determining the characteristics of those classes and the contribution of each to cost causation components such as base costs, peaking costs, delivery costs, conservation costs and fire protection.

Rate design is the final element of the rate-making procedure and uses the revenue requirement and cost of service analysis to determine rates for each customer class that reflect the cost of providing service to

those customers. Rates utilize “rate components” that build-up to the total commodity rates, and fixed charge rates, for the various customer classes. In the case of tiered rates, the rate components allocate the cost of service within each customer class, effectively treating each tier as a sub-class and determining the cost to serve each tier.

## **1.4. Legal Requirements and Rate Setting Methodology**

### **1.4.1. CALIFORNIA CONSTITUTION - ARTICLE XIII D, SECTION 6 (PROPOSITION 218)**

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

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

As stated in AWWA’s M1 Manual, “water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” Prop 218 requires that water rates 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. Raftelis follows industry standard rate setting methodologies set forth by the AWWA M1 Manual to ensure this study meets Proposition 218 requirements and develops rates that do not exceed the proportionate cost of providing water services.

### **1.4.2. CALIFORNIA CONSTITUTION - ARTICLE X, SECTION 2**

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

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

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

In addition, Section 106 of the Water Code declares that the highest priority use of water is for domestic purposes, with irrigation secondary. To meet the objectives of Article X, section 2, Water Code Section 375 et seq., a water purveyor may utilize its water rate design to incentivize the efficient use of water.

The District wishes to establish tiered rates based on the availability of water from each source to incentivize customers to use water as wisely as possible, while based on the proportionate costs incurred to provide water to customer classes to achieve compliance with Proposition 218.

Tiered Rates – “Inclining” tier rate structures (synonymous with “tiered” rates) when properly designed and differentiated by customer class, allow a water utility to send consistent price signals to customers. Tiered rates meet the requirements of Proposition 218 as long as the tiered rates reasonably reflect the proportionate cost of providing service to users in each tier.

### **1.4.3. COST-BASED RATE-SETTING METHODOLOGY**

As stated in the AWWA 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 rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility, there are four major steps discussed below and previously addressed in Section 1.3.

#### **Calculate Revenue Requirement**

The rate-making process starts by determining the test year (rate setting year) revenue requirement, which for this study is fiscal year ending (FYE) 2023. The revenue requirement should sufficiently fund the utility’s O&M, debt service, capital expenses, and reserves.

#### **Cost of Service Analysis (COS)**

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

1. Functionalize costs. Examples of functions are supply, treatment, transmission, distribution, storage, meter servicing, and customer billing and collection.
2. Allocate functionalized costs to cost causation components. Cost causation components include base, maximum day, maximum hour<sup>3</sup>, conservation, public fire protection, meter service, and customer servicing and billing costs.
3. Distribute the cost causation components. Distribute cost components, using unit costs, to customer classes in proportion to their demands on the water system. This is described in the M1 Manual published by AWWA.

A COS analysis considers both the average quantity of water consumed (base costs) and the peak rate at which it is consumed (peaking or capacity costs as identified by maximum day and maximum hour demands).<sup>4</sup> Peaking costs are costs that are incurred during peak times of consumption. There are additional costs associated with designing, constructing, and 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 peaking related costs.

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<sup>3</sup> Collectively maximum day and maximum hour costs are known as peaking costs or capacity costs.

<sup>4</sup> 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’s relative demands during the peak month, day, and hour event.

**Rate Design and Calculations**

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

**Rate Adoption**

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

# 2. Financial Plan Assumptions

## 2.1. Inflation

The Study period is for Fiscal Years (FY) 2022 to FY 2026, with FY 2023 being the test year used for the cost of service analysis. Various types of assumptions and inputs were incorporated into the Study based on discussions with and/or direction from District staff. These assumptions include account and water use growth rates for different customer classes, inflation factors, and other assumptions.

The District’s inflationary assumptions are presented in Table 2-1 below.

Table 2-1: Inflation Factor Assumptions

INFLATION FACTORS	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
General	2.0%	2.0%	2.0%	2.0%	2.0%
Salary	2.5%	2.5%	2.5%	2.5%	2.5%
Benefits	5.0%	5.0%	5.0%	5.0%	5.0%
Electricity	5.0%	5.0%	5.0%	5.0%	5.0%
Fuel	2.0%	2.0%	2.0%	2.0%	2.0%
Fixed Water Costs	5.0%	5.0%	5.0%	5.0%	5.0%
Variable Water Costs	5.0%	5.0%	5.0%	5.0%	5.0%
Construction	2.0%	2.5%	3.0%	3.0%	3.0%

## 2.2. Projected Demand and Growth

Projecting water demand relies on two key variables — the number of accounts and demand per account. Since the District is nearly built out, it is anticipated that there will be minimal account growth over the Study period. The growth rate is based on staff estimates using historic trends, development currently in process, and available parcels for development. The account growth by meter size is shown in Table 2-2.



**Table 2-2: Account Growth Rates by Customer Class**

CUSTOMER CLASS	GROWTH RATE				
	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
3/4"	0.25%	0.25%	0.25%	0.25%	0.25%
1"	0.08%	0.08%	0.08%	0.08%	0.08%
1 1/2"	0.00%	0.00%	0.00%	0.00%	0.00%
2"	0.00%	0.00%	0.00%	0.00%	0.00%
3"	0.00%	0.00%	0.00%	0.00%	0.00%
4"	0.00%	0.00%	0.00%	0.00%	0.00%
<b>Private Fireline</b>	0.33%	0.33%	0.33%	0.33%	0.33%
<b>Public Fire Protection</b>	0.00%	0.00%	0.00%	0.00%	0.00%

It is anticipated that water demand will stay at current levels for the entire projection period, to ensure sufficiently conservative revenue projections for the study period. The estimated water demand for each year, shown below in Table 2-3, is based on input from District staff.

**Table 2-3: Projected Annual Water Demand**

	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>AF Demand</b>	412 AF	412 AF	412 AF	412 AF	412 AF

## 2.3. Reserve Policy Assumptions

A reserve policy is a written document that establishes reserve goals/targets. It provides guidelines for sound financial management with an overall long-range perspective 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 management transparency and helps achieve or maintain a certain credit rating for future debt issues. Reserves can offset unanticipated reductions in revenues, offset fluctuations in costs of providing services, and fiscal emergencies such as revenue shortfalls, asset failure, and natural disaster. Capital reserves set funds aside for replacement of capital assets as they age and for new capital projects.

The appropriate amount of reserves and reserve types are determined by a variety of factors, such as the size of the operating budget, the amount of debt, the type of rate structure, frequency of customer billing, and risk of natural disaster. Most reserves tend to fall into the following categories: operations & maintenance (O&M), rate stabilization, capital replacement and refurbishment (R&R), and emergency.

### 2.3.1. O&M RESERVE

The purpose of an O&M reserve is to provide working capital to support the operation, maintenance and administration of the utility. From a risk management perspective, the O&M reserve supports cash flow needs during normal operations and ensures that operations can continue should there be significant events that impact revenue.

It is quite common to maintain 90 days cash (25 percent of annual operating budget) for both the Water Operating Fund and Sewer Operating Fund to ensure adequate working capital for operating expenses.

The budgeted O&M expenses for FY 2021 for the Water Enterprise are \$1.523M, which translates into \$375K for 90 days of cash reserves for the Water Operating Fund. Similarly, the Sewer Enterprise's O&M expenses for FY 2021 are \$1.734M, resulting in a cash operating reserve of \$427K.

### 2.3.2. CAPITAL RESERVE

Capital reserves are used to fund future capital projects (infrastructure). Because water utilities are highly capital-intensive enterprises, it is important to accurately estimate long-term capital costs and develop a reserve to fund eventual system replacement and new capital projects.

The total asset value for the Water Enterprise was estimated at \$22.05M at the beginning of FY 2016 during the prior rate study. There were no significant changes to the District's asset base since, so the same estimated value from the prior study was utilized to determine the reserve allocation. Based on discussions with Staff, the capital R&R reserve was set at 3.5% of the replacement value of water-related assets, or \$771K. This assumption was carried forward for the current Study. For the Sewer Enterprise, the total assets are valued at \$28M, yielding a capital reserve of \$980K.

### 2.3.3. RATE STABILIZATION RESERVE

While it is not typical for utilities to have substantial rate increases in a short period of time, factors such as rapidly increasing potable water supply costs, or sewage treatment costs for sewer service, may result in large rate increases. In order to minimize rate shocks, the District has established a rate stabilization reserve to smooth rate increases by drawing down reserves as opposed to implementing abrupt and large rate increases. A rate stabilization reserve acts as a buffer to protect customers from experiencing large increases in their bills. This reserve is set at 10% of annual operating revenues, or \$212K for the Water Enterprise and \$237K for the Sewer Enterprise. Although the District has not formally adopted this reserve, it is a goal of the District's to establish a rate stabilization reserve and was included in the financial model.

### 2.3.4. DEBT SERVICE RESERVE

Debt Service reserves are designed to meet the District's debt service obligations in periods of reduced revenue. Per the District's bond covenants, the funds residing in the rate stabilization reserve may be used towards its debt coverage ratio. The debt service reserve based on debt service and was provided by District staff. For FY 2021, the debt service reserve is \$398K for the Water Enterprise and \$191K for the Sewer Enterprise, which is kept constant through the study period.

### 2.3.5. PROPOSED WATER AND SEWER RESERVES

Table 2-4 summarizes the recommended reserve targets that were used to develop the financial plan. The reserve goals establish prudent operating, capital, rate stabilization, and debt service reserves.

**Table 2-4: FY 2021 Recommended Reserves**

Reserve	Recommended Policy	Water	Sewer
Operating Reserve	25% of Operating Budget	\$375K	\$427K
Capital Reserve	3.5% of Asset Value	\$771K	\$980K
Rate Stabilization Reserve	10% of annual Operating Budget	\$212K	\$237K
Debt Service Reserve	100% of annual debt service	\$398K	\$194K
<b>Total</b>		<b>\$1.75M</b>	<b>\$1.83M</b>

Applying the same methodology to determine reserve target levels to all years of the Study period yield the following targets, found in Table 2-5 and Table 2-6 below.

**Table 2-5: Water Enterprise Reserve Targets for Study Period**

Reserve	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Operating Reserve	\$424,878	\$442,132	\$460,156	\$478,988	\$498,666
Capital Reserve	\$787,360	\$807,044	\$831,255	\$856,192	\$881,878
Rate Stabilization Reserve	\$218,911	\$226,246	\$233,259	\$240,490	\$247,945
Debt Service Reserve	\$398,000	\$398,000	\$398,000	\$398,000	\$398,000
<b>Total Water Enterprise Target</b>	<b>\$1,829,149</b>	<b>\$1,873,421</b>	<b>\$1,922,670</b>	<b>\$1,973,671</b>	<b>\$2,026,489</b>

**Table 2-6: Sewer Enterprise Reserve Targets for Study Period**

Reserve	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Operating Reserve	\$432,237	\$281,946	\$290,107	\$298,528	\$307,217
Capital Reserve	\$999,637	\$1,024,628	\$1,055,367	\$1,087,028	\$1,119,639
Rate Stabilization Reserve	\$245,949	\$165,969	\$170,628	\$175,255	\$180,032
Debt Service Reserve	\$191,000	\$191,000	\$191,000	\$191,000	\$191,000
<b>Total Sewer Enterprise Target</b>	<b>\$1,868,823</b>	<b>\$1,663,544</b>	<b>\$1,707,102</b>	<b>\$1,751,812</b>	<b>\$1,797,889</b>

# 3. Water Enterprise Financial Plan

Establishing a utility’s revenue requirement is the first step in the rate setting process. We project operating revenues under the current rates, O&M expenses, capital expenditures, transfers between funds, and reserve requirements. This section of the report discusses the projected revenues, O&M and capital expenditures, capital improvement financing plan, and revenue adjustments required to ensure the fiscal sustainability of the Water Enterprise. Numbers shown in all tables of this section are rounded; therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown.

## 3.1. Revenues from Current Water Rates

The current rates were last adjusted in August 2020. The District’s water service charges have two components – a monthly fixed charge and a volumetric usage charge. Table 3-1 summarizes the current monthly fixed charges by meter size for both Harbor and non-Harbor customers.

**Table 3-1: Current Monthly Fixed Charges**

Meter Size	Non-Harbor Monthly Rate	Harbor Monthly Rate
3/4"	\$38.63	\$53.19
1"	\$60.80	\$85.07
1 ½"	\$116.23	\$164.77
2"	\$182.74	\$260.41
3"	\$393.38	\$563.28
4"	\$703.78	\$1,009.60

A separate monthly fixed charge schedule applies to fireline and construction service accounts. The rates for each of those customer classes is listed in Table 3-2 below.

**Table 3-2: Fireline and Construction Service Monthly Fixed Charges**

Customer Class / Meter Size	Monthly Rate
Residential Fireline ¾"	\$6.57
Residential Fireline 1"	\$9.91
Hydrant/Construction	\$50.00
Commercial Fireline	
1"	\$6.44
2"	\$12.04
3"	\$24.76
4"	\$46.69
6"	\$125.40
8"	\$261.15

In addition to the fixed monthly charge, customers pay volumetric use charges. Single family residential (SFR) and multi-family residential (MFR) customers are charged an inclining three-tier rate structure. All other users are charged a uniform commodity rate. The volumetric charges for all customer classes are shown below in Table 3-3.

**Table 3-3: Current Volumetric Rates**

<b>Residential (SFR &amp; MFR)</b>		
<b>Single Family</b>		
Tier 1	0 - 5 hcf	\$4.02
Tier 2	6 - 8 hcf	\$4.66
Tier 3	9 + hcf	\$6.47
<b>Multi-Family</b>		
Tier 1	0 - 4 hcf	\$4.02
Tier 2	5 - 6 hcf	\$4.66
Tier 3	7 + hcf	\$6.47
<b>Non-Residential</b>		
Commercial (Non-Harbor)	uniform	\$4.52
Construction	uniform	\$4.52
Commercial Harbor Accounts	uniform	\$5.28
Harbor Irrigation	uniform	\$5.28
Harbor Apartments	uniform	\$5.28

Using the account growth percentages in Table 2-2, Raftelis projected the number of accounts in each customer class as shown in Table 3-4.

**Table 3-4: Projected Account Totals by Meter Size**

<b>Meter Size</b>	<b>FY 2022</b>	<b>FY 2023</b>	<b>FY 2024</b>	<b>FY 2025</b>	<b>FY 2026</b>
3/4	1,720	1,724	1,728	1,732	1,737
1	70	70	70	70	70
1 1/2	16	16	16	16	16
2	29	29	29	29	29
3	28	28	28	28	28
4	8	8	8	8	8
<b>Total Accounts</b>	<b>1,871</b>	<b>1,875</b>	<b>1,879</b>	<b>1,884</b>	<b>1,888</b>

The projected potable water sales developed by Raftelis and District staff from Table 2-3 were used to project potable water usage in each tier and customer class as shown in Table 3-5. The projected water sales by customer class and tier for the Study period is shown in Table 3-5 below and are based on actual usage data from FY 2020.

**Table 3-5: Projected Water Usage by Tier and Customer Class**

Water Usage (hcf)	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>SFR</b>					
Tier 1	66,445	66,445	66,445	66,445	66,445
Tier 2	19,261	19,261	19,261	19,261	19,261
Tier 3	2,418	2,418	2,418	2,418	2,418
<b>Subtotal SFR</b>	<b>88,124</b>	<b>88,124</b>	<b>88,124</b>	<b>88,124</b>	<b>88,124</b>
<b>MFR</b>					
Tier 1	5,804	5,804	5,804	5,804	5,804
Tier 2	3,569	3,569	3,569	3,569	3,569
Tier 3	1,341	1,341	1,341	1,341	1,341
<b>Subtotal MFR</b>	<b>10,714</b>	<b>10,714</b>	<b>10,714</b>	<b>10,714</b>	<b>10,714</b>
<b>Non-Residential</b>					
Commercial (Non-Harbor)	3,660	3,660	3,660	3,660	3,660
Construction	17	17	17	17	17
Commercial Harbor Accounts	35,539	35,539	35,539	35,539	35,539
Harbor Irrigation	10,314	10,314	10,314	10,314	10,314
Harbor Apartments	31,101	31,101	31,101	31,101	31,101
<b>Subtotal Non-Residential</b>	<b>80,630</b>	<b>80,630</b>	<b>80,630</b>	<b>80,630</b>	<b>80,630</b>
<b>Total Water Usage (hcf)</b>	<b>179,467</b>	<b>179,467</b>	<b>179,467</b>	<b>179,467</b>	<b>179,467</b>
<b>Total Water Usage (AF)</b>	<b>412 AF</b>	<b>412 AF</b>	<b>412 AF</b>	<b>412 AF</b>	<b>412 AF</b>

Table 3-6 shows the projected revenues for the Study period under the existing rates. The commodity revenues shown for FY 2022 through FY 2026 are calculated by multiplying the projected usage (Table 3-5) by the rate (Table 3-3). For example, the commodity charge revenue from SFR Tier 1 usage for FY 2022 can be calculated as follows:

$$\begin{aligned} & \text{Projected SFR Tier 1 Usage for FY 2022} \times \text{Tier 1 Rate} \\ & 66,445 \times \$4.02 = \$267K \end{aligned}$$

The same calculation is repeated for all tiers and the other customer classes (including fireline, construction, and fire protection) to determine the total commodity revenue for each year of the Study period. For FY 2022, the projected volumetric rate revenue is \$844K.

The monthly fixed charge increases with meter size. Referring to the monthly fixed rates and account totals in Table 3-1 and Table 3-4 respectively, the monthly fixed charge revenue from all single family homes with a 3/4" meter for FY 2022 is calculated as follows:

$$\begin{aligned} & \text{fixed charge rate} \times \text{number of accounts with 3/4" meter} \times 12 \text{ months} \\ & \$38.63 \times 1,589 \times 12 = \$737K \end{aligned}$$

The same calculation is repeated for all meter sizes and then added to determine the total monthly fixed charge revenue for all customers (including fireline and construction). For FY 2022, the projected monthly fixed charge revenue from potable water meters is \$1.28M.

Adding the volumetric revenue, monthly fixed charge revenue, and revenue from fireline and construction services yields the total revenue from current rates, found in Table 3-6 below. The revenue from fixed charges for FY 2022 is 60.4% of all revenues from rates.

**Table 3-6: Revenues from Current Rates**

	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Monthly Fixed Charges</b>					
Residential & Comm. Service – Non-Harbor	\$855,186	\$857,195	\$859,209	\$861,228	\$863,252
Residential & Comm. Service – Harbor	\$397,939	\$397,972	\$398,006	\$398,040	\$398,074
Residential Fireline	\$5,174	\$5,191	\$5,209	\$5,226	\$5,243
Hydrant/Construction	\$600	\$600	\$600	\$600	\$600
Fire Protection	\$27,551	\$27,551	\$27,551	\$27,551	\$27,551
<b>Total Fixed Charge Revenue</b>	<b>\$1,286,450</b>	<b>\$1,288,510</b>	<b>\$1,290,575</b>	<b>\$1,292,645</b>	<b>\$1,294,721</b>
<b>Volumetric Revenue</b>					
SFR	\$ 372,506	\$ 372,506	\$ 372,506	\$ 372,506	\$ 372,506
MFR	\$ 48,637	\$ 48,637	\$ 48,637	\$ 48,637	\$ 48,637
Commercial Non-Harbor Construction	\$ 16,620	\$ 16,620	\$ 16,620	\$ 16,620	\$ 16,620
Commercial Harbor	\$ 351,857	\$ 351,857	\$ 351,857	\$ 351,857	\$ 351,857
Harbor Irrigation	\$ 54,455	\$ 54,455	\$ 54,455	\$ 54,455	\$ 54,455
<b>Total Volumetric Revenue</b>	<b>\$844,075</b>	<b>\$844,075</b>	<b>\$844,075</b>	<b>\$844,075</b>	<b>\$844,075</b>
<b>Total Revenues from Rates</b>	<b>\$2,130,525</b>	<b>\$2,132,585</b>	<b>\$2,134,650</b>	<b>\$2,136,720</b>	<b>\$2,138,796</b>

## 3.2. O&M Expenses

### 3.2.1. WATER PURCHASE COSTS

The cost of water is the Water Enterprise’s largest O&M expense. Table 3-7 summarizes the District’s water supply costs during the Study period. As expected, the total water supply cost increases each fiscal year as the cost per AF escalates (see Table 2-1 for water supply cost inflation factor assumptions). The imported water purchase costs account for a water loss factor of 4.0%<sup>5</sup>, as shown in Line 2. While 533 AF of PHWA Tier 1 water is available (Line 6) before incurring the Tier 2 rate, the District’s demand of 429<sup>6</sup> (Line 10) is well below that threshold. The total water supply costs for FY 2022 are calculated as follows:

$$\begin{aligned}
 &(\textit{Tier 1 unit cost} \times \textit{Tier 1 usage}) + \textit{Fixed Charges} = \textit{Total Water Supply Costs} \\
 &(\$1,119 \times 429 \textit{ AF}) + \$439,233 = \$919,339
 \end{aligned}$$

<sup>5</sup> Water loss factor is calculated as the difference between water purchased from PHWA and water sold to retail customers. The projected water loss factor percentage of 4.1% is based on historical data.

<sup>6</sup> The total AF purchased from PHWA includes water sales of 412 AF and water loss factor of 4.0%.

**Table 3-7: Projected Water Supply Costs**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Water Consumption (AF)	412	412	412	412	412
2	Water loss	4.0%	4.0%	4.0%	4.0%	4.0%
3	Total Demand (including loss)	429 AF	429 AF	429 AF	429 AF	429 AF
4						
5	Available Water Supply from PHWA					
6	Tier 1 - PHWA	533 AF	533 AF	560 AF	560 AF	560 AF
7	Tier 2 - PHWA	∞	∞	∞	∞	∞
8						
9	Water Supply Used to Meet Water Consumption including water loss					
10	Tier 1 - PHWA	429 AF	429 AF	429 AF	429 AF	429 AF
11	Tier 2 - PHWA	0 AF	0 AF	0 AF	0 AF	0 AF
12						
13	Water Supply Costs (with projected increases)					
14	Fixed Charges	\$439,233	\$461,195	\$484,255	\$508,467	\$533,891
15						
16	(\$ / AF) Effective for FY					
17	Tier 1 - PHWA	\$1,119	\$1,175	\$1,233	\$1,295	\$1,360
18						
19	<b>Water Purchase Costs</b>	<b>\$919,339</b>	<b>\$965,306</b>	<b>\$1,013,572</b>	<b>\$1,064,250</b>	<b>\$1,117,463</b>

**3.2.2. WATER OPERATING EXPENSES**

Using the District’s FY 2021 budget, inflation factors were assigned to each line item<sup>7</sup> to determine future O&M costs for the Water Enterprise. Table 3-8 summarizes budgeted and projected O&M expenses for the Water Enterprise during the Study period. The Water Supply Costs are taken from the calculated values in Table 3-7 above.

**Table 3-8: Projected O&M Costs**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Water Supply Costs	\$919,339	\$965,306	\$1,013,572	\$1,064,250	\$1,117,463
2	Other Water System Expenses	\$184,380	\$193,599	\$203,279	\$213,443	\$224,115
3	Maintenance Expenses	\$19,589	\$19,981	\$20,380	\$20,788	\$21,204
4	Salaries and Benefits	\$399,955	\$410,352	\$421,030	\$431,995	\$443,257
5	Administrative Expenses	\$199,855	\$203,852	\$207,929	\$212,087	\$216,329
6	<b>TOTAL O&amp;M EXPENSES</b>	<b>\$1,723,118</b>	<b>\$1,793,090</b>	<b>\$1,866,190</b>	<b>\$1,942,564</b>	<b>\$2,022,368</b>

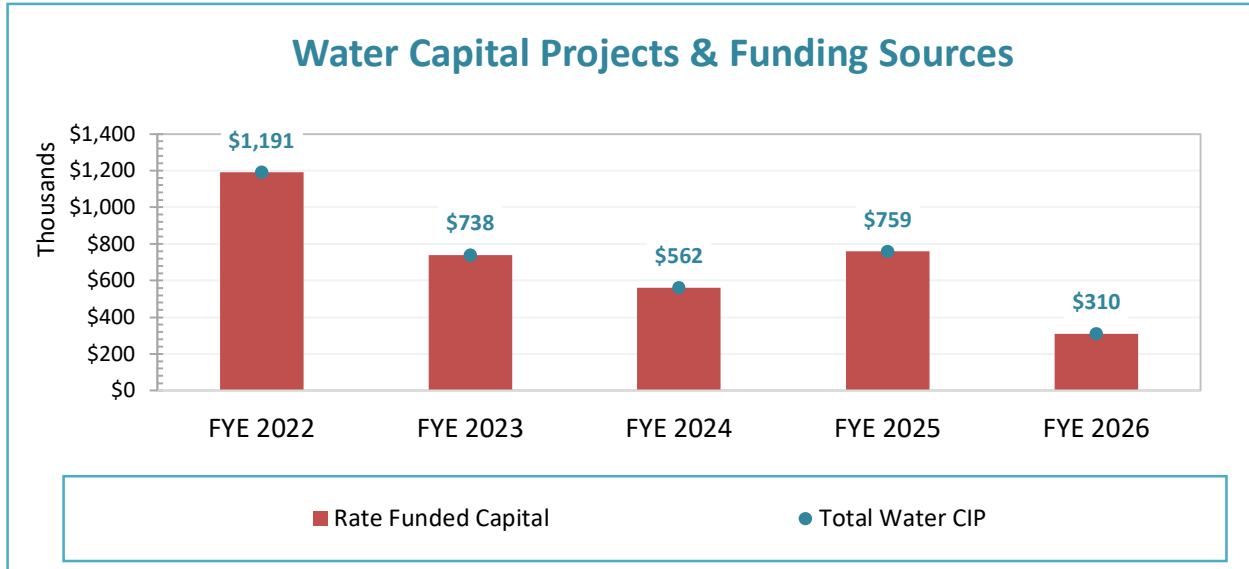
<sup>7</sup> See Table 2-1 for inflation factor assumptions.



### 3.3. Capital Improvement Projects (CIP)

The District projected capital improvement costs through the end of the Study period in FY 2026 to address R&R needs (Figure 3-1). The proposed capital improvement plan will be funded entirely through rate revenue (Pay As You Go or PAYGO) and reserves. The Water Enterprise’s current outstanding debt is composed of Series 2011 Water Refunding Revenue Bonds, with a final repayment schedule for this issue scheduled for FY 2022, and 50% of the loan for smart meter replacement, split with the Wastewater Enterprise, with payments through FY 2029. No proposed debt is expected during the Study period.

Figure 3-1: 5-Year Water Capital Expenditures



### 3.4. Status Quo Potable Water Financial Plan

Table 3-9 displays the District’s pro forma under current rates over the Study period. All projections shown in the table are based upon the District’s current rate structure and do not include rate adjustments. The pro-forma incorporates the data shown in Table 3-6 for revenues from current rates, Table 3-7 for water supply costs, Table 3-8 for O&M expenses and Figure 3-1 for CIP.

**Table 3-9: Status Quo Financial Plan Pro-Forma**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>REVENUES</b>					
2	Revenues from Rates	\$2,130,525	\$2,132,585	\$2,134,650	\$2,136,720	\$2,138,796
3	Revenue Adjustments	\$0	\$0	\$0	\$0	\$0
4	Allocation of Community Service	\$24,614	\$24,983	\$25,358	\$25,738	\$26,124
5	Interest Revenue	\$38,250	\$27,541	\$23,662	\$20,796	\$15,188
6	Capacity Fee Revenue					
7	<b>TOTAL REVENUES</b>	\$2,193,389	\$2,185,109	\$2,183,669	\$2,183,254	\$2,180,108
8						
9	<b>O&amp;M EXPENSES</b>					
10	Water Supply Costs	\$919,339	\$965,306	\$1,013,572	\$1,064,250	\$1,117,463
11	Other Water System Expenses	\$184,380	\$193,599	\$203,279	\$213,443	\$224,115
12	Maintenance Expenses	\$19,589	\$19,981	\$20,380	\$20,788	\$21,204
13	Salaries and Benefits	\$399,955	\$410,352	\$421,030	\$431,995	\$443,257
14	Administrative Expenses	\$199,855	\$203,852	\$207,929	\$212,087	\$216,329
15	<b>TOTAL O&amp;M EXPENSES</b>	\$1,723,118	\$1,793,090	\$1,866,190	\$1,942,564	\$2,022,368
16						
17	<b>NET REVENUES</b>	\$470,271	\$392,018	\$317,480	\$240,690	\$157,740
18						
19	<b>Debt Service</b>	\$350,637	\$42,403	\$42,403	\$42,403	\$42,403
20						
21	<b>Capital Expenditures</b>	\$1,190,585	\$737,548	\$561,650	\$759,117	\$309,603
22						
23	<b>NET CASH BALANCES</b>	(\$1,070,951)	(\$387,933)	(\$286,573)	(\$560,830)	(\$194,266)
24						
25	<b>BEGINNING BALANCES</b>	\$3,825,039	\$2,754,088	\$2,366,156	\$2,079,582	\$1,518,753
26	<b>ENDING BALANCES</b>	\$2,754,088	\$2,366,156	\$2,079,582	\$1,518,753	\$1,324,486
27	<b>TARGET BALANCES</b>	\$1,829,149	\$1,873,421	\$1,922,670	\$1,973,671	\$2,026,489

Under the ‘status-quo’ scenario, which does not include revenue adjustments, revenues generated from rates and other miscellaneous revenues are inadequate to sufficiently recover the expenses of the Water Enterprise and the fund balance does not meet target reserve levels starting in FY 2025 (as shown in the coral shaded cells).

### 3.5. Recommendations and Proposed Revenue Adjustments

To ensure that the Water Enterprise will have adequate revenues to fund operating expenses and capital expenditures, Raftelis recommends the following water revenue adjustments, (Table 3-10). The revenue adjustments are scheduled to be implemented in July of each year, except for the first year when it will be implemented September 1, 2021.

**Table 3-10: Proposed Revenue Adjustments**

<b>Effective Date</b>	<b>Proposed Water Revenue Adjustments</b>
September 2021	3 percent
July 2022	3 percent
July 2023	3 percent
July 2024	3 percent
July 2025	3 percent

**3.5.1. PROPOSED FINANCIAL PLAN**

A pro forma of the proposed financial plan is shown in Table 3-11 below. The proposed financial plan successfully meets the District’s financial needs, while minimizing rate impacts to its customers.

**Table 3-11: Proposed Financial Plan Pro-Forma**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>REVENUES</b>					
2	Revenues from Rates	\$2,130,525	\$2,132,585	\$2,134,650	\$2,136,720	\$2,138,796
3	Revenue Adjustments	\$58,589	\$129,874	\$197,940	\$268,177	\$340,655
4	Allocation of Community Service	\$24,614	\$24,983	\$25,358	\$25,738	\$26,124
5	Interest Revenue	\$38,250	\$28,127	\$25,552	\$24,685	\$21,797
6	Capacity Fee Revenue					
7	<b>TOTAL REVENUES</b>	<b>\$2,251,978</b>	<b>\$2,315,569</b>	<b>\$2,383,499</b>	<b>\$2,455,320</b>	<b>\$2,527,372</b>
8						
9	<b>O&amp;M EXPENSES</b>					
10	Water Supply Costs	\$919,339	\$965,306	\$1,013,572	\$1,064,250	\$1,117,463
11	Other Water System Expenses	\$184,380	\$193,599	\$203,279	\$213,443	\$224,115
12	Maintenance Expenses	\$19,589	\$19,981	\$20,380	\$20,788	\$21,204
13	Salaries and Benefits	\$399,955	\$410,352	\$421,030	\$431,995	\$443,257
14	Administrative Expenses	\$199,855	\$203,852	\$207,929	\$212,087	\$216,329
15	<b>TOTAL O&amp;M EXPENSES</b>	<b>\$1,723,118</b>	<b>\$1,793,090</b>	<b>\$1,866,190</b>	<b>\$1,942,564</b>	<b>\$2,022,368</b>
16						
17	<b>NET REVENUES</b>	\$528,861	\$522,479	\$517,310	\$512,756	\$505,004
18						
19	<b>Debt Service</b>	\$350,637	\$42,403	\$42,403	\$42,403	\$42,403
20						
21	<b>Capital Expenditures</b>	\$1,190,585	\$737,548	\$561,650	\$759,117	\$309,603
22						
23	<b>NET CASH BALANCES</b>	(\$1,012,362)	(\$257,473)	(\$86,743)	(\$288,764)	\$152,998
24						
25	<b>BEGINNING BALANCES</b>	\$3,825,039	\$2,812,678	\$2,555,205	\$2,468,462	\$2,179,699
26	<b>ENDING BALANCES</b>	\$2,812,678	\$2,555,205	\$2,468,462	\$2,179,699	\$2,332,696
27	<b>TARGET BALANCES</b>	\$1,829,149	\$1,873,421	\$1,922,670	\$1,973,671	\$2,026,489

Figure 3-2 illustrates the Water Enterprise operating position, where the expenses and reserve funding are shown by stacked bars and total revenues at current rates and proposed rates are shown by red and green lines, respectively.

Figure 3-2: Proposed Operating Financial Plan

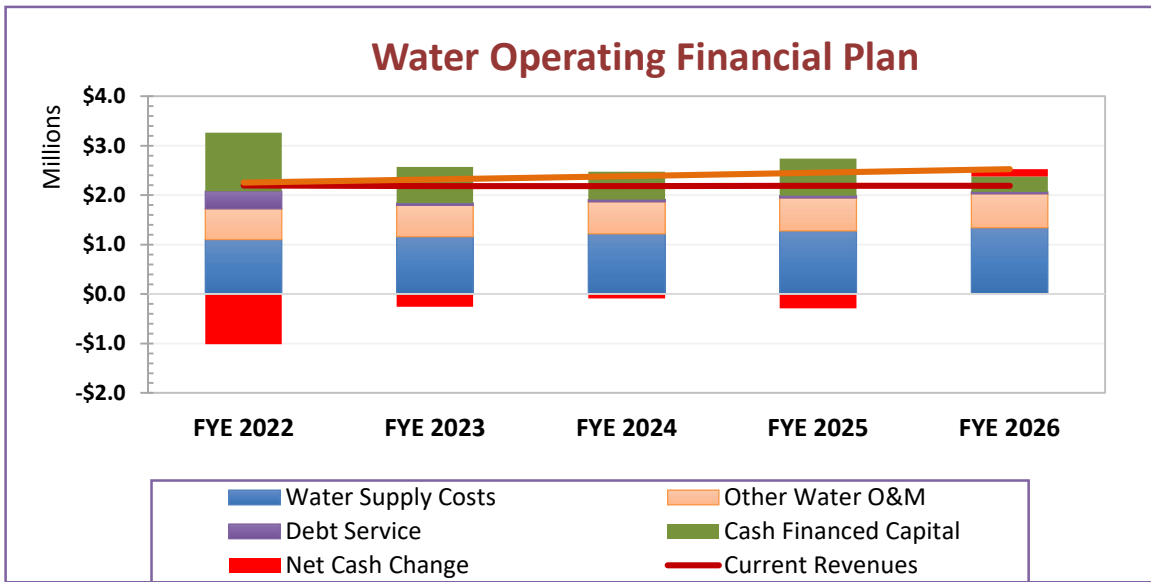
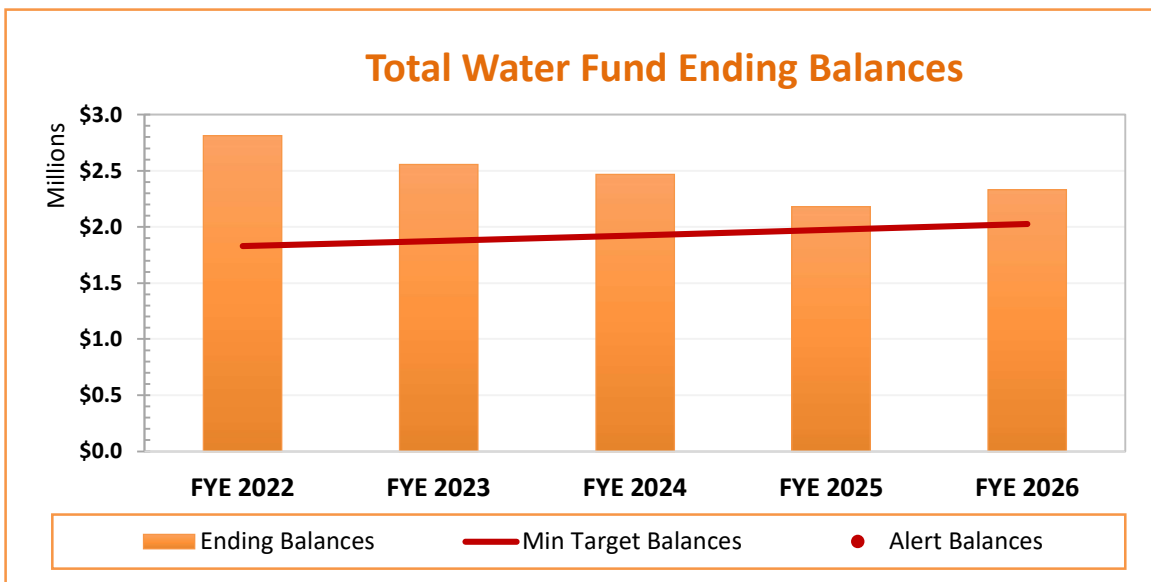


Figure 3-3 shows the Water Enterprise ending fund balance, where the red line indicates the target reserve balance as recommended by the reserve targets discussed in Section 3. With the proposed revenue adjustments, the ending fund balance meets the target reserve for all years. The proposed financial plan still meets the District’s debt coverage requirements while minimizing the rate impacts to its customers. The District has a covenant that requires it to maintain water system revenues at a level that meets a debt service coverage requirement of 1.00, which means that the District’s net revenue must amount to at least 1.00 times annual debt service. Net revenues equals revenues less O&M expenses.

Figure 3-3: Ending Balance for Water Fund under Proposed Financial Plan



# 4. Water Cost of Service Analysis

## 4.1. Cost of Service Process

This subsection provides an overview of a cost-of-service analysis. Each step described below will be described in greater detail throughout this section. Numbers shown in all tables of this section are rounded; therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown.

A cost of service analysis distributes a utility's revenue requirements (costs) to each customer class<sup>8</sup>. After determining a utility's revenue requirement, the next step in a cost of service analysis is to functionalize its O&M costs to the following **functions**:

1. Port Hueneme Water Agency readiness-to-serve charges (PHWA RTS)
2. Water supply
3. Treatment
4. Distribution
5. Meter
6. Customer service
7. Residential Fire
8. General and administrative costs

The functionalization of costs allows us to allocate the functionalized costs to the **cost causation components**. In addition to the cost causation components commonly found in most agencies, the District also has "Harbor-specific costs" which must be separated from the rest of the District customers. When the District entered into the Port Hueneme Water Agency (PHWA), the Harbor requested that 45%, or 465 AF, of the District's total PHWA capacity be reserved solely for Harbor use. The remaining 55% is reserved for Non-Harbor customers. The capacity requested by the Harbor requires the District to take on greater debt for construction of PHWA. Consequently, the 45% of the District's PHWA-Ready to Serve (RTS) (fixed) charge and debt service is directly attributable to Harbor customers. Therefore, a "Harbor" cost causation component must be included amongst the cost causation components, as found in the list below. Note that in FY 2023 one of the District's debt issuances is paid off. This reduces Harbor customer rates as they are fewer in number.

1. Base costs (costs incurred under average levels of usage)
2. Peaking costs (costs incurred during high levels of usage )
3. Meter service
4. Meter and customer service
5. General and administrative
6. Residential fire line
7. Direct fire protection
8. Harbor

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<sup>8</sup> Further detail of the Cost-Based Rate-Setting Methodology is provided in Section 1.4.3.

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<sup>9</sup> costs include the O&M and capital costs associated with meeting peak customer demand. This method is consistent with the AWWA M1 Manual, and is widely used in the water industry to perform cost of service analyses.

## **4.2. Cost of Service Analysis**

### **4.2.1. DETERMINATION OF TEST YEAR**

Typically, the most recent budget year or the one immediately following it are chosen as the test year, for which the cost of service analysis is performed. In our current study, FY 2021 was the most recent budget year. However, a cost of service analysis is a snapshot in time of the typical conditions over the next 4-5 years. The District is one year away from paying off a debt issuance for which the Harbor is responsible for 45% of the debt service. Once this debt service is paid off (with the last payment taking place in early FY 2022), the Harbor's share of costs (known as revenue requirement) decreases notably and results in a decrease in Harbor rates. Because this happens in FY 2023, it was chosen as a test year for the cost of service analysis.

The District will implement rate recommendations for FY 2022 based on the financial plan and rate study as outlined above, and will adopt the cost of service results for FY 2023. These results incorporate the rate recommendations as discussed in the financial plan and rate study.

### **4.2.2. DETERMINATION OF REVENUE REQUIREMENT**

In this Study, water rates are calculated for FY 2023 (known as the test year). Rates for FY 2022 are simply increased by the FY 2022 revenue adjustment. Test Year (FY 2023) revenue requirements are used in the cost allocation process. After rates are calculated for FY 2023, FY 2024 and subsequent years' rates are increased by the revenue adjustments shown in Table 3-10. We recommend the District review the cost of service analysis at least every five years to ensure that the rates are consistent with the costs of providing service.

The annual revenue requirements to be recovered from commodity charges are O&M expenses and capital costs. The total FY 2023 revenue requirement to be recovered from the District's water customers are shown in Table 4-1.

The revenue requirement determination is based upon the premise that the utility must generate annual revenues to meet O&M expenses, debt service needs, reserve levels, and capital investment needs. Revenues from sources other than water rates and charges (e.g. revenues from miscellaneous services) are deducted from the rate revenue requirement. The District's three enterprises (water, sewer, and trash) each pay a portion of the District's Community Service costs. Community Service costs, shown on Line 10 of Table 4-1, are a reverse revenue and increase the revenue requirement for the Water Enterprise.

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<sup>9</sup> The terms *extra capacity*, *peaking* and *capacity costs* are used interchangeably.

Additional deductions are made to reflect for net cash changes, shown on Line 18 of Table 4-1. The net cash change is the Water Enterprise’s net operating revenues of \$522K less the annual debt service of \$42K and rate funded capital of \$737K (found in Table 3-11).

**Table 4-1: Cost of Service Revenue Requirements**

		FY 2023				
1		Operating	Capital	Harbor	Total	Source
2	<b>Revenue Requirements</b>					
3	Water Supply	\$697,710			\$697,710	Table 3-9 <sup>10</sup>
4	Maintenance Expenses	\$19,981			\$19,981	Table 3-9
5	Salaries & Benefits	\$410,352			\$410,352	Table 3-9
6	Administrative Expenses	\$203,852			\$203,852	Table 3-9
7	Current Debt Service		\$0		\$0	Table 3-9
8	Proposed Debt Service		\$0		\$0	Table 3-9
9	Rate Funded Capital		\$737,548		\$737,548	Table 3-9
10	<b>Revenue Requirement before Adj.</b>	<b>\$1,331,895</b>	<b>\$737,548</b>		<b>\$2,069,443</b>	
11						
12	<b>Revenue Offsets</b>					
13	Allocation of Community Service	-\$24,983			-\$24,983	Table 3-11
14	Interest Revenue	-\$28,127			-\$28,127	Table 3-11
15	<b>Total Revenue Offsets</b>	<b>-\$53,110</b>			<b>-\$53,110</b>	
16						
17	<b>Adjustments</b>					
18	Net Cash Changes	-\$257,473			-\$257,473	Table 3-11
19	<b>Total Adjustments</b>	<b>-\$257,473</b>			<b>-\$257,473</b>	
20						
21	<b>Revenue Required before PHWA</b>	\$1,021,313	\$737,548		\$1,758,861	Line 10 – 15 – 20
22	PHWA-RTS	\$253,657		\$207,538	\$461,195	Table 3-11
23	Debt Service (Non-Harbor)	\$42,403			\$42,403	Table 3-11
24	<b>Revenue Required from Rates</b>	<b>\$1,317,374</b>	<b>\$737,548</b>	<b>\$207,538</b>	<b>\$2,262,459</b>	Line 22 + 23 + 24

### 4.2.3. ALLOCATION OF FUNCTIONALIZED COSTS TO COST CAUSATION COMPONENTS

To derive the cost to serve each customer class, costs first need to be functionalized as described in Section 4.1. Once functionalized, the costs are allocated to cost causation components. Raftelis used the Base-Extra Capacity method, as described in the AWWA M1 Manual, which consists of following functional cost components: Base, Max Day, Max Hour, Fire Protection, Meters, Customer/Customer Service, Conservation, and General. The cost causation components are defined below.

Base Costs are those operating and capital costs of the water system associated with serving customers at a constant, or average, rate of use. Supply costs are associated with meeting average day demand and are therefore typically considered base costs average usage.

<sup>10</sup> The District’s Water Supply Costs of \$1,158,905 from Table 3-8 are reduced by the PHWA-RTS costs of \$461,195.



Extra Capacity Costs or peaking costs represent those 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 are designed to meet Max Day requirements. Both have to 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 system wide peaking factors. For example, if the Max Day factor is 2.0, then certain system facilities have to 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.

Customer Service related costs include customer related costs. Customer costs include such costs as meter reading, billing, collecting, and customer accounting.

Meter Costs or meter service costs include maintenance and capital costs associated with servicing meters. These costs are assigned based on meter size or equivalent meter capacity.

Allocating costs into these cost components allows us to distribute these cost components to the various customer classes on the basis of their respective base, extra capacity and customer requirements for service.

#### **4.2.4. PEAKING ALLOCATION**

To determine how costs should be allocated to base demand and peak (Max Day and Max Hour) demands, the allocation percentages are derived from actual historical data and assigned to each cost component. Customer service related costs are allocated 100 percent to the customer service component. Costs related to meter maintenance are allocated to the meter service component. These two components, plus a portion of max day/max hour peaking costs are included in the fixed monthly service charges.

To allocate costs to base and peaking cost components, system peaking factors are used. The base demand is assigned a value of 1.0 signifying no peaking demands. The Max Day and Max Hour values shown in Table 4-2 were originally published in the District’s 2010 Infrastructure Review. A max day peaking factor of 1.3 means that the system delivers 1.3 times the amount of water it does during an average day.

**Table 4-2: System Peaking Factors**

	<b>Factor</b>
<b>Base</b>	1.0
<b>Max Day</b>	1.3
<b>Max Hour</b>	1.8

Next, the relative proportion of costs assigned to Base, Max Day, and Max Hour are used to allocate costs to the cost causation components. Cost components related solely to providing average day demand, such as supply sources, are allocated 100% to Base. Cost components that are designed to meet

Max Day peaks, such as distribution reservoirs and transmission facilities, are allocated to both Base and Max Day factors.

The allocation for Max Day peaking is calculated as follows:

$$\text{Max Day} = \frac{\text{Max Day} - \text{Base}}{\text{Max Day}}$$

The Max Day factor is 1.3, which means that Max Day demand is expected to be 130% of the average day capacity. In other words, 30 out of 130 represents the portion required to meet Max Day requirements. Applying the formula to the system peaking factors found in Table 4-2, yields the following:

$$\text{Base} = \frac{\text{Base}}{\text{Max Day}} = \frac{1}{1.3} \approx 77\%$$

$$\text{Max Day} = \frac{1.3 - 1}{1.3} \approx 23\%$$

Facilities designed for Max Hour peaks, such as distribution system facilities, are allocated similarly. The Max Hour factor is 1.8, so Max Hour facilities are designed to provide 180% of the average day capacity. Out of this 180, 100 represents the base demand, 30 represents the Max Day requirement and the remainder – 50 – represents the Max Hour requirement. The allocation of Max Hour facilities is shown below:

$$\text{Base} = \frac{\text{Base}}{\text{Max Hour}} = \frac{1}{1.8} \approx 56\%$$

$$\text{Max Day} = \frac{\text{Max Day} - \text{Base}}{\text{Max Hour}} = \frac{0.3}{1.8} \approx 17\%$$

$$\text{Max Hour} = \frac{\text{Max Hour} - \text{Max Day}}{\text{Max Hour}} = \frac{0.5}{1.8} \approx 28\%$$

The results of the allocation are presented in Table 4-3 below. These percentages are then applied to the operating and capital improvement expenses to allocate costs amongst Base, Max Day, and Max Hour cost components, which is explained in detail in the following sub-sections. The factors shown below are taken from Table 4-2 above.

**Table 4-3: Max Day/Max Hour Facility Allocation Factors**

		Factor	Base	Max Day	Max Hour
1	Base	1.00	100%	0%	0%
2	Max Day	1.30	77%	23%	0%
3	Max Hour	1.80	56%	17%	28%

#### 4.2.5. PEAKING FACTORS BY CUSTOMER CLASS

As noted above, the peaking characteristics of each customer class can place additional infrastructure requirements on the water system which translates into additional costs. The max day (MD) and max hour (MH) peaking factor for each customer class are calculated as follows:

$$\text{Max Billing Period Usage} \div \text{Average Billing Period Usage} = \text{MD Peaking Factor}$$

$$\text{MD Peaking Factor} \times (\text{System MH Factor} \div \text{System MD Factor}) = \text{MH Peaking Factor}$$

$$\text{MD Peaking Factor} \times (1.8 \div 1.3) = \text{MH Peaking Factor}$$

The peaking factor calculation for each SFR tier is shown below in Table 4-4.

**Table 4-4: Customer Class Peaking Factors**

Peaking Factors	Max Billing Period (hcf) <sup>11</sup>	Average Billing Period (hcf) <sup>12</sup>	MD Peaking Factor	MH Peaking Factor
<b>Combined SFR and MFR</b>				
Tier 1	6,504	5,496	1.18	1.64
Tier 2	2,781	1,702	1.63	2.26
Tier 3	492	278	1.77	2.45
<b>Commercial Non-Harbor</b>	522	286	1.82	2.53
<b>Commercial Harbor</b>	5,623	5,225	1.08	1.49
<b>Harbor Irrigation</b>	1,039	769	1.35	1.87

#### 4.2.6. ALLOCATION OF OPERATING EXPENSES

In this step, the Water Enterprise’s O&M costs are first functionalized and then allocated to the various cost components. Table 4-5 provides a matrix of the District’s functions, in the left most column, which are then allocated to the cost components.

As explained above in the introduction, 45% of the District’s capacity in PHWA is reserved for Harbor customers. Therefore, the PHWA-RTS costs are distributed 45% to Harbor customers and the remaining 55% is allocated to Non-harbor customers.

Water supply costs are all allocated entirely to Base, since these costs are shared by all users. Treatment is allocated based on the Max Day (see Line 2 in Table 4-3). Distribution is allocated based on Max Hour (see Line 3 in Table 4-3). General/Administration costs are distributed 100% to General. A summary of the functional cost allocation to cost causation components is shown in Table 4-5 below.

<sup>11</sup> Derived from FY 2020 usage data. Max Billing Period for FY 2020 was June.

<sup>12</sup> Derived from FY 2020 usage data. Average Billing Period usage is total annual usage divided by 12 (number of billing periods).

**Table 4-5: Functional Cost Allocation to Cost Causation Components**

Function	Base (A)	Max Day (B)	Max Hour (C)	Meter Service (D)	Customer (E)	Conservation (F)	General (G)	Res. Fire Line (H)	Direct Fire Protection (I)	Harbor (J)	TOTAL
PHWA-RTS	55%									45%	100%
Water Supply	100%										100%
Treatment	87%	13%									100%
Distribution	56%	17%	28%								100%
Meters				100%							100%
Customer Service					100%						100%
Residential Fire								100%			100%
General/Admin							100%				100%

**4.2.7. COST CAUSATION COMPONENT SUMMARY**

Table 4-6 shows the Water Enterprise’s O&M expenses. Functionalizing O&M expenses allows Raftelis to follow the principles of rate setting theory in which the end goal is to allocate O&M expenses to cost causation components. Table 4-6 shows how each cost component and how each cost component is collected from customers – via the fixed monthly charge, the per unit volumetric charge, or both.

**Table 4-6: Distribution of Functionalized O&M Costs**

Line No.	Cost Components	Cost of Service	Fixed	Variable	% Allocation Excluding Harbor	% Allocation Including Harbor
1	Base	\$973,728		✓	57%	54%
2	Max Day	\$28,378	✓		2%	2%
3	Max Hour	\$47,713	✓		3%	2%
4	Meter Services	\$20,759	✓		1%	1%
5	Customer	\$146,811	✓		9%	8%
6	Conservation	\$0	✓		0%	0%
7	General	\$479,465	✓		28%	27%
8	Residential Fire Line	\$6,843	✓		0.40%	0.38%
9	Direct Fire Protection	\$0	✓		0%	0%
10	Harbor	\$93,392	✓		0%	5%
11	<b>Total O&amp;M</b>	<b>\$1,793,090</b>			100%	100%

**4.2.8. ALLOCATION OF CAPITAL COSTS**

Capital costs include capital improvements financed from annual revenues, debt service and other sources. To allocate capital costs, Raftelis first functionalized the District’s assets, similar to how the O&M costs were functionalized. After the capital costs were functionalized, Raftelis used the resulting allocation percentages (found on the final Line of Table 4-7) to allocate capital costs to each of the cost causation components. Using this method to allocate capital costs reflects a more accurate distribution of the District’s long-term capital expenditures.

Costs are allocated based on the design criteria of each facility. For example, distribution lines are allocated to Max Hour since these facilities are designed to handle the maximum hour demand. Referencing the Distribution line item in Table 4-7 below, it reflects the Max Hour allocation found on Line 3 of Table 4-3. The resulting allocation of net investment serves as the basis for allocating the capital costs shown in Table 4-7.

**Table 4-7: Capital Allocation to Cost Components**

Capital Allocation	Base (A)	Max Day (B)	Max Hour (C)	Meter Service (D)	General (G)	Res. Fire Line (H)	Direct Fire Protection (I)	Harbor (J)
Water Supply	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Treatment	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Distribution	\$1,678,974	\$503,692	\$839,487	\$0	\$0	\$0	\$0	\$0
Meters	\$0	\$0	\$0	\$803,318	\$0	\$0	\$0	\$0
Customer Service	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Fire Hydrant	\$0	\$0	\$0	\$0	\$0	\$0	\$420,870	\$0
General/Admin	\$0	\$0	\$0	\$0	\$85,587	\$0	\$0	\$0
Total Assets	\$1,678,974	\$503,692	\$839,487	\$803,318	\$85,587	\$0	\$420,870	\$0
Allocation (%)	39%	12%	19%	19%	2%	0%	10%	0%

#### **4.2.9. DETERMINATION OF UNITS OF SERVICE**

In order to allocate costs of service to the different customer classes, unit costs of service need to be developed for each cost component. The unit costs of service are developed by dividing the total annual costs allocated to each parameter by the total annual service units of the respective component, as listed below:

- Base costs are divided by the total number of units sold (hcf).
- Extra capacity units are determined based on the peaking factors of the water system, shown in Table 4-9.
- Fire protection costs are redistributed to the fixed meter charge.
- Meter costs are based on equivalent meters. Table 4-8 shows the determination of the total annual units by customer class.
- Customer service related cost components are based on number of accounts and do not fluctuate with increases in meter size or usage.
- General expenses are allocated in the same proportion as all other operating expenses.

Based on the list above, three annual service units must first be determined before determining a unit cost for each cost category. These three annual service units are:

1. The number of accounts/meters (Table 4-8)
2. The number of equivalent meter units (Table 4-8)
3. The extra capacity units for Max Day and Max Hour (Table 4-9)

The following subsections derives the annual service units.

#### **4.2.10. DETERMINATION OF EQUIVALENT METER UNITS AND CUSTOMERS**

In order to create parity across the various meter sizes, each meter size is assigned a factor relative to a 3/4" meter, which has a value of 1. According to the AWWA M1 Manual, a particular meter size's ratio relative to that of a 3/4" meter is its "Equivalent Meter Units" (EMU). For example, a 2-inch meter has

5.33 times the throughput capacity of a 3/4” meter and therefore has a multiplication factor of 5.33 to determine its EMU to 3/4” meter. The Meter & Capacity factor escalates as meter size increases because the District’s cost to service a meter increases with its size. Based on the FY 2020 usage and account data, the customer count and EMUs are shown in Table 4-8.

**Table 4-8: Equivalent Meter Unit Calculation**

		(A)	(B)	C = A x B
Meter Size	Capacity (gpm)	AWWA Ratio	Number of Meters	Equivalent Meters
3/4	30	1.00	1,724	1,724
1	50	1.67	70	117
1 1/2	100	3.33	16	53
2	160	5.33	29	155
3	350	11.67	31	362
4	630	21.00	15	315
<b>Monthly Service Units</b>			<b>1,885</b>	<b>2,725</b>
<b>Annual Service Units</b>			<b>22,620</b>	<b>32,706</b>

The total number of meters is equivalent to the total number of customers. This figure serves as the divisor for the customer cost category. The equivalent meters serve as the divisor for all meter related costs. Both of these figures are multiplied by 12 to convert the totals from monthly service units into annual service units.

**4.2.11. DETERMINATION OF MAX DAY AND MAX HOUR EXTRA CAPACITY UNITS**

The extra capacity units are determined based on the peaking factors of the water system, shown in Table 4-4. The Max Day Demand (column D) is the Max Day Factor times the Daily Usage and the Max Day Requirement (column E) is the Max Day Demand less the Daily Usage. The Max Hour Demand is calculated similarly and the Max Hour Requirement is the Max Hour Demand less the Max Day Demand. The extra capacity units for both Max Day and Max Hour are shown in the final row of Table 4-9 below.

**Table 4-9: Determination of Extra Capacity Units<sup>13</sup>**

	A = Table 3-5	B = A/365	C = Table 4-4	D = B x C	E = D - B	F = Table 4-4	G = B x F	H = G - D
	Annual Use (hcf)	Average Daily Use (hcf/day)	MD Peaking Factor	MD Total Capacity (hcf/day)	MD Extra Capacity (hcf/day)	MH Peaking Factor	MH Total Capacity (hcf/day)	MH Extra Capacity (hcf/day)
<b>SFR</b>								
Tier 1	66,445	182	1.18	215	33	1.64	298	116
Tier 2	19,261	53	1.63	86	33	2.26	119	67
Tier 3	2,418	7	1.77	12	5	2.45	16	10
<b>MFR</b>								
Tier 1	5,804	16	1.18	19	3	1.64	26	10
Tier 2	3,569	10	1.63	16	6	2.26	22	12
Tier 3	1,341	4	1.77	7	3	2.45	9	5
Comm. Non Harbor	3,677	10	1.82	18	8	2.53	25	15
Comm. Harbor	66,640	183	1.08	196	14	1.49	272	89
Harbor Irrigation	10,314	28	1.35	38	10	1.87	53	25
<b>Total</b>	<b>179,468</b>	<b>492</b>			<b>116</b>			<b>350</b>

**4.2.12. ALLOCATION OF REVENUE OFFSETS, GENERAL COSTS, AND PEAKING COSTS**

All costs that apply generally to the District must be allocated to the cost causation categories based on the O&M allocation factors established in Table 4-6 and the Capital allocation factors established in Table 4-7. First, the District’s revenue offsets must be allocated to each cost causation category. The revenue offsets are summarized in Table 4-10. The O&M and Capital allocation factors are copied at the top of Table 4-10.

<sup>13</sup> The abbreviations MD for Max Day and MH for Max Hour are used in the table.

**Table 4-10: Allocation of Revenue Offsets**

	Base (A)	Max Day (B)	Max Hour (C)	Meter Service (D)	Customer (E)	Conservation (F)	General (G)	Res. Fire Line (H)	Direct Fire Protection (I)	Harbor (J)	Total (K)
O&M Allocation (Excluding Harbor)	57%	2%	3%	1%	9%	0%	28%	0.4%	0%	0%	100%
Capital Allocation	39%	12%	19%	19%	0%	0%	2%	0.0%	10%	0%	100%
Community Service (O&M Allocation)	\$14,312	\$417	\$643	\$305	\$2,158	\$0	\$7,047	\$101	\$0	\$0	\$24,983
Interest Revenue (Capital Allocation)	\$10,901	\$3,270	\$5,451	\$5,216	\$0	\$0	\$556	\$0	\$2,733	\$0	\$28,127
<b>Total</b>	<b>\$25,214</b>	<b>\$3,688</b>	<b>\$6,093</b>	<b>\$5,521</b>	<b>\$2,158</b>	<b>\$0</b>	<b>\$7,603</b>	<b>\$101</b>	<b>\$2,733</b>	<b>\$0</b>	<b>\$53,110</b>

General Costs are redistributed to all other cost categories in the same proportion as all other operating expenses. To demonstrate how General Costs are redistributed, assume there are three cost causation components (Components A, B, and C) and General Costs that comprises the revenue requirement. To spread General Costs among the three cost components, the relative percentage of components A, B and C are used to allocate that amount of General Costs.

$$\frac{\text{Component A Costs}}{\text{Total Cost} - \text{General Costs} - \text{Base Costs} - \text{Customer Costs}} = \% \text{ of General Costs assigned to Component A}$$

The same process is repeated for Max Hour. Furthermore, Public Fire Protection (Fire) costs are allocated entirely to the fixed meter charge, since all users benefit from fire protection regardless of volumetric use. Finally, all peaking costs are allocated to the meter charge. The policy decision to assign all peaking costs to the meter charge maintains the District’s percentage of fixed revenue around 60%. These allocations are summarized in Table 4-11.



**Table 4-11: Allocation of General, Fire, and Peaking Costs**

		Base (A)	Max Day (B)	Max Hour (C)	Meter Capacity (D)	Meter Service (E)	Customer (F)	General (G)	Private Fire Protection (H)	Res. Fire Line (I)	Direct Fire Protection (J)
1	<b>O&amp;M Allocation (Excluding Harbor)</b>	57%	2%	3%	1%	9%	0%	28%	0.4%	0%	0%
2	<b>Capital Allocation</b>	39%	12%	19%	19%	0%	0%	2%	0.0%	10%	0%
3											
4	Operating Expenses	\$615,519	\$17,938	\$27,632	NA	\$13,122	\$92,803	\$303,082		\$4,326	\$0
5	Capital Expenses	\$285,860	\$85,758	\$142,930	NA	\$136,772	\$0	\$14,572		\$0	\$71,657
6	Revenue Offsets	-\$25,214	-\$3,688	-\$6,093	NA	-\$5,521	-\$2,158	-\$7,603		-\$101	-\$2,733
7	<b>Subtotal Cost of Service</b>	<b>\$876,165</b>	<b>\$100,009</b>	<b>\$164,469</b>	<b>\$0</b>	<b>\$144,373</b>	<b>\$90,645</b>	<b>\$310,051</b>		<b>\$4,225</b>	<b>\$68,924</b>
		50%	6%	9%	0%	8%	5%	18%		0%	4%
8	Allocation of General Cost (%)	60.5%	6.9%	11.4%	0.0%	10.0%	6.3%			0.3%	4.8%
9	Allocation of General Cost (\$)	\$187,503	\$21,402	\$35,197	\$0	\$30,896	\$19,398	-\$310,051		\$904	\$14,750
10	<b>Subtotal Cost of Service</b>	<b>\$1,063,667</b>	<b>\$121,411</b>	<b>\$199,666</b>	<b>\$0</b>	<b>\$175,270</b>	<b>\$110,044</b>	<b>\$0</b>		<b>\$5,129</b>	<b>\$83,674</b>
		60%	7%	11%	0%	10%	6%	0%		0%	5%
11	Allocation of Public Fire Costs		-\$94,755	-\$169,170	\$522,868	-\$175,270					-\$83,674
12	Allocation to Private Fire		-\$9,841	-\$17,569					\$27,409		
13	Allocated Cost of Service	\$1,063,667	\$16,816	\$12,927	\$522,868	\$0	\$110,044	\$0	\$27,409	\$5,129	\$0
14	Adj. to Collect Capacity Costs Through Fixed Charge	-\$361,647	-\$16,816	-\$12,927	\$391,390						\$0
12	<b>Adjusted Cost of Service</b>	<b>\$702,020</b>	<b>\$0</b>	<b>\$0</b>	<b>\$914,258</b>	<b>\$0</b>	<b>\$110,044</b>	<b>\$0</b>	<b>\$27,409</b>	<b>\$5,129</b>	<b>\$0</b>

## 4.2.1. FIRE PROTECTION CALCULATIONS

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

Table 4-12 shows the steps to allocate costs between public and private fire service. Each fire connection size has a fire flow demand factor similar to a hydraulic capacity factor of a water meter. The diameter of the connection is raised to the 2.63 power to determine the fire flow demand factor<sup>14</sup>. The count of connections of a specific size is multiplied by the fire flow demand factor to derive total equivalent fire demand.

The potential fire demand (known as equivalent demand) of public and private fire accounts is calculated in Lines 2 and 8 of Table 4-12, respectively. Line 2 calculates the potential flow through public fire hydrants using the Hazen-Williams equation for pipe flow. Lines 4 through 8 calculate the potential flow through private fire connections also using the Hazen-Williams equation. The resulting potential fire demand and, therefore, cost allocation for public fire and private fire costs, is shown in Line 10. The total equivalent demand units are calculated by multiplying the potential demand by the number of connections/hydrants in service. The analysis estimates that 91 percent of fire capacity, and therefore costs, relate to public fire and will be included and recovered on the monthly fixed charges. The remaining 9 percent is attributable to private fire service and will be recovered through private fire service charges.

**Table 4-12: Derivation of Potential Flow to Private and Public Fire Connections**

	Connection Size	Demand Factor	Unit Counts	Equivalent Demand	Percent Allocation
<b>1</b>	<b>Public Hydrants</b>				
<b>2</b>	6"		176	19,591 <sup>14</sup>	<b>91%</b>
<b>3</b>					
<b>4</b>	<b>Private Fire Lines</b>				
<b>5</b>	4"	38.32	8	307	
<b>6</b>	6"	111.31	7	779	
<b>7</b>	8"	237.21	4	949	
<b>8</b>	<b>Total Private Fire</b>		<b>19</b>	<b>2,035</b>	<b>9%</b>
<b>9</b>					
<b>10</b>	<b>Total Fire Demand</b>		<b>195</b>	<b>21,625</b>	

<sup>14</sup> Hazen-Williams equation via AWWA M1 Manual

## 4.2.2. DETERMINATION OF UNIT COST

To determine a unit cost for each cost component, the total adjusted cost of service for each cost component found on the final line of Table 4-11 is divided by its total number of service units which are detailed above in Section 4.2.9.

Table 4-13 below details the unit cost, service units, service units of measure, and source of the service units for each cost component. The unit costs shown in Table 4-13 below do not include the District's Debt and PHWA-RTS costs, which will be applied in the following step.

**Table 4-13: Determination of Unit Cost**

	<b>Cost Component</b>	<b>Adjusted COS</b>	<b>Service Units</b>	<b>Unit of Measure</b>	<b>Unit Cost</b>
1	Base	\$702,020	179,468	hcf	\$3.91
2	Max Day	\$0	116	hcf/day	\$0.00
3	Max Hour	\$0	350	hcf/day	\$0.00
4	Meter Capacity	\$914,258	2,725	Capacity Equivalent Meters	\$27.95 <sup>15</sup>
5	Meter Service	\$0	2,231	Cost Equivalent Meters	\$0.00
6	Customer	\$110,044	22,848	bills	\$4.82
7	General	\$0			
8	Private Fire Protection	\$27,409	2,035	Fire Demand Units	\$13.47
9	Res Fire Line	\$5,129	67.7	Fire Demand Units	\$6.31
10	Total	\$1,758,861			

## 4.2.3. ADDITION OF PHWA-RTS COSTS

All unit costs derived in Section 4.2.1 apply to all District customers. This subsection discusses costs specific to Harbor and Non-Harbor customers. As discussed in previous sections, the District's PHWA-RTS costs are allocated 45% to Harbor Customers and 55% to Non-Harbor Customers. Referring to the PHWA-RTS costs found in Table 4-1, the costs allocated to Harbor and Non-Harbor Customers are shown in Table 4-14.

**Table 4-14: Allocation of Debt and PHWA-RTS Costs**

1		55%	45%	
2	Annual PHWA-RTS Charge	\$461,195	\$207,538	\$253,657
3	Annual Debt Service	\$42,403	\$0	\$42,403
4		<b>\$503,598</b>	<b>\$207,538</b>	<b>\$296,060</b>

After the total amount of PHWA-RTS allocable to Harbor and Non-Harbor Customers is determined, the costs are placed in either the Base or Meter Capacity cost causation components. For the Non-Harbor Customers, the Debt and PHWA-RTS costs follow the District's existing revenue split of 40% variable and 60% fixed (as shown on Line 1 of Table 4-15 below). For Harbor Customers, the PHWA-RTS costs are split evenly between Base and Meter Capacity (see Line 10 of Table 4-15 below) to promote affordability for lower volume users.

<sup>15</sup> Figure has been divided by 12 to show monthly charge.

**Table 4-15: Determination of Debt and PHWA-RTS Unit Costs**

		Base (Variable)	Meter Capacity (Fixed)	Total Cost	Notes/Source
1	Non-Harbor Allocation	40%	60%		
2					
3	Non-Harbor PHWA-RTS (55%)	\$101,243	\$152,414	\$253,657	Total × Allocation %
4	Non-Harbor Debt (55%)	\$16,925	\$25,479	\$42,403	Total × Allocation %
5	<b>Total Non-Harbor Adjusted Cost of Service</b>	<b>\$118,168</b>	<b>\$177,893</b>	<b>\$296,060</b>	Totals found in Table 4-14
6					
7	Units of Service (hcf, # of Eq Mtrs)	102,515 <sup>16</sup>	1,862		Table 4-9
8	Non-Harbor Unit Costs for Debt & PHWA-RTS	<b>\$1.15</b>	<b>\$7.96</b>		Line 5 ÷ Line 7
9					
10	Harbor Allocation	50%	50%		
11	Harbor PHWA- RTS (45%)	\$103,769	\$103,769	\$207,538	Total × Allocation %
12	Harbor Debt (45%)	\$0	\$0	\$0	Total × Allocation %
13	<b>Total Harbor Adjusted Cost of Service</b>	<b>\$103,769</b>	<b>\$103,769</b>	<b>\$207,538</b>	Totals found in Table 4-14
14					
15	Units of Service (hcf, # of Eq Mtrs)	76,953 <sup>17</sup>	863		Table 4-9
16	<b>Harbor Unit Costs for Debt &amp; PHWA-RTS</b>	<b>\$1.35</b>	<b>\$10.02</b>		Line 13 ÷ Line 15

The calculation of public and private fire service capacity are shown in Table 4-16. Line 1 assumes the average fire lasts three hours. To fight that fire, fire services needs 3,000 gallons per minute (gpm). Ninety one percent of the District’s fire costs are allocated to Public Fire due as derived in Line 2 of Table 4-12. Max day capacity demanded for fire is then determined by converting 3,000 gpm to gallons per hour, then multiplying it by the three hour duration of a typical fire. This is then converted to hundred cubic feet. A similar calculation is done for the max hour capacity, multiplying the max day capacity by 24 hours less the capacity already allocated to Max Day. Public Fire is then allocated 91 percent each of those capacities as derived in Table 4-12. The percent of extra capacity required for public and private fire service is shown in Lines 9 of Table 4-16. These percentages are calculated by dividing the capacity needed for public or private fire (Lines 6 and 7) by the total extra capacity in Line 9 for both max day and max hour. The units are then converted to gallons per day, and the total cost for fire capacity is calculated (as shown in Line 14) by multiplying the units times the unit cost of service (Line 11 x Line 13). The public and private fire service cost is then determined by calculating the percent of the public and private fire max day respectively to total extra capacity.

<sup>16</sup> 102,515 is the summation of all Non-Harbor usage, which consists of SFR, MFR, and Commercial Non-Harbor. The same methodology is used for Number of Equivalent Meters

<sup>17</sup> 76,953 is the summation of all Harbor usage, which consists of Commercial Harbor and Harbor Irrigation. The same methodology is used for Number of Equivalent Meters

**Table 4-16: Calculation of Fire Service Capacity**

	<b>Fire Estimate</b>	<b>Max Day</b>	<b>Max Hour</b>	
1	<b>Hours for Fire: 3.0</b>			
2	Gals/minute	3,000	3,000	
3				
4	<b>Cost to Public Fire</b>	91%	91%	
5	Capacity Demand for Fire	722	5,053	
6	Public Fire	654	4,578	
7	Private Fire	68	475	
8	<b>Total Fire Capacity</b>	<b>722</b>	<b>5,053</b>	
9	Total Extra Capacity – Fire & Potable (hcf/day)	<b>838</b>	<b>5,403</b>	
10				
11	Unit Cost of Service	\$193.70	\$49.40	
12	Unit	\$/1,000 gals/day	\$/1,000 gals/day	
13	Fire Protection Units	540	3,780	
14	Total Cost for Fire Capacity	\$104,595	\$186,739	Line 11 x Line 13
15	<b>Public Fire Protection</b>	<b>\$94,755</b>	<b>\$169,170</b>	78% (Line 6/Line 9)
16	<b>Private Fire Service</b>	<b>\$9,841</b>	<b>\$17,569</b>	8% (Line 7/Line 9)

Once the fire costs are determined, the next step to determine the full the Base and Meter Capacity unit costs for Non-Harbor and Harbor Customers, the unit rates developed in Table 4-13 must be added to the unit costs developed in Table 4-15. The combined unit costs for all cost causation components are shown in Table 4-17 below.

**Table 4-17: Summary of Unit Costs for Harbor and Non-Harbor Customers**

		<b>Base</b>	<b>Meter Capacity</b>	<b>Customer</b>	<b>Private Fire Protection</b>	<b>Residential Fire Line</b>
1	<b>Non-Harbor Customers</b>					
2	Unit Rate for All District Customers	\$3.91	\$27.95	\$4.82	\$13.47	\$6.31
3	Additional Unit Rate for Non-Harbor	\$1.15	\$7.96			
4	Non-Harbor Unit Rates	<b>\$5.06</b>	<b>\$35.91</b>	<b>\$4.82</b>	<b>\$13.47</b>	<b>\$6.31</b>
5						
6	<b>Harbor Customers</b>					
7	Unit Rate for All District Customers	\$3.91	\$27.95	\$4.82	\$13.47	\$6.31
8	Additional Unit Rate For Harbor	\$1.35	\$10.02			
9	Harbor Unit Rates	<b>\$5.26</b>	<b>\$37.97</b>	<b>\$4.82</b>	<b>\$13.47</b>	<b>\$6.31</b>

#### **4.2.4. ALLOCATION OF COSTS TO CUSTOMER CLASS**

Lastly, costs are allocated to customer classes using the unit costs (repeated on Line 1 and Line 2 of Table 4-18 below) developed in Table 4-13 and the respective service units for each customer class. Respective allocations for FY 2023 are below in Table 4-18.

**Table 4-18: Allocation of Costs to Customer Class<sup>18</sup>**

		A (Table 3-5)	B (Table 4-8)	C = Unit Cost x A	D = Unit Cost x B	E = Unit Cost x B	F = Unit Cost x B	G = Unit Cost x B	
		Usage	Capacity Equivalent Meters	Base	Meter Capacity	Customer	Private Fire Protection	Residential Fire	Total COS
1	Non-Harbor Unit Rates			\$5.06	\$35.91	\$4.82	\$13.47	\$6.31	
2	Harbor Unit Rates			\$5.26	\$37.97	\$4.82	\$13.47	\$6.31	
3									
4	<b>NON-HARBOR CUSTOMERS</b>								
5	<b>SF Residential</b>	<b>88,124</b>	<b>1,649</b>	<b>\$446,292</b>	<b>\$715,288</b>	<b>\$94,378</b>			<b>\$1,255,958</b>
6	Tier 1	66,445		\$336,501	\$0	\$0			\$336,501
7	Tier 2	19,261		\$97,545	\$0	\$0			\$97,545
8	Tier 3	2,418		\$12,246	\$0	\$0			\$12,246
9									
10	<b>MF Residential</b>	<b>10,714</b>	<b>122</b>	<b>\$54,260</b>	<b>\$54,221</b>	<b>\$6,692</b>			<b>\$115,173</b>
11	Tier 1	5,804		\$29,394	\$0	\$0			\$29,394
12	Tier 2	3,569		\$18,075	\$0	\$0			\$18,075
13	Tier 3	1,341		\$6,791	\$0	\$0			\$6,791
14									
15	Commercial Non-Harbor	3,677	46	\$18,622	\$32,664	\$1,452			\$52,737
16									
17	<b>HARBOR CUSTOMERS</b>								
18	Commercial Harbor	66,640	352	\$350,533	\$346,789	\$4,684			\$702,007
19	Harbor Irrigation	10,314	62	\$54,251	\$46,523	\$1,682			\$102,455
20									
21	<b>OTHER</b>								
22	Residential Fire		68	\$0	\$0	\$0		\$5,129	\$5,129
23	Private Comm Fire Lines		19	\$0	\$0	\$1,098	\$27,409		\$28,508
25	Hydrant Construction		1	\$0	\$434	\$58			\$492
26	<b>Total</b>			<b>\$923,957</b>	<b>\$1,195,920</b>	<b>\$110,044</b>	<b>\$27,409</b>	<b>\$5,129</b>	<b>\$2,262,459</b>
				<i>Variable Revenue</i>	<i>Fixed Revenue</i>	<i>Fixed Revenue</i>	<i>Fixed Revenue</i>	<i>Fixed Revenue</i>	

<sup>18</sup> The Unit Costs in Line 1 have been rounded to the nearest whole cent. Multiplying these values by the usage found in Column A may produce slightly different results than what is shown in the table in each respective column.

## 4.2.5. COMPARISON OF THE PRIOR AND CURRENT COST TO SERVE EACH CLASS

After performing a cost of service analysis and adjusting the tier structure, each customer class and tier's responsibility of the Water Enterprise's overall costs is likely to shift. Table 4-19 shows a comparison of the proposed cost to serve each customer class with the proposed cost to serve (in percent) in the last two columns of Table 4-19. These changes are reasonable and not a large change from the previous study.

**Table 4-19: Comparison of Proposed and Current Cost Allocation to Customer Classes**

	Customer Class	Variable Revenue	Fixed Revenue	Total Revenue	Proposed Revenue %	Current Revenue %
1	SF Residential	\$446,292	\$809,666	\$1,255,958	56%	52%
2	MF Residential	\$54,260	\$60,913	\$115,173	5%	5%
3	Commercial Non-Harbor	\$18,622	\$34,116	\$52,737	2%	2%
4	Commercial Harbor	\$350,533	\$351,473	\$702,007	31%	34%
5	Harbor Irrigation	\$54,251	\$48,205	\$102,455	5%	5%
6	Residential Fire	\$0	\$5,129	\$5,129	0%	0%
7	Private Comm. Fire Lines	\$0	\$28,508	\$28,508	1%	1%
8	Hydrant Construction	\$0	\$492	\$492	0%	0%
9	<b>Total</b>	<b>\$923,957</b>	<b>\$1,338,502</b>	<b>\$2,262,459</b>	<b>100%</b>	<b>100%</b>

## 4.3. Fixed vs. Variable Revenue Split

One of the District's primary Study goals was to develop cost of service-based rates while retaining rate stability. The proposed revenue split achieves this goal, as outlined in Table 4-20 below. Note that the percentage increase between the total proposed revenue and total current revenue matches the proposed FY 2023 revenue adjustment outlined in Table 3-10 .

**Table 4-20: Fixed vs. Variable Revenue**

		Fixed	Variable	Total
1	Current	\$1,345,218	\$1,338,502	\$2,189,293
2		60%	40%	100%
3				
4	Proposed	\$1,338,502	\$844,075	\$2,262,459
5		59%	41%	100%
6				
7	<b>Revenue Adjustment from FY 22</b>			3%

# 5. Rate Design and Customer Impacts

## 5.1. Development of Monthly Fixed Charge

The monthly fixed charges proposed for FY 2023 in Table 5-1 are derived by adding the monthly service charge components – Customer Service and Meter Service. The customer service cost is the same for each account regardless of meter size. The meter component of the monthly fixed charge is determined by multiplying the unit cost of \$35.91 (found in Table 4-17) by the appropriate meter factor found in Table 4-8. Adding these two components together yields the total proposed monthly fixed charge for each meter size for FY 2023, as shown in Table 5-1 below.

**Table 5-1: Development of Monthly Fixed Charge**

	A	B	C	D = B + C					
	Meter Size	Meter Ratio	Meter	Customer	Proposed Charges	Current Charges	Difference	No. of Meters	Projected Revenue
		Table 4-8	Table 4-13	Table 4-17		Table 3-1		Table 4-8	
<b>1</b>	<b>Non-Harbor Customers</b>								
<b>2</b>	3/4	1.00	\$35.91	\$4.82	\$40.74	\$38.63	5.5%	1,709	\$835,375
<b>3</b>	1	1.67	\$59.86	\$4.82	\$64.68	\$60.80	6.4%	60	\$46,681
<b>4</b>	1 1/2	3.33	\$119.71	\$4.82	\$124.54	\$116.23	7.1%	2	\$2,989
<b>5</b>	2	5.33	\$191.54	\$4.82	\$196.36	\$182.74	7.5%	0	\$0
<b>6</b>	3	11.67	\$419.00	\$4.82	\$423.82	\$393.38	7.7%	4	\$20,343
<b>7</b>	4	21.00	\$754.20	\$4.82	\$759.02	\$703.78	7.8%	0	\$0
<b>8</b>									
<b>9</b>	<b>Harbor Customers</b>								
<b>10</b>	3/4	1.00	\$37.97	\$4.82	\$42.79	\$53.19	-20%	15	\$7,760
<b>11</b>	1	1.67	\$63.29	\$4.82	\$68.10	\$85.07	-20%	10	\$8,192
<b>12</b>	1 1/2	3.33	\$126.57	\$4.82	\$131.39	\$164.77	-20%	14	\$22,074
<b>13</b>	2	5.33	\$202.52	\$4.82	\$207.34	\$260.41	-20%	29	\$72,153
<b>14</b>	3	11.67	\$443.01	\$4.82	\$447.83	\$563.28	-20%	27	\$145,096
<b>15</b>	4	21.00	\$797.42	\$4.82	\$802.24	\$1,009.60	-21%	15	\$144,403
<b>16</b>	<b>Total</b>							<b>1,885</b>	<b>\$1,305,066</b>

As established in Table 4-17, the unit rate for Residential Fireline service is \$6.31 for a 3/4” meter size. The District also has customers with 1” fireline service. Employing the same methodology used above, the fixed charges for each are shown in Table 5-2.

**Table 5-2: Development of Residential Fire Charge**

	Residential Fire Line	Capacity Equivalency Factor	Residential Fire Rate	Current Residential Fire Rate	Difference (\$)
<b>1</b>	3/4	1.00	\$6.31	\$6.57	-\$0.26
<b>2</b>	1	1.51	\$9.52	\$9.91	-\$0.39



## 5.2. Proposed Monthly Fixed Charges for the Study Period

Applying the proposed revenue adjustments from Table 3-10 to the proposed monthly fixed charges in Table 5-1 above yields the proposed monthly fixed charges for the Study period in Table 5-3.

**Table 5-3: Proposed Monthly Fixed Charges for Study Period**

	Current	FY 2022 Proposed <sup>19</sup>	FY 2023 Proposed	FY 2024 Proposed	FY 2025 Proposed	FY 2026 Proposed
<b>Rev Adj.</b>		3%	3%	3%	3%	3%
<b>Non-Harbor Customers</b>						
3/4	\$38.63	\$39.79	\$40.74	\$41.96	\$43.22	\$44.52
1	\$60.80	\$62.62	\$64.68	\$66.62	\$68.62	\$70.68
1 1/2	\$116.23	\$119.72	\$124.54	\$128.28	\$132.12	\$136.09
2	\$182.74	\$188.22	\$196.36	\$202.25	\$208.32	\$214.57
3	\$393.38	\$405.18	\$423.82	\$436.53	\$449.63	\$463.12
4	\$703.78	\$724.89	\$759.02	\$781.79	\$805.24	\$829.40
<b>Harbor Customers</b>						
3/4	\$53.19	\$54.79	\$42.79	\$44.07	\$45.39	\$46.76
1	\$85.07	\$87.62	\$68.10	\$70.15	\$72.25	\$74.42
1 1/2	\$164.77	\$169.71	\$131.39	\$135.33	\$139.39	\$143.57
2	\$260.41	\$268.22	\$207.34	\$213.56	\$219.96	\$226.56
3	\$563.28	\$580.18	\$447.83	\$461.26	\$475.10	\$489.35
4	\$1,009.60	\$1,039.89	\$802.24	\$826.30	\$851.09	\$876.63

The same methodology is used to determine the monthly fireline charges for the Study period, as shown in Table 5-4.

**Table 5-4: Monthly Fireline Charges**

	Current	FY 2022 Proposed	FY 2023 Proposed	FY 2024 Proposed	FY 2025 Proposed	FY 2026 Proposed
<b>Rev Adj.</b>		3%	3%	3%	3%	3%
<b>Residential Fire Line</b>						
3/4	\$6.57	\$6.77	\$6.31	\$6.50	\$6.69	\$6.89
1	\$9.91	\$10.21	\$9.52	\$9.80	\$10.10	\$10.40
<b>Private Line</b>						
1	\$6.44	\$6.63	\$5.94	\$6.12	\$6.30	\$6.49
2	\$12.04	\$12.40	\$11.77	\$12.12	\$12.48	\$12.86
3	\$24.76	\$25.50	\$25.00	\$25.75	\$26.53	\$27.32
4	\$46.69	\$48.09	\$47.84	\$49.27	\$50.75	\$52.27
6	\$125.40	\$129.16	\$129.78	\$133.67	\$137.68	\$141.81
8	\$261.15	\$268.98	\$271.12	\$279.25	\$287.63	\$296.26

<sup>19</sup> The revenue adjustment shown represents a 3% adjustment in overall revenue from the current overall revenue. Starting in FY 23, cost of service rates apply, after which an overall revenue adjustment applies for the rest of the projection period.

## 5.3. Volumetric Rate Derivation

PHWA, the District’s sole source of water, receives water from two sources – United (UWCD) and Calleguas (CMWD). The District meets most of its water needs from UWCD with about 20% coming from CMWD. The groundwater from UWCD is significantly less expensive than the imported State water from CMWD. To determine the total cost of water produced, the price and quantity for each source is added together. The total cost of water is presented in Table 5-5.

**Table 5-5: Cost of Water Produced – FY 2023**

	Source (A)	AF Purchased (B)	HCF Purchased (C)	Cost per AF (D)	Cost per hcf <sup>20</sup> (E)	Total Cost of Water Produced
		Table 3-7: Projected Water Supply Costs	$A \times 435.6^{21}$	Table 3-7	$D \div 435.6$	$B \times D$
1	UWCD BWRDF	373	162,479	\$693	\$1.59	\$258,511
2	CMWD	56	24,466	\$1,867	\$4.29	\$104,876
3		429	186,945			\$363,387

Next, the total cost of water is divided by the total water sold by the District to develop the average supply cost per hcf, as shown in Table 5-6 below.

**Table 5-6: Average Cost of Supply**

		Cost	Notes
1	Total Cost of Water Produced	\$363,387	Table 5-5
2	Total Water Sold	179,468	Table 3-5
3	Average Supply Cost of Water	\$2.02	

While the cost of water supply for both Harbor and Non-Harbor customers is the same, there are differences in the base costs established in the cost of service analysis from Table 4-17. The bases costs include both supply and delivery costs. Therefore, subtracting the average supply costs from the base costs for each customer class produces the delivery costs for each, shown in Table 5-7.

**Table 5-7: Determination of Delivery Costs**

		Non-Harbor	Harbor	Notes
1	Base Rate - COS	\$5.06	\$5.26	Table 4-17
2	Average Supply Cost	\$2.02	\$2.02	Table 5-6
3	Delivery Costs	\$3.04	\$3.24	

The percentage of each customer class’ water use with respect to overall use is used to allocate the District’s lowest cost water to each class. For example, SFR customers account for 49.1% of the District’s overall use and therefore are entitled to 49.1%, or 88,124 hcf, of UWCD water – which is the more economical source of water. The District must purchase CMWD water to meet the remainder of SFR customers’ needs. The same calculation is repeated for all other customer classes as shown in Table 5-8.

<sup>20</sup> The supply cost per hcf has been inflated by 4% to account for system water loss.

<sup>21</sup> 435.6 is the conversion factor between acre feet and hundred cubic feet.

**Table 5-8: Source of Water Supply by Customer Class**

	Source	Total Water Sold	SFR	MFR	Commercial Non-Harbor	Harbor Irrigation	Commercial Harbor	Notes
1	<b>Total Use (hcf)</b>	179,469	88,124	10,714	3,677	10,314	66,640	Table 3-5
2	<b>Percent Use</b>	100%	49.1%	6.0%	2.0%	5.7%	37.1%	Table 3-5
3								
4	<b>UWCD</b>	155,980	76,590	9,312	3,196	8,964	57,918	Line 1 × Line 2
5	<b>CMWD</b>	23,487	11,533	1,402	481	1,350	8,721	Line 1 – Line 4
6	<b>Total</b>	179,467	88,123	10,714	3,677	10,314	66,639	

Once the quantities from each water source are allocated to each customer class, the unit cost for tiered customers needs to be determined. Since both SFR and MFR customers utilize a tiered rate structure, the quantities (hcf) for each customer class are added together to develop a common unit supply rate. The summation of the quantities by source are shown in Table 5-9 below.

**Table 5-9: Summation of SFR and MFR Usage by Tier and Source**

	Source/Tier	SFR	MFR	Residential Total	Source/Tier
1	Tier 1	66,445	5,804	72,249	Table 3-5
2	Tier 2	19,261	3,569	22,830	Table 3-5
3	Tier 3	2,418	1,341	3,759	Table 3-5
4	<b>Total</b>	88,124	10,714	98,838	Lines 1+2+3
5					
6	UWCD	76,590	9,312	85,902	Table 5-8
7	CMWD	11,534	1,402	12,936	Table 5-8
8	<b>Total</b>	88,124	10,714	98,838	Line 6 + Line 7

To ultimately determine the unit supply rate for each tier, the cost of supply for each tier is divided by projected usage in that tier. The lowest cost water, UWCD water, is assigned to Tier 1, to promote affordability for low water users. Any residual UWCD water can be used for Tier 2, once all the needs for Tier 1 are met. As shown in Table 5-10 below, Residential Customers (SFR combined with MFR) are entitled to 85,902 hcf of UWCD water. The collective Tier 1 demand is only 72,249 – therefore the remaining 13,562 hcf of UWCD water can be used for Tier 2. The remaining Tier 2 demand and the entirety of the Tier 3 demand is fulfilled by the more expensive CMWD water. Note that Tier 1 is comprised entirely of UWCD water, therefore, the supply rate is equal to the supply cost of UWCD water; similarly, Tier 3 is comprised entirely of CMWD water and the supply rate is equal to the supply cost of CMWD water. Tier 2 is a blend of both water sources.

**Table 5-10: Determination of Residential Tiered Water Supply Costs**

	Source	Res. Use by Tier (A)	UWCD (hcf) (B)	CMWD (hcf) (C)	UWCD Costs (D)	CMWD Costs (E)	Total Costs (F)	Tier Supply Rate (G)
1	Availability		85,902	12,936				
2	Cost per hcf		\$1.66	\$4.47				
3								
4	<b>Tier</b>	Table 5-9			UWCD Rate × A	CMWD Rate × B	D + E	F ÷ A
5	Tier 1	72,249	72,249	-	\$119,741	\$0	\$119,741	<b>\$1.66</b>
6	Tier 2	22,830	13,653	9,177	\$22,628	\$40,977	\$63,605	<b>\$2.79</b>
7	Tier 3	3,759	-	3,759	\$0	\$16,785	\$16,785	<b>\$4.47</b>
8	<b>Total</b>	<b>98,838</b>	<b>85,902</b>	<b>12,936</b>	<b>\$142,369</b>	<b>\$57,762</b>	<b>\$200,131</b>	

Finally, the components of the variable rate are added together to produce the proposed rates for each customer class and tier. Table 5-11 shows the addition of the supply and delivery costs for each tier and customer class. Note that Commercial Harbor and Harbor Irrigation customers have higher delivery costs, as established in Table 5-7.

**Table 5-11: Derivation of Variable Water Rate**

		Supply Unit Cost	Delivery Unit Cost	Proposed Rates
1	<b>Single Family</b>			<i>Supply + Delivery</i>
2	Tier 1	\$1.66	\$3.04	\$4.70
3	Tier 2	\$2.79	\$3.04	\$5.83
4	Tier 3	\$4.47	\$3.04	\$7.50
5				
6	<b>Multi-Family</b>			
7	Tier 1	\$1.66	\$3.04	\$4.70
8	Tier 2	\$2.79	\$3.04	\$5.83
9	Tier 3	\$4.47	\$3.04	\$7.50
10				
11	Commercial	\$2.02	\$3.04	\$5.06
12	Commercial Harbor	\$2.02	\$3.24	\$5.26
13	Harbor Irrigation	\$2.02	\$3.24	\$5.26

## 5.4. Proposed Volumetric Charges for Study Period

The proposed volumetric charges developed for each tier in Table 5-11 are shown in the FY 2023 column in Table 5-12 below. Much like the monthly fixed charges, the volumetric charges are increased each year of the Study period per the proposed revenue adjustments found in Table 3-10. For FY 2023, the cost of service rates are effective based on the analysis discussed above,

**Table 5-12: Proposed Variable Charges for FY 2022 to FY 2026**

	Current	FY 2022 Proposed <sup>22</sup>	FY 2023 Proposed	FY 2024 Proposed	FY 2025 Proposed	FY 2026 Proposed
<b>Rev Adj.</b>		3%	COS	3%	3%	3%
<b>Single Family</b>						
Tier 1	\$4.02	\$4.14	\$4.70	\$4.84	\$4.99	\$5.14
Tier 2	\$4.66	\$4.80	\$5.83	\$6.00	\$6.19	\$6.37
Tier 3	\$6.47	\$6.66	\$7.50	\$7.73	\$7.96	\$8.20
<b>Multi-family</b>						
Tier 1	\$4.02	\$4.14	\$4.70	\$4.84	\$4.99	\$5.14
Tier 2	\$4.66	\$4.80	\$5.83	\$6.00	\$6.19	\$6.37
Tier 3	\$6.47	\$6.66	\$7.50	\$7.73	\$7.96	\$8.20
Commercial	\$4.52	\$4.66	\$5.06	\$5.21	\$5.37	\$5.53
Commercial Harbor	\$5.28	\$5.44	\$5.26	\$5.42	\$5.58	\$5.75
Harbor Irrigation	\$5.28	\$5.44	\$5.26	\$5.42	\$5.58	\$5.75

## 5.5. Harbor Proportionality Clause

As discussed in the Harbor Agreement, the revenue collected from Harbor customers cannot contractually exceed their proportional share of water sales. Based on the proposed rates and the projected usage, Harbor water use would account for 40% of all District water use and revenue would contribute less than 35% of all revenues. Therefore, the proposed rates are compliant with the District’s proportionality clause with the Harbor.

**Table 5-13: Harbor Proportionality**

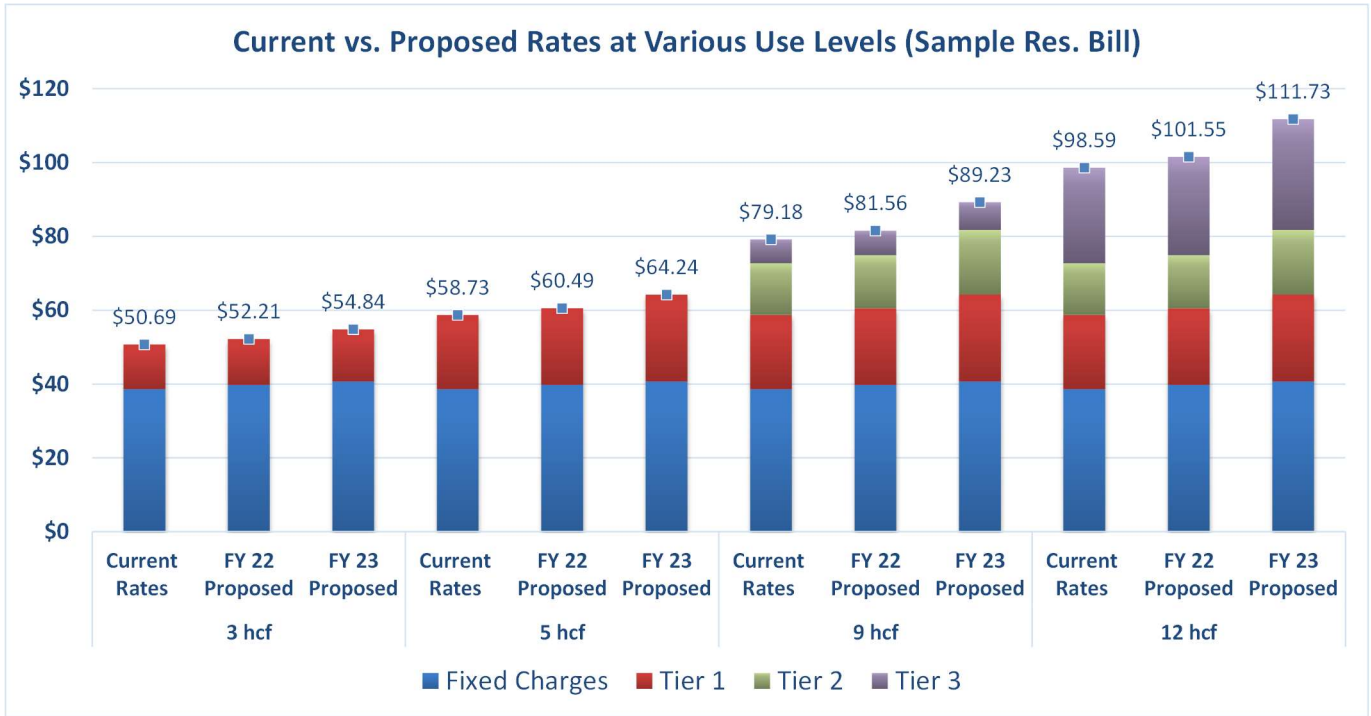
	Harbor
<b>1</b> Total Harbor Use	76,954
<b>2</b> Total District Use	179,469
<b>3 Harbor % of Total Use</b>	<b>42.88%</b>
<b>4</b>	
<b>5</b> Harbor Fixed Revenue	\$399,678
<b>6</b> Harbor Commodity Revenue	\$404,775
<b>7</b> Total Harbor Revenue	\$804,453
<b>8</b> Total District Revenue	\$2,261,848
<b>9 Harbor % of Total Revenue</b>	<b>35.57%</b>

## 5.6. Single Family Residential Bill Impacts

Figure 5-1 compares the bill totals for a non-Harbor residential customer with a ¾” meter at various levels of usage for the current rates and the proposed rates. The average monthly usage for a SFR customer is 5 hcf per month.

<sup>22</sup> The revenue adjustment shown represents a 3% adjustment in overall revenue from the current overall revenue. Starting in FY 23, cost of service rates apply, after which an overall revenue adjustment applies for the rest of the projection period.

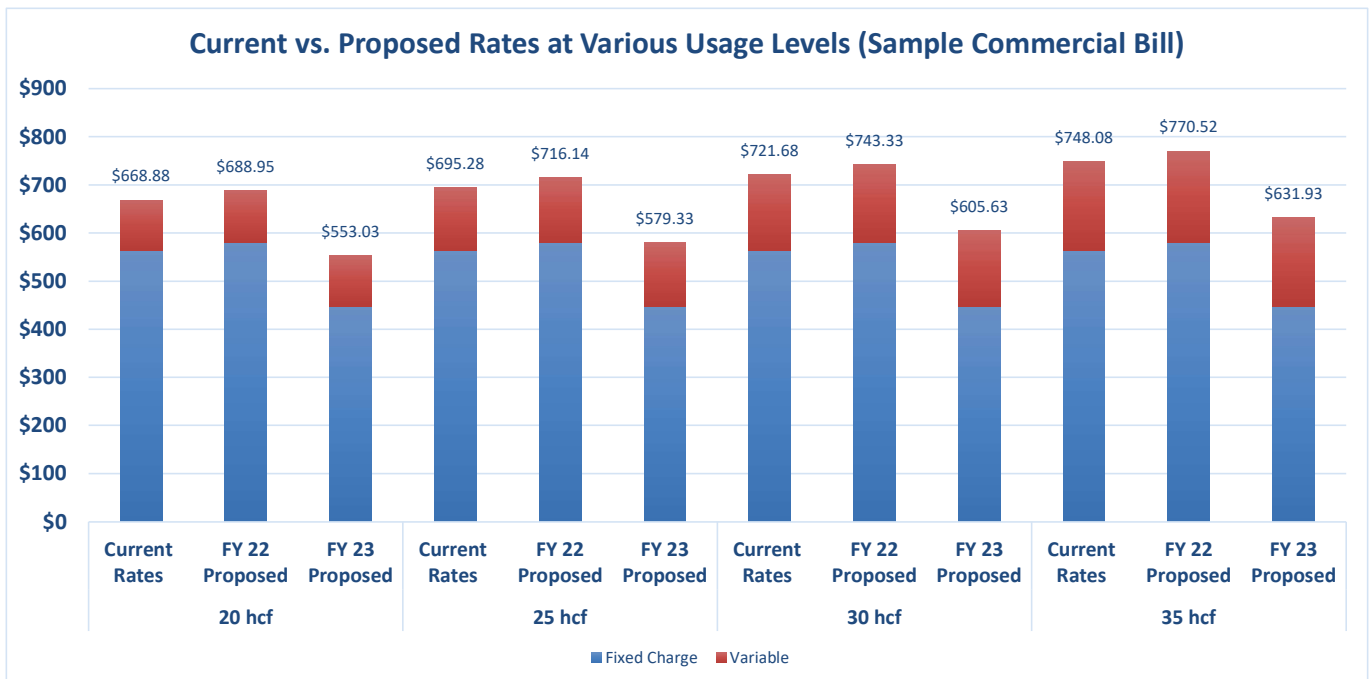
**Figure 5-1: Non-Harbor Residential Customer with a 3/4" Meter Bill Comparison**



## 5.7. Harbor Commercial Bill Impacts

Figure 5-2 shows the monthly bill totals for Harbor Commercial customers of various meter sizes. The quantity (hcf) presented in the figure is the average use for Harbor Customers of that meter size, based on FY 2020 consumption data.

**Figure 5-2: Harbor Commercial Bill Totals for Average Use of Various Meter Sizes**



# 6. Sewer Financial Plan

Much like the Water Enterprise, calculating the Sewer Enterprise’s revenue requirements is the first step in the rate study process. Raftelis analyzed annual operating revenues under the status quo, O&M expenses, transfers between funds, and reserve requirements. This section of the report discusses projected revenues, O&M expenses, other reserve funding and revenue adjustments estimated as required to ensure the fiscal sustainability and solvency of the Sewer Enterprise. Numbers shown in all tables of this section are rounded; therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown.

## 6.1. Current Sewer Rate Revenue

Table 6-1 shows the current sewer rates effective July 2020. All residential users (SFR and MFR) are billed a base charge of \$27.99 per month, and volumetric rate of \$6.60 for sewer service. Commercial customers are charged similarly, with the base charge and volumetric rate varying by customer class and strength.

The sewer service charges for each customer class are summarized in Table 6-1.

**Table 6-1: Current Sewer Service Charges**

Customer Class	Monthly Rate
<b>Sewer Base Charges</b>	
Single-Family Residential	\$27.99
Multi-Family Residential	\$22.38
Sewer Service Only	\$22.38
School	\$165.37
Commercial I	\$26.34
Commercial II	\$66.39
<b>Sewer Volumetric Rate</b>	
Single-Family Residential	\$6.60
Multi-Family Residential	\$6.60
Sewer Service Only	\$6.60
School	\$6.30
Commercial I	\$6.38
Commercial II	\$7.92

Referring to Figure 1-1 on page 10, the District’s sewer service area does not contain the Harbor<sup>23</sup> (portion shaded in blue). However, the sewer service area includes over 300 additional homes that are not part of the District’s water service area – referred to as “Sewer Service Only” on Line 3 of Table 6-2. Table 6-2 summarizes the projected number of accounts and EDU, as well as volume by customer class for the Study period. The existing number of accounts/EDUs for FY 2020 provided by the District were inflated by the account growth rate found in Table 2-2 to determine the number of EDUs for future years. The volume is determined based on return to sewer factor and has been accounted for in the numbers shown below.

<sup>23</sup> The District conveys sewage for Harbor customers to the City of Oxnard’s collection system and receives sewer rate revenue from the City of Oxnard in return. However, the District does not directly bill these customers and they are considered sewer service customers of the City of Oxnard.

**Table 6-2: Sewer Service Accounts and Volume**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
	<b>EDU Count</b>					
1	Single-Family Residential	1,616	1,616	1,616	1,616	1,616
2	Multi-Family Residential	264	264	264	264	264
3	Sewer Service Only	344	345	347	348	349
4	School	1	1	1	1	1
5	Commercial I	23	23	23	23	23
6	Commercial II	8	8	8	8	8
7	<b>TOTAL</b>	<b>2,256</b>	<b>2,258</b>	<b>2,259</b>	<b>2,260</b>	<b>2,261</b>
	<b>Volume</b>					
8	Single-Family Residential	81,803	81,803	81,803	81,803	81,803
9	Multi-Family Residential	10,070	10,070	10,070	10,070	10,070
10	Sewer Service Only	13,625	13,625	13,625	13,625	13,625
11	School	107	107	107	107	107
12	Commercial I	1,263	1,263	1,263	1,263	1,263
13	Commercial II	639	639	639	639	639
14	<b>TOTAL</b>	<b>107,506</b>	<b>107,506</b>	<b>107,506</b>	<b>107,506</b>	<b>107,506</b>

Revenues from the current sewer rates can be determined by multiplying the base charge by the EDUs plus the volumetric rate times the volume for the given year. For example, the FY 2022 sewer service revenues for SFR customers under current rates are calculated as follows:

$$\begin{aligned}
 & \text{SFR Base Charge} \times \text{Number of projected SFR ERUs for 2022} \times 12 \text{ months} \\
 & + \text{SFR Volumetric Rate} \times \text{Volume (after return to sewer factor)} \\
 & \$27.99 \times 1,616 \times 12 + \$6.60 \times 81,803 = \$1,082,682
 \end{aligned}$$

In addition to user charge revenue, the Sewer Enterprise also receives revenue from the City of Oxnard to convey sewage to the City’s collection system. The District receives 90% of the sewer rate revenue generated by the Harbor customers. Therefore, any increase in the City of Oxnard’s sewer service charges results in an increase to the reimbursement to the District. The contract with the City of Oxnard will remain in place until the end of FY 2022. The contract will then be renegotiated. To conservatively project these payments, we assumed Oxnard will pay their share of O&M expenses as shown in Table 6-4. The District and Oxnard will discuss and negotiate capital related charges in the future. In addition to the City of Oxnard, the District will start collecting revenues from Ventura County for flows disposed. The FY 2021 revenue from the reimbursement is estimated in Table 6-3 below and is projected based on calculations that will be described in the section below.

**Table 6-3: Projected Reimbursement from City of Oxnard and Ventura County**

	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Reimbursement from Oxnard &amp; Ventura County</b>	\$921,827	\$921,827	\$79,709	\$81,300	\$82,799	\$84,519

Culling together the user charge revenues, and reimbursement revenues from the City of Oxnard and Ventura County yields the total revenues from current sewer rates as shown in Table 6-4 below.



**Table 6-4: Sewer Service Revenues from Current Rates**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>User Charge Revenue</b>					
2	Single-Family Residential	\$1,082,789	\$1,082,789	\$1,082,789	\$1,082,789	\$1,082,789
3	Multi-Family Residential	\$137,327	\$137,327	\$137,327	\$137,327	\$137,327
4	Sewer Service Only	\$182,379	\$182,684	\$182,990	\$183,297	\$183,605
5	School	\$9,044	\$9,044	\$9,044	\$9,044	\$9,044
6	Commercial I	\$15,327	\$15,327	\$15,327	\$15,327	\$15,327
7	Commercial II	\$11,434	\$11,434	\$11,434	\$11,434	\$11,434
8	<b>User Charge Revenue Subtotal</b>	<b>\$1,438,299</b>	<b>\$1,438,604</b>	<b>\$1,438,910</b>	<b>\$1,439,218</b>	<b>\$1,439,526</b>
9						
10	Oxnard Reimbursement Revenue	\$921,827	\$921,827	\$79,709	\$81,300	\$82,799
11	<b>Total Revenue from Current Rates</b>	<b>\$2,360,126</b>	<b>\$1,518,313</b>	<b>\$1,520,211</b>	<b>\$1,522,017</b>	<b>\$1,524,045</b>

## 6.2. City of Oxnard and Ventura County Revenue Calculations

The District collects revenue from the City of Oxnard for the use of District infrastructure to transmit Oxnard customer sewage to the Oxnard treatment plant. Ventura County also uses the District’s infrastructure to send stormwater flow to Oxnard’s wastewater treatment plant. This section calculates the charge to Oxnard and Ventura County for the use of District infrastructure.

Raftelis calculated charges using the utility basis and cash basis. In either of the two methodologies, the O&M expenses are the same. The difference between the utility and cash basis is the recovery of capital costs. In the utility basis, capital costs are recovered via a return of capital and depreciation. In the cash basis, Oxnard capital costs are allocated based on capacity. For example, Oxnard uses 53% of a forcemain, therefore Oxnard would be responsible for 53% of all capital costs on that forcemain.

The District is currently in discussions with Oxnard, and it is our understanding that at the time of this report, Oxnard has not put forward a preference for either the utility basis or the cash basis. As such, the project team conservatively assumed Oxnard would only pay for O&M expenses while the parties negotiate capital costs. Table 6-5 shows the assumed payments from the City of Oxnard and Ventura County.

**Table 6-5: City of Oxnard and Ventura County Calculations**

Line No.		FY 2023	FY 2024	FY 2025	FY 2026
1	Oxnard	\$50,936	\$52,464	\$54,038	\$55,659
2	Ventura County	\$28,773	\$28,836	\$28,762	\$28,860
3	<b>Total City Of Oxnard &amp; Ventura County Charge</b>	<b>\$79,709</b>	<b>\$81,300</b>	<b>\$82,799</b>	<b>\$84,519</b>

### 6.3. Sewer Enterprise O&M Expenses

Using the District’s FY 2021 budget, inflation factors (Table 2-1 on page 16) were applied to each line item to determine future O&M costs. Table 6-6 summarizes budgeted and projected O&M expenses during the Study period. The Sewer System expense (Line 1) includes wastewater treatment costs of \$980K for FY 2022 paid to the City of Oxnard. The City of Oxnard is in the process of a cost of service study that will provide an updated calculation for this cost. The table below reflects the treatment cost estimates provided to the District by the City for the projection period.

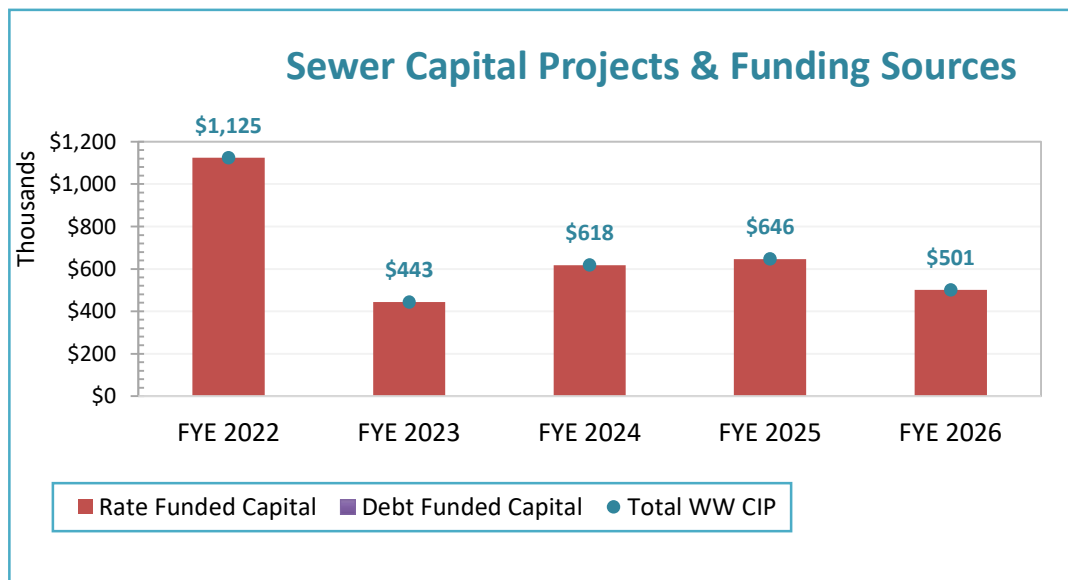
**Table 6-6: Projected Sewer Enterprise O&M Expenses**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Sewer System Expense	\$1,134,620	\$510,285	\$528,191	\$546,770	\$566,048
2	Maintenance Expenses	\$19,105	\$19,487	\$19,876	\$20,274	\$20,679
3	Salaries and Benefits	\$410,063	\$420,720	\$431,664	\$442,903	\$454,444
4	Administrative Expenses	\$189,172	\$192,955	\$196,814	\$200,751	\$204,766
5	<b>TOTAL O&amp;M EXPENSES</b>	<b>1,752,960</b>	<b>\$1,143,447</b>	<b>1,176,546</b>	<b>1,210,697</b>	<b>1,245,937</b>

### 6.4. Projected Capital Improvement Program Costs

The District’s capital improvement program through the end of the Study period in FY 2026 is shown in Figure 6-1. The proposed capital improvement plan will be funded entirely through rate revenue (Pay As You Go or PAYGO) and reserves. The Sewer Enterprise currently has outstanding debt in the form of two issues: Series 2016 Refunding Bonds, and the share of the loan for the smart meter replacement. There is no proposed debt during the Study period.

**Figure 6-1: Programmed 5-Year Sewer Capital Expenditures**



### 6.5. Status Quo Sewer Enterprise Financial Plan

Table 6-7 displays the pro forma under current rates over the Study period. All projections shown in the table are based upon the District’s current rate structure and do not include rate adjustments. The pro forma incorporates revenues from current rates (Table 6-4), O&M expenses (Table 6-6), and capital expenditures (Figure 6-1).

Under the “status quo” scenario, the District is unable to meet reserve targets starting in FY 2025, as set in the reserve targets discussed in Section 2.3 (projected ending balances are less than target balances as shown in the coral shaded cells below).

**Table 6-7: Sewer Enterprise Status Quo Financial Plan Pro-Forma**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>REVENUES</b>					
2	Revenues from Rates	\$1,438,299	\$1,438,604	\$1,438,910	\$1,439,218	\$1,439,526
3	Revenue Adjustments	\$0	\$0	\$0	\$0	\$0
4	Reimbursement from City of Oxnard & Ventura County	\$921,827	\$79,709	\$79,377	\$78,895	\$78,575
5	Allocation of Community Service	\$26,136	\$26,528	\$26,926	\$27,330	\$27,740
6	Interest Revenue	\$33,670	\$26,846	\$24,440	\$19,931	\$14,742
7	Capacity Fee Revenue					
8	<b>TOTAL REVENUES</b>	<b>\$2,419,932</b>	<b>\$1,571,687</b>	<b>\$1,569,653</b>	<b>\$1,565,374</b>	<b>\$1,560,582</b>
9						
10	<b>O&amp;M EXPENSES</b>					
11	Sewer System Expenses	\$1,134,620	\$510,285	\$528,191	\$546,770	\$566,048
12	Maintenance Expenses	\$19,105	\$19,487	\$19,876	\$20,274	\$20,679
13	Salaries and Benefits	\$410,063	\$420,720	\$431,664	\$442,903	\$454,444
14	Administrative Expenses	\$189,172	\$192,955	\$196,814	\$200,751	\$204,766
15	<b>TOTAL O&amp;M EXPENSES</b>	<b>1,752,960</b>	<b>\$1,143,447</b>	<b>1,176,546</b>	<b>1,210,697</b>	<b>1,245,937</b>
16						
17	<b>NET REVENUES</b>	<b>\$666,972</b>	<b>\$428,240</b>	<b>\$393,107</b>	<b>\$354,677</b>	<b>\$314,645</b>
18						
19	<b>Debt Service</b>	<b>\$224,785</b>	<b>\$225,835</b>	<b>\$226,135</b>	<b>\$227,235</b>	<b>\$227,135</b>
20						
21	<b>Capital Expenditures</b>	<b>\$1,124,550</b>	<b>\$443,031</b>	<b>\$617,851</b>	<b>\$646,369</b>	<b>\$501,248</b>
22						
23	<b>NET CASH BALANCES</b>	<b>(\$682,362)</b>	<b>(\$240,625)</b>	<b>(\$450,878)</b>	<b>(\$518,927)</b>	<b>(\$413,738)</b>
24						
25	<b>BEGINNING BALANCES</b>	<b>\$3,366,977</b>	<b>\$2,684,614</b>	<b>\$2,443,989</b>	<b>\$1,993,111</b>	<b>\$1,474,184</b>
26	<b>ENDING BALANCES</b>	<b>\$2,684,614</b>	<b>\$2,443,989</b>	<b>\$1,993,111</b>	<b>\$1,474,184</b>	<b>\$1,060,446</b>
27	<b>TARGET BALANCES</b>	<b>\$1,864,867</b>	<b>\$1,654,743</b>	<b>\$1,693,440</b>	<b>\$1,733,094</b>	<b>\$1,773,915</b>

To ensure that the sewer enterprise will have adequate revenues to fund operating expenses and capital expenditures, Raftelis recommends the revenue adjustments shown in Table 6-8. The revenue adjustments are scheduled to be implemented in August or September for the next fiscal year (FY 2022), and then in July of each year, beginning in July 2022 for FY 2023.

**Table 6-8: Proposed Sewer Enterprise Revenue Adjustments**

<b>Effective Date</b>	<b>Proposed Water Revenue Adjustments</b>
September 2021	3 percent
July 2022	3 percent
July 2023	3 percent
July 2024	3 percent
July 2025	3 percent

## **6.6. Proposed Financial Plan**

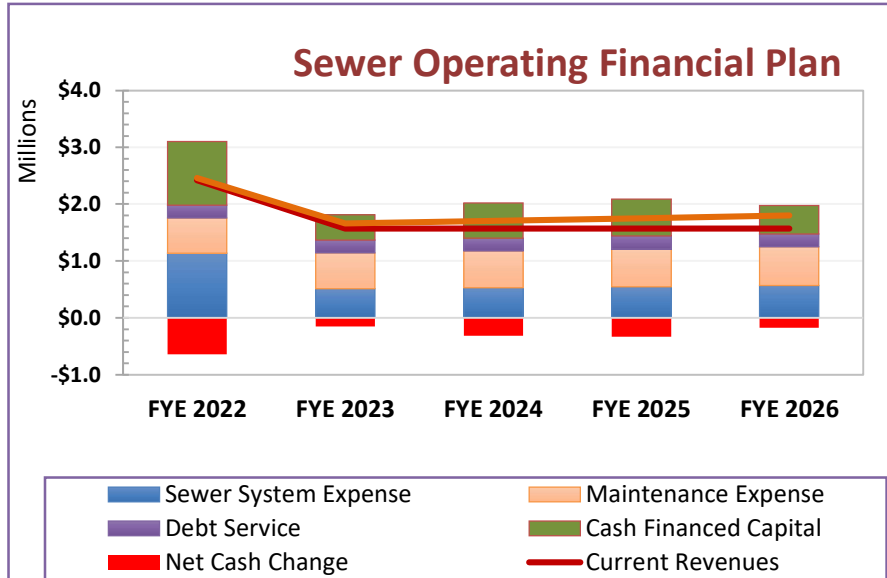
A pro forma of the proposed financial plan is shown in Table 6-9 below. The proposed financial plan successfully meets the District’s financial needs, exceeding target reserve balances throughout the entirety of the Study period. The Sewer Enterprise experiences significant capital costs throughout the Study period, yet the proposed revenues are sufficient to meet these needs. Note that the District uses reserves to lower the bill impact on District customers.

**Table 6-9: Sewer Enterprise Proposed Financial Plan Pro-Forma**

Line No.		FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	<b>REVENUES</b>					
2	Revenues from Rates	\$1,438,299	\$1,438,604	\$1,438,910	\$1,439,218	\$1,439,526
3	Revenue Adjustments	\$39,553	\$87,611	\$133,426	\$180,634	\$229,279
4	Reimbursement from City of Oxnard	\$921,827	\$79,709	\$79,377	\$78,895	\$78,575
5	Allocation of Community Service	\$26,136	\$26,528	\$26,926	\$27,330	\$27,740
6	Interest Revenue	\$33,670	\$27,242	\$25,715	\$22,573	\$19,255
7	Capacity Fee Revenue					
8	<b>TOTAL REVENUES</b>	<b>\$2,459,485</b>	<b>\$1,659,694</b>	<b>\$1,706,278</b>	<b>\$1,752,554</b>	<b>\$1,800,320</b>
9						
10	<b>O&amp;M EXPENSES</b>					
11	Sewer System Expenses	\$1,134,620	\$510,285	\$528,191	\$546,770	\$566,048
12	Maintenance Expenses	\$19,105	\$19,487	\$19,876	\$20,274	\$20,679
13	Salaries and Benefits	\$410,063	\$420,720	\$431,664	\$442,903	\$454,444
14	Administrative Expenses	\$189,172	\$192,955	\$196,814	\$200,751	\$204,766
15	<b>TOTAL O&amp;M EXPENSES</b>	<b>1,752,960</b>	<b>\$1,143,447</b>	<b>1,176,546</b>	<b>1,210,697</b>	<b>1,245,937</b>
16						
17	<b>NET REVENUES</b>	\$706,525	\$516,247	\$529,732	\$541,857	\$554,382
18						
19	<b>Debt Service</b>	\$224,785	\$225,835	\$226,135	\$227,235	\$227,135
20						
21	<b>Capital Expenditures</b>	\$1,124,550	\$443,031	\$617,851	\$646,369	\$501,248
22						
23	<b>NET CASH BALANCES</b>	(\$642,809)	(\$152,619)	(\$314,254)	(\$331,747)	(\$174,001)
24						
25	<b>BEGINNING BALANCES</b>	\$3,366,977	\$2,724,167	\$2,571,549	\$2,257,295	\$1,925,549
26	<b>ENDING BALANCES</b>	\$2,724,167	\$2,571,549	\$2,257,295	\$1,925,549	\$1,751,548
27	<b>TARGET BALANCES</b>	\$1,868,823	\$1,663,544	\$1,707,102	\$1,751,812	\$1,797,889

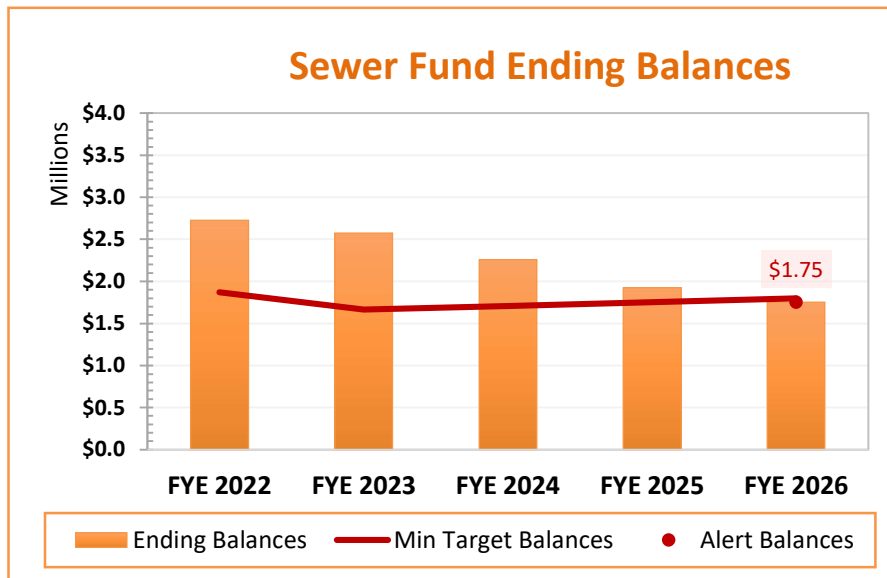
The proposed revenue allows the District to fund the necessary capital expenditures planned for the Study period. As shown in Figure 6-2, the proposed revenue (shown by the orange line) meets all operating obligations (shown by stacked bars) and contributes to reserves each year of the Study period except FY 2026 for future capital replacement projects and to meet reserve requirements as discussed in Table 2-4.

Figure 6-2: Proposed Sewer Operating Financial Plan



The ending fund balance is projected and shown in Figure 6-3, where the red line indicates the target reserve balance as recommended by the reserve goals discussed in Section 2.3. Under the proposed financial plan, the ending fund balance is above the target reserve level for every year of the Study period except FY 2026.

Figure 6-3: Sewer Enterprise Ending Fund Balance



# 7. Sewer Enterprise Cost of Service

## 7.1. Sewer Cost of Service Analysis

This section of the Report discusses the allocation of O&M expenses and capital costs to the appropriate parameters consistent with industry standards, the determination of unit costs, and calculation of costs by customer class for the Sewer Enterprise. Numbers shown in all tables of this section are rounded; therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown.

The total cost of sewer service is analyzed by system function in order to equitably distribute costs of service to the various classes of customers. For this analysis, sewer utility costs of service are developed consistent with the guidelines for allocating costs detailed in the Water Environment Federation (WEF) Manual of Practice No. 27, Financing and Charges for Wastewater Systems, 2004.

The sewer system COS analysis consists of seven major steps, as outlined below:

1. Determine non-residential customer flow and strength loadings based on estimated flows.
2. Conduct a plant balance to estimate the flow and strength of each customer class taking into consideration infiltration and inflow (I&I).
3. Use functionalized O&M budget and CIP to determine O&M and Capital allocations.
4. Allocate O&M expenses to cost causation components such as Flow, Biochemical Oxygen Demand (BOD), Total Suspended Solids (TSS), and Billing and Customer Service.
5. Develop units of service by cost component.
6. Calculate the cost component rates by dividing the total cost in each cost component in Step 4 by the units of service Step 5.
7. Calculate the cost by customer class by multiplying the unit costs in Step 6 by the customer class characteristics in Step 5.

## 7.2. Current Sewer Customer Classes

The District currently has two classes of sewer service – residential (SFR and MFR) and commercial. All sewer customers are billed based on a base charge and volumetric rate component, similar to water customers.

Commercial customers are classified into one three strength levels show in Table 7-1 below, with schools being a separate class. The District currently has one school in their service area.

**Table 7-1: Commercial Sewer Classes of Service and Strength Concentrations**

Strength Class	Description	BOD	TSS
Public Schools	Light users – applies specifically to schools campuses	130	100
Commercial I	Light users: Schools and Offices, etc.	150	150
Commercial II	Medium users: gas stations, shopping centers, etc.	664	432
Commercial III	Heavy users: restaurants, markets and mortuaries, etc.	1,000	600

### 7.3. Mass Balance Analysis

The plant balance analysis is used to estimate and validate the sewage loadings (flow and strength) generated by each customer class. Raftelis relied on the flow and strength loadings found in the District's agreement with the City of Oxnard. Non-residential customer flows can be estimated based on their water usage; non-residential customer strengths can be estimated based on the Los Angeles County Sanitation District sewage generation factors and is summarized in Table 7-1. The remaining loadings, net of the total less infiltration and inflow of 13.9%<sup>24</sup> (I&I), and non-residential and industrial, are assigned to residential customers. Based on this mass balance, the estimated residential flow for a single family residential customer is determined to be 133 gallons per day or 55 gallons per capita per day, which is an industry standard estimate of the amount of indoor water usage per person. The estimated residential strength concentration is 248 and 244 milligrams per liter (mg/l) of BOD and TSS, respectively, which is also an industry standard estimate of residential strength.

The estimated loadings by customer class are shown in Table 7-2 including the assumed BOD and TSS loadings. The numbers shown in Table 7-2 below are derived as follows:

- Sewer Use is projected from actual bill data from FY 2020. The sewer billing data shown in Table 7-2 coincides with the projections for FY 2023 shown in Table 3-5.
- Return-to-sewer Factor is the percentage of water use that enters the sewage collection system. The return-to-sewer factor is assumed to be 100% for all commercial customers (all water usage enters sewer system). The return to sewer factor for SFR and MFR customers is 93% and 94% respectively. Since there is no water usage data available for Sewer Service Only customers, they were assigned the same return-to-sewer factor as MFR customers since Sewer Service only customers are mobile homes and mobile homes tend to use water similarly to MFR customers. The billed flows shown below incorporate the return to sewer factor already, as they were provided by District staff.
- BOD (mg/L), or biochemical oxygen demand, is the amount of oxygen required to break down the organic material present in the wastewater. Higher strength wastewater require higher amounts of oxygen and therefore are more costly to treat due to aeration needs. This is reflected in Oxnard's wastewater charges to the District to treat sewage.
- TSS (mg/L), or total suspended solids, is the measure of the suspended solids in wastewater. Higher suspended solids are also more costly to treat. Like BOD, TSS is also a measure of wastewater strength. This is reflected in Oxnard's wastewater charges to the District to treat sewage.
- Estimated Flow (mgd) is the estimated sewage flow converted from hundred cubic feet (hcf) to million gallons per day (mgd).

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<sup>24</sup> Based on AECOM Infrastructure Report, 2012



**Table 7-2: Mass Balance**

	Description	Return to Sewer % A	Sewer Use (hcf) B	BOD (mg/L) C	TSS (mg/L) D	Est. Flow (MGD) E	BOD (lbs/year) F	TSS (lbs/year) G
1						$\approx C$	$F \times D$ $\times 8.34^{25}$ $\times 365$	$F \times E$ $\times 8.34$ $\times 365$
2	Total Plant Influent			229	220	0.258	179,620	172,727
3	Less I&I (13.9%)			50	50	0.036	5,457	5,457
4	Net Plant			258	247	0.222	174,163	167,270
5								
			(Table 3-5)					
6	<b>Commercial</b>							
7	Public Schools	100%	355	130	100	0.001	288	221
8	Commercial I	100%	947	150	150	0.002	887	887
9	Commercial II	100%	-	664	432	-	-	-
10	Commercial III	100%	1,568	1,000	600	0.003	9,782	5,864
11	<b>Total Commercial</b>		2,870			<b>0.006</b>	<b>10,956</b>	<b>6,972</b>
12								
13	<b>Residential</b>							
14	SFR	93%	81,803	248	244	0.168	126,550	124,295
15	MFR	94%	10,070	248	244	0.021	15,578	15,301
16	Sewer Service Only	94%	13,625	248	244	0.028	21,078	20,702
17	<b>Total Residential</b>		108,368	248	244	<b>0.216</b>	<b>163,207</b>	<b>160,298</b>

### 7.3.1. COST ALLOCATION TO COST COMPONENTS

The sewer utility is comprised of various facilities, each designed and operated to fulfill a given function. In order to provide adequate service to its customers at all times, the utility must be capable of collecting and conveying the total amount of wastewater generated. The separation of costs by function allows allocation of such costs to the functional cost components. As shown in Table 6-6, the District’s budget has already been functionalized.

Collection systems are allocated to flow parameters. Wastewater Treatment (the cost paid to City of Oxnard for treatment) costs are allocated to flow, BOD, and TSS since the costs to treatment the District’s sewage is dependent on these cost causation components as described in the second amendment to the contract with the City of Oxnard. Salaries expenses are mostly allocated to the flow/collection and partially to general and meter costs reflecting staff time to maintain the collection system. Other system expenses include fuel and fleet costs and are allocated to the flow component. The resulting allocations are shown in Table 7-3 below. The total allocation to each cost component is shown on the final line of the table.

<sup>25</sup> 8.34 pounds is the weight of a gallon of water. The daily weight is multiplied by 365 to obtain the annual load.

**Table 7-3: Allocating O&M Costs to Cost Causation Components**

Description	O&M	Flow / Collection	BOD	TSS	General	Meter Reading	Total
Wastewater Treatment	\$351,943	66%	14%	20%	0%		100%
Other Sewer System Expense	\$158,342	100%					100%
Maintenance Expense	\$19,487	100%					100%
Salaries & Benefits	\$420,720	98%	0%	0%	1%	1%	100%
Administrative Expenses	\$192,955	100%					100%
<b>Total</b>	<b>\$1,143,447</b>	<b>\$1,014,547</b>	<b>\$50,017</b>	<b>\$70,469</b>	<b>\$5,042</b>	<b>\$3,373</b>	
<b>O&amp;M Cost Allocation Factors</b>		<b>88.7%</b>	<b>4.4%</b>	<b>6.2%</b>	<b>0.4%</b>	<b>0.3%</b>	

The Sewer Enterprise’s capital costs for FY 2023 were assigned to each cost causation component based on the nature of each project. The District’s capital projects are limited to flow/collection functions only, with the exception of its plant improvement project. The resulting cost causation allocations are found on the final line of Table 7-4 below.

**Table 7-4: Capital Cost Allocation Factors**

Description	FY 2023	Flow / Collection	BOD	TSS	General	Total
I&I Reduction	\$78,100	100%				100%
Sewer Lift Station and PS Rehab	\$57,178	100%				100%
Pump Station B Replacement	\$81,818	100%				100%
Oxnard Wastewater Plant Improvement	\$265,921	66%	14%	20%		100%
CCTV Video Inspection Program	\$8,500	100%				100%
Yard and Building Improvements	\$77,500	100%				100%
Asset Management Program	\$5,430	100%				100%
Vehicle Replacement Program	\$22,329	100%				100%
Water & Sewer Rate Study	\$4,250	100%				100%
<b>Total</b>	<b>\$601,025</b>	<b>\$509,988</b>	<b>\$37,792</b>	<b>\$53,245</b>	<b>\$0</b>	
<b>Capital Cost Allocation Factors</b>		<b>84.9%</b>	<b>6.3%</b>	<b>8.9%</b>	<b>0.0%</b>	

### **7.3.2. DETERMINATION OF REVENUE REQUIREMENTS**

Based on the proposed financial plan, the cost of service analysis translates the revenue requirement into the cost to serve each class. The first step in the cost of service analysis is to determine how much revenue is required to be collected from rates. The methodology used is based upon the premise that the utility must generate annual revenues adequate to meet its estimated annual O&M expenses, reserve targets, debt service and capital investment.

To determine the revenue requirement, several adjustments are made to the appropriate cost elements to ensure the adequate collection of revenue. Revenues from non-rate revenue sources, such as the payment from the City of Oxnard (Line 9) and the Allocation of Community Service (Line 10), must be subtracted from the revenue

requirement. Next, the Enterprise’s annual cash balance is subtracted. The annual cash balance is the net operating revenues less debt service and cash funded capital. Finally, the revenue to be collected from rates to support operating and capital needs is shown in Line 18 of Table 7-5.

**Table 7-5: Sewer Enterprise Revenue Requirement for FY 2023**

Line No.		Operating	Capital	Total	Source
<b>1</b>	<b>Revenue Requirements</b>				
2	O&M Expenses	\$1,143,447		\$1,143,447	Table 6-6
3	Existing Debt Service		\$225,835	\$225,835	Table 6-9
4	Proposed Debt Service		\$0	\$0	
5	Capital Projects		\$443,031	\$443,031	
6	<b>Subtotal Revenue Requirements</b>	\$1,143,447	\$668,865	\$1,812,313	
7					
8	<b>Less: Revenue from Other Sources</b>				
9	Payment from City of Oxnard	\$79,709		\$79,709	Table 6-3
10	Allocation of Community Service	\$26,528		\$26,528	Table 6-9
11	Interest Revenue	\$27,242		\$27,242	Table 6-9
12	<b>Total Revenue from Other Sources</b>	\$133,479	\$0	\$133,479	
13					
14	<b>Less: Adjustments</b>				
15	Adjustments to Annual Cash Balance	\$152,619		\$152,619	Table 6-9
16	<b>Total Adjustments</b>	\$152,619	\$0	\$152,619	
17					
18	<b>Rate Revenue Requirement</b>	<b>\$857,350</b>	<b>\$668,865</b>	<b>\$1,526,215</b>	

### **7.3.3. ALLOCATING THE REVENUE REQUIREMENT TO COST CAUSATION COMPONENTS**

The resulting O&M Allocation from Table 7-3 and Capital Allocation from Table 7-4 is the basis for how the functionalized costs are allocated to the cost causation components (Flow, BOD, and TSS). The O&M and Capital allocations are repeated on Line 1 and Line 2 in Table 7-7. After assigning General costs to the other cost causation components (Line 9), the final allocation to cost components is shown in Line 10.

**Table 7-6: Revised Cost of Service**

Line No.	Source	Flow	BOD	TSS	General	Meter Reading	Total	
1	O&M Allocation	Table 7-3	88.7%	4.4%	6.2%	0.4%	0.3%	
2	Capital Allocation	Table 7-4	84.9%	6.3%	8.9%	0.0%	0.0%	
3								
4	Operating Costs	Line 1 × Total	\$760,702	\$37,503	\$52,837	\$3,780	\$2,529	\$857,350
5	Capital Costs	Line 2 × Total	\$612,695	\$28,380	\$27,790	\$0	\$0	\$668,865
6	Total Cost of Service		\$1,373,397	\$65,882	\$80,627	\$3,780	\$2,529	\$1,526,215
7	Allocation Excluding General		91.6%	4.2%	4.2%	0.0%	100%	
8								
9	Allocation of General Costs	Line 7 × General	\$3,410	\$164	\$200	-\$3,780	\$6	
10	Allocation of Revenue Requirement	Line 6 + Line 9	\$1,376,807	\$66,046	\$80,827	\$0	\$2,535	\$1,526,215

**7.3.4. UNIT COST DETERMINATION**

To allocate costs of service to different customer classes, a unit cost of service is developed for each cost component, which can be calculated as follows:

$$\text{Unit Cost of Service} = \frac{\text{Total cost by component}}{\text{Total annual service units}}$$

This calculation is repeated for all components, such as flow, BOD, and TSS. Table 7-7 shows the total unit costs for each cost causation component. The Revised Cost of Service is then divided by its respective Total Units (Line 3) to develop the Unit Cost for each cost causation component (Line 6).

**Table 7-7: Sewer Enterprise Determination of Unit Costs**

Line No.	Source	Flow	BOD	TSS	General	Meter Reading	Total	
1	Revised Cost of Service	Line 10	\$1,376,807	\$66,046	\$80,827	\$0	\$2,535	\$1,526,215
2								
3	Total Units	Table 7-2	108,368	174,163	167,270		36	
4	Unit		hcf/year	lbs/year	lbs/year		meters	
5								
6	Unit Cost	Line 10 ÷ Line 12	\$12.70	\$0.38	\$0.48		\$5.87	

### 7.3.5. DISTRIBUTING COSTS TO CUSTOMER CLASS

The unit cost of each of the cost component shown in Table 7-7 is then applied to the FY 2023 service units to derive the cost to serve each class shown in Table 7-8. The Sewer Enterprise’s fixed costs are 50% of O&M, therefore, the District plans to collect 50% of sewer revenues through a fixed charge and the remainder through a variable charge. Table 7-9 shows the total cost to serve each class and the total amounts to be collected from both fixed and variable charges. Note that there are no Commercial II customers.

**Table 7-8: Sewer COS Allocation to Customer Class**

Line No.	Source	Flow	BOD	TSS	Meter Reading	Total	Fixed	Variable	
1	Unit Cost of Service	Table 7-7	\$12.70	\$0.38	\$0.48	\$5.87	50%	50%	
2									
3	SFR	Table 7-2	81,803	126,550	124,295				
4		Line 1 × Line 3	\$1,039,297	\$47,990	\$60,061	\$1,147,348	\$573,674	\$573,674	
5									
6	MFR	Table 7-2	10,070	15,578	15,301				
7		Line 1 × Line 6	\$127,938	\$5,908	\$7,394	\$141,239	\$70,620	\$70,620	
8									
9	Sewer Only	Table 7-2	13,625	21,078	20,702	36			
10		Line 1 × Line 9	\$173,104	\$7,993	\$10,004	\$2,535	\$193,636	\$104,989	\$104,989
11									
12	Public Schools	Table 7-2	355	288	221				
13		Line 1 × Line 12	\$4,510	\$109	\$107	\$4,726	\$2,363	\$2,363	
14									
15	Commercial I	Table 7-2	947	887	887				
16		Line 1 × Line 15	\$12,037	\$336	\$428	\$12,801	\$6,401	\$6,401	
17									
18	Commercial III	Table 7-2	1,568	9,782	5,864				
19		Line 1 × Line 18	\$19,921	\$3,709	\$2,834	\$26,464	\$13,232	\$13,232	
20	<b>Total</b>		<b>\$1,376,807</b>	<b>\$66,046</b>	<b>\$80,827</b>	<b>\$2,535</b>	<b>\$1,526,215</b>	<b>\$771,188</b>	<b>\$771,188</b>

### 7.3.6. DETERMINATION OF FIXED AND VARIABLE RATES

After determining a unit rate for each cost causation component (Table 7-7) and fixed versus variable revenue collection, the rates for each customer class can be calculated. For example, referring to data found in Table 7-9, the monthly fixed charge for the SFR customer class is calculated as follows:

$$\text{Fixed Revenue} \div \text{Equiv flow EDUs} \div 12 \text{ months} \times \text{EDU equiv Ratio} = \text{Monthly Fixed Charge}$$

$$\$761,840 \div 2,191 \div 12 \text{ months} \times .8 = \$28.98$$

The EDU (equivalent dwelling unit) equivalency ratio, or the SFR flow ratio as labeled in Table 7-9, is the estimated sewer flow for each class in comparison to the average single family household. SFR customers are assigned a value of 1.0 and every other customer class is assigned a ratio relative to single family residential usage. For example, based on consumption data, Commercial III customers use an average of 2.84 times that an average SFR customer per EDU.

**Table 7-9: Determination of Monthly Fixed Sewer Charge**

Line No.	Customer Class	Fixed Revenue	Dwelling Units	SFR Flow Ratio	Equivalent Flow EDU	Monthly Fixed Charge
1	Single Family Residential	\$573,674	1,786	1	1,786	\$28.98
2	Multi-family Residential	\$70,620	93	0.8	74	\$23.18
3	Sewer Service Only	\$104,898	342	0.8	274	\$23.18
4	School	\$2,363	1	7.00	7	\$202.83
5	Commercial I	\$6,401	20	0.94	19	\$27.24
6	Commercial III	\$13,232	11	2.84	31	\$82.28
7	<b>Total</b>	<b>\$771,188</b>	<b>2,253</b>		<b>2,191</b>	

To determine the variable charges, the total variable revenue requirement from each customer class is divided by the sewage flow for each class. The variable rates for each customer class are shown in Table 7-10.

**Table 7-10: Determination of Variable Sewer Charges**

Line No.	Customer Class	Variable Revenue Requirement	Sewage Flow	Variable Rate
1	Single Family Residential	\$573,674	81,803	\$7.01
2	Multi-family Residential	\$70,620	10,070	\$7.01
3	Sewer Service Only	\$104,898	13,625	\$7.01
4	School	\$2,363	355	\$6.66
5	Commercial I	\$6,401	947	\$6.76
6	Commercial III	\$13,232	1,568	\$8.44
7	Total	<b>\$771,188</b>	<b>124,337</b>	

**7.3.7. FIVE YEAR PROPOSED SEWER SERVICE RATES**

The proposed 5-year sewer service rates for residential and commercial customers is summarized in Table 7-11 below. The rates for FY 2022 are increased based on the revenue adjustments restated in Line 1 of Table 7-11. The fixed charges shown in Lines 1 – 10 (for FY 2023) are taken from Table 7-9 and the variable rates shown in Lines 11 - 17 are taken from Table 7-10. The rates for FY 2023 are determined based on the cost of service analysis discussed above, and then multiplied by the revenue adjustments restated in Line 1 of Table 7-11 to determine the rates for each subsequent year.

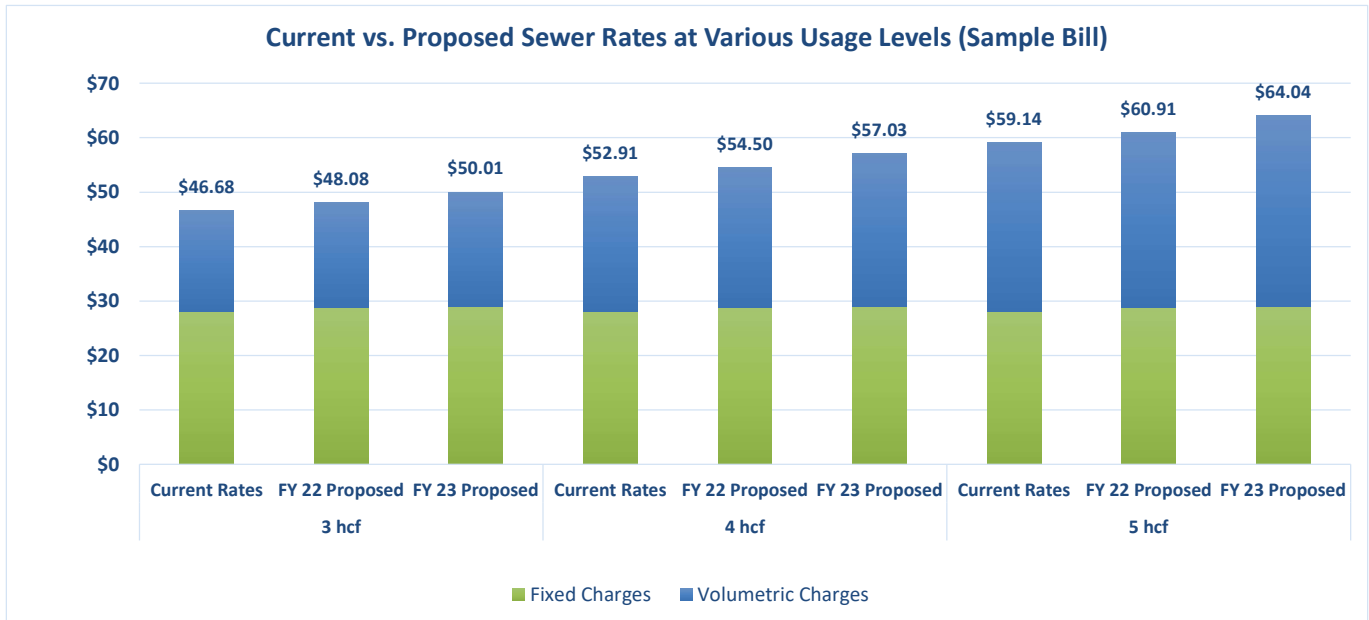
**Table 7-11: Proposed Five-Year Fixed and Variable Sewer Rates**

Line No.	Customer Class	FYE 2022	FYE 2023	FYE 2024	FYE 2025	FYE 2026
1	Revenue Adjustment	3%	COS	3%	3%	3%
2						
3	<b>Monthly Fixed Charge</b>					
4	Single Family Residential	\$28.83	\$28.98	\$29.84	\$30.74	\$31.66
5	Multi-family Residential	\$23.05	\$23.18	\$23.88	\$24.59	\$25.33
6	Sewer Service Only	\$23.05	\$23.18	\$23.88	\$24.59	\$25.33
7	School	\$170.33	\$202.83	\$208.91	\$215.18	\$221.64
8	Commercial I	\$27.13	\$27.24	\$28.05	\$28.90	\$29.76
9	Commercial III	\$68.38	\$82.28	\$84.74	\$87.29	\$89.90
10						
11	<b>Variable Rates</b>					
12	Single Family Residential	\$6.80	\$7.01	\$7.22	\$7.44	\$7.66
13	Multi-family Residential	\$6.80	\$7.01	\$7.22	\$7.44	\$7.66
14	Sewer Service Only	\$6.80	\$7.01	\$7.22	\$7.44	\$7.66
15	School	\$6.49	\$6.66	\$6.86	\$7.06	\$7.27
16	Commercial I	\$6.57	\$6.76	\$6.96	\$7.17	\$7.38
17	Commercial III	\$8.16	\$8.44	\$8.69	\$8.95	\$9.22

## 7.4. Single Family Residential Sewer Bill Impacts

Figure 7-1 shows the monthly sewer bills for SFR Customers at various levels of usage. The average SFR sewer use is 4 hcf.

**Figure 7-1: SFR Sewer Bill Totals at Various Levels of Usage**



## 7.5. Commercial Sewer Bill Impacts

The District provides sewer service only to Non-Harbor Commercial Customers. Figure 7-2 compares the monthly sewer bill totals for a Commercial Customer I - Low (office, store) at various levels of usage. The average usage for a Commercial I customer is 4 hcf.

**Figure 7-2: Monthly Sewer Bill Totals for Commercial I – Low Customer at Various Levels of Usage**

