



Whatcom County PUD #1

Water Utility Rate Study

FINAL REPORT
November 2023

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FCS GROUP
Solutions-Oriented Consulting

November 21, 2023

Annette Smith
Director of Finance
Public Utility District No. 1 of Whatcom County
1705 Trigg Road
Ferndale, WA 98248

Subject: Water Utility Rate Study 2023

Dear Ms. Smith:

FCS GROUP is pleased to submit this report documenting the Utility Rate Study conducted for PUD No. 1 of Whatcom County. The recommended across-the-board adjustments are shown in the table below. These increases are forecast to generate the revenue needed to fully fund each utility on a standalone basis, considering operating and maintenance expenditures, fiscal policy achievement, and the capital project needs of each water utility. The detailed methodology used to derive these revenue needs is included in this report.

Annual Revenue Need Increases by Utility

Utility	2024	2025	2026	2027
Grandview	30.00%	30.00%	9.00%	9.00%
Industrial Water	21.00%	11.50%	11.50%	8.00%

In addition to these revenue requirement results, this report also documents cost-of-service results, rate design recommendations, and updated general facilities charges for each water utility.

It has been a pleasure to work with you and other District staff on this effort. Please let us know if you have any questions or need additional information. Tage can be reached at (425) 615-6487 or TageA@fcsgroup.com.

Sincerely,



Angie Sanchez-Virnoche
Principal and Vice President



Tage Aaker
Senior Project Manager



Evan Coughlan
Senior Analyst

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Section I. INTRODUCTION

Background

In 2022, Public Utility District No. 1 of Whatcom County (District) engaged FCS GROUP to conduct a Water Utility Rate Study for the Industrial Water (IW) and Grandview Water Utility (“Grandview” or “GWU”). This 2022-23 rate study updates the results originally developed in the 2015-16 study that FCS GROUP performed for the District.

The overall objective of the study is to develop rates and charges that are cost-based and support financial stability and resiliency and allow for the achievement of strong financial performance in the future. The scope of the project included the following key elements:

- Review fiscal policies.
- Assess revenue needs for a multi-year period that includes adequate funding for operations and maintenance, system reinvestment, debt service, and other program activities.
- Incorporate capital plans and develop a capital funding forecast.
- Use industry-accepted practices to establish a defensible basis for assigning “cost shares” and establishing “equity” for IW and GWU customers.
- Recommend rates for each system that generate sufficient revenue to meet each system’s financial obligations on a standalone basis.
- Calculate general facilities charges (GFCs) for the Industrial and Grandview water utilities.
- Develop a financial planning modeling toolset for the District’s internal use.

The methodology, key factors, conclusions, and recommendations developed and utilized for the study are discussed in the following sections of this report.

Section II. STUDY METHODOLOGY

RATE SETTING PRINCIPLES AND METHODOLOGY

The methods used to establish user rates are based on principles that are generally accepted and widely followed throughout the industry. These principles are designed to produce rates that equitably recover costs from each customer or class of customers by setting the appropriate level of revenue to be collected from ratepayers and establishing a rate structure to equitably collect those revenues. The primary tasks of the rate study are listed below:

- **Revenue Requirement Analysis.** This analysis identifies the total revenue requirement to fully fund each system on a standalone basis, considering operating and maintenance expenditures, capital funding needs, debt requirements, and fiscal policy objectives.
- **Cost-of-Service Analysis.** This analysis equitably distributes costs to customers based on their proportional demand and use of each system.
- **Rate Design Analysis.** This analysis includes the development of rates that generate sufficient revenue to meet each system's revenue requirement forecast, incorporate findings from the cost-of-service analysis, and address the pricing objectives of the District.
- **General facilities charges (GFCs).** This analysis calculates GFCs for each water utility. These charges help provide equity between existing and new customers, and they also provide a source of funding for utility-related capital projects as growth occurs.

Each of these analyses is described in more detail below.

Revenue Requirement

A revenue requirement analysis forms the basis for a long-range financial plan and multi-year rate management strategy for each system. It also enables the District to set utility rate structures that fully recover the total cost of operating each system: capital improvement and replacement, operations, maintenance, general administration, fiscal policy attainment, cash reserve management, and debt repayment. Linking rate levels to a financial plan such as this helps to enable not only sound financial performance for each system but also establishes a clear and reasonable relationship between the costs imposed on utility customers and the costs incurred to provide the service.

A revenue requirements analysis includes the following core elements to form a complete portrayal of the system's financial obligations.

- **Fiscal Policy Analysis.** Identifies formal and informal fiscal policies of the District to ensure that current policies are maintained, including reserve levels, capital/system replacement funding, and debt service coverage.
- **Capital Funding Plan.** Defines a strategy for funding the system's capital improvement program, including an analysis of available resources from rate revenues, debt financing, and any special resources that may be readily available (e.g., grants, outside contributions, etc.).
- **Operating Forecast.** Identifies future annual non-capital costs associated with the operation, maintenance, and administration of each system.
- **Sufficiency Testing.** Evaluates the sufficiency of revenues in meeting all financial obligations, including any coverage requirements associated with long-term debt.

- **Rate Strategy Development.** Designs a forward-looking strategy for adjusting rates to fully fund all financial obligations on a periodic or annual basis over the projection period.

Cost-of-Service

The purpose of a cost-of-service analysis is to provide a rational basis for distributing the full costs of each utility service to each class of customers in proportion to the demands they place on the system. Detailed cost allocations, along with appropriate customer class designations, help to sharpen the degree of equity that can be achieved in the resulting rate structure design. The key analytical steps of the cost-of-service analysis are as follows:

- **Functional Cost Allocation.** Apportions the annual revenue requirement to the major functions of the system:
 - » Grandview allocations: base (average use), peak (highest use), meters & services (reading and servicing meters), fire protection (fire specific costs), potable costs, non-potable costs, and customer (general customer costs).
 - » Industrial Water allocations: Treatment, transmission, fire, and general plant.
- **Customer Designation.** Identifies the customers that will be evaluated as part of the study. Existing as well as new or revised customers may be considered. It is appropriate to group customers that exhibit similar usage characteristics and service requirements.
- **Cost Allocation.** Allocates the costs from the functional cost allocation to customers based on their unique demands for each service as defined by system planning documents, industry standards, and recorded user history (from billing data). The results identify shifts in cost recovery from that experienced under the existing rate structure.

Rate Design

The principal consideration of rate design is for the rate structure to generate sufficient revenues for the system which are reasonably commensurate with the cost of providing service. The pricing structure is largely dictated by the objectives of the system. Most rate designs consist of fixed and variable charges. Fixed costs typically attempt to cover costs of the system that do not vary while variable costs will fluctuate with a change in user demand, though other policy considerations, such as revenue stability, may influence final results.

General Facilities Charge (GFC) Methodology

A general facilities charge or connection charge is imposed as a condition of service on new customers connecting to each system. In addition to any other costs related to physically connecting a customer to the system, the GFC charge allows for the recovery of a blend of historical and / or planned future capital investments in system infrastructure.

The purpose of the GFC is two-fold: 1) to provide a source for capital financing and 2) to equitably recover a proportionate share of utility plant-in-service costs from new customers. In the absence of a GFC, growth-related costs would be borne in large part by existing customers. The cost of the system to be recovered by a GFC can be defined in two parts: an existing cost portion based on historical investments in existing infrastructure, and a future cost portion that recovers costs related to planned capital projects. Revenues generated from the GFCs can be used to fund capital projects or debt

service incurred to finance capital projects but should not be used to pay for operating and maintenance costs.

There are a variety of approaches that are used in the industry to establish a defensible GFC. While the District has some flexibility to define an equitable share of system costs, it is important that the District follows a rational approach to consistently determine and implement cost-based GFCs.

The District is authorized to assess fees and charges under Section 54.16.030 of the Revised Code of Washington (RCW). There is no specific language specifying the methodology to be used for the calculation of GFCs or connection charges for PUDs.

There is, however, more specific language related to the calculation of GFCs in the RCW for Special Districts. Section 57.08.005 (11) of the RCW sets forth the requirements and basis for the calculation of general facilities charges for water and sewer districts in the State of Washington. FCS GROUP uses this more specific language as guidance for the calculation of GFCs as it would likely be used as a reference if GFCs are challenged.

In Washington, GFCs can include an existing cost basis and a future cost basis. **The District historically has only included the existing cost basis in the GFC.** This approach is termed the buy-in approach and aims to promote parity with existing customers by dividing the cost of the existing system by the number of customer equivalents that can be currently served by existing infrastructure.

The buy-in approach defines an equitable contribution from a new customer based on the average system investment that has been made by existing customers, requiring a like contribution from new customers to avoid diluting the investment and causing a subsidy. This approach is most appropriate for mature systems with capital needs that are primarily oriented toward infrastructure replacement and regulatory compliance.

The calculation used for the District is the buy-in approach. This approach maintains consistency with the current calculation methodology in use by the District. An overview of the GFC methodology employed is summarized below.

Existing Cost Basis

The existing cost basis is intended to recognize the current ratepayers' net investment in the original cost of system assets. The main provisions of the calculation include:

- **Utility Plant-In-Service.** The majority of the existing cost basis is composed of the original cost plant-in-service, as documented in the fixed asset schedule.
- **Less: Contributed Capital.** Assets funded by developers or grants are excluded from the cost basis on the premise that the connection fee should only recover costs actually incurred by the District. Assets funded by special assessments are also excluded from the cost basis to avoid double charging customers for assets that were funded through those assessments.
- **Plus: Interest on Utility-Funded Assets.** The RCW and subsequent legal interpretations provide a guideline for connection charges which suggests that such charges can include interest on an asset at the rate applicable during the time of construction. Using the historical Bond Buyer Index for 20-year term bonds, interest can accumulate for a maximum of ten years from the date of construction for any particular asset and cannot exceed an interest earnings rate above 10% in any given year. (Note: this 10% "cap" is based on guidance provided in the RCW for municipal utilities – this guidance is not binding for PUDs, but this assumption was made to be financially conservative in the calculation of the District's GFCs). Conceptually, this interest provision

attempts to account for opportunity costs that the District's customers incurred by supporting investments in infrastructure rather than having it available for investment or other uses.

- **Less: Net Debt Principal Outstanding.** Another adjustment to the existing system cost basis is to deduct the net liability of outstanding utility debt, recognizing that new customers will bear a proportionate share of this debt related to existing assets through their utility rates. Therefore, the cost of those assets charged to new development is offset to some degree by the remaining debt liability. Since the utility typically has cash resources that are not included in the system cost basis, the net debt load is defined as total debt minus outstanding cash and investments.

System Capacity

To calculate an equitable share of the system costs for new connections, the GFC cost basis is divided by the system capacity and / or the system's individualized functional capacity. The total GFC cost basis, divided by the total capacity served by the system, determines the equitable unit cost of system buy-in as a basis for setting the GFC. The specific GFC calculation and the resulting charge are detailed in the GFC section of this report.

Section III. GRANDVIEW WATER UTILITY

INTRODUCTION

The Grandview Water Utility provides potable water service, non-potable water service (a relatively new service offering), and fire service to light industrial customers. The potable system is generally separate from the non-potable / fire system. The utility has struggled financially in the past because of the small customer base and large capital needs. The objective of the rate study is to evaluate the sufficiency of the existing revenue of the GWU to meet its financial obligations on a stand-alone basis. The analysis completed for the GWU includes the following elements:

- Revenue requirement.
- Cost-of-Service.
- Rate Design.

REVENUE REQUIREMENT

A revenue requirement analysis forms the basis for a long-range financial plan and multi-year rate management strategy. The analysis is developed by completing an operating forecast that identifies future annual operating costs and a capital funding plan that defines a strategy for funding the capital improvement needs of the GWU.

Operating Forecast

The purpose of the operating forecast is to determine whether the existing rates and charges are sufficient to recover the costs the utility incurs to operate and maintain the system. The 2023 budget formed the baseline for this forecast. The operating forecast was developed for the 2023 through 2041 time period with a focus on the short-term 2023-2027 to determine a rate strategy. This short-term period aligns with the District's 2023-27 capital improvement plan (CIP) identified in the adopted 2023 budget. The following sections highlight key policies considered and assumptions used in the development of the operating forecast.

Operating Reserve

The operating reserve is designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower-than-expected collections.

Recommended Policy: For the GWU, the operating minimum reserve level is comprised of two components. The first account, "Cash - Temp Pool Invest Operations", targets 60 days of operating and maintenance (O&M) expenses (\$36,000 - \$55,000 during the 2023-27 rate-setting period).

The second component, "Emergency Reserve/Investment" is a restricted operating "emergency" reserve – this account had \$18,000 beginning in 2023 but is drawn down close to zero in the forecast to supplement the operating account. However, a target minimum of \$2,500 is added to the 60-day target, which is based on aging workforce cash-out expectations.

A common operating reserve minimum target range within the industry is 60-180 days with water utilities typically at 90 days of O&M. Any excess operating reserves beyond the minimum target are considered to be available for capital and transferred to the capital reserve. Beginning 2023 cash balances in the “Cash - Temp Pool Invest Operations” account amounted to roughly 40 days of O&M which is below the minimum target. The forecast shows the operating reserve ending at 12 days of O&M in 2023, 34 days in 2024, and then exceeding 60 days in 2025-27. If allowable, the District may consider transferring money from the capital reserve into the operating reserve to supplement interim reserve balances in the next 1-2 years.

Capital Reserve

The capital reserve is an amount of cash set aside in case of an emergency should a piece of equipment or a portion of the utility’s infrastructure fail unexpectedly. The reserve also could be used for other unanticipated capital needs including capital project cost overruns. Industry practices range from maintaining a balance equal to 1 to 2 percent of fixed assets, an amount equal to a 5-year rolling average of CIP costs, or an amount determined sufficient to fund equipment failure (other than catastrophic failure).

Recommended Policy: The capital reserve minimum target for the GWU is approximately 1.5% of the 2022 original cost plant in service or \$59,000. The District’s capital target is within the industry standard range. The capital reserve meets minimum target requirements throughout the short-term study period.

Beginning 2023 cash balances in the “Cash-Temp Pool Invest - Capital” account amounted to \$314,000 which is well above the minimum target.

System Reinvestment

System reinvestment funding (also referred to as rate-funded capital) promotes system integrity. Target system reinvestment funding levels are commonly linked to annual depreciation expense as a measure of the decline in asset value associated with routine use of the system. Particularly for utilities that do not already have an explicit system reinvestment policy in place, implementing a funding level based on full depreciation expense could significantly impact rates. The specific benchmark used to set system reinvestment funding targets is a matter of policy that must balance various objectives including managing rate impacts and keeping long-term costs down.

Recommended Policy: The study does not include a specific component for system reinvestment at this time. This approach was taken to minimize rate pressure. The District may want to consider slowly phasing in annual depreciation expense (estimated at \$81,000 per year) to contribute to future system reinvestment needs.

The rate adjustments incorporated into the forecast allow the utility to cash fund system reinvestment at approximately \$64,000 in 2025, \$78,000 in 2026, and \$36,000 in 2027. The dip in 2027 is due to a reduction in planned local utility district assessments in 2027, which supplement the cash flow of the utility. No system reinvestment is assumed in 2023-24 as any “extra” cash flow is replenishing the operating reserve.

Debt Management

It is prudent to consider policies related to debt management as part of a broader utility financial policy structure. Debt management policies should be evaluated and formalized including the level of acceptable outstanding debt, debt repayment, bond coverage, and total debt coverage targets.

Recommended Policy: At a minimum, the District is required to meet its existing bond coverage test of 1.20 identified in the bond covenants. However, per Resolution No. 728, the District has an internal policy of 1.50 debt coverage on all debt for the District as a whole, which it strives to meet or exceed.

On a stand-alone basis, the Grandview system does not meet the debt service coverage requirements at existing rate levels. Since the District's debt is issued as a combined utility, stand-alone utility rates are not required to meet the debt service coverage targets.

Operating Revenue

- **Rate Revenue.** Based on actual 2023 customer accounts and 2022 detailed usage statistics from the District's billing system. Rate revenue was validated by applying the District's current rates to the billing statistics and reconciling them with actual reported revenue.
- **Non-Rate Revenue.** Non-rate revenue consists of LUD assessment revenue. The annual revenue forecast for this revenue source is from the 2023 budget. The 2016 LTGO Bonds refinanced the 2007 bonds; debt service to be paid by LUD Assessments. Generally, the assessments cover the bond payments with the exception of 2027 when the assessments are projected to cover only \$73,000 of the \$150,000 payment.
- **Customer Growth.** No customer growth was assumed for the rate-setting period.
- **Interest Earnings.** A rate of 2.50% per year is used based on rates at the time of analysis.

O&M Expenses

- **General Cost Inflation.** The general cost inflation factor is assumed to be 3.0% per year. As a reference, the Consumer Price Index for all Urban Consumers (CPI-U) Seattle/Tacoma/Bellevue for the historical 10 and 15-year periods has averaged around 3% per year. Additionally, the Washington State Economic and Revenue Forecast Council has projected the Seattle Consumer Price Index to increase between 2.1% and 3.1% per year 2024-2027 (*Table A1.3, Washington Economic Forecast Summary, September 2023*).
- **Construction Cost Inflation.** The construction cost inflation factor is assumed to be 3.5% per year. As a reference, the current Engineering News-Record's Construction Cost Index (ENR-CCI) 20-City index for the historical 10 and 15-year periods has averaged around 3.3% to 3.4% per year.
- **Labor and Benefits Cost Inflation.** Inflation for labor and benefits is held at 4% per year and 5% per year respectively, based on discussions with District staff.
- **Power Cost Inflation.** Power cost inflation is assumed to increase at 4% per year, based on discussions with District staff.
- **State Excise Taxes.** The public utility tax is 5.029% and applies to most water rate revenue.
- **State B&O Tax.** The business and occupation tax is 1.50% and generally applies to non-rate revenue, except for LUD assessments.

Reserve Balances

The District began 2023 with roughly \$550,000 in combined cash or cash equivalents. For forecasting purposes, **Figure 1** shows that of the \$550,000 in beginning cash, \$25,000 was allocated to the operating reserve, \$314,000 was assumed to be available for capital projects, \$193,000 was allocated to LUD debt reserves, and \$18,000 is kept for emergency funding.

Figure 1. Cash or Cash Equivalent Balances (rounded)

Reserve	2023 Beginning Balance
Operating Reserve	\$25,000
Capital Reserve	\$314,000
LUD Debt Reserve	\$193,000
Emergency Reserve	\$18,000
Total	\$550,000

Internal Service Allocation

The District supplied FCS GROUP with hourly staffing labor estimates to determine budgeting allocation for the District’s Internal Service Fund’s staffing costs going forward (labor and benefits). Internal Service Fund’s staffing costs in the 2023 budget total roughly \$2.5 million.

This staffing analysis estimated that 6.97% of internal services staff should be allocated to Grandview (\$174,000), compared to the \$7,000 that is currently being allocated to Grandview (*Section 3, Page 1 of 2; 2023 Budget*). This increase is a significant cost driver for the revenue forecast, and therefore, is assumed to be phased in over a ten year period by adding approximately \$16,000 per year, plus inflation.

Figure 2. Hourly Labor Requirements by Fund

Category	Industrial Water	Grandview	Electric
Water Operators	14,680	1,402	-
Electricians	3,847	201	2,874
Total Water Operators / Electricians	18,527	1,603	2,874
Water Operators / Electricians %	80.54%	6.97%	12.49%

Debt Service

- **Existing Debt.** There are two outstanding debt obligations for the GWU:
 - » The first is the LTGO issue. Payments are approximately \$150,000 per year and continue until 2027. These payments are largely offset by annual assessments.
 - » The second is an interfund loan from Industrial Water to GWU to repay the cost of the connection to Industrial Water for the non-potable / fire suppression water lines. Payments are \$65,000 per year and continue until 2047.

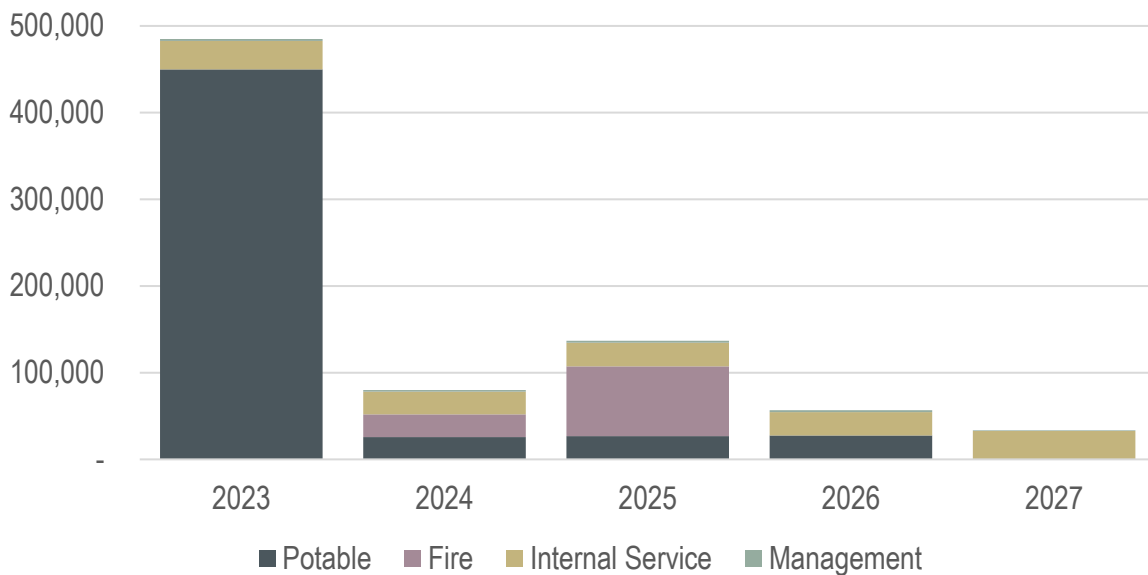
- **New Debt.** There is one new debt issuance forecast for the GWU:
 - » An interfund loan from the electric utility set at approximately \$360,000 is forecast in 2023 to help provide funding for up to three potable capital projects. Annual principal and interest payments total roughly \$24,000 per year.

Capital Plan

Capital Expenditures

The District supplied FCS GROUP with the 2023-2027 capital plan, which totals \$770,000 in 2023 dollars or \$790,000 with anticipated cost escalation. A graphical depiction of the capital plan is provided below in **Figure 3**:

Figure 3. Grandview Water Utility Capital Improvement Plan

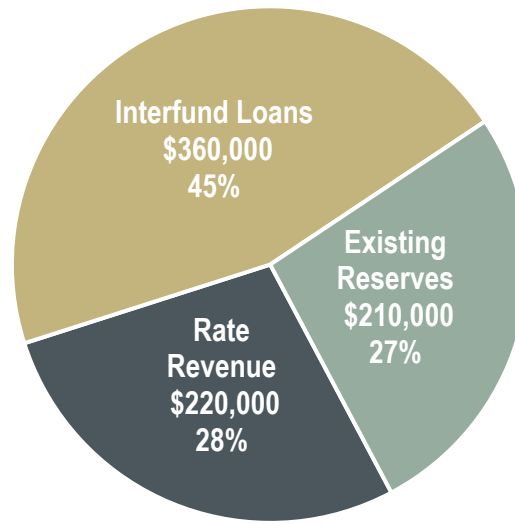


The potable projects noted in 2023 include GVP-4 (Potable Plant Land Acquisition), GVP-5 (Road Crossing at 2349 Grandview), and GVP-6 (Line Extension on Grandview). These three projects total \$425,000 – the cost estimates and timing are considered preliminary and may change. If the cost and / or timing of these projects change, it is assumed that the interfund loan noted in **Figure 4** would change, as that loan is primarily assumed to cover most of these projects if / when they are needed.

Capital Funding Strategy

The 2023-2027 capital plan totals \$790,000 with cost escalation. This results in a plan in which \$220,000 is expected to be funded with water rate revenue and fund interest earnings, \$360,000 is expected to be funded with an interfund loan, and \$210,000 is expected to be funded by drawing down existing reserves. The capital funding strategy is shown in **Figure 4**.

Figure 4. Capital Funding Strategy 2023-2027



Summary of Revenue Requirement

The operating forecast components of O&M expenses, debt service, and capital funding come together to form the multi-year revenue requirement. The revenue requirement compares the overall revenue of the utility system to the expenses to evaluate the sufficiency of rates on an annual basis. As mentioned previously, the rate-setting period focuses on 2023-27.

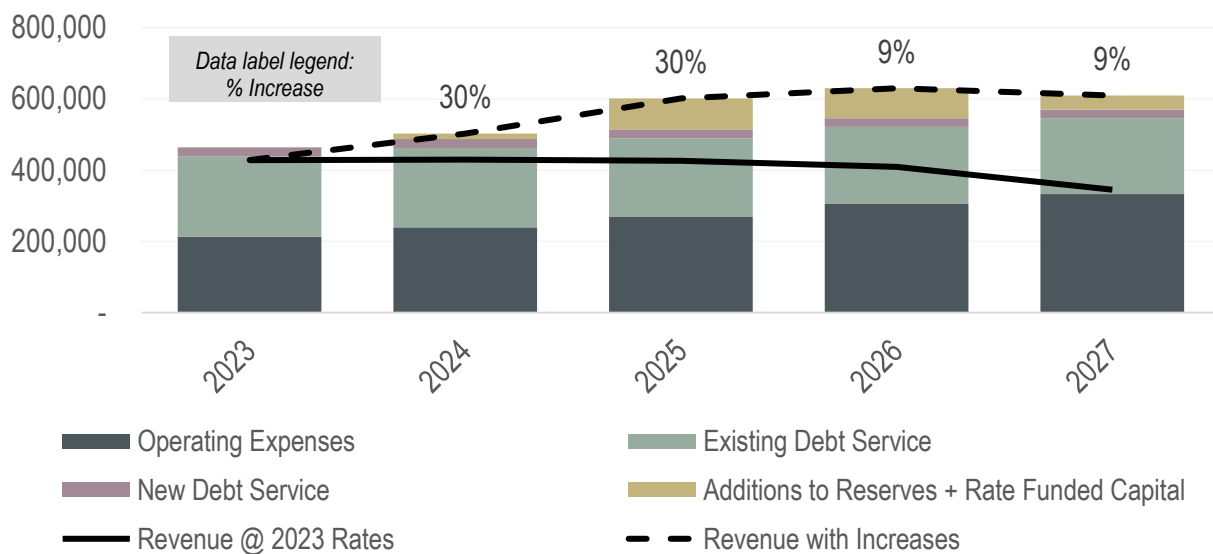
Figure 5 provides a summary of the GWU revenue requirement findings. The stacked columns represent the costs and obligations of the utility such as operating expenses and annual rate revenue earmarked for capital projects. The solid black line represents revenue at existing rates and the dashed line shows forecasted revenue with rate increases.

- **Solid black line:** Revenue at existing rates.
 - » GWU rate revenue is expected to be roughly \$266,000 in 2023 and is forecast to remain at this level throughout the study period. Additionally, this line also includes annual revenue of \$160,000 from the LUD assessment fee (anticipated to end in 2028). In total, annual revenues fail to meet annual system obligations in each year (including 2023). The deficiency ranges from \$36,000 in 2023 to \$212,000 in 2027 with no rate action.
- **Dashed black line:** Revenues with rate increases.
 - » Rate revenue must increase to allow the utility to cover its existing financial obligations while also funding capital improvement projects by covering new debt service and / or providing for rate-funded capital.
- **Dark blue bar:** Operating Expenses.
 - » Operating expenses are based on the adopted 2023 budget and increase with the annual cost escalation assumptions previously discussed.
- **Green bar:** Existing Debt Service.
 - » Existing debt from the LTGO Bond and interfund loan from Industrial Water average \$155,000 and \$65,000 per year respectively. The LTGO Bond is forecast to end in 2027, while the interfund loan repayment continues for the duration of the study period.

- **Purple bar:** New Debt Service
 - » New debt from a potential interfund loan from the Electric Utility is forecast to average approximately \$24,500 in debt service per year.
- **Gold bar:** Additions to Reserves + Rate Funded Capital.
 - » In 2024, roughly \$15,000 is available for rate-funded capital. With rate increases, this amount is projected to increase to \$84,000 by 2026. This is projected to dip in 2027, temporarily, when the LUD assessment drops.

To satisfy the rate deficiency annual rate increases of 30% in 2024 and 2025 and 9% in 2026 and 2027 are needed.

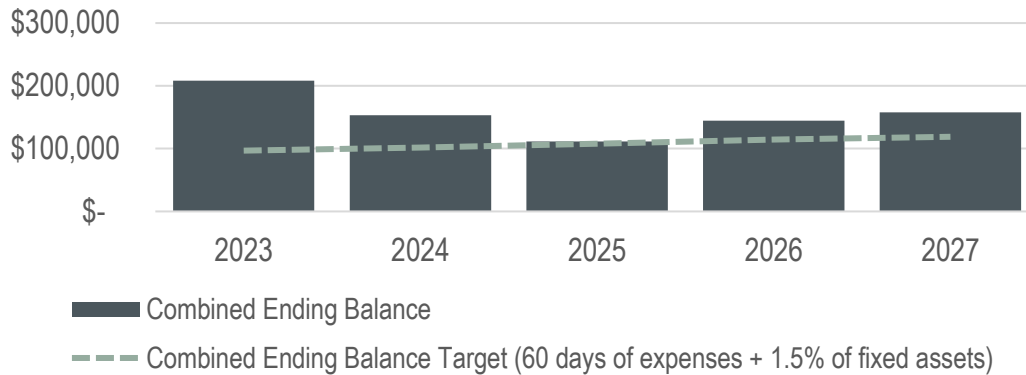
Figure 5. Grandview Water Utility Revenue Requirement Summary



Forecasted Reserves

The target operating reserve is equal to 60 days of operating expenses. The target minimum capital reserve is equal to 1.5% of the original cost of fixed assets. In 2023, the utility plans to spend over \$400,000 on capital projects, which results in a significant drawdown of existing reserves. **Figure 6** shows that although the combined reserve declines, the ending fund balance is generally at or above these targets over the study period with the recommended rate increases.

Figure 6. Ending Operating and Capital Reserve Forecast



COST-OF-SERVICE

A cost-of-service analysis determines the equitable recovery of costs from customers according to the unique demands each customer places on the system. There are three fundamental steps to allocating the annual revenue requirement to customer classes and developing the final rates – 1) allocate total utility assets and costs by function, 2) develop customer-specific allocation factors, and 3) develop unit costs. The methodology used conforms to industry-accepted practices identified by the *American Water Works Association (AWWA) Principles of Water Rates, Fees and Charges, M1 Manual*.

Allocation of Utility Assets by Function

The GWU assets in service were reviewed to identify what infrastructure assets are in use and relate to providing water service. This allocation assigns value and costs to functional categories based on documented system requirements, including engineering criteria, (e.g., average demand, peak demand, etc.) and industry-accepted practice based on the relationship of each class of asset and their use in the system. Assets are allocated to the functions of service according to known or assumed cost “causation”. The functions of service to which the GWU assets were allocated are discussed below and summarized in **Figure 7**.

- **Customer.** These are the costs associated with establishing, maintaining, and serving water customers and tend to include administrative, billing, and customer service costs. These costs are generally uniform by customer regardless of their meter size or demand placed on the water system. Oftentimes, there are no customer-specific assets.
- **Meters & Services Costs.** These costs are associated with installation, maintenance, and repairs of meters and services. These costs are typically allocated based on number of connections and meter size. It does not appear that the District has meter assets in its inventory. One asset, *Potable Metered Connections*, could possibly be allocated to meters, but was assumed to be pipe-related and therefore included in the transmission and distribution row (consistent with the last study).
- **Base Costs.** These costs relate to the average service provided on demand and are essentially correlated with year-round water consumption.
- **Peak Costs.** These costs relate to peak demand for service typically associated with the ability of the system to provide capacity to customers with higher than average volume, which usually occurs during the summer months.

- **Fire.** The fire assets identified are a separate system from the potable water system. These are the costs associated with the ability of the system to provide adequate capacity and water flow corresponding to the minimum fire safety standards required to serve its customer demographic.

Assets providing non-potable service to Grandview are technically Industrial Water assets and therefore do not show up in the Grandview asset inventory.

Figure 7. Grandview Water Utility Functional Plant (Assets) in Service

Plant in Service	Original Cost	FUNCTIONS OF WATER SERVICE					As All Others	Total (%)	Allocation Basis
		CUSTOMER	METERS & SERVICES	BASE	PEAK	FIRE FUNCTION			
Supply	\$ 32,500	0.00%	0.00%	75.50%	24.50%	0.00%	0.00%	100.00%	Peak Demand Ratio
Treatment	2,216	0.00%	0.00%	75.50%	24.50%	0.00%	0.00%	100.00%	Peak Demand Ratio
Storage	45,944	0.00%	0.00%	75.50%	24.50%	0.00%	0.00%	100.00%	Peak Demand Ratio
Pumping	6,648	0.00%	0.00%	75.50%	24.50%	0.00%	0.00%	100.00%	Peak Demand Ratio
Transmission & Distribution	1,124,869	0.00%	0.00%	75.50%	24.50%	0.00%	0.00%	100.00%	Peak Demand Ratio
Fire	2,122,793	0.00%	0.00%	0.00%	0.00%	100.00%	0.00%	100.00%	All Fire
General Plant	114,134	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	General Plant
Total Utility Plant	\$ 3,449,103	\$ -	\$ -	\$ 915,249	\$ 296,928	\$ 2,122,793	\$ 114,134	\$ 3,449,103	
Water Service Functions		0.00%	0.00%	27.44%	8.90%	63.65%		100.00%	
Allocation of "As All Others"		\$ -	\$ -	\$ 31,323	\$ 10,162	\$ 72,649	\$ (114,134)	\$ -	
Plant in Service: Functional Allocation	\$ 3,449,103	\$ -	\$ -	\$ 946,571	\$ 307,090	\$ 2,195,442	\$ -	\$ 3,449,103	
Plant in Service: Allocation %		0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	100.00%	

Most assets were functionalized based on the 2022 peak demand ratio of maximum month to peak month (1.32). Although 2021 statistics were available, and had a higher peak demand ratio, an outlier in July 2021 was noted in the data. For this reason, only 2022 customer statistics were used in determining the peak demand ratio. Compared to the previous study in 2015-16, the ratio decreased, causing a higher portion of assets to be allocated to base, and a lower portion to be allocated to peak. Fire was allocated 100% to fire, and General Plant was allocated as all other plant assets. The result was an allocation of 27% to base costs (25% in 2015-16), 9% to peak costs (13% in 2015-16), and 64% to fire (62% in 2015-16). These results are generally consistent with the 2015-16 study.

Allocation of Utility Costs by Function

The annual test period costs (forecasted 2024 costs) were also grouped by function, many of them informed by the percentages developed in **Figure 7**. A review of each line item was completed to determine the most equitable allocation for the GWU costs. The following identifies the key allocation assumptions:

- **Labor.** All GWU labor and benefits are split between potable and non-potable water services based on District-supplied employee hourly cost splits. The result is approximately 85% potable and 15% non-potable.
- **Purchased Water & Power.** Allocated via peak demand ratio of 75.50% base and 24.50% peak.
- **Plant Chemicals.** As 100% potable.
- **Accounting/Financial Services/Customer.** As 100% customer.
- **Taxes.** Allocated as all other expenses.
- **All Other O&M.** The remaining amount was split as plant-in-service: 27.44% base, 8.90% peak, and 63.65% fire.
- **Existing & New Debt Service.** Allocated as plant-in-service: 27.44% base, 8.90% peak, and 63.65% fire.
- **Rate Funded Capital.** Allocated as plant-in-service: 27.44% base, 8.90% peak, and 63.65% fire.

- **Non-rate revenue/Cash Flow Adjustments.** LUD assessment revenue as plant in service, interest earnings as all other, and net cash flow after rate increase as O&M expense.

Total rate revenue requirements are calculated by taking the total expenses, deducting non-rate revenue, and adding net cash flow resulting from the proposed annual rate increase. The line-by-line utility cost allocation results in costs being allocated to the functional cost pools shown in **Figure 8**.

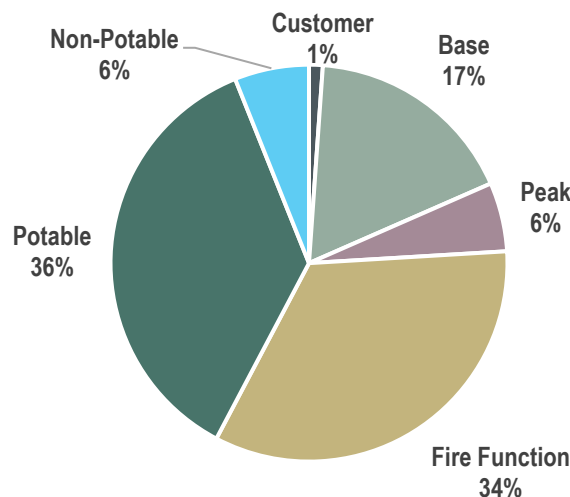
The Base and Peak columns are spread to both potable and non-potable customers based on water consumption, whereas costs specifically identified as Potable or Non-Potable are allocated directly to each category (e.g., water purchases are allocated to non-potable, whereas treatment chemicals are allocated only to potable customers).

Figure 8. Grandview Water Utility Functional Cost Allocation

Revenue Requirement	Total (\$)	FUNCTIONS OF WATER SERVICE								Total (%)	Allocation Basis	
		CUSTOMER	METERS & SERVICES	BASE	PEAK	FIRE FUNCTION	POTABLE	NON-POTABLE	As All Others			
Total Expenses												
Cash Operating Expenses	\$ 222,837	1.54%	0.00%	13.49%	4.38%	22.38%	49.85%	8.36%	0.00%	100.00%	As O&M Expenses	
Taxes	13,402	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
Existing Debt Service	157,949	0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	0.00%	100.00%	100.00%	As Plant in Service	
Interfund Loan from Industrial Water	65,000	0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	0.00%	100.00%	100.00%	As Plant in Service	
New Debt Service	24,840	0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	0.00%	100.00%	100.00%	As Plant in Service	
Rate Funded Capital	-	0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	0.00%	100.00%	100.00%	As Plant in Service	
Total Expenses	\$ 484,027	0.71%	0.00%	20.26%	6.57%	42.89%	22.95%	3.85%	2.77%	100.00%		
Less: Non-Rate Revenues												
Interest Revenue	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
LUD Assessment Revenue	(157,949)	0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	0.00%	100.00%	100.00%	As Plant in Service	
Assessment Shortfall Draw	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
[Extra]	-	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
GFC Revenue Towards Debt Service	-	0.00%	0.00%	27.44%	8.90%	63.65%	0.00%	0.00%	100.00%	100.00%	As Plant in Service	
Interest Earnings	(5,445)	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
Plus: Cash Flow Adjustments												
Adjustment for Partial Year Increase	6,662	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
Additional Taxes Due to Rate Increases	3,686	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	100.00%	100.00%	As All Others	
Net Cash Flow After Rate Increase	15,458	1.54%	0.00%	13.49%	4.38%	22.38%	49.85%	8.36%	0.00%	100.00%	As O&M Expenses	
Rate Revenue Requirement	\$ 346,439	\$ 3,872	\$ -	\$ 56,805	\$ 18,429	\$ 110,525	\$ 118,786	\$ 19,918	\$ 18,305	\$ 346,439		
Water Service Functions		1.12%	0.00%	17.31%	5.62%	33.68%	36.20%	6.07%		100.00%		
Allocation of "As All Others"		\$ 205	\$ -	\$ 3,169	\$ 1,028	\$ 6,165	\$ 6,626	\$ 1,111	\$ (18,305)	\$ -		
Rate Revenue Requirement	\$ 346,439	\$ 3,877	\$ -	\$ 59,973	\$ 19,457	\$ 116,690	\$ 125,412	\$ 21,029	\$ -	\$ 346,439		
Allocation %		1.12%	0.00%	17.31%	5.62%	33.68%	36.20%	6.07%	0.00%	100.00%		

The cost allocation results in the following, as shown in **Figure 9**: Roughly 1% of costs are customer-specific, 23% apply to both potable and non-potable customers (base plus peak), 34% are related to fire protection, 36% apply only to potable customers, and lastly, 6% apply only to non-potable customers.

Figure 9. Grandview Water Utility Cost Allocation Summary



Cost-of-Service Unit Costs

The costs by functional category are allocated to customers based on the allocation basis identified as most equitable for allocating the type of cost under review. The following summarizes the allocation basis for each functional cost pool:

- **Customer.** Number of meters (accounts).
- **Base Costs.** Allocated by the total annual water use of the customer class.
- **Peak Costs.** Allocated by the total annual water use of the customer class, weighted by each class’s peaking factor.
- **Potable Costs.** Allocated entirely to potable customers.
- **Non-Potable Costs.** Allocated entirely to non-potable.
- **Fire Protection.** Allocated by the number of fire meter equivalents.

Customer-Specific Allocation Factors

Figure 10 shows total annual and peak usage by customer group – both groups of customers had very similar peaking tendencies in 2022. In the case where a customer has both a potable and non-potable connection (e.g., Healthy Pet) they count as one customer account and do not get two shares of customer costs or fire protection costs. Share of usage is based on 100 cubic feet (ccf).

Figure 10. Water Utility Customer Statistics by Class in 2022

Category	Annual Usage (ccf)	Peak Usage (ccf)
Retail (Potable)	59%	59%
Non-Potable	41%	41%
Total	100%	100%

Figure 11 provides a comparison of the current revenue distribution between customer classes and the distribution of revenues resulting from the cost-of-service analysis within the Grandview utility. The “Existing 2023 Revenue” column shows how each customer class is currently supporting the water system based on the existing rate structure. Note that the across-the-board revenue increase in 2024 is 30%. Industry-accepted practice is that if a customer class is within plus or minus five to ten percent of the cost-of-service, they are considered to be within a reasonable range and cost-of-service adjustments may not be needed. As shown in the figure below, both classes are within that reasonable range. Potable customers are slightly below cost-of-service and a slight increase above the across-the-board adjustment could be supported. Non-potable customers are slightly above cost-of-service and a slight decrease relative to the across-the-board adjustment could be supported.

Figure 11. Water Utility Existing, ATB, and COSA-Based Revenues

Category	Estimated 2023 Revenue	2024 Across-the-Board	% Change	2024 Cost-of-Service	% Change (COSA to ATB)
Retail (Potable)	\$223,561	\$290,630	30%	\$292,545	1%
Non-Potable	\$42,930	\$55,809	30%	\$53,894	-3%
Total	\$266,491	\$346,439	30%	\$346,439	0%

RATE DESIGN

The principal objective of the rate design stage is to implement water rate structures that collect the appropriate level of revenue. Beyond that, establishing rates is a blend of “art” and “science.”

Existing Rates

The existing GWU water rates are composed of a fixed meter charge (based on the size of a customer’s meter), a fixed fire charge (based on the occupancy of the lot), and a variable consumption charge per hundred cubic feet (ccf) for all water use.

Proposed Rates

In this evaluation two different rate structures were considered and discussed with the District:

- **Across-the-Board Increases:** The proposed rate increases in 2024 applied proportionally to 2023 utility rates. This approach does not incorporate cost-of-service findings.
- **Cost-of-Service Based Increases:** Revenue is allocated based on the calculated cost-of-service. The existing rate structure is maintained but is slightly adjusted so that the potable class is slightly higher than the across-the-board scenario (1%) and the non-potable class is slightly lower than the across-the-board scenario (-3%). While other approaches could be taken, this approach is straightforward in that it maintains the current rate structure, yet it also incorporates the cost-of-service findings.

Figure 12 shows the existing 2023 rates, 2024 rates if adjustments are applied across -the-board, and 2024 rates consistent with cost-of-service.

Figure 12. Rate Adjustment Options for 2024

Monthly Charges	Existing 2023 Rates	2024 Across-the-Board	% Change above 2023	2024 Cost-of-Service	% Change (COSA to ATB)
Potable					
Meter Equivalent Charge (per ME)	\$78.00	\$101.40	30%	\$102.07	1%
Volume Charge (per ccf)	\$14.33	\$18.63	30%	\$18.75	1%
Non-Potable					
Usage Charge	\$9.00	\$11.70	30%	\$11.30	-3%
Fixed Fire Charge (per Connection)	\$156.00	\$202.80	30%	\$204.14	1%

GWU RATE STUDY SUMMARY

The analysis described above concludes the rate study for the Grandview system. After performing a rate revenue analysis, it was identified that the revenues at current levels are not sufficient to fund future system obligations. The rate deficiency is a result of costs continuing to increase as growth remains flat. The proposed rate forecast attempts to use both rate increases and operating reserve balances to phase in needed rate increases. To begin to address the deficiencies, the financial plan includes the following annual increases: 30% in 2024 and 2025 and 9% 2026 and 2027. The proposal includes the use of a \$360,000 interfund loan from the Electric Utility to meet capital expenditures.

Rate revenue will increase over time and can cover system obligations by 2024. We recommend that the District revisit the study findings annually during the budget cycle to check that the assumptions are used and to determine if the proposed rate strategy can be maintained or will need to be updated. The District should use the study findings as a living document, continuously comparing the study outcomes to actual revenues and expenses. Any significant or unexpected changes will require adjustments to the rate strategy proposed.

The GFCs for both Grandview and Industrial Water are discussed in a subsequent, stand alone section. The detailed technical exhibits developed as part of the Grandview utility rate study can be found at the end of this report in the appendices.

Section IV. INDUSTRIAL WATER

INTRODUCTION

The Industrial Water (IW) utility serves heavy industrial customers located in the Cherry Point service area as well as irrigation customers along the water lines going to Cherry Point. There are currently 11 industrial customers and 29 irrigation customers being served by this system.

Similar to the Grandview Water utility rate study, the objective of the Industrial Water rate study is to evaluate the sufficiency of the existing revenue to meet the utility's financial obligations on a stand-alone basis. The analyses completed for the IW system include:

- Revenue requirement.
- Cost-of-Service.
- Rate Design Review.

REVENUE REQUIREMENT

The revenue requirement for Industrial Water is developed by completing an operating forecast that identifies future annual operating costs and a capital funding plan that meets the capital improvement needs of the IW utility system.

Operating Forecast

The purpose of the operating forecast is to determine whether the existing rates and charges are sufficient to recover the costs incurred to operate and maintain the system. The 2023 budget formed the baseline for this forecast. The operating forecast was developed for the 2023 through 2041 time period with a focus on the short-term 2023-2027 to determine a rate strategy – this short-term period aligns with the District's 2023-27 capital improvement plan (CIP) identified in the adopted 2023 budget. The following sections highlight some of the key assumptions used in the development of the operating forecast.

Operating Fund

As previously noted, the operating fund is designed to provide a liquidity cushion to ensure that adequate cash working capital will be maintained to deal with significant cash balance fluctuations such as seasonal fluctuations in billings and receipts, unanticipated cash expenses, or lower-than-expected collections.

Recommended Policy: For the IW system, the operating minimum fund level is comprised of two components. The first component is 60 days of operating and maintenance expenses (\$1.0 million - \$1.2 million during the short-term study period). The second component is a restricted operating fund (\$61,500 is included as part of this study, to cover a portion of the District's retirement liability). The two components total \$1.1 million - \$1.2 million for the planning period. The IW system meets minimum target requirements throughout the short-term study period.

Capital Fund

As previously noted, this reserve provides a source of emergency funding for unexpected asset failures or other unanticipated capital needs. This capital reserve policy is not intended to guard against catastrophic system failure or extreme acts of nature.

Recommended Policy: The capital fund minimum target for the IW system, is approximately 1.5% of the 2022 original cost plant in service or \$700,000. Additionally, the District holds in reserve an additional \$200,000 to account for possible reductions in customer usage. In total, this reserve ranges from \$900,000 to \$2.1 million during the study period. The increase over the period is largely due to the 1.5% being applied to completed CIP projects in the forecast. The District's capital target is within the industry accepted range. The capital fund meets minimum target requirements throughout the short-term study period.

System Reinvestment

Again, as previously noted, target system reinvestment funding levels are commonly linked to annual depreciation expense as a measure of the decline in asset value.

Recommended Policy: At a minimum, the District should strive to cash-fund depreciation expense, which is estimated to be \$1.2 million as of the beginning of 2023. Throughout the forecast, rates are set to cover not only operating and debt service obligations but also to have enough left over to fund \$1.5 million to \$2.5 million of rate funded capital per year.

Debt Management

It is prudent to consider policies related to debt management as part of a broader utility financial policy structure. Debt management policies should be evaluated and formalized including the level of acceptable outstanding debt, debt repayment, bond coverage, and total debt coverage targets.

Recommended Policy: At a minimum, the District is required to meet its existing bond coverage test of 1.20 identified in the bond covenants. However, per Resolution No. 728, the District has an internal policy of 1.50 debt coverage on all debt for the District as a whole, which it strives to meet or exceed.

The District is forecast to slip to approximately 1.4 in 2026, coinciding with a forecast debt issue in Industrial Water, but recovers to over 1.6 in the following year under the recommended rate plan described in a subsequent section.

Operating Revenue

- **Rate Revenue.** Based on actual 2023 customer accounts and 2022 detailed usage statistics from the District's billing system, rate revenue was validated by applying the District's current rates to the billing statistics and reconciling them with actual reported revenue.
- **Non-Rate Revenue.** Ongoing other revenue consists of business service revenue (education & outreach, feasibility study), miscellaneous revenue (cell tower rent, customer reimbursement), temporary water sales, and irrigation revenue. Based on discussions with District staff, this study assumes a 5% increase in irrigation rates per year. To recognize this different rate increase plan for these irrigation customers, they have been placed under the non-rate revenue category.

- **Customer Growth.** No customer growth was assumed for the rate-setting period.
- **Interest Earnings.** A rate of 2.50% per year is used based on rates at the time of analysis.

O&M Expenses

The inflationary assumptions previously discussed in the Grandview section also apply to the Industrial Water forecast.

Fund Balances

The District began 2023 with roughly \$7.8 million in combined cash or cash equivalents. For forecasting purposes, **Figure 13** shows that of the \$7.8 million in beginning cash, \$3.5 million was allocated to the operating reserve, \$3.3 million was assumed to be available for capital projects, \$810,000 was allocated to debt reserves, and \$212,000 is kept for emergency funding.

Figure 13. Cash or Cash Equivalent Balances

Reserve	2023 Beginning Balance
Operating Reserve	\$3,500,000
Capital Reserve	\$3,300,000
Debt Reserve	\$810,000
Emergency Reserve	\$212,000
Total	\$7,822,000

Internal Service Allocation

The staffing analysis previously discussed in the Grandview section also applies to the Industrial water forecast. The analysis estimates that 80.54% of internal services staff should be allocated to Industrial water, compared to the 69.03% that is currently being allocated to Industrial water (*Section 3, Page 1 of 2; 2023 Budget*). This increase is assumed to be phased in over a ten year period by adding approximately \$28,000 per year, plus inflation.

Debt Service

- **Existing Debt.** There are five outstanding debt obligations for the IW system:
 - » Two are LTGO bonds issued in 2012. These payments continue until 2024 and have combined payments of approximately \$360,000 per year.
 - » One is an LTGO bond issued in 2013. Payments continue until 2032 and are approximately \$450,000 per year.
 - » One is an LTGO bond issued in 2021. Payments continue until 2030 and are approximately \$1.1 million per year.
 - » One is an EDI loan issued in 2019. Payments continue until 2039 and are approximately \$45,000 per year.
- **New Debt.** There are two new debt issuances forecast for the Industrial Water utility – the bonds are assumed to have a 20-year term with a 5% interest rate:

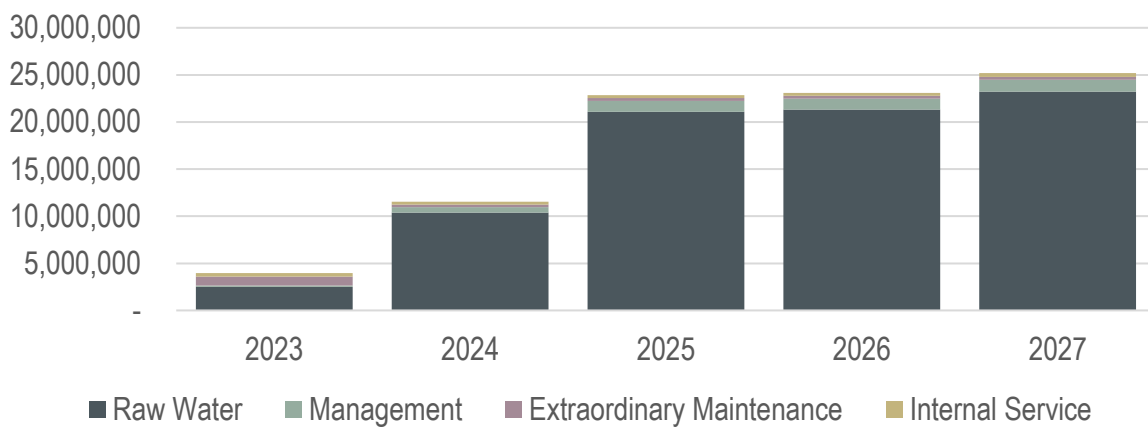
- » A revenue bond set at approximately \$28.0 million is forecast in 2024. Annual principal and interest payments average \$2.5 million per year.
- » A revenue bond set at approximately \$43.0 million is forecast in 2026. Annual principal and interest payments average \$3.8 million per year.

Capital Funding Plan

Capital Expenditures

The District supplied FCS GROUP with the 2023-2027 capital plan, which totals \$79 million in 2023 dollars or \$87 million with anticipated cost escalation. A graphical depiction of the capital plan is provided below in **Figure 14**.

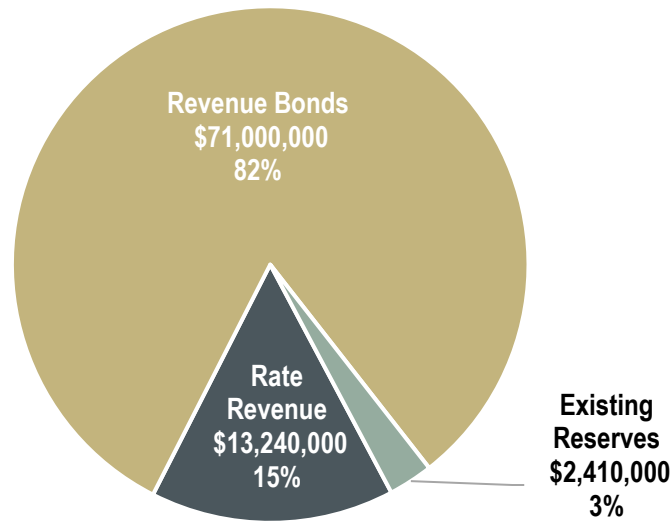
Figure 14. Industrial Water Utility Capital Improvement Plan (escalated \$)



Capital Funding Strategy

As previously noted, the capital plan through 2027 totals \$79 million (\$87 million with cost escalation), of which about \$13.2 million is expected to be funded with cash financing (sometimes referred to as “pay-as-you-go” financing). In addition, \$2.4 million is expected to come from existing reserves. The remaining \$71 million is expected to come from revenue bonds. **Figure 15** shows the projected funding strategy for the CIP. This debt is associated with the Plant 1 rebuild; due to the timing and scale of the project, the District would need to borrow to cover most of the project cost.

Figure 15. Capital Funding Strategy 2023-2027



Summary of Revenue Requirement

The operating forecast components of O&M expense, debt service, and capital funding come together to form the multi-year revenue requirement. The revenue requirement compares the overall revenue of the utility system to the expenses to evaluate the sufficiency of rates on an annual basis. As mentioned previously the financial plan has been developed for a 20-year time period, however, the rate-setting period focuses on 2023-2027.

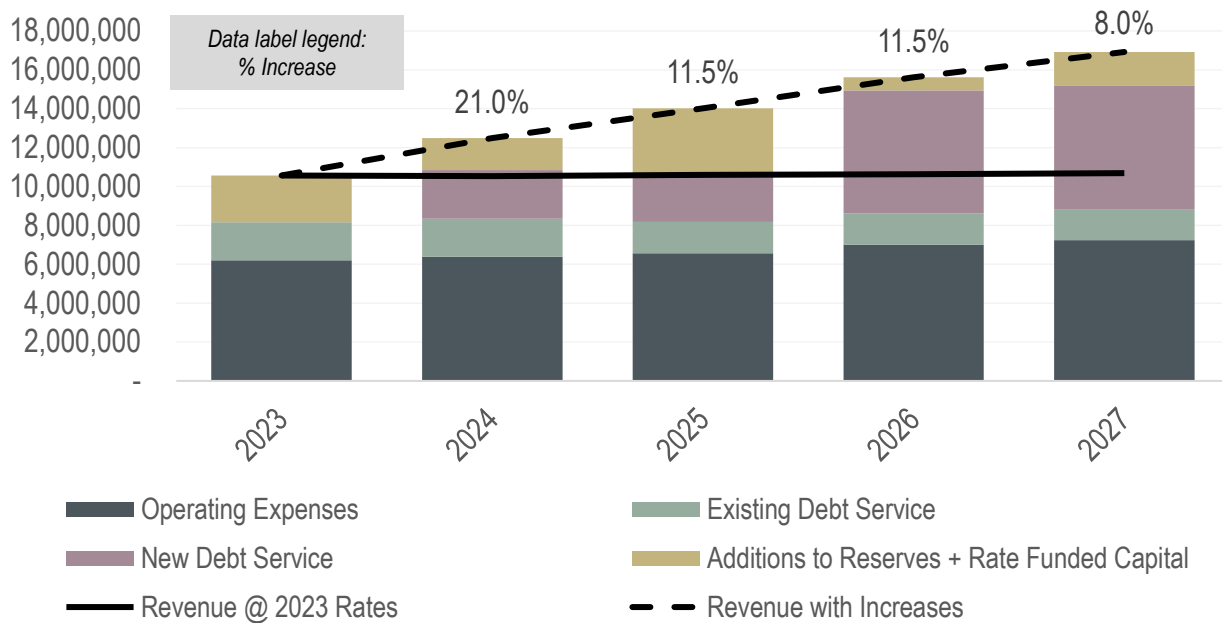
Figure 16 provides a summary of the IW system revenue requirement findings. The stacked columns represent the costs and obligations of the utility such as operating expenses and annual rate revenue earmarked for capital projects. The solid black line represents revenue at existing rates and the dashed line shows forecasted revenue with rate increases.

- **Solid black line:** Revenue at existing rates.
 - » IW system rate revenue is expected to be roughly \$10.1 million in 2023 and is forecast to remain at this level through the study period, before rate adjustments. This line also contains annual revenue from non-rate sources, including \$100,000 from Irrigation revenue.
 - » IW system revenues fail to meet annual system obligations beginning in 2024. The deficiency ranges from \$1.7 million in 2024 to \$6.7 million in 2027 with no rate action.
- **Dashed black line:** Revenues with rate increases.
 - » Rate revenue must increase to allow the utility to cover its existing financial obligations while also funding capital improvement projects. These rate increases start in 2024.
- **Dark blue bar:** Operating Expenses.
 - » Operating expenses are based on the adopted 2023 budget and increase with the annual cost escalation assumptions previously discussed.

- **Green bar:** Existing Debt Service.
 - » Existing debt from LTGO and EDI loans averages \$1.7 million per year. Two LTGO payments are forecast to end in 2024, while the remaining payments continue for the duration of the study period.
- **Purple bar:** New Debt Service.
 - » New revenue bond debt service is forecast to be \$6.3 million per year by 2027.
- **Gold bar:** Additions to Reserves + Rate Funded Capital.
 - » In 2024, roughly \$1.5 million is available for rate funded capital. With rate increases, this amount is projected to increase to \$2.5 million by 2027, except for a dip in 2026 when a second revenue bond is assumed to be issued.

To satisfy the rate deficiency annual rate increases of 21% in 2024, 11.5% in 2025 and 2026 and 8% in 2027 are needed. Rate drivers are the increase in rate funded capital along with the addition of new debt to support capital needs.

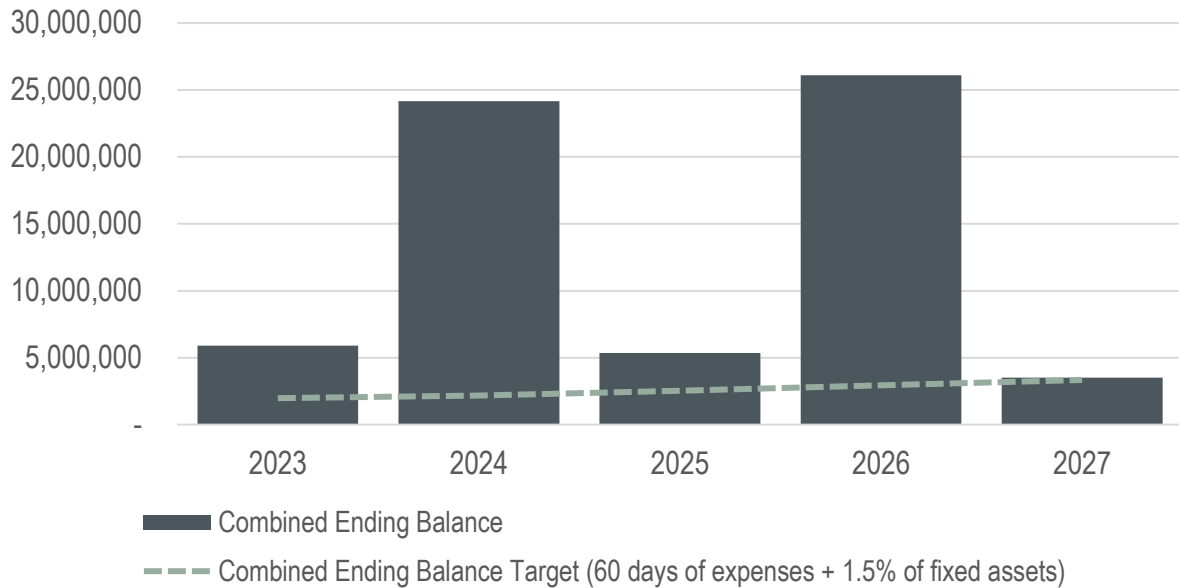
Figure 16. Industrial Water Utility Revenue Requirement Summary



Forecasted Reserves

The target operating reserve is equal to 60 days of operating expenses (plus a small amount to help cover retirement liabilities). The target minimum capital reserve is equal to 1.5% of the original cost of fixed assets. **Figure 17** shows that although the combined reserve varies, the ending fund balance is generally at or above these targets over the study period with the recommended rate increases. The reserve increases shown in 2024 and 2027 correspond to revenue bond issuances to help fund capital projects during two-year spans, respectively.

Figure 17. Ending Operating and Capital Reserve Forecast



COST-OF-SERVICE

A cost-of-service analysis determines the equitable recovery of costs from customers according to unique demands each customer places on the system. The cost-of-service analysis for the IW Utility included classifying assets and expenses into the functional cost pools of treatment, transmission, fire, and general plant. Costs were then determined to be fixed or variable and a unit cost was calculated for the specific functional cost.

Allocation of Utility Assets by Function

The IW Utility assets in service were reviewed to identify what infrastructure assets are in use and relate to providing water service. This allocation assigns value and costs to functional categories based on documented system requirements, including engineering criteria, and industry-accepted practice based on the relationship of each class of asset and their use in the system. Assets are allocated to the functions of service according to known or assumed cost “causation”. **Figure 18** provides a summary of the detailed Industrial Water assets by function.

In the 2015-16 study, 87% of the assets were assigned to Treatment and 13% were assigned to Transmission. Since that study, a majority of the newly constructed assets have been transmission-related, and therefore, increase the overall share of transmission-related assets in this study.

Figure 18. Industrial Raw Water Plant (assets) in Service by Function

Plant in Service	Original Cost	Treatment	Transmission	General Plant	Total	Allocation
Treatment	\$ 32,390,671	100.00%	0.00%	0.00%	100.00%	Treatment
Transmission	7,425,117	0.00%	100.00%	0.00%	100.00%	Transmission
General Plant	1,257,609	0.00%	0.00%	100.00%	100.00%	General Plant
Total Utility Plant	\$ 41,073,398	\$ 32,390,671	\$ 7,425,117	\$ 1,257,609	\$ 41,073,398	
Water Service Functions		78.86%	18.08%	3.06%	100.00%	
Allocation of General Plant		\$ 1,023,082	\$ 234,527	\$ (1,257,609)	\$ -	
Plant in Service: Functional Allocation		\$ 33,413,753	\$ 7,659,645	\$ -	\$ 41,073,398	
Plant in Service: Allocation %		81.35%	18.65%	0.00%	100.00%	

Allocation of Utility Costs by Function

The annual test period costs (budget 2024) were also grouped by function. The accounting system facilitates this process with accounts grouped into water treatment and transmission. The labor and other administrative costs required a line-by-line review to determine how costs would be allocated to the treatment, transmission, and general function cost pools.

- **Labor.** All IW labor and benefits are split between treatment and transmission based on employee hourly cost splits provided by District staff. The result is approximately 55% treatment and 45% transmission.
- **Treatment.** Treatment-specific costs, such as chemical costs used in each treatment plant, are assigned 100% to treatment.
- **Purchased power.** Purchased power cost is allocated between treatment and transmission to represent operating costs of related system pumps, consistent with past studies (roughly 11% to Treatment and 89% to transmission).
- **Taxes.** Allocated as all other expenses.
- **All Other O&M.** All other O&M budget line items not specifically identified were allocated as plant-in-service 81% treatment, and 19% transmission. It is assumed that all other costs support both systems as represented by the plant values.
- **Existing Debt Service.** Allocated as plant-in-service: 81% treatment, 19% transmission.
- **New Debt Service.** Allocated based on the 2023-2027 CIP at 99% allocated to treatment and 1% to transmission (the large allocation to Treatment is related to the Plant 1 Rebuild project).
- **Rate Funded Capital.** Allocated as plant-in-service: 81% treatment, 19% transmission.

Once costs were allocated to functions, the line item expenses were categorized as either fixed or variable. All O&M costs are considered fixed except power and plant chemicals which are considered to be variable. Existing debt, new debt, and rate funded capital are considered fixed capital. Non-rate revenue is deducted from expenses as all other expenses are allocated. **Figure 19** summarizes the test period annual revenue requirement by functional cost allocation and split between fixed and variable costs.

Figure 19. Summary of IW Utility Functional Cost Allocation

Revenue Requirement	Total \$	Treatment			Transmission			As All Others	Total
		Fixed O&M	Variable O&M	Fixed Capital	Fixed O&M	Variable O&M	Fixed Capital		
Rate Revenue Requirement	\$ 12,268,817	\$ 3,050,290	\$ 516,527	\$ 5,298,743	\$ 1,683,867	\$ 520,092	\$ 661,684	\$ 537,613	\$ 12,268,817
Water Service Functions		26.00%	4.40%	45.17%	14.35%	4.43%	5.64%		100.00%
Allocation of "As All Others"		\$ 139,787	\$ 23,671	\$ 242,829	\$ 77,168	\$ 23,835	\$ 30,323	\$ (537,613)	\$ -
Rate Revenue Requirement Allocation %	\$ 12,268,817	\$ 3,190,078	\$ 540,198	\$ 5,541,572	\$ 1,761,035	\$ 543,927	\$ 692,008	\$ -	\$ 12,268,817
		26.00%	4.40%	45.17%	14.35%	4.43%	5.64%	0.00%	100.00%

Cost-of-Service Unit Costs

The unit cost-of-service is determined by taking the functional cost pools (shown in **Figure 19**) and determining the appropriate allocation basis by which units will be calculated. Utility functional allocation units include the following, along with notes comparing this study's results to the 2015-16 rate study:

- **Total Use.** Total gallons delivered for the year in review. Total usage is down roughly 600 million gallons (down from 4.6 billion), primarily due to decreases in the BP and Alcoa customers.
- **Qic.** Instantaneous contract demand quantity. Qic remains unchanged at 35.630 MGD.
- **Qio.** Operating demand quantity. Qio has decreased from 20.730 MGD to 18.950 MGD.

Figure 20 summarizes the allocation units to derive cost-of-service unit costs.

Figure 20. Summary of Allocation Units

Customer	Total (gal)	QIC	QIO
Cherry Point			
ALCOA INTALCO	10,612,290	2.800 MGD	0.180 MGD
ALCOA INTALCO - SCADA	6,818,400	0.000 MGD	0.000 MGD
BN/SF	-	0.000 MGD	0.000 MGD
BP CHERRY POINT	-	18.270 MGD	12.600 MGD
BP CHERRY POINT - SCADA	2,425,237,424	0.000 MGD	0.000 MGD
PETROGAS	7,246,874	0.050 MGD	0.030 MGD
CHEMCO	86,000	0.020 MGD	0.010 MGD
CHEVRON TEXACO (CHEVRON) PIT	-	5.330 MGD	0.000 MGD
PHILLIPS 66 SCADA3	1,239,610,240	6.000 MGD	4.000 MGD
CORNERSTONE COMMUNITY CHURCH	-	0.000 MGD	0.000 MGD
FRIBERG CONST.	-	0.000 MGD	0.000 MGD
PRAXAIR #21	11,828,424	0.140 MGD	0.070 MGD
PSE WHITEHORN	199,732	0.290 MGD	0.040 MGD
PSE FERNDAL E GEN STN SCADA1	291,249,024	2.700 MGD	2.000 MGD
FREE RAIN FARMS	1,492,270	0.020 MGD	0.010 MGD
GRANDVIEW	6,756,250	0.010 MGD	0.010 MGD
Total	4,001,136,928	35.630 MGD	18.950 MGD

Figure 21 provides a summary of the allocated costs by functional cost pool along with the allocation basis, units, and resulting unit cost. Increased costs, and in some cases, reduced consumption and Qio contribute to higher unit costs (higher numerator and lower denominator).

Figure 21. Unit Cost-of-Service Summary

	Total	Treatment			Transmission		
		Fixed O&M	Variable O&M	Fixed Capital	Fixed O&M	Variable O&M	Fixed Capital
2024 Costs	\$ 12,268,817	\$ 3,190,078	\$ 540,198	\$ 5,541,572	\$ 1,761,035	\$ 543,927	\$ 692,008
Allocation Basis		QIO - Treatment	Total (gal)	QIC - Treatment	QIO - Transmission	Total (gal)	QIC - Transmission
Allocation Units		18.950 MGD	4,001,136,928	35.630 MGD	18.950 MGD	4,001,136,928	35.630 MGD
Unit Cost		\$14,028.49	\$135.01	\$12,960.92	\$7,744.22	\$135.94	\$1,618.50
		<i>per MGD of QIO / month</i>	<i>per MG</i>	<i>per MGD of QIC / month</i>	<i>per MGD of QIO / month</i>	<i>per MG</i>	<i>per MGD of QIC / month</i>

RATE DESIGN

The principal objective of the rate design stage is to implement water rate structures that collect the appropriate level of revenue. The results of the revenue requirement analysis and cost-of-service were used to inform the rate design process.

Existing Water Rates

The existing IW rates are composed of several charges assessed by different billing units:

- Monthly fixed capital charge billed per instantaneous contract demand unit (Qic).
- Monthly fixed operating charge billed per instantaneous operating demand unit (Qio).
- Monthly fixed fire charge billed per account.
- Monthly potable charge billed solely to Praxair #21.
- Consumption charge billed per million gallons (MG).
- Excess demand charge – Reviewed monthly and charged if a customer exceeds the Qio amount stated in service contracts (currently equal to 1 MGD of fixed operating charge x 12 months)

Cost-of-Service Based Rates

Generally, no rate structure changes are proposed for the IW Utility. The fixed and consumption cost components are appropriate to cover the required costs. All unit costs have been updated based on the cost-of-service analysis. The final rate adjustments for each rate component will be determined by the District annually to collect the total overall revenue needs of the system. Based on the cost-of-service results, it appears that the fixed charges could increase and the consumption charge could decrease to be more in line with cost of service results.

The one rate change identified for consideration is the elimination of the fixed fire service charge. This utility rarely provides fire service and there is currently no cost basis for this charge. Contract rates are established based on negotiated agreements as to service, terms, and rates. As previously noted, **the District may want to consider eliminating the fire charge during the next contract renewal period.**

Figure 22 provides a summary comparison of the District's existing IW Utility rates in 2023, the rates if the 21% across-the-board increase were applied, and the rates based on the updated cost-of-service unit rates. The District could adopt either the across-the-board rates or the cost-of-service based rates (or some blend of the two approaches). The 2015-16 study results also suggested larger increases to the fixed charge and decreases to the variable charge. The District-applied increases from 2022 to 2023 were primarily applied to the fixed charges (4% to the fixed capital charge, 14% to the fixed operating charge, and 0.69% to the consumption charge).

Figure 22. Existing Rates, ATB Rates, and Cost-of-Service Rates Comparison

Monthly Rates	Existing 2023	ATB 2024	% Change from Existing	COSA 2024	% Change from Existing
Cherry Point					
Fixed Capital Charge (per Qic)	\$10,488.13	\$12,690.64	21%	\$14,579.43	39%
Fixed Operating Charge (per Qio)	\$17,124.57	\$20,720.73	21%	\$21,772.70	27%
Fixed Fire Charge (per account)	\$1,124.78	\$1,360.98	21%		
Fixed Potable Charge (per account)	\$75.00	\$90.75	21%		
Consumption Rate (per MG)	\$435.03	\$526.39	21%	\$270.95	-38%
Irrigation (separate increase)					
Fixed Charge (per meter)	\$633.57	\$665.25	5%		
Consumption Charge (per MG)	\$1,431.02	\$1,502.57	5%		
Temporary (separate increase)					
Fixed Charge	\$300.00	\$315.00	5%		
Consumption Charge	\$3,150.00	\$3,307.50	5%		

The irrigation and temporary customers were not incorporated into the cost-of-service analysis.

RATE STUDY SUMMARY

The analysis described above concludes the rate study for the Industrial Water System.

The rate adjustments applied to the fixed and consumption charges will be determined by the District annually with the overall objective of collecting the total annual revenue needs of the system. One change identified for consideration is the elimination of the fixed fire service charge. This utility does not provide fire service to the industrial water utility and there is currently no cost basis for this charge. We recommend that the District revisit the study findings annually during the budget cycle to check that the assumptions used remain appropriate and to determine if the proposed rate strategy can be maintained or will need to be updated.

The District should use the study findings as a living document, continuously comparing the study outcomes to actual revenues and expenses. Any significant or unexpected changes will require adjustments to the rate strategy proposed. The detailed technical exhibits developed as part of the rate study can be found at the end of this report in the appendices.

Section V. GENERAL FACILITIES CHARGES

General Methodology

The GFC analysis uses the existing system buy-in approach, discussed in *Section II Study Methodology*. The following sections will summarize four different GFCs – three for Grandview customers (potable, non-potable, and fire) and one for Industrial Water customers.

Grandview

Overview

The Grandview fire system is closely connected to components of Industrial water. As a part of the IW system, the District operates Industrial-grade water for customers requiring fire flow and non-potable demand in areas including the Grandview-Northgate area. In 2019, the fire protection system was connected directly to the District’s Industrial Water system, which became the fire protection system’s sole source of supply with no direct connection to the Grandview-Northgate potable system. A proper calculation of the GWU system general facilities charge includes the assets of a part of the IW system that serve the Grandview fire line.

Results

The following figure shows the total cost basis, applicable functional system capacity, and the resulting charge per unit. The calculation and key inputs are detailed in **Appendix A and B**.

Figure 23. GFCs by Function – Grandview System

Description	Potable	Fire	Non-Potable: Aldergrove Line	Non-Potable: Vista Line	Non-Potable: Industrial Plant 2	Non-Potable: Total
Cost Basis	\$461,561	\$1,256,626	\$430,627	\$536,081	\$31,662,735	
Capacity	227.64 meter equivalents	115 parcels	14 MGD	2.88 MGD	18.1 MGD	
GFC per Unit	\$2,028 per meter equivalent	\$10,927 per parcel	\$30,759 per MGD	\$186,139 per MGD	\$1,749,322 per MGD	\$1,966,221 per MGD

The following bullets provide additional information for each type of GFC:

Grandview: Potable Function GFC

- **Charge:** Customers connecting to the potable water system would pay a connection charge of \$2,028 per meter equivalent.
- **Cost basis:** As shown in the appendix, capital assets, construction in progress, and interest on non-contributed capital totals about \$1.44 million, which is reduced by about \$0.98 million of contributed / donated capital. The resulting cost basis is \$0.46 million.
- **Capacity:** The resulting cost basis is divided by the estimated system capacity of 228 meter equivalents. This capacity figure is based on District staff analysis which equates current meter equivalents to current maximum gallons per minute, over a four-year period. During that period, the system averaged 50.2 meter equivalents per year, compared to a maximum month gpm of 19.85. In other words, 2.5 meter equivalents equates to 1 gpm. The utility's well can draw 90 gallons per minute, which when multiplied by 2.5 meter equivalents per gallon per minute, equates to a maximum capacity of roughly 228 meter equivalents.

Grandview: Fire Function GFC

- **Charge:** Customers connecting to the fire suppression system would pay a connection charge of \$10,927 per parcel. The charge is comprised of \$7,802 per parcel resulting from Grandview-funded assets and \$3,125 per parcel resulting from an allocation of industrial water assets. When these charges are collected, the Industrial portion of the charge should be remitted to the Industrial Water utility.
- **Cost basis:** As shown in the appendix, capital assets, construction in progress, and interest on non-contributed capital totals about \$2.85 million (\$2.20 million from capital assets, \$0.29 million from interest, and \$0.36 million from the Industrial water fire allocation), which is reduced by about \$1.59 million of contributed / donated capital. The resulting cost basis is \$1.26 million. Of that total cost basis, roughly \$0.36 million results from an allocation of the Industrial Water assets that help provide fire flow to the Grandview System (a small proportional allocation of the Aldergrove line, the Vista line, and Plant 2).
- **Capacity:** The resulting cost basis is divided by the estimated system capacity of 115 parcels. In a perfect world, the calculation would consider the unique fire flow requirements of each of the developed parcels (roughly 40 have been developed to-date, out of 115 total parcels), and perhaps extrapolate that to the remaining undeveloped parcels. That approach could acknowledge, for example, that a parcel with a fire flow requirement of 3,000 gallons per minute might pay a higher Fire GFC than a parcel with a 1,500 gallons per minute requirement. However, after conversations with District staff, it was concluded that this level of information was not available – neither for existing nor for prospective development. District staff did note that if a parcel had significant fire flow requirements, they would be required to install a fire suppression sprinkler system, which would help make that parcel's remaining fire flow requirement comparable to other parcels with lesser requirements.

Grandview Non-Potable GFC

- **Charge:** Customers connecting to the *non-potable* water system would pay a connection charge of \$1.97 million per million gallons per day. As a comparison point, the District's existing customer, Healthy Pet, is estimated to use 5,275 ccf in 2023 per the 2023 budget – this equates to

0.01 MGD. If a newly connecting customer had a similar amount of consumption, it would pay a non-potable connection charge of roughly \$20,000.

- **Cost basis:** As shown in **Appendix B**, capital assets, construction in progress, and interest on non-contributed capital (shown in the Adjusted Total line) results in \$0.44 million for the Aldergrove line, \$0.57 million for the Vista line, and \$31.98 million for Plant 2. These figures are then adjusted by the costs allocated to the Grandview fire charge. While 100% of the Vista line and Industrial Plant 2 assets were proportionally allocated to the Grandview non-potable system, it was estimated that only 20% of the Aldergrove line served the Grandview non-potable system, since the line itself extends well beyond the tie-in to the Grandview system.
- **Capacity:** Each component of the resulting cost basis has a unique limiting capacity, as shown in **Figure 24**. Based on discussions with District staff – and consulting the system plan – it was determined that the Aldergrove line had an estimated capacity of 14 MGD, the Vista line an estimated capacity of 2.88 MGD (based on 2,000 gpm for the limiting 8-inch ductile iron line that ties into the Grandview system), and the Industrial Water Plant 2 a capacity of 18.1 MGD.

Industrial Water

Overview

The District's current connection fees for the Industrial Water Utility are assessed to all new contract water utility customers. In keeping with the RCWs related to connection fees, the fees are intended as payment of the new customers' prorated share of the District's costs and investment in the assets and general facilities of the IW utility. The existing IW Utility connection fee includes four components:

- **Contract Demand Fee.** Based upon the contract demand specified in the Customer's contract. The fee is based on the cash reserve of the utility determined at the time of contract negotiations. The collected fees are added to District reserves.
- **Operating Demand Fee.** Based upon the operating demand specified in the Customer's contract. The fee is based on the IW Utility plant investment and expressed in a million gallons a day (MGD) charge. The fee is prorated based on the current established capacity.
- **Future Facilities Fee.** This fee is paid by District customers when the District requires additional investment to increase facility capacity in the IW Utility system. All customers who have new operating demand will pay their proportionate share of the costs when any customer triggers the need for expansion.
- **Special Facilities Fee.** This is the fee to be charged for any facilities built specifically for the delivery of water to a customer.

Methodology Review

The District requested a review of the current connection fee components, methodology, and equity based on FCS GROUP's experience. The following conclusions and recommendations resulted from the IW Utility connection charge review – some of these recommendations would require a renegotiation of existing contracts, and therefore, may not be feasible at this time:

- The current connection charges are consistent with the current water connection fee policy discussed in Resolution No. 375.
- Considerations related to the calculation of charges during contract renewal include:
 - » Merge the contract demand fee and operating demand fee.

- » Use the full system development charge as the reservation fee for customers who want to hold capacity even if they are not using the full capacity. This will help align the actual demand with reserve capacity requests that may not be utilized for some time.
- » When future costs are required to increase capacity (e.g., upsized transmission line) spread the upsizing of costs through all customers instead of just the customer(s) triggering the expansion.

Results

The following figure shows the total cost basis, applicable functional system capacity, and the resulting charge per unit, incorporating the recommendations noted above. The detail backup detail is shown in **Appendix C**.

Figure 24. GFCs by Function – Raw Water System

Description	Potable
Cost Basis	\$52,408,181
Capacity	28.0 MGD
GFC per MGD	\$1,871,721

The following bullets provide additional information for each component:

- **Charge:** Customers connecting to the Industrial Water system would pay a connection charge of \$1,871,721 per MGD.
- **Cost basis:** As shown in the appendix, capital assets, construction in progress, interest on non-contributed capital, and net debt principal outstanding totals about \$53.26 million, which is reduced by about \$0.85 million of contributed / donated capital. The resulting cost basis is \$52.41 million.
- **Capacity:** The resulting cost basis is divided by the estimated system capacity of 28.0 MGD. This capacity figure is based on the current limiting factors of the Industrial Water system – its transmission lines. Both lines have a capacity of 14.0 MGD each, for a combined capacity of 28.0 MGD.

Section VI. SUMMARY

GRANDVIEW RATES

The recommended rates in **Figure 25** allow the Grandview utility to accomplish the following:

- Fund existing and planned operating expenses, plus inflation;
- Replenish drawn-down operating reserves;
- Cover existing and planned debt service obligations; and
- Fund \$0.8 million in capital projects 2023-2027 (escalated dollars).

Figure 25. Annual Revenue Needs

Utility	2024	2025	2026	2027
Grandview	30.00%	30.00%	9.00%	9.00%

The District could apply these increases across-the-board and as a result maintain the existing rate structure, or as shown in **Figure 26**, apply slight cost-of-service adjustments.

Figure 26. Rate Adjustment Options for 2024

Monthly Charges	Existing 2023 Rates	2024 Across-the-Board	% Change above 2023	2024 Cost-of-Service	% Change (COSA to ATB)
Potable					
Meter Equivalent Charge (per ME)	\$78.00	\$101.40	30%	\$102.07	1%
Fixed Fire Charge (per Connection)	\$156.00	\$202.80	30%	\$204.14	1%
Volume Charge (per ccf)	\$14.33	\$18.63	30%	\$18.75	1%
Non-Potable					
Usage Charge	\$9.00	\$11.70	30%	\$11.30	-3%

INDUSTRIAL WATER RATES

The recommended rates in **Figure 27** allow the Industrial Water utility to accomplish the following:

- Fund existing and planned operating expenses, plus inflation;
- Maintain reserves at or above minimum targets;
- Cover existing and planned debt service obligations; and
- Fund \$87 million in capital projects 2023-2027 (escalated dollars).

Figure 27. Annual Revenue Needs

Utility	2024	2025	2026	2027
Industrial	21.00%	11.50%	11.50%	8.00%

The District could apply these increases across-the-board and as a result maintain the existing rate structure, or as shown in **Figure 28**, apply cost-of-service unit adjustments.

Figure 28. Rate Adjustment Options for 2024

Monthly Rates	Existing 2023	ATB 2024	% Change from Existing	COSA 2024	% Change from Existing
Cherry Point					
Fixed Capital Charge (per Qic)	\$10,488.13	\$12,690.64	21%	\$14,579.43	39%
Fixed Operating Charge (per Qio)	\$17,124.57	\$20,720.73	21%	\$21,772.70	27%
Fixed Fire Charge (per account)	\$1,124.78	\$1,360.98	21%		
Fixed Potable Charge (per account)	\$75.00	\$90.75	21%		
Consumption Rate (per MG)	\$435.03	\$526.39	21%	\$270.95	-38%
Irrigation (separate increase)					
Fixed Charge (per meter)	\$633.57	\$665.25	5%		
Consumption Charge (per MG)	\$1,431.02	\$1,502.57	5%		
Temporary (separate increase)					
Fixed Charge	\$300.00	\$315.00	5%		
Consumption Charge	\$3,150.00	\$3,307.50	5%		

GFCS

The calculated GFCs for each utility and function are shown below in **Figure 29** and represent the maximum allowable charge. The District may choose to implement a charge at any level up to the calculated charge and / or phase into these levels over time.

Figure 29. GFCs by Utility & Function

Utility & Function	Existing [a]	Calculated	Unit
Grandview: Potable	\$4,404	\$2,028	Per meter equivalent
Grandview: Fire	\$8,000	\$10,927	Per parcel
Grandview: Non-Potable	n/a	\$1,966,221	Per million gallons per day
Industrial Water	\$872,738	\$1,871,721	Per million gallons

[a] Source: "GV Connect 20.xlsx" and "RW Connection.xls"

Section VII. APPENDIX

APPENDIX A – GRANDVIEW GFC: ALLOCATING IW ASSETS

IW Assets Serving GWU Customers	Aldergrove	Vista Line (16")	Industrial Plant 2	Total
Asset Original Cost & Adjustments				
Percentage of Assets to Proportionally Recover from Grandview Non-Pot Customers	20%	100%	100%	
Asset Original Cost	\$ 1,381,723	\$ 2,511,520	\$ 23,499,861	\$ 27,393,105
plus: Interest on Non-Contributed Capital	799,458	257,597	8,480,914	9,537,970
Resulting Allocation Before Adjustments	\$ 436,236	\$ 2,769,118	\$ 31,980,776	\$ 35,186,129
Less: Outstanding Debt Principal	-	(1,397,298)	-	(1,397,298)
Less: Grants	-	(800,000)	-	(800,000)
Resulting Allocation After Adjustments	\$ 436,236	\$ 571,820	\$ 31,980,776	\$ 32,988,831
Total Capacity				
Total Capacity (MGD)	14.00	2.88	18.10	MGD
Total Capacity (gallons per minute)	9,722	2,000	12,569	GPM
Total Capacity (gallons per day)	14,000,000	2,880,000	18,100,000	GPD
Fire Suppression Needs				
Amount for Fire Flow (gpm)	1,500	1,500	1,500	GPM
Duration for Fire Suppression Need (hours)	2.00	2.00	2.00	Hours
Total Gallons per Fire Event	180,000	180,000	180,000	Gallons
Percentage for Fire Flow	1.3%	6.3%	1.0%	
Percentage for Non Fire Flow (Non Potable)	98.7%	93.8%	99.0%	
Total	100.0%	100.0%	100.0%	
Cost for Fire Flow	\$ 5,609	\$ 35,739	\$ 318,041	\$ 359,388
Cost for Non Fire Flow (Non Potable)	430,627	536,081	31,662,735	32,629,443
Total	\$ 436,236	\$ 571,820	\$ 31,980,776	\$ 32,988,831
Total Capacity of the Aldergrove Line (MGD) -- Assumed to be Limiting Capacity	14.00	2.88	18.10	
Non-Potable Connection Charge for Customers in Grandview, Connected to IW System, per 1.0 MGD	\$ 30,759	\$ 186,139	\$ 1,749,322	\$ 1,966,221
Non-Potable Connection Charge for Customers in Grandview, Connected to IW System, per 0.01 MGD	308	1,861	17,493	19,662

APPENDIX B – GRANDVIEW GFC RESULTS

EXISTING COST BASIS	Potable	Fire	Total	Non-Potable: Aldergrove Line	Non-Potable: Vista Line	Non-Potable: Industrial Plant 2	Total
Grandview Assets							
Utility Capital Assets	\$ 1,253,662	\$ 2,195,442	\$ 3,449,103				
plus: Construction Work-In-Progress	27,993	-	27,993				
less: Contributed Capital	(982,461)	(1,590,194)	(2,572,655)				
plus: Interest on Non-Contributed Capital	162,367	291,989	454,356				
Total	\$ 461,561	\$ 897,237	\$ 1,358,798				
Industrial Water Assets							
Utility Capital Assets				\$ 1,381,723	\$ 2,511,520	\$ 23,499,861	\$ 27,393,105
plus: Interest on Non-Contributed Capital				799,458	257,597	8,480,914	9,537,970
less: Outstanding Debt Principal				-	(1,397,298)	-	(1,397,298)
less: Grants				-	(800,000)	-	(800,000)
Total		\$ 359,388	\$ 359,388	\$ 2,181,181	\$ 571,820	\$ 31,980,776	\$ 34,733,776
Percentage of Assets to Proportionally Recover from Grandview Non-Pot Customers				20%	100%	100%	
Adjusted Total				\$ 436,236	\$ 571,820	\$ 31,980,776	\$ 32,988,831
Less: Costs Allocated to the Fire Function				(5,609)	(35,739)	(318,041)	(359,388)
				430,627	536,081	31,662,735	32,629,443
Grand Total (Grandview + Industrial Water)	\$ 461,561	\$ 1,256,626	\$ 1,718,186	\$ 430,627	\$ 536,081	\$ 31,662,735	\$ 32,629,443

Capacity	Potable [a]	Fire [b]	Non-Potable: Aldergrove Line [c]	Non-Potable: Vista Line [d]	Non-Potable: Industrial Plant 2 [e]	Total
System Capacity by Function	227.64 meter equivalents	115.00 parcels	14.00 MGD	2.88 MGD	18.10 MGD	

Calculated Charge	Potable	Fire	Non-Potable: Aldergrove Line	Non-Potable: Vista Line	Non-Potable: Industrial Plant 2	Total
Grandview Portion	\$2,028	\$7,802	\$0	\$0	\$0	\$0
Industrial Wastewater Portion	\$0	\$3,125	\$30,759	\$186,139	\$1,749,322	\$1,966,221
Total	\$2,028	\$10,927	\$30,759	\$186,139	\$1,749,322	\$1,966,221
	per meter equivalent	per parcel	per MGD	per MGD	per MGD	per MGD

APPENDIX C - RAW WATER GFC

EXISTING COST BASIS	Total
Utility Capital Assets	\$ 41,073,398
plus: Construction Work-In-Progress	1,256,914
less: Contributed Capital	(854,780)
plus: Interest on Non-Contributed Capital	15,650,272
2023 Outstanding Debt Principal	(12,483,691)
2023 Cash Balances	7,766,068
less: Net Debt Principal Outstanding	(4,717,622)
Grand Total	\$ 52,408,181

Capacity	Total
System Capacity [a]	28.0 MGD

Calculated Charge	
Industrial Water Charge per MGD	\$1,871,721

APPENDIX D – GRANDVIEW FORECAST SUMMARY

Revenue Requirement - Fund 411	2023	2024	2025	2026	2027
Revenues @ Existing Rates					
Rate Revenues Under Existing Rates	\$ 266,491	\$ 266,491	\$ 266,491	\$ 266,491	\$ 266,491
Non-Rate Revenues	162,217	163,394	160,276	142,817	78,914
Total Revenues	\$ 428,709	\$ 429,885	\$ 426,768	\$ 409,308	\$ 345,406
Expenses					
Cash Operating Expenses	\$ 213,221	\$ 236,239	\$ 261,081	\$ 294,243	\$ 319,400
Existing Debt Service	225,995	222,949	219,902	216,855	213,808
New Debt Service	25,200	24,840	24,480	24,120	23,760
Rate Funded Capital	-	-	-	-	-
Total Expenses	\$ 464,416	\$ 484,027	\$ 505,464	\$ 535,218	\$ 556,969
Net Surplus (Deficiency)	\$ (35,707)	\$ (54,142)	\$ (78,696)	\$ (125,910)	\$ (211,563)
Additions to Meet Coverage	-	-	-	-	-
Total Surplus (Deficiency)	\$ (35,707)	\$ (54,142)	\$ (78,696)	\$ (125,910)	\$ (211,563)
Annual Rate Increase		30.00%	30.00%	9.00%	9.00%
Cumulative Rate Increase		30.00%	69.00%	84.21%	100.79%
Rate Revenues After Rate Increase	\$ 266,491	\$ 339,777	\$ 441,710	\$ 487,526	\$ 531,403
Incremental Rate Revenues (Compared with 2015)	\$ -	\$ 73,285	\$ 175,218	\$ 221,035	\$ 264,912
Additional Taxes from Rate Increase	\$ -	\$ 3,686	\$ 8,812	\$ 11,116	\$ 13,322
Net Cash Flow After Rate Increase	(35,707)	15,458	87,711	84,009	40,027
Coverage After Rate Increase: Revenue Bonds Only	n/a	n/a	n/a	n/a	n/a
Coverage After Rate Increase: All Debt	0.91	1.10	1.39	1.38	1.20
	208,434.20	153,308.99	112,160.05	145,657.19	158,937.27
Fund Balances - Fund 411					
OPERATING FUND					
Beginning Balance	\$ 24,745	\$ 7,038	\$ 22,195	\$ 45,417	\$ 50,869
plus: Net Cash Flow after Rate Increase	(35,707)	15,458	87,711	84,009	40,027
plus: Transfers In	18,000	-	-	-	-
less: Transfers Out	-	(300)	(64,489)	(78,558)	(35,891)
Ending Balance	\$ 7,038	\$ 22,195	\$ 45,417	\$ 50,869	\$ 55,004
<i>Minimum Target Balance</i>	\$ 37,550	\$ 41,334	\$ 45,417	\$ 50,869	\$ 55,004
CAPITAL FUND					
Beginning Balance	\$ 313,808	\$ 201,396	\$ 131,113	\$ 66,743	\$ 94,788
plus: Rate Funded Capital	-	-	-	-	-
plus: Transfers In	-	-	64,189	78,258	35,591
less: Transfers Out	-	-	-	-	-
plus: Capital Grants / Contributions / Other Expenses	-	-	-	-	-
plus: GFC Revenue Towards Capital	-	-	-	-	-
plus: Net Debt Proceeds	360,000	-	-	-	-
plus: Interest Earnings	12,664	9,854	8,097	6,488	7,189
less: Capital Expenditures	(485,076)	(80,137)	(136,656)	(56,700)	(33,635)
Ending Balance	\$ 201,396	\$ 131,113	\$ 66,743	\$ 94,788	\$ 103,933
<i>Minimum Target Balance</i>	\$ 59,289	\$ 60,491	\$ 62,541	\$ 63,392	\$ 63,896
EMERGENCY RESERVE					
Beginning Balance	\$ 18,000	\$ -	\$ 300	\$ 600	\$ 900
plus: Transfers In	-	300	300	300	300
less: Transfers Out	(18,000)	-	-	-	-
Ending Balance	\$ -	\$ 300	\$ 600	\$ 900	\$ 1,200
<i>Minimum Target Balance</i>	\$ -	\$ -	\$ -	\$ -	\$ -
DEBT RESERVE FUNDS					
Beginning Balance	\$ 192,765	\$ 192,765	\$ 192,765	\$ 192,765	\$ 192,765
plus: Reserve Funding from New Debt	-	-	-	-	-
less: Use of Reserves for Debt Service	-	-	-	-	-
Ending Balance	\$ 192,765	\$ 192,765	\$ 192,765	\$ 192,765	\$ 192,765
<i>Minimum Target Balance</i>	\$ -	\$ -	\$ -	\$ -	\$ -

APPENDIX E – INDUSTRIAL FORECAST SUMMARY

Revenue Requirement - Fund 403	2023	2024	2025	2026	2027
Revenues @ Existing Rates					
Rate Revenues Under Existing Rates	\$ 10,139,518	\$ 10,139,518	\$ 10,139,518	\$ 10,139,518	\$ 10,139,518
Non-Rate Revenues	428,610	394,007	464,609	491,408	546,941
Total Revenues	\$ 10,568,127	\$ 10,533,525	\$ 10,604,127	\$ 10,630,926	\$ 10,686,459
Expenses					
Cash Operating Expenses	\$ 6,200,127	\$ 6,280,425	\$ 6,393,700	\$ 6,765,486	\$ 6,925,863
Existing Debt Service	1,965,374	1,963,319	1,604,602	1,602,118	1,598,329
New Debt Service	-	2,497,109	2,497,109	6,331,955	6,331,955
Rate Funded Capital	2,200,000	1,500,000	2,500,000	2,500,000	2,500,000
Total Expenses	\$ 10,365,501	\$ 12,240,853	\$ 12,995,411	\$ 17,199,560	\$ 17,356,147
Net Surplus (Deficiency)	\$ 202,626	\$ (1,707,328)	\$ (2,391,284)	\$ (6,568,633)	\$ (6,669,688)
Additions to Meet Coverage	-	-	-	-	-
Total Surplus (Deficiency)	\$ 202,626	\$ (1,707,328)	\$ (2,391,284)	\$ (6,568,633)	\$ (6,669,688)
Annual Rate Increase		21.00%	11.50%	11.50%	8.00%
Cumulative Rate Increase		21.00%	34.92%	50.43%	62.46%
Rate Revenues After Rate Increase	\$ 10,139,518	\$ 12,091,375	\$ 13,562,154	\$ 15,121,802	\$ 16,371,445
Incremental Rate Revenues (Compared with 2015)	\$ -	\$ 1,951,857	\$ 3,422,636	\$ 4,982,284	\$ 6,231,928
Additional Taxes from Rate Increase	\$ -	\$ 98,159	\$ 172,124	\$ 250,559	\$ 313,404
Net Cash Flow After Rate Increase	202,626	146,370	859,228	(1,836,908)	(751,164)
Coverage After Rate Increase: Revenue Bonds Only	n/a	2.48	3.23	1.38	1.65
Coverage After Rate Increase: All Debt	2.27	1.39	1.97	1.10	1.32

Fund Balances - Fund 403	2023	2024	2025	2026	2027
OPERATING FUND					
Beginning Balance	\$ 3,459,822	\$ 2,831,448	\$ 2,974,818	\$ 3,831,047	\$ 1,991,138
plus: Net Cash Flow after Rate Increase	202,626	146,370	859,228	(1,836,908)	(751,164)
plus: Transfers In	19,000	-	-	-	-
less: Transfers Out	(850,000)	(3,000)	(3,000)	(3,000)	(39,976)
Ending Balance	\$ 2,831,448	\$ 2,974,818	\$ 3,831,047	\$ 1,991,138	\$ 1,199,998
<i>Minimum Target Balance</i>	<i>\$ 1,080,699</i>	<i>\$ 1,093,899</i>	<i>\$ 1,112,519</i>	<i>\$ 1,173,635</i>	<i>\$ 1,199,998</i>
CAPITAL FUND					
Beginning Balance	\$ 3,284,138	\$ 3,079,667	\$ 21,193,377	\$ 1,522,408	\$ 24,110,042
plus: Rate Funded Capital	2,200,000	1,500,000	2,500,000	2,500,000	2,500,000
plus: Transfers In	850,000	-	-	-	36,976
less: Transfers Out	-	-	-	-	-
plus: Capital Grants / Contributions / Other Expenses	617,000	65,000	65,000	65,000	65,000
plus: GFC Revenue Towards Capital	-	-	-	-	-
plus: Net Debt Proceeds	-	28,000,000	-	43,000,000	-
plus: Interest Earnings	102,356	97,244	612,515	120,741	781,303
less: Capital Expenditures	(3,973,827)	(11,548,535)	(22,848,484)	(23,098,106)	(25,182,302)
Ending Balance	\$ 3,079,667	\$ 21,193,377	\$ 1,522,408	\$ 24,110,042	\$ 2,311,019
<i>Minimum Target Balance</i>	<i>\$ 896,090</i>	<i>\$ 1,069,318</i>	<i>\$ 1,412,045</i>	<i>\$ 1,758,517</i>	<i>\$ 2,136,252</i>
DEBT RESERVE FUNDS					
Beginning Balance	\$ 810,108	\$ 810,108	\$ 3,307,217	\$ 3,307,217	\$ 7,142,063
plus: Reserve Funding from New Debt	-	2,497,109	-	3,834,846	-
less: Use of Reserves for Debt Service	-	-	-	-	-
Ending Balance	\$ 810,108	\$ 3,307,217	\$ 3,307,217	\$ 7,142,063	\$ 7,142,063
<i>Minimum Target Balance</i>	<i>\$ -</i>	<i>\$ -</i>	<i>\$ -</i>	<i>\$ -</i>	<i>\$ -</i>