CITY OF

FAIR OAKS RANCH

Water and Wastewater Cost of Service

Draft Report / February 2022

RAFTELIS

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February 18, 2022

Mr. Tobin Maples
City Manager
City of Fair Oaks
7286 Dietz Elkhorn
Fair Oaks Ranch, TX 78015

Subject: Water, Wastewater and Reuse Rate Update Study

Dear Mr. Maples,

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to provide this Water, Wastewater and Reuse Rate Update Study Report (Report) for The City of Fair Oaks (City). The Report summarizes the key study findings and recommendations.

The critical outcomes of the study include the following:

1. A **financial plan** which establishes the level of revenues necessary to sustainably fund the ongoing provision of safe and reliable water service.
2. A **cost-of-service analysis** which assigns responsibility for water and wastewater utility costs to customer classes, based on how each class uses the City's water and wastewater systems.
3. **Rate recommendations** which involve adjusting the City's water and wastewater rates so that they reasonably align with each class's cost of service and achieve the City's objectives.

This report summarizes our key findings and recommendations related to the development of the financial plan, cost of service analysis and rate recommendations.

This report represents the culmination of several months of work, not only on behalf of the Raftelis project team, but also the Rate Advisory Panel and City staff as well. We truly appreciate you and your staff's responsiveness both in providing the information needed to complete the study and providing helpful feedback on study deliverables. It has been a pleasure working with you, and we thank you and City staff for the support provided during the course of this study.

Sincerely,

Angie Flores

Angie Flores
Senior Manager

3755 S Capital of Texas Hwy, Suite 155
Austin, Texas 78704
www.raftelis.com

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Executive Summary

Introduction

The City retained Raftelis Financial Consultants, Inc. (Raftelis) to complete a Water, Wastewater and Reuse Rate Update Study (Study) to determine the necessary level of rate revenue required to meet annual operating expenses, payments on existing and proposed debt service, fund the capital improvement program while maintaining financial performance metrics. The primary Study objectives were to:

- Develop water and wastewater financial plans for the 10-year study period, 2023 through 2032.
- Analyze costs of providing water and wastewater service to customer classes.
- Determine water and wastewater rate adjustments for 2023 through 2028 to generate sufficient revenue to meet annual revenue requirements, sustain adequate cash reserves, and sustain debt service coverage.

This Report provides our Study assumptions, findings and recommendations. The Appendix to the report includes calculations supporting the Study findings.

Background

The City of Fair Oaks Ranch provides service to approximately 3,500 water and wastewater accounts. The City's water and wastewater utilities are part of an enterprise fund that is financially self-sufficient. They are financially self-sufficient with funding for capital and operating requirements derived primarily from rates, impact fees, interest income, and other miscellaneous sources.

Operations and Maintenance (O&M), repair and replacement of depreciating assets (RR&D), Capital Improvement Plan (CIP), debt service reserves and expenses are recovered through the City's monthly water and wastewater user charges. Capital expenses are funded with cash and bond proceeds. User charge revenue is designed to meet revenue requirements, debt service coverage, and maintain appropriate reserves.

Financial Plan Findings and Recommendations

Raftelis developed a financial plan that forecasts costs based on the assumptions outlined below. The financial plan provides the City with a roadmap for maintaining the financial sustainability of the utility. It is important to understand that the financial plan is based on a certain set of assumptions and any changes to the assumptions will require a re-evaluation of the forecast. It is recommended that the financial plan be reviewed each budget year for accuracy. Any changes that may affect the assumptions may require adjustments to rates or the revenue requirement.

ASSUMPTIONS

Raftelis incorporated the following key assumptions into the financial planh. Changes in these assumptions could have a material effect on study findings.

- The number of accounts for different customer classes increase on average as follows:
    - Residential average increase 2%
    - Commercial average increase 0%
- Water and Wastewater Fees are calculated using the basis developed and used by the City. The fees include:
    - Texas Commission on Environmental Quality (TCEQ) Regulatory Fee
    - Debt Service Fee

    - Capital Reserve Fee
    - Surface Water Fee
- Operations and Maintenance Expenses
    - Based on FY 2022 Budget
    - O&M costs are anticipated to increase at 3% annually
    - Forecast considers savings anticipated from purchase of sludge press
    - Guadalupe-Blanco River Authority (GBRA) costs are anticipated to increase 4% annually
- Capital Expenses
    - Impact Fees are assumed to cash-fund impact-fee eligible projects
    - Capital Reserve used to cash-fund capital, assets and other investments
    - Equipment Replacement Fund used to cash-fund equipment and vehicle replacement
    - Any remaining capital expenses are assumed to be bond funded
        - Proposed debt service is based on 4% annual interest rate, 20-year term, 1% issuance costs, and debt service reserve equal to average annual debt service payment.
- The water and wastewater utility will maintain the following minimum reserves:
    - Operating reserve of 365 days of annual operation and maintenance expense (O&M)
    - Capital Reserve Fund funded with revenues from Capital Reserve Fee
    - Repair and Replacement Fund funded based on annual depreciation of certain assets

FINANCIAL POLICIES

Raftelis reviewed the City's current financial policies to determine how they compare to industry policies. Financial policies can help ensure long-term stability so that the utility is able to maintain operations when unexpected problems arise. Financial policies can also guide future financial and rate decisions. Since each utility has unique operations and service characteristics, there is no "one size fits all" with respect to financial policies. The number one guidance for financial policies is that a City have an adopted financial policy document, which the City does have. At this time, Raftelis does not have any recommendations for changes to the policy. The financial planning model considers and maintains the current financial policies.

Key Finding: Current wastewater revenue levels are insufficient to sustainably fund the ongoing provision of safe and reliable wastewater service. On the other hand, water revenue levels are sufficient to fund water operations.

Recommendations: Raftelis recommends overall rate revenue adjustments of 50% in FY 2023.

Key Finding: Current water revenue levels are sufficient to fund future costs of the utility assuming service fees to recover forecasted debt service and capital reserve funding are set to recover future needs.

Recommendations: Raftelis recommends that the City continue to calculate the required Service Fees based on future costs.

Cost-of-Service Findings and Recommendations

Raftelis completed a cost-of-service study based on industry standards. The cost-of-service study uses processes that ensure costs will be allocated to each customer class based on the proportionate demands that they impose on the water and wastewater systems. The standards used to develop the cost of service are well established in the water and wastewater industry. For water, the cost-of-service process follows a multi-step allocation based on the methodologies published by the American Water Works Association (AWWA) in *Manual of Water Supply Practices M1, Principles of Water Rates, Fee, Charges* (Manual M1). For wastewater, a multi-step cost allocation process is based on methodologies published by the Water Environment Federation (WEF) in *Manual of Practice No. 27, Financing and*

Charges for Wastewater Systems. The City has residential and commercial customer classes for both water and wastewater.

Key Finding: For water, each customer class is covering their costs with small variances for each class.

Recommendations: Raftelis recommends that each calculated rate be based on the cost of service for each class.

Key Finding: For wastewater, rate changes should be based on the cost of service for the residential and commercial customer classes. As mentioned above, current wastewater revenues are under-recovering the cost of the wastewater utility.

Recommendation: Raftelis recommends that the wastewater rates be based on the cost of service.

Rate Design Findings and Recommendations

Once the cost of service is determined for each utility and customer class, the City can recover the revenue needed based on a rate design that meets its goals and objectives. To determine the goals and objectives of the City and the community, Raftelis held a Pricing Objectives Workshop with the City Council and the City's Rate Advisory Panel. The Rate Advisory Panel was appointed by City Council and included various representatives from around the City. It included 18 total members, all of which are current utility customers. The Rate Advisory Panel met four times where they were presented information about the rate study process, results of the cost-of-service and rate design scenarios. Through these meetings the members provided feedback throughout the rate study process and more importantly on the proposed rate design.

An important first step of rate design is the Pricing Objectives Workshop. Through the Pricing Objectives Workshop, the following were identified as the most important objectives by the Council and also by the Panel:

- Revenue Stability
- Equity between Classes
- Minimize Customer Impacts
- Conservation Pricing Signal

While each of these objectives were considered, there were some instances in which some could not be achieved because they conflicted with others. For example, a rate design that sends a conservation pricing signal could result in very large bill impacts for higher water users.

From an industry perspective, a utility has wide latitude on how to recover its costs through its rate structures.
In developing the rate structures for your consideration, Raftelis considered these objectives in conjunction with historical consumption patterns of the City's customers. In addition, the current rate structures were evaluated to determine how well they met each objective.

In considering a potential change to the City's rate design, the City Council commissioned an Advisory Panel made up of 18 residents that represent various areas of the City. The Advisory Panel met four times where they were presented information about the rate study process, results of the cost-of-service and rate design scenarios. Raftelis presented three scenarios for water and wastewater rates. **Table 1** and **Table** 2 show the three scenarios that were presented to the Advisory Panel. Each scenario considers the cost-of-service analysis and the pricing objectives. As identified below, the water scenarios address three of the pricing objectives. Although the minimizing customer

impact is not identified as being addressed in scenarios 2 and 3 for water, lower water users might see a smaller impact than higher users with the adjusted tiers. For wastewater, because of the rate increases needed, all customers will see an increase in rates. The Advisory Panel recommended Scenario 2 for consideration by the City Council.

Table 1: Water Scenarios

Scenario 1	Scenario 2	Scenario 3
Maintain Current Rate Structures: Service Availability Charges, Water Service Fees and Volumetric Fees	Adjust Service Availability Charges to reflect Industry Meter Factors related to Meter Sizes Maintain Water Service Fees Adjust Volumetric Charges by charging for all usage and adjust tiers to encourage conservation (Different for residential and commercial)	Adjust Service Availability Charges to reflect Industry Meter Factors Eliminate Debt Service and Capital Reserve Fees (continue to maintain capital reserve) Adjust Volumetric Charges by charging for all usage, collect costs recovered in Water Service Fees and adjust tier to encourage conservation
Pricing Objectives: Revenue Stability, Minimize Customer Impacts	Pricing Objectives: Revenue Stability, Equity between Classes and Conservation Pricing Signals	Pricing Objectives: Revenue Stability, Equity between Classes and Conservation Pricing Signals

Table 2: Wastewater Scenarios

Scenario 1	Scenario 2	Scenario 3
Maintain Current Rate Structures: Service Availability Charges, Water Service Fees and Volumetric Fees Reflect Rate Increases required to meet costs	Base Rate is adjusted to recover customer service costs Maintain all Wastewater Service Fees Adds a Uniform Volumetric Rate for Average Winter Consumption	Same as Scenario 2 but eliminates Debt Service Fee and Capital Reserve Fee (continue to maintain capital reserve) Adjust Volumetric Rate to recover costs previously recovered in the Debt Service and Capital Reserve Fees
Pricing Objectives: Revenue Stability	Pricing Objectives: Revenue Stability and Equity between Classes	Pricing Objectives: Revenue Stability and Equity between Classes

RECOMMENDED RATES

The proposed rates are identified in **Table 3** and **Table 4**. Residential and Commercial customer classes will continue to pay the same Service Availability Charges and Water Service Fees. The Water and Wastewater Service Fees are calculated annually based on forecasted costs. Water volumetric fees will differ between residential and commercial. For wastewater, the rates for residential and commercial will be the same. Average Winter Consumption will be based on water usage in the months of December, January and February.

Table 3: Water Rates

Service Availability Charges by Meter Size	
¾”	$20.00
1”	$33.40
1 ½”	$66.60
2”	$106.00
3”	$200.00
4”	$333.40

Water Service Itemized Fees	
Surface Water Fee	$14.25
TCEQ Fee	$0.20
Debt Service	$7.43
Capital Reserve	$6.72
Total	$28.60

Residential Tiered Volume Charges	
Usage (in 1,000 gallons)	$/1,000 gallons
0 – 7	$2.17
7 – 17	$2.82
17 – 30	$6.51
30 – 50	$8.67
50+	$10.84

Commercial Tiered Volume Charges	
Usage (in 1,000 gallons)	$/1,000 gallons
0 – 10	$3.28
10 – 30	$4.26
30+	$6.55

Table 4: Wastewater Rates

Service Availability Charges	
All Meters	$28.94

Wastewater Service Itemized Fees	
TCEQ Fee	$0.05
Debt Service	$2.30
Capital Reserve	$4.12
Total	$6.47

Wastewater Volume Charge

Usage (based on Average Winter Consumption)	Rate Per 1,000 Gallons
All Gallons	$6.00

Financial Plan

The City's water and wastewater fund is a self-supporting enterprise fund. This section presents the financial plan forecast for the operating fund for the 10-year study period, FY 2023 through FY 2033. The illustrations in this report will focus on a five-year forecast period of FY 2023 – FY 2028.

The primary objective of the financial plan involves comparing forecasted utility revenues under existing rates to forecasted expenditures and determining what annual adjustments to revenues are necessary to ensure the financial sustainability of the water and wastewater utility going forward. This involves three steps:

1. Forecast revenue under existing rates
2. Forecast utility operating expenses and capital expenditures
3. Evaluate the sufficiency of existing revenues and adjustments needed to fund utility expenditures in a financially sustainable fashion

In developing the financial planning model, the revenue requirements of the overall enterprise fund were allocated between water and wastewater. This allocation is important for determining whether each utility is self-sustaining. While some of the costs of the utility are tracked at the direct expense level, other shared expenses require allocation between water and wastewater. In those instances, industry practices were used to allocate costs. While this allocation is important for the overall rate study, it is equally important to consider the combined utility when considering financial metrics. For reporting purposes, the City presents the enterprise fund as a combined utility.

The operating fund tracks financial activities associated with operations and maintenance of the water and wastewater systems and funding for the capital improvement program. The utility has several sub-funds of the operating fund that are used to fund capital expenditures. The funds include the Capital Reserve Fund, Impact Fee Fund, and the Equipment Replacement Fund. This Report will be focused on the overall operating fund which includes the sub-fund activities.

Evaluating financial sustainability involves two key financial performance metrics: days expenditures and a debt service coverage ratio. Raftelis recommends the City continue to maintain a goal of 365 days O&M Expenditures and at least 1.0 times debt service coverage ratio, as required by its current Financial Management Policy and bond requirements. Days Expenditures is a measure of the ability of the utility to deal with unanticipated declines in revenue or emergency expenditures without reducing service quality or dramatically increasing rates. A Debt Service Coverage Ratio is a measure of how much current revenues exceed current debt service obligations, after operating expenses have been funded. A ratio above one indicates that current net revenues (operating revenues less expenses) are sufficient to meet current debt service obligations with room to spare for unforeseen emergencies. A ratio of less than one would mean that the utility does not have sufficient current revenues to cover operating expenses and meet debt service payment obligations. Coverage requirements vary by the type of debt issued, bond covenants and ratings agency criteria, but the financial plans developed for the City are based on maintaining a minimum 1.0 times debt service coverage ratio. Raftelis considered the City's current financial policies and provided the memo attached to this report in Attachment A.

In **Table 5** the results of the financial planning analysis are shown. The forecast shows that the debt service coverage and operating reserve targets are met based on the assumptions in the financial plans described in the subsequent sections.

Table 5: Revenue Sufficiency – Combined Utility

	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027
Beginning Balance	$ 4,189,251	$ 4,932,948	$ 5,663,727	$ 6,381,616	$ 7,076,247
Revenue from Rates					
Revenue from Rates	$ 5,734,642	$ 6,272,178	$ 7,261,460	$ 8,109,223	$ 8,775,388
Impact Fees	566,511	567,453	568,414	569,395	570,396
Miscellaneous Revenue	321,357	321,357	321,357	321,357	321,357
Total	$ 6,622,510	$ 7,160,988	$ 8,151,230	$ 8,999,974	$ 9,667,141
Revenue Requirement					
O&M	$ 4,434,232	$ 4,567,259	$ 4,704,277	$ 4,845,405	$ 4,990,768
Debt Service					
Existing	$ 339,746	$ 336,514	$ 338,256	$ 334,974	$ 336,666
Proposed	84,118	505,576	1,370,504	2,095,515	2,630,402
Subtotal	$ 423,863	$ 842,090	$ 1,708,760	$ 2,430,489	$ 2,967,068
Transfers					
Cash-Funded Capital	$ (0)	$ -	$ -	$ -	$ -
Capital Reserve Fund	398,959	406,805	414,808	422,972	431,298
Impact Fee Fund	566,511	567,453	568,414	569,395	570,396
Equipment Replacement Fund	55,247	46,601	37,082	37,082	29,937
Subtotal	$ 1,020,717	$ 1,020,859	$ 1,020,304	$ 1,029,448	$ 1,031,632
Total Revenue Requirement	$ 5,878,813	$ 6,430,208	$ 7,433,341	$ 8,305,343	$ 8,989,468
Ending Balance	$ 4,932,948	$ 5,663,727	$ 6,381,616	$ 7,076,247	$ 7,753,920
Operating Reserve Target	$ 4,434,232	$ 4,567,259	$ 4,704,277	$ 4,845,405	$ 4,990,768
Debt Service Coverage	5.16	3.08	2.02	1.71	1.58
Debt Service Coverage Target	1.00	1.00	1.00	1.00	1.00

Water Financial Plan

Although the enterprise fund includes both the water and wastewater utilities, for purposes of the rate study, the revenue requirements for each utility were determined. As described above, this was done by considering the direct expenses of each utility and then allocating any shared expenses based on City staff input or industry practices. The Water Financial Plan considers the allocation to the water system. Debt Service is based on capital expenditures related to water only.

SOURCES OF FUNDS

Water revenue is derived from water rates, water impact fee revenue, miscellaneous revenues, and investment income. Rates account for 86% of the current water revenue for the year 2022 and 14% of revenue comes from impact fee and miscellaneous revenues. The City's existing rate structure is composed of service availability charges by meter size, water service fees and volumetric rates. The water service fees are shown in **Table 6**. The water service fees are calculated each year. The model follows the same assumptions where the fees are adjusted based on future estimated surface water, debt service and capital reserve costs.

Water service revenue in the financial planning model is based on water customer consumption and a detailed analysis of historical utility billing records and discussions with City staff. The number of residential accounts is projected to grow 2% per year on average. There is no growth forecasted for the commercial class. Impact Fee revenue is based on estimates provided by City staff. Investment income is calculated using a 0.5 percent annual interest rate applied to the average annual operating fund balance. Miscellaneous revenues are held constant.

Table 6: Water Service Itemized Fees

Fee	Purpose
Surface Water Fee	Recover a portion of the cost of GBRA water
Texas Commission on Environmental Quality Fee	Recover the TCEQ Regulatory Fee
Debt Service Fee	Recover Debt Service Payment
Capital Reserve Fee	Contribution to Capital Reserve

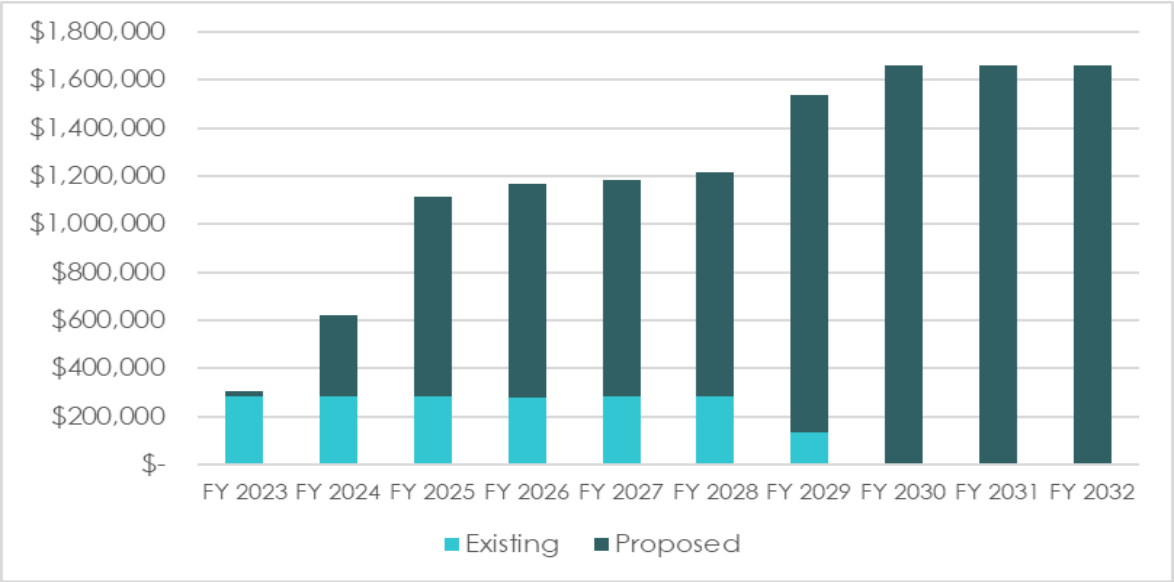
REVENUE REQUIREMENTS

Operations and Maintenance (O&M) costs, debt service on existing and proposed bonds, and transfers to other funds comprise operating fund revenue requirements. O&M consists of personnel, materials, supplies, and contractual services to supply, treat, and distribute water to water customers. An annual inflation allowance of 3% has been included in O&M projections. One of the highest O&M costs to the water utility is the cost of water purchased from the GBRA. O&M costs also include transfers to the General Fund for shared expenses.

Debt service includes principal and interest payments on existing certificates of obligation bonds, and proposed revenue bonds. Currently the water system is paying debt service on one outstanding debt issue, which will be paid off in FY 2029. The City is projected to issue debt to fund capital projects, totaling approximately $20 million, identified in the City's 5-year Water, Wastewater and Reuse Capital Improvement Plan. **Figure 1** illustrates the existing and proposed debt service projections over the study period. The proposed debt service is reduced by cash-funding from the Impact Fee Fund, Capital Reserve Fund and Equipment Replacement Fund. The Impact Fee Fund is funded with impact fee revenue. The Capital Reserve Fund is funded through revenue collected from the Capital Reserve Fee and the Equipment Replacement Fund is funded with rates.

Financial metrics are measured at the combined utility level, as mentioned above. For purposes of generating sufficient revenue to maintain the operating reserve and coverage goals, the revenue requirement for water includes any shortfalls for the water financial metric goals.

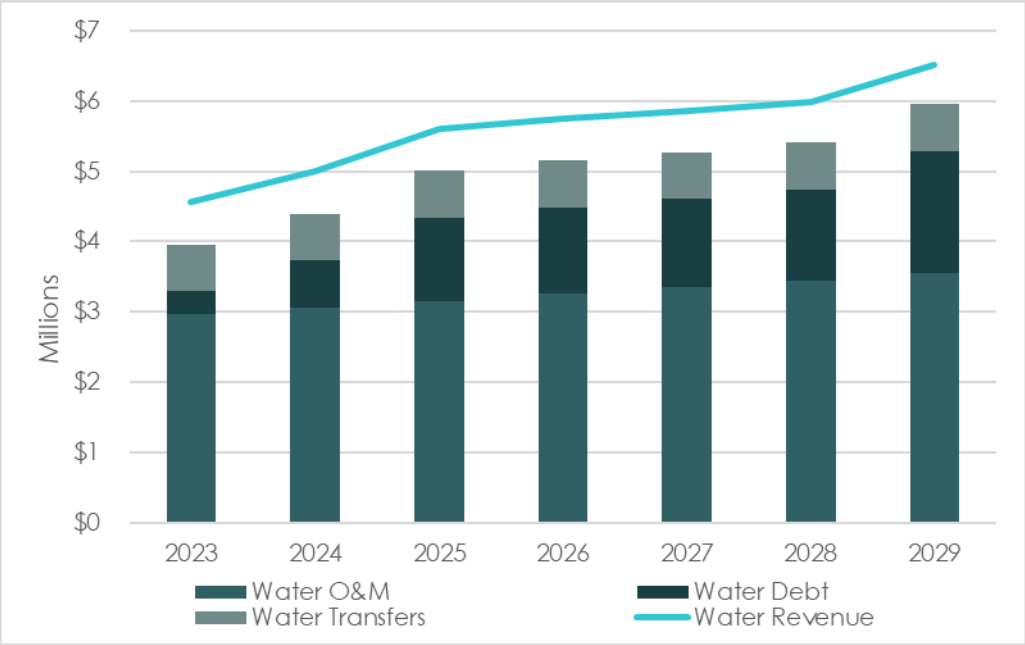
Figure 1: Water Debt Service Projections



REVENUE SUFFICIENCY

The final step in the financial planning process involves compiling a cash-flow forecast which identifies the revenue adjustments necessary to ensure financial sustainability. As indicated by **Figure 2** current revenue levels are sufficient to sustainably fund the ongoing provision of safe and reliable water. The increase in revenue is driven by increases in growth and increases to the Water Services Fees based on forecasted increases in the costs related to those fees.

Figure 2: Water Revenue Sufficiency



Wastewater Financial Plan

As with Water, the revenue requirements of the wastewater system were determined by allocating the costs between the water and wastewater systems. Debt service was based on capital expenditures related to the wastewater system only.

SOURCES OF FUNDS

Wastewater revenue is derived from wastewater rates, wastewater impact fee revenue, miscellaneous revenues, and investment income. 77% of the current wastewater revenue for the year 2022 comes from rates and 24% comes from impact fee and miscellaneous revenues. The City's existing rate structure is composed of service availability charges and wastewater service fees. Currently, the wastewater rates do not include a volumetric charge. The wastewater service fees are shown in **Table 7**. Like water, the wastewater service fees are calculated each year. The model follows the same assumptions where the fees are adjusted based on future estimated, debt service and capital reserve costs.

Wastewater service revenue in the financial planning model is based on the current rate structure. The number of residential accounts is projected to grow two percent per year on average. There is no growth forecasted for the commercial class.

Table 7: Wastewater Service Itemized Fees

Fee	Purpose
Texas Commission on Environmental Quality Fee	Recover the TCEQ Regulatory Fee
Debt Service Fee	Recover Debt Service Payment
Capital Reserve Fee	Contribution to Capital Reserve

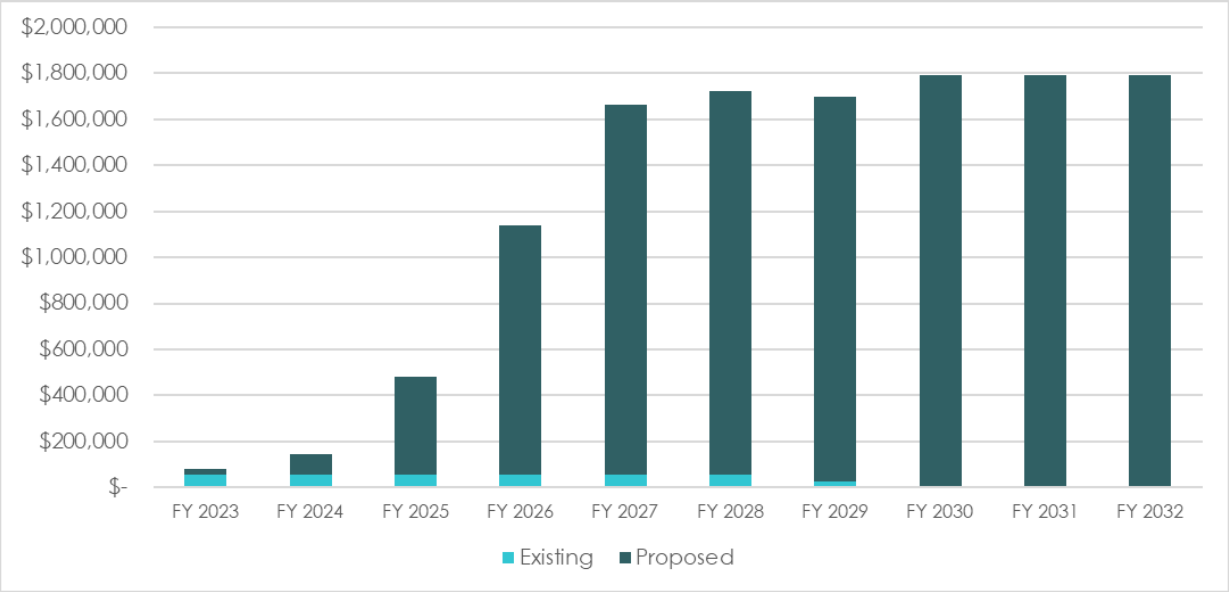
REVENUE REQUIREMENTS

Operations and Maintenance (O&M) costs, debt service on existing and proposed bonds, and transfers to other funds comprise operating fund revenue requirements. O&M consists of personnel, materials, supplies, and costs incurred at the wastewater treatment plant. An annual inflation allowance of 3% has been included in O&M projections. O&M costs also include transfers to the General Fund for shared expenses.

Debt service includes principal and interest payments on existing certificates of obligation bonds, and proposed revenue bonds. Currently the wastewater system is paying debt service on one outstanding debt issue. The City is projected to issue debt to fund capital projects, totaling approximately $21 million, identified in the City's five-year Water, Wastewater and Reuse Capital Improvement Plan. **Figure 3** illustrates the existing and proposed debt service projections over the study period. The proposed debt service is reduced by cash-funding from the Impact Fee Fund, Capital Reserve Fund and Equipment Replacement Fund.

Financial metrics are measured at the combined utility level, as mentioned above. For purposes of generating sufficient revenue to maintain the operating reserve and coverage goals, the revenue requirement for wastewater includes any shortfalls for the wastewater financial metric goals.

Figure 3: Wastewater Debt Service Projections

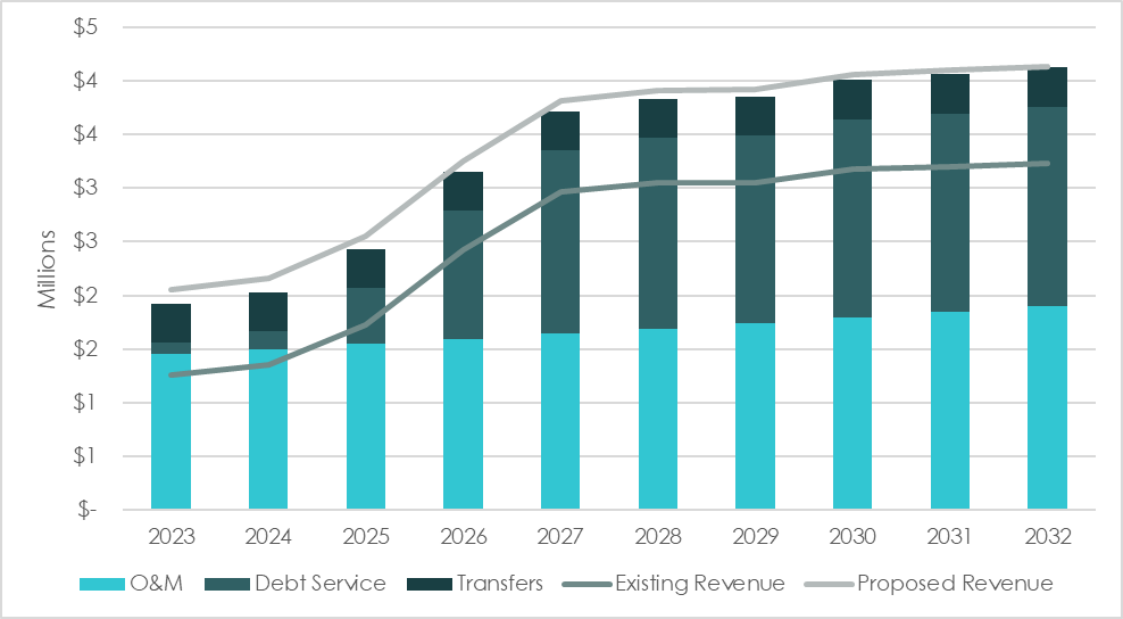


REVENUE SUFFICIENCY

The final step in the financial planning process involves compiling a cash flow forecast which identifies the revenue adjustments necessary to ensure financial sustainability. As indicated by **Figure 4**, at existing rates, the wastewater utility will not be sustainable, even with adjustments to the Debt Service and Capital Reserve fees. The proposed

revenue is based on a 50% rate adjustment in FY 2023, along with future adjustments to the Debt Service and Capital Reserve fees.

Figure 4: Wastewater Revenue Sufficiency



Cost of Service

Introduction

The key objective of the cost-of-service analysis is to determine each customer class's share of the cost based on how they use the City's water and wastewater systems. The cost-of-service analysis aligns responsibility for these costs with the customer classes that cause them to incur creating equity in the system. The principle of using cost causation as a guide for water and wastewater rate setting is well established throughout the industry and is the basis for the methodology described in the American Water Works Association's (AWWA) *Principles of Water Rates, Fees, and Charges, Manual M1* and Water Environmental Federation's (WEF) *Financing and Charges for Wastewater Systems*.

Technically, a cost-of-service analysis involves the following steps:

1. **Functionalize Revenue Requirement.** Applying the principle of cost causation requires a determination of how the costs incurred relate to the design and operation of the utility systems.

2. **Allocate Functionalized Revenue Requirement to Cost Drivers.** The cost of each function from Step 1 is driven by different types of customer demand. Step 2 attributes the functionalized costs to these cost drivers. The result is an understanding of the proportion of the revenue requirement for each utility which can be attributed to each type of customer demand. This allows for a distribution of the revenue requirement based on customer demands (Steps 3 through 5).

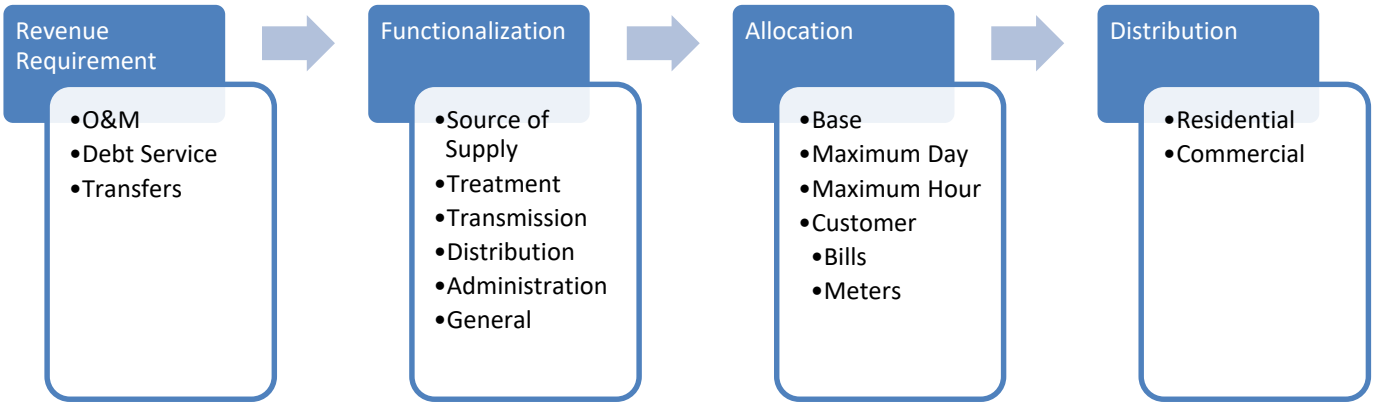
3. **Determine Customer Class Units of Service.** While Steps 1 and 2 allocate the revenue requirement according to the various types of customer demand, Step 3 determines the level of that demand for each customer class.

4. **Calculate Unit Cost of Service.** This step divides the allocated revenue requirement determined in Step 2, by the customer class units of service determined in Step 3. The result is a unit cost of service for each type of customer demand.

5. **Distribute Revenue Requirement to Customer Classes.** This step multiplies the unit cost for each type of demand by the units of service for each customer class. The result is a determination of the cost to serve each customer class based on their share of.

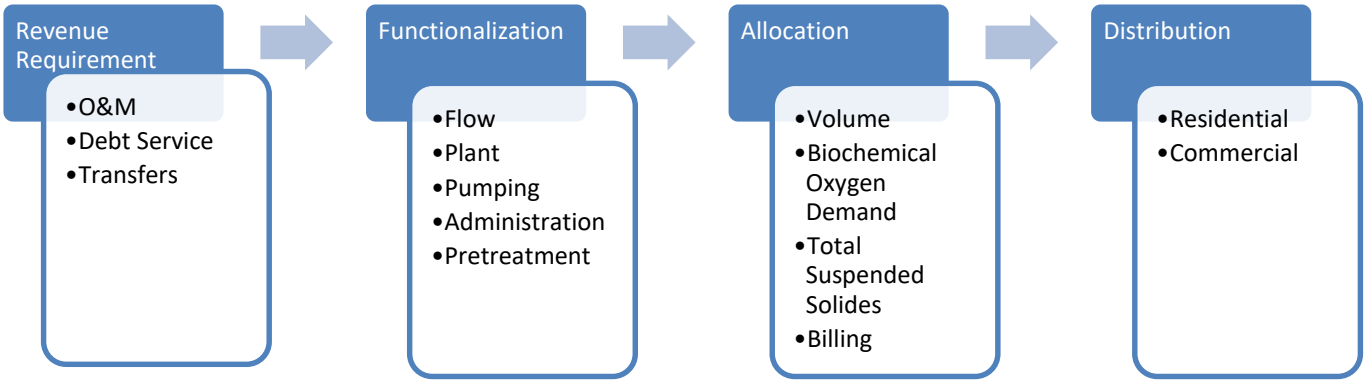
Simplified, the cost-of-service process for water is illustrated in Figure 5.

Figure 5: Water Cost of Service Process



The cost-of-service process for wastewater is illustrated in Figure 6

Figure 6: Wastewater Cost of Service Process



Water Cost of Service

Cost of service is typically determined for a single test year. The test year establishes the total revenues that must be recovered from all customers, regardless of how that revenue is distributed. The cost-of-service analysis then apportions that revenue recovery to each customer class, based on that class's use of the City's water system.

FUNCTIONALIZE REVENUE REQUIREMENT

Functionalization of the Revenue Requirement involves allocating the operating and capital components to the various functions performed by the City to provide utility service to customers. For water systems, these may include functions such as supply, treatment, storage, transmission, distribution, hydrants, services, meters, billing and collection. Three approaches were used to functionalize the revenue requirement: direct allocation, allocation using net plant investment and indirect allocation.

Direct allocation is used where a specific cost can be attributed directly to a specific function. O&M costs are generally allocated to functional cost components that best reflect the function associated with the particular expense.

For example, computer/phone user charges are associated with providing service to individual customers and are allocated to the billing portion of the customer cost component.

System assets. The use of system asset investment is common throughout the industry. Capital costs are generally allocated using plant investment, based on the presumption that the City will reinvest in the utility systems in proportion to the existing level of investment. The result is a smoother allocation of capital costs over time relative to allocating capital costs on a project specific basis. Raftelis reviewed the fixed asset records of each utility and assigned each asset to the functional categories to allocate the City's capital expenditures.

Indirect allocation was used for costs which are incurred to support all functions and are assumed to be incurred in proportion to all other costs allocated directly.

REVENUE REQUIREMENTS SUMMARY

There are two commonly accepted industry methods for developing the revenue requirement – the cash basis and utility basis. Both approaches recover operating costs in the same fashion but differ in terms of capital cost recovery. The cash basis recovers cash capital costs which include debt service, cash funded capital expenditures, addition to/use of reserves and any adjustments related to the timing of when increases are implemented. The utility basis recovers capital costs via depreciation and return on rate base. Rate base is simply the net book value of assets. The utility basis approach to rate setting allows the City to earn a rate of return on assets used to provide service to wholesale customers. The method used for this study is cash basis. Total test year cost of service includes revenue requirements net of miscellaneous revenue, investment income, change in fund balance while maintaining annual operating reserve requirements. The test year revenue requirement for the water utility equals $3,859,675 summarized using the cash basis in **Table 8**.

Table 8: Water Revenue Requirement

Description	Operating	Capital	Total
Revenue Requirements			
Water O&M	$ 2,898,777	$ -	$ 2,898,777
Existing Debt Service/Debt Service Reserve	-	283,880	283,880
Proposed Debt Service		-	
Other Expenditures and Transfers:			-
Transfer to:			
Capital Reserve		287,540	287,540
Impact Fee Fund		350,000	350,000
Cash Funded Capital	-	-	-
Equipment Replacement Fund		66,554	66,554
Total Revenue Requirements	**$ 2,898,777**	**$ 987,974**	**$ 3,886,751**
Non-Rate Revenues			
Impact Fee Revenue		(350,000)	$ (350,000)
Misc Revenue	(270,567)		$ (270,567)
Total Non-Rate Revenues	**$ (270,567)**	**$ (350,000)**	**$ (620,567)**
Other Adjustments			
Rate Adjustments	-		$ -
Surplus/Deficit	$ 593,491		$ 593,491
Operating Reserve Usage			-
Total Other Adjustments	**$ 593,491**	**$ -**	**$ 593,491**
Net Revenue Requirements	**$ 3,221,702**	**$ 637,974**	**$ 3,859,675**

ALLOCATE FUNCTIONALIZED REVENUE REQUIREMENT TO TEST DRIVERS

Once costs have been functionalized, they must then be allocated to cost components. Cost components represent the drivers of utility costs, or the types of customer demand which drive the design, operation and—in turn—cost of the water system.

A water system is designed to treat and distribute water during periods of average customer demand as well as peak demand. Peak demand occurs when many customers are using water at the same time such as in the morning as they prepare for the day. Like the interstate highway system, a water system must be designed not only to meet the average demands (such as in the middle of the day), but also peak demands (such as during rush hour traffic). If peak demand is twice that of average demand, water infrastructure must be double the size. Put another way, if no peak demand existed, a much smaller, less costly system could be built to serve customers.

Given that additional costs are incurred to serve peak demand, the question then becomes who should pay for those incremental costs, and how much should they pay. The base-extra capacity methodology is the most common method for assigning such costs for water. The base-extra capacity method allocates maximum day and maximum hour costs based on the incremental demand above average day. Thus, customers whose demand drives the need for the larger system are allocated a greater share of costs.

The cost drivers related to customer demand are as follows:

- **Base** – Demand on an average day,
- **Maximum Day Extra Capacity** – maximum day demand excluding average day,
- **Maximum Hour Extra Capacity** – maximum hour demand excluding maximum day demand and average day demand.

In addition to these categories, there are costs incurred to serve a customer regardless of how much water they use. These customer-related components include billing, collection, meter service, and customer service.

DETERMINATION OF ALLOCATION FACTORS

Based on the functional costs being allocated, there may be one-way, two-way, or three-way allocations:

Purchased water is a function of the amount of water used by customers on an annual basis, regardless of peak demand. Accordingly, it is allocated 100% to base demand.

Storage and distribution system costs, which are used to meet the peak demands of customers, are split between base demand, maximum day demand and maximum hour demand. This split is based on assumed system design criteria of average day demand for maximum day and maximum hour.

For maximum day, it is assumed that the water system is designed to deliver water at 2.50 times the average day (base) rate on maximum day. In other words, the water system needs incremental capacity to deliver water on a maximum day as compared to an average day. Accordingly, costs incurred to support base and maximum day service are allocated between base and maximum day based on the proportion of each relative to the overall capacity requirement.

A similar approach is used for costs incurred to support base, maximum day and maximum hour service. Maximum hour demand represents the incremental demand above maximum day demand, based on the design criteria outlined above the maximum hour allocation.

Meters and services costs are a function of the number of customers at each meter size. These costs are allocated to equivalent meters, which recognizes difference in capacity and cost for meters of different sizes.

ALLOCATION OF COST OF SERVICE

Table 9 provides the allocation of O&M to functional cost components. O&M costs are generally allocated to functional cost components that best reflect the function associated with that particular expense. Transmission expenses are associated with the storage and transmission of treated water and are allocated to the base, and maximum day cost components. Expenses not specifically assigned to a cost component are allocated in proportion to all other expense allocations.

Table 9: Water Allocation of Operations & Maintenance

Item	Total	Base	Extra Capacity		Customer	
			Maximum Day	Maximum Hour	Meters	Billing
Allocation of Expenses						
Admin	$ 1,076,102	$ -	$ -	$ -	$ 538,051	$ 538,051
Source of Supply	$ 1,237,427	$ 1,237,427	$ -	$ -	$ -	$ -
Pumping	$ -	$ -	$ -	$ -	$ -	$ -
Treatment	$ 30,280	$ 11,535	$ 18,745	$ -	$ -	$ -
Storage	$ -	$ -	$ -	$ -	$ -	$ -
Transmission	$ -	$ -	$ -	$ -	$ -	$ -
Distribution	$ 314,148	$ 125,659	$ 84,820	$ 103,669	$ -	$ -
Meters	$ -	$ -	$ -	$ -	$ -	$ -
Taps	$ -	$ -	$ -	$ -	$ -	$ -
Hydrants	$ -	$ -	$ -	$ -	$ -	$ -
General	$ 240,820	$ 124,545	$ 9,383	$ 9,393	$ 48,749	$ 48,749
Total O&M	**$ 2,898,777**	**$ 1,499,167**	**$ 112,948**	**$ 113,062**	**$ 586,800**	**$ 586,800**

System assets are typically allocated based on design parameters of a particular facility. For example, transmission mains are designed to meet maximum day requirements and capital costs associated with these mains are allocated to the base cost component and the maximum day cost component. The allocation is based on maximum day peaking parameters, as discussed in the Determination of Allocation Factors section. Other assets are assigned directly to their respective cost components. These include meters and services. General plant assets are allocated based on a weighted average allocation of all other assets. **Table 10** illustrates the water assets allocations to each design parameter.

Table 10: Water Allocation of System Assets

Water Assets	Total Plant in Service	Base	Extra Capacity		Customer	
			Maximum Day	Maximum Hour	Meters	Billing
Admin	$ -	$ -	$ -	$ -	$ -	
Source of Supply	$ 2,080,266	$ 2,080,266	$ -	$ -	$ -	$ -
Pumping	$ 311,297	$ 124,519	$ 84,050	$ 102,728	$ -	$ -
Treatment	$ 416,844	$ 158,798	$ 258,046	$ -	$ -	$ -
Storage	$ 18,082	$ 7,233	$ 4,882	$ 5,967	$ -	$ -
Transmission/Distribution	$ 6,579,687	$ 2,631,875	$ 1,776,515	$ 2,171,297	$ -	$ -
Meters	$ 29,634	$ -	$ -	$ -	$ 29,634	$ -
Total Water Assets	**$ 9,435,809**	**$ 5,002,690**	**$ 2,123,494**	**$ 2,279,992**	**$ 29,634**	**$ -**
Indirect Allocation	100%	53.02%	22.50%	24.16%	0.31%	0.00%

ALLOCATION OF COSTS TO CUSTOMER CLASSES

Water customers have been separated into Residential and Commercial classes. The classes group customers with similar service requirement characteristics and provide a means for allocating costs equitably to customers.

Units Of Service

Class service requirements include average daily water use projections, maximum day and maximum hour demands, and metering and billing requirements. Class base cost responsibility relates to the quantity of water used under average day load conditions. Class responsibility for extra capacity costs varies maximum day and maximum hour demands. Average day usage and capacity factors represent the estimated relationship between individual class peak demand and average day usage and are used to develop extra capacity requirements for maximum day and maximum hour demands. Estimated capacity factors are based on an analysis of each class's monthly usage characteristics. **Table 11** shows the units of service used for the residential and commercial class.

Table 11: Water Units of Service

Unit Cost Component	Base	Max Day	Max Hour	Meters	Bills
Units of Service	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(meter equivalents)	(no. of bills)
Residential	465,975	1,273	1,275	4,019	41,822
Commercial	31,780	57	72	675	966
Total	497,755	1,330	1,347	4,694	42,788

Unit Costs Of Service

Table 12 shows the development of the cost-of-service for each functional cost component. Unit costs are calculated by dividing functionalized costs of service by the water units of service. The unit costs of service at the bottom of the table are then multiplied by each customer class's units of service to develop their respective cost of service.

Table 12: Water Cost of Service by Functional Cost Component

Unit Cost Component	Total	Base	Max Day	Max Hour	Meters	Bills
Operating Expenses	$2,898,777	$1,499,167	$ 112,948	$ 113,062	$ 586,800	$586,800
Capital Expenses	$ 987,974	$ 338,012	$ 143,476	$ 154,050	$ 352,436	$ -
Gross Revenue Requirement	$3,886,751	$1,837,178	$ 256,424	$ 267,111	$ 939,237	$586,800
Adjustments:						
Impact Fee Revenue	$ (350,000)	$ (350,000)	$ -	$ -	$ -	$ -
Miscellaneous Revenue	$ (270,567)	$ (193,167)	$ -	$ -	$ (24,480)	$ (52,920)
Surplus/(Deficit)	$ 593,491	$ 306,937	$ 23,125	$ 23,148	$ 120,141	$120,141
Total Adjustments	$ (27,075)	$ (236,229)	$ 23,125	$ 23,148	$ 95,661	$ 67,221
Cash-Basis Revenue Requirement	$3,859,675	$1,600,949	$ 279,549	$ 290,259	$1,034,897	$654,021
Unit Cost of Service - $ per Unit		$ 3.22	$ 210.22	$ 215.52	$ 220.49	$ 15.29

Customer Class Cost Of Service

Total unit cost of service, applied to class service requirements, results in the allocated class cost of service. **Table 13** shows the cost-of-service adjustments for the residential and commercial classes. Raftelis recommends making these slight adjustments in the rate design changes.

Table 13: Water Cost of Service Adjustments

Class	Allocated Cost of Service	Revenue Under Existing Rates	Difference	Overall Change %
Residential	$ 3,726,376	$ 3,760,016	$ (33,640)	-1%
Commercial	$ 133,300	$ 99,659	$ 33,640	34%

Wastewater Cost of Service

In developing an equitable schedule of charges for wastewater service, the cost of service is allocated to the City's customer classes according to class-specific service requirements. Allocation of cost of service considers the volume of wastewater contributed, strength of wastewater, and number of customers. Cost of service allocations are made for a test year representative of the period for which resultant rates are expected to be in effect.

Wastewater cost of service uses the same 5-step process as water for determining the costs for the classes. The difference is the cost functions performed by the City to provide wastewater utility service to customers. Wastewater functions include treatment, collections, lift stations, and meters.

REVENUE REQUIREMENTS SUMMARY

Total test year cost of service includes revenue requirements net of miscellaneous revenue, investment income, change in fund balance while maintaining annual operating reserve requirements. Test year COS for the utility equals $1,780,581 summarized in **Table 14** below. As indicated previously, the wastewater utility is operating at a deficit. Due to this, the deficit has been added to the revenue requirement as a rate adjustment to ensure that rates are adjusted to make up for the current shortfall.

Table 14: Wastewater Revenue Requirement

Description	*Operating*	*Capital*	*Total*
Revenue Requirements			
Wastewater O&M	$ 1,457,989	$ -	$ 1,457,989
Existing DS		$ 54,359	54,359
Proposed DS		$ 45,121	45,121
Transfer to :			-
Capital Reserve		$ 105,798	105,798
Impact Fee Fund		$ 227,979	227,979
Cash Funded Capital		$ -	-
Equipment Replacement Fund		$ 26,325	26,325
Total Revenue Requirements	**$ 1,457,989**	**$ 459,583**	**$ 1,917,572**
Non Rate Revenues			
Impact Fee Revenue	$ -	$ (227,979)	$ (227,979)
Misc Revenue	(50,790)		(50,790)
Total Other Revenue	**$ (50,790)**	**$ (227,979)**	**$ (278,769)**
Adjustments			
Rate Adjustments	**$ 141,779**		141,779
Surplus/Deficit	-		-
Operating Reserve			-
	$ 141,779	**$ -**	**$ 141,779**
NET REVENUE REQUIREMENTS	**$ 1,548,978**	**$ 231,604**	**$ 1,780,581**

ALLOCATION OF FUNCTIONALIZED REVENUE REQUIREMENT TO COST DRIVERS

Once costs have been functionalized, they must then be allocated to cost components. Cost components represent the drivers of utility costs, or the types of customer demand which drive the design, operation and—in turn—cost of the wastewater system.

The wastewater system is designed to collect, treat, and discharge customer sewage. The cost drivers related to customers are as follows:

- Volume – volume of customer sewage discharged
- Strength – concentration of strength into the system measured in biochemical oxygen demand (BOD), and total suspended solids (TSS).

In addition to these demand categories, there are costs incurred to serve a customer regardless of how much wastewater they use. These customer related components are as follows:

- Bills – costs driven by providing customer service (i.e., billing, collection, customer service)
- Meters and Services – shared costs with water and driven by maintaining customer meters and collection lines

DETERMINATION OF ALLOCATION FACTORS

Treatment costs are driven by the volume of sewage discharged by customers as well as the strength of pollutants, which must be removed via the physical and biological processes at the treatment plant. Strength costs vary with the strengths of biochemical oxygen demand (BOD), and total suspended solids (TSS) contributed. Treatment costs were

allocated based on 50% to volume, 25% to biochemical oxygen demand (BOD), 25% to total suspended solids (TSS) contributed.

Collection system costs are driven by the volume of sewage discharged by customers both directly, via indoor water use, and indirectly via the infiltration and inflow (I/I). These costs were allocated 100% to volume, 0% BOD, and 0% TSS.

Billing costs are related to billing, collection and customer service, which is a function of the number of wastewater customers. Accordingly, these costs were allocated 100% to the bills cost driver.

ALLOCATION OF WASTEWATER COST OF SERVICE ALLOCATION

Table 15 shows the allocation of O&M expenses to function cost components. O&M expenses are generally allocated to the functional cost component that reflects the design parameter associated with the expense. Treatment related expenses are associated with wastewater treatment, and are allocated to volume, BOD, and TSS, cost components. Collection main expenses are associated with the cost of collecting wastewater from customers and delivering wastewater to the treatment plant. Expenses not specifically assigned to a cost component are allocated in proportion to all other expense allocations, such as administrative costs.

Table 15: Wastewater Allocation of O&M Expense

Item	Total	Volume	Strength BOD	Strength TSS	Customer Billing
Allocation of Expenses					
Flow	$ 108,233	108,233	-	-	-
WW Plant	$ 597,949	298,974	149,487	149,487	-
WW Pumping	$ 43,021	21,511	10,755	10,755	-
Admin	$ 515,933	-	-	-	515,933
General	$ 192,852	65,352	24,427	24,427	78,647
Total O&M	$ 1,457,989	$ 494,070	$ 184,669	$ 184,669	$ 594,580

Wastewater system assets (and their accrued depreciation expense) are generally allocated to the functional cost component that reflects the design parameter associated with the asset. Treatment plant assets are designed to treat wastewater and are allocated equally to volume, BOD, and TSS cost components. Collection main assets, for example, are associated with collecting wastewater from customers and delivering it to the treatment plant. These costs are allocated equally between volume cost and local collector sewer cost components.

Table 16 illustrates the wastewater capital allocation to volume, BOD, TSS and Billing.

Table 16: Allocation of Capital Expenses

Item	Total	Volume	Strength BOD	Strength TSS	Customer Bills
Existing Debt Service	$ 54,359	$ -	$ -	$ -	$ 54,359
Proposed Debt Service	$ 45,121	$ 30,073	$ 6,869	$ 6,869	$ 1,311
Capital Reserve	$ 105,798	$ 70,513	$ 16,105	$ 16,105	$ 3,074
Impact Fee Fund	$ 227,979	$ 151,946	$ 34,704	$ 34,704	$ 6,625
Cash Funded Capital	$ -	$ -	$ -	$ -	$ -
Equipment Replacement Fund	$ 26,325	$ 17,545	$ 4,007	$ 4,007	$ 765
Total Capital Costs	$ 459,583	$ 270,077	$ 61,686	$ 61,686	$ 66,135

ALLOCATION OF COSTS TO CUSTOMER CLASSES

Wastewater customers have also been separated into Residential and Commercial classes. The classes group customers with similar service requirement characteristics and provide a means for equitably allocating costs to customers.

Wastewater Units of Service

Historical data and information provided from utility records were used to estimate projected units of service. Wastewater collected and treated consists of:

- Contributed sanitary and industrial wastewater flow
- Infiltration/inflow (I/I) of groundwater into the sewers

Contributed wastewater flow is that portion of annual water use or other discharge of each customer class that enters the wastewater system. The winter average[1] is used and therefore excludes volume that does not reach the wastewater system, such as volume used for lawn sprinkling and other outdoor use. The difference in volume is I/I of groundwater into the sewer system. It is estimated that flow entering the sewers through I/I will average approximately 5% of total wastewater flow reaching the treatment plant. Each customer class should bear its proportionate share of costs associated with I/I, as the wastewater system must be able to adequately convey and process total wastewater flow. I/I is allocated to customer classes on the premise that 100% of the total is distributable based on volume contributed by each customer. **Table 17** shows the wastewater units of service.

Table 17: Wastewater Units of Service

Unit Cost Component	Volume	BOD	TSS	Billing
Units of Service	(1,000 gallons)	(1,000 gallons)	(1,000 gallons)	(no. of bills)
Residential	255,004	397,956	521,386	25,043
Commercial	3,331	5,198	6,810	134
Total	258,334	403,154	528,196	25,177

Unit Costs Of Service

Table 18 shows the development of the cost of service for each functional cost component. Unit costs are calculated by dividing functionalized costs of service by the wastewater units of service. The unit costs of service at the bottom of the table are then multiplied by each customer class's units of service to develop their respective cost of service.

Table 18: Wastewater Cost of Service By Functional Component

Unit Cost Component	Total	Volume	BOD	TSS	Billing
Operating Expenses	$ 1,457,989	$ 494,070	$ 184,669	$ 184,669	$ 594,580
Capital Expenses	$ 459,583	$ 270,077	$ 61,686	$ 61,686	$ 66,135
Gross Revenue Requirement	$ 1,917,572	$ 764,148	$ 246,355	$ 246,355	$ 660,714
Adjustments					
Impact Fee Revenue	$ (227,979)	$ (113,990)	$ (56,995)	$ (56,995)	$ -
Miscellaneous Revenue	$ (50,790)	$ (21,025)	$ (9,353)	$ (9,353)	$ (11,060)
Surplus/(Deficit)	$ 141,779	$ 48,045	$ 17,958	$ 17,958	$ 57,819
Total Adjustments	$ (136,990)	$ (86,970)	$ (48,390)	$ (48,390)	$ 46,759
Cash Basis Revenue Requirement	$ 1,780,581	$ 677,178	$ 197,965	$ 197,965	$ 707,473
Unit Cost of Service - $ per Unit		$ 2.62	$ 0.49	$ 0.37	$ 28.10

[1] Volume was estimated using winter consumption for the months of December, January and February.

Customer Class Cost Of Service

Total unit cost of service, applied to class service requirements, results in the allocated class cost of service. **Table 19** shows the cost-of-service adjustments for the residential and commercial classes. As can be seen, there is a shortfall of about $750,000 to the wastewater cost of service. This amount was considered when developing the rate design.

Table 19: Wastewater Revenue Adjustments

Class	Allocated Cost of Service	Revenue Under Existing Rates	Difference	Overall Change %
Residential	$ 1,762,983	$ 1,023,259	$ 739,725	72%
Commercial	$ 17,598	$ 5,472	$ 12,126	222%
Total	$ 1,780,581	$ 1,028,731	$ 751,851	73%

Reuse Water

Discharges from wastewater treatment have been regulated for many years. How a utility discharges its effluent is influenced by the utility's permit. Wastewater effluent is typically discharged to a stream, river, or land. The City's permit[2] authorizes disposal of a "daily average flow not to exceed 500,000 gallons per day via surface irrigation of 280 acres of Fair Oaks Ranch Golf and Country Club land." The permit does not allow for the disposal for the effluent to any other water supply and limits it to the golf course. The effluent limitations are defined in the City's permit.

Over the years, the use of wastewater effluent has changed and has provided an additional water supply resource for water utilities. In some instance the wastewater is treated to different levels so that the effluent can provide an additional beneficial use. Today, effluent or reuse water can be used for agricultural, irrigation or even in industrial processes. The level of treatment might vary, but reuse water can augment raw water supplies. In addition, in some instances, distribution lines are required to transport the reuse water. These pipes are often referred to as "purple pipe."

PRICING REUSE WATER

Pricing reuse water follows the same cost-causation principles used when pricing potable water. In this case, reuse costs are allocated to customer classes based on how they use the reuse water. Pricing will be influenced by the objectives of the utility and will be based on the type and purpose for the reuse. Oftentimes, there will be consideration of subsidies to encourage the use of the reuse water. In other words, reuse water must be priced at a level that will favor the use of reuse water over potable water. Reuse costs can include distribution costs, incremental treatment costs and storage costs.

In considering pricing policies for reuse water, the utility must consider how the reuse water will be used. In the case of the City, currently, all the effluent from its wastewater treatment process is disposed on the golf course as part of its permit as mentioned above. Historically because of this arrangement, the effluent is provided at no cost to the golf course. In considering a price to the golf course for the City's effluent, the arrangement must be mutually beneficial to both the City and golf course. As the volume of effluent delivered by the City increases over the next few year, it will offset the volume of potable water the golf course purchases for irrigation. Further, without the golf course, the City would need another method of disposal that could have cost and permit implications to the overall wastewater system.

[2] TCEQ Permit No. WQ0011867001

In the future as additional wastewater effluent becomes available the City may want to price the additional reuse water and make it available to other customers other than the golf course. In this case, the incremental costs for providing the reuse water would be the basis for a rate.

Rate Design

Once the cost of service is calculated for each class, the rates that will recover the revenue requirement can be determined. The rates should meet the goals and objectives of the utility. As stated in Manual M1, "as an analytical framework, rates derived through cost-of-service analyses establish a benchmark for assessment of rate equity and defensibility that has been accepted by governmental entities and legal courts throughout North America." While the cost of service is a well-defined process, rate design is often referred to as the "art" of ratemaking. Utilities have a wide range of latitude when developing rates.

Rate Advisory Panel

In considering a potential change to the City's rate design, the City Council commissioned an Advisory Panel made up of 18 residents that represent various areas of the City. The Advisory Panel met four times where they were presented information about the rate study process, results of the cost-of-service and rate design scenarios. An important first step of rate design is the Pricing Objectives Workshop. Pricing objectives are a means of ensuring that community values are reflected in the way costs of providing service are recovered. In this workshop, the group was asked to consider a set of pricing objectives to rank in order of importance. The pricing objectives workshop was conducted for the City Council and the Advisory Panel. Both were presented the list of objectives and definitions, presented in **Table 20**. It is important that when the group is ranking the objectives that they have a similar understanding for each objective.

Table 20: Pricing Objectives

Objective	Definition
Revenue Stability	Generate stable and predictable revenues
Equity between classes	Each customer class pays its cost of service
Customer impact	Changes in rate structure minimize impact
Equity within the class	Customers within classes pay based on the amount of water they use
Conservation pricing signal	Contains a pricing signal that encourage wise water use
Demand management	Contains a pricing signal that encourage reduced water use during peak times
Essential use affordability	Provides essential water use at an affordable price
Customer understanding	Subject to few misinterpretations; consistent with customer communication
Ease of understanding/implementation	Compatible with billing system; based on readily available information

The results of the workshops are shown in **Table 21**. In considering the results, the objectives that are ranked as "essential" and "very important" become the goals for the rate design. For both the City Council and the advisory panel, the same four objectives were selected. Therefore, the goals that were addressed through the rate design include:

- Revenue Stability
- Customer Impact
- Equity between classes
- Conservation pricing signal

Table 21: Pricing Objectives Workshop Results

Council Ranking of Pricing Objectives

Classification	Rank	Objective	Score
Essential	1	Revenue Stability	24
	2	Customer impact	18
Very Important	3	Equity between classes	15
	3	Conservation pricing signal	15
Important	5	Essential use affordability	14
	5	Demand management	14
	7	Equity within a class	13
Least Important	8	Customer Understanding	11
	9	Ease of adminstration/implementation	10
	10	Equity between existing and new customers	9

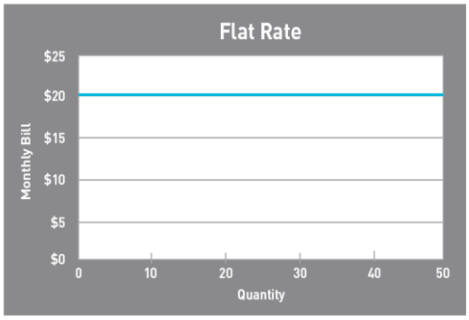
Panel Ranking of Pricing Objectives

Classification	Rank	Objective	Score
Essential	1	Equity between classes	24
	2	Customer impact	18
Very Important	3	Revenue Stability	15
	3	Conservation pricing signal	15
Important	5	Equity within a class	5
	6	Essential use affordability	4
	7	Demand management	3
Least Important	7	Customer Understanding	3
	7	Ease of adminstration/implementation	3
	10	Equity between existing and new customers	0

Water Rate Design Scenarios

Over the years, water rate design in the industry has evolved from flat rates to volume-based inclining block rates. The evolution of rates has been influenced by many factors including billing system limitations to new goals and objectives of utilities. As shown in **Table 22**, with a flat rate, customers pay the same amount each month regardless of usage. While this provides revenue stability for the utility, it is inequitable, does not provide a conservation pricing signal, and can make essential use unaffordable. A uniform rate is a volume rate that is the same for all volume. Again, this provides for revenue stability, but does not adequately send a conservation pricing signal. Uniform rates are typically used for certain classes, like commercial, where consumption may not vary from month to month. The inclining tiered rate, which is most often used for residential classes, promotes conservation and can be structured to make essential use affordable. This type of structure targets large users to encourage wise water use.

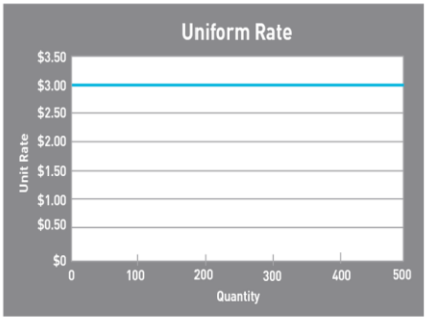
Table 22: Evolution of Water Rates



Flat Rate: $xx / month regardless of usage

Pros: Revenue stability, easy to understand

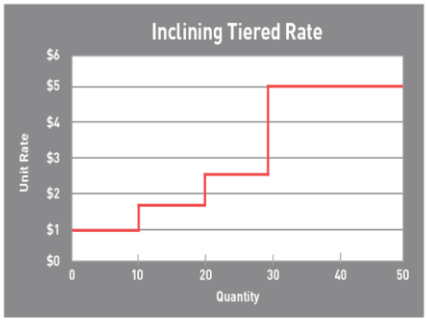
Cons: Inequitable, no conservation signal, not affordable for essential use



Uniform Rate: $xx / 1,000 gallons

Pros: Revenue stability, administrative ease, easy to understand

Cons: Weak conservation, not affordable for essential use



Inclining Tiered Rate:

Pros: Promote conservation, affordable for essential use, easy to administer, easy to understand

Cons: Target large users

EXISTING RATE STRUCTURE

The City's current water rate structure includes Service Availability Charges, Service Fees and Volumetric Charges. Rates vary between the residential and commercial classes. Because of the City's Service Availability Charges and Service Fees, the City generates about 60% of its revenue from fixed charges. Because this revenue does not fluctuate from month to month based on usage, a fair amount of the City's revenue is stable. On the contrary, although the City has inclining block rates for both the residential and commercial classes, the customer's bill is not going to vary

significantly from month to month, due to 60% of the bill being based on fixed charges. The City's existing rates are shown in **Table 23**.

Table 23: Existing Water Rates

Service Availability Charges by Meter Size	
¾"	$26.48
1"	$28.01
1 ½"	$41.02
2"	$48.33
3"	$62.94
4"	$94.42

Water Service Itemized Fees	
Surface Water Fee	$14.25
TCEQ Fee	$0.20
Debt Service	$7.43
Capital Reserve	$6.72
Total	$28.60

Residential Tiered Volume Charges	
Usage (in 1,000 gallons)	$/1,000 gallons
0 – 6	No Charge
6 – 12.5	$3.81
12.5 – 25	$4.76
25 – 50	$7.14
50 – 75	$10.72
75 – 100	$16.07
100+	$24.11

Commercial Tiered Volume Charges	
Usage (in 1,000 gallons)	$/1,000 gallons
0 – 6	No Charge
6 – 50	$3.81
50 – 100	$4.76
100 – 150	$7.14
150+	$10.72

A few observations should be made about the existing rates from an industry perspective. These observations include:

- The ratios between the service availability charges do not reflect industry meter factors[3]
- There is no charge for water usage between 0 and 6,000 gallons
- Flat rates for surface water, debt service and capital reserve mean that everyone pays the same amount for those costs and is not based on the amount of water used and does not necessarily reflect the cost of service

As recommended by the Texas Water Development Board Report 362, Section 3.1 Water Conservation Pricing, "it is not recommended that a minimum monthly water allotment be included in the minimum bill. The AWWA notes that minimum charges are often considered counter to conservation goals and are unfair to those who use less than the monthly minimum." If a customer does not use 6,000 gallons regularly, they may be inclined to use up to that amount to get full use of their allotment. This does not encourage wise water use. Through a conservation-based rate, water usage can be affected and provides incentives for less water usage, by charging less. Flat rates discourage wise water use since the customer pays the same amount regardless of usage.

PROPOSED RATE STRUCTURES

In consideration of the pricing objectives and industry practices, the Advisory Panel considered three rate structure scenarios. The residential water rate scenarios are shown in **Table 24**. Scenario 1 maintains the current rate structure of the City, while Scenarios 2 and 3 reflect changes to the existing rate structure to address the pricing objectives identified by the City Council and the Advisory Panel.

[3] AWWA *Principles of Water Rates, Fees and Charges, Manual M1,* Table VII.2-5, Meter Equivalencies

Table 24: Residential Water Rate Scenarios

Scenario 1 (Status Quo)*	Scenario 2	Scenario 3
Maintain existing rate structure for Service Availability Charge and Volumetric Fees. Water Service Fees based on Oct. 2021 adoption (Surface Water Fee, TCEQ Fee, Debt Service Fee and Capital Reserve Fund Fee)	Adjust service availability charges to reflect industry meter factors Maintain all water service fees, adjust volumetric tiers by charging for all use, adjust tier levels	Similar to Scenario 2 except eliminate Debt Service Fee and Capital Reserve Fund Fee**

*No change to existing rate structure and existing rates, other than recently adopted water service fees

**Does not eliminate Capital Reserve Fund

For commercial, the scenarios are similar to residential with a few nuances. The commercial water rate scenarios are shown in **Table 25**.

Table 25: Commercial Water Rate Scenarios

Scenario 1 (Status Quo)*	Scenario 2	Scenario 3
Maintain existing rate structure for Service Availability Charge and Volumetric Fees. Water Service Fees based on Oct. 2021 adoption (Surface Water Fee, TCEQ Fee, Debt Service Fee and Capital Reserve Fund Fee)	Adjust service availability charges to reflect industry meter factors Maintain all water service fees; Adjust volumetric tiers by charging for all use, Adjust tier levels	Similar to Scenario 2 except eliminates Debt Service Fee and Capital Reserve Fund Fee**

*No change to existing rate structure and existing rates, other than recently adopted water service fees

**Does not eliminate Capital Reserve Fund

As shown in **Table 26**, each scenario addresses the pricing objectives differently. Scenarios 2 and 3 impact customers in various ways

Table 26: How Scenarios address Pricing Objectives

Scenario	Equity	Revenue Stability	Minimizes Bill Impacts	Incentivizes Wise Use
Scenario 1 (Status Quo)	No	Yes	Yes	No
Scenario 2	Yes	Yes	No	Yes
Scenario 3	Yes	Yes	No	Yes

In addition, Scenarios 2 and 3 begin to address some of the shortcomings of the existing rate structure. First, by adjusting the Service Availability Charges to reflect the meter equivalency factors, the rates more accurately reflect the impact larger meters place on the system. Next by adjusting the volumetric tiers and eliminating the "free" 6,000 gallons, the rates become more conservation based. In Scenario 2, the Water Service Fees are maintained to continue the objective of revenue stability.

The following tables show the various water rates for each scenario.

Table 27: Water Rates by Scenario

Water Service Availability Charges

Meter Size	Scenario 1	Scenario 2	Scenario 3
¾"	$26.48	$20.00	$20.00
1"	$28.01	$33.40	$33.40
1 ½"	$41.02	$66.60	$66.60
2"	$48.33	$106.60	$106.60
3"	$62.94	$200.00	$200.00
4"	$94.42	$333.40	$333.40

Water Service Fees

Fee	Scenario 1	Scenario 2	Scenario 3
Surface Water	$14.25	$14.25	$14.25
TCEQ	$0.20	$0.20	$0.20
Debt Service	$7.43	$7.43	$ -
Capital Reserve	$6.72	$6.72	$ -
Total	$28.60	$28.60	$14.45

Residential Volumetric Rates

Scenario 1		Scenario 2		Scenario 3	
Usage (in 1,000 gallons)	Rate	Usage (in 1,000 gallons)	Rate	Usage (in 1,000 gallons)	Rate
0 – 6	$0	0 – 7	$2.17	0 – 7	$2.95
6 – 12.5	$3.81	7 – 17	$2.82	7 – 17	$3.84
12.5 – 25	$4.76	17 – 30	$6.51	17 – 30	$8.86
25 – 50	$7.14	30 – 50	$8.67	30 – 50	$11.81
50 – 75	$10.72	50+	$10.84	50+	$14.76
75 – 100	$16.07				
100+	$24.11				

Commercial Volumetric Rates

Scenario 1		Scenario 2		Scenario 3	
Usage (in 1,000 gallons)	Rate	Usage (in 1,000 gallons)	Rate	Usage (in 1,000 gallons)	Rate
0 – 6	$0	0 – 10	$3.28	0 – 10	$3.84
6 – 50	$3.81	10 – 30	$4.26	10 – 30	$4.99
50 – 100	$4.76	30+	$6.55	30+	$7.67
100 – 150	$7.14				
150+	$10.72				

Based on the information provided to the Advisory Panel, the decision was made to recommend Scenario 2 to the City Council. Rate impacts will be shown in a later section.

Wastewater Rate Scenarios

Like water, wastewater rate design has evolved over the years. Typically, wastewater rate design does not include inclining block rates. Residential wastewater rates do often include a volumetric rate that bills based on water usage during a winter period of either November, December and January or December, January and February. Because residential customers do not usually water during these winter months, it is assumed that this usage represents the amount of wastewater that a resident contributes to the wastewater system. For commercial, since water usage does not vary from month to month, a wastewater volumetric rate is usually a uniform rate. Monthly minimum charges for wastewater can vary from a flat month minimum to a minimum charge based on meter sizes.

EXISTING RATE STRUCTURE

The City's existing wastewater rate structure is a flat fee made up of a wastewater availability charge and wastewater service fees, including the TCEQ fee, a debt service fee and a capital reserve fee. In this case, all customers pay the same flat fee regardless of how much water they use. As shown in **Table 28**, 100% of revenue is fixed. With this kind of structure, customers are not paying based on their own demand on the system, instead a customer pays the same amount each month.

Table 28: Existing Wastewater Rates

Service Availability Charges	
All Meters	$40.86

Water Service Itemized Fees	
TCEQ Fee	$0.05
Debt Service	$2.30
Capital Reserve	$4.12
Total	$6.47

PROPOSED RATE STRUCTURES

In consideration of the pricing objectives and industry practices, the Advisory Panel considered three rate structure scenarios. The residential wastewater rate scenarios are shown in **Table 29**. Scenario 1 maintains the current rate structure of the City, while Scenarios 2 and 3 reflect changes to the existing rate structure to address the pricing objectives identified by the City Council and the Advisory Panel. For wastewater, one rate structure is proposed for residential and commercial customers, as the number of commercial customers is small and usage patterns of both classes do not differ significantly. In water the commercial customers are mostly Homeowner Associations that irrigate their common areas; therefore, they are not wastewater customers.

How the proposed rate structures address the pricing objectives is shown in **Table 30**. In these proposed scenarios, each one including the existing rate structure will impact customers negatively due to the need for rate increases to cover the cost of service. Each scenario will maintain the objective of revenue stability and scenarios 2 and 3 address equity by allowing customer to pay based on the demand they place on the system. The main change to the existing rate structure in the proposed scenarios is the addition of a volumetric rate to be based on winter consumption in the months of December, January and February.

Table 29: Wastewater Rate Scenarios

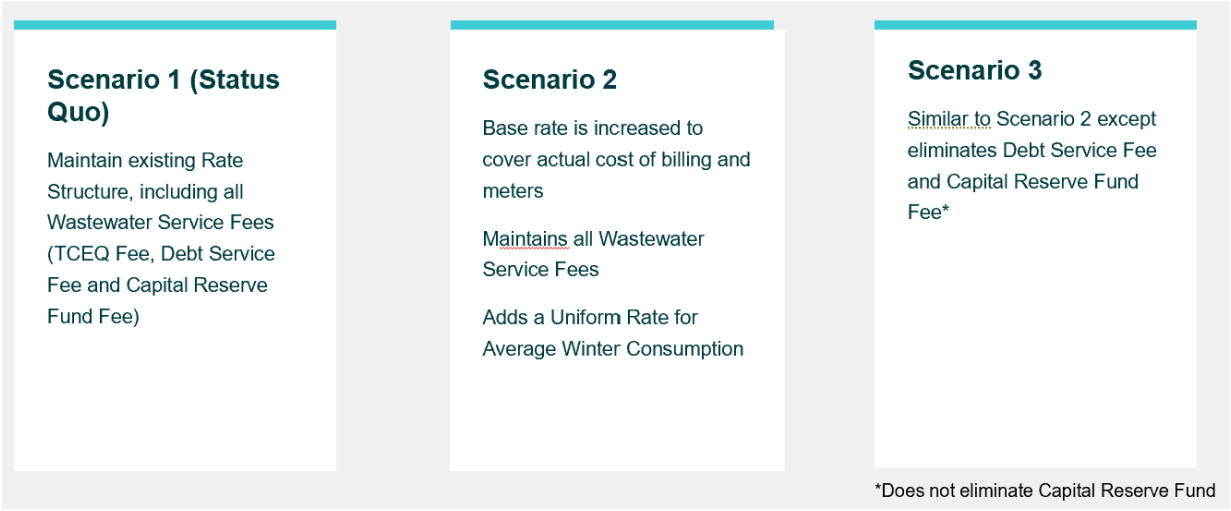


Table 30: How Scenarios address Pricing Objectives

Scenario	Equity	Revenue Stability	Minimizes Bill Impacts
Scenario 1 (Status Quo)	No	Yes	No
Scenario 2	Yes	Yes	No
Scenario 3	Yes	Yes	No

The following tables show the wastewater rates for the various scenarios.

Table 31: Wastewater Rate Scenarios

Fee Type	Existing	Scenario 1	Scenario 2	Scenario 3
Service Availability Charge	$42.08	$62.99	$28.94	$28.94
TCEQ Fee	$0.05	$0.05	$0.05	$0.05
Debt Service Fee	$2.30	$2.30	$2.30	$ -
Capital Reserve Fee	$4.12	$4.12	$4.12	$ -
Volumetric Charge per 1,000 gallons	$ -	$ -	$6.09	$7.09

Like with the water scenarios, the Advisory Panel chose Scenario 2 to recommend to the City Council.

Rate Impacts

It is important to consider the impact of rate design changes when deciding which is best suited for the City. In this section the impacts to customers at various usage levels will be presented. When considering rate impacts, it is important to know the consumption statistics of the system. In the industry, average water usage is often used to calculate a "typical" bill. That's to say that on average, a customer will pay that rate throughout the year. For wastewater, the average winter consumption of the system is used to calculate the typical bill for wastewater. For purposes of considering the rate impacts to the customers of the utility, a low, average, and high usage is considered for both the residential and commercial classes. In addition, winter versus summer usage was also considered.

For the residential class, the low, average, and high-water usage is presented in **Table 32**. In the same table the percentage of users using less than that amount of usage is provided. For calculating the sewer bill, the winter consumption is used to calculate the bill. This would represent the average winter consumption for that type of user.

The low, average, and high-water usage for commercial is in **Table 33**.

Table 32: Residential Water Usage Comparisons

Type of User	Winter		Summer	
	Usage	% of Users	Usage	% of Users
Low	4,000	26%	8,000	52%
Average	8,000	26%	17,000	23%
High	15,000	22%	30,000	17%

Table 33: Commercial Water Usage Comparisons

Type of User	Winter		Summer	
	Usage	% of Users	Usage	% of Users
Low	8,000	50%	15,000	64%
Average	16,000	14%	30,000	15%
High	30,000	15%	60,000	14%

In **Table 34**, **Table 35**, and **Table 36**, the bill impacts for the low, average, and high residential user are shown.

Table 34: Low Residential User

Scenario	Winter Bill (4,000 gallons)			Summer Bill (8,000 gallons)		
	Water	Sewer	Total	Water	Sewer	Total
Existing	$55.08	$48.55	$103.63	$62.70	$48.55	$111.25
Scenario 1	$55.08	$69.46	$124.55	$62.70	$69.46	$132.17
Scenario 2	$57.28	$59.40	$116.67	$66.60	$59.40	$126.00
Scenario 3	$46.26	$57.34	$103.60	$58.96	$57.34	$116.30

	Increase / (Decrease) over Existing Rates					
	Water	Sewer	Total	Water	Sewer	Total
Scenario 1	$ -	$20.91	$20.91	$ -	$20.91	$20.91
Scenario 2	$2.20	$10.85	$13.05	$3.90	$10.85	$14.75
Scenario 3	($8.82)	$8.79	($0.03)	($3.74)	$8.79	$5.05

Table 35: Average Residential User

Scenario	Winter Bill (8,000 gallons)			Summer Bill (17,000 gallons)		
	Water	Sewer	Total	Water	Sewer	Total
Existing	$62.70	$48.55	$111.25	$101.27	$48.55	$149.82
Scenario 1	$62.70	$69.46	$132.17	$101.27	$69.46	$170.73
Scenario 2	$66.60	$83.38	$149.98	$91.97	$83.38	$175.36
Scenario 3	$58.96	$85.69	$144.65	$93.51	$85.69	$179.20

	Increase / (Decrease) over Existing Rates					
	Water	Sewer	Total	Water	Sewer	Total
Scenario 1	$ -	$20.91	$20.91	$ -	$20.91	$20.91
Scenario 2	$3.90	$34.83	$38.73	($9.30)	$34.83	$25.53
Scenario 3	($3.74)	$37.14	$33.40	($7.76)	$37.14	$29.38

Table 36: High Residential User

Scenario	Winter Bill (15,000 gallons)			Summer Bill (30,000 gallons)		
	Water	Sewer	Total	Water	Sewer	Total
Existing	$91.75	$48.55	$140.30	$175.05	$48.55	$223.60
Scenario 1	$91.75	$69.46	$161.21	$175.05	$69.46	$244.51
Scenario 2	$86.33	$125.36	$211.69	$176.54	$125.36	$301.90
Scenario 3	$85.83	$135.30	$221.13	$208.67	$135.30	$343.97

	Increase / (Decrease) over Existing Rates					
	Water	Sewer	Total	Water	Sewer	Total
Scenario 1	$ -	$20.91	$20.91	$ -	$20.91	$20.91
Scenario 2	($5.42)	$76.81	$71.39	$1.49	$76.81	$78.30
Scenario 3	($5.92)	$86.75	$80.83	$33.62	$86.75	$120.37

In **Table 37**, **Table 38**, and **Table 39**, the bill impacts for the low, average, and high commercial user are shown.

Table 37: Low Commercial User

Scenario	Winter Bill (8,000 gallons)			Summer Bill (15,000 gallons)		
	Water	Sewer	Total	Water	Sewer	Total
Existing	$62.70	$48.55	$111.25	$89.37	$48.55	$137.92
Scenario 1	$62.70	$69.46	$132.17	$89.37	$69.46	$158.84
Scenario 2	$74.81	$83.38	$158.19	$102.64	$83.38	$186.03
Scenario 3	$65.15	$85.69	$150.84	$97.77	$85.69	$183.46

	Increase / (Decrease) over Existing Rates					
	Water	Sewer	Total	Water	Sewer	Total
Scenario 1	$ -	$20.91	$20.91	$ -	$20.91	$20.91
Scenario 2	$12.11	$34.83	$46.94	$13.27	$34.83	$48.10
Scenario 3	$2.45	$37.14	$39.59	$8.40	$37.14	$45.54

Table 38: Average Commercial User

Scenario	Winter Bill (16,000 gallons)			Summer Bill (30,000 gallons)		
	Water	Sewer	Total	Water	Sewer	Total
Existing	$93.18	$48.55	$141.73	$146.52	$48.55	$195.07
Scenario 1	$93.18	$69.46	$162.65	$146.52	$69.46	$215.99
Scenario 2	$106.90	$131.36	$238.26	$166.51	$131.36	$297.87
Scenario 3	$102.75	$142.39	$245.15	$172.60	$142.39	$314.99

	Increase / (Decrease) over Existing Rates					
	Water	Sewer	Total	Water	Sewer	Total
Scenario 1	$ -	$20.91	$20.91	$ -	$20.91	$20.91
Scenario 2	$13.72	$82.81	$96.53	$19.99	$82.81	$102.80
Scenario 3	$9.57	$93.84	$103.41	$26.08	$93.84	$119.92

Table 39: High Commercial User

Scenario	Winter Bill (30,000 gallons)			Summer Bill (60,000 gallons)		
	Water	Sewer	Total	Water	Sewer	Total
Existing	$146.52	$48.55	$195.07	$270.32	$48.55	$318.87
Scenario 1	$146.52	$69.46	$215.99	$270.32	$69.46	$339.79
Scenario 2	$166.51	$215.31	$381.82	$363.03	$215.31	$578.34
Scenario 3	$172.60	$241.62	$414.22	$402.84	$241.62	$644.46

	Increase / (Decrease) over Existing Rates					
	Water	Sewer	Total	Water	Sewer	Total
Scenario 1	$ -	$20.91	$20.91	$ -	$20.91	$20.91
Scenario 2	$19.99	$166.76	$186.75	$92.71	$166.76	$259.47
Scenario 3	$26.08	$193.07	$219.15	$132.52	$193.07	$325.59

Council Recommendation

The Rate Advisory Panel, through several meetings, underwent a review of the rate study and its results. Through these meetings they gained a thorough understanding of the challenges facing the utility. Through the process, they provided input about the pricing objectives of the community and considered these objectives when reviewing the proposed rate design scenarios. Rate design is the "art of ratemaking." Through rate design, a utility can influence how customers might use water, send messages about essential use and consider the risk aversion of the utility. From a regulatory perspective, once the cost of service for a customer class is established, the utility has flexibility on the rate design that it selects for its customer classes.

As mentioned above, the Rate Advisory Panel recommends that the Council consider Scenario 2 of the proposed rate design scenarios. Before addressing why scenario 2 was selected for both the water and wastewater rates, it's important to consider the essential and very important pricing objectives. As mentioned above, these 4 pricing objectives were the same for the City Council and Rate Advisory Panel. The 4 objectives and their definitions, as shown in Table 20 include:

- Revenue Stability – Generate stable and predictable revenues,
- Equity between classes – Each customer class pays its cost of service
- Customer Impact – Changes in rate structure minimize impact, and
- Conservation Pricing Signals – Contains a pricing signal that encourages wise water use.

Scenarios 2 and 3 were developed to address the pricing objective of the City Council and the Rate Advisory Panel. Each scenario as addressed above in Table 26 and Table 30 meet some of the pricing objectives but not others. In the next sections, how Scenario 2 addresses each of these objectives will be discussed.

Water Rates

In considering the changes to the water rates, Raftelis first considered what the existing rates did well. Through the Service Availability Charges and the Water Service Fees, the utility collects a fixed amount of revenue consistently every month. As a result of this, the utility's revenue is very stable. The utility's existing volumetric charges are inverted block rates, which means that as a customer uses more water, the customer pays more on a cost per thousand gallons. This, however, does not necessarily send a pricing signal. The current tiered structure has a few problems. First, the first 6,000 gallons are "free" and included in the Service Availability Charge. This contradicts the objective of conservation. To receive a pricing signal, a customer should pay for all water usage. Further, the existing structure has 7 tiers, or blocks, with very few customers using in some of the higher tiers. The break in the tiers also does not reflect how the utility's current water customers use water.

REVENUE STABILITY

Scenario 2 essentially maintains the utility's current revenue recovery from fixed charges by maintaining the Service Availability Charges and the Water Service Fees. In addition, by adjusting the Service Availability Charges to reflect the industry standards, larger meters will now pay their fair share based on their meter size. By maintaining the Water Service Fees, the utility will continue to collect a fee that is based on its actual debt service cost and assumed funding for the Capital Reserve. As capital investment increases those fees will increase ensuring that the revenue collected for those costs will not fluctuate based on usage and every customer pays the same amount.

EQUITY BETWEEN CLASSES

Raftelis developed the rate structures based on each class's cost of service. Through the cost-of-service analysis, the impact of each class on the system was evaluated and considered. The rate structure presented in Scenario 2 is based on the residential and commercial cost of service.

CUSTOMER IMPACT

In Scenario 2, the impact to the customers will vary based on the amount of water that they use. As mentioned earlier, not all the pricing objectives would necessarily be met. For scenario 2, minimizing customers impact was not met, as shown in Table 26. This is due to keeping the Service Availability Charges and Water Service Fees in place. From a volumetric perspective, because customers will now start paying for all water usage, a customer that use water in the 0 – 6,000 gallon block will see an increase because they will now start paying for that water.

CONSERVATION PRICING SIGNAL

In determining how to send a conservation pricing signal, it was important to consider the actual consumption for each class. The blocks developed for Scenario 2 considered how the customers of each class use water on average. Water systems are sized to serve peak usage not average usage. If peaking is significant, water systems must be sized larger and result in larger investments. Through tiered rates, the utility will charge customers that impact the system through peaking (higher summer consumption) more than customers that only use the system for essential use. Residential customers have differing consumption patterns that are dependent on the household. There is essential use for cooking, washing and everyday household needs. Then there is discretionary usage that is often for outdoor irrigation use, whether for watering lawns or gardens or for filling swimming pools. Commercial customers tend to use water as part of the business. In that sense the water usage of commercial customers typically does not tend to fluctuate month over month. For the City, many of its commercial customers are Homeowners Associations (HOAs) whose water usage tends to increase in the summertime, much like residential customers. This was taken into account when considering the rate structure for commercial customers.

Residential Volumetric Water Rates

Because residential consumption is measured through one meter, it is not possible to know what amount of water is used indoors and what is used for irrigation purposes. Industry practice is to determine what the winter average usage is for the residential class. This is used as a surrogate for essential water use because it is assumed that during the winter months customers are not irrigating. The winter average usage of the residential class is about 7,000 gallons. This was used as the first tier so that essential use would be charged at a lower rate per 1,000 gallons. The next tier, 7,000 – 17,000 was meant to capture essential use of larger households but could also include some discretionary outdoor usage. Only 25% of customers use greater than 17,000 gallons, so Raftelis considers the next two blocks as being entirely discretionary. To send a pricing signal three additional blocks were proposed, so that consumption that increases up to 50,000 gallons will be charged at a higher cost per gallon.

Commercial Volumetric Water Rates

Typically, commercial volumetric water rates are charged through a uniform rate. For Fair Oaks Ranch, the commercial class is made up of small businesses and HOAs. The small businesses tend to use less water and the HOAs tend to use little water in the winter and more water in the summer for irrigation. Although the usage of the HOAs increases in the summer, it is part of doing business. At the same time, it is good to encourage efficient water use. The first tier of 0 – 10,000 gallons was set to capture the use of the smaller businesses. The next two tiers were based on higher commercial usage and to send a signal for efficient water usage.

Wastewater Rates

The existing wastewater rates are all fixed charges. They include the Service Availability Charges and the Wastewater Service Fees, only. In this case the revenue is very stable in that it is the same every month. Under this type of rate structure, all customers pay the same amount regardless of their usage on the system. Although wastewater is not metered, the industry uses winter average as a method of measuring wastewater. Much like the essential use measurement, winter average is a good measure for the amount of wastewater that a customer will put into the wastewater system. One aspect of the proposed wastewater rate structure is the fact that an increase in wastewater revenue is warranted to recover costs of the wastewater system. This aspect will be discussed below. For the wastewater rate structure, a single rate was maintained and not separated into classes. This was due to not having much differing characteristics between the residential and commercial customers. In wastewater, the HOAs are not wastewater customers.

REVENUE STABILITY

As mentioned above the existing wastewater rates are all fixed. In considering the revenue stability objective, Raftelis maintained the Service Availability Charges and the Water Service Fees but added a volumetric charge that will be charged to customers based on their winter average consumption. While this addition of a volumetric charge means that the Service Availability Charge will be less, 41% of the revenue will remain fixed.

EQUITY BETWEEN CLASSES

Although classes were not created, the equity between the types of customers is maintained through the volumetric charge. Customers are paying based on their impact to the system, which achieves equity.

CUSTOMER IMPACT

As mentioned above a revenue increase is required to meet the costs of the wastewater system. Because of this needed increase, all customers will be impact by the rate change. Although, it must be noted that based on a customer's usage, the amount of the increase will be less for a lower user.

Other Rate Advisory Panel Considerations

In addition to considering the various rate scenarios, the Advisory Panel discussed the water surplus, as shown in Figure 2 above. Currently, the utility collects revenue through the Capital Reserve Fee. Scenario 2 assumes that the Capital Reserve Fee will be maintained. In addition to the revenue from the Capital Reserve Fee, the utility collects a surplus from the water system. Historically, this surplus has funded the shortfall of the wastewater system. With the adjustment of the wastewater rates to full cost recovery, the water surplus will be available for the water system. The cost-of-service analysis, as well as the proposed Scenarios 2 and 3, assume that the utility will maintain that surplus. In finalizing the rate scenarios, the Advisory Panel considered the following about the surplus:

- Maximize the contribution to capital,
- Eliminate the surplus by reducing water rates, and
- Use the surplus for a transfer to the General Fund.

Of these three considerations, the Rate Advisory Panel recommended additional contribution to capital.

ADDITIONAL CONTRIBUTION TO CAPITAL

As mentioned above the utility transfers funds to the Capital Reserve to cash-fund capital. With the additional surplus now available to the water utility, the Advisory Panel considered and recommended using the surplus to increase the

amount available for cash-funding capital beyond the amount available from the capital reserve fee. This additional contribution to capital has several positive effects, including:

- Reducing future debt service,
- Water customers pay for future water system needs,
- Cash is available to the water system if growth does not occur, and
- Future rate adjustments should be minimal.

REDUCTION OF WATER RATES

The Advisory Panel considered reducing water rates to a level that would only meet the O&M, debt service and operating reserve costs of the water utility and limit the contribution to the capital reserve to only the amount that is collected through the capital reserve fee. This change would result in a reduction of the water rates. On the other hand, this reduction would make future revenues dependent on growth, which could result in the need for future rate increases if the growth does not occur. It would also limit the additional cash available for reinvestment into the water system.

GENERAL FUND TRANSFER

The Advisory Panel also considered using some of the surplus for a transfer to the general fund. While some utilities are in the practice of transferring surplus funds from the water utility to the general fund, the methodology for determining the appropriate level of the transfer can be dubious. The methodologies for calculating an appropriate amount of the transfer include a PILOT (Payment in Lieu of Taxes) or the application of an appropriate Franchise Fee.

These types of transfers will benefit the taxpayers of the city and not the ratepayer. In addition, by transferring funds to the General Fund, less funds will be available for reinvestment into the water system. Further, to remain equitable, the wastewater system should also make a transfer to the General Fund, which would result in further rate increases to the wastewater system.

Conclusion

It is important to keep in mind that a utility has much flexibility on rate design. As objectives change the rate design should be evaluated to determine whether they are still sending the message desired by the utility. The proposed rates provided in this report were developed through a process that considered leadership's objectives as well as the objectives of the community. While those objectives can be met in many different ways, the Rate Advisory Panel came to the conclusion that Scenario 2 provided the most effective way of meeting the current objectives.

APPENDIX A:

FINANCIAL POLICY REVIEW