

# Amador Water Agency

## 2021 Wastewater Rate Study

Draft Report / June 7, 2021







June 7, 2021

Mr. Larry McKenney  
General Manager  
Amador Water Agency  
12800 Ridge Road  
Sutter Creek, CA 95685

**Subject: Amador Water Agency 2021 - Wastewater Rate Study**

Dear Mr. McKenney,

Raftelis is pleased to provide this Wastewater Rate Study Report (Report) for Amador Water Agency (Agency). The major objectives of the study include the following:

1. Develop financial plans for the wastewater enterprises to ensure financial sufficiency, meet operation and maintenance (O&M) costs, and ensure sufficient funding for capital refurbishment and replacement (R&R) needs.
2. Conduct a cost of service analysis for the wastewater enterprises.
3. Develop wastewater rates for a five-year period to ensure fairness and equity, enhance revenue stability for recovering fixed costs, and comply with Proposition 218 requirements.

This Report summarizes the key findings and recommendations related to the development of the financial plans for wastewater enterprises and the associated wastewater rates.

It has been a pleasure working with you, and we thank you and the Agency staff for the support provided during the course of this study.

Sincerely,

A handwritten signature in black ink, appearing to read 'Sanjay Gaur'.

**Sanjay Gaur**  
Vice President

A handwritten signature in black ink, appearing to read 'Nancy Phan'.

**Nancy Phan**  
Senior Consultant

A handwritten signature in black ink, appearing to read 'Michael Hicks'.

**Michael Hicks**  
Consultant

# Table of Contents

<b>1.</b>	<b>Introduction .....</b>	<b>1</b>
1.1.	System Overview .....	1
1.2.	Legal Requirements and Rate Setting Methodology.....	1
1.2.1.	Legal Requirements .....	1
1.2.2.	Rate Setting Methodology .....	2
<b>2.</b>	<b>Wastewater Financial Plan.....</b>	<b>3</b>
2.1.	Wastewater Assumptions.....	3
2.1.1.	Inflation .....	3
2.1.2.	Projected Account and Demand Growth.....	4
2.1.3.	Reserve Policy .....	4
2.2.	Revenues from Current Wastewater Rates.....	5
2.3.	Wastewater O&M Expenses .....	9
2.4.	Projected Capital Improvement Projects.....	9
2.5.	Debt Service .....	11
2.5.1.	Existing Debt Service.....	11
2.5.2.	Proposed Debt Service .....	12
2.6.	Status Quo Wastewater Financial Plan .....	12
2.7.	Proposed Wastewater Financial Plan .....	15
<b>3.</b>	<b>Wastewater Cost of Service and Rate Derivation.....</b>	<b>1</b>
3.1.	Process and Approach .....	1
3.2.	Wastewater Cost of Service Analysis.....	1
3.2.1.	Pine Grove .....	1
3.2.2.	Revenue Requirement Determination .....	1
3.2.3.	O&M Cost Allocation to Cost Components .....	2
3.2.4.	Capital Cost Allocation to Cost Components .....	4
3.2.5.	Units of Service and Mass Balance.....	5
3.2.6.	Unit Cost of Service.....	7
3.2.7.	Class Cost of Service.....	8
3.3.	Wastewater Rate Calculation.....	8
3.3.1.	Internal Loan Rates .....	9

3.3.2.	Proposed Rate Summary .....	11
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# List of Tables

Table 2-1: Revenue Escalation Factors .....	3
Table 2-2: Expense Escalation Factors .....	3
Table 2-3: Account Growth Projections .....	4
Table 2-4: Demand Growth Projections.....	4
Table 2-5: FY 2021 Target Wastewater Reserves .....	5
Table 2-6: Wastewater Monthly Service Charges.....	5
Table 2-7: Wastewater Commercial Usage Charges.....	6
Table 2-8: Wastewater Monthly Debt Service Charges.....	6
Table 2-9: Wastewater Accounts for Customer Class (EDUs).....	6
Table 2-10: Wastewater Accounts for Debt Service Charges (EDUs) .....	6
Table 2-11: Commercial Wastewater Usage (ccf).....	7
Table 2-12: Projected Wastewater Fixed Service Charge Revenue.....	7
Table 2-13: Projected Wastewater Debt Service Charge Revenue.....	8
Table 2-14: Projected Wastewater Commercial Usage Charge Revenue.....	8
Table 2-15: Wastewater Rate Revenue Summary .....	8
Table 2-16: Projected Wastewater Revenues.....	9
Table 2-17: Projected Wastewater O&M Expenses.....	9
Table 2-18: Wastewater Capital Projects (Inflated).....	10
Table 2-19: Wastewater Capital Financing Plan .....	11
Table 2-20: Existing Wastewater Debt Service .....	12
Table 2-21: Proposed Debt Terms FY 2024.....	12
Table 2-22: Annual Wastewater Debt Service .....	12
Table 2-23: Status Quo Wastewater Financial Plan.....	14
Table 2-24: Proposed Wastewater Revenue Adjustments.....	15
Table 2-25: Proposed Wastewater Financial Plan .....	17
Table 3-1: Wastewater Revenue Requirement.....	2
Table 3-2: O&M Allocation Percentages.....	3
Table 3-3: O&M Allocation Dollars .....	4
Table 3-4: Capital Allocation Percentages .....	5
Table 3-5: Capital Allocation Dollars .....	5
Table 3-6: Mass Balance.....	6
Table 3-7: Units of Service .....	7
Table 3-8: Unit Cost Calculation.....	7
Table 3-9: Class Cost of Service.....	8
Table 3-10: Wastewater Rate Calculation .....	8
Table 3-11: FY 2021 Internal Loans.....	9
Table 3-12: FY 2022 Internal Loans.....	9
Table 3-13: Internal Loan Balances .....	10

Table 3-14: Proposed Rates .....	11
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# List of Figures

Figure 2-1: Wastewater Growth and Replacement Capital Projects .....	10
Figure 2-2: Wastewater Capital Financing Plan .....	11
Figure 2-3: Status Quo Financial Plan Wastewater .....	13
Figure 2-4: Status Quo Wastewater Ending Balances .....	13
Figure 2-5: Proposed Financial Plan Wastewater .....	15
Figure 2-6: Proposed Wastewater Ending Balances .....	16



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# 1. Introduction

## 1.1. System Overview

The Amador Water Agency (Agency) provides treated and untreated retail water service through more than 7,200 residential, commercial, industrial, and irrigation water service connections, as well as treated wholesale water services to several neighboring public agencies. The Agency currently delivers about 1.4 billion gallons of safe, reliable water per year through a water distribution system that includes 230 miles of pipelines, as well as water production, transmission, treatment, and storage facilities.

Additionally, the Agency also owns and operates several different wastewater systems in various areas throughout Amador County. Currently the Agency serves the communities of Fairway Pines, Tiger Creek Estates, Gayla Manor, Wildwood Estates, Surrey Junction, Jackson Pines, Pine Grove, Martell, Viewpoint Estates, Eagles Nest, and Lake Camanche Village Unit 6. The wastewater generated in Martell is piped to the City of Sutter Creek for treatment. The remaining systems consist of subsurface leach fields and spray disposal fields.

The major objectives of the study include the following:

1. Develop financial plans for the wastewater enterprises to ensure financial sufficiency, meet operation and maintenance (O&M) costs, and ensure sufficient funding for capital refurbishment and replacement (R&R) needs.
2. Conduct a cost of service analysis for the wastewater enterprises.
3. Develop wastewater rates for a five-year period to ensure fairness and equity, enhance revenue stability for recovering fixed costs, and comply with Proposition 218 requirements.

This Report summarizes the key findings and recommendations related to the development of the financial plans for water and wastewater enterprises and the development of the associated rates.

## 1.2. Legal Requirements and Rate Setting Methodology

### 1.2.1. LEGAL REQUIREMENTS

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

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

As stated in the American Water Works Association's (AWWA) *Principles of Water Rates, Fees, and Charges: Manual of Water Supply Practices M1*, 6<sup>th</sup> edition (M1 Manual), "water rates and charges should be recovered from

classes of customers in proportion to the cost of serving those customers.” Proposition 218 requires that rates cannot be *arbitrary and capricious*, meaning that the rate-setting methodology must be sound and that there must be a nexus between the costs and the rates charged. This study follows industry standard rate setting methodologies set forth by the *M1 Manual*, adhering to Proposition 218 requirements by developing rates that do not exceed the proportionate cost of providing water services.

### **1.2.2. RATE SETTING METHODOLOGY**

This report was prepared using the principles established by AWWA’s M1 Manual and the Water Environment Federation’s (WEF) Manual No. 27, which establishes commonly accepted professional standards for cost of service studies. The general principles of rate structure design and the objectives of the study are described below.

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

After determining a utility’s revenue requirements, a utility’s next step is determining the cost of service. Utilizing a public agency’s approved budget, financial reports, operating data, and capital improvement plans, a rate study generally categorizes (functionalizes) the costs (such as treatment, storage, and pumping), expenses, and assets of the utility system among major operating functions to determine the cost of service.

After the assets and the costs of operating those assets are properly categorized by function, the rate study allocates those “functionalized costs” to the various customer classes (e.g., single-family residential, multi-family residential and commercial) by determining the characteristics of those classes and the contribution of each to incurred costs based on service characteristics and demand patterns. Rate design is the final part of the M1 Manual’s rate-making procedure and generally uses the revenue requirement and cost of service analysis to determine appropriate rates for each customer class.

# 2. Wastewater Financial Plan

A review of the Agency’s revenue requirements is a key first step in the rate study process. This section of the report provides a discussion of the projected revenues, O&M expenses, other reserve funding, and revenue adjustments estimated as required to ensure the fiscal sustainability and solvency of the Wastewater Enterprise. Numbers shown in all the tables of this section are rounded; therefore, hand calculations based on the displayed numbers, such as summing or multiplying, may not equal the exact results shown.

## 2.1. Wastewater Assumptions

The study period is for Fiscal Years (FY) 2021 to FY 2026<sup>1</sup>. For all cost of service analyses in this report, the cost of service year will be FY 2021 and rate-setting year will be FY 2022. It is important to note that the Agency updates its rates in July of each year with the exception of FY 2022 where the rates will be updated in October.

### 2.1.1. INFLATION

Various types of assumptions and inputs were incorporated into the study based on discussions with, and/or at the direction of Agency staff. These include the projected number of accounts and annual growth rates in consumption for different customer classes, inflation factors, and other assumptions. The inflation factor assumptions are presented in **Table 2-1** and **Table 2-2**.

**Table 2-1: Revenue Escalation Factors**

A	B	C	D	E	F	G
Revenue Escalation Factors	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Miscellaneous Revenues	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Meter Sales	2.0%	2.0%	2.0%	2.0%	2.0%	2.0%
Reimbursements	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Reserve Interest Rate	1.0%	1.0%	1.0%	1.0%	1.0%	1.0%
Non-Inflated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Table 2-2: Expense Escalation Factors**

A	B	C	D	E	F	G
Expense Escalation Factors	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
General	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Salaries	3.0%	6.0%	4.0%	4.0%	4.0%	4.0%
Benefits	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
Water	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Utilities	4.0%	4.0%	4.0%	4.0%	4.0%	4.0%
PG&E	5.0%	5.0%	5.0%	5.0%	5.0%	5.0%
Capital	3.0%	3.0%	3.0%	3.0%	3.0%	3.0%
Non-Inflated	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

<sup>1</sup> FY 2021 is the year beginning on July 1, 2020 and ending June 30, 2021.

### 2.1.2. PROJECTED ACCOUNT AND DEMAND GROWTH

Raftelis assumes no customer account or demand growth over the study period to ensure sufficiently conservative revenue projections. The projected account growth and demand growth assumptions for the study period are shown in **Table 2-3** and **Table 2-4** below.

**Table 2-3: Account Growth Projections**

A	B	C	D	E	F	G
Customer Account Growth	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Residential</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Commercial</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

**Table 2-4: Demand Growth Projections**

A	B	C	D	E	F	G
Demand Growth	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Residential</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%
<b>Commercial</b>	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

### 2.1.3. RESERVE POLICY

A reserve policy is a written document that provides a basis for a utility to cope with unanticipated reductions in revenues, offset fluctuations in costs of providing services, and fiscal emergencies such as revenue shortfalls, asset failure, and natural disaster. It also provides guidelines for sound financial management with an overall long-range perspective to maintain financial solvency and to mitigate financial risks associated with revenue instability, volatile capital costs, and emergencies. It also sets funds aside for replacement of capital assets as they age and for new capital projects. Additionally, adopting and adhering to a sustainable reserve policy enhances financial management transparency and helps achieve or maintain a certain credit rating for future debt issues.

The appropriate amount of reserves and reserve types are determined by a variety of factors, such as the size of the operating budget, the amount of debt, the type of rate structure, frequency of customer billing, and risk of natural disaster. With this being said, most reserves tend to fall into the following categories: O&M cash flow, capital R&R, and emergency.

**Operating Reserves** – The purpose of an O&M reserve is to provide working capital to support the operation, maintenance, and administration of the utility. From a risk management perspective, the O&M reserve supports the Agency’s cash flow needs during normal operations and ensures that operations can continue should there be significant events that impact cash flows. As it is unlikely for a utility to precisely predict the revenues and revenue requirements for each billing period, a reserve set aside to hedge the risk of monthly negative cash positions is prudent financial planning. Another factor to consider when creating a cash flow reserve is the frequency of billing. A utility that bills once a month would require fewer minimum reserves than a utility that bills bi-monthly. Raftelis reviewed the reserve policy with Agency staff and determined that three months of annual operating expenses is the most appropriate to support the operations, maintenance, and administration of the Agency.

**Emergency** – The purpose of an emergency fund is to allow the Agency to provide uninterrupted service in light of a fiscal emergency, natural disaster, or facility failure. An emergency reserve decreases risk by recognizing the high capital costs of the facilities and setting aside adequate funds to restart the system after an unanticipated event or to replace an essential facility. Discussions with Agency staff regarding their capital needs and critical asset considerations form the basis for the target level of the emergency reserve. A \$500 thousand emergency fund was deemed most appropriate for the Agency’s needs.

**Capital Replacement** – Capital R&R reserves are used to fund future obligations that are necessary for maintaining a reliable infrastructure. Because water and sewer utilities are highly capital-intensive enterprises, it is important to accurately estimate long-term R&R costs and develop a reserve to fund the eventual replacement of the system and new capital projects. The capital replacement reserve is equal to 1% of Asset Value Net of Depreciation.

**Table 2-5** summarizes the Wastewater Enterprise’s Target Reserves for FY 2021.

**Table 2-5: FY 2021 Target Wastewater Reserves**

A	B	C
Reserve Targets	Policy	FY 2021 Target
<b>Operating Reserves</b>	3 Months of Operating Budget	\$476,757
<b>Capital Replacement</b>	1% of Asset Value Net of Depreciation	\$71,730
<b>Emergency</b>		\$500,000
<b>Grand Total</b>		<b>\$1,048,487</b>

## 2.2. Revenues from Current Wastewater Rates

**Table 2-6** show the current rates effective since July 1, 2020. Single Family Dwelling, Commercial and Pine Grove fixed charges are based on equivalent dwelling units (EDUs). Residential wastewater rates reflect average winter (February and March) water use for residential users of 5 hundred cubic feet (ccf) per month.

**Table 2-6: Wastewater Monthly Service Charges**

A	B
Customer Class	Wastewater Service Charge (per EDU)
Single Family Dwellings	\$108.82
Pine Grove	\$27.73
Commercial	\$43.04

Commercial customers also pay a variable sanitation flows rate based on average monthly water usage for February and March of each year shown on **Table 2-7**.

**Table 2-7: Wastewater Commercial Usage Charges**

A	B
Customer Class	Wastewater Usage Rate (per ccf)
Low Strength	\$13.16
Medium Strength	\$15.51
High Strength	\$20.21

The Agency also maintains a debt service charge which is associated with specific service areas. The debt service charges are shown in **Table 2-8** below.

**Table 2-8: Wastewater Monthly Debt Service Charges**

A	B
Service Area	Debt Service Charge (per EDU)
Wastewater ID#1	\$9.88
Pine Grove	\$21.40
Lake Camanche	\$10.80
Martell	\$1.83

**Table 2-9** summarizes the projected number of accounts and EDUs by customer class for the study period, and **Table 2-10** summarizes the projected number of accounts and EDUs by service area that pay debt service charges for the study period. **Table 2-11** summarizes the amount commercial use that is billed for the study period at the three strength levels. The EDUs and usage projections were provided by Agency staff for FY 2021.

**Table 2-9: Wastewater Accounts for Customer Class (EDUs)**

A	B	C	D	E	F	G
Customer Class (EDUS)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Single Family Dwellings	689	689	689	689	689	689
Pine Grove	54	54	54	54	54	54
Commercial	637	637	637	637	637	637
<b>Total</b>	<b>1,380</b>	<b>1,380</b>	<b>1,380</b>	<b>1,380</b>	<b>1,380</b>	<b>1,380</b>

**Table 2-10: Wastewater Accounts for Debt Service Charges (EDUs)**

A	B	C	D	E	F	G
Service Area (EDUS)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Wastewater ID#1	301	301	301	301	301	301
Pine Grove	71	71	71	71	71	71
Lake Camanche	352	352	352	352	352	352
Martell	621	621	621	621	621	621
<b>Total</b>	<b>1,345</b>	<b>1,345</b>	<b>1,345</b>	<b>1,345</b>	<b>1,345</b>	<b>1,345</b>



**Table 2-11: Commercial Wastewater Usage (ccf)**

A	B	C	D	E	F	G
Customer Class (ccf)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Low Strength	10,765	10,765	10,765	10,765	10,765	10,765
Medium Strength	7,450	7,450	7,450	7,450	7,450	7,450
High Strength	12,298	12,298	12,298	12,298	12,298	12,298
<b>Total</b>	<b>30,513</b>	<b>30,513</b>	<b>30,513</b>	<b>30,513</b>	<b>30,513</b>	<b>30,513</b>

As can be seen from above tables, the existing number of EDUs for FY 2021 remain stable through all years of the study period as mentioned above in **Table 2-3** and **Table 2-4**.

The current rates (**Table 2-6**, **Table 2-7**, **Table 2-8**) are multiplied by the customer accounts (**Table 2-9**, **Table 2-10**), and usage data (**Table 2-11**) to determine the total calculated rate revenue.

For example, to calculate the Single Family Dwelling rate revenues, the number of Single Family Dwellings EDUs are multiplied by the Single Family Dwellings monthly service charge per EDU for 12 months. The formula below shows how the value in Column B of **Table 2-12** is derived.

$$\begin{aligned} & \text{Projected \# of EDUs for FY 2021} \times \text{FY 2021 Single Family Rate} \times 12 \text{ Months} \\ & 689 \text{ EDUs} \times \$108.82 \text{ per EDU per month} \times 12 \text{ months} = \$899,724 \end{aligned}$$

The same formula is applied to each of the customer classes to derive the projected revenues for that class. **Table 2-12** shows the projected revenues for the Wastewater Fixed Service Charge.

**Table 2-12: Projected Wastewater Fixed Service Charge Revenue**

A	B	C	D	E	F	G
Customer Class (EDUS)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Single Family Dwellings	\$899,724	\$899,724	\$899,724	\$899,724	\$899,724	\$899,724
Pine Grove	\$17,969	\$17,969	\$17,969	\$17,969	\$17,969	\$17,969
Commercial	\$328,998	\$328,998	\$328,998	\$328,998	\$328,998	\$328,998
<b>Total</b>	<b>\$1,246,691</b>	<b>\$1,246,691</b>	<b>\$1,246,691</b>	<b>\$1,246,691</b>	<b>\$1,246,691</b>	<b>\$1,246,691</b>

The same formula is also applied to derive the debt service charge of each of the service area. The derivation for Wastewater ID#1 (**Table 2-13**, Column B) is shown below.

$$\begin{aligned} & \text{Projected \# of EDUs for FY 2021} \times \text{FY 2021 Debt Service Rate} \times 12 \text{ Months} \\ & 301 \text{ EDUs} \times \$9.88 \text{ per EDU per month} \times 12 \text{ months} = \$35,687 \end{aligned}$$

**Table 2-13** shows the projected revenues for the debt service charge.

**Table 2-13: Projected Wastewater Debt Service Charge Revenue**

A	B	C	D	E	F	G
Customer Class (EDUS)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Wastewater ID#1	\$35,687	\$35,687	\$35,687	\$35,687	\$35,687	\$35,687
Pine Grove	\$18,233	\$18,233	\$18,233	\$18,233	\$18,233	\$18,233
Lake Camanche	\$45,619	\$45,619	\$45,619	\$45,619	\$45,619	\$45,619
Martell	\$13,637	\$13,637	\$13,637	\$13,637	\$13,637	\$13,637
<b>Total</b>	<b>\$113,176</b>	<b>\$113,176</b>	<b>\$113,176</b>	<b>\$113,176</b>	<b>\$113,176</b>	<b>\$113,176</b>

The variable revenues are calculated in a similar manner, the projected usage for FY 2021 as shown **Table 2-11** is multiplied by the FY 2021 rate shown in **Table 2-7**. The formula below shows how the value for the Low Strength in Column B of **Table 2-14** is derived. **Table 2-14** shows the projected revenues for the commercial usage charges.

$$\text{Projected Low Strength Usage for FY 2021} \times \text{Low Strength Rate} \\ 10,765 \text{ ccf} \times \$13.76 \text{ per ccf} = \$141,667$$

**Table 2-14: Projected Wastewater Commercial Usage Charge Revenue**

A	B	C	D	E	F	G
Wastewater Usage Rate	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Low Strength	\$141,667	\$141,667	\$141,667	\$141,667	\$141,667	\$141,667
Medium Strength	\$115,550	\$115,550	\$115,550	\$115,550	\$115,550	\$115,550
High Strength	\$248,543	\$248,543	\$248,543	\$248,543	\$248,543	\$248,543
<b>Total</b>	<b>\$505,759</b>	<b>\$505,759</b>	<b>\$505,759</b>	<b>\$505,759</b>	<b>\$505,759</b>	<b>\$505,759</b>

**Table 2-15** shows the summary of wastewater rate revenue from each of the rate components which is used to project the revenues through the study period.

**Table 2-15: Wastewater Rate Revenue Summary**

A	B	C	D	E	F	G
Customer Class (EDUS)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Monthly Service Charge	\$1,246,691	\$1,246,691	\$1,246,691	\$1,246,691	\$1,246,691	\$1,246,691
Debt Service Charge	\$113,176	\$113,176	\$113,176	\$113,176	\$113,176	\$113,176
Wastewater Usage Charge	\$505,759	\$505,759	\$505,759	\$505,759	\$505,759	\$505,759
<b>Total</b>	<b>\$1,865,626</b>	<b>\$1,865,626</b>	<b>\$1,865,626</b>	<b>\$1,865,626</b>	<b>\$1,865,626</b>	<b>\$1,865,626</b>

In addition to revenue from rates, the wastewater enterprise also receives miscellaneous revenues from different sources such as interest earnings and other operating and non-operating sources. Total miscellaneous revenues and rate revenues for the study period are shown in **Table 2-16**. The figures below are based on Agency staff projections for the study period. Revenues are not inflated year to year to ensure sufficiently conservative revenue projections for the study period.

**Table 2-16: Projected Wastewater Revenues**

A	B	C	D	E	F	G
Projected Revenue	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Rate Revenue	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626
Other Operating Revenue	\$133,487	\$133,487	\$133,487	\$133,487	\$133,487	\$133,487
Non-Operating Revenue	\$107,965	\$107,965	\$107,965	\$107,965	\$107,965	\$107,965
Transfers In	\$15,256	\$15,256	\$15,256	\$15,256	\$15,256	\$15,256
<b>Total Revenue</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>

## 2.3. Wastewater O&M Expenses

Using the Agency’s FY 2022 budget values, inflation factors were assigned to each line item to determine future O&M costs for the wastewater enterprise. These inflation factors can be referenced **Table 2-2**. **Table 2-17** summarizes budgeted and projected O&M expenses for the wastewater enterprise during the study period. Other operating expenses include salaries & benefits, chemicals, tool & equipment, and other utility expenses (please refer to the Agency’s budget document for descriptions of each expense item).

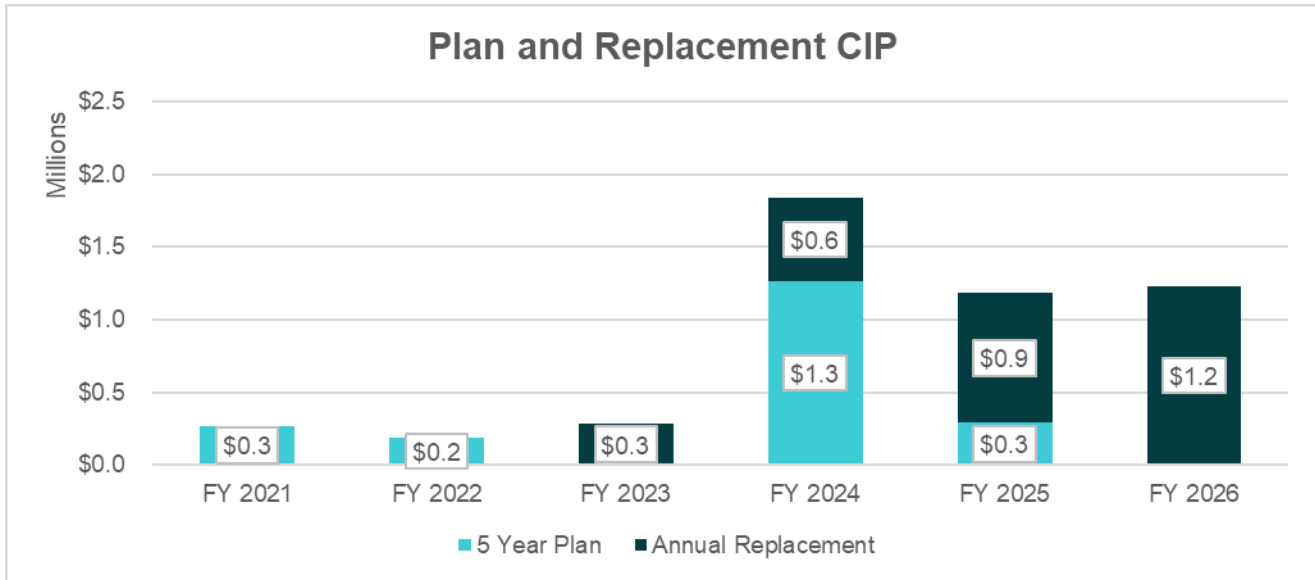
**Table 2-17: Projected Wastewater O&M Expenses**

A	B	C	D	E	F	G
Projected O&M Expenses	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Board of Directors	\$9,109	\$6,013	\$11,272	\$8,807	\$10,544	\$10,936
Administration	\$137,476	\$112,649	\$113,876	\$116,321	\$118,732	\$122,902
Engineering	\$78,411	\$61,149	\$62,969	\$64,851	\$66,797	\$69,171
Finance	\$134,368	\$132,553	\$136,909	\$141,439	\$146,151	\$151,760
Non-Departmental	\$68,010	\$71,482	\$76,571	\$80,101	\$85,616	\$88,185
Operations and Maintenance	\$1,479,655	\$1,674,474	\$1,733,454	\$1,794,553	\$1,857,849	\$1,924,254
<b>Total O&amp;M Expenses</b>	<b>\$1,907,028</b>	<b>\$2,058,320</b>	<b>\$2,135,051</b>	<b>\$2,206,072</b>	<b>\$2,285,689</b>	<b>\$2,367,208</b>

## 2.4. Projected Capital Improvement Projects

The Agency has programmed approximately \$5 million in total capital expenditures during the study period. As shown in **Figure 2-1**, approximately \$3 million is allocated to annual repair and replacement costs (dark blue) and another \$2 million is allocated to growth related projects (teal). A full list of projects and their costs can be seen in **Table 2-18**. The capital improvement project (CIP) costs for future years are determined by using the programmed/budgeted costs and inflating the value by the capital inflation factor shown in **Table 2-2**.

**Figure 2-1: Wastewater Growth and Replacement Capital Projects**

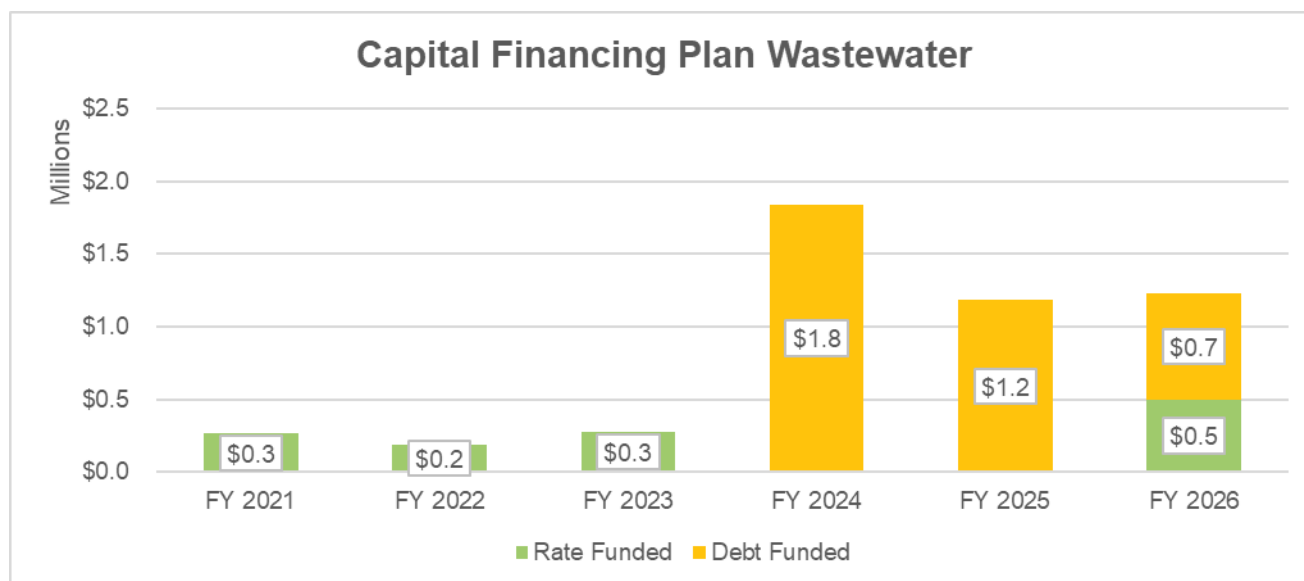


**Table 2-18: Wastewater Capital Projects (Inflated)**

A	B	C	D	E	F	G
Capital Projects (Inflated)	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Wastewater Master Plan	\$204,000	\$0	\$0	\$0	\$0	\$0
Martell Argonaught to LS#2 I&I Study & Repairs	\$62,000	\$0	\$0	\$0	\$0	\$0
Camanche WWTP Screen Aerator	\$0	\$190,550	\$0	\$0	\$0	\$0
Lift Station #2 Replacement	\$0	\$0	\$0	\$1,092,727	\$0	\$0
Security & Fencing Improvements	\$0	\$0	\$0	\$170,465	\$0	\$0
Lift Station C& D Generators	\$0	\$0	\$0	\$0	\$289,256	\$0
Annual Replacement	\$0	\$0	\$280,679	\$578,198	\$893,316	\$1,226,821
<b>Total Capital Projects</b>	<b>\$266,000</b>	<b>\$190,550</b>	<b>\$280,679</b>	<b>\$1,841,391</b>	<b>\$1,182,572</b>	<b>\$1,226,821</b>

The Agency plans to fund its CIP needs via a mix of pay-as-you-go (PAYGO) (green) and a \$3.75 million debt issuance to be made in FY 2024 (yellow), as shown in **Figure 2-2**. The capital financing plan is shown in tabular format in **Table 2-19**.

**Figure 2-2: Wastewater Capital Financing Plan**



**Table 2-19: Wastewater Capital Financing Plan**

A	B	C	D	E	F	G
Capital Financing Plan	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Inflated Project Costs	\$266,000	\$190,550	\$280,679	\$1,841,391	\$1,182,572	\$1,226,821
Debt Proceeds	\$0	\$0	\$0	\$3,750,000	\$0	\$0
<b>Capital Financing</b>						
Rate Funded	\$266,000	\$190,550	\$280,679	\$0	\$0	\$500,784
Debt Funded	\$0	\$0	\$0	\$1,841,391	\$1,182,572	\$726,037

## 2.5. Debt Service

The Agency has a number of long-term debt obligations. The repayment of these obligations is associated with specific service areas and as such there are several debt related components in the current rates that are subdivided by service area. However, since 2013, new debt has been issued on a system-wide basis and is allocated across the entire water system, independent of service area. Further detail relating to the debt service charge will be discussed in the Cost-of-Service Section of this report.

### 2.5.1. EXISTING DEBT SERVICE

The Agency currently has internal loan obligations which total to approximately \$114 thousand to \$133 thousand a year for the study period. Internal loans were developed to address financial constraints created when each service area was treated as a separate enterprise. The internal loan obligations can be seen in **Table 2-20**.

**Table 2-20: Existing Wastewater Debt Service**

A	B	C	D	E	F	G
Existing Debt Service	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
Internal Loans	\$133,895	\$132,023	\$130,151	\$118,063	\$116,385	\$114,707
<b>Total Existing Debt Service</b>	<b>\$133,895</b>	<b>\$132,023</b>	<b>\$130,151</b>	<b>\$118,063</b>	<b>\$116,385</b>	<b>\$114,707</b>

## 2.5.2. PROPOSED DEBT SERVICE

In order to fund the wastewater capital improvement projects as discussed in **Section 2.4** of this Report, the agency intends to issue a \$3.75 million debt in FY 2024 which will be allocated to the projects mentioned in **Table 2-18**. The proposed debt terms are discussed in **Table 2-21** and the annual debt service requirements are shown in **Table 2-22**.

**Table 2-21: Proposed Debt Terms FY 2024**

A	B
Proposed Debt Terms	FY 2024
Interest Rate	5%
Term (years)	30
Issuance Cost	2%

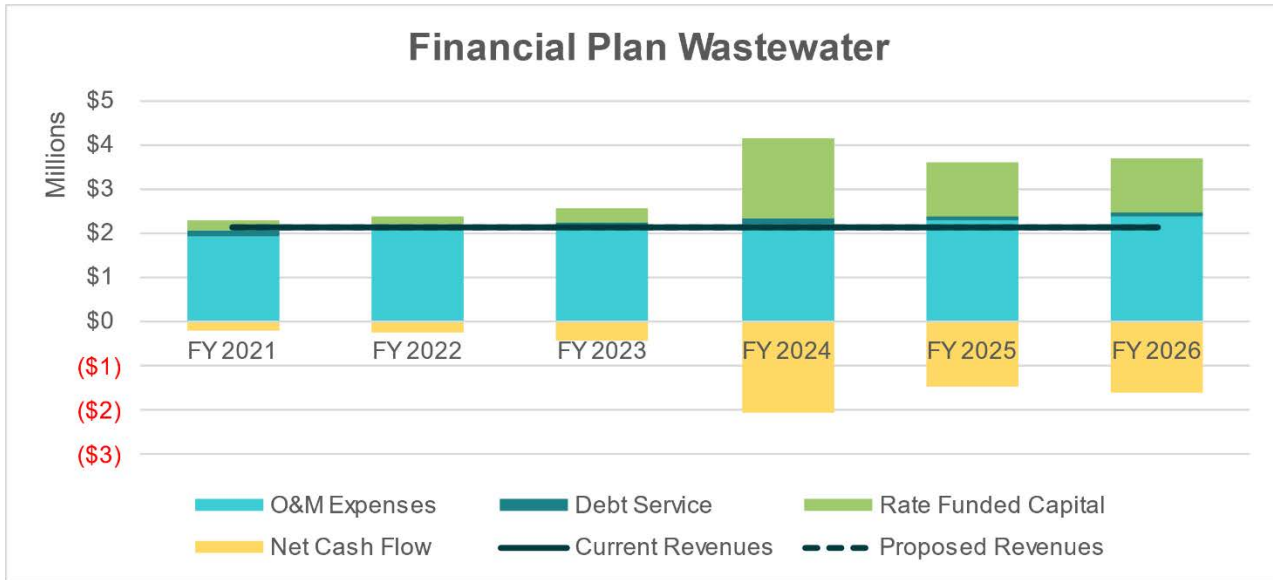
**Table 2-22: Annual Wastewater Debt Service**

A	B	C	D	E	F	G
Proposed Debt Service	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Annual Debt Service Requirement</b>						
Proposed Debt Issuance	\$0	\$0	\$0	\$248,921	\$248,921	\$248,921
<b>Total Proposed Debt Service</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$248,921</b>	<b>\$248,921</b>	<b>\$248,921</b>

## 2.6. Status Quo Wastewater Financial Plan

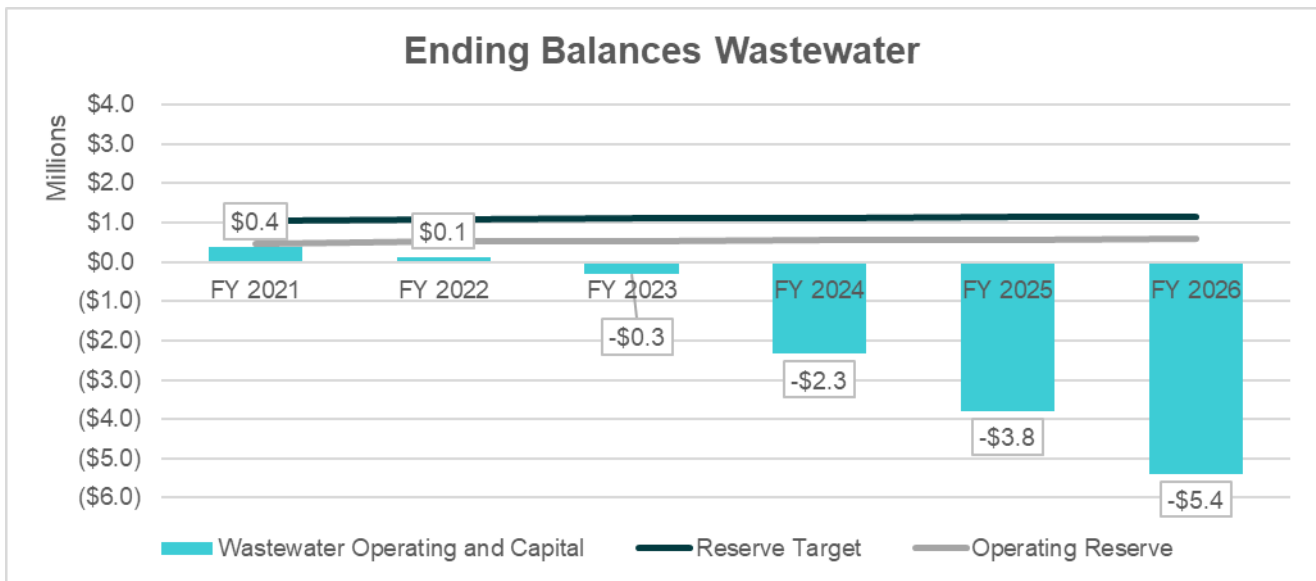
**Figure 2-3** shows the revenue shortfalls that begin in FY 2021 and carry through each year of the study period. The solid blue line represents the projected revenues from current rates without any adjustment (gross increase in rate revenues). Note that the blue dashed line (proposed) matches the solid blue line (current) as no revenue adjustments are made in this scenario. Additionally, no debt issuances are assumed as the status quo captures only the currently generated revenues.

Figure 2-3: Status Quo Financial Plan Wastewater



The stacked bars represent the expenditures such as debt service (dark teal), O&M expenses (light blue), and PAYGO CIP (green). The yellow bars below the axis signify that the collected revenues are insufficient for operating and capital costs in those years and require drawing on the current wastewater fund reserve balances which draw into the negative beginning in FY 2023 as can be seen in **Figure 2-4**. This makes clear that the current wastewater revenues are insufficient to recover the costs to operate in all years as the Agency is not able to meet its target reserves under the status quo; thus, certain revenue adjustments are required. **Table 2-23** summarizes this data in a tabular format. Net Cash Flow is the Total Revenue Less Total O&M expenses and Total Debt and Capital. Net Revenue is simply Total Revenues less Total O&M expenses and is used to calculate debt coverage. The required debt coverage ratio for the Agency is 1.25, which means that the Agency’s net revenue must amount to at least 1.25 times annual debt service. It is important to note that Calculated Debt Coverage in **Table 2-23** is blank as internal loans are not included in the debt coverage requirement formula.

Figure 2-4: Status Quo Wastewater Ending Balances



**Table 2-23: Status Quo Wastewater Financial Plan**

A	B	C	D	E	F	G
Wastewater Financial Plan	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Revenues</b>						
Rate Revenue	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626
Revenue Adjustments	\$0	\$0	\$0	\$0	\$0	\$0
Other Operating Revenue	\$133,487	\$133,487	\$133,487	\$133,487	\$133,487	\$133,487
Non-Operating Revenue	\$107,965	\$107,965	\$107,965	\$107,965	\$107,965	\$107,965
Transfers In	\$15,256	\$15,256	\$15,256	\$15,256	\$15,256	\$15,256
<b>Total Revenue</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>	<b>\$2,122,334</b>
<b>O&amp;M Expenses</b>						
Board of Directors	\$9,109	\$6,013	\$11,272	\$8,807	\$10,544	\$10,936
Administration	\$137,476	\$112,649	\$113,876	\$116,321	\$118,732	\$122,902
Engineering	\$78,411	\$61,149	\$62,969	\$64,851	\$66,797	\$69,171
Finance	\$134,368	\$132,553	\$136,909	\$141,439	\$146,151	\$151,760
Non-Departmental	\$68,010	\$71,482	\$76,571	\$80,101	\$85,616	\$88,185
Operations and Maintenance	\$1,479,655	\$1,674,474	\$1,733,454	\$1,794,553	\$1,857,849	\$1,924,254
<b>Total O&amp;M Expenses</b>	<b>\$1,907,028</b>	<b>\$2,058,320</b>	<b>\$2,135,051</b>	<b>\$2,206,072</b>	<b>\$2,285,689</b>	<b>\$2,367,208</b>
<b>Debt &amp; Capital</b>						
Existing Debt Service	\$133,895	\$132,023	\$130,151	\$118,063	\$116,385	\$114,707
Proposed Debt Service	\$0	\$0	\$0	\$0	\$0	\$0
Rate Funded Capital Projects	\$266,000	\$190,550	\$280,679	\$1,841,391	\$1,182,572	\$1,226,821
<b>Total Debt &amp; Capital</b>	<b>\$399,895</b>	<b>\$322,573</b>	<b>\$410,830</b>	<b>\$1,959,454</b>	<b>\$1,298,957</b>	<b>\$1,341,527</b>
<b>Net Cashflow</b>	(\$184,589)	(\$258,560)	(\$423,547)	(\$2,043,193)	(\$1,462,312)	(\$1,586,402)
Net Operating Revenue	\$200,050	\$48,758	(\$27,973)	(\$98,995)	(\$178,611)	(\$260,131)
Calculated Debt Coverage						
Required Debt Coverage	1.25	1.25	1.25	1.25	1.25	1.25
<b>Beginning Balance</b>	<b>\$567,285</b>	<b>\$386,523</b>	<b>\$129,243</b>	<b>(\$294,304)</b>	<b>(\$2,337,497)</b>	<b>(\$3,799,809)</b>
Net Cashflow	(\$184,589)	(\$258,560)	(\$423,547)	(\$2,043,193)	(\$1,462,312)	(\$1,586,402)
New Debt Proceeds (less Debt Funded CIP)	\$0	\$0	\$0	\$0	\$0	\$0
Interest Income	\$3,827	\$1,280	\$0	\$0	\$0	\$0
<b>Ending Balance</b>	<b>\$386,523</b>	<b>\$129,243</b>	<b>(\$294,304)</b>	<b>(\$2,337,497)</b>	<b>(\$3,799,809)</b>	<b>(\$5,386,211)</b>
<i>Target Balance</i>	<i>\$1,048,487</i>	<i>\$1,086,310</i>	<i>\$1,105,493</i>	<i>\$1,123,248</i>	<i>\$1,143,152</i>	<i>\$1,163,532</i>



## 2.7. Proposed Wastewater Financial Plan

Raftelis developed a five-year financial plan incorporating the known and projected cost increases for operating and capital expenditures. The results were presented and discussed with Agency staff and the Agency Board. Raftelis devised several scenarios for the Board to review and the Agency deemed the scenario below to be the most appropriate. The proposed revenue adjustments for the wastewater fund are shown below on **Table 2-24**. As mentioned in section 2.5.2, The Agency is planning to issue a \$3.75 million dollar debt which is included in the proposed financial plan below.

**Table 2-24: Proposed Wastewater Revenue Adjustments**

FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
October	July	July	July	July
30.0%	3.5%	3.5%	3.5%	3.5%

The wastewater financial plan with the proposed revenue adjustments is summarized in the following figures. In **Figure 2-5**, the solid blue line represents projected revenues from current rates without any adjustment while the dashed blue line represents the projected revenues with the proposed revenue adjustments. The stacked bars represent the expenditures such as debt service (dark teal), O&M expenses (light blue), and PAYGO CIP (green). The yellow bars above the axis in FY 2022 to FY 2025 signify that the collected revenues are sufficient for operating and capital costs, and that the wastewater enterprise is able to build up its reserves. **Figure 2-6** shows the forecasted wastewater fund ending balances (blue bars) after incorporating the proposed revenue adjustments and projected expenses (shown in **Figure 2-5**), and the estimated water fund beginning balance as of FY 2021. The blue bar intersecting with the dark blue line in FY 2026 indicates that the Agency will achieve its reserve target in FY 2026. **Table 2-25** numerically summarizes the financial plan under the proposed scenario.

**Figure 2-5: Proposed Financial Plan Wastewater**

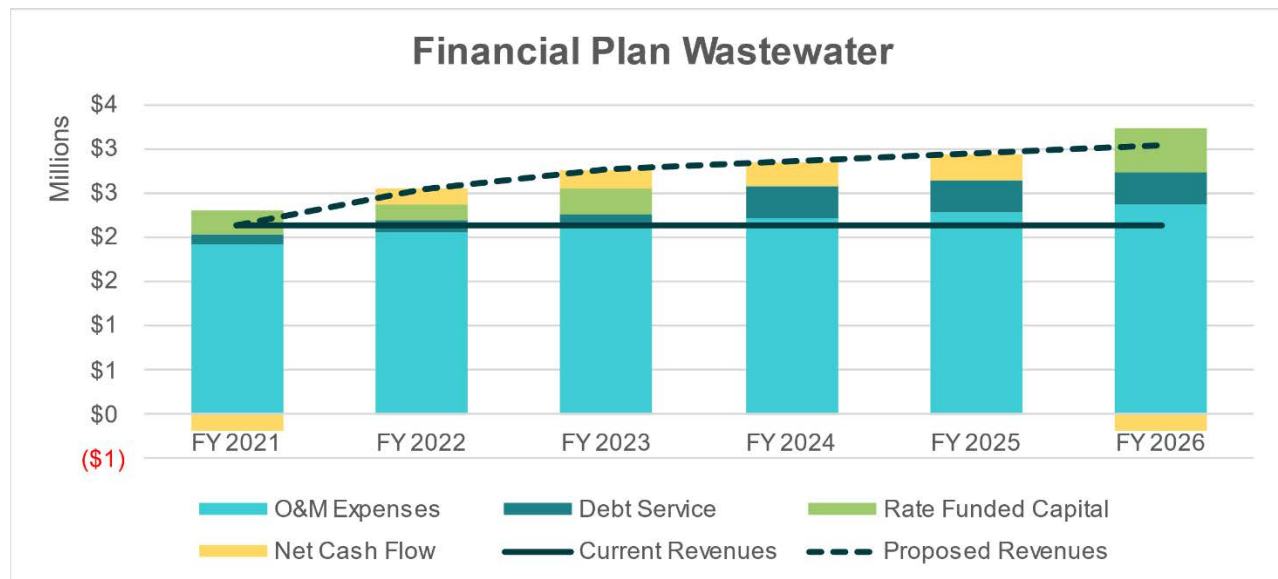
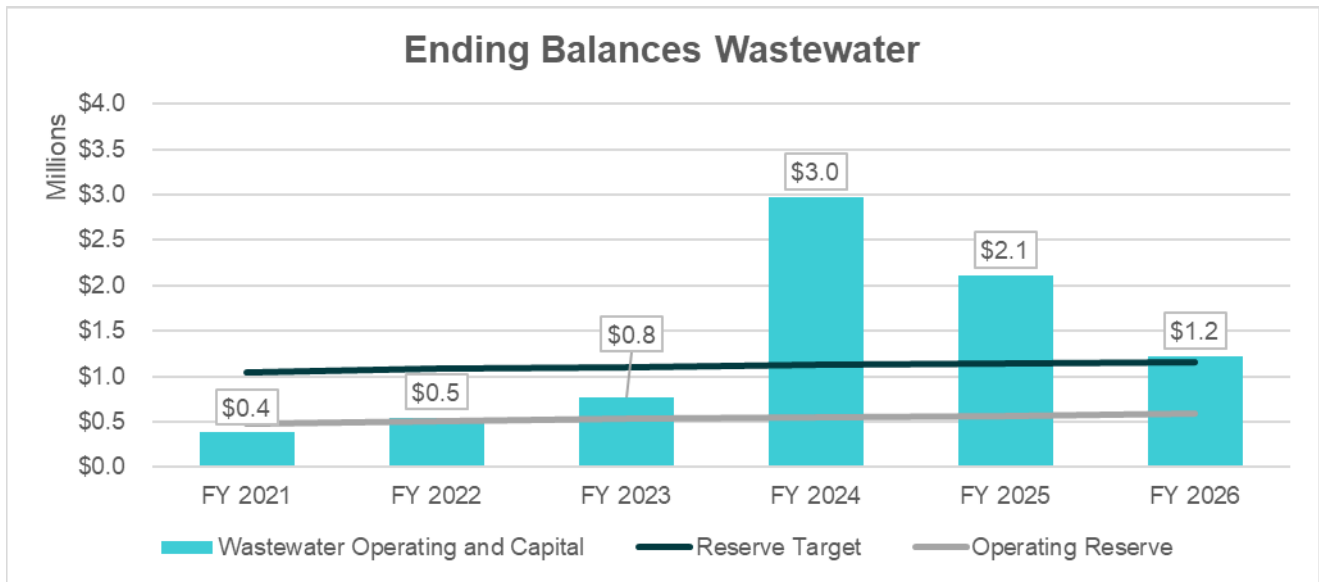


Figure 2-6: Proposed Wastewater Ending Balances



**Table 2-25: Proposed Wastewater Financial Plan**

A	B	C	D	E	F	G
Wastewater Financial Plan	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Revenues</b>						
Rate Revenue	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626	\$1,865,626
Revenue Adjustments	\$0	\$419,766	\$644,574	\$732,431	\$823,363	\$917,477
Other Operating Revenue	\$133,487	\$133,487	\$133,487	\$133,487	\$133,487	\$133,487
Non-Operating Revenue	\$107,965	\$107,965	\$107,965	\$107,965	\$107,965	\$107,965
Transfers In	\$15,256	\$15,256	\$15,256	\$15,256	\$15,256	\$15,256
<b>Total Revenue</b>	<b>\$2,122,334</b>	<b>\$2,542,100</b>	<b>\$2,766,907</b>	<b>\$2,854,764</b>	<b>\$2,945,696</b>	<b>\$3,039,811</b>
<b>O&amp;M Expenses</b>						
Board of Directors	\$9,109	\$6,013	\$11,272	\$8,807	\$10,544	\$10,936
Administration	\$137,476	\$112,649	\$113,876	\$116,321	\$118,732	\$122,902
Engineering	\$78,411	\$61,149	\$62,969	\$64,851	\$66,797	\$69,171
Finance	\$134,368	\$132,553	\$136,909	\$141,439	\$146,151	\$151,760
Non-Departmental	\$68,010	\$71,482	\$76,571	\$80,101	\$85,616	\$88,185
Operations and Maintenance	\$1,479,655	\$1,674,474	\$1,733,454	\$1,794,553	\$1,857,849	\$1,924,254
<b>Total O&amp;M Expenses</b>	<b>\$1,907,028</b>	<b>\$2,058,320</b>	<b>\$2,135,051</b>	<b>\$2,206,072</b>	<b>\$2,285,689</b>	<b>\$2,367,208</b>
<b>Debt &amp; Capital</b>						
Existing Debt Service	\$133,895	\$132,023	\$130,151	\$118,063	\$116,385	\$114,707
Proposed Debt Service	\$0	\$0	\$0	\$248,921	\$248,921	\$248,921
Rate Funded Capital Projects	\$266,000	\$190,550	\$280,679	\$0	\$0	\$500,784
<b>Total Debt &amp; Capital</b>	<b>\$399,895</b>	<b>\$322,573</b>	<b>\$410,830</b>	<b>\$366,985</b>	<b>\$365,306</b>	<b>\$864,412</b>
<b>Net Cashflow</b>	<b>(\$184,589)</b>	<b>\$161,206</b>	<b>\$221,027</b>	<b>\$281,708</b>	<b>\$294,701</b>	<b>(\$191,809)</b>
Net Operating Revenue	\$200,050	\$468,523	\$616,601	\$633,436	\$644,751	\$657,347
Calculated Debt Coverage				2.54	2.59	2.64
Required Debt Coverage	1.25	1.25	1.25	1.25	1.25	1.25
<b>Beginning Balance</b>	<b>\$567,285</b>	<b>\$386,523</b>	<b>\$553,206</b>	<b>\$781,975</b>	<b>\$3,002,015</b>	<b>\$2,135,286</b>
Net Cashflow	(\$184,589)	\$161,206	\$221,027	\$281,708	\$294,701	(\$191,809)
New Debt Proceeds (less Debt Funded CIP)	\$0	\$0	\$0	\$1,908,609	(\$1,182,572)	(\$726,037)
Interest Income	\$3,827	\$5,477	\$7,742	\$29,723	\$21,141	\$12,174
<b>Ending Balance</b>	<b>\$386,523</b>	<b>\$553,206</b>	<b>\$781,975</b>	<b>\$3,002,015</b>	<b>\$2,135,286</b>	<b>\$1,229,614</b>
<i>Target Balance</i>	<i>\$1,048,487</i>	<i>\$1,086,310</i>	<i>\$1,105,493</i>	<i>\$1,123,248</i>	<i>\$1,143,152</i>	<i>\$1,163,532</i>



# 3. Wastewater Cost of Service and Rate Derivation

This section of the report details the cost of service analysis and rate calculation process to determine the proposed wastewater rates. The goal of this process is to determine the cost of providing wastewater service to each of the Agency' wastewater customer classes and to ensure equity and fairness among the various classes.

## 3.1. Process and Approach

The cost of service analysis utilized to develop the wastewater rates followed the guidelines for allocating costs outlined in the WEF's Manual No. 27. The cost of service analysis and rate design process consists of six major steps, as outlined below:

1. Determine the revenue requirement, equal to the revenue to be recovered from rates.
2. Functionalize O&M expenses and capital assets into functional categories such as flow, customer, general, and treatment.
3. Develop customer class characteristics and units of service by cost component.
4. Calculate the cost component unit rates by dividing the total cost in each cost component by the total units of service for that component.
5. Calculate the cost for each customer class by multiplying the unit cost by the units of service for each customer class.
6. Design rates to meet Agency's objectives.

## 3.2. Wastewater Cost of Service Analysis

### 3.2.1. PINE GROVE

The Agency currently charges residents in the Pine Grove area who are not currently connected to the wastewater system a monthly fee to account for capacity reservation should those customers connect in the future. Raffelis recommends ending that charge for these customers.

### 3.2.2. REVENUE REQUIREMENT DETERMINATION

The revenue required from rates is the amount of revenue required to fund all wastewater expenses in the cost of service year (FY 2021). The utility must generate annual revenues adequate to meet its estimated annual O&M expenses, reserve targets, debt service and capital investment.

**Table 3-1** shows the derivation of the revenue requirement for FY 2021. The total wastewater revenue requirement includes O&M, debt service, and capital expenses shown in the upper portion of the table. Revenue from other sources is subtracted from this total an adjustment is made for the yearly ending cash balance as shown in the last line of the table. These final adjustments are subtracted. The revenues and expenses in the following tables correspond to the FY 2021 values in **Table 2-25**.

**Table 3-1: Wastewater Revenue Requirement**

A	B	C	D
Revenue Requirement (FY 2021)	Operating	Capital	Total
<b>Revenue Requirements</b>			
O&M Expenses	\$1,907,028	\$0	\$1,907,028
Capital	\$0	\$133,895	\$133,895
Internal Loans	\$0	\$266,000	\$266,000
<b>Total Revenue Requirements</b>	<b>\$1,907,028</b>	<b>\$399,895</b>	<b>\$2,306,923</b>
<b>Revenue from Other Sources</b>			
Other Operating Revenue	\$133,487	\$0	\$133,487
Non Operating Revenue	\$107,965	\$0	\$107,965
Transfers In	\$15,256	\$0	\$15,256
<b>Total Revenue from Other Sources</b>	<b>\$256,708</b>	<b>\$0</b>	<b>\$256,708</b>
<b>Adjustments</b>			
Cash from/(to) Reserves	\$0	\$184,589	\$184,589
<b>Total Adjustments</b>	<b>\$0</b>	<b>\$184,589</b>	<b>\$184,589</b>
<b>Revenue to be Recovered from Rates</b>	<b>\$1,650,320</b>	<b>\$215,306</b>	<b>\$1,865,626</b>

### 3.2.3.O&M COST ALLOCATION TO COST COMPONENTS

This section discusses the allocation of O&M expenses and capital costs to the wastewater cost components and customer classes. **Table 3-2** shows the allocation of the Agency’s FY 2021 O&M budget to the cost components – Flow, Biological Oxygen Demand (BOD), Total Suspended Solids (TSS), Customer, Internal Loans, and General costs. Flow costs are those costs associated with treating the volume of wastewater; greater volume causes these costs to increase. BOD and TSS costs are ones that increase relative to the level of pollutants in the wastewater. Customer costs are linked to the total number of wastewater customers, regardless of their use of the system. The internal loan cost component serves to isolate those costs for calculation of separate rates, and general costs are all others that will be reallocated on the basis of directly allocated costs. Column A shows the budget line item to be allocated. The percentages in Columns B to G present the allocation factors. Most of these factors are based on common industry allocations. For example, costs associated with wastewater treatment are allocated to the pollutant cost drivers, while costs of the collection system are allocated to flow. Salaries and benefits are proportionally allocated on the basis of all other O&M costs. These factors are applied in **Table 3-3**. The costs allocated to each component are carried forward to **Table 3-8**. The total cost in Column H of the final row aligns with the expense shown in **Table 2-25**. The total allocation to each cost component is shown on the final line of the table.

**Table 3-2: O&M Allocation Percentages**

A	B	C	E	D	F	G	H
O&M Expense Allocation	Flow	BOD	TSS	Customer	General	Internal Loans	Total
<b>Percentage Allocation</b>							
Board of Directors	0%	0%	0%	100%	0%	0%	100%
Administration	0%	0%	0%	100%	0%	0%	100%
Engineering	0%	0%	0%	100%	0%	0%	100%
Finance	0%	0%	0%	100%	0%	0%	100%
Non-Departmental	0%	0%	0%	100%	0%	0%	100%
Salaries/Benefits	18%	31%	31%	5%	15%	0%	100%
Distribution/Collection	100%	0%	0%	0%	0%	0%	100%
Storage/Dams/Reservoirs	0%	0%	0%	100%	0%	0%	100%
Disposal	0%	0%	0%	100%	0%	0%	100%
Treatments Plants	0%	50%	50%	0%	0%	0%	100%
Chemicals	0%	50%	50%	0%	0%	0%	100%
Water Tests	0%	50%	50%	0%	0%	0%	100%
Vehicle Fleet	50%	25%	25%	0%	0%	0%	100%
Vehicle Maintenance/Repair	50%	25%	25%	0%	0%	0%	100%
Gas & Oil	50%	25%	25%	0%	0%	0%	100%
Electricity - PGE	50%	25%	25%	0%	0%	0%	100%
Other Utilities	0%	50%	50%	0%	0%	0%	100%
Radios	0%	0%	0%	0%	100%	0%	100%
Small Tool Replacement	0%	0%	0%	0%	100%	0%	100%
Tool/Equip Mntc/Replace	50%	25%	25%	0%	0%	0%	100%
Tool & Equip Rental	50%	25%	25%	0%	0%	0%	100%
Uniforms	0%	0%	0%	0%	100%	0%	100%
State Fees	0%	0%	0%	0%	100%	0%	100%
Licenses & Certifications	0%	0%	0%	0%	100%	0%	100%
Misc Repair & Maintenance	0%	0%	0%	0%	100%	0%	100%
Spray Field Mowing	0%	0%	0%	0%	100%	0%	100%
Tank/Res-Diving & Insp/Maint	50%	25%	25%	0%	0%	0%	100%
Training	0%	0%	0%	0%	100%	0%	100%

**Table 3-3: O&M Allocation Dollars**

A	B	C	E	D	F	G	H
O&M Expense Allocation	Flow	BOD	TSS	Customer	General	Internal Loans	Total
<b>Dollar Allocation</b>							
Board of Directors	\$0	\$0	\$0	\$9,109	\$0	\$0	\$9,109
Administration	\$0	\$0	\$0	\$137,476	\$0	\$0	\$137,476
Engineering	\$0	\$0	\$0	\$78,411	\$0	\$0	\$78,411
Finance	\$0	\$0	\$0	\$134,368	\$0	\$0	\$134,368
Non-Departmental	\$0	\$0	\$0	\$68,010	\$0	\$0	\$68,010
Salaries/Benefits	\$147,308	\$256,519	\$256,519	\$37,629	\$127,263	\$0	\$825,238
Distribution/Collection	\$28,000	\$0	\$0	\$0	\$0	\$0	\$28,000
Storage/Dams/Reservoirs	\$0	\$0	\$0	\$1,000	\$0	\$0	\$1,000
Disposal	\$0	\$0	\$0	\$28,840	\$0	\$0	\$28,840
Treatments Plants	\$0	\$10,000	\$10,000	\$0	\$0	\$0	\$20,000
Chemicals	\$0	\$8,984	\$8,984	\$0	\$0	\$0	\$17,967
Water Tests	\$0	\$12,339	\$12,339	\$0	\$0	\$0	\$24,677
Vehicle Fleet	\$13,904	\$6,952	\$6,952	\$0	\$0	\$0	\$27,808
Vehicle Maintenance/Repair	\$7,252	\$3,626	\$3,626	\$0	\$0	\$0	\$14,504
Gas & Oil	\$8,750	\$4,375	\$4,375	\$0	\$0	\$0	\$17,500
Electricity - PGE	\$38,160	\$19,080	\$19,080	\$0	\$0	\$0	\$76,320
Other Utilities	\$0	\$127,691	\$127,691	\$0	\$0	\$0	\$255,381
Radios	\$0	\$0	\$0	\$0	\$2,500	\$0	\$2,500
Small Tool Replacement	\$0	\$0	\$0	\$0	\$2,000	\$0	\$2,000
Tool/Equip Mntc/Replace	\$2,500	\$1,250	\$1,250	\$0	\$0	\$0	\$5,000
Tool & Equip Rental	\$12,000	\$6,000	\$6,000	\$0	\$0	\$0	\$24,000
Uniforms	\$0	\$0	\$0	\$0	\$5,000	\$0	\$5,000
State Fees	\$0	\$0	\$0	\$0	\$1,500	\$0	\$1,500
Licenses & Certifications	\$0	\$0	\$0	\$0	\$61,000	\$0	\$61,000
Misc Repair & Maintenance	\$0	\$0	\$0	\$0	\$1,200	\$0	\$1,200
Spray Field Mowing	\$0	\$0	\$0	\$0	\$24,720	\$0	\$24,720
Tank/Res-Diving & Insp/Maint	\$6,250	\$3,125	\$3,125	\$0	\$0	\$0	\$12,500
Training	\$0	\$0	\$0	\$0	\$3,000	\$0	\$3,000
<b>Total O&amp;M Expenses</b>	<b>\$264,124</b>	<b>\$459,939</b>	<b>\$459,939</b>	<b>\$494,842</b>	<b>\$228,183</b>	<b>\$0</b>	<b>\$1,907,028</b>

### 3.2.4. CAPITAL COST ALLOCATION TO COST COMPONENTS

Capital costs are allocated in a similar manner in **Table 3-4** and **Table 3-5**.



**Table 3-4: Capital Allocation Percentages**

A	B	C	E	D	F	G	H
Capital Expense Allocation	Flow	BOD	TSS	Customer	General	Internal Loans	Total
Percentage Allocation							
Internal Loans	0%	0%	0%	0%	0%	100%	100%
Rate Funded Capital	0%	0%	0%	0%	100%	0%	100%

**Table 3-5: Capital Allocation Dollars**

A	B	C	E	D	F	G	H
Capital Expense Allocation	Flow	BOD	TSS	Customer	General	Internal Loans	Total
Dollar Allocation							
Internal Loans	\$0	\$0	\$0	\$0	\$0	\$133,895	\$133,895
Rate Funded Capital	\$0	\$0	\$0	\$0	\$266,000	\$0	\$266,000
<b>Total Capital Expenses</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$0</b>	<b>\$266,000</b>	<b>\$133,895</b>	<b>\$399,895</b>

### 3.2.5. UNITS OF SERVICE AND MASS BALANCE

The second step of the cost of service analysis is to conduct a plant mass balance analysis. The mass balance analysis is used to estimate and validate the wastewater loadings (flow and strength) generated by each customer class. The first row of **Table 3-6**, labeled Total Wastewater Treated, represents the total volume entering the wastewater system across all service areas within the Agency, as provided by staff. This wastewater is treated at the Agency’s local treatment facilities, collected and deposited at various leach fields, or sent to the City of Sutter Creek for treatment. Flows contributed by high, medium, and low strength commercial customers are based on billed water use, and residential flows are calculated based on an estimate of 2 people per household each using 55 gallons per day<sup>2</sup>, as shown in Column B. The remaining flow is assumed to be due to inflow and infiltration. Average BOD and TSS strengths are estimated in milligrams per liter in Columns C and D; the strength and flow for each class are combined to estimate total pounds of pollutants in Columns E and F.

<sup>2</sup> 55 gallons per person per day \* 2 people per household \* 365 days per year \* 689 ERUs = 27,663,350 gallons / 748.052 gallon to ccf conversion = 36,981 ccf

**Table 3-6: Mass Balance**

A	B	C	D	E	F
Plant Balance	Flow (ccf)	BOD (mg/l)	TSS (mg/l)	BOD (lbs)	TSS (lbs)
<b>Total Wastewater Treated</b>	80,758	300	300	150,898	150,899
Less: I&I	13,265	10	100	828	8,275
<b>Net Plant Influent</b>	<b>67,494</b>	356	339	<b>150,071</b>	<b>142,624</b>
<b>Contributed Flows</b>					
<b>Residential</b>	36,981	325	300	74,982	69,214
<b>Commercial</b>					
Low Strength	10,765	225	200	15,111	13,432
Medium Strength	7,450	300	300	13,944	13,944
High Strength	12,298	600	600	46,035	46,035
<b>Total Contributed Flows</b>	<b>67,494</b>	356	339	<b>150,071</b>	<b>142,624</b>

**Table 3-7** summarizes the units of service from the billing data and estimated in the mass balance. These units are used to distribute costs to the customer classes in the following steps.

**Table 3-7: Units of Service**

A	B	C	E	F
Customer Class	Flow (ccf)	BOD (lbs/yr)	TSS (lbs/yr)	EDUs
<b>Residential</b>	36,981	74,982	69,214	689
<b>Commercial</b>				637
Low Strength	10,765	15,111	13,432	
Medium Strength	7,450	13,944	13,944	
High Strength	12,298	46,035	46,035	
<b>Total</b>	<b>67,494</b>	<b>150,071</b>	<b>142,624</b>	<b>1,326</b>

### 3.2.6. UNIT COST OF SERVICE

Table 3-8 shows the calculation of unit costs by cost component. The operating revenue requirement (Table 3-3), capital revenue requirement (Table 3-5) and revenue offsets (Table 3-1, all allocated to General) are summarized here. Total General costs are reallocated proportionally to the Flow, BOD, and TSS components. The Adjusted Cost of Service for each component is divided by the units of service (Table 3-7) on the final line, resulting in the unit cost per cost component.

**Table 3-8: Unit Cost Calculation**

A	B	C	E	F	G	H	I
Cost of Service Allocation	Flow	BOD	TSS	Customer	General	Internal Loans	Total
<b>Operating Revenue Requirement</b>	\$264,124	\$459,939	\$459,939	\$494,842	\$228,183	\$0	\$1,907,028
Capital Revenue Requirement	\$0	\$0	\$0	\$0	\$266,000	\$133,895	\$399,895
Revenue Offsets					(\$441,297)		(\$441,297)
<b>Total Cost of Service</b>	<b>\$264,124</b>	<b>\$459,939</b>	<b>\$459,939</b>	<b>\$494,842</b>	<b>\$52,886</b>	<b>\$133,895</b>	<b>\$1,865,626</b>
Allocation of General Costs	\$8,320	\$14,489	\$14,489	\$15,588	(\$52,886)		\$0
<b>Adjusted Cost of Service</b>	<b>\$272,444</b>	<b>\$474,428</b>	<b>\$474,428</b>	<b>\$510,430</b>	<b>\$0</b>	<b>\$133,895</b>	<b>\$1,865,626</b>
<b>Units of Service</b>	67,494	150,071	142,624	1,326			
	ccf	lbs/yr	lbs/yr	EDUs/yr			
<b>Unit Cost</b>	\$4.04	\$3.16	\$3.33	\$384.94			
	ccf	lbs/yr	lbs/yr	per EDU			

### 3.2.7. CLASS COST OF SERVICE

The final step in the cost of service analysis is to allocate the revenue requirement to each customer class based on their share of burden in the wastewater system. **Table 3-9** shows the revenue requirement allocated to each customer class based on the cost components, which is calculated by multiplying the unit costs of each cost component (**Table 3-8**) by the units of service for each customer class (**Table 3-7**). Note that the total cost of service is equal to the total revenue required from rates **Table 3-1**, less internal loan costs which are discussed in detail in **Section 3.3.1**. The calculations in the table may not be equal to the precise number shown due to rounding within the tables.

**Table 3-9: Class Cost of Service**

A	B	C	E	F	G
Customer Class	Flow	BOD	TSS	Customer	Total
<b>Residential</b>	\$149,276	\$237,044	\$230,234	\$265,223	\$881,777
<b>Commercial</b>				\$245,207	\$245,207
Low Strength	\$43,454	\$47,771	\$44,681		\$135,906
Medium Strength	\$30,073	\$44,081	\$46,382		\$120,536
High Strength	\$49,642	\$145,532	\$153,130		\$348,304
<b>Total</b>	<b>\$272,444</b>	<b>\$474,428</b>	<b>\$474,428</b>	<b>\$510,430</b>	<b>\$1,731,730</b>

### 3.3. Wastewater Rate Calculation

**Table 3-10** shows the calculation of wastewater rates for each class. Residential customers pay only a fixed monthly charge based on EDUs. The total revenue requirement in Column B (from Column G, **Table 3-9**) is divided by the EDUs in Column C, then by 12 to calculate a monthly rate. Customer costs allocated to the commercial class are recovered in the same manner. Treatment costs for commercial customers, the sum of the Flow, BOD, and TSS cost components for those classes from **Table 3-9**, are recovered in the volume rate. These costs are divided by ccf in Column C to derive the rate in Column E.

**Table 3-10: Wastewater Rate Calculation**

A	B	C	E
Customer Class	Cost of Service	FY 2021 Units	FY 2021 COS Rate
<b>Fixed Service Charge</b>		<i>EDUs</i>	<i>per EDU</i>
Residential	\$881,777	689	\$106.65
Commercial	\$245,207	637	\$32.08
<b>Usage Rate</b>		<i>ccf of water</i>	<i>per ccf</i>
Low Strength	\$135,906	10,765	\$12.63
Medium Strength	\$120,536	7,450	\$16.18
High Strength	\$348,304	12,298	\$28.33

### 3.3.1.INTERNAL LOAN RATES

The Agency has also several historical internal loans to account for. Generally, these are loans made from restricted funds, such as the Wastewater Participation Fee fund, to the wastewater capital funds to finance specific projects. Although other costs, such as those recovered in the rate calculation above, are treated as uniform costs for all Agency customers to share in, repayment of internal loans is from customers in the specific local system benefiting from the loan; WW General loans are the only ones recovered from all customers. **Table 3-11** summarizes debt service payments due from each service area in FY 2021; this is the value shown in **Table 3-8**, Column H. These costs are recovered as an additional fixed monthly charge per EDU. The payment in Column B is divided by the EDUs in Column C, as provided by Staff, to derive the rate in Column D.

**Table 3-11: FY 2021 Internal Loans**

A	B	C	D
Service Area	FY 2021 Payment	FY 2021 Units	FY 2021 Proposed Rate
Pine Grove	\$10,797	71	\$12.68
WID No. 1	\$31,643	301	\$8.77
Lake Camanche	\$61,800	352	\$14.64
WW General	\$29,656	1,326	\$1.87
<b>Total</b>	<b>\$133,895</b>		

The rates are adjusted for FY 2022 debt service in **Table 3-12**.

**Table 3-12: FY 2022 Internal Loans**

A	B	C	D
Service Area	FY 2022 Payment	FY 2022 Units	FY 2022 Proposed Rate
Pine Grove	\$10,603	71	\$12.45
WID No. 1	\$31,208	301	\$8.65
Lake Camanche	\$60,957	352	\$14.44
WW General	\$29,255	1,326	\$1.84
<b>Total</b>	<b>\$132,023</b>		

Table 3-13 provides information about each internal loan. The Service Area in Column B indicates which customers are responsible for the payment of the loan. Column C shows the outstanding balance as of the first day of FY 2022, and the final column presents the fiscal year in which the final payment will be made.

**Table 3-13: Internal Loan Balances**

<b>A</b>	<b>B</b>	<b>C</b>	<b>D</b>
<b>Loan ID</b>	<b>Service Area</b>	<b>FY 2022 Balance</b>	<b>Final Payment</b>
<b>2004-39</b>	Pine Grove	\$20,432	2023
<b>2012-14</b>	WW General	\$57,853	2042
<b>2005-64</b>	WW General	\$351,096	2042
<b>2010-09 (Part 1)</b>	WID No. 1	\$172,684	2040
<b>2010-09 (Part 2)</b>	WID No. 1	\$263,232	2040
<b>2010-23</b>	WID No. 1	\$91,967	2041
<b>2013-48</b>	WW General	\$19,825	2033
<b>2010-08</b>	Lake Camanche	\$354,587	2040
<b>2010-22</b>	Lake Camanche	\$515,827	2041

### 3.3.2. PROPOSED RATE SUMMARY

Table 3-13 presents the schedule of proposed rates. The rates calculated above are presented in Column C, with a comparison to current rates in Column B. Columns D through H apply the revenue adjustments determined in Table 2-24, with an adjustment to recognize that internal loan rates are fixed through the period<sup>3</sup>.

Table 3-14: Proposed Rates

A	B	C	D	E	F	G	H
Effective Year	FY 2021 Current	FY 2021 COS	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
<b>Effective Month</b>			October	July	July	July	July
<b>Financial Plan Rate Adjustment</b>			30.0%	3.5%	3.5%	3.5%	3.5%
<b>Effective Rate Adjustment</b>			32.4%	3.7%	4.2%	3.7%	3.7%
<b>Fixed Service Charge (\$/EDU)</b>							
Residential	\$108.82	\$106.65	\$141.26	\$146.56	\$152.71	\$158.40	\$164.28
Commercial	\$43.04	\$32.08	\$42.49	\$44.09	\$45.94	\$47.66	\$49.43
<b>Usage Rate (\$/ccf)</b>							
Low Strength	\$13.16	\$12.63	\$16.73	\$17.36	\$18.09	\$18.77	\$19.47
Medium Strength	\$15.51	\$16.18	\$21.43	\$22.24	\$23.18	\$24.05	\$24.95
High Strength	\$20.21	\$28.33	\$37.53	\$38.94	\$40.58	\$42.10	\$43.67
<b>Debt Service Charge (\$/EDU)</b>							
Pine Grove	\$21.40	\$12.68	\$12.45	\$12.45	\$0.00	\$0.00	\$0.00
WID No. 1	\$9.88	\$8.77	\$8.65	\$8.65	\$8.65	\$8.65	\$8.65
Lake Camanche	\$10.80	\$14.64	\$14.44	\$14.44	\$14.44	\$14.44	\$14.44
Martell	\$1.83	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
WW General		\$1.87	\$1.84	\$1.84	\$1.84	\$1.84	\$1.84

<sup>3</sup> Table 2-24 adjustments are assumed to be applied to all revenue. The cost of service analysis separated rates to finance operations and rates to make payments on internal loans. In order to achieve a 30% overall revenue increase in FY 2022 as required by the financial plan, the FY 2021 COS rates must be adjusted by 32.4% while the internal loan rates decrease slightly.