San Bernardino Municipal Water Department

Comprehensive Cost of Services and Rate Structure Study

Final Report / March 2, 2022

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March 2, 2022

Ms. Cynthia Mouser
Director of Finance
City of San Bernardino Municipal Water Department
397 Chandler Place
San Bernardino, CA 92408

Subject: Comprehensive Cost of Services and Rate Structure Study Report

Dear Ms. Mouser,

Raftelis is pleased to provide this report for the San Bernardino Municipal Water Department's (Department) Comprehensive Cost of Services and Rate Structure Study. The high level objectives for the study included the development of:

- Water and wastewater financial plans that quantify the amount of rate revenues that must be collected from customers during the five-year period FY 2022 - FY 2026.
- Water and wastewater cost of service studies that quantify the amount of rate revenues that must be collected from each customer class based on their unique demand characteristics.
- Proposed water and wastewater rates for the five-year period FY 2022 - FY 2026.
- Proposed drought surcharge rates.

The report discusses, in comprehensive detail, our key findings and recommendations for each of the above listed items. It has been a pleasure working with you and other members of the Department's staff. Thank you for the support you provided during the course of this study.

Sincerely,

John Wright
Senior Manager

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1. Executive Summary

1.1. Study Objectives

The San Bernardino Municipal Water Department (Department) retained the services of Raftelis to complete the Comprehensive Cost of Services and Rate Design Study (study). The study included the development of water and wastewater financial plans, the completion of water and wastewater cost of service (COS) analyses, the development of proposed rate structure modifications, and the preparation of proposed water and wastewater rates for the period FY 2022 - FY 2026.

1.2. Study Findings and Recommendations

1.2.1. WATER FINANCIAL PLAN

The Department's water utility incurs all of the costs necessary to provide potable water service to customers. If the Department's current water rates remain unchanged, projected rate revenues will be inadequate to meet the water utility's annual revenue requirements during the period FY 2022 - FY 2026. Table 1-1 summarizes the recommended rate revenue adjustments.

Table 1-1: Proposed Water Rate Revenue Adjustments

Line	Year	Effective Data	% Revenue Increase
1	FY 2022	April	6.0%
2	FY 2023	July	6.0%
3	FY 2024	July	4.0%
4	FY 2025	July	3.0%
5	FY 2026	July	3.0%

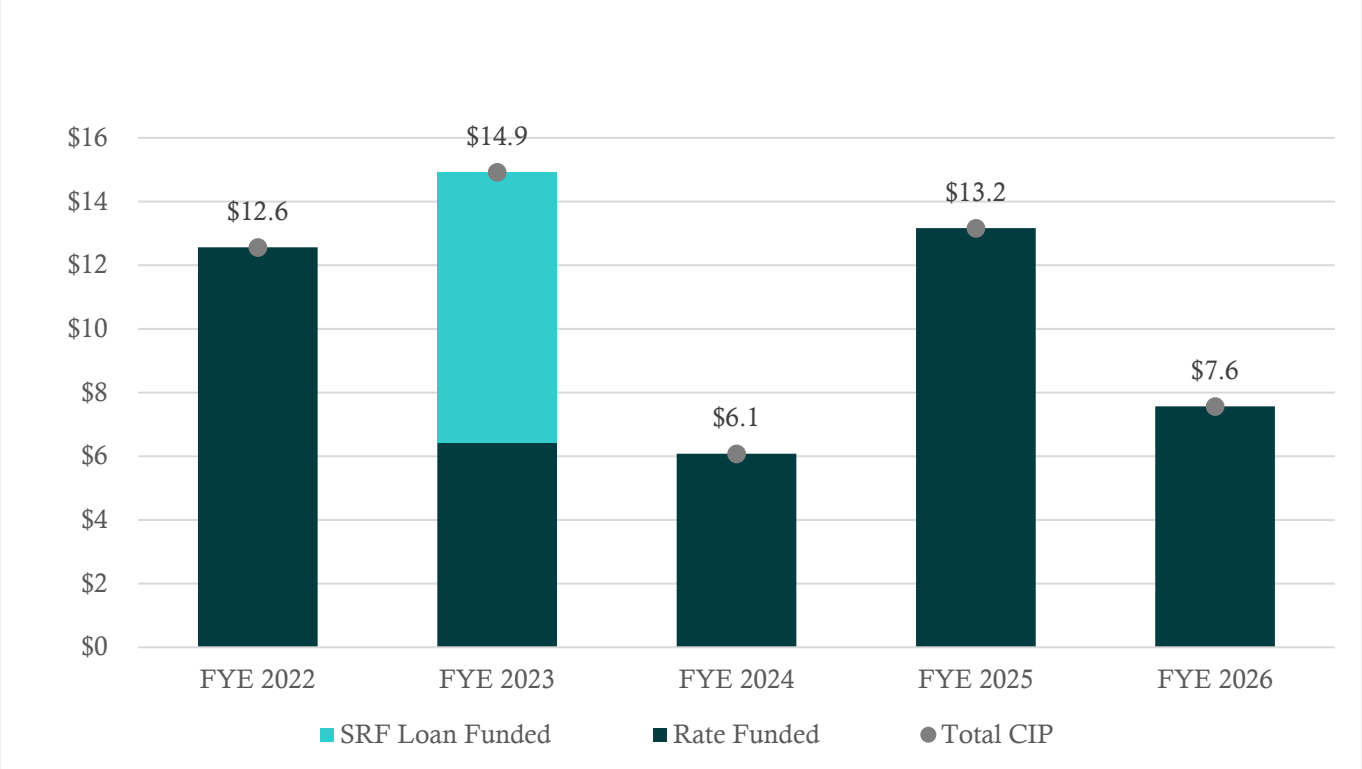
Table 1-2 provides a high-level summary of the water utility financial plan for the period FY 2022 - FY 2026.

Table 1-2: Summary FY 2022 - FY 2026 Water Utility Financial Plan

Line	Description	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	% Increase in Rate Revenues	6.0%	6.0%	4.0%	3.0%	3.0%
2	Effective Month	April	July	July	July	July
3						
4	External Debt Financing					
5	Bond Proceeds	$0	$0	$0	$0	$0
6	SRF Loan Proceeds	$0	$8,500,000	$0	$0	$0
7						
8	**Summary of Cash Flows**					
9	Revenue from Existing Rates	$39,566,923	$39,765,721	$39,966,109	$40,168,121	$40,371,789
10	Revenue from Rate Increases	$593,504	$4,915,043	$6,736,048	$8,178,242	$9,677,454
11	Total Rate Revenues	$40,160,427	$44,680,764	$46,702,157	$48,346,363	$50,049,243
12						
13	Non-Rate Revenues	$4,061,500	$4,153,678	$4,216,498	$4,210,814	$4,202,809
14	Total Revenues	$44,221,927	$48,834,442	$50,918,655	$52,557,178	$54,252,052
15						
16	Expenditures					
17	O&M	$37,750,992	$39,367,536	$40,474,954	$41,615,543	$42,790,388
18	Debt Service	$2,990,388	$3,492,801	$3,489,176	$3,493,051	$3,489,301
19						
20	CIP Expenditures	$12,563,500	$14,923,725	$6,080,137	$13,167,392	$7,564,587
21	Less: Debt Proceeds Applied to CIP Expenditures	$0	$8,500,000	$0	$0	$0
22	Net Rate Funded CIP Expenditures	$12,563,500	$6,423,725	$6,080,137	$13,167,392	$7,564,587
23						
24	Total Expenditures (Lines 17 + 18 + 22)	$53,304,880	$49,284,062	$50,044,267	$58,275,987	$53,844,277
25						
26	Net Operating Surplus/(Deficit) (Line 14 - Line 24)	($9,082,953)	($449,620)	$874,388	($5,718,809)	$407,775

Figure 1-1 provides a graphical representation of the water utility capital financing plan for this same period, as shown in lines 4 - 6 of Table 1-2. Specifically, the Department will obtain $8.5 million in State Revolving Fund (SRF) loan proceeds in FY 2023, as shown in line 6 of Table 1-2.

Figure 1-1: Water Utility Capital Financing Plan ($ Millions)



1.2.2. WATER COST OF SERVICE ANALYSIS

The COS analysis is a method of allocating the annual revenue requirement from rates developed in the financial plan to customer classes based on the principle of cost causation. Customer classes are assigned costs based on the demands each customer class imposes on the water utility system. Table 1-3 shows the outcome of the FY 2022 COS analysis. The FY 2022 water utility COS revenue requirement is $41,940,93 (line 8), which is 6.0% more than the projected FY 2022 revenues of $39,566,923 if existing rates remain unchanged.

Table 1-3: FY 2022 Water COS Summary

Line	Customer Class	FY 2022 COS	Revenue at Existing Rates	$ Difference	% Difference
1	Single Family Residential	$22,020,046	$22,363,433	($343,387)	-1.5%
2	Multi-Family Residential	$5,046,915	$5,019,073	$27,842	0.6%
3	Commercial	$9,828,620	$6,901,631	$2,926,990	42.4%
4	Irrigation	$1,034,298	$1,977,138	($942,839)	-47.7%
5	Institutional	$3,272,650	$2,375,646	$897,004	37.8%
6	Other	$452,384	$360,148	$92,236	25.6%
7	Fire Connections	$286,036	$555,566	($269,530)	-48.5%
8	Total COS	$41,940,950	$39,552,634	$2,388,316	6.0%

1.2.3. WATER RATE STRUCTURE MODIFICATIONS

As shown in Table 1-4, the Department has a complex water rate structure that includes monthly fixed charges based on meter size and separate $/HCF commodity rates for:

- Billed consumption (referred to as the commodity charge)

- Water replenishment (applicable to all usage)
- Elevation zone (applicable to usage within a specific elevation level)
- Conservation (water usage above a specified tier)

Table 1-4: Existing Water Rate Structure

Fixed Charges	
Meter Charge	**$/Account/Month**
1/2" or 5/8"	$23.39
3/4"	$29.28
1"	$40.98
1½ inch	$70.35
2"	$105.52
3"	$187.66
4"	$286.63
6"	$598.33
8"	$950.34
10"	$1,361.01
Commodity Rates	
Commodity Charge	**$/HCF**
All Consumption	$1.15
Replenishment Charge	**$/HCF**
All Consumption	$0.17
Elevation Zone Charge	**$/HCF**
Zone 1	$0.11
Zone 2	$0.19
Zone 3	$0.17
Zone 4	$0.14
Zone 5	$0.23
Zone 6	$0.23
Conservation Charge	**$/HCF**
Consumption Above Specified Conservation Tier	$0.49
Conservation Tiers (HCF per Billing Cycle)	
Residential	32
Multi-Family Dwelling Unit (2)	42
Multi-Family Dwelling (2+) per unit	17
Non-residential 5/8"	24
Non-residential 3/4"	36
Non-residential 1"	65
Non-residential 1 1/2"	150
Non-residential 2"	250
Non-residential 3"	740
Commercial 5/8"	42
Commercial 3/4"	130
Commercial 1"	275
Commercial 1 1/2"	445
Commercial 2"	875
Commercial 4"	2,400
Commercial 6"	9,000

The key objectives for potential modifications to the current water rate structure, as determined by Department staff in consultation with Raftelis, are listed below. These objectives were presented to the City Water Board (Board) at a public meeting held on August 23, 2021.

- Simplicity/Ease of Understanding
    - Elimination of elevation level pumping surcharges
    - Consolidating the water replenishment charge within commodity rates
    - Consolidation/elimination of conservation surcharge tiers
- Revenue Stability

- Affordability
- Water Supply Reliability (cost-based customer water use efficiency)
- Development of Drought Rates

1.2.4. PROPOSED WATER RATE STRUCTURE AND RATES

As an outcome of the study process, Raftelis, in consultation with Department staff, developed a new recommended water rate structure. Key modifications to the existing rate structure are the implementation of a 3-tier structure for Single Family Residential customers and the creation of a new Institutional customer class. In the new recommended rate structure, separate commodity charges for water replenishment, elevation zone, and conservation were consolidated into a single commodity rate. The proposed cost-based commodity rates under this new structure are shown Table 1-5.

Table 1-5: Proposed Water Commodity Rates for FY 2022 - FY 2026 ($/HCF)

Customer Class	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
Single Family Residential						
Tier 1 (0 - 13 HCF)	$1.43	$1.35	$1.44	$1.50	$1.55	$1.60
Tier 2 (14 - 23 HCF)	$1.43	$1.83	$1.94	$2.02	$2.09	$2.16
Tier 3 (> 23 HCF)	$1.92	$2.33	$2.47	$2.57	$2.65	$2.73
Multi-Family Residential	$1.43	$1.51	$1.61	$1.68	$1.74	$1.80
Commercial	$1.43	$1.65	$1.75	$1.82	$1.88	$1.94
Irrigation	$1.85	$2.32	$2.46	$2.56	$2.64	$2.72
Institutional	$1.43	$2.06	$2.19	$2.28	$2.35	$2.43
Other (All Consumption)	$1.43	$3.82	$4.05	$4.22	$4.35	$4.49

The proposed water commodity rate structure shown in Table 1-5 meets the objectives of simplicity and ease of understanding by combining all of the Department's different $/HCF commodity rates into a single consolidated commodity rate framework.

The proposed water commodity rate structure also enhances bill affordability for Single Family Residential customers with low water usage because the proposed cost-based Tier 1 rate is lower than the existing combination of commodity rates currently being charged by the Department. Finally, the proposed rate structure assists in achieving water supply reliability (i.e., cost-based customer water usage efficiency) because the costs associated with large volume Single Family Residential customers will be shifted to Tier 3 usage (above 23 HCF per billing period). The proposed Tier 3 rate is based on the proportional cost of service and exceeds the combined $/HCF rate that high volume users are currently being charged by the Department.

Table 1-6 presents the proposed cost-based meter service charges ($/account/month) under the new recommended water rate structure.

Table 1-6: Proposed Water Fixed Rates for FY 2022 - FY 2026

Meter Size	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
5/8" or 1/2"	$23.39	$20.49	$21.72	$22.59	$23.27	$23.97
3/4"	$29.28	$28.17	$29.87	$31.07	$32.01	$32.98
1"	$40.98	$43.51	$46.13	$47.98	$49.42	$50.91
1 1/2"	$70.35	$81.87	$86.79	$90.27	$92.98	$95.77
2"	$105.52	$127.91	$135.59	$141.02	$145.26	$149.62
3"	$187.66	$388.77	$412.10	$428.59	$441.45	$454.70
4"	$286.63	$772.38	$818.73	$851.48	$877.03	$903.35
6"	$598.33	$1,232.72	$1,306.69	$1,358.96	$1,399.73	$1,441.73
8"	$950.34	$2,153.40	$2,282.61	$2,373.92	$2,445.14	$2,518.50
10"	$1,361.01	$4,224.92	$4,478.42	$4,657.56	$4,797.29	$4,941.21
12"	$1,361.01	$4,224.92	$4,478.42	$4,657.56	$4,797.29	$4,941.21

1.2.5. PROPOSED DROUGHT SURCHARGE RATES

In addition to developing recommended commodity rates and monthly fixed charges, Raftelis also developed proposed drought surcharges that are designed to assist the Department in recovering revenues that are sufficient to fund all of the Department's fixed costs during periods of mandated drought curtailments. Table 1-7 shows these proposed drought surcharges which, in the case of a drought emergency declared by the Board, are intended to be assessed in addition to the proposed FY 2022 – FY 2026 commodity rates shown in Table 1-5.

Table 1-7: Proposed Drought Surcharge Rates ($/HCF)

Customer Class	Current Rates	10% Reduction	15% Reduction	20% Reduction	30% Reduction
Residential					
Tier 1 (0 - 13 HCF)	$1.35	$1.52	$1.62	$1.74	$2.03
Tier 2 (14 - 23 HCF)	$1.83	$2.06	$2.20	$2.36	$2.75
Tier 3 (> 23 HCF)	$2.33	$2.62	$2.80	$3.00	$3.51
Multi-Family Residential	$1.51	$1.70	$1.81	$1.95	$2.27
Commercial	$1.65	$1.86	$1.98	$2.13	$2.48
Irrigation	$2.32	$2.61	$2.79	$2.99	$3.49
Institutional	$2.06	$2.32	$2.48	$2.65	$3.10
Other	$3.82	$4.30	$4.59	$4.92	$5.75

1.2.6. WASTEWATER FINANCIAL PLAN

The Department's wastewater utility incurs all of the costs necessary to provide wastewater service to customers. If the Department's current wastewater rates remain unchanged, projected rate revenues will be inadequate to meet the wastewater utility's annual revenue requirements during the period FY 2022 - FY 2026. Table 1-8 summarizes the recommended rate revenue adjustments.

Table 1-8: Proposed Wastewater Rate Revenue Adjustments

Line	Year	Effective Data	% Revenue Increase
1	FY 2022	April	11.0%
2	FY 2023	July	11.0%
3	FY 2024	July	8.0%
4	FY 2025	July	8.0%
5	FY 2026	July	8.0%

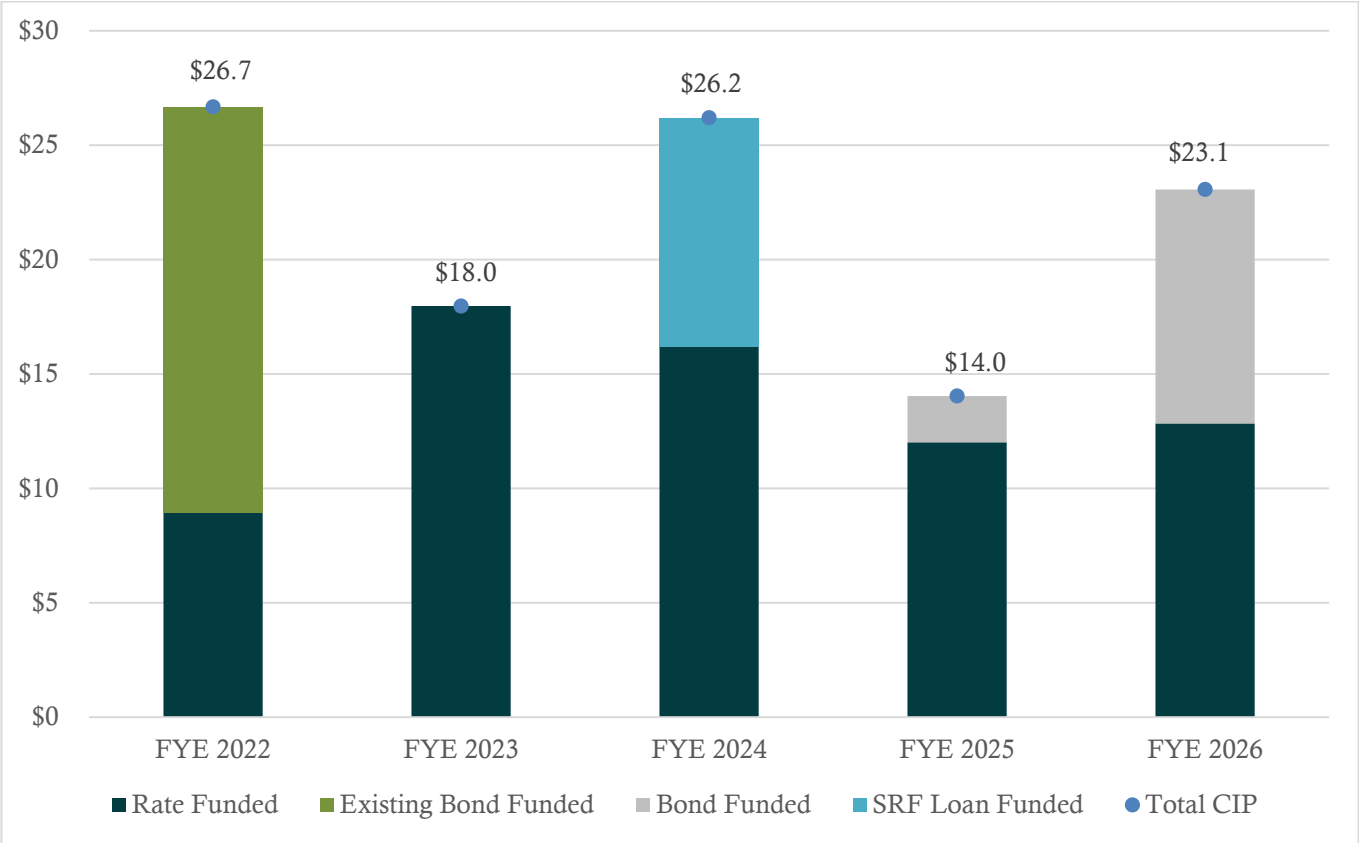
Table 1-9 provides a high-level summary of the wastewater utility financial plan for the period FY 2022 - FY 2026. The line 19 reduction in non-rate revenues from FY 2022 to FY 2023 is due to the loss of the East Valley Water District (EVWD) as a wholesale wastewater treatment customer. EVWD is currently expected to leave the Department's wastewater system when its new wastewater treatment facility becomes operational in Spring of 2022.

Figure 1-2 provides a graphical representation of the wastewater utility capital financing plan for the period FY 2022 - FY 2026. The debt funding shown in Figure 1-2 reflects the use of external debt financing referenced in lines 4 - 11 of Table 1-9.

Table 1-9: Summary FY 2022 - FY 2026 Wastewater Utility Financial Plan

Line	Description	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	% Increase in Rate Revenues	11.0%	11.0%	8.0%	8.0%	8.0%
2	Effective Month	April	July	July	July	July
3						
4	External Debt Financing					
5	Treatment					
6	Bond Proceeds	$0	$0	$0	$12,500,000	$0
7	SRF Loan Proceeds	$0	$0	$10,000,000	$0	$0
8						
9	Collection System					
10	Bond Proceeds	$0	$0	$0	$12,500,000	$0
11	SRF Loan Proceeds	$0	$0	$0	$0	$0
12						
13	**Summary of Cash Flows**					
14	Revenues					
15	Revenue from Existing Rates	$28,877,761	$28,904,307	$28,930,881	$28,957,481	$28,984,107
16	Revenue from Rate Increases	$794,138	$6,708,690	$9,566,517	$12,657,936	$16,001,869
17	Total Rate Revenues	$29,671,899	$35,612,997	$38,497,397	$41,615,416	$44,985,977
18						
19	Non-Rate Revenues	$8,593,250	$2,751,721	$2,421,888	$2,348,709	$2,501,651
20	Total Revenues	$38,265,149	$38,364,719	$40,919,286	$43,964,125	$47,487,627
21						
22	Expenditures					
23	O&M	$33,913,759	$34,806,670	$35,723,750	$36,665,677	$37,633,151
24	Debt Service	$1,967,775	$1,966,900	$2,068,306	$3,427,578	$3,430,953
25						
26	Treatment CIP Expenditures	$22,027,400	$14,080,367	$15,291,792	$2,021,791	$10,226,489
27	Less: Debt Proceeds Applied to CIP Expenditures	$17,725,340	$0	$10,000,000	$2,021,791	$10,226,489
28	Net Rate Funded Treatment CIP Expenditures	$4,302,060	$14,080,367	$5,291,792	$0	$0
29						
30	Collection System CIP Expenditures	$4,648,000	$3,886,870	$10,907,980	$12,011,150	$12,835,950
31	Less: Debt Proceeds Applied to CIP Expenditures	$0	$0	$0	$12,011,150	$488,850
32	Net Rate Funded Collection System CIP Expenditures	$4,648,000	$3,886,870	$10,907,980	$0	$12,347,100
33						
34	Total Rate Funded CIP Expenditures	$8,950,060	$17,967,237	$16,199,772	$0	$12,347,100
35						
36	Total Expenditures (Line 18+19+29)	$44,831,594	$54,740,807	$53,991,828	$40,093,254	$53,411,203
37						
38	Net Operating Surplus/(Deficit) (Line 15 - Line 31)	($6,566,444)	($16,376,088)	($13,072,542)	$3,870,871	($5,923,576)

Figure 1-2: Wastewater Utility Capital Financing Plan (Millions)



1.2.7. WASTEWATER COST OF SERVICE ANALYSIS

Table 1-10 shows a summarized version of the outcome of the FY 2022 COS analysis. The FY 2022 COS revenue requirement is $32,054,314 (line 18). This is 11% more than projected FY 2022 revenues if existing rates remain unchanged. A more detailed version of the outcome of the COS analysis is presented later in this report.

Table 1-10: FY 2022 Wastewater COS Summary

Line	Customer Class	Total COS	Revenue at Existing Rates	$ Difference	% Difference
1	Inside City				
2	All Residential Customers - Domestic Strength	$16,337,340	$14,566,758	$1,770,582	12.2%
3	Non-Residential Customers - Low Strength	$683,314	$831,346	($148,033)	-17.8%
4	Non-Residential Customers - Medium Strength	$9,256,640	$8,355,468	$901,172	10.8%
5	Non-Residential Customers - High Strength	$1,550,837	$994,087	$556,750	56.0%
6	Domestic Liquid Waste	$278,057	$194,852	$83,205	42.7%
7	Industrial	$1,682,388	$1,604,288	$78,100	4.9%
8	Total Inside City	$29,788,575	$26,546,800	$3,241,775	12.2%
9					
10	Loma Linda				
11	All Residential Customers - Domestic Strength	$997,020	$1,230,335	($233,315)	-19.0%
12	Non-Residential Customers - Low Strength	$10,678	$15,782	($5,104)	-32.3%
13	Non-Residential Customers - Medium Strength	$1,166,045	$1,014,000	$152,045	15.0%
14	Non-Residential Customers - High Strength	$57,260	$41,048	$16,212	39.5%
15	Other	$34,736	$29,796	$4,939	16.6%
16	Total Loma Linda	$2,265,739	$2,330,961	($65,221)	-2.8%
17					
18	Total System	$32,054,314	$28,877,761	$3,176,554	11.0%

1.2.8. WASTEWATER RATE STRUCTURE MODIFICATIONS

As shown in Table 1-11, the Department has a complex wastewater rate structure that includes both fixed charges and commodity rates designed to recover the costs of the wastewater treatment system. Because the Department provides wastewater treatment services to the City of Loma Linda (Outside City- Loma Linda), wastewater treatment rates and charges are paid by both Inside City and Loma Linda customers. In addition, the Department also maintains separate fixed charges and commodity rates to recover the cost of wastewater collection system that serves Inside City customers (Loma Linda has its own separate collection system).

The key objectives for potential modifications to the current wastewater rate structure, as determined by Department staff in consultation with Raftelis, are listed below. These objectives were presented to the Board at a public meeting held on September 14, 2021.

- Revenue Sufficiency/Adequacy
- Affordability
- Simplicity/Ease of Understanding
    - Consolidation of the Treatment and Collection Rates

Table 1-11: Existing Wastewater Rate Structure

Treatment System Rates and Charges Fixed Charges		
Monthly Service Charge ($/Account/Month)	**San Bernardino**	**Loma Linda**
Residential	$23.10	$21.55
Multi-Family (2 Units)	$46.20	$43.10
Multi-Family (3 Units)	$69.29	$64.64
Multi Family (4+ Units) and Mobile Home Parks	$3.52	$1.97
Non-Residential	$3.52	$3.52
Industrial	$1.83	$0.28
Commodity Rates		
Commodity Charge ($/HCF)	**San Bernardino**	**Loma Linda**
Residential	N/A	N/A
Multi-Family (2 Units)	N/A	N/A
Multi-Family (3 Units)	N/A	N/A
Multi-Family, Mobile Home Parks (4 or more units)	$1.53	$1.53
Retail, Commercial, Light Industrial	$2.55	$2.55
Auto Repair, Car Wash	$1.58	$1.58
Office, Motels (without Restaurants)	$1.83	$1.83
Restaurants, Hotels	$3.28	$3.28
Laundromats	$1.83	$1.83
Hospitals, Convalescent Homes	$1.63	$1.63
Schools, Churches, Nursery Schools	$1.33	$1.33
Domestic Liquid Waste ($/Gallon)	$0.05	$0.05
Industrial		
Discharge Flow ($/Million Gallons)	$1,094.00	$1,094.00
Biochemical Oxygen Demand Charge ($/Thousand Pounds)	$438.00	$438.00
Suspended Solids Charge ($/Thousand Pounds)	$778.00	$778.00
Collection System Rates and Charges **Fixed Charges**		
Monthly Service Charge ($/Account/Month)	**San Bernardino**	**Loma Linda**
Residential	$9.90	N/A
Multi-Family (2 Units)	$19.85	N/A
Multi-Family (3 Units)	$29.75	N/A
Multi-Family, Mobile Home Parks (4 or more units)	$3.10	N/A
Commodity Rates		
Commodity Charge ($/HCF)	**San Bernardino**	**Loma Linda**
Multi-Family (4+Units, Mobile Home Parks, Non-Residential)	0.87	N/A

1.2.9. PROPOSED WASTEWATER RATES

As an outcome of the study process, Raftelis, in consultation with Department staff, developed a new recommended wastewater rate structure. The proposed cost-based commodity rates under this new structure are shown in Table

1-12. The proposed wastewater commodity rate structure shown in Table 1-12 meets the objectives of simplicity and ease of understanding in two ways. First, it eliminates the need for separate treatment and collection system rates. Second, it combines all of the Department's different $/HCF commodity rates into one of three cost-based customer classes. Under the recommended wastewater rate structure, Residential customers (Single Family Residential and Multi-Family Residential of 3 units or less) will not pay a commodity rate. Instead, cost recovery for these customers will be through a monthly fixed charge.

Table 1-12: Proposed Wastewater Commodity Rates for FY 2022 - FY 2026

Customer Class	Billing Unit	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
Inside City							
Residential: Domestic Strength							
Residential	$/HCF	N/A	N/A	N/A	N/A	N/A	N/A
Multi-Family (2 Units)							
Multi-Family (3 Units)							
Non-Residential: Low Strength							
Laundromats	$/HCF	$2.70	$2.15	$2.39	$2.58	$2.78	$3.01
Schools, Churches, Nursery Schools		$2.20					
Non-Residential: Medium Strength							
Multi-Family, Mobile Home Parks (4 or more units)	$/HCF	$2.40	$2.71	$3.01	$3.25	$3.51	$3.79
Hospitals, Convalescent Homes		$2.50					
Retail, Commercial, Light Industrial		$3.42					
Auto Repair, Car Wash		$2.45					
Office, Motels (without Restaurants)		$2.70					
Non-Residential: High Strength							
Restaurants, Hotels	$/HCF	$4.15	$6.42	$7.13	$7.70	$8.31	$8.98
Domestic Liquid Waste	$/Gallons	$0.0500	$0.0714	$0.0793	$0.0856	$0.0924	$0.0998
Industrial							
Flow	$ per MG	$1,094.00	$1,420.83	$1,577.12	$1,703.29	$1,839.55	$1,986.72
Biochemical Oxygen Demand	$ per 1,000 lbs.	$438.00	$648.28	$719.59	$777.16	$839.33	$906.48
Suspended Solids	$ per 1,000 lbs.	$778.00	$648.50	$719.84	$777.42	$839.62	$906.78
Loma Linda							
Residential: Domestic Strength							
Residential	$/HCF	N/A	N/A	N/A	N/A	N/A	N/A
Multi-Family (2 Units)							
Multi-Family (3 Units)							
Non-Residential: Low Strength							
Laundromats	$/HCF	$1.83	$1.56	$1.73	$1.87	$2.02	$2.18
Schools, Churches, Nursery Schools		$1.33					
Non-Residential: Medium Strength							
Multi-Family, Mobile Home Parks (4 or more units)	$/HCF	$1.53	$1.87	$2.08	$2.24	$2.42	$2.61
Hospitals, Convalescent Homes		$1.63					
Retail, Commercial, Light Industrial		$2.55					
Auto Repair, Car Wash		$1.58					
Office, Motels (without Restaurants)		$1.83					
Non-Residential: High Strength							
Restaurants, Hotels	$/HCF	$3.28	$4.67	$5.18	$5.60	$6.05	$6.53

Table 1-13 presents the proposed cost-based wastewater monthly service charges ($/account/month) under the new recommended wastewater rate structure. The wastewater monthly service charges shown in Table 1-13 have achieved the objective of simplicity and ease of understanding by consolidating the Department's current treatment system and collection system service charges into a single consolidated fixed charge applicable to all non-residential customers.

Table 1-13: Proposed Wastewater Service Charges for FY 2022 - FY 2026

Customer Class	Billing Unit	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
Inside City							
Residential							
Residential	$/Account/Month	$33.00	$37.83	$41.99	$45.35	$48.98	$52.90
Multi-Family (2 Units)	$/Account/Month	$66.05	$75.66	$83.98	$90.70	$97.96	$105.80
Multi-Family (3 Units)	$/Account/Month	$99.04	$113.49	$125.98	$136.05	$146.94	$158.69
All Non-Residential	$/Account/Month	$6.62	$16.56	$18.38	$19.85	$21.44	$23.16
Domestic Liquid Waste	$/Account/Month	N/A	N/A	N/A	N/A	N/A	N/A
Industrial	$/Account/Month	4.93	$16.56	$18.38	$19.85	$21.44	$23.16
Loma Linda							
Residential							
Residential	$/Account/Month	$21.55	$21.02	$23.33	$25.20	$27.22	$29.39
Multi-Family (2 Units)	$/Account/Month	$43.10	$42.04	$46.67	$50.40	$54.43	$58.79
Multi-Family (3 Units)	$/Account/Month	$64.64	$63.06	$70.00	$75.60	$81.65	$88.18
All Non-Residential (Note 1)	$/Account/Month	$3.52	$6.00	$6.66	$7.19	$7.77	$8.39
Note 1: Multi-Family, Mobile Home Parks (4 or more units) currently pay a service charge of $1.97 per account per month.							

2. Introduction

2.1. Study Background

2.1.1. DEPARTMENT SERVICE TERRITORY

The Department was formed as a municipal utility by Article 9 of the City of San Bernardino Charter, as adopted on January 6, 1905. The Department's potable water service area encompasses approximately 45-square miles of the City's 62 square miles and serves water to roughly 200,000 people throughout both the City of San Bernardino and the unincorporated areas of San Bernardino County. The Department's service area is bounded by the San Bernardino National Forest and Devore Water Company to the north, by East Valley Water District (EVWD) and Redlands Municipal Utilities Department to the east, by the cities of Loma Linda and Colton to the south, and by West Valley Water District, the City of Rialto, and the Muscoy Mutual Water Company to the west.

2.1.2. WATER SUPPLY

Based on an analysis of billing data provided by the Department staff, Raftelis estimates that annual potable water demand on the Department's system in FY 2021 was approximately 16.3 million HCF (or 37,400 acre-feet). As discussed in the Department's Water Facilities Master Plan Report dated June 17, 2015 (2015 Water Facilities Master Plan), the Department relies solely on water extracted from the underlying Bunker Hill Groundwater Basin aquifer, to meet its demands. The Department incurs operational expenses to extract the Bunker Hill groundwater and must also pay water replenishment fees to the San Bernardino Valley Municipal Water District (SBVMWD). SBVMWD is a California State Water Contractor responsible for providing water supplies to a large portion of the San Bernardino Valley. SBVMWD also has the ability to provide a small amount of imported State Water Project water available for purchase by the Department.

The Department does not currently serve customers with recycled water. However, the Department's Water Reclamation Division is actively pursuing a recycled water project (Tertiary Treatment System or TTS) to treat effluent from the San Bernardino Water Reclamation Plant to a quality approved for recharge of the Bunker Hill Groundwater Basin.

The TTS is also designed to produce recycled water effluent to a quality approved for direct non-potable use and convey the tertiary treated recycled water to customers that can benefit from a non-potable water supply. In the future, it is projected that Department will continue to receive the majority of its water supply from groundwater. However, recycled water and imported water are expected to augment the groundwater to complete the future water supply portfolio.

2.1.3. WATER SYSTEM INFRASTRUCTURE

As described in the 2015 Water Facilities Master Plan, the Department's water transmission and distribution system consists of pipelines, storage reservoirs, pumping stations, hydroelectric generating stations, manual and automatic control valves, fire hydrants, and water meters located throughout the various individual pressure zones. The Department has more than 700 miles of pipeline varying in size from 2 inches to 78 inches in diameter, approximately 42,000 metered water services, 13,800 valves, and 4,000 fire hydrants. The Department has 44 water storage reservoirs containing a total of 112 million gallons of domestic water storage capacity. These reservoirs vary in size from 40,000 gallons to 12 million gallons and are located throughout many of the pressure zones.

The Department has pumping stations capacities range from 1,500 gpm to 14,000 gpm. In addition, most pressure zones have automated inter-zonal water transfer capabilities to improve water system reliability. The Department

also has 54 groundwater production wells. There are 19 primary pressures zones within the Department's water distribution system. The zone reservoir elevations range from 1,249 feet to 2,100 feet above sea level and are located at appropriate elevations necessary to provide adequate water pressure throughout the pressure zone service area.

2.1.4. WASTEWATER SYSTEM INFRASTRUCTURE

The Department provides wastewater services to the western two-thirds of the City of San Bernardino. EVWD serves the eastern third of the City. As discussed in the Department's 2019 Sewer Master Plan Update (dated March 2020 but referred to as the 2019 Sewer Master Plan Update), the Water Reclamation Plant (WRP) was constructed in 1958 and is a 33 million gallons per day (MGD) Regional Secondary Treatment facility that provides wastewater treatment services for the Cities of San Bernardino and Loma Linda, EVWD, the San Bernardino International Airport, Patton State Hospital, and areas of unincorporated San Bernardino County. EVWD is currently expected to leave the Department's wastewater system when its new wastewater treatment facility becomes operational in Spring of 2022. The existing wastewater collection system consists of 493 miles of pipes, 15 active lift stations, 12 siphons, and approximately 38,300 wastewater connections.

2.2. Study Objectives

The Department retained the services of Raftelis via a professional service agreement that was executed on December 20, 2020. Work on the study has been ongoing throughout 2021. The Department's objectives for the study included:

- The preparation of water and wastewater financial plans for the five-year period FY 2022 - FY 2026. The purpose of the financial plans is to determine the amount of rate revenue that must be collected from customers to pay for projected operations and maintenance (O&M) expenses, debt service payments, and rate-funded capital expenditures. This amount of annual required revenue is referred to as the revenue requirement from rates.

- The preparation of water and wastewater COS studies using industry standard cost allocation principles. The purpose of the COS studies is to quantify the amount of rate revenues that must be collected from each customer class based on their unique demand characteristics.

- The analysis of the Department's existing water and wastewater rate structures and the development of recommendations for modifications. The purpose of recommended modifications is to more effectively achieve the Department's cost-based financial, operational, and policy objectives in compliance with the requirements of Proposition 218.

- The development of proposed water and wastewater rates for the five-year period FY 2022 - FY 2026. These projected rates are determined in a manner that complies with the intent of Proposition 218 and other applicable California regulatory requirements.

- The development of proposed drought surcharge rates to assist the Department in recovering adequate revenue during periods when water sales are curtailed during drought emergencies.

Progress presentations discussing the status of the study were provided to the Board at the following public meetings:

- February 9, 2021: Introduction
- August 24, 2021: Water Utility Progress Update
- September 14, 2021: Wastewater Utility Progress Update

2.3. Report Contents

This report contains the following sections:

- **Section 1: Executive Summary**. Summarizes the study results for the wastewater financial plan, cost of service analysis and rate design.

- **Section 2: Study Background**. Provides an overview and purpose of the study as well as key components of the study process.

- **Section 3: Water Financial Plan**: Discussion of the development of the water financial plan, including a discussion of operating expenses, capital expenditures, debt service, cash reserve requirements, debt service coverage requirements, and the annual revenue requirement from rates.

- **Section 4: Water COS Analysis**. Discussion of the process used to functionalize, allocate, and distribute the annual water rate revenue requirement to customer classes.

- **Section 5: Water Rate Design**. Discussion of the process of developing the recommended water rate structure and proposed water rates. This section also includes the calculation of drought surcharges and selected FY 2022 customer bill impacts.

- **Section 6: Wastewater Financial Plan**. Discussion of the development of the wastewater financial plan including a discussion of operating expenses, capital expenditures, debt service, cash reserve requirements, debt service coverage requirements, and the annual revenue requirement from rates.

- **Section 7: Wastewater COS Analysis**. Discussion of the process used to functionalize, allocate, and distribute the annual wastewater revenue requirement from rates to customer classes.

- **Section 8: Wastewater Rate Design**. Details the process of developing the recommended wastewater rate structure and proposed wastewater rates. This includes calculation of selected FY 2022 customer bill impacts under water proposed rates.

2.4. Legal and Statutory Considerations

2.4.1. PROPOSITION 218

In November 1996, California voters approved Proposition 218, which amended the California Constitution by adding Article XIII C and Article XIII D. Article XIII D placed substantive limitations on the use of the revenue collected from property-related fees and on the amount of the fee that may be imposed on each parcel. Additionally, it established procedural requirements for imposing new, or increasing existing, property-related fees. The California Supreme Court has determined that water and wastewater service fees are property-related fees. These provisions require that a property-related fee must meet all of the following requirements:

- Revenues derived from the fee must not exceed the funds required to provide the property-related service.

- Revenues from the fee must not be used for any purpose other than that for which the fee is imposed.

- The amount of a fee imposed upon any parcel or person as an incident of property ownership must not exceed the proportional cost of the service attributable to the parcel.

- The fee may not be imposed for a service, unless the service is actually used by, or immediately available to, the owner of the property subject to the fee. A fee based on potential or future use of a service is not permitted and stand-by charges must be classified as assessments subject to the ballot protest and proportionality requirements for assessments.

- No fee may be imposed for general governmental services, such as police, fire, ambulance, or libraries, where the service is available to the public in substantially the same manner as it is to property owners. The five substantive requirements in Article XIII D are structured to place limitations on (1) the use of the revenue collected from property-related fees and (2) the allocation of costs recovered by such fees to ensure that they are proportionate to the cost of providing the service attributable to each parcel.

As stated in the American Water Works publication, *Manual of Water Supply Practice M1, Principles of Water Rates, Fees, and Charges*,7th Edition (AWWA Manual M1),"water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers." Similarly, the Water Environment Federation (WEF) publication, *Financing and Charges for Wastewater Systems, WEF Manual of Practice No. 27*, 4th Edition (WEF Manual 27), states, "the process of identifying the service characteristics of the utility's customers and distributing costs in proportion to their service demands are critical steps in the development of equitable rates and charges."

Proposition 218 requires that water rates cannot be "arbitrary and capricious," meaning that the rate-setting methodology must be sound and that there must be a nexus between the costs and the rates charged in addition to meeting the substantive requirements set forth therein. California Courts have also made clear that, while agencies are authorized to use industry-standard rate setting methodologies set forth in AWWA Manual M1 and WEF Manual 27, rates for water and wastewater service must meet the substantive requirements of Proposition 218. This study demonstrates that such requirements have been met for the water and wastewater fees.

2.4.2. CALIFORNIA CONSTITUTION – ARTICLE X, SECTION 2

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

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

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

2.5. The Rate Setting Process

The rate setting process includes the following key steps:

- **Revenue Requirement Determination**: The rate-making process starts by determining the "test-year" (rate-setting year) revenue requirement from rates. The revenue requirement should sufficiently fund the utility's O&M, debt service, capital expenses, and other identified costs with funding to reserves (positive cash) or using reserves (negative cash), all based on a long-term financial plan.

- **COS Analysis**: The annual cost of providing water and wastewater service is distributed among customer classes in proportion to their service requirements. A COS analysis involves the following key steps:

    - **Assignment of Costs to Functions**: Examples of water system functions include storage, treatment, and distribution. Examples of wastewater system functions include collection, conveyance, and treatment.

    - **Allocation of Costs to Cost Causation Components:** Examples of water cost components include base demand, maximum day demand, and maximum hour demand. Examples of wastewater cost causation components include flow, biochemical oxygen demand, and suspended solids.

    - **Distribution of Costs to Customer Classes**: Costs are distributed to customer classes in proportion to the demands they place on the water and wastewater systems.

- **Rate Design and Proposed Rates**: Rates do more than simply recover costs. Properly designed rates should support and optimize a blend of various utility objectives, such as promoting cost-based water use efficiency, affordability for essential needs, and revenue stability, among other objectives.

- **Rate Adoption Process**: Rate adoption is the last step of the rate-making process and is part of the procedural requirements of Proposition 218. Raftelis documents the rate study results in reports to serve as the utility's administrative record and a public education tool about the proposed changes, the rationale and justifications behind the changes, and their anticipated financial impacts.

Government Code §54999.7© requires that water and wastewater agencies conduct a cost of service study at a minimum of every ten years. Raftelis conducted a comprehensive cost of service rate study for the Department in Section 5 and documented the results and findings in this report. This Study focuses on financial plan updates and incorporates the latest financial information and cost projections for the next five years. The proposed revenue adjustments resulting from the financial plan will be applied across all categories of the updated rates to calculate the proposed rates for FY 2022 – FY 2026.

2.6. Reliance on Department Provided Data

During the study, Department staff provided Raftelis with a variety of technical information, including demand, cost, and revenue data. Raftelis did not independently assess or test for the accuracy of such data – historic or projected. Raftelis has relied on this data in the formulation of our findings and subsequent recommendations, as well as in the preparation of this report. Raftelis also relied on cost allocation data provided by the Department as needed to complete the COS analysis.

3. Water Financial Plan

3.1.1. OVERVIEW OF THE FINANCIAL PLANNING PROCESS

This section describes the process used to develop the water utility financial plan for the period FY 2022 - FY 2026. The overarching objective of the financial planning process is to project the revenue requirement from rates (i.e., rate revenues that must be collected from customers) based on a utility's desired capital funding strategy. Key steps in the development of a water financial plan include:

- **Forecast of Billed Water Consumption (Demand Forecast)**: The demand forecast projects the level of billed water consumption for each customer class based on anticipated customer account growth and projected per account water consumption.

- **Projection of Water Sales Revenues at Existing Rates**: This step in the financial planning process determines how much rate revenue will be earned from forecast billed water consumption if there are *no rate increases*. This projected level of rate revenue can then be compared to projected expenditures to determine the annual funding shortfall (i.e., the difference between projected water sales revenues and projected expenditures) that must be met by the appropriate combination of rate revenue increases or external debt financing.

- **Projection of Miscellaneous Non-Rate Revenue**: Miscellaneous non-rate revenue items can include interest income from cash reserves, grants, capacity fee receipts, and miscellaneous ancillary fees. Miscellaneous non-rate revenues assist in closing the annual funding shortfall. Miscellaneous non-rate revenues also reduce the revenue requirement from rates (i.e., the level of amount of rate revenue that must be earned from customers).

- **Projection of Expenditures (O&M, Cash Funded CIP Expenditures, Debt Service Payments)**: This step in the financial planning process determines the level of expenditures that will be incurred by the utility to provide service during each year of the planning horizon. Projected expenditures are compared against projected water sales revenue at existing rates and projected miscellaneous non-rate revenue to determine the annual funding gap.

- **Identification of Cash Reserve and Debt Service Coverage Targets**: Utilities must not only have sufficient revenues to pay for projected expenditures, but they must also maintain prudent cash reserves and meet both contractually obligated and target debt service coverage requirements.

- **Determination of the Capital Financing Strategy**: In this final step in the financial planning process, the utility determines the optimal mix of annual rate revenue increases and external debt financing to cover the funding shortfall. As discussed previously, the funding shortfall is the difference between revenues at existing rates and projected expenditures (including funding for prudent cash reserves and debt service coverage levels).

3.1.2. PROJECTED BILLED WATER CONSUMPTION

The Statistical Section of the Department's Annual Comprehensive Financial Report for the Year Ending June 30, 2021, indicates that during the nine-year period from FY 2012 - FY 2021, the number of water service connections served by the Department grew from 43,411 in FY 2012 to 45,490 in FY 2021. This represents a compound annual growth rate of 0.52%. Based on consultations with Department Staff (as shown in Table 3-1), a 0.6% annual increase

in water customer accounts was assumed during the FY 2022 - FY 2026 planning horizon. Annual billed water consumption was projected to grow at a rate of 0.4% annually.

Table 3-1: Projected Account Growth and Billed Water Consumption

Line	Metric	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
4	Projected Metered Customer Accounts					
5	Residential	36,146	36,289	36,434	36,578	36,724
6	Multi-Family Residential	2,879	2,891	2,902	2,914	2,925
7	Commercial	3,660	3,675	3,689	3,704	3,719
8	Irrigation	112	112	113	113	113
9	Institutional	419	420	422	424	425
10	Other	67	67	67	67	68
11	Total Metered Accounts	43,283	43,454	43,627	43,800	43,974
12						
13	Projected Fire Service Connections	2,300	2,385	2,474	2,565	2,660
14	Total Projected Customer Accounts	45,583	45,839	46,101	46,365	46,634
15	% Change in Customer Accounts		0.6%	0.6%	0.6%	0.6%
16						
17	Projected Billed Water Consumption (HCF)					
18	Residential	7,460,709	7,489,689	7,518,782	7,547,989	7,577,309
19	Multi-Family Residential	2,402,704	2,412,037	2,421,406	2,430,812	2,440,255
20	Commercial	3,404,544	3,417,768	3,431,044	3,444,372	3,457,752
21	Irrigation	369,078	370,511	371,950	373,395	374,846
22	Institutional	1,144,935	1,149,382	1,153,847	1,158,329	1,162,828
23	Other	89,667	90,015	90,364	90,715	91,068
24	Total	14,871,636	14,929,402	14,987,394	15,045,612	15,104,057
25	Annual % Change	--	0.4%	0.4%	0.4%	0.4%

3.1.3. PROJECTED REVENUES AT EXISTING RATES

Table 3-2 shows both projected water sales revenues at existing rates and projected miscellaneous non-rate revenues during the FY 2022 - FY 2026 planning horizon. The amounts shown in the Table 3-2 were calculated by multiplying the projected customer accounts and billed water consumption shown in Table 3-1 by existing FY 2021 water rates and charges.

Table 3-2: Projected Rate Revenues at Existing Rates

Line	Revenue Description Projected Rate Revenues at Existing Rates	FY 2022 Budgeted	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
1	Monthly Service Charge Revenue					
2	Water Service Charge	$15,327,461	$15,388,113	$15,449,006	$15,510,140	$15,571,516
3	Fire Service Charge	$555,566	$576,122	$597,439	$619,544	$642,467
4	Total Fixed Revenue	$15,883,027	$15,964,235	$16,046,444	$16,129,684	$16,213,983
5						
6	Commodity Rate Revenue					
7	Commodity Charge	$16,981,585	$17,069,890	$17,158,653	$17,247,878	$17,337,567
8	Replenishment Charge Water Service	$2,110,418	$2,118,859	$2,127,335	$2,135,844	$2,144,387
9	Replenishment Charge Landscape Service	$344,038	$345,173	$346,312	$347,455	$348,602
10	Elevation Charge	$2,320,886	$2,332,955	$2,345,086	$2,357,280	$2,369,538
11	Conservation Charge	$995,581	$999,563	$1,003,562	$1,007,576	$1,011,606
12	Water Supply Shortage	$834,396	$837,734	$841,085	$844,449	$847,827
13	Assessment District Charge	$96,991	$97,312	$97,633	$97,955	$98,278
14	Total Commodity Rate Revenue	$23,683,896	$23,801,485	$23,919,665	$24,038,437	$24,157,806
15						
16	Total Rate Revenue at Existing Rates	$39,566,923	$39,765,721	$39,966,109	$40,168,121	$40,371,789
17						
	Miscellaneous Non-Rate Revenue					
18	Fees	$1,290,500	$1,290,500	$1,290,500	$1,290,500	$1,290,500
19	Interest - Other	$1,000	$1,010	$1,020	$1,030	$1,041
20	Interest - Reserves	$175,000	$267,168	$329,978	$324,284	$316,269
21	Other	$595,000	$595,000	$595,000	$595,000	$595,000
22	Non-Capital Grants	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
23	Total Miscellaneous Non-Rate Revenue	$4,061,500	$4,153,678	$4,216,498	$4,210,814	$4,202,809
24						
25	Total Revenue at Existing Rates	$43,628,423	$43,919,398	$44,182,607	$44,378,935	$44,574,598

3.1.4. PROJECTED O&M EXPENSES

Projected O&M expenses for the FY 2022 - FY 2026 planning horizon were based on a starting point of the Department's FY 2022 budget. O&M expenses are projected forward based on the cost escalation factors shown in the top half of Table 3-3. These cost escalation factors were developed in consultation with Department Staff. Actual projected O&M expenses are shown in the bottom half of Table 3-3. The water production costs shown in line 9 of Table 3-3 include water replenishment charges paid to the SBVMWD and all of the Department's costs related to wellhead pumping and water treatment costs.

Table 3-3: Projected O&M Expenses

Line	Description	FY 2022 Budgeted	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
1	Inflation/Cost Escalation Factors					
2	General	2.5%	2.5%	2.5%	2.5%	2.5%
3	Salary	4.0%	4.0%	4.0%	4.0%	4.0%
4	Benefits	6.0%	6.0%	6.0%	6.0%	6.0%
5	Utilities	3.0%	3.0%	3.0%	3.0%	3.0%
6	Power	5.0%	5.0%	5.0%	5.0%	5.0%
7						
8	Projected O&M					
9	Water Production	$8,902,799	$9,217,134	$9,543,259	$9,881,647	$10,232,789
10	Administrative Division	$14,538,949	$14,902,422	$15,274,983	$15,656,858	$16,048,279
11	Water Utility Division	$14,306,345	$15,245,006	$15,653,664	$16,073,916	$16,506,119
12	Non-Operating	$2,900	$2,973	$3,047	$3,123	$3,201
13	Capital Outlay	$0	$0	$0	$0	$0
14	Total O&M	$37,750,992	$39,367,536	$40,474,954	$41,615,543	$42,790,388
15	Annual % Change		4.3%	2.8%	2.8%	2.8%

3.1.5. PROJECTED CIP EXPENDITURES

CIP expenditures made by the Department are generally paid in two primary ways: rate revenues (also known as PAYGO funding) and external debt financing. Table 3-4 shows projected CIP expenditures for FY 2022 - FY 2026 as provided by the Department Staff. Included in Table 3-4 is a projection of how the CIP expenditures will be funded (lines 25-28). The mix of rate-funded PAYGO CIP and debt funded CIP reflects the Department's preferred capital financing strategy.

Table 3-4: Projected CIP Expenses

Line	Description	FY 2022 Budgeted	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	Total
1	Water Repair & Replacement Projects						
2	Wells And Pumping Equipment Rehabilitation	$365,000	$515,500	$531,481	$547,956	$564,943	$2,524,880
3	Pumps, Boosters, & ACVs Rehabilitation & Replacement	$144,500	$2,232,115	$175,389	$180,826	$186,431	$2,919,260
4	Reservoir Rehabilitation	$375,000	$0	$0	$0	$0	$375,000
5	Water Main Replacement	$3,290,000	$340,230	$850,369	$2,421,967	$1,694,829	$8,597,395
6	System Appurtenances Rehabilitation & Replacement	$5,342,000	$2,969,280	$3,061,328	$3,156,229	$3,254,072	$17,782,908
7	Facilities And Plants Rehabilitation & Replacement	$50,000	$180,425	$186,018	$191,785	$197,730	$805,958
8	Total Water Repair & Replacement Projects	$9,566,500	$6,237,550	$4,804,584	$6,498,763	$5,898,005	$33,005,402
9							
10	Water New System Assets						
11	Wells And Pump Equipment	$150,000	$1,443,400	$186,018	$1,534,278	$0	$3,313,696
12	Pumps And Booster Plants	$0	$3,402,300	$0	$0	$0	$3,402,300
13	Reservoirs	$147,000	$2,062,000	$318,888	$4,011,041	$847,415	$7,386,344
14	Water Mains	$342,000	$1,031,000	$0	$328,774	$0	$1,701,774
15	Facilities And Plants	$1,718,000	$567,050	$584,629	$602,752	$621,437	$4,093,868
16	Total Water New System Assets	$2,357,000	$8,505,750	$1,089,535	$6,476,845	$1,468,852	$19,897,982
17							
18	Water Other Funded Projects						
19	Public Works Projects	$640,000	$180,425	$186,018	$191,785	$197,730	$1,395,958
20	Consent Decree Remedy Replacement	$0	$0	$0	$0	$0	$0
21	Total Water Other Funded Projects	$640,000	$180,425	$186,018	$191,785	$197,730	$1,395,958
22							
23	Total Water CIP	$12,563,500	$14,923,725	$6,080,137	$13,167,392	$7,564,587	$54,299,341
24							
25	CIP Funding						
26	Proposed Rate Funded	$12,563,500	$6,423,725	$6,080,137	$13,167,392	$7,564,587	$45,799,341
27	Proposed SRF Loan Funded	$0	$8,500,000	$0	$0	$0	$0
28	Total CIP Funding	$12,563,500	$14,923,725	$6,080,137	$13,167,392	$7,564,587	$54,299,341

3.1.6. PROJECTED DEBT SERVICE PAYMENTS

Table 3-5 shows the Department's projected water utility debt service payments for the period FY 2022 - FY 2026. The proposed State Revolving Fund (SRF) debt service payments shown in line 4 of Table 3-5 reflect the Department's preferred capital financing plan, which features obtaining an SRF loan of $8,998,664 in FY 2023.

Table 3-5: Projected Debt Service Payments

Line	Debt Service	FY 2022 Budgeted	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
1	Existing Debt Service	$2,990,388	$2,994,138	$2,990,513	$2,994,388	$2,990,638	$2,994,138	$2,989,763
2	Proposed Revenue Bond Debt Service	$0	$0	$0	$0	$0	$0	$0
3	Proposed SRF Debt Service	$0	$498,664	$498,664	$498,664	$498,664	$498,664	$498,664
4	Total Debt Service	$2,990,388	$3,492,801	$3,489,176	$3,493,051	$3,489,301	$3,492,801	$3,488,426

3.1.7. CASH RESERVE AND DEBT SERVICE COVERAGE

The Department's financial plan is based on the maintenance of the cash reserve and debt service coverage targets shown in Table 3-6.

Table 3-6: Cash Reserve and Debt Service Coverage Targets

Line	Description	Metric	Description
1	Operating Reserve	45	Days of Annual O&M Expenses
2	Rate Stabilization Reserve	20%	of Total Water Sales
3	Emergency Reserve	2%	of Capital Assets
4	Capital Reserve	5	Year Average and Rate-Funded PAYGO CIP
6	Target Debt Service Coverage	1.75	Annual Debt Service Coverage

3.1.8. PROJECTED WATER UTILITY FINANCIAL PLAN

Table 3-7 shows the proposed water utility financial plan for the period FY 2022 - FY 2026. This financial plan reflects the Department's preferred capital financing strategy as determined by Department staff. Line 1 of Table 3-7 indicates the proposed annual rate revenue increases. Funding for water utility operations will be augmented by a proposed State Revolving Fund loan in the amount of $8,998,664. The net proceeds of this loan are estimated to be $8.5 million as shown in line 6 of Table 3-7. The derivation of key sections of Table 3-7 are described below:

- Lines 1 - 6 reflect the Department Staff's preferred water utility financing strategy for the period FY 2022 - FY 2026. Specifically, it reflects the combination of rate revenue increases and external debt financing determined to best meet the financial needs of the water utility.

- Lines 9 - 23 show the projection of rate revenues and miscellaneous non-rate revenues during the FY 2022 - FY 2026 planning horizon. Table 3-2 shows a detail of the projection of revenues at existing rates, as presented line 11 of Table 3-7. Line 12 reflects the projected additional rate revenues that will be earned each year based on the specified percentage rate revenue increases and rate revenue increase effective dates shown in lines 1 and 2. The miscellaneous non-rate revenues shown in Rows 15-21 were developed in consultation with Department staff.

- Lines 27 - 33 show projected O&M expenses for the FY 2022 - FY 2026 planning horizon, as originally shown in Table 3-3.

- Lines 35 - 39 show projected debt service expenditures for the FY 2022 - 2025 planning horizon, as originally shown in Table 3-5.

- Lines 41 - 44 show, for the FY 2022 - FY 2025 planning horizon, projected CIP expenditures and the mix of rate-funded PAYGO and debt funded CIP based in the Department's preferred capital financing strategy. The details of each proposed CIP project (as shown in Table 3-4) are summarized in lines 41 - 44 of Table 3-7.

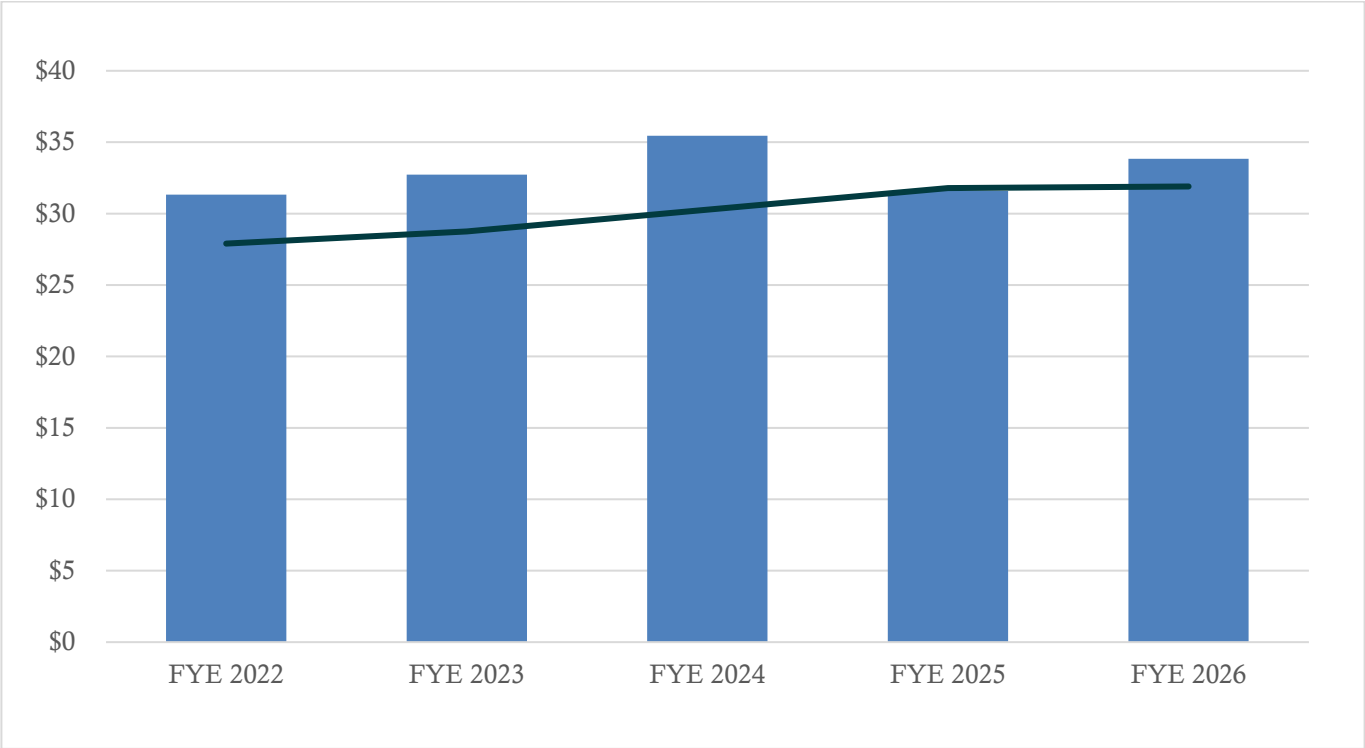
- Lines 50 - 54 reflect the Department's projected beginning and ending cash reserves for the FY 2022 - FY 2025 planning horizon, based on the projected net operating surplus (line 48) and use of debt financing to fund CIP expenditures.

Table 3-7: Water Utility Financial Plan for FY 2022 - FY 2026

Line	Description	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Annual Rate Revenue Increase	6.0%	6.0%	4.0%	3.0%	3.0%
2	Effective Date	April	July	July	July	July
3						
4	External Debt Financing					
5	Bond Proceeds	$0	$0	$0	$0	$0
6	SRF Loan Proceeds	$0	$8,500,000	$0	$0	$0
7						
8	**Detail of Cash Flows**					
9	Revenues					
10						
11	Revenues from Existing Rates	$39,566,923	$39,765,721	$39,966,109	$40,168,121	$40,371,789
12	Revenues from Rate Increases	$593,504	$4,915,043	$6,736,048	$8,178,242	$9,677,454
13	Total Rate Revenues	$40,160,427	$44,680,764	$46,702,157	$48,346,363	$50,049,243
14						
15	Miscellaneous Non-Rate Revenues					
16	Fees	$1,290,500	$1,290,500	$1,290,500	$1,290,500	$1,290,500
17	Interest - Other	$1,000	$1,010	$1,020	$1,030	$1,041
18	Interest - Reserves	$175,000	$267,168	$329,978	$324,284	$316,269
19	Other	$595,000	$595,000	$595,000	$595,000	$595,000
20	Non-Capital Grants	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
21	Total Miscellaneous Non-Rate Revenues	$4,061,500	$4,153,678	$4,216,498	$4,210,814	$4,202,809
22						
23	Total Revenues	$44,221,927	$48,834,442	$50,918,655	$52,557,178	$54,252,052
24						
25	Expenditures					
26						
27	O&M Expenses					
28	Water Production	$8,902,799	$9,217,134	$9,543,259	$9,881,647	$10,232,789
29	Administrative Division	$14,538,949	$14,902,422	$15,274,983	$15,656,858	$16,048,279
30	Water Utility Division	$14,306,345	$15,245,006	$15,653,664	$16,073,916	$16,506,119
31	Non-Operating	$2,900	$2,973	$3,047	$3,123	$3,201
32	Capital Outlay	$0	$0	$0	$0	$0
33	Total O&M Expenses	$37,750,992	$39,367,536	$40,474,954	$41,615,543	$42,790,388
34						
35	Debt Service					
36	Existing Debt Service	$2,990,388	$2,994,138	$2,990,513	$2,994,388	$2,990,638
37	Proposed Revenue Bond Debt Service	$0	$0	$0	$0	$0
38	Proposed SRF Debt Service	$0	$498,664	$498,664	$498,664	$498,664
39	Total Debt Service	$2,990,388	$3,492,801	$3,489,176	$3,493,051	$3,489,301
40						
41	CIP Expenditures					
42	Total CIP Expenditures	$12,563,500	$14,923,725	$6,080,137	$13,167,392	$7,564,587
43	Less: Debt Proceeds Applied to CIP Expenditures	$0	$8,500,000	$0	$0	$0
44	Net Rate Funded CIP Expenditures	$12,563,500	$6,423,725	$6,080,137	$13,167,392	$7,564,587
45						
46	Total Expenditures (Lines 33 + 39 + 44)	$53,304,880	$57,784,062	$50,044,267	$58,275,987	$53,844,277
47						
48	Net Surplus/(Deficit) (Line 23 - 46)	($9,082,953)	($8,949,620)	$874,388	($5,718,809)	$407,775
49						
50	Cash Reserves					
51	Beginning Balance	$38,395,465	$31,325,176	$32,725,556	$35,449,944	$31,581,135
52	Net Cash Change	($9,082,953)	($449,620)	$874,388	($5,718,809)	$407,775
53	Capital Contributions	$1,850,000	$1,850,000	$1,850,000	$1,850,000	$1,850,000
54	Ending Cash Reserves	$31,162,511	$32,725,556	$35,449,944	$31,581,135	$33,838,910

Figure 3-1 provides a graphical representation of water utility cash reserves for the period FY 2022 - FY 2026, as shown in line 54 of Table 3-7.

Figure 3-1: Water Utility Cash Reserves (Millions)



3.1.9. WATER UTILITY REVENUE REQUIREMENT FROM RATES

A key outcome of the financial planning process is the determination of the annual revenue requirement from rates. The cost of service process assigns the revenue requirement from rates to each customer class based on their proportionate share of total system water demands. Table 3-8 shows the projected revenue requirement from rates for FY 2022 - FY 2026. Note that line 28 of Table 3-8 (Net Revenue Requirement from Rates Before Adjustment) equals line 13 of Table 3-7 (Total Rate Revenue). This demonstrates the linkage between the financial plan as shown in Table 3-7 and the determination of the revenue requirement from rates as shown in Table 3-8.

Line 28 of Table 3-8 is increased by $1,780,520 (line 30) to reflect the fact that FY 2022 rate increases will not become effective until April 1, 2022, a full nine months after the start of FY 2022. The adjustment ensures that the Department's water utility will earn one full year of rate revenue under the new rates that become effective on April 1, 2022. The derivation of this adjustment is discussed below.

The Department will implement a water rate revenue increase of 6% on April 1, 2022. Thus, additional rate revenues from this increase will be earned for only three months (April 2022, May 2022, and June 2022). During this three month period, the Department will earn additional rate revenues of $593,504. If the Department had adopted a 6% rate revenue increase on at the state of FY 2022 (July 1, 2021), a total of $2,374,015 in additional rate revenues would have been earned over the entire twelve months of FY 2022. Thus, the $1,780,520 revenue requirement adjustment shown on line 30 of Table 3-8 increases the FY 2022 revenue requirement by this amount to ensure that the rates implemented on April 1, 2022, actually produce a full twelve months of rate revenue.

If the revenue requirement adjustment of $1,780,520 is not made, the water rates implemented by the Department on April 1, 2022, will be inadequate to recover the entire amount of required rate revenue as derived in the financial plan.

Table 3-8: Water Utility Revenue Requirement from Rates for FY 2022 - FY 2026

Line	Description	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	O&M					
2	Water Production	$8,902,799	$9,217,134	$9,543,259	$9,881,647	$10,232,789
3	Administrative Division	$14,538,949	$14,902,422	$15,274,983	$15,656,858	$16,048,279
4	Water Utility Division	$14,306,345	$15,245,006	$15,653,664	$16,073,916	$16,506,119
5	Non-Operating	$2,900	$2,973	$3,047	$3,123	$3,201
6	Capital Outlay	$0	$0	$0	$0	$0
7	Total O&M	$37,750,992	$39,367,536	$40,474,954	$41,615,543	$42,790,388
8						
9	Debt Service					
10	Existing Debt Service	$2,990,388	$2,994,138	$2,990,513	$2,994,388	$2,990,638
11	Proposed Revenue Bond Debt Service	$0	$0	$0	$0	$0
12	Proposed SRF Debt Service	$0	$498,664	$498,664	$498,664	$498,664
13	Total Debt Service	$2,990,388	$3,492,801	$3,489,176	$3,493,051	$3,489,301
14						
15	Rate Funded Capital	$12,563,500	$6,423,725	$6,080,137	$13,167,392	$7,564,587
16						
17	Gross Revenue Requirement from Rates	$53,304,880	$49,284,062	$50,044,267	$58,275,987	$53,844,277
18						
19	Revenue Offsets					
20	Fees	$1,290,500	$1,290,500	$1,290,500	$1,290,500	$1,290,500
21	Interest - Other	$1,000	$1,010	$1,020	$1,030	$1,041
22	Interest - Reserves	$175,000	$267,168	$329,978	$324,284	$316,269
23	Other	$595,000	$595,000	$595,000	$595,000	$595,000
24	Non-Capital Grants	$2,000,000	$2,000,000	$2,000,000	$2,000,000	$2,000,000
25	Total Revenue Offsets	$4,061,500	$4,153,678	$4,216,498	$4,210,814	$4,202,809
26						
27	Change in Cash Balance - Net Operating Surplus/(Deficit)	($9,082,953)	($449,620)	$874,388	($5,718,809)	$407,775
28	Net Revenue Requirement Before Adjustments	$40,160,427	$44,680,764	$46,702,157	$48,346,363	$50,049,243
29						
30	Adjustment for 4th Quarter Increase	$1,780,512	$0	$0	$0	$0
31	Final Net Revenue Requirement from Rates	$41,940,938	$44,680,764	$46,702,157	$48,346,363	$50,049,243

4. Water COS Analysis

4.1.1. COST OF SERVICE METHODOLOGY

A COS analysis distributes a utility's revenue requirements from rates (costs) to each customer class based on their proportionate share of total system water demand. The COS analysis completed by Raftelis follows industry standard cost allocation principles as presented in AWWA Manual M1.

4.1.2. REVENUE REQUIREMENT COST COMPONENTS

The starting point of the water COS analysis is to identify the operating and capital cost components of the annual revenue requirement from rates. Table 4-1 shows this for the Department's FY 2022 water utility revenue requirement. All of the information shown in Table 4-1 was derived from the FY 2022 column in Table 3-8 (Water Utility Revenue Requirement from Rates for FY 2022 - FY 2026).

Table 4-1: FY 2022 Revenue Requirement Cost Components

Line	Revenue Requirement Component	Operating	Capital	Total
1	Operating Costs	$0	$0	$0
2	Water Production	$8,902,799	$0	$8,902,799
3	Administrative Division	$14,538,949	$0	$14,538,949
4	Water Utility Division	$14,306,345	$0	$14,306,345
5	Non-Operating	$2,900	$0	$2,900
6	Capital Outlay	$0	$0	$0
7	Total Operating Costs	$37,750,992	$0	$37,750,992
8				
9	Debt & Capital			
10	Existing Debt Service	$0	$2,990,388	$2,990,388
11	Proposed Revenue Bond Debt Service	$0	$0	$0
12	Proposed SRF Debt Service	$0	$0	$0
13	Rate Funded Capital	$0	$12,563,500	$12,563,500
14	Total Debt and Capital Costs	$0	$15,553,888	$15,553,888
15				
16	Gross Revenue Requirement	$37,750,992	$15,553,888	$53,304,880
17				
18	Miscellaneous Non-Rate Revenue Offsets			
19	Fees	$1,290,500	$0	$1,290,500
20	Interest - Other	$1,000	$0	$1,000
21	Interest - Reserves	$175,000	$0	$175,000
22	Other	$595,000	$0	$595,000
23	Non-Capital Grants	$2,000,000	$0	$2,000,000
24	Total Miscellaneous Non-Rate Revenue Offsets	$4,061,500	$0	$4,061,500
25				
26	Less: Adjustments			
27	Change in Cash Balance	$0	($9,082,953)	($9,082,953)
28	Adjustment for Mid-Year Increase	$0	$1,780,512	$1,780,512
29	Total Adjustments	$0	($7,302,442)	($7,302,442)
30				
31	Total Revenue Requirement	$33,689,492	$8,251,446	$41,940,938

4.1.3. COST CAUSATION COMPONENTS

After determining the FY 2022 operating and capital cost revenue requirement components, the next step in the cost of service process is to assign the revenue requirement from rates to specific functional categories and cost causation components. The assignment of costs to functional categories answers the question, what water utility functions are supported by (i.e., paid for) the rate revenue provided by customers? Functional categories for water utilities may include, but not necessarily be limited to, the supply, wells, reservoirs, treatment, pumping, transmission and distribution, customer service, and general and administration functions.

Cost causation components reflect the types of demands the water utility must have the ability to serve. The allocation of costs to cost causation components answers the question, what types of customer demands are met by (i.e., paid for) by each function of the water utility system? Cost causation components used in the study include:

- Supply
- Base Delivery
- Maximum Day Demand
- Maximum Hour Demand
- Meters
- Fire
- Customer Service
- Conservation
- Groundwater Recharge
- General

The maximum day demand is the maximum amount of water used in a single day in a year. Maximum hour demand is the maximum hour usage on the maximum usage day. Both maximum day and maximum hour demands are used to calculate peaking factors that are critical in distributing costs to customer classes. In the COS analysis, peaking costs are allocated in proportion to how the different customer classes use water during maximum day and maximum hour usage. This method is consistent with the AWWA M1 Manual and is widely used in the water industry to perform the cost of service analyses.

4.1.4. SYSTEM PEAKING FACTORS AND DEMAND RATIOS

The revenue requirement is allocated to functional categories such as treatment, storage, pumping, and transmission (among many others). Many of these functionalized costs are then allocated to the volumetric cost causation components of base demand, maximum day demand, and maximum hour demand. For example, for many water utility systems, the treatment and transmission functions meet both base and maximum day customer demands. Therefore, the costs incurred to provide treatment and transmission are generally allocated to the base and maximum day cost causation components.

Table 4-2 shows the system peaking factors and demand ratios used in the COS analysis. The maximum day system peaking factor of 1.54 was obtained from the Department's 2015 Water Facilities Master Plan. The maximum day peaking factor of 2.31 is an estimate made by Raftelis based on the assumption that maximum hour demand is 1.5 times greater than maximum day demand. To understand the system demand ratio percentages shown in Table 4-2, we must first establish that base demand reflects average daily demand during the year. Thus, functionalized costs that are incurred to meet base demand are allocated 100% to the base cost causation component. Similarly, functionalized costs that are incurred to meet a combination of base and maximum day demand are allocated 65% to the base cost causation component (1.00/1.54 = 65%) and 35% to the maximum day cost causation component (100% - 65%). Expenses that are incurred to meet a combination of base, maximum day, and maximum hour demand are allocated 43% to the base cost causation component (1.0/2.31 = 43%), 23% to the maximum day cost causation component ((1.54 - 1.0)/2.31)), and 33% to the maximum hour cost causation component (100% - 43% - 23% = 33%).

Table 4-2: System Peaking Factors and Demand Ratios

			System Demand Ratios			
Line	Type of Demand	System Peaking Factors	Base	Max Day	Max Hour	Total
1	Base	1.00	100%	0%	0%	100%
2	Maximum Day	1.54	65%	35%	0%	100%
3	Maximum Hour	2.31	43%	23%	33%	100%

4.1.5. CUSTOMER CLASS PEAKING FACTORS

Water utility systems must be designed, constructed, and operated to meet the peak demands imposed by customers. Because water utilities incur higher costs to service customer peak demand, those customers that impose higher peak demands are allocated more costs in the COS process and must ultimately pay higher rates. For this reason, estimating the peaking factors of each customer class is a critical component of the COS analysis.

Table 4-3 shows the customer class peaking factors used in the COS analysis. These peaking factors are based on FY 2020 customer billed consumption. The maximum day peaking factors for each customer class are determined by dividing maximum month demand by average month demand. The maximum hour peaking factors are determined by multiplying the customer class maximum day peaking factor by the ratio of the system maximum hour peaking factor to the system maximum day peaking factor. For example, line 5 in Table 4-3 shows an estimated maximum day peaking factor for Multi-Family Residential customers of 1.29. The estimated maximum hour peaking factor of 1.93 is determined by multiplying 1.29 * 2.31/1.54 (lines 2 and 3 in Table 4-2).

Note that peaking factors estimated in Table 4-3 reflect the customer classes in the proposed new water rate structure, which features the implementation of a 3-tier structure for Single Family Residential customers and the creation of a new Institutional customer class.

Table 4-3: Customer Class Peaking Factors

Line	Customer Class	FY 2020 Annual Use	% of Annual Use	Max Month	Average Month	Peaking Factor (Max Day)	Peaking Factor (Max Hour)
1	Single Family Residential	7,403,087	50%	883,117	616,924	1.43	2.15
2	Tier 1 (0 - 13 HCF)	4,367,821	59%	409,568	362,488	1.13	1.69
3	Tier 2 (14 - 23 HCF)	1,554,648	21%	205,160	126,829	1.62	2.43
4	Tier 3 (> 23 HCF)	1,480,617	20%	263,967	124,628	2.12	3.18
5	Multi-Family Residential	2,384,147	16%	255,705	198,679	1.29	1.93
6	Commercial	3,378,249	23%	403,839	281,521	1.43	2.15
7	Irrigation	366,227	2%	64,261	30,519	2.11	3.16
8	Institutional	1,136,092	8%	174,984	94,674	1.85	2.77
9	Other	88,974	1%	26,831	7,415	3.62	5.43
10	Total	14,756,776	100%				

4.1.6. EQUIVALENT METERS AND PRIVATE FIRE LINES

To allocate non-volumetric meter-related costs appropriately, Raftelis estimated the number of equivalent meters on the Department's water utility system. By using equivalent meters instead of the actual meter count, the COS analysis reflects the fact that larger meters impose greater demands on the system and are more expensive to install, maintain, and replace.

The number of equivalent meters is based on maximum hydraulic capacity at each meter size (gallons per minute of maximum flow). Equivalent meters represent the potential demand on the water system expressed in terms of the smallest actual meter size on the system. For example, if a 5/8" meter has a maximum capacity of 20 gallons per minute and a 3" meter has a maximum capacity of 500 gallons per minute, the number of equivalent 5/8" meters represented by a single 3" meter would be 17.5 (500/20 = 25.0). Table 4-4 shows the equivalent meter count used in the COS analysis. The hydraulic capacity ratios shown in Table 4-4 are based on Department standard meters.

Table 4-4: Equivalent Meter Counts

Line	Meter Size	Flow Capacity (gpm)	Flow Ratio	Number of Meters	Equivalent Meters	Annual Bills
1	5/8" or 1/2"	20	1.00	36,575	36,575	438,896
2	3/4"	30	1.50	2,512	3,768	30,143
3	1"	50	2.50	1,963	4,908	23,559
4	1 1/2"	100	5.00	935	4,675	11,221
5	2"	160	8.00	876	7,004	10,506
6	3"	500	25.00	240	6,000	2,880
7	4"	1,000	50.00	128	6,400	1,536
8	6"	1,600	80.00	26	2,080	312
9	8"	2,800	140.00	23	3,220	276
10	10"	5,500	275.00	3	825	36
11	12"	5,500	275.00	1	275	12
12	Total			43,281	75,730	519,376

Note that equivalent capacity associated with private fire service line accounts and public fire hydrants are calculated separately, with their own hydraulic capacity ratios based on industry standards. Public fire hydrant capacity represents 70% of the total fire capacity based on the formula:

Total Equivalent Hydrants/(Total Equivalent Hydrants + Total Equivalent Fire Lines) = Public Fire Capacity

Table 4-5 shows the equivalent meter count used in the COS analysis. The hydraulic capacity ratios shown in Table 4-5 are based on engineering equations for the flow capacity of different pipe diameters.

Table 4-5: Fire Connections

Line	Private Fire Connection Size	Fire Demand Ratio	Number of Connections	Equivalent Connections
1	1"	1.00	1,074	1,074
2	1 1/2"	2.90	4	12
3	2"	6.19	8	47
4	3"	17.98	4	77
5	4"	38.32	282	10,796
6	6"	111.31	425	47,282
7	8"	237.21	339	80,352
8	10"	426.58	160	68,351
9	12"	689.04	4	2,964
10	Total		2,300	210,955
11				
12	**Hydrant Size**	**Fire Demand Ratio**	**Number of Hydrants**	**Equivalent Connections**
13	2"	6.19	8	50
14	3"	17.98	10	180
15	4"	38.32	1,334	51,118
16	6"	111.31	3,988	443,908
17	Total		5,340	495,255
18				
19			Total Equivalent Fire Connections	706,210
20			Percent Allocated to Public Fire Protection	70%
21			Percent Allocated to Private Fire Protection	30%

4.1.7. ALLOCATION OF COSTS

Table 4-6 shows how functionalized operating costs are distributed to cost causation factors. The percentages shown in Table 4-6 define the percentage allocations to cost causation factors as shown in Table 4-7. The resulting dollar allocation of operating costs to each cost causation factor is shown in Table 4-8. Table 4-9 shows the percentage and dollar allocations for functionalized capital costs.

Table 4-6: Functionalized O&M Cost Distributions to Cost Causation Factors

Line	Function	Rationale	Supply	Base	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	General	Total
1	Supply	Supply	100%										100%
2	Storage	Max Day		65%	35%	0%							100%
3	Treatment	Max Day		65%	35%	0%							100%
4	Transmission	Max Day		65%	35%	0%							100%
5	Distribution	Max Hour		43%	23%	33%							100%
6	Pumping	Max Day		65%	35%	0%							100%
7	Meters	Meters					100%						100%
8	Fire	Fire						100%					100%
9	Customer	Customer							100%				100%
10	Conservation	Conservation								100%			100%
11	Groundwater Recharge	GW Recharge									100%		100%
12	General	General										100%	100%

Table 4-7: O&M Percentage Allocations to Cost Causation Factors

Line	O&M Allocation	Function	Supply	Base	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	General	Total
1	Administrative Division												
2	Water Board	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
3	Administration	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
4	Administrative Services	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
5	Environmental and Regulatory Compliance	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
6	Human Resources	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
7	Finance and Accounting	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
8	Information Technology	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
9	Purchasing	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
10	Fleet	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
11	Customer Relations	Customer	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%
12	Water Conservation and Public Affairs	Conservation	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
13	Customer Service	Customer	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%
14	Billing and Collections	Customer	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%
15	Cashiering	Customer	0%	0%	0%	0%	0%	0%	100%	0%	0%	0%	100%
16	Field and Meter Services	Meters	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
17	General Administrative Expense	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
18	Uncollectible Charge Offs	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
19	Facilities Maintenance Expense	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
20	Water Utility Division												
21	Water Utility Administration	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
22	Distribution Administration	Distribution	0%	43%	23%	33%	0%	0%	0%	0%	0%	0%	100%
23	Distribution Service and Repair	Distribution	0%	43%	23%	33%	0%	0%	0%	0%	0%	0%	100%
24	Distribution System Maintenance	Distribution	0%	43%	23%	33%	0%	0%	0%	0%	0%	0%	100%
25	Water Loss Management	Conservation	0%	0%	0%	0%	0%	0%	0%	100%	0%	0%	100%
26	Operations Administration	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
27	Production and Treatment												
28	Personnel - Salaries	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
29	Personnel - Benefits	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
30	Employee Reimbursements	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
31	Uniform Rental And Cleaning	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
32	Safety Clothing And Supplies	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
33	Miscellaneous Expense	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
34	General Office Supplies	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
35	Telephone	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
36	Computer Equipment	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
37	Permits And Fees	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
38	Utilities - Electric	Pumping	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
39	Utilities - Gas	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
40	Materials And Supplies	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
41	Small Tools And Equipment	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
42	Equipment Repair And Maintenance	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
43	Chlorine - In Plant	Treatment	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
44	Granular Activated Carbon	Treatment	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
45	Mt Vernon Assessment	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
46	Supplemental Water Purchases	GW Recharge	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%
47	Water Extraction Fees	GW Recharge	0%	0%	0%	0%	0%	0%	0%	0%	100%	0%	100%
48	Contingency Expense	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
49	Plant and Facility Maintenance	Transmission	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
50	Specialty Construction	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
51	Electrical, Instrumentation and SCADA	Meters	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
52	Engineering	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
53	Water Quality and Backflow Control	Treatment	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
54	Overhead Applied to CIP	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
55	Non-Operating												
56	Interest Expense	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
57	Bond Service and Trustee Fees	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
58	Capital Outlay												
59	Equipment & Vehicles	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
60	Capital Improvement Projects - Carryover	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
61	Capital Improvement Projects - New Projects	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
62	Capital Improvement Projects - Labor Portion	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
63	Capital Improvement Projects - Equipment	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%

Table 4-8: O&M Dollar Allocations to Cost Causation Factors

Line	O&M Allocation	Function	Supply	Base	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	General	Total
1	Administrative Division												
2	Water Board	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$49,443	$49,443
3	Administration	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$547,987	$547,987
4	Administrative Services	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
5	Environmental and Regulatory Compliance	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$607,186	$607,186
6	Human Resources	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$333,651	$333,651
7	Finance and Accounting	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$769,875	$769,875
8	Information Technology	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$765,273	$765,273
9	Purchasing	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$266,496	$266,496
10	Fleet	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$722,021	$722,021
11	Customer Relations	Customer	$0	$0	$0	$0	$0	$0	$141,147	$0	$0	$0	$141,147
12	Water Conservation and Public Affairs	Conservation	$0	$0	$0	$0	$0	$0	$0	$356,243	$0	$0	$356,243
13	Customer Service	Customer	$0	$0	$0	$0	$0	$0	$1,239,708	$0	$0	$0	$1,239,708
14	Billing and Collections	Customer	$0	$0	$0	$0	$0	$0	$452,199	$0	$0	$0	$452,199
15	Cashiering	Customer	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
16	Field and Meter Services	Meters	$0	$0	$0	$0	$1,370,441	$0	$0	$0	$0	$0	$1,370,441
17	General Administrative Expense	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,118,680	$6,118,680
18	Uncollectible Charge Offs	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$300,000	$300,000
19	Facilities Maintenance Expense	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$498,600	$498,600
20	Water Utility Division												
21	Water Utility Administration	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$714,805	$714,805
22	Distribution Administration	Distribution	$0	$219,052	$118,288	$168,670	$0	$0	$0	$0	$0	$0	$506,010
23	Distribution Service and Repair	Distribution	$0	$1,401,684	$756,909	$1,079,297	$0	$0	$0	$0	$0	$0	$3,237,890
24	Distribution System Maintenance	Distribution	$0	$1,046,090	$564,888	$805,489	$0	$0	$0	$0	$0	$0	$2,416,467
25	Water Loss Management	Conservation	$0	$0	$0	$0	$0	$0	$0	$526,103	$0	$0	$526,103
26	Operations Administration	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$461,615	$461,615
27	Production and Treatment												
28	Personnel - Salaries	Supply	$1,271,429	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,271,429
29	Personnel - Benefits	Supply	$590,670	$0	$0	$0	$0	$0	$0	$0	$0	$0	$590,670
30	Employee Reimbursements	Supply	$3,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$3,000
31	Uniform Rental And Cleaning	Supply	$6,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,000
32	Safety Clothing And Supplies	Supply	$2,700	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,700
33	Miscellaneous Expense	Supply	$2,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,000
34	General Office Supplies	Supply	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
35	Telephone	Supply	$31,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$31,000
36	Computer Equipment	Supply	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
37	Permits And Fees	Supply	$292,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$292,000
38	Utilities - Electric	Pumping	$0	$2,597,403	$1,402,597	$0	$0	$0	$0	$0	$0	$0	$4,000,000
39	Utilities - Gas	Supply	$1,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,000
40	Materials And Supplies	Supply	$15,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$15,000
41	Small Tools And Equipment	Supply	$10,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$10,000
42	Equipment Repair And Maintenance	Supply	$85,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$85,000
43	Chlorine - In Plant	Treatment	$0	$129,870	$70,130	$0	$0	$0	$0	$0	$0	$0	$200,000
44	Granular Activated Carbon	Treatment	$0	$275,974	$149,026	$0	$0	$0	$0	$0	$0	$0	$425,000
45	Mt Vernon Assessment	Supply	$18,000	$0	$0	$0	$0	$0	$0	$0	$0	$0	$18,000
46	Supplemental Water Purchases	GW Recharge	$0	$0	$0	$0	$0	$0	$0	$0	$1,600,000	$0	$1,600,000
47	Water Extraction Fees	GW Recharge	$0	$0	$0	$0	$0	$0	$0	$0	$350,000	$0	$350,000
48	Contingency Expense	Supply	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
49	Plant and Facility Maintenance	Transmission	$0	$832,149	$449,360	$0	$0	$0	$0	$0	$0	$0	$1,281,509
50	Specialty Construction	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$947,028	$947,028
51	Electrical, Instrumentation and SCADA	Meters	$0	$0	$0	$0	$1,048,876	$0	$0	$0	$0	$0	$1,048,876
52	Engineering	Supply	$1,898,901	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,898,901
53	Water Quality and Backflow Control	Treatment	$0	$1,174,279	$634,111	$0	$0	$0	$0	$0	$0	$0	$1,808,389
54	Overhead Applied to CIP	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	-$541,250	-$541,250
55	Non-Operating												
56	Interest Expense	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
57	Bond Service and Trustee Fees	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,900	$2,900
58	Capital Outlay												
59	Equipment & Vehicles	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
60	Capital Improvement Projects - Carryover	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
61	Capital Improvement Projects - New Projects	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
62	Capital Improvement Projects - Labor Portion	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
63	Capital Improvement Projects - Equipment	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
64	Total O&M Expenses		**$4,226,700**	**$7,676,500**	**$4,145,310**	**$2,053,456**	**$2,419,316**	**$0**	**$1,833,054**	**$882,346**	**$1,950,000**	**$12,564,309**	**$37,750,992**
65	O&M Allocation		11%	20%	11%	5%	6%		5%	2%	5%	33%	100%

Table 4-9: Capital Cost Allocations

Line	Capital Asset Allocation	Function	Supply	Base Delivery	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	General	Total
1	Buildings & Improvements	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
2	Distribution	Distribution	0%	43%	23%	33%	0%	0%	0%	0%	0%	0%	100%
3	Equipment & Vehicles	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
4	Fire	Fire	0%	0%	0%	0%	0%	100%	0%	0%	0%	0%	100%
5	General & Admin	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
6	Geothermal	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
7	Land & Easement	General	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%	100%
8	Meters	Meters	0%	0%	0%	0%	100%	0%	0%	0%	0%	0%	100%
9	Pumping	Pumping	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
10	Source Of Supply	Supply	100%	0%	0%	0%	0%	0%	0%	0%	0%	0%	100%
11	Storage	Storage	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
12	Transmission	Transmission	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
13	Treatment	Treatment	0%	65%	35%	0%	0%	0%	0%	0%	0%	0%	100%
14													
15	Capital Asset Allocation	Function	Supply	Base Delivery	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	General	Total
16	Buildings & Improvements	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$7,053,633	$7,053,633
17	Distribution	Distribution	$0	$38,350,979	$20,709,529	$29,530,254	$0	$0	$0	$0	$0	$0	$88,590,761
18	Equipment & Vehicles	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$15,172,213	$15,172,213
19	Fire	Fire	$0	$0	$0	$0	$0	$7,444,521	$0	$0	$0	$0	$7,444,521
20	General & Admin	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$2,703,668	$2,703,668
21	Geothermal	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$1,762,059	$1,762,059
22	Land & Easement	General	$0	$0	$0	$0	$0	$0	$0	$0	$0	$6,581,668	$6,581,668
23	Meters	Meters	$0	$0	$0	$0	$6,041,280	$0	$0	$0	$0	$0	$6,041,280
24	Pumping	Pumping	$0	$2,392,200	$1,291,788	$0	$0	$0	$0	$0	$0	$0	$3,683,988
25	Source Of Supply	Supply	$21,890,580	$0	$0	$0	$0	$0	$0	$0	$0	$0	$21,890,580
26	Storage	Storage	$0	$12,658,280	$6,835,471	$0	$0	$0	$0	$0	$0	$0	$19,493,751
27	Transmission	Transmission	$0	$1,700,092	$918,050	$0	$0	$0	$0	$0	$0	$0	$2,618,142
28	Treatment	Treatment	$0	$6,386,115	$3,448,502	$0	$0	$0	$0	$0	$0	$0	$9,834,617
29	Total Capital Assets		$21,890,580	$61,487,666	$33,203,339	$29,530,254	$6,041,280	$7,444,521	$0	$0	$0	$33,273,241	$192,870,881
30	Capital Allocation		11%	32%	17%	15%	3%	4%	0%	0%	0%	17%	100%

4.1.8. UNIT COST CALCULATION

The next step in the COS analysis process is to calculate the unit cost of service for each cost causation component. This requires the summarization of the units of service for each cost causation component as shown in Table 4-10

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Table 4-10: Units of Service

Line	Customer Class	Percent in Tier	Annual Use (hcf)	Average Daily Use (hcf/day)	Max Day Peaking Factor	Total Capacity (hcf/day)	Extra Capacity (hcf/day)	Max Hour Peaking Factor	Total Capacity (hcf/day)	Extra Capacity (hcf/day)	Equivalent Meters / Connections	Number of Customers
1	Single Family Res.		7,460,709	20,440	1.43	29,260	8,820	2.15	43,890	14,630		
2	Tier 1 (0 - 13 HCF)	59%	4,404,983	12,068	1.13	13,636	1,567	1.69	20,454	6,818		
3	Tier 2 (14 - 23 HCF)	21%	1,541,234	4,223	1.62	6,830	2,608	2.43	10,246	3,415		
4	Tier 3 (> 23 HCF)	20%	1,514,493	4,149	2.12	8,788	4,639	3.18	13,183	4,394		
5	Multi-Family Residential		2,402,704	6,583	1.29	8,472	1,889	1.93	12,708	4,236		
6	Commercial		3,404,544	9,328	1.43	13,380	4,053	2.15	20,070	6,690		
7	Irrigation		369,078	1,011	2.11	2,129	1,118	3.16	3,194	1,065		
8	Institutional		1,144,935	3,137	1.85	5,798	2,661	2.77	8,697	2,899		
9	Other		89,667	246	3.62	889	643	5.43	1,333	444		
10	Meters							2.15			75,730	519,376
11	Fire Connections										210,955	27,603
12	Total		14,871,636	40,744		59,923	19,179		89,884	29,961	286,685	546,979

The calculation of public and private fire service capacity is shown in Table 4-11. Line 1 assumes the average fire lasts four hours. To fight that fire, fire services need 5 thousand gallons/minute (kgal/minute). 70% of the Department's fire costs are allocated to public fire protection due to the public fire hydrant's share of total equivalent fire lines (calculated in Table 4-5). Maximum day capacity demand is then determined by converting 5 kgal/minute to kgal/hour, then multiplying it by the four-hour duration of a typical fire. This is then converted to acre feet (AF). A similar calculation is done for the maximum hour capacity by multiplying the maximum day capacity by 24 hours less the capacity already allocated to maximum day. Public fire is then allocated 70% each of those capacities. Public fire costs include the costs associated with delivering water in sufficient quantities and pressures to public fire hydrants to combat fire on property served by the Department. Such costs are included in water rates because public fire hydrants provide a property-related service – they deliver water to property served by the Department in a way internal fixtures cannot, in order to combat fire on such property. Public fire hydrants are designed to deliver water to such property, and not to the general public.

Table 4-11: Calculation of Fire Capacity

Line	Fire Estimate	Max Day	Max Hour
1	Hours for Fire	4	
2	Kgal/minute	5	5
3			
4	Cost to Public Fire	70%	70%
5	Capacity Demanded for Fire (hcf)	1,604	8,021
6	Public Fire	1,125	5,625
7	Private Fire	479	2,396
8	Total Fire	1,604	8,021
9	Total Capacity	20,783	37,982

The final calculation of the unit cost of service for each cost causation complement is shown in Table 4-12. The calculated unit costs can be seen in line 13.

Table 4-12: Unit Cost of Service Calculation

Line	Cost Allocation	Supply	Base Delivery	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	General	Total
1	Operating Revenue Requirement	$3,771,964	$6,850,612	$3,699,330	$1,832,532	$2,159,030	$0	$1,635,842	$787,417	$1,740,206	$11,212,558	$33,689,492
2	Capital Revenue Requirement	$936,528	$2,630,579	$1,420,513	$1,263,370	$258,459	$318,493	$0	$0	$0	$1,423,503	$8,251,446
3	Total Cost of Service	$4,708,492	$9,481,191	$5,119,843	$3,095,902	$2,417,490	$318,493	$1,635,842	$787,417	$1,740,206	$12,636,062	$41,940,938
4	Allocation of General Cost		$4,870,835	$2,630,251	$1,590,478	$1,241,953	$163,622	$840,392	$404,525	$894,008	-$12,636,062	$0
5	Allocation of Public Fire to Meter						-$338,100	$338,100				$0
6	Allocation of Base to Meter		-$7,176,013			$7,176,013						$0
7	Allocation of Peaking to Meter			-$1,937,523	-$1,171,595	$3,109,118						$0
8	Total Adjusted Cost of Service	$4,708,492	$7,176,013	$5,812,570	$3,514,785	$13,944,574	$144,015	$2,814,333	$1,191,943	$2,634,214	$0	$41,940,938
9												
10	**Unit of Service**	14,871,636	14,871,636	19,179	29,961	908,760	2,531,461	546,979	14,871,636	14,871,636		
11	Unit of Measure	hcf	hcf	hcf/day	hcf/day	equiv. meter/yr	equiv. connection/yr	bills/yr	hcf	hcf		
12												
13	**Unit Cost**	**$0.32**	**$0.48**	**$303.07**	**$117.31**	**$15.34**	**$0.06**	**$5.15**	**$0.08**	**$0.18**		
14	Unit of Measure	hcf	hcf	hcf/day	hcf/day	equiv. meter/month	equiv. connection/month	per month	hcf	hcf		

4.1.9. DISTRIBUTION OF COSTS TO CUSTOMER CLASSES

The final step in the COS analysis is to distribute costs to customer classes. This is accomplished by multiplying the unit cost of service for each cost causation component by the customer class units of service as shown in Table 4-10. Table 4-13 summarizes the customer COS for each cost causation component.

Table 4-13: Distribution of Costs to Customer Classes

Line	Customer Class Cost of Service	Tier Definition	Supply	Base Delivery	Max Day	Max Hour	Meters	Fire	Customer	Conservation	GW Recharge	Total
1	Single Family Residential											
2	Tier 1	13	$1,394,657	$2,125,537	$475,058	$799,815	$7,519,297	$0	$2,231,758	$353,054	$780,255	$15,679,430
3	Tier 2	23	$487,968	$743,692	$790,391	$400,642	$0	$0	$0	$123,528	$272,999	$2,819,219
4	Tier 3	>23	$479,502	$730,789	$1,405,978	$515,482	$0	$0	$0	$121,385	$268,262	$3,521,397
5	Multi-Family Residential		$760,717	$1,159,377	$572,634	$496,936	$1,261,333	$0	$177,752	$192,574	$425,591	$5,046,915
6	Commercial		$1,077,909	$1,642,795	$1,228,273	$784,819	$3,992,945	$0	$225,963	$272,870	$603,047	$9,828,620
7	Irrigation		$116,853	$178,091	$338,825	$124,885	$173,794	$0	$6,895	$29,581	$65,375	$1,034,298
8	Institutional		$362,497	$552,466	$806,439	$340,063	$890,769	$0	$25,850	$91,765	$202,802	$3,272,650
9	Other		$28,389	$43,267	$194,973	$52,143	$106,437	$0	$4,106	$7,187	$15,883	$452,384
10	Fire Connections		$0	$0	$0	$0	$0	$144,015	$142,022	$0	$0	$286,036
11	Total		$4,708,492	$7,176,013	$5,812,570	$3,514,785	$13,944,574	$144,015	$2,814,345	$1,191,943	$2,634,214	$41,940,950

4.1.10. COMPARISON OF CLASS COS TO REVENUES AT EXISTING RATES

The final step in the COS analysis process is to compare the calculated cost of service by customer class to the level of rate revenue earned from each class under existing rates. This process shows the appropriate allocation of costs to reflect current costs of service. The outcome of the process should result in an overall percentage change that matches the financial planning input. Table 4-14 compares the water COS for each customer class to the current level of revenue at existing rates. The 6.0% overall percentage difference matches the overall utility financial planning increase discussed previously (see Table 1-1).

Table 4-14: FY 2022 Customer Class COS vs. Revenue at Existing Rates

Line	Customer Class	FY 2022 COS	Revenue at Existing Rates	$ Difference	% Difference
1	Single Family Residential	$22,020,046	$22,363,433	($343,387)	-1.5%
2	Multi-Family Residential	$5,046,915	$5,019,073	$27,842	0.6%
3	Commercial	$9,828,620	$6,901,631	$2,926,990	42.4%
4	Irrigation	$1,034,298	$1,977,138	($942,839)	-47.7%
5	Institutional	$3,272,650	$2,375,646	$897,004	37.8%
6	Other	$452,384	$360,148	$92,236	25.6%
7	Fire Connections	$286,036	$555,566	($269,530)	-48.5%
8	Total COS	$41,940,950	$39,552,634	$2,388,316	6.0%

5. Water Rate Design

5.1.1. WATER RATE DESIGN - NEW RECOMMENDED STRUCTURE

Water rates must be designed to recover the customer class cost of service as determined by the COS analysis. This section of the report discusses the derivation of both monthly fixed charges and $/HCF commodity rates under the recommended new rate structure. Key modifications to the existing rate structure are the implementation of a 3-tier structure for Single Family Residential customers and the creation of a new Institutional customer class. In the new recommended rate structure, separate commodity charges for water replenishment and conservation were consolidated into a single commodity rate. Elevation charges were also eliminated. Elevation charges were originally intended to cover cost to pump water to higher elevations. However, the Department now has 50 groundwater wells located across the entire service area at all elevations. The power needs and associated costs in different pumping zones within the service area can vary significantly every year depending on which of these groundwater wells are active. Furthermore, groundwater supply wells are located in the different elevation zones served by the Department, which reduces the need to maintain separate pumping surcharges.

5.1.2. DERIVATION OF FIXED CHARGES

Monthly fixed charges recover the cost fixed causation components that do not vary with water demand. Under the proposed water rate structure, there are two types of fixed charges, the monthly meter service charge and a private fire line charge. The monthly meter service charge is calculated based on two separate cost components as shown in line 13 of Table 4-12: the $15.34 unit cost per equivalent meters and the $5.15 unit cost per customer bill. Table 5-1 shows the calculation of the proposed FY 2022 meter service charge using these inputs.

Table 5-1: Calculation of the FY 2022 Meter Service Charge

Line	Meter Size	Capacity Ratio	Meter	Customer	Proposed Charge	Current Charge	Difference ($)	Difference (%)
1	5/8" or 1/2"	1.00	$15.34	$5.15	$20.49	$23.39	-$2.90	-12%
2	3/4"	1.50	$23.02	$5.15	$28.17	$29.28	-$1.11	-4%
3	1"	2.50	$38.36	$5.15	$43.51	$40.98	$2.53	6%
4	1 1/2"	5.00	$76.72	$5.15	$81.87	$70.35	$11.52	16%
5	2"	8.00	$122.76	$5.15	$127.91	$105.52	$22.39	21%
6	3"	25.00	$383.62	$5.15	$388.77	$187.66	$201.11	107%
7	4"	50.00	$767.23	$5.15	$772.38	$286.63	$485.75	169%
8	6"	80.00	$1,227.57	$5.15	$1,232.72	$598.33	$634.39	106%
9	8"	140.00	$2,148.25	$5.15	$2,153.40	$950.34	$1,203.06	127%
10	10"	275.00	$4,219.77	$5.15	$4,224.92	$1,361.01	$2,863.91	210%
11	12"	275.00	$4,219.77	$5.15	$4,224.92	$1,361.01	$2,863.91	210%

The monthly private fire line charge is calculated based on the two cost components shown in line 14 of Table 4-12: the $0.06 unit cost per equivalent private fire line connection and the $5.15 unit cost per customer bill. Table 5-2 shows the calculation of the proposed FY 2022 meter service charge using these inputs.

Table 5-2: Calculation of the FY 2022 Private Fire Charges

Line	Private Fire Connection Size	Fire Demand Ratio	Private Fire	Customer	Proposed Charge	Current Charge	Line	Difference (%)
1	1"	1.00	$0.06	$5.15	$5.21	$2.70	$2.51	93%
2	1 1/2"	2.90	$0.17	$5.15	$5.32	$10.75	-$5.43	-51%
3	2"	6.19	$0.35	$5.15	$5.50	$10.75	-$5.25	-49%
4	3"	17.98	$1.02	$5.15	$6.17	$16.15	-$9.98	-62%
5	4"	38.32	$2.18	$5.15	$7.33	$21.49	-$14.16	-66%
6	6"	111.31	$6.33	$5.15	$11.48	$32.24	-$20.76	-64%
7	8"	237.21	$13.49	$5.15	$18.64	$42.99	-$24.35	-57%
8	10"	426.58	$24.27	$5.15	$29.42	$53.74	-$24.32	-45%
9	12"	689.04	$39.20	$5.15	$44.35	$64.48	-$20.13	-31%

5.1.3. COMMODITY RATE DESIGN - SINGLE FAMILY RESIDENTIAL

In the new recommended rate structure, Single Family Residential customers will pay $/HCF commodity rates based on their usage in one of three consumption tiers that are specifically tailored to the demand characteristics of their customer class usage. These consumption tiers are:

- **Tier 1: 0 - 13 HCF**: The tier 1 breakpoint of 13 HCF was selected because it reflects average indoor water usage of Single Family Residential customers service by the Department. Winter average water usage is a proxy for non-discretionary indoor water consumption.

- **Tier 2: >13 - 23 HCF**: The tier 2 breakpoint of 23 HCF was selected because 23 HCF reflects the average water usage of Single Family Residential customers during the months of June - October. Thus, the 23 HCF breakpoint reflects a reasonable allocation of water for the vast majority of customers during outdoor irrigation season.

- **Tier 3: >23 HCF**: Tier 3 is designed to reflect water usage above overall customer class average during the outdoor irrigation season.

The proposed Single Family Residential commodity rate structure also enhances bill affordability for those customers with low to average water usage because the proposed cost-based Tier 1 and Tier 2 rates are lower than the existing combination of commodity rates currently charged by the Department. Finally, the proposed rate structure assists in achieving water supply reliability (i.e., cost-based customer water usage efficiency) because large volume Single Family Residential customers will be required to pay a cost-based commodity rate for Tier 3 usage above 23 HCF.

5.1.4. DERIVATION OF CUSTOMER CLASS COMMODITY RATES

Commodity rates are composed of $/HCF unit costs for the following cost causation components: supply, base demand, maximum day demand, maximum hour demand, peaking, conservation, and groundwater recharge. Table 5-3 provides a detail of the $/HCF unit cost of water supply for each customer class. The Department has a net FY 2022 O&M revenue requirement of $33,689,492 and a net FY 2022 capital cost revenue requirement of $8,251,446 (see line 31 of Table 4-1). As part of the cost allocation process, $3,771,964 of O&M costs and $936,528 of capital costs were allocated to the supply cost causation component which results in a total FY 2022 water supply cost revenue requirement of $4,708,492. (see lines 1, 2 and 8 in the "Supply" column of Table 4-12). The value of $4,708,492 is shown in line 10 of Table 5-3. The supply costs for each customer class were determined based on the proportional share of annual estimated FY 2022 demand.

Table 5-3: FY 2022 $/HCF Water Supply Costs by Customer Class

Line	Customer Class	Annual Use (hcf)	Supply Cost	Supply Unit Cost
1	Single Family Residential			
2	Tier 1 (0 - 13 HCF)	4,404,983	$1,394,657	$0.32
3	Tier 2 (14 - 23 HCF)	1,541,234	$487,968	$0.32
4	Tier 3 (> 23 HCF)	1,514,493	$479,502	$0.32
5	Multi-Family Residential	2,402,704	$760,717	$0.32
6	Commercial	3,404,544	$1,077,909	$0.32
7	Irrigation	369,078	$116,853	$0.32
8	Institutional	1,144,935	$362,497	$0.32
9	Other	89,667	$28,389	$0.32
10	Total	14,871,636	$4,708,492	$0.32

Table 5-4 provides a detail of the $/HCF unit cost of peaking costs for each customer class. Based on the cost allocation process described in Section 4 (Water COS), the Deparment has total maximum day and maximum hour peaking costs of $9,327,355 ($5,812,570 for maximum day and $3,514,785 for maximum hour, as shown in line 8 of Table 4-12). As shown in line 13 of Table 4-12, the maximum day and maximum hour unit cost of service, expressed on a $/HCF basis, are $303.07 and $117.31, respectively. The peaking costs allocated to each customer class were determined by mulitplying these unit cost of service values by the unique maximum day and maximum hour units of service estimated for each customer class (see Table 4-10).

Table 5-4: FY 2022 $/HCF Peaking Costs by Customer Class

Line	Customer Class	Annual Use (hcf)	Max Day Costs	Max Hour Costs	Total Peaking Costs	Unit Cost
1	Single Family Residential					
2	Tier 1 (0 – 13 HCF)	4,404,983	$475,058	$799,815	$1,274,873	$0.29
3	Tier 2 (14 – 23 HCF)	1,541,234	$790,391	$400,642	$1,191,032	$0.77
4	Tier 3 (> 23 HCF)	1,514,493	$1,405,978	$515,482	$1,921,459	$1.27
5	Multi-Family Residential	2,402,704	$572,634	$496,936	$1,069,570	$0.45
6	Commercial	3,404,544	$1,228,273	$784,819	$2,013,092	$0.59
7	Irrigation	369,078	$338,825	$124,885	$463,710	$1.26
8	Institutional	1,144,935	$806,439	$340,063	$1,146,502	$1.00
9	Other	89,667	$194,973	$52,143	$247,116	$2.76
10	Total	14,871,636	$5,812,570	$3,514,785	$9,327,355	

Table 5-5 provides a detail of how the final proposed FY 2022 $/HCF commodity rates were calcuated. The base delivery unit cost of $0.48/hcf (shown in Table 5-5) was determined as shown in line 13 of Table 4-12 (base delivery costs of $7,176,013 divided by estimated annual demand of 14,871,636 hcf). The conservation unit cost of $0.08/hcf was determined as shown in line 13 of Table 4-12 (conservation costs of $1,191,943 divided by estimated annual demand of 14,871,636 hcf). The groundwater recharge costs of $0.18/hcf were determined as shown in line 13 of Table 4-12 (groundwater recharge costs of $2,634,214 divided by estimated annual demand of 14,871,636 hcf).

Table 5-5: FY 2022 Proposed $/HCF Commodity Rates by Customer Class

Line	Customer Class	Tier Definition	Supply	Base Delivery	Peaking	Conservation	GW Recharge	Final Proposed Rate
1	Single Family Residential							
2	Tier 1 (0 - 13 HCF)	13	$0.32	$0.48	$0.29	$0.08	$0.18	$1.35
3	Tier 2 (14 - 23 HCF)	23	$0.32	$0.48	$0.77	$0.08	$0.18	$1.83
4	Tier 3 (> 23 HCF)	>23	$0.32	$0.48	$1.27	$0.08	$0.18	$2.33
5	Multi-Family Residential		$0.32	$0.32	$0.48	$0.45	$0.08	$0.18
6	Commercial		$0.32	$0.32	$0.48	$0.59	$0.08	$0.18
7	Irrigation		$0.32	$0.48	$1.26	$0.08	$0.18	$2.32
8	Institutional		$0.32	$0.32	$0.48	$1.00	$0.08	$0.18
9	Other		$0.32	$0.48	$2.76	$0.08	$0.18	$3.82

5.1.5. PROPOSED RATES FOR FY 2022 - 2026

After determining COS rates for FY 2022, the rates for the period FY 2023 - 2026 are calculated based on the overall financial planning increase originally shown in Table 1-1. Those increases were 6% for FY 2023, 4% for FY 2024, and 3% in FY 2025 and FY 2026. The resulting proposed meter service charges for the entire FY 2022 - FY 2026 planning horizon are shown in Table 5-6.

Table 5-6: Proposed FY 2022 - FY 2026 Meter Service Charges

Line	Meter Size	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
1	5/8" or 1/2"	$23.39	$20.49	$21.72	$22.59	$23.27	$23.97
2	3/4"	$29.28	$28.17	$29.87	$31.07	$32.01	$32.98
3	1"	$40.98	$43.51	$46.13	$47.98	$49.42	$50.91
4	1 1/2"	$70.35	$81.87	$86.79	$90.27	$92.98	$95.77
5	2"	$105.52	$127.91	$135.59	$141.02	$145.26	$149.62
6	3"	$187.66	$388.77	$412.10	$428.59	$441.45	$454.70
7	4"	$286.63	$772.38	$818.73	$851.48	$877.03	$903.35
8	6"	$598.33	$1,232.72	$1,306.69	$1,358.96	$1,399.73	$1,441.73
9	8"	$950.34	$2,153.40	$2,282.61	$2,373.92	$2,445.14	$2,518.50
10	10"	$1,361.01	$4,224.92	$4,478.42	$4,657.56	$4,797.29	$4,941.21
11	12"	$1,361.01	$4,224.92	$4,478.42	$4,657.56	$4,797.29	$4,941.21

Proposed private fire line charges for the FY 2022 - FY 2026 planning horizon are shown in Table 5-7.

Table 5-7: Proposed FY 2022 - FY 2026 Private Fire Line Charges

Line	Private Fire Connection Size	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
1	1"	$2.70	$5.21	$5.53	$5.76	$5.94	$6.12
2	1 1/2"	$10.75	$5.32	$5.64	$5.87	$6.05	$6.24
3	2"	$10.75	$5.50	$5.83	$6.07	$6.26	$6.45
4	3"	$16.15	$6.17	$6.55	$6.82	$7.03	$7.25
5	4"	$21.49	$7.33	$7.77	$8.09	$8.34	$8.60
6	6"	$32.24	$11.48	$12.17	$12.66	$13.04	$13.44
7	8"	$42.99	$18.64	$19.76	$20.56	$21.18	$21.82
8	10"	$53.74	$29.42	$31.19	$32.44	$33.42	$34.43
9	12"	$64.48	$44.35	$47.02	$48.91	$50.38	$51.90

Proposed commodity rates for the FY 2022 - FY 2026 planning horizon are shown in Table 5-8.

Table 5-8: Proposed FY 2022 - FY 2026 Commodity Rates

Line	Customer Class	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
1	Single Family Residential						
2	Tier 1 (0 - 13 HCF)	$1.43	$1.35	$1.44	$1.50	$1.55	$1.60
3	Tier 2 (14 - 23 HCF)	$1.92	$1.83	$1.94	$2.02	$2.09	$2.16
4	Tier 3 (> 23 HCF)	$1.92	$2.33	$2.47	$2.57	$2.65	$2.73
5	Multi-Family Residential	$1.43	$1.51	$1.61	$1.68	$1.74	$1.80
6	Commercial	$1.43	$1.65	$1.75	$1.82	$1.88	$1.94
7	Irrigation	$1.85	$2.32	$2.46	$2.56	$2.64	$2.72
8	Institutional	$1.43	$2.06	$2.19	$2.28	$2.35	$2.43
9	Other	$1.43	$3.82	$4.05	$4.22	$4.35	$4.49

5.1.6. CUSTOMER BILL IMPACTS

Table 5-9 shows the projected bill impacts for Single Family Residential customers under the new rate structure.

Table 5-9: Proposed FY 2022 Single Family Residential Bill Impacts (April 2022)

Total Use (hcf)	Current	Proposed 3-Tier Structure	Increase/(Decrease)
10	$37.69	$33.99	($3.70)
15	$44.84	$41.70	($3.14)
18 (Note 1)	$49.13	$47.19	($1.94)
30	$66.29	$72.65	$6.36
40	$84.51	$95.95	$11.44
Note 1: 18 HCF is the average monthly usage for Single Family Residential Customers.			

5.1.7. DROUGHT SURCHARGE RATES

In the Department's Water Shortage Contingency Plan (dated June 2021), the California Department of Water Resources (DWR) defines six levels of water shortage stages that correspond to a gap in supply compared to normal year water availability. The Department uses different water shortage stage categories that correspond to the DWR's standardized shortage stage categories. These are shown in Table 5-10.

Table 5-10: Drought Shortage Stages

Shortage Stage	Percent of Shortage Range	DWR Water Shortage Condition	Department Water Shortage Condition
1	Up to 10%	Normal Conditions	Stage 1
2	Up to 20%	Mandatory Restrictions	Stage 2
3	Up to 30%	Extreme Mandatory Restrictions	Stage 2A
4	Up to 40%	Water Shortage Emergency	Stage 3
5	Up to 50%	Water Shortage Emergency	Stage 3
6	> 50%	Water Shortage Emergency	Stage 3

In the event of a drought emergency that requires mandatory curtailments in customer water usage, water utilities can incur a significant loss in water sales revenue. Drought surcharge rates are a tool that allows water utilities to recover all or a portion of their lost revenues during periods of mandatory customer water usage curtailments. Specifically, drought surcharges are designed to recover revenues adequate to fund a utility's ongoing fixed costs, which must be paid regardless of the level of customer water consumption.

At the request of the Department, Raftelis developed drought surcharge rates to recover the lost revenues that will be incurred at mandatory customer water usage curtailments of 10%, 15%, 20%, and 30% under the new recommended commodity rate structure discussed in this report.

Drought Curtailment Water Usage Declines

The first step in the process of calculating drought surcharge rates is to estimate the reduction in usage and the volume of lost water sales revenue for each customer class. Table 5-11 shows these estimated demand reductions.

Table 5-11: Estimated Drought Curtailment Water Usage Declines

Customer Class	FY 2022 Base Demand (HCF)	10% Reduction		15% Reduction		20% Reduction		30% Reduction	
		Demand Reduction Factor	Estimated Demand	Demand Reduction Factor	Estimated Demand	Demand Reduction Factor	Estimated Demand	Demand Reduction Factor	Estimated Demand
Residential									
Tier 1 (0 - 13 HCF)	4,404,983	5.0%	4,184,733	7.5%	4,074,609	10.0%	3,964,484	15.0%	3,744,235
Tier 2 (14 - 23 HCF)	1,541,234	10.0%	1,387,110	15.0%	1,310,049	20.0%	1,232,987	30.0%	1,078,864
Tier 3 (> 23 HCF)	1,514,493	25.0%	1,135,870	37.5%	946,558	50.0%	757,246	75.0%	378,623
Multi-Family Residential	2,402,704	5.0%	2,282,569	7.5%	2,222,501	10.0%	2,162,434	15.0%	2,042,299
Commercial	3,404,544	10.0%	3,064,089	15.0%	2,893,862	20.0%	2,723,635	30.0%	2,383,181
Irrigation	369,078	25.0%	276,808	37.5%	230,673	50.0%	184,539	75.0%	92,269
Institutional	1,144,935	15.0%	973,195	22.5%	887,324	30.0%	801,454	45.0%	629,714
Other	89,667	10.0%	80,700	15.0%	76,217	20.0%	71,733	30.0%	62,767
Total Water Usage	14,871,636		13,385,074		12,641,794		11,898,513		10,411,951
Reduction in Demand			1,486,562		2,229,842		2,973,123		4,459,685
% Reduction from Base Demand			-10.0%		-15.0%		-20.0%		-30.0%

Drought Curtailment Water Sales Revenue Declines

Having established an estimate in customer water consumption at each mandatory drought curtailment stage, the next step in the process is to estimate the level of lost water sales revenue. Table 5-12 shows these estimated commodity revenue reductions.

Table 5-12: Estimated Declines in Commodity Water Sales Revenue

Customer Class	FY 2022 Proposed Commodity Rates ($/HCF)	FY 2022 Base Revenue	10% Reduction	15% Reduction	20% Reduction	30% Reduction
Residential						
Tier 1 (0 - 13 HCF)	$1.35	$5,946,727	$5,649,390	$5,500,722	$5,352,054	$5,054,718
Tier 2 (14 - 23 HCF)	$1.83	$2,820,458	$2,538,412	$2,397,389	$2,256,366	$1,974,320
Tier 3 (> 23 HCF)	$2.33	$3,528,769	$2,646,577	$2,205,480	$1,764,384	$882,192
Multi-Family Residential	$1.51	$3,628,083	$3,446,679	$3,355,977	$3,265,275	$3,083,871
Commercial	$1.65	$5,617,497	$5,055,747	$4,774,873	$4,493,998	$3,932,248
Irrigation	$2.32	$856,260	$642,195	$535,162	$428,130	$214,065
Institutional	$2.06	$2,358,566	$2,004,781	$1,827,888	$1,650,996	$1,297,211
Other	$3.82	$342,526	$308,274	$291,147	$274,021	$239,768
Total Commodity Revenue		$25,098,885	$22,292,054	$20,888,639	$19,485,224	$16,678,393
Reduction in Commodity Revenue from Base Level			$2,806,831	$4,210,246	$5,613,661	$8,420,492
% Reduction from Base Commodity Revenue			-11.2%	-16.8%	-22.4%	-33.5%

Drought Revenue Adjustments at Each Drought Curtailment Stage

The next step in the process of developing drought surcharges is to calculate the percentage adjustment in revenue (i.e., the revenue that must be collected at each drought stage). This is accomplished by first estimating the cost savings the utility will incur if customer water consumption is reduced. For example, water purchase costs may decline. Similarly, operational costs related to electricity and chemicals may decline.

The Department's water supply contract with SBVMWD is on a "take or pay" basis. This means that the Department must pay SBVMWD the same amount regardless of how much water it pumps from groundwater basins. Therefore, there are no water supply cost savings. As part of the study, the Department identified no other variable cost savings. Table 5-13 shows the calculation of the drought revenue adjustment for each curtailment stage taking into consideration all identified variable costs savings ($0 cost savings).

Table 5-13: Calculation of Drought Revenue Adjustments

Line	Description	FY 2022 Base Costs	10% Reduction	15% Reduction	20% Reduction	30% Reduction
1	Reduction in Variable Costs - Water Supply					
2	Water Purchase Requirements					
3	Assumed Water Loss	9.6%	9.6%	9.6%	9.6%	9.6%
4	Required Water Purchases (HCF)	16,454,473	14,809,692	13,164,910	11,520,129	11,520,129
5	Required Water Purchases (AF)	37,774	33,998	30,222	26,447	26,447
6	Reduction in Required Water Purchases (AF)		3,776	7,552	11,328	11,328
7						
8	Reduction in Water Supply Costs					
9	Untreated SBVMWD Supply Cost per AF	$118	$118	$118	$118	$118
10	Supply Cost Savings without Take or Pay Contract		$447,066	$670,599	$894,133	$1,341,199
11	Actual Supply Cost Savings		$0	$0	$0	$0
12						
13	Reduction in Other Variable Costs		$0	$0	$0	$0
14	Total Reduction in Costs		$0	$0	$0	$0
15						
16	Revenue from Commodity Rates		$22,292,054	$20,888,639	$19,485,224	$16,678,393
17	Net Revenue Loss	$2,806,831	$4,210,246	$5,613,661	$8,420,492	$8,420,492
18	Percentage Revenue Adjustment at Each Drought Stage		12.6%	20.2%	28.8%	50.5%

Drought Surcharge Calculation

In this final step, drought surcharges are calculated for each commodity rate paid by each customer class. Table 5-14 shows this calculation, which reflects the proposed drought surcharges that, in the case of a drought emergency declared by the Board, are intended to be assessed in addition to the proposed FY 2022 commodity rates shown Table 5-8. If it is necessary to implement drought surcharges in the years FY 2023 through FY 2026, then the effective commodity rates would be increased by the percentages shown for each drought stage in Table 5-14 (12.6% for a 10% reduction, 20.2% for a 15% reduction, 28.8% for a 20% reduction, and 50.5% for a 30% reduction).

Table 5-14: Drought Surcharge Calculation

Volumetric Rates ($/HCF)	FY 2022 Proposed Rates	Rates at 10% Drought Reduction	Rates at 15% Drought Reduction	Rates at 20% Drought Reduction	Rates at 30% Drought Reduction
Residential					
Tier 1 (0 - 13 HCF)	$1.35	$1.52	$1.62	$1.74	$2.03
Tier 2 (14 - 23 HCF)	$1.83	$2.06	$2.20	$2.36	$2.75
Tier 3 (> 23 HCF)	$2.33	$2.62	$2.80	$3.00	$3.51
Multi-Family Residential	$1.51	$1.70	$1.81	$1.95	$2.27
Commercial	$1.65	$1.86	$1.98	$2.13	$2.48
Irrigation	$2.32	$2.61	$2.79	$2.99	$3.49
Institutional	$2.06	$2.32	$2.48	$2.65	$3.10
Other	$3.82	$4.30	$4.59	$4.92	$5.75
Volumetric Rate Dollar Change from FY 2022 Proposed Rates		**Rates at 10% Drought Reduction**	**Rates at 15% Drought Reduction**	**Rates at 20% Drought Reduction**	**Rates at 30% Drought Reduction**
Residential					
Tier 1 (0 - 13 HCF)		$0.17	$0.27	$0.39	$0.68
Tier 2 (14 - 23 HCF)		$0.23	$0.37	$0.53	$0.92
Tier 3 (> 23 HCF)		$0.29	$0.47	$0.67	$1.18
Multi-Family Residential		$0.19	$0.30	$0.44	$0.76
Commercial		$0.21	$0.33	$0.48	$0.83
Irrigation		$0.29	$0.47	$0.67	$1.17
Institutional		$0.26	$0.42	$0.59	$1.04
Other		$0.48	$0.77	$1.10	$1.93
Volumetric Rate Percentage Change from FY 2022 Proposed Rates		**Rates at 10% Drought Reduction**	**Rates at 15% Drought Reduction**	**Rates at 20% Drought Reduction**	**Rates at 30% Drought Reduction**
Residential					
Tier 1 (0 - 13 HCF)		12.6%	20.2%	28.8%	50.5%
Tier 2 (14 - 23 HCF)		12.6%	20.2%	28.8%	50.5%
Tier 3 (> 23 HCF)		12.6%	20.2%	28.8%	50.5%
Multi-Family Residential		12.6%	20.2%	28.8%	50.5%
Commercial		12.6%	20.2%	28.8%	50.5%
Irrigation		12.6%	20.2%	28.8%	50.5%
Institutional		12.6%	20.2%	28.8%	50.5%
Other		12.6%	20.2%	28.8%	50.5%

6. Wastewater Financial Plan

6.1.1. OVERVIEW OF THE FINANCIAL PLANNING PROCESS

This section describes the process used to develop the wastewater utility financial plan for the period FY 2022 - FY 2026. As noted previously, the overarching objective of the financial planning process is to project the revenue requirement from rates (i.e., rate revenues that must be collected from customers) based on a utility's desired capital funding strategy. Key steps in the development of a wastewater financial plan include:

- **Forecast of Billed Sewer Discharges (Demand Forecast)**: The demand forecast projects the level of billed wastewater discharges for each customer class based on anticipated customer account growth and projected per account water consumption (wastewater billed discharges are based on metered water consumption).

- **Projection of Wastewater Sales Revenues at Existing Rates**: This step in the financial planning process determines how much rate revenue will be earned from forecast billed wastewater discharges if there are *no rate increases*. This projected level of rate revenue can then be compared to projected expenditures to determine the annual funding shortfall (i.e., the difference between projected wastewater sales revenues and projected expenditures) that must be met by the appropriate combination of rate revenue increases or external debt financing.

- **Projection of Miscellaneous Non-Rate Revenue**: Miscellaneous non-rate revenue items can include interest income from cash reserves, grants, capacity fee receipts, and miscellaneous ancillary fees. Miscellaneous non-rate revenues assist in closing the in the annual funding shortfall. Miscellaneous non-rate revenues also reduce the revenue requirement from rates (i.e., the level of amount of rate revenue that must be earned from customers).

- **Projection of Expenditures (O&M, Cash Funded CIP Expenditures, Debt Service Payments)**: This step in the financial planning process determines the level of expenditures that will be incurred by the utility to provide service during each year of the planning horizon. Projected expenditures are compared against projected wastewater sales revenue at existing rates and projected miscellaneous non-rate revenue to determine the annual funding gap.

- **Identification of Cash Reserve and Debt Service Coverage Targets**: Utilities must not only have sufficient revenues to pay for projected expenditures, but they must also maintain prudent cash reserves and meet both contractually obligated and target debt service coverage requirements.

- **Determination of the Capital Financing Strategy**: In this final step in the financial planning process, the utility determines the optimal mix of annual rate revenue increases and external debt financing to cover the funding shortfall. As discussed previously, the funding shortfall is the difference between revenues at existing rates and projected expenditures (including funding for prudent cash reserves and debt service coverage levels).

6.1.2. PROJECTED CUSTOMER ACCOUNTS

Table 6-1 shows projected customer accounts for both Inside City and Loma Linda customers for the period FY 2022 - FY 2026.

6.1.3. PROJECTED BILLED SEWER DISCHARGES

Table 6-2 shows projected billed sewer discharges for both Inside City and Loma Linda customers for the period FY 2022 - FY 2026. The Statistical Section of the Department's Annual Comprehensive Financial Report for the Year Ending June 30, 2021, indicates that during the nine-year period from FY 2012 - FY 2021, the number of combined wastewater treatment customers served by the Department (Cities of San Bernardino and Loma Linda) decreased from 43,015 in FY 2012 to 40,980 in FY2021. This represents a compound annual growth decline of -0.54%. During the period FY 2020 to FY 2021, this decline reversed and there was a 2.0% increase in wastewater treatment customers. Projected annual customer account growth (Table 6-1) and projected annual billed sewer discharges (Table 6-2) for the FY 2022 - FY 2026 planning horizon assumes a 0.1% growth rate that reflects a minor change from recent history. This growth rate was developed in consultation with Department staff.

Table 6-1: Projected Customer Accounts

Line	Customer Class	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Inside City					
2	Residential	33,250	33,284	33,317	33,350	33,384
3	Multi-Family (2 Units)	1,217	1,219	1,220	1,221	1,222
4	Multi-Family (3 Units)	366	366	366	367	367
5	Multi-Family, Mobile Home Parks (4 or more units)	984	985	986	987	988
6	Retail, Commercial, Light Industrial	1,448	1,449	1,451	1,452	1,454
7	Auto Repair, Car Wash	239	240	240	240	240
8	Office, Motels (without Restaurants)	661	662	663	663	664
9	Restaurants, Hotels	266	266	266	266	267
10	Laundromats	23	23	23	23	23
11	Hospitals, Convalescent Homes	46	46	46	46	46
12	Schools, Churches, Nursery Schools	283	283	283	283	284
13	Industrial	10	10	10	10	10
14	Total Inside City	38,793	38,832	38,871	38,910	38,949
15						
16	Outside City-Loma Linda					
17	Residential	4,529	4,534	4,538	4,543	4,547
18	Multi-Family (2 Units)	166	166	166	166	166
19	Multi-Family (3 Units)	50	50	50	50	50
20	Multi-Family, Mobile Home Parks (4 or more units)	382	382	383	383	383
21	Retail, Commercial, Light Industrial	79	79	79	79	79
22	Auto Repair, Car Wash	10	10	10	10	10
23	Office, Motels (without Restaurants)	60	61	61	61	61
24	Restaurants, Hotels	29	29	29	29	29
25	Laundromats	2	2	2	2	2
26	Hospitals, Convalescent Homes	29	29	29	29	29
27	Schools, Churches, Nursery Schools	6	6	6	6	6
28	Industrial	0	0	0	0	0
29	Bi-Monthly Flat Rate	608	608	609	609	610
30	MFR Bi-Monthly Flat Rate	172	172	172	173	173
31	Total Outside City-Loma Linda	6,121	6,127	6,133	6,140	6,146
32						
33	Total	44,915	44,960	45,005	45,050	45,095
	Annual Percentage Change	0.1%	0.1%	0.1%	0.1%	0.1%

Table 6-2: Projected Billed Sewer Discharges

Line	Customer Class	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Inside City	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
2	Multi-Family, Mobile Home Parks (4 or more units)	1,655,570	1,657,226	1,658,883	1,660,542	1,662,202
3	Retail, Commercial, Light Industrial	607,394	608,001	608,609	609,218	609,827
4	Auto Repair, Car Wash	82,063	82,145	82,227	82,309	82,392
5	Office, Motels (without Restaurants)	452,051	452,503	452,955	453,408	453,862
6	Restaurants, Hotels	234,456	234,691	234,925	235,160	235,395
7	Laundromats	63,892	63,955	64,019	64,083	64,148
8	Hospitals, Convalescent Homes	202,325	202,527	202,730	202,933	203,136
9	Schools, Churches, Nursery Schools	288,437	288,725	289,014	289,303	289,592
10	Domestic Liquid Waste	5,210	5,215	5,220	5,225	5,230
11	Industrial	350,970	351,321	351,673	352,024	352,376
12	Total Inside City	3,942,368	3,946,310	3,950,256	3,954,207	3,958,161
13						
14	Outside City-Loma Linda					
15	Multi-Family, Mobile Home Parks (4 or more units)	385,010	385,395	385,780	386,166	386,552
16	Retail, Commercial, Light Industrial	47,146	47,193	47,240	47,288	47,335
17	Auto Repair, Car Wash	9,892	9,902	9,912	9,921	9,931
18	Office, Motels (without Restaurants)	21,373	21,394	21,415	21,437	21,458
19	Restaurants, Hotels	12,032	12,044	12,056	12,068	12,080
20	Laundromats	4,882	4,887	4,892	4,896	4,901
21	Hospitals, Convalescent Homes	154,009	154,163	154,317	154,471	154,626
22	Schools, Churches, Nursery Schools	2,998	3,001	3,004	3,007	3,010
23	Industrial	0	0	0	0	0
24	Total Outside City-Loma Linda	637,341	637,978	638,616	639,255	639,894
25						
26	Total	4,579,708	4,584,288	4,588,872	4,593,461	4,598,055

6.1.4. SUMMARY OF PROJECTED REVENUES EXISTING RATES

Table 6-3 shows a summary of the projection of wastewater revenues at existing rates during the FY 2022 - FY 2026 planning horizon. Note that only Inside City customers pay collection system-related rates and charges. This is because the City of Loma Linda maintains its own collection system operations. The amounts shown in the Table 6-3 were calculated by multiplying projected customer accounts and billed sewer discharges from Tables 6-1 and 6-2 by existing FY 2021 wastewater rates and charges.

Table 6-3: Summary of Projected Revenues at Existing Rates

Line	Rate Revenue Component	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Fixed Treatment Charges					
2	Inside City	$10,363,116	$10,373,479	$10,383,852	$10,394,236	$10,404,631
3	Outside City-Loma Linda	$1,263,391	$1,263,391	$1,263,391	$1,263,391	$1,263,391
4	Total	$11,626,507	$11,636,870	$11,647,243	$11,657,627	$11,668,021
5						
6	Variable Treatment Usage Rates					
7	Inside City	$8,436,686	$8,445,123	$8,453,568	$8,462,021	$8,470,483
8	Outside City-Loma Linda	$1,067,570	$1,067,570	$1,067,570	$1,067,570	$1,067,570
9	Total	$9,504,256	$9,512,693	$9,521,138	$9,529,591	$9,538,053
10						
11	Total Treatment Revenues	$21,130,763	$21,149,562	$21,168,381	$21,187,218	$21,206,075
12						
13	Fixed Collection System Charges					
14	Inside City	$4,518,014	$4,522,532	$4,527,055	$4,531,582	$4,536,113
15						
16	Variable Collection System Usage Rates					
17	Inside City	$3,228,984	$3,232,213	$3,235,445	$3,238,681	$3,241,919
18						
19	Total Collection System Revenues	$7,746,998	$7,754,745	$7,762,500	$7,770,262	$7,778,033
20						
21	Total Rate Revenues at Existing Rates	$28,877,761	$28,904,307	$28,930,881	$28,957,481	$28,984,107

6.1.5. PROJECTED O&M EXPENSES

Projected O&M expenses for the FY 2022 - FY 2026 planning horizon were based on a starting point of the Department's FY 2022 budget. O&M expenses are projected forward based on the cost escalation factors shown in the top half of Table 6-4. These cost escalation factors were developed in consultation with Department Staff. Actual projected O&M expenses are shown in the bottom half of Table 6-4.

Table 6-4: Projected O&M Expenses

Line	Expense	FY 2022 Budgeted	FY 2023 Projected	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected
1	General	2.5%	2.5%	2.5%	2.5%	2.5%
2	Salary	4.0%	4.0%	4.0%	4.0%	4.0%
3	Benefits	6.0%	6.0%	6.0%	6.0%	6.0%
4	Utilities	3.0%	3.0%	3.0%	3.0%	3.0%
5						
6	Treatment Expenditures					
7	Administrative Division	$7,422,273	$7,607,142	$7,796,616	$7,990,809	$8,189,839
8	Water Reclamation Division	$18,760,201	$19,227,468	$19,706,374	$20,197,207	$20,700,266
9	Non-Operating	$2,900	$2,972	$3,046	$3,122	$3,200
10	Total Treatment	$26,185,374	$26,837,583	$27,506,036	$28,191,139	$28,893,306
11						
12	Collection Expenditures					
13	Administrative Division	$5,235,347	$5,365,273	$5,498,434	$5,634,912	$5,774,788
14	Water Reclamation Division	$571,050	$585,273	$599,851	$614,792	$630,105
15	Sewer Collection Division	$1,921,987	$1,969,859	$2,018,923	$2,069,209	$2,120,747
16	Total Collection System	$0	$0	$0	$0	$0
17						
18	Total Wastewater Utility	$33,913,759	$34,757,988	$35,623,244	$36,510,051	$37,418,946
19	Annual % Change		2.5%	2.5%	2.5%	2.5%

6.1.6. PROJECTED CIP EXPENDITURES

CIP expenditures made by the Department are generally paid in two primary ways: rate revenues (also known as PAYGO funding) and external debt financing. Table 6-5 shows projected CIP expenditures for FY 2022 - FY 2026 as provided by Department Staff. Included in Table 6-5 is a projection of how the CIP expenditures will be paid for (lines 86-91). The mix of rate funded PAYGO CIP, and debt funded CIP reflects the Department's preferred capital financing strategy.

Table 6-5: Projected CIP Expenses

Line	Project	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Treatment					
2	Facilities Rehabilitation					
3	Unit 1 Secondary Effluent Modifications	$0	$773,250	$0	$0	$0
4	E Street Lift Station Controls Upgrades	$120,000	$0	$0	$0	$0
5	Annual R/R - Solids Handling Systems	$155,000	$97,945	$97,945	$97,945	$97,945
6	Annual R/R - WRP Operational	$50,000	$10,310	$10,310	$10,310	$10,310
7	Annual R/R - WRP Structural	$85,000	$10,310	$10,310	$10,310	$10,310
8	Annual R/R - WRP Mechanical	$570,000	$293,835	$293,835	$293,835	$293,835
9	Annual R/R - WRP Electrical, Instrumentation and SCADA	$55,000	$56,705	$56,705	$56,705	$56,705
10	Annual R/R - WRP Facilities	$30,000	$30,930	$30,930	$30,930	$30,930
11	East Lift Station Modification for SNRC	$50,000	$257,750	$0	$0	$0
12	Master Plan - WRP Rehab Project No. 1	$500,000	$4,639,500	$0	$0	$0
13	Master Plan - VFD Replacement Project R&R	$5,012,000	$0	$0	$0	$0
14	Master Plan - Unit 3 R&R	$160,000	$0	$0	$0	$0
15	Digester C & D Permanent Repairs	$0	$0	$3,093,000	$1,031,000	$0
16	Conveyor No. 5 Belt Replacement	$0	$0	$0	$0	$41,240
17	Pavement Replacement Project	$0	$0	$1,031,000	$0	$41,240
18	Total	$6,787,000	$6,170,535	$4,624,035	$1,531,035	$582,515
19						
20	New Equipment					
21	Chemically Enhanced Primary Treatment	$120,000	$0	$0	$0	$0
22	Digester B Replacement with Biosolids Strategic Plan	$9,914,000	$0	$0	$0	$0
23	Brine Line Improvements	$200,000	$0	$0	$0	$0
24	Unit 3 Expansion and Completion Phase I	$0	$0	$489,725	$490,756	$9,643,974
25	Electrical Master Plan Resultant Projects	$0	$5,876,700	$5,876,700	$0	$0
26	DG Pipe Rack Project	$150,000	$1,031,000	$0	$0	$0
27	Total	$10,384,000	$6,907,700	$6,366,425	$490,756	$9,643,974
28						
29	Other					
30	Phase 2 - Tertiary Treatment System (Design)	$2,598,000	$0	$0	$0	$0
31	Total Treatment	$19,769,000	$13,078,235	$10,990,460	$2,021,791	$10,226,489
32						
33	Collection System					
34	Lift Station Rehabilitation					
35	Annual R/R - Lift Station Mechanical	$110,000	$154,650	$154,650	$154,650	$154,650
36	Annual R/R - Lift Station Electrical, Instrumentation & SCADA	$50,000	$77,325	$77,325	$77,325	$77,325
37	Annual R/R - Lift Station Structural	$50,000	$25,775	$25,775	$25,775	$25,775
38	Annual R/R - Lift Station Facilities Safety	$35,000	$25,775	$25,775	$25,775	$25,775
39	Condition Based Lift Station R/R Short-Term Horizon	$0	$283,525	$283,525	$283,525	$283,525
40	Total	$245,000	$567,050	$567,050	$567,050	$567,050
41						
42	Sewer Main Replacement					
43	Annual R/R - Sectional Main Repairs	$1,000,000	$1,031,000	$1,031,000	$1,031,000	$1,031,000
44	Blackstone 0540176-0540164 Rehabilitation	$200,000	$515,500	$0	$0	$0
45	Condition Based Primary Sewer Replacements	$0	$123,720	$855,730	$0	$0
46	Condition Based Secondary Replacements	$0	$670,150	$7,010,800	$4,639,500	$4,639,500
47	Condition Based Sewer Rehabilitation Plans	$225,000	$0	$0	$0	$0
48	Sewer Capacity Studies	$350,000	$154,650	$0	$0	$0
49	Sewer Siphon Rehabilitation & Replacements	$0	$0	$1,031,000	$5,361,200	$6,186,000
50	Total	$1,775,000	$2,495,020	$9,928,530	$11,031,700	$11,856,500
51						
52	Manhole Replacement					
53	Annual R/R - Manholes	$300,000	$309,300	$309,300	$309,300	$309,300
54	Total	$300,000	$309,300	$309,300	$309,300	$309,300
55						
56	Collection New System CIP					
57	Meridian Lift Station Generator Project	$2,278,000	$0	$0	$0	$0
58	Lift Station SCADA Phase I	$0	$412,400	$0	$0	$0
59	Total	$2,278,000	$412,400	$0	$0	$0
60						
61	Other					
62	Annual Unplanned Public Works	$50,000	$103,100	$103,100	$103,100	$103,100
63	Total	$50,000	$103,100	$103,100	$103,100	$103,100
64						
65	Total Collection System	$4,648,000	$3,886,870	$10,907,980	$12,011,150	$12,835,950
66						
67	RIX					
68	Annual R/R - UV System					
69	Annual R/R - UV System	$16,000	$24,744	$24,744	$0	$0
70	Annual R/R - Well Systems	$440,000	$94,852	$94,852	$0	$0
71	Annual R/R - Other	$48,000	$0	$0	$0	$0
72	Annual R/R - Electrical, Instrumentation & SCADA	$44,000	$49,488	$49,488	$0	$0
73	Annual R/R - Facilities	$32,000	$8,248	$8,248	$0	$0
74	Total	$580,000	$177,332	$177,332	$0	$0
75						
76	New System CIP					
77	Sand Replenishment Project - Year 2	$800,000	$0	$0	$0	$0
78	Sand Replenishment Project - Future Years	$800,000	$824,800	$4,124,000	$0	$0
79	RIX Administration Building - Supervisor's Office Tenant Improvement	$78,400	$0	$0	$0	$0
80	Total	$1,678,400	$824,800	$4,124,000	$0	$0
81						
82	Total RIX	$2,258,400	$1,002,132	$4,301,332	$0	$0
83						
84	GRAND TOTAL	$26,675,400	$17,967,237	$26,199,772	$14,032,941	$23,062,439
85						
86	CIP Funding					
87	Proposed Rate Funded	$8,950,060	$17,967,237	$16,199,772	$0	$23,062,439
88	Proposed Bond Funded - Existing Proceeds	$17,725,340	$0	$0	$0	$0
89	Proposed Bond Funded - New Proceeds	$0	$0	$0	$14,032,941	$0
90	Proposed SRF Loan Funded	$0	$0	$10,000,000	$0	$0
91	Total CIP Funding	$26,675,400	$17,967,237	$26,199,772	$14,032,941	$23,062,439

6.1.7. PROJECTED DEBT SERVICE PAYMENTS

Table 6-6 shows the Department's projected water utility debt service payments for the period FY 2022 - FY 2026. The proposed SRF debt service payments shown in lines 3 and 4 of Table 6-6 reflect the Department's preferred capital financing plan for the wastewater treatment system, which includes obtaining an SRF loan of $10,403,101 in FY 2024 and issuing revenue bonds in the amount of $27,175,432 in FY 2025.

Table 6-6: Projected Debt Service Payments

Line	Debt Service	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Treatment					
2	Existing Debt	$1,967,775	$1,966,900	$1,964,275	$1,964,775	$1,968,150
3	Proposed Revenue Bonds	$0	$0	$0	$679,386	$679,386
4	Proposed SRF Debt	$0	$0	$104,031	$104,031	$104,031
5	Total	$1,967,775	$1,966,900	$2,068,306	$2,748,192	$2,751,567
6						
7	Collection System					
8	Existing Debt	$0	$0	$0	$0	$0
9	Proposed Revenue Bond Debt	$0	$0	$0	$679,386	$679,386
10	Proposed SRF Debt	$0	$0	$0	$0	$0
11	Total	$0	$0	$0	$679,386	$679,386
12						
13	Total Debt Service	$1,967,775	$1,966,900	$2,068,306	$3,427,578	$3,430,953

6.1.8. CASH RESERVES AND DEBT SERVICE COVERAGE

The Department's financial plan is based on the maintenance of the cash reserve and debt service coverage targets shown in Table 6-7.

Table 6-7: Cash Reserves and Debt Service Coverage Targets

Line	Description	Metric	Description
1	Operating Reserve	45	Days of Annual O&M Expenses
2	Rate Stabilization Reserve	20%	of Total Wastewater Sales
3	Emergency Reserve	2%	of Capital Assets
4	Capital Reserve	5	Year Average and Rate-Funded PAYGO CIP
6	Target Debt Service Coverage	175%	Annual Debt Service Coverage

6.1.9. PROJECTED WASTEWATER UTILITY FINANCIAL PLAN

Table 6-8 shows the proposed wastewater utility financial plan for the period FY 2022 - FY 2026. This financial plan reflects the Department's preferred capital financing strategy as determined by Department staff. Line 1 of Table 6-8 indicates the proposed annual rate revenue increases. Lines 4 - 6 show the proposed use of external debt financing. Funding for wastewater treatment operations will be augmented by a proposed SRF loan of $10,403,101 in FY 2024 (proceeds of $10 million) and a revenue bonds issue in the amount of $27,175,432 in FY 2025 (proceeds of $25 million). The derivation of key sections of Table 6-8 are described below:

- Lines 1 - 11 reflect the Department Staff's preferred wastewater utility financing strategy for the period FY 2022 - FY 2026. Specifically, it reflects the combination of rate revenue increases and external debt financing determined to best meet the financial needs of the wastewater utility.

- Lines 13 - 42 show the projection of rate revenues and miscellaneous non-rate revenues during the FY 2022 - FY 2026 planning horizon. Table 6-3 shows a detail of the projection of revenues at existing rates as presented in lines 15 - 22 in Table 6-8. Line 24 reflects the projected additional rate revenues that will be earned each year based on the specified percentage rate revenue increases and rate revenue increase effective dates shown in lines 1 and 2. The miscellaneous non-rate revenues shown in Rows 27-42 were developed in consultation with Department staff.

- Lines 44 - 51 show projected O&M expenses for the FY 2022 - FY 2026 planning horizon (as originally shown in Table 6-4).

- Lines 53 - 60 show projected debt service expenditures for the FY 2022 - 2025 planning horizon (as originally shown in Table 6-6).

- Lines 64 - 77 show, for the FY 2022 - FY 2025 planning horizon, projected CIP expenditures and the mix of rate-funded PAYGO and debt-funded CIP based in the Department's preferred capital financing strategy. A detail of each proposed CIP project summarized in lines 64 - 72 is presented in Table 6-5.

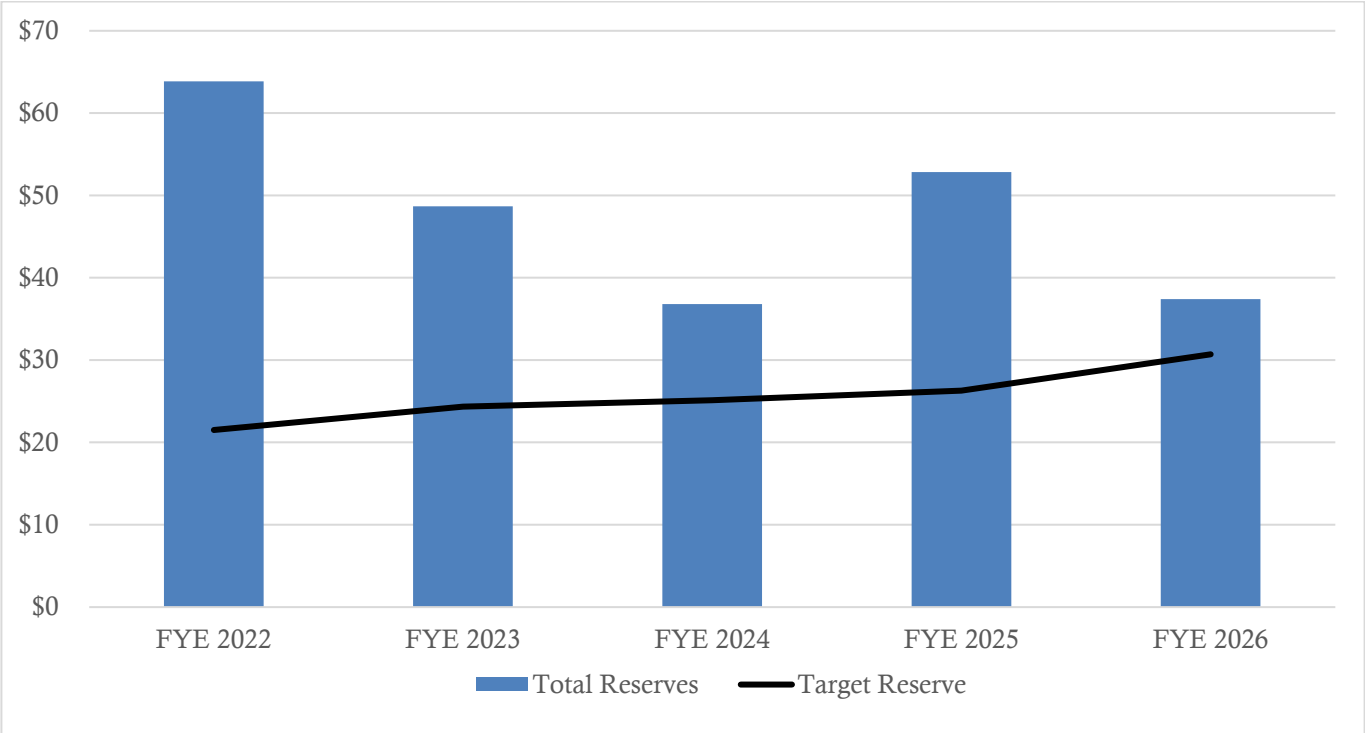
- Lines 83 - 86 reflect the Department's projected beginning and ending cash reserves for the FY 2022 - FY 2025 planning horizon based on the projected net operating surplus (line 76) and use of debt financing to fund CIP expenditures.

Table 6-8: Wastewater Utility Financial Plan for FY 2022 - FY 2026

Line	Description	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Annual Rate Revenue Increase	11%	11%	8%	8%	8%
2	Effective Date	April	July	July	July	July
3						
4	External Debt Financing					
5	Treatment					
6	Bond Proceeds	$0	$0	$0	$12,500,000	$0
7	SRF Loan Proceeds	$0	$0	$10,000,000	$0	$0
8						
9	Collection System					
10	Bond Proceeds	$0	$0	$0	$12,500,000	$0
11	SRF Loan Proceeds	$0	$0	$0	$0	$0
12						
13	Detail of Cash Flows					
14	Revenue					
15	Treatment Revenues at Existing Rates					
16	Inside City	$18,799,802	$18,818,602	$18,837,420	$18,856,258	$18,875,114
17	Loma Linda	$2,330,961	$2,330,961	$2,330,961	$2,330,961	$2,330,961
18	Total	$21,130,763	$21,149,562	$21,168,381	$21,187,218	$21,206,075
19						
20	Collection Revenue at Existing Rates					
21	Inside City	$7,746,998	$7,754,745	$7,762,500	$7,770,262	$7,778,033
22	Total	$7,746,998	$7,754,745	$7,762,500	$7,770,262	$7,778,033
23						
24	Additional Rate Revenue from Rate Increases	$794,138	$6,708,690	$9,566,517	$12,657,936	$16,001,869
25	Total Rate Revenue	$29,671,899	$35,612,997	$38,497,397	$41,615,416	$44,985,977
26						
27	Miscellaneous Non-Rate Revenue					
28	Treatment					
29	Fees	$312,000	$312,312	$312,624	$312,937	$313,250
30	Interest	$437,000	$469,092	$144,593	$155,792	$289,894
31	Other	$400,000	$400,400	$400,800	$401,201	$401,602
32	FY 2022 EVWD Treatment Revenue	$6,313,500	$0	$0	$0	$0
33	EVWD Settlement	$525,000	$700,000	$700,000	$700,000	$700,000
34	SBVMWD Recycled	$393,750	$525,000	$525,000	$525,000	$525,000
35	Total	$8,381,250	$2,406,804	$2,083,018	$2,094,930	$2,229,746
36						
37	Collection System					
38	Fees	$10,000	$10,010	$10,020	$10,030	$10,040
39	Interest	$202,000	$334,908	$328,850	$243,749	$261,864
40	Total	$212,000	$344,918	$338,870	$253,779	$271,904
41						
42	Total Non-Rate Revenues	$8,593,250	$2,751,721	$2,421,888	$2,348,709	$2,501,651
43						
44	Treatment O&M					
45	Water Reclamation Division	$18,760,201	$19,233,469	$19,718,764	$20,216,397	$20,726,684
46	Non-Operating	$2,900	$2,972	$3,046	$3,122	$3,200
47	Total	$18,763,101	$19,236,441	$19,721,810	$20,219,519	$20,729,883
48						
49	Collection O&M					
50	Administrative Division	$5,235,347	$5,370,179	$5,508,547	$5,650,546	$5,796,274
51	Water Reclamation Division	$571,050	$588,774	$607,079	$625,986	$645,515
52	Sewer Collection Division	$1,921,987	$1,997,483	$2,075,963	$2,157,548	$2,242,360
53	Non-Operating	$0	$0	$0	$0	$0
54	Total	$7,728,384	$7,956,436	$8,191,590	$8,434,080	$8,684,149
55						
56	Total O&M	$26,491,485	$27,192,877	$27,913,400	$28,653,599	$29,414,032
57						
58	Treatment Debt Service					
59	Existing Debt	$1,967,775	$1,966,900	$1,964,275	$1,964,775	$1,968,150
60	Proposed Revenue Bonds	$0	$0	$0	$679,386	$679,386
61	Proposed SRF Debt	$0	$0	$104,031	$104,031	$104,031
62	Total	$1,967,775	$1,966,900	$2,068,306	$2,748,192	$2,751,567
63						
64	Collection System					
65	Total	$0	$0	$0	$679,386	$679,386
66						
67	Total Debt Service	$1,967,775	$1,966,900	$2,068,306	$3,427,578	$3,430,953
68						
69	Treatment CIP Expenditures	$22,027,400	$14,080,367	$15,291,792	$2,021,791	$10,226,489
70	Less: Debt Proceeds Applied to CIP	$17,725,340	$0	$10,000,000	$2,021,791	$10,226,489
71	Net Rate Funded Treatment CIP Expenditures	$4,302,060	$14,080,367	$5,291,792	$0	$0
72						
73	Collection System CIP Expenditures	$4,648,000	$3,886,870	$10,907,980	$12,011,150	$12,835,950
74	Less: Debt Proceeds Applied to CIP	$0	$0	$0	$12,011,150	$488,850
75	Net Rate Funded Collection System CIP Expenditures	$4,648,000	$3,886,870	$10,907,980	$0	$12,347,100
76						
77	Total Rate Funded CIP Expenditures	$8,950,060	$17,967,237	$16,199,772	$0	$12,347,100
78						
79	Total Expenditures (Line 18+19+29)	$10,917,835	$19,934,137	$18,268,078	$3,427,578	$15,778,053
80						
81	Net Operating Surplus/(Deficit) (Line 15 - Line 31)	($10,917,835)	($19,934,137)	($18,268,078)	($3,427,578)	($15,778,053)
82						
83	Capital Replacement Reserve (Treatment + Collection)	$48,220,576	$32,049,393	$21,450,229	$35,580,717	$17,554,480
84	Rate Stabilization Reserve (Treatment + Collection)	$3,889,954	$4,108,957	$4,170,592	$4,367,706	$4,433,222
85	Emergency Replacement Reserve (Treatment + Collection)	$5,877,146	$5,965,303	$6,054,783	$6,145,604	$6,237,789
86	Total Ending Balance	$57,987,676	$42,123,654	$31,675,603	$46,094,027	$28,225,490

Figure 6-1 provides a graphical representation of wastewater utility cash reserves for the period FY 2022 - FY 2026 (as shown in line 86 of Table 6-8).

Figure 6-1: Wastewater Utility Cash Reserves (Millions)



6.1.10. WASTEWATER UTILITY REVENUE REQUIREMENT FROM RATES

A key outcome of the financial planning process is the determination of the annual revenue requirement from rates. The cost of service process assigns the revenue requirement from rates to each customer class based on their proportionate share of total system wastewater discharges. This is true regardless of whether the rates paid by a customer class are solely fixed in nature (i.e., a monthly fixed charge), solely volumetric in nature (i.e., $/HCF commodity rates), or some combination of the two. Table 6-9 shows the projected revenue requirement from rates for FY 2022 - FY 2026. Note that line 56 of Table 6-9 (Net Revenue Requirement from Rates Before Adjustment) equals line 19 of Table 6-8 (Total Rate Revenue). This demonstrates the linkage between the financial planning process and the determination of the revenue requirement from rates.

Line 56 of Table 6-9 is increased by $2,382,415 to reflect the fact that FY 2022 rate increases will not become effective until April 1, 2022, a full eight months after the start of FY 2022 (on July 1, 2021). The adjustment ensures that the Department's wastewater utility will earn one full year of rate revenue under the new rates that will become effective on April 1, 2022.

The Department will implement a wastewater rate revenue increase of 11% on April 1, 2022. Thus, additional rate revenues from this increase will be earned for only three months (April 2022, May 2022, and June 2022). During this three month period, the Department will earn additional rate revenues of $794,138. If the Department had adopted an 11% rate revenue increase on at the state of FY 2022 (July 1, 2021), a total of $2,382,415 in additional rate revenues would have been earned over the entire twelve months of FY 2022. Thus, the $2,382,415 revenue requirement adjustment shown on line 56 of Table 6-9 increases the FY 2022 revenue requirement by this amount, ensuring that the rates implemented on April 1, 2022 actually produce a full twelve months of rate revenue.

If the revenue requirement adjustment of $2,382,415 is not made, the wastewater rates implemented by the Department on April 1, 2022 will be inadequate to recover the entire amount of required rate revenue as derived in the financial plan.

Table 6-9: Wastewater Utility Revenue Requirement from Rates for FY 2022 - FY 2026

Line	Description	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026
1	Treatment O&M					
2	Administrative Division	$7,422,273	$7,613,793	$7,810,349	$8,012,078	$8,219,119
3	Water Reclamation Division	$18,760,201	$19,233,469	$19,718,764	$20,216,397	$20,726,684
4	Non-Operating	$2,900	$2,972	$3,046	$3,122	$3,200
5	Total	$26,185,374	$26,850,234	$27,532,160	$28,231,597	$28,949,002
6						
7	Collection O&M					
8	Administrative Division	$5,235,347	$5,370,179	$5,508,547	$5,650,546	$5,796,274
9	Water Reclamation Division	$571,050	$588,774	$607,079	$625,986	$645,515
10	Sewer Collection Division	$1,921,987	$1,997,483	$2,075,963	$2,157,548	$2,242,360
11	Non-Operating	$0	$0	$0	$0	$0
12	Total	$7,728,384	$7,956,436	$8,191,590	$8,434,080	$8,684,149
13						
14	Total O&M	$33,913,759	$34,806,670	$35,723,750	$36,665,677	$37,633,151
15						
16	Debt Service					
17	Treatment (Includes RIX)					
18	Existing Debt	$1,967,775	$1,966,900	$1,964,275	$1,964,775	$1,968,150
19	Proposed Revenue Bonds	$0	$0	$0	$679,386	$679,386
20	Proposed SRF Debt	$0	$0	$104,031	$104,031	$104,031
21	Total	$1,967,775	$1,966,900	$2,068,306	$2,748,192	$2,751,567
22						
23	Collection					
24	Existing Debt	$0	$0	$0	$0	$0
25	Proposed Revenue Bond Debt	$0	$0	$0	$679,386	$679,386
26	Proposed SRF Debt	$0	$0	$0	$0	$0
27	Total	$0	$0	$0	$679,386	$679,386
28						
29	Total Debt Service	$1,967,775	$1,966,900	$2,068,306	$3,427,578	$3,430,953
30						
31	Rate Funded Capital					
32	Treatment	$4,302,060	$14,080,367	$5,291,792	$0	$0
33	Collection	$4,648,000	$3,886,870	$10,907,980	$0	$12,347,100
34	Total	$8,950,060	$17,967,237	$16,199,772	$0	$12,347,100
35						
36	Gross Revenue Requirement from Rates	$44,831,594	$54,740,807	$53,991,828	$40,093,254	$53,411,203
37						
38	Miscellaneous Non-Rate Revenue Offsets					
39	Treatment					
40	Fees	$312,000	$312,312	$312,624	$312,937	$313,250
41	Interest	$437,000	$468,978	$144,089	$252,560	$681,685
42	Other	$400,000	$400,400	$400,800	$401,201	$401,602
43	FY 2022 EVWD Treatment Revenue	$6,313,500	$0	$0	$0	$0
44	EVWD Settlement	$525,000	$700,000	$700,000	$700,000	$700,000
45	SBVMWD Recycled	$393,750	$525,000	$525,000	$525,000	$525,000
46	Total	$8,381,250	$2,406,690	$2,082,514	$2,191,698	$2,621,538
47						
48	Collection					
49	Fees	$10,000	$10,010	$10,020	$10,030	$10,040
50	Interest	$202,000	$334,908	$328,850	$243,749	$261,864
51	Total	$212,000	$344,918	$338,870	$253,779	$271,904
52						
53	Total Miscellaneous Non-Rate Revenue Offsets	$8,593,250	$2,751,608	$2,421,384	$2,445,477	$2,893,442
54						
55	Change in Cash Balance (Net Operating Cash Flow)	($6,566,444)	($16,376,088)	($13,072,542)	$3,870,871	($5,923,576)
56	Net Revenue Req. from Rates Before Adjustment	$29,671,899	$35,613,111	$38,497,902	$41,518,648	$44,594,185
57						
58	Adjustment for Mid-Year Increase	$2,382,415	$0	$0	$0	$0
59	Final Net Revenue Requirement from Rates	$32,054,314	$35,613,111	$38,497,902	$41,518,648	$44,594,185

7. Wastewater COS Analysis

7.1.1. COST OF SERVICE METHODOLOGY

A COS analysis distributes a utility's revenue requirements from rates (costs) to each customer class based on their proportionate share of total system wastewater demand. The COS analysis completed by Raftelis follows industry standard cost allocation principles as presented in WEF Manual 27.

7.1.2. REVENUE REQUIREMENT COST COMPONENTS

The starting point of the wastewater COS analysis is to identify the operating and capital cost components of the annual revenue requirement. Table 7-1 shows this for the Department's FY 2022 water utility revenue requirement. All the information shown in Table 7-1 was derived from the FY 2022 column in Table 6-9 (Wastewater Utility Revenue Requirement from Rates for FY 2022 - FY 2026).

Table 7-1: FY 2022 Revenue Requirement Cost Components

Line	Revenue Requirement Component	Operating	Capital	Total
1	O&M			
2	Treatment Expenses			
3	Administrative Division	$7,422,273		$7,422,273
4	Water Reclamation Division	$18,760,201		$18,760,201
5	Non-Operating	$2,900		$2,900
6		$0		$0
7	Collection Expenses			
8	Administrative Division	$5,235,347		$5,235,347
9	Water Reclamation Division	$571,050		$571,050
10	Sewer Collection Division	$1,921,987		$1,921,987
11	Non-Operating	$0		$0
12		$0		$0
13	Debt & Capital			
14	Existing Debt		$1,967,775	$1,967,775
15	Proposed Revenue Bonds		$0	$0
16	Proposed SRF Debt		$0	$0
17	Rate Funded Capital		$8,950,060	$8,950,060
18				
19	Gross Revenue Requirement	$33,913,759	$10,917,835	$44,831,594
20				
21	Miscellaneous Non-Rate Revenue Offsets			
22	Fees	$322,000	$0	$322,000
23	Interest	$639,000	$0	$639,000
24	Other	$400,000	$0	$400,000
25	FY 2022 EV Rate Revenue	$6,313,500	$0	$6,313,500
26	EV Settlement Revenue	$525,000	$0	$525,000
27	SBVMWD Recycled	$393,750	$0	$393,750
28	Capital Contributions	$0	$0	$0
29	Total	$8,593,250	$0	$8,593,250
30				
31	Revenue Adjustments			
32	Change in Cash Balance	$0	($6,566,444)	($6,566,444)
33	Mid-Year Adjustment	$0	$2,382,415	$2,382,415
34	Total	$0	($4,184,029)	($4,184,029)
35				
36	Net Revenue Requirement from Rates	$25,320,509	$6,733,806	$32,054,314

7.1.3. COST CAUSATION COMPONENTS

After determining the FY 2022 operating and capital cost revenue requirement components, the next step in the cost of service process is to assign the revenue requirement from rates to specific functional categories and cost causation components. The assignment of costs to functional categories answers the question, what wastewater utility functions are supported by (i.e., paid for) by the rate revenue provided by customers? Functional categories for wastewater utilities may include, but are not necessarily be limited to:

- Volume of Flow
- Biochemical Oxygen Demand (a measurement of the strength of customer sewer discharges)
- Total Suspended Solids (also a measurement of the strength of customer sewer discharges)
- Supply
- Customer Service
- Customer Billing
- General

7.1.4. MASS BALANCE ANALYSIS

A "mass balance" analysis helps to identify the appropriate units of service that should be used to allocate costs to each customer class in the COS analysis. This is accomplished by estimating the volume of flow and strength loadings contributed by each customer class to the influent stream monitored at the Department's water reclamation plant (i.e., WRP or treatment plant). The aggregate of all customer class contributed flows and strength loadings compared to the metered and strength tested influent at the WRP. If these two totals approximate each other (i.e., if they are in approximate balance) it serves to verify the appropriateness of the total system units of service for each cost causation component and the units of service used to allocate the wastewater revenue requirement to customer classes.

The key assumptions that must be made in the mass balance analysis include those shown in Table 7-2.

Table 7-2: Mass Balance Analysis Assumptions

Item	Customer Class	Basis for Assumption
Return Flows	Residential	Estimate developed in consultations between Raftelis and Department Staff
	Multi-Family (2 Units)	Estimate developed in consultations between Raftelis and Department Staff
	Multi-Family (3 Units)	2019 Sewer Master Plan Update
	Non-Residential	Raftelis estimate made after consulting the 2019 Sewer Master Plan Update
	Industrial	100% return flow because all Industrial customers have sewer discharge meters
Strength Loadings	All	1998 State Water Control Board Revenue Program Guidelines, the 2017 Update of the Sanitation District of Los Angeles Revenue Program Report, or estimates developed by Raftelis in consultation with the Department Staff.

Table 7-3 shows the reconciliation of the aggregate estimated customer class contributed flows and strength loadings compared to the metered and strength tested influent at the WRP. The source of the information presented in Table 7-3 is provided in the notes at the bottom of the table.

Table 7-4 shows a detail of the estimated flow and strength contributions of each customer class. The flow assumptions presented in Table 7-4 were based on actual billed water consumption data unless otherwise noted. The return flow assumptions used in Table 7-4 were developed by Raftelis in consultation with Department Staff. The source of the strength loadings assumed for each customer class are noted in Table 7-4.

Table 7-3: Mass Balance Reconciliation

Mass Balance Analysis: Reconciliation of Estimated Customer Flow and Strength to Water Reclamation Plant Influent								
Line	Flow Metric	Comment	Flow (mgd)	Flow (hcf/yr)	BOD (mg/L)	TSS (mg/L)	BOD (lbs/yr)	TSS (lbs/yr)
1	Inside City	Note 1	13.50	6,588,396	285.95	268.82	11,763,720	11,058,794
2	Loma Linda Outside City	Note 1	1.87	913,275	259.22	246.92	1,478,226	1,408,116
4	Estimated Flow Contributed by Customers		15.37	7,501,671	282.70	266.15	13,241,946	12,466,910
5								
6	Add: Estimated I/I (3.0%)	Note 2	0.474	231,159	284.54	269.12	410,614	388,358
7	Total Estimated WRP Influent		15.85	7,732,829			13,652,560	12,855,269
8								
9	Total Plant Influent	Note 3	15.79	7,705,307	284.54	269.12	13,687,118	12,945,283
10	Total Metered Plant Influent		15.79	7,705,307			13,687,118	12,945,283
11								
12	Difference		0.06	27,522			(34,559)	(90,014)
13	Percentage Difference		*0.4%*	*0.4%*			*-0.3%*	*-0.7%*
Note 1: Customer contributed flows, BOD poundage, and TSS poundage are based on billed water consumption, wastewater return flow, and strength loading assumptions detailed in Table 7-4.								
Note 2: Estimate of 3% annual infiltration and Inflow (I/I) made by Raftelis.								
Note 3: Water Reclamation Plant influent volumes, BOD poundage, and TSS poundage based on data provided by Department staff								

Table 7-4: Mass Balance Analysis - Estimated Flow and Strength Contributions to the WRP

Line		Customer Annual Water Usage Before Return Factor			SBMWD 2019 Master Plan	Customer Flows to the Treatment Plant		Strength Loading Assumptions				
1	INSIDE CITY	Basis	Flow (mgd)	Flow (hcf/yr)	Return Factor (%)	Flow (mgd)	Flow (hcf/yr)	BOD (mg/L)	TSS (mg/L)	BOD (lbs/yr)	TSS (lbs/yr)	Source of Strength Loading Assumption
2	All Residential Customers - Domestic Strength											
3	Residential	Actual Annual	13.97	6,818,894	40.0%	5.59	2,727,558	250	240	4,256,883	4,086,608	Estimate
4	Multi-Family (2 Units)	Actual Annual	0.61	295,253	55.0%	0.33	162,389	250	240	253,440	243,302	Estimate
5	Multi-Family (3 Units)	Actual Annual	0.25	121,875	65.0%	0.16	79,219	250	240	123,636	118,691	Estimate
6												
7	Commercial Customers - Low Strength											
8	Laundromats	Actual Annual	0.13	63,764	100.0%	0.13	63,764	150	110	59,710	43,787	1998 State Water Control Board Revenue Program Guidelines
9	Schools, Churches, Nursery Schools	Actual Annual	0.59	287,861	85.0%	0.50	244,682	130	100	198,574	267,051	1998 State Water Control Board Revenue Program Guidelines
10											152,749	
11	Commercial Customers - Medium Strength											
12	Multi-Family, Mobile Home Parks (4 or more units)	Actual Annual	3.64	1,777,302	85.0%	3.10	1,510,707	250	240	2,357,751		Estimate
13	Hospitals, Convalescent Homes	Actual Annual	0.41	201,921	85.0%	0.35	171,633	259	249	277,322	2,263,441	LACSD 2017 Revenue Program Report
14	Retail, Commercial, Light Industrial	Actual Annual	1.24	606,181	95.0%	1.18	575,872	258	276	926,179	990,796	LACSD 2017 Revenue Program Report (Store)
15	Auto Repair, Car Wash	Actual Annual	0.17	81,899	85.0%	0.14	69,614	258	276	111,961	119,772	LACSD 2017 Revenue Program Report (Repair Shop)
16	Office, Motels (without Restaurants)	Actual Annual	0.92	451,148	95.0%	0.88	428,591	258	270	689,305	721,366	LACSD 2017 Revenue Program Report (Office Building)
17												
18	Commercial Customers - High Strength											
19	Restaurants, Hotels	Actual Annual	0.48	233,988	85.0%	0.41	198,890	999	599	1,240,821	743,898	LACSD 2017 Revenue Program Report(Restaurant)
20												
21	Domestic Liquid Waste	Actual Annual	0.01	5,210	100.0%	0.01	5,210	5,400	12,000	175,621	390,268	1998 State Water Control Board Revenue Program Guidelines
22	Industrial	Actual Annual	0.72	350,269	100.0%	0.72	350,269	503	419	1,100,477	917,064	LACSD 2017 Revenue Program Report (Manufacturing)
23	Total Inside City		23.15	11,295,564		13.50	6,588,396	0	0	11,771,681	11,058,794	
24												
25	OUTSIDE CITY -LOMA LINDA	Basis	Flow (mgd)	Flow (hcf/yr)	Return Factor (%)	Flow (mgd)	Flow (hcf/yr)	BOD (mg/L)	TSS (mg/L)	BOD (lbs/yr)	TSS (lbs/yr)	Source of Strength Loading Assumptions
26	All Residential Customers - Domestic Strength											
27	Residential	Estimated Annual - Inside City %	1.72	838,359	40.0%	0.69	335,343	250	240	523,369	502,434	Estimate
28	Multi-Family (2 Units)	Estimated Annual - Inside City %	0.07	36,300	55.0%	0.04	19,965	250	240	31,160	29,913	Estimate
29	Multi-Family (3 Units)	Estimated Annual - Inside City %	0.03	14,984	65.0%	0.02	9,740	250	240	15,201	14,593	Estimate
30												
31	Commercial Customers - Low Strength											
32	Laundromats	Actual Annual	0.01	4,872	100.0%	0.01	4,872	150	110	4,562	3,346	1998 State Water Control Board Revenue Program Guidelines
33	Schools, Churches, Nursery Schools	Actual Annual	0.01	4,686	85.0%	0.01	2,543	130	100	2,064	203,278	1998 State Water Control Board Revenue Program Guidelines
34											1,588	
35	Commercial Customers - Medium Strength											
36	Multi-Family, Mobile Home Parks (4 or more units)	Actual Annual	0.79	384241	0.85	0.669360981	326604.85	250	240	509730.2681		Estimate
37	Hospitals, Convalescent Homes	Actual Annual	0.32	153,701	85.0%	0.27	130,646	259	249	211,096	489,341	LACSD 2017 Revenue Program Report
38	Retail, Commercial, Light Industrial	Actual Annual	0.10	47,052	95.0%	0.09	44,699	258	276	71,890	76,906	LACSD 2017 Revenue Program Report (Store)
39	Auto Repair, Car Wash	Actual Annual	0.02	9,872	85.0%	0.02	8,391	258	276	13,496	14,437	LACSD 2017 Revenue Program Report (Repair Shop)
40	Office, Motels (without Restaurants)	Actual Annual	0.04	21,330	95.0%	0.04	20,264	258	270	32,590	34,106	LACSD 2017 Revenue Program Report (Office Building)
41												
42	Commercial Customers - High Strength										38,176	
43	Restaurants, Hotels	Actual Annual	0.02	12008	0.85	0.020918347	10206.8	999.3529369	599.1324562	63677.54081		LACSD 2017 Revenue Program Report (Restaurant)
44												
45	Total Loma Linda		3.13	1,527,405	0	1.87	913,275	0	0	1,478,835		
46												
47	Total Est. Customer Contributed Flows		26.28	12,822,969		15.37	7,501,671			13,250,516	12,466,910	

Before the revenue requirement can be allocated to cost causation components and eventually distributed to customer classes, a basis for determining the annual amount of Inflow and Infiltration (I/I) received at the WRP must be determined. As shown in line 6 Table 7-3, Raftelis assumed that 3% of the volumes received at the Department's WRP were associated with I/I. Inflow is water introduced into the wastewater collection and conveyance system through direct connections such as manhole covers. Infiltration is water entering the wastewater collection system through leaky sewer pipelines. I/I volumes and strength loadings are allocated to customers because there is a cost to treat the I/I received at the wastewater treatment plant, and this cost must be borne by the customers whose rates pay for the wastewater utility system.

There is no industry-standard, one-size-fits-all approach for the allocation of I/I in every situation. Methods for allocating I/I to customer classes range from relying entirely on the proportionate share of contributed volume from each customer class (100% volume) to relying entirely on the proportionate share of customer accounts/wastewater service connections (100% accounts). For this study, Raftelis has allocated I/I to customer classes based 67% on accounts and 33% on contributed volumes. The rationale for this approach is that the majority of infiltration entering the wastewater system is from leaky connections from service lines that connect to individual customer premises. Table 7-5 shows this allocation.

Table 7-5: Allocation of Inflow and Infiltration Volumes

Line	Allocation of I/I Between Accounts & Volume	Percentage		
1	% of I/I Allocated on Accounts	67%		
2	% of I/I Allocated on Flow	33%		
3				
4	FY 2022 Allocation of I/I Units	Estimated Flow (HCF)	Estimated COD Pounds	Estimated TSS Pounds
5	Estimated I/I From Mass Balance	231,159	410,614	388,358
6				
7	Amount Allocated Based on Accounts	154,876	275,111	260,200
8	Amount Allocated Based on Flow	76,282	135,502	128,158
9	Total	231,159	410,614	388,358

7.1.5. ALLOCATION OF COSTS TO COST CAUSATION COMPONENTS

The process of allocating the wastewater revenue requirement to cost causation components begins with a review of the wastewater assets. The Department's WRP operations team maintains excellent asset records as part of its asset management process. Raftelis reviewed over 100 discrete asset groupings to determine the percentage of assets that were used to meet demand in each cost causation component. The resulting percentages were used to allocate the capital cost portion of the FY 2022 revenue requirement and some of the Department's FY 2022 O&M costs. Table 7-6 shows outcome of this asset analysis.

Table 7-6: Allocation of Asset Values to Cost Component

Metric	Total	Flow	BOD	TSS	Customer Service	Billing	Admin
Asset Value	$182,612,850	$21,358,800	$76,766,731	$71,787,869	$0	$0	$0
% of Asset Value	100.0%	11.7%	42.0%	39.3%	0.0%	0.0%	0.0%

Table 7-7 shows the outcome of the process of allocating the FY 2022 revenue requirement to cost causation components. Note that each asset in the FY 2020 operating expense portion of the revenue requirement was specifically reviewed by Raftelis to determine the appropriate allocation factors. The miscellaneous non-rate revenue offset allocations shown in Table 7-7 are based on the overall allocation of treatment and collection system O&M expenses. The overall treatment revenue requirement resulting from this process is $21,870,010, as shown on line 42. The overall collection system revenue requirement is $10,184,304, as shown on line 67. The total revenue requirement is $32,054,314, as shown on line 70. This matches the total FY 2022 revenue requirement from rates as shown in line 36 of Table 7-1.

Table 7-7: Allocation of FY 2022 Revenue Requirement to Cost Causation Components

Line	Capital Cost Revenue Requirement	Allocation Basis	Total	Flow	BOD	TSS	Customer Svc.	Billing	General
1	Existing Debt	Overall Asset Allocation	$1,967,775	$230,155	$827,213	$773,562	$0	$0	$136,845
2	Proposed Revenue Bonds	Overall Asset Allocation	$0	$0	$0	$0	$0	$0	$0
3	Proposed SRF Debt	Overall Asset Allocation	$0	$0	$0	$0	$0	$0	$0
4	Total Rate Funded Capital	Overall Asset Allocation	$8,950,060	$1,046,819	$3,762,423	$3,518,404	$0	$0	$622,414
5	Change in Cash Balance	Overall Asset Allocation	($6,566,444)	($768,026)	($2,760,400)	($2,581,368)	$0	$0	($456,650)
6	Mid-Year Adjustment	Overall Asset Allocation	$2,382,415	$278,653	$1,001,519	$936,563	$0	$0	$165,680
7	Total		$6,733,806	$787,601	$2,830,755	$2,647,161	$0	$0	$468,289
8									
9	% Treatment (60.4%)	% of FY 2022 CIP	$4,065,886	$475,555	$1,709,216	$1,598,361	$0	$0	$282,754
10	% Collection (39.6%)	% of FY 2022 CIP	$2,667,920	$312,046	$1,121,539	$1,048,800	$0	$0	$185,535
11	Total		$6,733,806	$787,601	$2,830,755	$2,647,161	$0	$0	$468,289
12									
13	**Treatment O&M**	**Allocation Basis**	**Total**	**Flow**	**BOD**	**TSS**	**Inside CS**	**Inside Billing**	**General**
14	Administrative Division	Specific Allocation	$7,422,273	$295,473	$805,896	$753,628	$598,884	$419,142	$4,549,251
15	Water Reclamation Division								
16	Water Reclamation Administration	Specific Allocation	$397,582	$0	$0	$0	$0	$0	$397,582
17	Operations	Specific Allocation	$6,110,124	$905,477	$2,580,765	$2,415,900	$0	$0	$207,982
18	Bio-Solids Processing	Specific Allocation	$2,155,100	$4,098	$1,105,539	$1,045,463	$0	$0	$0
19	RIX Facility	Specific Allocation	$4,166,685	$4,166,685	$0	$0	$0	$0	$0
20	Plant Maintenance	Specific Allocation	$3,369,152	$393,479	$1,414,221	$1,322,499	$0	$0	$238,953
21	Electrical, Instrumentation and SCADA	Specific Allocation	$1,340,230	$168,472	$605,515	$566,243	$0	$0	$0
22	Environmental Control	Specific Allocation	$781,289	$98,211	$352,986	$330,092	$0	$0	$0
23	Engineering	Specific Allocation	$440,041	$55,315	$198,810	$185,916	$0	$0	$0
24	Non-Operating	Specific Allocation	$2,900	$339	$1,219	$1,140	$0	$0	$202
25	Total Treatment O&M		$26,185,374	$6,087,549	$7,064,950	$6,620,879	$598,884	$419,142	$5,393,970
26									
27	Treatment Revenue Offsets								
28	Fees	Treatment O&M Allocations	$312,000	$72,533	$84,179	$78,888	$7,136	$4,994	$64,269
29	Interest	Treatment O&M Allocations	$437,000	$101,593	$117,905	$110,494	$9,995	$6,995	$90,018
30	Other	Treatment O&M Allocations	$400,000	$92,992	$107,922	$101,139	$9,148	$6,403	$82,397
31	FY 2022 EVWD Treatment Revenue	Treatment O&M Allocations	$6,313,500	$1,467,756	$1,703,415	$1,596,346	$144,396	$101,058	$1,300,529
32	EVWD Settlement	Treatment O&M Allocations	$525,000	$122,051	$141,648	$132,744	$12,007	$8,404	$108,146
33	SBVMWD Recycled	Treatment O&M Allocations	$393,750	$91,539	$106,236	$99,558	$9,005	$6,303	$81,109
34	Total Treatment Revenue Offsets		$8,381,250	$1,948,464	$2,261,305	$2,119,169	$191,687	$134,156	$1,726,468
35									
36	Net Treatment O&M	Treatment O&M - Offsets	$17,804,124	$4,139,085	$4,803,645	$4,501,710	$407,197	$284,985	$3,667,502
37									
38	Treatment Capital Costs	Capital Cost Allocation	$4,065,886	$475,555	$1,709,216	$1,598,361	$0	$0	$282,754
39	Revenue Req. before General Allocation	Overall Asset Allocation	$21,870,010	$4,614,639	$6,512,861	$6,100,071	$407,197	$284,985	$3,950,256
40									
41	Allocation of General	10% of Administrative Costs	$0	$100,285	$141,536	$132,566	$8,849	$6,193	($389,429)
42	Total Treatment Net Revenue Req.		$21,870,010	$4,714,924	$6,654,398	$6,232,637	$416,046	$291,179	$3,560,827
43									
44	**Collection O&M**	**Allocation Basis**	**Total**	**Flow**	**BOD**	**TSS**	**Inside CS**	**Inside Billing**	**Admin**
45	Administrative Division	Specific Allocation	$5,235,347	$205,402	$738,247	$690,367	$308,983	$101,514	$3,190,834
46	Water Reclamation Division	Specific Allocation							
47	Water Reclamation Admin.	Specific Allocation	$231,923	$0	$0	$0	$0	$0	$231,923
48	Operations	Specific Allocation	$339,127	$339,127	$0	$0	$0	$0	$0
49	Sewer Collection Division	Specific Allocation							
50	Operations	Specific Allocation	$1,830,283	$1,830,283	$0	$0	$0	$0	$0
51	Lift Station Maintenance	Specific Allocation	$91,704	$91,704	$0	$0	$0	$0	$0
52	Non-Operating	Specific Allocation	$0	$0	$0	$0	$0	$0	$0
53	Total Collection O&M		$7,728,384	$2,466,517	$738,247	$690,367	$308,983	$101,514	$3,422,756
54									
55	Collection Revenue Offsets								
56	Fees	Collection O&M Allocations	$10,000	$3,192	$955	$893	$400	$131	$4,429
57	Interest	Collection O&M Allocations	$202,000	$64,468	$19,296	$18,044	$8,076	$2,653	$89,462
58	Other	Collection O&M Allocations	$0	$0	$0	$0	$0	$0	$0
59	Total Collection Revenue Offsets		$212,000	$67,660	$20,251	$18,938	$8,476	$2,785	$93,891
60									
61	Net Collection O&M	Collection O&M - Offsets	$7,516,384	$2,398,857	$717,996	$671,429	$300,507	$98,729	$3,328,866
62									
63	Collection Capital Costs	Capital Cost Allocation	$2,667,920	$312,046	$1,121,539	$1,048,800	$0	$0	$185,535
64	Revenue Req. before General Allocation		$10,184,304	$2,710,903	$1,839,535	$1,720,229	$300,507	$98,729	$3,514,401
65									
66	Allocation of Administrative Costs	10% of Administrative Costs	$0	$140,815	$95,553	$89,355	$15,610	$5,128	($346,461)
67	Total Collection Revenue Req.		$10,184,304	$2,851,718	$1,935,088	$1,809,584	$316,117	$103,858	$3,167,940
68									
69	**Total System**		**Total**	**Flow**	**BOD**	**TSS**	**Inside CS**	**Inside Billing**	**Admin**
70	Total Revenue Requirement		$32,054,314	$7,566,642	$8,589,486	$8,042,221	$732,163	$395,036	$6,728,767
71	% of Total Revenue Requirement			23.6%	26.8%	25.1%	2.3%	1.2%	21.0%

7.1.6. TREATMENT UNIT COST OF SERVICE

Table 7-8 shows the outcome of the process of allocating the FY 2022 treatment revenue requirement to cost causation components and the calculation of the unit cost of service for each of these components. Note that there is no cost causation component for Outside City-Loma Linda customer service or billing. This is because these services are not performed by the Department. Rows 41 - 45 in Table 7-78 show the final unit cost of service calculation.

Table 7-8: Treatment Unit Cost of Service

Line	Customer Class	Total	Flow	BOD	TSS	Inside Cust. Svc.	Inside Billing	Inside Admin	Common to All General
1	Units		*Annual hcf*	*Annual lbs*	*Annual lbs*	*Annual Bills*	*Annual Bills*	*Annual Bills*	*Annual Bills*
2	Inside City								
3	Residential		2,727,558	4,256,883	4,086,608	398,208	398,208	398,208	398,208
4	Multi-Family (2 Units)		162,389	253,440	243,302	29,160	29,160	29,160	29,160
5	Multi-Family (3 Units)		79,219	123,636	118,691	13,140	13,140	13,140	13,140
6	Multi-Family, Mobile Home Parks (4 or more units)		1,510,707	2,357,751	2,263,441	11,784	11,784	11,784	11,784
7	Retail, Commercial, Light Industrial		575,872	926,179	990,796	17,340	17,340	17,340	17,340
8	Auto Repair, Car Wash		69,614	111,961	119,772	2,868	2,868	2,868	2,868
9	Office, Motels (without Restaurants)		428,591	689,305	721,366	7,920	7,920	7,920	7,920
10	Restaurants, Hotels		198,890	1,240,821	743,898	3,180	3,180	3,180	3,180
11	Laundromats		63,764	59,710	43,787	276	276	276	276
12	Hospitals, Convalescent Homes		171,633	277,322	267,051	552	552	552	552
13	Schools, Churches, Nursery Schools		244,682	198,574	152,749	3,384	3,384	3,384	3,384
14	Domestic Liquid Waste		5,210	175,621	390,268	0	0	0	0
15	Industrial		350,269	1,100,477	917,064	120	120	120	120
16	Total Inside City		6,588,396	11,771,681	11,058,794	487,932	487,932	487,932	487,932
17									
18	Outside City-Loma Linda								
19	Residential		335,343	523,369	502,434				27,121
20	Multi-Family (2 Units)		19,965	31,160	29,913				1,986
21	Multi-Family (3 Units)		9,740	15,201	14,593				895
22	Multi-Family, Mobile Home Parks (4 or more units)		326,605	509,730	489,341				2,286
23	Retail, Commercial, Light Industrial		44,699	71,890	76,906				472
24	Auto Repair, Car Wash		8,391	13,496	14,437				62
25	Office, Motels (without Restaurants)		20,264	32,590	34,106				362
26	Restaurants, Hotels		10,207	63,678	38,176				171
27	Laundromats		4,872	4,562	3,346				13
28	Hospitals, Convalescent Homes		130,646	211,096	203,278				172
29	Schools, Churches, Nursery Schools		2,543	2,064	1,588				36
30	Industrial		0	0	0				0
31	Bi-Monthly Flat Rate		0	0	0				3,638
32	MFR Bi-Monthly Flat Rate		0	0	0				1,030
33	Total Outside City-Loma Linda		913,275	1,478,835	1,408,116	0	0	0	38,244
34									
35	Total Customer Contributed Before I/I Allocation		7,501,671	13,250,516	12,466,910	487,932	487,932	487,932	526,176
36									
37	Inflow/Infiltration		231,159	410,614	388,358				
38	Total Units of Service		7,732,829	13,661,129	12,855,269	487,932	487,932	487,932	526,176
39									
40									
41	**Unit Cost of Service for Treatment**	**Total**	**Flow**	**BOD**	**TSS**	**Inside CS**	**Inside Billing**	**Inside Admin**	**Common to All General**
42	Treatment Revenue Requirement	$21,870,010	$4,714,924	$6,654,398	$6,232,637	$416,046	$291,179	$0	$3,560,827
43	Units of Service		7,732,829	13,661,129	12,855,269	487,932	487,932	487,932	526,176
44	Total System Unit Cost of Service		$0.61	$0.49	$0.48	$0.85	$0.60	$0.00	$6.77
45	Units		$/hcf	$/lb	$/lb	$/bill	$/bill	$/bill	Note 1

Note 1: Accounts adjusted to reflect Multi-Family Residential Dwelling Units

7.1.7. TREATMENT CUSTOMER CLASS REVENUE REQUIREMENTS

Table 7-79 shows the outcome of the process of allocating the FY 2022 treatment revenue requirement customer classes. This is accomplished by multiplying the unit cost of service for each causation component by the appropriate customer class units of service. Note that the total treatment COS of $21,869,580 (line 34) matches the treatment COS shown in line 42 of Table 7-97. This confirms the integrity of the cost allocation process.

Table 7-9: Allocation of FY 2022 Treatment Revenue Requirement to Customer Classes

			Flow and Strength (Variable)					Customer (Fixed)				
Line	Customer Class	Total	Total Flow and Strength	I/I Flow	Flow	BOD	TSS	Total Fixed	I/I Accounts	Inside CS	Inside Billing	Common to All General
1	Inside City											
2	Residential	$9,321,786	$5,781,433	$63,502	$1,663,069	$2,073,547	$1,981,315	$3,540,353	$268,355	$339,541	$237,635	$2,694,822
3	Multi-Family (2 Units)	$603,459	$344,206	$3,781	$99,013	$123,452	$117,961	$259,253	$19,651	$24,864	$17,402	$197,337
4	Multi-Family (3 Units)	$284,739	$167,915	$1,844	$48,302	$60,224	$57,545	$116,824	$8,855	$11,204	$7,841	$88,923
5	Multi-Family, Mobile Home Parks (>4 units)	$3,306,918	$3,202,150	$35,172	$921,120	$1,148,471	$1,097,387	$104,768	$7,941	$10,048	$7,032	$79,747
6	Retail, Commercial, Light Industrial	$1,450,213	$1,296,048	$13,407	$351,125	$451,146	$480,369	$154,165	$11,686	$14,785	$10,348	$117,346
7	Auto Repair, Car Wash	$182,171	$156,672	$1,621	$42,446	$54,537	$58,069	$25,499	$1,933	$2,445	$1,712	$19,409
8	Office, Motels (without Restaurants)	$1,027,221	$956,807	$9,978	$261,324	$335,764	$349,741	$70,414	$5,337	$6,753	$4,726	$53,598
9	Restaurants, Hotels	$1,119,246	$1,090,974	$4,630	$121,269	$604,410	$360,665	$28,272	$2,143	$2,711	$1,898	$21,520
10	Laundromats	$93,131	$90,677	$1,485	$38,879	$29,085	$21,229	$2,454	$186	$235	$165	$1,868
11	Hospitals, Convalescent Homes	$378,113	$373,205	$3,996	$104,649	$135,085	$129,475	$4,908	$372	$471	$329	$3,736
12	Schools, Churches, Nursery Schools	$355,756	$325,670	$5,697	$149,189	$96,726	$74,058	$30,086	$2,281	$2,885	$2,019	$22,901
13	Domestic Liquid Waste	$278,057	$278,057	$121	$3,176	$85,546	$189,214	$0	$0	$0	$0	$0
14	Industrial	$1,203,459	$1,202,392	$8,155	$213,569	$536,047	$444,621	$1,067	$81	$102	$72	$812
15	Total Inside City	$19,604,270	$15,266,207	$153,388	$4,017,131	$5,734,039	$5,361,649	$4,338,064	$328,821	$416,046	$291,179	$3,302,018
16												
17	Outside City-Loma Linda											
18	Residential	$912,619	$710,806	$7,807	$204,468	$254,935	$243,596	$201,813	$18,277	$0	$0	$183,536
19	Multi-Family (2 Units)	$57,097	$42,319	$465	$12,173	$15,178	$14,503	$14,778	$1,338	$0	$0	$13,440
20	Multi-Family (3 Units)	$27,304	$20,645	$227	$5,939	$7,404	$7,075	$6,659	$603	$0	$0	$6,056
21	Multi-Family, Mobile Home Parks (>4 units)	$709,295	$692,284	$7,604	$199,140	$248,292	$237,248	$17,011	$1,541	$0	$0	$15,470
22	Retail, Commercial, Light Industrial	$104,112	$100,600	$1,041	$27,254	$35,018	$37,286	$3,512	$318	$0	$0	$3,194
23	Auto Repair, Car Wash	$19,346	$18,885	$195	$5,116	$6,574	$7,000	$461	$42	$0	$0	$420
24	Office, Motels (without Restaurants)	$47,931	$45,237	$472	$12,355	$15,875	$16,536	$2,694	$244	$0	$0	$2,450
25	Restaurants, Hotels	$57,260	$55,988	$238	$6,223	$31,018	$18,509	$1,272	$115	$0	$0	$1,157
26	Laundromats	$7,025	$6,928	$113	$2,971	$2,222	$1,622	$97	$9	$0	$0	$88
27	Hospitals, Convalescent Homes	$285,361	$284,081	$3,042	$79,658	$102,826	$98,555	$1,280	$116	$0	$0	$1,164
28	Schools, Churches, Nursery Schools	$3,653	$3,385	$59	$1,551	$1,005	$770	$268	$24	$0	$0	$244
29	Industrial	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
30	Bi-Monthly Flat Rate	$27,071	$0	$0	$0	$0	$0	$27,071	$2,452	$0	$0	$24,620
31	MFR Bi-Monthly Flat Rate	$7,665	$0	$0	$0	$0	$0	$7,665	$694	$0	$0	$6,970
32	Total Loma Linda	$2,265,739	$1,981,158	$21,262	$556,850	$720,347	$682,699	$284,581	$25,773	$0	$0	$258,809
33												
34	Total Treatment Revenue Requirement	$21,870,010	$17,247,365	$174,651	$4,573,980	$6,454,386	$6,044,348	$4,622,645	$354,593	$416,046	$291,179	$3,560,827

7.1.8. COLLECTION SYSTEM UNIT COST OF SERVICE

Table 7-10 shows outcome of the process of allocating the FY 2022 collection system revenue requirement to cost causation components and the calculation of the unit cost of service for each of these components. Note that there are not collection system costs allocated to Outside City-Loma Linda. Rows 41 - 45 in Table 7-7 show the final unit cost of service calculation.

Table 7-10: Collection System Unit Cost of Service

Line	Customer Class	Total	Flow	BOD	TSS	Inside CS	Inside Billing	Inside Admin	Common to All General
1	Units		*Annual hcf*	*Annual lbs*	*Annual lbs*	*Annual Bills*	*Annual Bills*	*Annual Bills*	*Annual Bills*
2	Inside City								
3	Residential		2,727,558	4,256,883	4,086,608	398,208	398,208	398,208	398,208
4	Multi-Family (2 Units)		162,389	253,440	243,302	29,160	29,160	29,160	29,160
5	Multi-Family (3 Units)		79,219	123,636	118,691	13,140	13,140	13,140	13,140
6	Multi-Family, Mobile Home Parks (>4 units)		1,510,707	2,357,751	2,263,441	11,784	11,784	11,784	11,784
7	Retail, Commercial, Light Industrial		575,872	926,179	990,796	17,340	17,340	17,340	17,340
8	Auto Repair, Car Wash		69,614	111,961	119,772	2,868	2,868	2,868	2,868
9	Office, Motels (without Restaurants)		428,591	689,305	721,366	7,920	7,920	7,920	7,920
10	Restaurants, Hotels		198,890	1,240,821	743,898	3,180	3,180	3,180	3,180
11	Laundromats		63,764	59,710	43,787	276	276	276	276
12	Hospitals, Convalescent Homes		171,633	277,322	267,051	552	552	552	552
13	Schools, Churches, Nursery Schools		244,682	198,574	152,749	3,384	3,384	3,384	3,384
14	Domestic Liquid Waste		0	0	0	0	0	0	0
15	Industrial		350,269	1,100,477	917,064	120	120	120	120
16	Total Inside City		6,583,186	11,596,060	10,668,526	487,932	487,932	487,932	487,932
17									
18	Outside City-Loma Linda								
19	Residential								
20	Multi-Family (2 Units)								
21	Multi-Family (3 Units)								
22	Multi-Family, Mobile Home Parks (>4 units)								
23	Retail, Commercial, Light Industrial								
24	Auto Repair, Car Wash								
25	Office, Motels (without Restaurants)								
26	Restaurants, Hotels								
27	Laundromats								
28	Hospitals, Convalescent Homes								
29	Schools, Churches, Nursery Schools								
30	Industrial								
31	Bi-Monthly Flat Rate								
32	MFR Bi-Monthly Flat Rate								
33	Total Loma Linda		0	0	0	0	0	0	0
34									
35	Total Customer Contributed Before I/I Allocation		6,583,186	11,588,099	10,668,526	487,932	487,932	487,932	487,932
36									
37	Inflow/Infiltration		231,159	410,614	388,358				
38	Total Units of Service		6,814,345	12,006,674	11,056,884	487,932	487,932	487,932	487,932
39									
40	Metric	Total	Flow	BOD	TSS	Inside CS	Inside Billing	Inside Admin	Common to All General
41	Collection Revenue Requirement	$10,184,304	$2,851,718	$1,935,088	$1,809,584	$316,117	$103,858	$0	$3,167,940
42	Units of Service		6,583,186	11,596,060	10,668,526	487,932	487,932	487,932	487,932
43	Total System Unit Cost of Service		$0.42	$0.16	$0.16	$0.65	$0.21	$0.00	$6.49
44	Units		$/hcf	$/lb	$/lb	$/bill	$/bill	$/bill	Note 1
45	Note 1: Accounts adjusted to reflect Multi-Family Residential Dwelling Units								

7.1.9. COLLECTION SYSTEM CUSTOMER CLASS REVENUE REQUIREMENTS

Table 7-11 shows outcome of process of allocating the FY 2022 collection system revenue requirement customer classes. This is accomplished by multiplying the units cost of service for each causation component by the appropriate customer class units of service. Note that the total collection system COS of $10,184,735 (line 34) matches the collection system COS shown in line 67 of Table 7-117. This confirms the integrity of the cost allocation process.

Table 7-11: Allocation of FY 2022 Collection System Revenue Requirement to Customer Classes

			Flow and Strength (Variable)					Customer (Fixed)				
Line	Customer Class	Total	Total Flow and Strength	I/I Flow	Flow	BOD	TSS	Total Fixed	I/I Accounts	Inside CS	Inside Billing	Common to All General
1	Inside City											
2	Residential	$5,579,286	$2,527,305	$30,965	$1,141,449	$686,072	$668,820	$3,051,981	$123,835	$257,987	$84,760	$2,585,399
3	Multi-Family (2 Units)	$373,957	$150,467	$1,844	$67,958	$40,846	$39,819	$223,491	$9,068	$18,892	$6,207	$189,324
4	Multi-Family (3 Units)	$174,111	$73,403	$899	$33,152	$19,926	$19,425	$100,709	$4,086	$8,513	$2,797	$85,313
5	Multi-Family, Mobile Home Parks (>4 units)	$1,490,109	$1,399,793	$17,150	$632,212	$379,993	$370,438	$90,316	$3,665	$7,635	$2,508	$76,509
6	Retail, Commercial, Light Industrial	$691,857	$558,958	$6,538	$240,995	$149,270	$162,155	$132,899	$5,392	$11,234	$3,691	$112,581
7	Auto Repair, Car Wash	$89,551	$67,570	$790	$29,133	$18,044	$19,602	$21,981	$892	$1,858	$610	$18,621
8	Office, Motels (without Restaurants)	$474,080	$413,379	$4,866	$179,360	$111,094	$118,060	$60,701	$2,463	$5,131	$1,686	$51,421
9	Restaurants, Hotels	$431,591	$407,218	$2,258	$83,233	$199,980	$121,747	$24,372	$989	$2,060	$677	$20,646
10	Laundromats	$46,313	$44,198	$724	$26,684	$9,623	$7,166	$2,115	$86	$179	$59	$1,792
11	Hospitals, Convalescent Homes	$166,407	$162,176	$1,948	$71,826	$44,695	$43,706	$4,231	$172	$358	$117	$3,584
12	Schools, Churches, Nursery Schools	$188,113	$162,177	$2,778	$102,396	$32,004	$24,999	$25,936	$1,052	$2,192	$720	$21,971
13	Domestic Liquid Waste	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
14	Industrial	$478,929	$478,009	$3,976	$146,583	$177,361	$150,088	$920	$37	$78	$26	$779
15	Total Inside City	$10,184,304	$6,444,653	$74,736	$2,754,981	$1,868,911	$1,746,025	$3,739,652	$151,738	$316,117	$103,858	$3,167,940
16												
17	Loma Linda											
18	Residential	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
19	Multi-Family (2 Units)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
20	Multi-Family (3 Units)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
21	Multi-Family, Mobile Home Parks (>4 units)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
22	Retail, Commercial, Light Industrial	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
23	Auto Repair, Car Wash	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
24	Office, Motels (without Restaurants)	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
25	Restaurants, Hotels	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
26	Laundromats	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
27	Hospitals, Convalescent Homes	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
28	Schools, Churches, Nursery Schools	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
29	Industrial	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
30	Bi-Monthly Flat Rate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
31	MFR Bi-Monthly Flat Rate	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
32	Total Loma Linda	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0	$0
33												
34	Total	$10,184,304	$6,444,653	$74,736	$2,754,981	$1,868,911	$1,746,025	$3,739,652	$151,738	$316,117	$103,858	$3,167,940

7.1.10. COMPARISON OF COS TO REVENUES AT EXISTING RATES

The final step in the COS analysis process is to compare the calculated cost of service by customer class to the level of rate revenue earned from each class under existing rates. This process shows adjustments necessary to rates to meet current costs of service. The outcome of the process should result in an overall percentage change that matches the financial planning input. Table 7-12 compares the wastewater COS for each customer class to the current level of revenue at existing rates. The 11.0% overall percentage difference matches the overall utility financial planning increase as discussed previously in Table 1-8.

Table 7-12: FY 2022 Customer Class COS vs. Revenue at Existing Rates

Line	Customer Class	Total Cost of Service	Total Revenue at Existing Rate	Difference	
				$ Diff	% Diff
1	Inside City				
2					
3	All Residential Customers - Domestic Strength				
4	Residential	$14,901,072	$13,167,159	$1,733,914	13.17%
5	Multi-Family (2 Units)	$977,417	$964,936	$12,481	1.29%
6	Multi-Family (3 Units)	$458,850	$434,663	$24,187	5.56%
7	Total	$16,337,340	$14,566,758	$1,770,582	12.15%
8					
9	Non-Residential Customers - Low Strength				
10	Laundromats	$139,444	$174,338	($34,894)	-20.01%
11	Schools, Churches, Nursery Schools	$543,869	$657,008	($113,139)	-17.22%
12	Total	$683,314	$831,346	($148,033)	-17.81%
13					
14	Non-Residential Customers - Medium Strength				
15	Multi-Family, Mobile Home Parks (4 or more units)	$4,797,028	$4,160,535	$636,493	15.30%
16	Hospitals, Convalescent Homes	$544,519	$509,474	$35,045	6.88%
17	Retail, Commercial, Light Industrial	$2,142,069	$2,192,308	($50,238)	-2.29%
18	Auto Repair, Car Wash	$271,722	$220,078	$51,643	23.47%
19	Office, Motels (without Restaurants)	$1,501,301	$1,273,072	$228,229	17.93%
20	Total	$9,256,640	$8,355,468	$901,172	10.79%
21					
22	Non-Residential Customers - High Strength				
23	Restaurants, Hotels	$1,550,837	$994,087	$556,750	56.01%
24					
25	Domestic Liquid Waste	$278,057	$194,852	$83,205	42.70%
26					
27	Industrial	$1,682,388	$593		
28	Discharge Flow		$287,222		
29	Biochemical Oxygen Demand (BOD)		$907,949		
30	Suspended Solids Charge (TSS)		$408,524		
31	Total Industrial	$1,682,388	$1,604,288	$78,100	4.87%
32					
33					
34	Total Inside City	$29,788,575	$26,546,800	$3,241,775	12.21%
35					
36					
37	Loma Linda				
38					
39	All Residential Customers - Domestic Strength				
40	Residential	$912,619	$1,224,557	($311,938)	-25.47%
41	Multi-Family (2 Units)	$57,097	$1,274	$55,823	4380.89%
42	Multi-Family (3 Units)	$27,304	$4,503	$22,801	506.29%
43	Total	$997,020	$1,230,335	($233,315)	-18.96%
44					
45	Non-Residential Customers - Low Strength				
46	Laundromats	$7,025	$9,042	($2,017)	-22.31%
47	Schools, Churches, Nursery Schools	$3,653	$6,739	($3,086)	-45.80%
48	Total	$10,678	$15,782	($5,104)	-32.34%
49					
50	Non-Residential Customers - Medium Strength				
51	Multi-Family, Mobile Home Parks (4 or more units)	$709,295	$588,491	$120,804	20.53%
52	Hospitals, Convalescent Homes	$285,361	$250,631	$34,730	13.86%
53	Retail, Commercial, Light Industrial	$104,112	$119,983	($15,871)	-13.23%
54	Auto Repair, Car Wash	$19,346	$15,816	$3,530	22.32%
55	Office, Motels (without Restaurants)	$47,931	$39,080	$8,851	22.65%
56	Total	$1,166,045	$1,014,000	$152,045	31.74%
57					
58	Non-Residential Customers - High Strength				
59	Restaurants, Hotels	$57,260	$41,048	$16,212	39.50%
60					
61	Other				
62	Industrial	$0	$127	($127)	-100.00%
63	Bi-Monthly Flat Rate	$27,071	$25,612	$1,460	5.70%
64	MFR Bi-Monthly Flat Rate	$7,665	$4,058	$3,606	88.86%
65	Total	$34,736	$29,796	$4,939	16.58%
66					
67	Total Loma Linda	$2,265,739	$2,330,961	($65,221)	-2.80%
68					
69	Total System	$32,054,314	$28,877,761	$3,176,554	11.00%

8. Wastewater Rate Design

8.1.1. WASTEWATER RATE DESIGN - NEW RECOMMENDED STRUCTURE

Wastewater rates must be designed to recover the customer class cost of service determined by the COS analysis. This section of the report discusses the derivation of both monthly fixed charges and $/HCF commodity rates under the recommended new rate structure. The Department has a complex wastewater rate structure that includes both fixed charges and commodity rates designed to recover the costs of the wastewater treatment system. Because the Department provides wastewater treatment services to the City of Loma Linda (Loma Linda), wastewater treatment rates and charges are paid by both Inside City and Loma Linda customers. In addition, the Department also maintains separate fixed charges and commodity rates to recover the cost of wastewater collection system that serves Inside City customers (Loma Linda has its own separate collection system).

8.1.2. BILLING UNITS USED IN COMMODITY RATE DESIGN

Table 8-1 illustrates the rationale for the billing units used in the wastewater commodity rate design. Note that the billing units used for Residential customers are based on an annualized estimate of average residential winter water consumption.

Table 8-1: FY 2022 Billing Units Used in Commodity Rate Design

Line	Inside City	Billed Water Consumption	Return Flow Volume	Billing Units Used in Rate Design	Comment
1	Residential	6,818,894	2,727,558	4,883,595	Estimated winter average water consumption
2	Multi-Family (2 Units)	295,253	162,389	295,253	Based on Actual Water Usage
3	Multi-Family (3 Units)	121,875	79,219	121,875	"
4	Multi-Family, Mobile Home Parks (>4 units)	1,777,302	1,510,707	1,777,302	"
5	Retail, Commercial, Light Industrial	606,181	575,872	606,181	"
6	Auto Repair, Car Wash	81,899	69,614	81,899	"
7	Office, Motels (without Restaurants)	451,148	428,591	451,148	"
8	Restaurants, Hotels	233,988	198,890	233,988	"
9	Laundromats	63,764	63,764	63,764	"
10	Hospitals, Convalescent Homes	201,921	171,633	201,921	"
11	Schools, Churches, Nursery Schools	287,861	244,682	287,861	"
12	Domestic Liquid Waste	5,210	5,210	5,210	"
13	Industrial	350,269	350,269	350,269	"
14	Total Inside City	11,295,564	6,588,396	9,360,265	
15			58.3%	82.9%	
16	Outside City-Loma Linda	Billed Water Consumption	Return Flow Volume	Billing Units Used in Rate Design	Comment
17	Residential	838,359	335,343	600,421	Estimated winter average water consumption
18	Multi-Family (2 Units)	36,300	19,965	36,300	Based on Actual Water Usage
19	Multi-Family (3 Units)	14,984	9,740	14,984	"
20	Multi-Family, Mobile Home Parks (>4 units)	384,241	326,605	384,241	"
21	Retail, Commercial, Light Industrial	47,052	44,699	47,052	"
22	Auto Repair, Car Wash	9,872	8,391	9,872	"
23	Office, Motels (without Restaurants)	21,330	20,264	21,330	"
24	Restaurants, Hotels	12,008	10,207	12,008	"
25	Laundromats	4,872	4,872	4,872	"
26	Hospitals, Convalescent Homes	153,701	130,646	153,701	"
27	Schools, Churches, Nursery Schools	4,686	2,543	4,686	"
28	Industrial	0	0	0	"
29	Bi-Monthly Flat Rate	0	0	0	"
30	MFR Bi-Monthly Flat Rate	0	0	0	"
31	Total Loma Linda	1,527,405	913,275	1,289,467	
32			59.8%	84.4%	
34	Total System	12,822,969	7,501,671	10,649,732	

8.1.3. STRENGTH LOADING BASED RATES

The key objectives for potential modifications to the current wastewater rate structure, as determined by Department staff in consultation with Raftelis, are listed below. These objectives were presented to the Board at a public meeting held on September 14, 2021.

- Revenue Sufficiency/Revenue Adequacy
- Affordability
- Simplicity/Ease of Understanding
- Consolidation of the Treatment and Collection Rates

The new recommended rate structure as developed by Raftelis in consultation with Department staff achieves the above objectives. The proposed cost-based commodity rates under this new structure meets the objectives of simplicity and ease of understanding in two ways. First, it eliminates the need for separate treatment and collection system rates. Second, it combines all the Department's different $/HCF commodity rates into one of three cost-based customer classes (as shown below in Table 8-2).

Under the new recommended wastewater rate structure, Residential customers (Single Family Residential and Multi-Family Residential of 3 units or less) will not pay a commodity rate. Instead, cost recovery from these customers will be through a monthly fixed charge. It is important to note that rates of all customers, regardless of the cost recovery mechanism used in the rate design, reflect the determination of customer class cost of service based on the strength loading ranges shown in Table 7-4.

Table 8-2: FY 2022 Customer Class Strength Ranges

Line	Strength Range	BOD mg/L Range	TSS mg/L Range	Type of Cost Recovery
1	Residential Customers - Domestic Strength	0 - 250	0 - 240	Fixed
2	Non-Residential Customers - Low Strength	0 - 200	0 - 200	Fixed + Commodity
3	Non-Residential Customers - Medium Strength	201 - 400	201 - 400	Fixed + Commodity
4	Non-Residential Customers - High Strength	401 - 1000	401 - 1000	Fixed + Commodity

8.1.4. CALCULATION OF BLENDED TREATMENT RATES

Inside City and Outside City-Loma Linda customers pay for the recovery of variable treatment costs on a proportional basis. Table 8-3 shows the calculation of the blended treatment rate for each strength range. Because the treatment rate is shared between both Inside City and Outside City-Loma Linda customers, the billed units of service are combined. Note that, because the recommended rate design recovers costs from Residential customers on a fixed basis (i.e., Residential customers do not pay a commodity rate), the total variable treatment costs for Residential customers are divided by the number of bills instead of billed water consumption.

Table 8-3: Calculation of FY 2022 Blended Treatment Rates

Line	Variable Treatment Rate (Inside City + Outside City-Loma Linda)	Inside City Variable Treatment COS	Loma Linda Variable Treatment COS	Total Variable Treatment COS	Billed Units: Inside City + Outside City-Loma Linda	$/HCF	Bills	$/Bill/Mo
1	**Residential - Domestic Strength**							
2	Residential	$5,781,433	$710,806	$6,492,239	5,484,016	$1.19	425,329	$15.27
3	Multi-Family (2 Units)	$344,206	$42,319	$386,525	331,553	$1.17	31,146	$12.42
4	Multi-Family (3 Units)	$167,915	$20,645	$188,560	136,859	$1.38	14,035	$13.44
5	All Residential	$6,293,554	$773,770	$7,067,324	5,952,428	$1.19	470,510	$15.02
6								
7	**Non-Residential - Low Strength**							
8	Laundromats	$90,677	$6,928	$97,606	68,636	$1.43		
9	Schools, Churches, Nursery Schools	$325,670	$3,385	$329,055	206,607	$1.60		
10	All Low Strength	$416,348	$10,313	$426,661	275,243	$1.56		
11								
12	**Non-Residential - Medium Strength**							
13	Multi-Family, Mobile Home Parks (4 or more units)	$3,202,150	$692,284	$3,894,434	2,161,543	$1.81		
14	Hospitals, Convalescent Homes	$373,205	$284,081	$657,286	441,562	$1.49		
15	Retail, Commercial, Light Industrial	$1,296,048	$100,600	$1,396,647	653,233	$2.14		
16	Auto Repair, Car Wash	$156,672	$18,885	$175,558	91,771	$1.92		
17	Office, Motels (without Restaurants)	$956,807	$45,237	$1,002,044	472,478	$2.13		
18	All Medium Strength	$5,984,882	$1,141,087	$7,125,969	3,820,587	$1.87		
19								
20	**Non-Residential - High Strength**							
21	Restaurants, Hotels	$1,090,974	$55,988	$1,146,961	245,996	**$4.67**		
22								
23	**Domestic Liquid Waste**	$278,057		$278,057	3,897,037	**$0.0714**		
24					Gallons	$ per Gallon		
25	**Industrial**							
26	Discharge Flow							
27	Biochemical Oxygen Demand (BOD)							
28	Suspended Solids Charge (TSS)							
29	Industrial	$1,202,392	$0	$1,202,392	350,269	**Industrial rates calculated separately**		
30								
31	Total Variable Treatment COS	$15,266,207	$1,981,158	$17,247,365	14,541,559			

8.1.5. CALCULATION OF INSIDE CITY COLLECTION RATES

Only Inside City customers pay collection-related rates designed to pay for variable collection system costs on a proportional basis. Table 8-4 shows the calculation of these rates. Note that, because the recommended rate design recovers costs from Residential customers on a fixed basis, the total variable collection system costs for Residential customers are divided by the number of bills instead of billed water consumption.

Table 8-4: Calculation of FY 2022 Inside City Collection Rates

Line	Variable Collection System Rate (Inside City Only)	Collection Variable	Total Variable	Billed Units	$/HCF	Bills	$/Bill/Mo
1	**Residential - Domestic Strength**						
2	Residential	$2,527,305	$2,527,305	4,883,595	$0.52	398,208	$6.35
3	Multi-Family (2 Units)	$150,467	$150,467	295,253	$0.51	29,160	$5.17
4	Multi-Family (3 Units)	$73,403	$73,403	121,875	$0.61	13,140	$5.59
5	All Residential	$2,751,175	$2,751,175	5,300,723	$0.52	440,508	**$6.25**
6							
7	**Non-Residential - Low Strength**						
8	Laundromats	$44,198	$44,198	63,764	$0.70		
9	Schools, Churches, Nursery Schools	$162,177	$162,177	287,861	$0.57		
10	All Low Strength	$206,375	$206,375	351,625	**$0.59**		
11							
12	**Non-Residential - Medium Strength**						
13	Multi-Family, Mobile Home Parks (4 or more units)	$1,399,793	$1,399,793	1,777,302	$0.79		
14	Hospitals, Convalescent Homes	$162,176	$162,176	201,921	$0.81		
15	Retail, Commercial, Light Industrial	$558,958	$558,958	606,181	$0.93		
16	Auto Repair, Car Wash	$67,570	$67,570	81,899	$0.83		
17	Office, Motels (without Restaurants)	$413,379	$413,379	451,148	$0.92		
18	Total Medium	$2,601,876	$2,601,876	3,118,451	**$0.84**		
19							
20	**Non-Residential - High Strength**						
21	Restaurants, Hotels	$407,218	$407,218	233,988	$1.75		
22							
23	**Domestic Liquid Waste**	$0	$0	3,897,037	$0.00		
24				Gallons	$ per Gallon		
25	**Industrial**						
26	Discharge Flow						
27	Biochemical Oxygen Demand (BOD)						
28	Suspended Solids Charge (TSS)						
29	Industrial	$478,009	$478,009	350,269	**Industrial rates calculated separately**		
30							
31	Total Variable Collection System Rate	$6,444,653	$6,444,653	9,360,265			

8.1.6. CALCULATION OF INSIDE CITY MONTHLY SERVICE CHARGES

Fixed charges do not vary based on the volume of customer billed discharges. Therefore, all Inside City customers pay the same monthly service charge. Table 8-5 shows this calculation for Inside City customers. All Inside City customers pay $16.56 per account/bill per month.

Table 8-5: Calculation of FY 2022 Inside City Monthly Service Charges

		Fixed $/Account/Month				
Line	Inside City Fixed Charge	Treatment Fixed	Collection Fixed	Total Fixed	Bills	$/Acct /Month
1	**Residential - Domestic Strength**					
2	Residential	$3,540,353	$3,051,981	$6,592,334	398,208	$16.56
3	Multi-Family (2 Units)	$259,253	$223,491	$482,744	29,160	$16.56
4	Multi-Family (3 Units)	$116,824	$100,709	$217,533	13,140	$16.56
5	All Residential	$3,916,430	$3,376,180	$7,292,611	440,508	$16.56
6						
7	**Non-Residential - Low Strength**					
8	Laundromats	$2,454	$2,115	$4,569	276	$16.56
9	Schools, Churches, Nursery Schools	$30,086	$25,936	$56,022	3,384	$16.56
10	All Low Strength	$32,540	$28,051	$60,591	3,660	$16.56
11						
12	**Non-Residential - Medium Strength**					
13	Multi-Family, Mobile Home Parks (4 or more units)	$104,768	$90,316	$195,084	11,784	$16.56
14	Hospitals, Convalescent Homes	$4,908	$4,231	$9,138	552	$16.56
15	Retail, Commercial, Light Industrial	$154,165	$132,899	$287,064	17,340	$16.56
16	Auto Repair, Car Wash	$25,499	$21,981	$47,480	2,868	$16.56
17	Office, Motels (without Restaurants)	$70,414	$60,701	$131,116	$7,920	$16.56
18	All Medium Strength	$359,754	$310,128	$669,882	40,464	$16.56
19						
20	**Non-Residential - High Strength**					
21	Restaurants, Hotels	$28,272	$24,372	$52,645	3,180	$16.56
22						
23	**Domestic Liquid Waste**	$0	$0	$0	0	$0.00
24						
25	**Industrial**					
26	Discharge Flow					
27	Biochemical Oxygen Demand (BOD)					
28	Suspended Solids Charge (TSS)					
29	Industrial	$1,067	$920	$1,987	120	$16.56
30						
31	Total Inside City Fixed COS	$4,338,064	$3,739,652	$8,077,715	487,932	**$16.56**

8.1.7. CALCULATION OF LOMA LINDA MONTHLY SERVICE CHARGES

Fixed charges do not vary based on the volume of customer billed discharges. Therefore, all Outside City-Loma Linda customers pay the same monthly service charge. Table 8-6 shows this calculation. Note that the Loma Linda monthly fixed charge excludes $1.45 of customer billing and customer service costs per month because Loma Linda customers do not receive the benefit of these services. All Inside City customers pay $6.00 per account/bill per month.

Table 8-6: Calculation of FY 2022 Outside City-Loma Linda Monthly Service Charges

		Fixed $/Account/Month				
Line	Loma Linda Fixed Charge	Treatment Fixed	Collection Fixed	Total Fixed	Bills	$/Acct /Month
1	**Residential - Domestic Strength**					
2	Residential	$201,813	$0	$162,503	27,121	$6.00
3	Multi-Family (2 Units)	$14,778	$0	$11,900	1,986	$6.00
4	Multi-Family (3 Units)	$6,659	$0	$5,362	895	$6.00
5	All Residential	$223,250	$0	$179,765	30,002	$6.00
6						
7	**Non-Residential - Low Strength**					
8	Laundromats	$97	$0	$78	13	$6.00
9	Schools, Churches, Nursery Schools	$268	$0	$216	36	$6.00
10	All Low Strength	$365	$0	$294	49	$6.00
11						
12	**Non-Residential - Medium Strength**					
13	Multi-Family, Mobile Home Parks (4 or more units)	$17,011	$0	$13,697	$2,286	$6.00
14	Hospitals, Convalescent Homes	$1,280	$0	$1,031	$172	$6.00
15	Retail, Commercial, Light Industrial	$3,512	$0	$2,828	$472	$6.00
16	Auto Repair, Car Wash	$461	$0	$371	$62	$6.00
17	Office, Motels (without Restaurants)	$2,694	$0	$2,169	$362	$6.00
18	All Medium Strength	$24,958	$0	$20,097	$3,354	$6.00
19						
20	**Non-Residential - High Strength**					
21	Restaurants, Hotels	$1,272	$0	$1,025	171	$6.00
22						
23	Total Outside City: Loma Linda Fixed COS	$284,581	$0	$229,150	38,244	**$6.00**

8.1.8. CALCULATION OF INDUSTRIAL VARIABLE RATES

The Department provides service to approximately ten Industrial customers. The wastewater flow volumes discharged by these customers is monitored via separate discharge meters. Rates for Industrial customers are charged on the following basis: $/million gallons for flow, $/thousand pound for BOD and TSS. Table 8-7 shows the calculation of FY 2022 Industrial customer rates.

Table 8-7: Calculation of FY 2022 Industrial Rates

Line	Industrial COS	Total COS	I/I Flow	Flow	BOD	TSS			
1	Treatment								
2	Industrial	$1,202,392	$8,155	$213,569	$536,047	$444,621			
3	Units of Service		350,269	350,269	1,100,477	917,064			
4	Unit COS		$0.0233	$0.6097	$0.4871	$0.4848			
5									
6	Collection								
7	Industrial	$478,009	$3,976	$146,583	$177,361	$150,088			
8	Units of Service		350,269	350,269	1,100,477	917,064			
9	Unit COS		$0.0114	$0.4185	$0.1612	$0.1637			
10									
11	Combined								
12	Industrial	$1,680,401	$12,131	$360,152	$713,409	$594,709			
13	Units of Service		350,269	350,269	1,100,477	917,064			
14	Unit COS		$0.0346	$1.0282	$0.6483	$0.6485			
15									
16									
17	Industrial Rate Design	Total	Flow (HCF)	Flow (Gallons)	Flow (MG)	BOD (Pounds)	BOD (1,000s of Pounds)	TSS (Pounds)	TSS (1,000s of Pounds)
18	COS	$1,680,401	$372,283	$372,283	$372,283	$713,409	$713,409	$594,709	$594,709
19	Units of Service		350,269	262,018,375	262.0	1,100,477	1,100.5	917,064	917.06
20	Unit Cost of Service		$1.06	$0.00142	$1,420.83	$0.65	$648.28	$0.65	$648.50
21									
22									
23	Rate Summary		$ Units	Existing Rates	Calculated Rates				
24	Flow		$ per MG	$1,094.00	$1,420.83				
25	BOD		$ per 1,000 lbs.	$438.00	$648.28				
26	TSS		$ per 1,000 lbs.	$778.00	$648.50				

8.1.9. PROPOSED COMMODITY RATES FOR FY 2022 - 2026

After determining COS rates for FY 2022, the rates for the period FY 2023 - 2026 are calculated based on the overall financial planning increase originally shown in Table 1-1. Those increases were 11% for FY 2023, 8% for FY 2024, and 8% in FY 2025 and FY 2026. The resulting proposed wastewater commodity rates for the entire FY 2022 - FY 2026 planning horizon are shown in Table 8-8.

Table 8-8: Proposed FY 2022 - FY 2026 Wastewater Commodity Rates

Customer Class	Billing Unit	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
Inside City							
Residential: Domestic Strength							
Residential	$/HCF	N/A	N/A	N/A	N/A	N/A	N/A
Multi-Family (2 Units)							
Multi-Family (3 Units)							
Non-Residential: Low Strength							
Laundromats	$/HCF	$2.70	$2.15	$2.39	$2.58	$2.78	$3.01
Schools, Churches, Nursery Schools		$2.20					
Non-Residential: Medium Strength							
Multi-Family, Mobile Home Parks (4 or more units)	$/HCF	$2.40	$2.71	$3.01	$3.25	$3.51	$3.79
Hospitals, Convalescent Homes		$2.50					
Retail, Commercial, Light Industrial		$3.42					
Auto Repair, Car Wash		$2.45					
Office, Motels (without Restaurants)		$2.70					
Non-Residential: High Strength							
Restaurants, Hotels	$/HCF	$4.15	$6.42	$7.13	$7.70	$8.31	$8.98
Domestic Liquid Waste	$/Gallons	$0.0500	$0.0714	$0.0793	$0.0856	$0.0924	$0.0998
Industrial							
Flow	$ per MG	$1,094.00	$1,420.83	$1,577.12	$1,703.29	$1,839.55	$1,986.72
Biochemical Oxygen Demand	$ per 1,000 lbs.	$438.00	$648.28	$719.59	$777.16	$839.33	$906.48
Suspended Solids	$ per 1,000 lbs.	$778.00	$648.50	$719.84	$777.42	$839.62	$906.78
Loma Linda							
Residential: Domestic Strength							
Residential	$/HCF	N/A	N/A	N/A	N/A	N/A	N/A
Multi-Family (2 Units)							
Multi-Family (3 Units)							
Non-Residential: Low Strength	$/HCF						
Laundromats		$1.83	$1.56	$1.73	$1.87	$2.02	$2.18
Schools, Churches, Nursery Schools		$1.33					
Non-Residential: Medium Strength							
Multi-Family, Mobile Home Parks (4 or more units)	$/HCF	$1.53	$1.87	$2.08	$2.24	$2.42	$2.61
Hospitals, Convalescent Homes		$1.63					
Retail, Commercial, Light Industrial		$2.55					
Auto Repair, Car Wash		$1.58					
Office, Motels (without Restaurants)		$1.83					
Non-Residential: High Strength							
Restaurants, Hotels	$/HCF	$3.28	$4.67	$5.18	$5.60	$6.05	$6.53

8.1.10. PROPOSED MONTHLY SERVICE CHARGES FOR FY 2022 - 2026

Proposed wastewater monthly wastewater service charges for the entire FY 2022 - FY 2026 planning horizon are shown in Table 8-9.

Table 8-9: Proposed FY 2022 - FY 2026 Monthly Service Charges

Customer Class	Billing Unit	Current	FY 2022 (April 2022)	FY 2023 (July 2022)	FY 2024 (July 2023)	FY 2025 (July 2024)	FY 2026 (July 2025)
Inside City							
Residential							
Residential	$/Account/Month	$33.00	$37.83	$41.99	$45.35	$48.98	$52.90
Multi-Family (2 Units)	$/Account/Month	$66.05	$75.66	$83.98	$90.70	$97.96	$105.80
Multi-Family (3 Units)	$/Account/Month	$99.04	$113.49	$125.98	$136.05	$146.94	$158.69
All Non-Residential	$/Account/Month	$6.62	$16.56	$18.38	$19.85	$21.44	$23.16
Domestic Liquid Waste	$/Account/Month	N/A	N/A	N/A	N/A	N/A	N/A
Industrial	$/Account/Month	4.93	$16.56	$18.38	$19.85	$21.44	$23.16
Loma Linda							
Residential							
Residential	$/Account/Month	$21.55	$21.02	$23.33	$25.20	$27.22	$29.39
Multi-Family (2 Units)	$/Account/Month	$43.10	$42.04	$46.67	$50.40	$54.43	$58.79
Multi-Family (3 Units)	$/Account/Month	$64.64	$63.06	$70.00	$75.60	$81.65	$88.18
All Non-Residential (Note 1)	$/Account/Month	$3.52	$6.00	$6.66	$7.19	$7.77	$8.39
Note 1: Multi-Family, Mobile Home Parks (4 or more units) currently pay a service charge of $1.97 per account per month							

8.1.11. CUSTOMER BILL IMPACTS

Table 8-10 shows the estimated sewer bill impacts for a Single-Family Residential customer.

Table 8-10: Single Family Residential Bill Impacts

Current	April 2022	$ Increase	July 2022	$ Increase
$33.00	$37.83	$4.83	$42.00	$4.17