

Attachment A

CITY OF PASADENA

Water Financial Plan & Rate Study

FINAL DRAFT REPORT / MAY 15, 2024



PASADENA



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May 15, 2024

Elena Chamorro
Principal Financial/Rate Analyst
City of Pasadena
100 N. Garfield Ave.,
Pasadena, CA 91101

Subject: Water Financial Plan & Rate Study Report

Dear Ms. Chamorro,

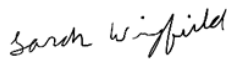
Raftelis is pleased to present this Water Financial Plan & Rate Study Report. The rate study involved a comprehensive review of Pasadena Water and Power's financial plan, an assessment of and presentation to the Municipal Services Committee of alternative tiered rate structures (including budget-based tiered rates), and an allocation of costs to customer classes and tiers using Cost of Service principles. The report provides a brief Executive Summary followed by a detailed discussion regarding study assumptions and an in-depth rate derivation.

It was a pleasure working with you and we wish to express our thanks for the support from you and your staff. If you have any questions, please call me at 213 262 9308.

Sincerely,

A handwritten signature in blue ink that reads 'Steve Gagnon'.

Steve Gagnon
Vice President, PE
Project Manager

A handwritten signature in blue ink that reads 'Sarah Wingfield'.

Sarah Wingfield
Associate Consultant

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1. Executive Summary

1.1. Background

In 2022, the City of Pasadena’s Water and Power Department (Department) engaged Raftelis to conduct a Water Rate Study (Study) which included a financial plan, cost of service study, and rate design. This report presents the financial plan and the resulting rates recommended for implementation beginning on July 1, 2024.

This Executive Summary summarizes the water financial plan and proposed rates and contains a description of the methodology, results, and recommendations. The Department’s last rate adjustment was effective on January 1, 2023. The last structural adjustment to rates was in 2009. Cost of service compliance studies were completed in 2016, 2018, and 2022, but no additional structural changes were made. In this study, the Department wishes to establish rates that:

1. Meet the Department’s fiscal needs in terms of operational expenses, reserve goals, debt coverage requirements, and capital investment to maintain the system
2. Are fair and equitable and therefore proportionately allocate the costs of providing service in accordance with California Constitution Article XIII D, section 6 (commonly referred to as Proposition 218)
3. Result in stable charges over time for customers
4. Promote water conservation

1.2. Methodology

The water rates presented in this report were developed using cost of service (COS) principles set forth by the American Water Works Association M1 Manual titled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). Cost of service principles endeavor to distribute costs to customer classes in accordance with the way each class uses the water system which affects system sizing and operating costs. This methodology is described in detail in Sections 3 and 4. The Base-Extra Capacity Method of the AWWA M1 Manual was used to distribute costs to customer classes and tiers. This method separates costs into five main components: (1) base (sometimes called delivery costs) (2) extra capacity costs, (3) customer costs, (4) meter maintenance costs and (5) fire protection costs. These components are the standard components of a cost of service study, however there are often additional cost components as described in Section 3.2. Base costs are associated with meeting average daily demand needs and include operations and maintenance costs and capital costs designed to meet average load conditions. Extra capacity costs are (both operating and capital costs) associated with meeting peak demand. Customer costs are associated with serving customers, such as meter reading, billing and customer service, etc. Meter maintenance costs are those associated with maintaining and replacing meters. Fire protection costs are related solely to the fire protection function of a water system, such as fire hydrants and related mains and valves.

1.3. Results and Recommendations

Table 1-1 shows the revenue adjustments for the water enterprise as part of the proposed financial plan. The revenue adjustment is the additional amount of revenue collected compared to the amount collected

by current rates. Note that revenue increases are not the same as customer bill impacts, because cost allocations made as part of the cost of service analysis and the revised rate structure affects customer bills.

Table 1-1: Proposed Rate Revenue Adjustments

Fiscal Year (FY)	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Effective Date	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027	July 1, 2028
Revenue Adjustment	13.0%	12.0%	9.0%	8.0%	7.0%

1.3.1. FACTORS AFFECTING REVENUE ADJUSTMENTS

The following items affect the Department’s revenue requirement (i.e., costs) and thus the rate. The Department’s revenue requirement include: Operation and Maintenance (“O&M”) expenses, capital expenses, debt service and reserve funding.

- » **O&M Expenses:** The Department’s O&M expenses are projected to increase each year, in line with general cost inflation and the increasing cost of employee benefits. Post pandemic inflation has been higher than the average for the last 20 years.
- » **Water Supply Costs:** The Department’s expenses for imported water purchases are also expected to increase based on rate increases proposed by the Department’s wholesale water supplier; Metropolitan Water District (“MWD”).
- » **Capital Investment:** The Department will complete significant replacement projects and repairs to its water system, totaling approximately \$197million over the entire study period (or an estimated average of \$36 million per year). These improvements are required to maintain the reliability of the Department’s extensive water delivery system. The Department will use bond financing and cash to fund the projects. A small portion of the projects will be funded by NASA and Contributions in Aid of Construction (from developers).

The Department will purposely make use of fund balances, as shown herein, to minimize customer rate impacts. Using fund balances to fund operating and capital costs lowers the amount of required rate revenue and therefore customer bills.

1.4. Current Water Rates

In this report, the terms fee and charge are often used interchangeably. The Department currently charges customers a fixed Distribution and Customer (D&C) charge, including a public Fire Protection Surcharge (FPS), (shown in monthly terms but billed bi-monthly), and a variable rate in dollars per hundred cubic feet (\$/HCF. The Department also charges a uniform, \$/HCF Water Capital Improvement Charge. This rate is designed to collect revenues for capital repair and replacement (R&R) projects that help maintain the functionality of the entire system. In addition, the Department maintains fixed private fire services charges for customers with private fire lines. All rates and tiers are shown in monthly terms; however, in practice, the Department bills the majority of its customers on a bi-monthly basis (equal to two months’ fixed charges and the individual customers’ bi-monthly water use charges).

1.4.1. MONTHLY FIXED CHARGES

The Department currently bills its water customers two fixed charges: the fixed Distribution & Customer Charge and a Public Fire Protection Surcharge (FPS).

The D&C charge is designed to recover the costs associated with installing, maintaining, and servicing a customer's meter, as well as the cost for customer service and meter reading and a portion of the fixed costs associated with extra capacity (e.g. sizing of distribution pipelines, storage tanks, etc.). The D&C charge is monthly fixed charge that varies by meter size; the difference between meter sizes are in accordance with the meter capacity ratios set forth by the AWWA. Table 1-7 shows the current D&C charges by meter size. All charges are shown in monthly terms.

Table 1-2: Current Monthly Fixed Distribution & Customer Charge

Description	Current
Fixed Charge (All Customers)	
5/8"	\$26.08
3/4"	\$26.08
1"	\$49.55
1 1/2"	\$101.71
2"	\$234.75
3"	\$573.79
4"	\$881.50
6"	\$1,361.36
8"	\$2,214.32
10"	\$2,881.97

The FPS component recovers costs associated with public fire protection, or the maintenance and capacity costs required to maintain fire hydrants and public fire protection systems that all customers benefit from. These costs also depend on the meter size and are therefore proportional to the meter size according to AWWA standards. The Department has chosen to absorb the public fire charge into the fixed meter charge so that all customers will simply be billed one fixed charge rather than two. Table 1-3 shows the current Fire Protection Surcharges. All values are in monthly terms.

Table 1-3: Current Public Fire Protection Surcharges¹

Description	Current
Public Fire Surcharge	
5/8"	\$0.38
3/4"	\$0.38
1"	\$0.70
1 1/2"	\$2.68
2"	\$3.45
3"	\$8.13
4"	\$9.58
6"	\$22.00
8"	\$29.48
10"	\$38.20

1.4.2. VARIABLE RATE AND CAPITAL IMPROVEMENT CHARGE

The Department currently bills its water customers two volumetric charges: the Commodity rate and Capital Improvement Charge (CIC). The Commodity rate is an increasing 4-block (or tiered) rates structure, with varying water block allocations based on meter size. That is, all customers pay the same rates for use in each tier but have different tier breakpoints based on meter size. The Water Capital Improvement Charge (CIC) is designed to collect revenues for capital repair and replacement (R&R) projects that help maintain the functionality of the entire system. Table 1-4 shows the current volumetric rates² and the water capital improvement charge (CIC).³ These rates are designed to recover the costs associated with serving each class and tier as discussed in the financial planning and cost of service sections. All values are shown in dollar amount per Hundred Cubic Feet (HCF).

¹ As noted above, the City will absorb these costs into the Fixed Distribution & Customer Charge shown in Table 1-7.

² The City currently bills each tier the same \$/HCF rate, regardless of meter size. Tier breakpoints vary by meter size, however.

³ The CIC charge is a uniform (\$/HCF) rate designed to recover capital costs associated with water system improvements required to treat and deliver water to City customers and a portion of debt service on Water System bonds. All customer classes and meter sizes pay the CIC charge each unit of HCF used during the respective billing period.

Table 1-4: Current Variable Rates (\$/HCF)

Description	Current
Commodity Rates (\$/HCF)	
Block 1	\$1.76489
Block 2	\$3.74827
Block 3	\$4.39376
Block 4	\$5.33137
Water Capital Improvement Charge (\$/HCF)	\$1.12404

Table 1-5 shows the current tier breakpoints by meter size. As shown below, tiers are determined based on meter size. For example, all customers with a 1” meter, regardless of customer class, are subject to the tier breakpoints listed in the second row of Table 1-5. The breakpoints determine how much water is charged at each of the rates (see block rate from Table 1-4). All values are in HCF.

Table 1-5: Current Block Allocation Breakpoints (HCF)

Meter Size(s)	Block 1	Block 2	Block 3	Block 4
5/8", 3/4"	0-8	9-24	25-34	>35
1"	0-12	13-40	41-60	>61
2"	0-48	49-188	189-290	>291
3"	0-116	117-500	501-860	>861
4"	0-225	226-1,000	1,001-1,800	>1,801
6"	0-500	501-5,600	5,601-8,800	>8,801
8"	0-500	501-5,600	5,601-10,000	>10,001
10-12"	0-500	501-24,000	24,001-32,000	>32,001

1.4.3. PRIVATE FIRE SERVICE CHARGES

Table 1-6 shows the Department’s current monthly private fire charges. As with the fixed D&C and FPS charges, these rates are based on meter size and help collect the revenue necessary to cover the costs of maintaining fire-fighting capacity for private fire customers.

Table 1-6: Current Fixed Private Fire Service Charges

Description	FY 2025
4"	\$50.71
6"	\$94.82
8"	\$170.35
10"	\$250.53
12"	\$332.89
16"	\$332.89

1.5. Proposed Water Rates

1.5.1. FIXED CHARGE

The proposed monthly Fixed Charge is designed to recover the costs associated with installing, maintaining, and servicing a customer's meter, as well as the cost for customer service and meter reading and a portion of the fixed costs associated with what is called extra capacity. Note that the revenues for capital repair and replacement projects (R&R) previously collected through the Capital Improvement Charge (CIC) have now been absorbed into the Fixed and Variable charges; the CIC will no longer be charged to customers. The monthly fixed charges vary by meter size; the rate differences between meter sizes are in accordance with the meter capacity ratios set forth by the AWWA. Table 1-7 shows the proposed Fixed Charge by meter size for FY 2025 through FY 2029. All charges are shown in monthly terms.

Table 1-7: Proposed Monthly Fixed Charge

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
All Customers					
5/8"	\$38.62	\$43.25	\$47.15	\$50.92	\$54.48
3/4"	\$38.62	\$43.25	\$47.15	\$50.92	\$54.48
1"	\$60.19	\$67.41	\$73.48	\$79.36	\$84.91
1 1/2"	\$114.11	\$127.81	\$139.31	\$150.45	\$160.98
2"	\$178.82	\$200.28	\$218.31	\$235.77	\$252.27
3"	\$475.40	\$532.45	\$580.37	\$626.80	\$670.68
4"	\$815.13	\$912.94	\$995.11	\$1,074.72	\$1,149.95
6"	\$1,731.84	\$1,939.66	\$2,114.23	\$2,283.37	\$2,443.20
8"	\$3,026.02	\$3,389.14	\$3,694.16	\$3,989.70	\$4,268.97
10"	\$4,535.89	\$5,080.20	\$5,537.42	\$5,980.41	\$6,399.04

1.5.2. VARIABLE RATE

The proposed variable rate structure consists of separate rates for Residential Single Family (SFR), Residential Multi-Family (MFR), and Commercial classes. Commercial classes are further divided into sub-classes according to meter size. All non-residential customer classes are now included in the Commercial class. The proposed variable rate structure consists of three tiers as opposed to the previous four. The variable rates are designed to recover the costs associated with water purchases, testing and treatment of local groundwater, water production, and a portion of capital improvement projects. The breakpoint for tier 1 is equal to the monthly indoor water use for four people calculated as 42 gallons per person per day. The tier 2 breakpoint is equal to the average summertime use for single family residential customers. This is a common method to set tier breakpoints. Table 1-8 shows the proposed variable rates for each customer class/tier. All values are shown in \$/HCF.

Table 1-8: Proposed Variable Rates (\$/HCF)

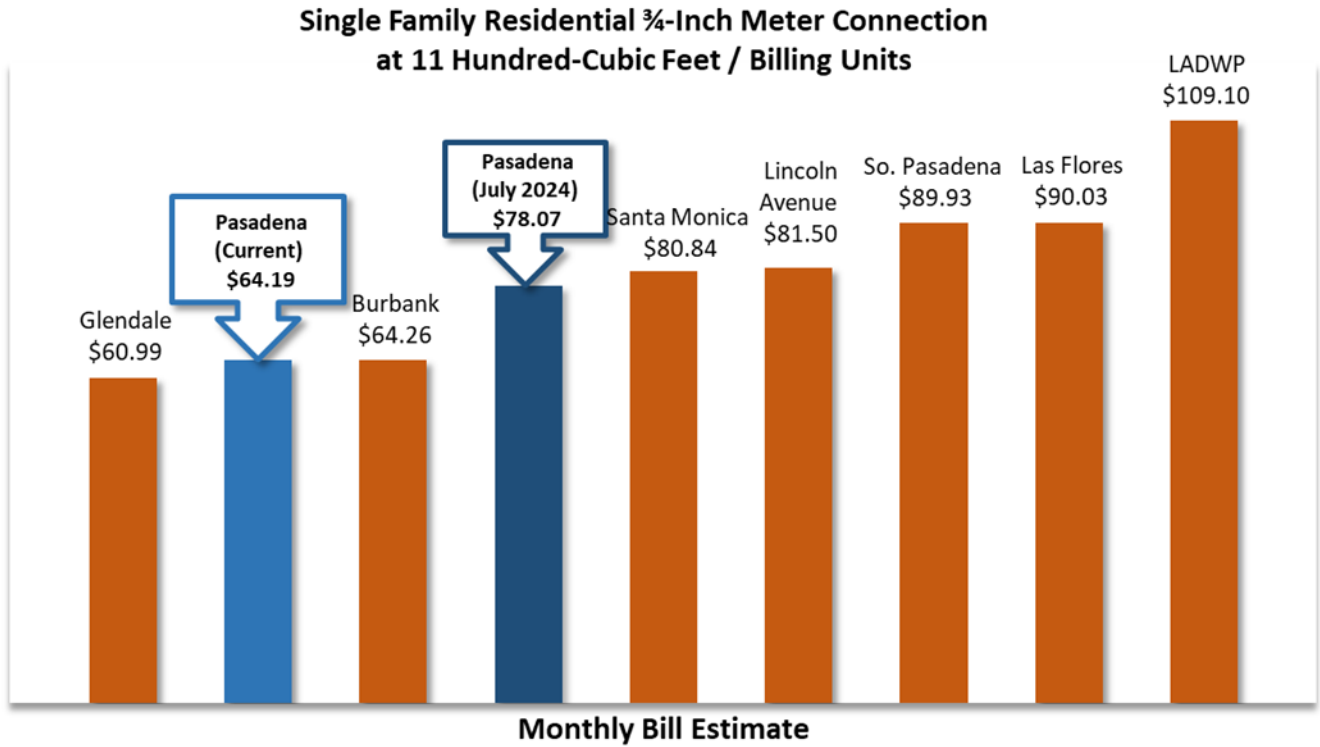
Description	Tier Breakpoints	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Single Family Residential						
Tier 1	0-7	\$2.24818	\$2.51796	\$2.74458	\$2.96414	\$3.17163
Tier 2	7-29	\$5.92680	\$6.63802	\$7.23544	\$7.81428	\$8.36128
Tier 3	Over 29	\$6.44550	\$7.21896	\$7.86867	\$8.49816	\$9.09303
Multi-Family Residential						
Tier 1	0-5	\$2.24209	\$2.51114	\$2.73714	\$2.95611	\$3.16304
Tier 2	5-10	\$5.87186	\$6.57648	\$7.16836	\$7.74183	\$8.28376
Tier 3	Over10	\$6.24448	\$6.99382	\$7.62327	\$8.23313	\$8.80945
Commercial Small (5/8"-1")						
Tier 1	0-8	\$2.21109	\$2.47642	\$2.69930	\$2.91524	\$3.11931
Tier 2	8-43	\$5.84411	\$6.54540	\$7.13448	\$7.70524	\$8.24461
Tier 3	Over 43	\$6.19440	\$6.93773	\$7.56212	\$8.16709	\$8.73879
Commercial Medium (1 1/2"-4")						
Tier 1	0-52	\$2.25510	\$2.52571	\$2.75303	\$2.97327	\$3.18140
Tier 2	52-265	\$5.88262	\$6.58853	\$7.18150	\$7.75602	\$8.29894
Tier 3	Over 265	\$6.36652	\$7.13050	\$7.77224	\$8.39402	\$8.98160
Commercial Large (6" & up)						
Tier 1	0-850	\$2.27128	\$2.54383	\$2.77278	\$2.99460	\$3.20422
Tier 2	850-5,050	\$5.94146	\$6.65444	\$7.25333	\$7.83360	\$8.38195
Tier 3	Over 5,050	\$6.55430	\$7.34082	\$8.00149	\$8.64161	\$9.24652

1.5.3. SURROUNDING AGENCY BILL SURVEY

Figure 1-1 shows a monthly⁴ water bill comparison for the current and proposed rates against seven neighboring agencies. The survey assumes a single-family residential customer using 11 HCF of water per month, with a 3/4" metered connection. This survey was conducted in January 2024 and should only be used as a reference point or as a snapshot in time.

⁴ Agencies with a bi-monthly billing cycle are adjusted to a monthly billing cycle by dividing fixed charges and tier widths in half.

Figure 1-1: Monthly Bill Comparisons for Neighboring Agencies



2. Water Enterprise Financial Plan

This section describes the water Financial Plan, which is used to determine the revenue requirement for rates based on costs associated with operating & maintenance expenses (O&M), capital improvement projects (CIP), debt coverage, and reserve targets. The revenue requirement was determined to meet the reserve targets for a 5-year period to satisfy the capital funding needs and the debt coverage requirements.

2.1. Water System Background

Located in eastern Los Angeles County, the Department of Pasadena Department of Water & Power provides water services to approximately 38,000 residential, commercial, and industrial customers over 25 square miles comprised of the unincorporated areas of Pasadena, Altadena, and San Gabriel.

The Department’s water system currently consists of approximately 520 miles of transmission and distribution pipeline, 14 reservoirs, 12 wells, 19 booster stations, and 2 treatment plants. Water demand is currently met through a combination of local groundwater from the Raymond Basin and imported water from the Metropolitan Water District of Southern California.

2.2. Financial Plan Assumptions

Raftelis created a five-year Financial Plan which models anticipated revenue and expenses. This report shows the Financial Plan and assumptions for the next 5 years (FY 2025 to FY 2029) to correspond with the rate development for these years. This is also known as the study period.

2.2.1. ACCOUNT AND WATER USE GROWTH ASSUMPTIONS

The revenue calculated for each fiscal year in the Financial Plan is a function of the number of accounts, account growth, water use trends, and existing rates. Table 2-1 shows the assumed account growth rates and water demand factors used to project future revenue.

Table 2-1: Account Growth and Water Use Assumptions

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Account Growth					
SFR	0.2%	0.2%	0.2%	0.2%	0.2%
MFR	0.1%	0.1%	0.1%	0.1%	0.1%
Commercial	0.2%	0.2%	0.2%	0.2%	0.2%
Water Demand Factor	100.5%	100.5%	100.5%	100.5%	100.0%

2.2.2. NUMBER OF ACCOUNTS

Table 2-2 shows the projected number of water accounts by meter size and customer class for each year in the study period. Residential customer classes include Single Family Residential and Multi-Family Residential. All non-residential sub classes (except for Private Fire) are in the Commercial class under the new rate structure. These include Commercial, City, Industrial, and Commercial & Industrial (C&I)

Emergency Interconnection. Account projections are based on the corresponding account growth inflation factors (shown above in Table 2-1).

Table 2-2: Projected Accounts by Meter Size

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Single Family Residential					
5/8"	15	15	15	15	15
3/4"	16,880	16,914	16,948	16,982	17,016
1"	9,738	9,757	9,777	9,796	9,816
1 1/2"	1,209	1,211	1,214	1,216	1,219
2"	325	326	327	327	328
3"	4	4	4	4	4
Subtotal – SFR	28,171	28,228	28,284	28,341	28,397
Multi-Family Residential					
5/8"	2	2	2	2	2
3/4"	2,069	2,071	2,073	2,075	2,077
1"	1,216	1,218	1,219	1,220	1,221
1 1/2"	490	490	491	491	492
2"	563	564	564	565	565
3"	92	92	92	92	93
4"	47	47	47	47	47
6"	24	24	24	24	24
Subtotal - MFR	4,504	4,508	4,513	4,518	4,522
Commercial					
5/8"	5	5	5	5	5
3/4"	1,168	1,170	1,172	1,175	1,177
1"	1,013	1,015	1,017	1,019	1,021
1 1/2"	504	505	506	507	508
2"	863	865	867	869	870
3"	161	161	161	162	162
4"	168	168	168	169	169
6"	73	73	74	74	74
8"	24	24	24	24	24
10"	4	4	4	4	4
Subtotal – Commercial	3,983	3,991	3,999	4,007	4,015
Total – All Accounts	36,658	36,727	36,796	36,865	36,934

Table 2-3 shows the projected Private Fire Accounts by meter size for the study period. Raftelis developed the projections below by applying the Commercial account growth factors to the Department-provided Private Fire account estimates for FY 2022.

Table 2-3: Projected Private Fire Accounts by Meter Size

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Private Fire					
4"	722	723	725	726	728
6"	394	394	395	396	397
8"	144	144	144	144	145
10"	2	2	2	2	2
12"	3	3	3	3	3
16"	3	3	3	3	3
Total – All Private Fire	1,267	1,270	1,272	1,275	1,277

2.2.3. WATER USE

Table 2-4 shows the projected water use for the study period under the *current rate* structure. The values shown do not include system water loss of 7%. The Department's current structure consists of four tiers. Customers pay the same rate for use in each tier; tier breakpoints (e.g. the permitted use for each tier) depends on meter size (see Table 1-5 above). Estimates for future variable revenues *under existing rates* may therefore be calculated by multiplying the total use for all customers in each tier by the corresponding rate. All values are shown in HCF.

Table 2-4: Projected Water Use by Customer Class (HCF), Existing Structure

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
All Customers					
Tier 1	4,943,184	4,967,900	4,992,739	5,017,703	5,017,703
Tier 2	4,479,521	4,501,918	4,524,427	4,547,049	4,547,049
Tier 3	516,150	518,730	521,324	523,931	523,931
Tier 4	240,638	241,841	243,051	244,266	244,266
Total – All Use (HCF)	10,179,493	10,230,390	10,281,541	10,332,949	10,332,949

2.2.4. INFLATIONARY AND WATER PURCHASE COST ASSUMPTIONS

To ensure future O&M costs are reasonably projected, Raftelis made informed assumptions about inflationary factors related to O&M and capital costs. Table 2-5 shows the inflationary categories that were used to escalate the Department's FY 2024 O&M expense budget, which is part of the Financial Plan. The inflationary factors shown in Table 2-5 reflect long-term averages for general and capital (construction) inflation and utility prices. Personnel, services and supplies, equipment, internal services, and utilities factors were developed in conjunction with Department staff and reflect the City of Pasadena and Department's projections.

Table 2-5: Inflationary Assumptions

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
General	6.0%	4.0%	3.0%	3.0%	3.0%
Personnel	3.5%	3.5%	3.0%	2.5%	3.0%
Services and Supplies	3.0%	3.0%	3.0%	3.0%	3.0%
Equipment	5.0%	4.0%	3.0%	3.0%	3.0%
Internal Services	4.0%	4.0%	4.0%	4.0%	3.0%
Utilities	2.4%	2.4%	2.4%	2.4%	2.4%

Table 2-6 shows projected wholesale water purchase cost inflation. The Department has two potable water sources: groundwater from the Raymond Basin and purchased imported water. The Department purchases most of its imported water from the Metropolitan Water District (MWD). The MWD cost escalators shown in Table 2-6 are taken from MWD’s presentation titled *Proposed Biennial Budget for FYs 2024/25 and 2025/26 Workshop #1, Item 9-4* on February 12, 2024. Historically, Raymond Basin Watermaster charges have not increased often and therefore this study assumes no increase in watermaster charges.

Table 2-6: Water Purchase Cost Inflation

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Water Supply					
MWD RTS Charge	3.0%	10.8%	4.9%	13.4%	3.6%
MWD Capacity Charge	-3.6%	18.5%	3.1%	15.9%	2.0%
MWD Volumetric Rate	16.6%	8.3%	11.5%	6.3%	4.6%
Raymond Basin Watermaster Service	0.0%	0.0%	0.0%	0.0%	0.0%

Table 2-7 shows the estimated water sources/production in acre feet (AF) over the study period. Note that these values are in AF and must be converted to HCF by multiplying the values shown below by 435.6 before comparing to the total water consumption values shown above in Table 2-4. In addition, water loss from small leaks and inefficiencies that develop as the water system ages result in slightly lower values for water consumption than actual water purchases.

Table 2-7: Projected Water Supply by Source (AF)

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Local Groundwater	10,345	10,400	10,450	10,500	10,500
MWD Purchases	14,783	14,853	14,930	15,007	15,007
Total Water Supply	25,128	25,253	25,380	25,507	25,507

Raftelis used the assumptions shown in Table 2-5 through Table 2-7 to develop the Department’s status quo and proposed financial plans which projects revenue and expenses. The financial plan projects annual operating expenses and revenues, capital expenditures, reserve fund balances, and annual debt service coverage ratios to estimate additional rate revenue needed per year.

2.2.5. CAPITAL IMPROVEMENT PROGRAM (CIP) PLAN

Table 2-8 shows the Department’s proposed Capital Improvement Program for FY 2025 through FY 2029. Per Department advice, it accounts for inflation. The Department will need to fund over \$197 million of capital repair & replacement (R&R) projects over the study period. The Department plans to finance these capital projects through a combination of rate revenue, reserve funds (e.g., Water Fund, or WF), Contributions in Aid of Construction and NASA funding. The funding source is shown below in the funding source column. Adopted CIP numbers may differ from this Rate Study due to timing of model and rate development.

Table 2-8: Detailed Capital Improvement Program

Description	Funding Source	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Capital Improvement Projects (CIP)						
Field Services and Meter Reading Automation	WF	\$70,630	\$17,500	\$17,500	\$17,500	\$17,500
Non-Potable Water Reuse Project	WF	\$403,600	\$500,000	\$500,000	\$1,000,000	\$10,000,000
Emergency Generators - Water	WF	\$60,540	\$150,000			\$625,000
Management Information Systems	WF	\$183,638	\$87,500	\$70,000	\$52,500	\$52,500
Geographic Information System (GIS) Enhancements	WF	\$206,845	\$70,000	\$70,000	\$52,500	\$52,500
Computerized Maintenance Management System	WF	\$1,164,386	\$960,000			
Water Operations / Training and Storage / Work Shop	WF	\$70,630				
Reservoir Improvements	WF	\$403,600	\$175,000	\$300,000	\$4,100,000	\$3,550,000
Arroyo Seco Canyon Project	CIC	\$4,520,320	\$4,900,000	\$1,500,000	\$1,000,000	
Booster Improvements	CIC	\$575,130	\$195,000	\$2,445,000	\$2,335,000	\$295,000
Well Improvements	CIC	\$988,820	\$150,000	\$150,000	\$150,000	\$150,000
Sunset Reservoir Improvements	CIC	\$465,149	\$25,366,550	\$42,873,805	\$3,815,132	
Advanced Metering Infrastructure (AMI)	CIC	\$2,324,825	\$4,773,500	\$1,991,000		
Distribution Mains	CIC	\$6,576,662	\$8,000,000	\$8,000,000	\$8,000,000	\$8,000,000
Meters and Services	CIC	\$1,614,400	\$800,000	\$700,000	\$900,000	\$900,000
Water SCADA Improvements	CIC	\$68,612	\$25,000	\$25,000	\$30,000	\$50,000
New Water Well	CIC	\$378,375	\$25,000	\$5,223,000	\$1,432,000	
Facilities Site Improvement Initiative	CIC	\$176,575	\$175,000	\$175,000	\$175,000	\$175,000
Customer Information System Managed Services - Water	CIC	\$618,013	\$541,800	\$541,800	\$541,800	\$541,800
Monk Hill Groundwater Treatment Improvements	NASA	\$5,756,345	\$1,260,000			
Customer Driven - Mains, Meters, and Services	CIAC	\$2,018,000	\$2,000,000	\$2,000,000	\$2,000,000	\$2,000,000
Total – All CIP		\$28,645,095	\$50,171,850	\$66,582,105	\$25,601,432	\$26,409,300

2.2.6. STATUS QUO FINANCIAL PLAN (NO RATE INCREASES)

Table 2-9 describes each line item in the financial plan which is shown in Table 2-10 without revenue increases. The purpose of showing the financial plan without revenue increases is to show that revenue is not sufficient to cover costs as shown by the net cashflow in Line 24.

Table 2-9: Description of Line Items in Financial Plan Cashflow

Category	Line(s)	Description
Revenues		
Rate Revenues	2-3	All revenues from CURRENT fixed charges and variable rates, assuming no rate increase. Rate revenue from current rates and charges include revenues from the Fixed Service Charge, Fire Protection Surcharge, Capital Improvement Charge, variable rates, and Private Fire Charges (where applicable). Rate revenues were calculated using the water use and customer account assumptions from Section 2.2.1.
Revenue from Rate Increases	NA	Revenue from proposed rate increases are excluded in Table 2-10 (financial plan without rate increases), but included in Table 2-14 (line 4), the proposed financial plan with increases.
Miscellaneous, Interest and Other Revenue	4-6	Additional revenues which lower the revenue required from rate revenue. All Other revenues include interest revenue, non-operating revenue, intergovernmental revenue, and any other miscellaneous revenues.
Expenses	21	Sum of O&M Expenses, Debt, & CIP.
O&M Expenses	10-16	Costs associated with maintenance and operations (O&M), as well as water supply costs. The O&M budget is projected using the inflationary factors discussed in Table 2-5. Administration expenses include general, salary, benefits, and utilities administrative costs, as well as water purchase cost and other related recurring expenses.
Debt	18-19	Costs associated with existing debt service. Annual debt service includes three revenue bonds: <ul style="list-style-type: none"> • 2017A Water Bond • 2020A Water Bond • 2021A Water Bond
Rate-Funded CIP	21	Cash-funded capital projects associated with capital repair and replacement (R&R).
Net Cashflow	24	Total revenues less total expenses (Line 7 – Line 22).
Debt Coverage	25	Equal to the net operating revenue (all revenues less O&M) divided by the total debt service payments (Lines 15-16)
Target Coverage	26	The target or minimum required debt coverage value for the calculation in Line 21. Maintaining target debt coverage helps assure the utility’s credit rating and overall financial stability.

Table 2-10 shows that current rate revenue is insufficient and to demonstrates the need for the rate increases that are discussed in the next section and shown in Table 2-13.

Table 2-10: Status Quo Financial Plan

Line	Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
1	Revenues					
2	Rate Revenues	\$58,149,305	\$58,347,638	\$58,546,798	\$58,746,789	\$58,800,099
3	CIC Revenues ⁵	\$11,442,157	\$11,499,368	\$11,556,864	\$11,614,648	\$11,614,648
4	Miscellaneous Revenue	\$2,651,808	\$2,678,326	\$2,705,110	\$2,732,161	\$2,759,482
5	Interest Income	\$345,416	\$78,009	\$0	\$0	\$0
6	All Other Revenues	\$1,473,974	\$1,488,714	\$1,503,601	\$1,518,637	\$1,533,824
7	Subtotal - All Revenues	\$74,062,662	\$74,092,055	\$74,312,372	\$74,612,235	\$74,708,052
8						
9	Expenses					
10	O&M					
11	General Manager	\$1,516,225	\$1,569,293	\$1,616,371	\$1,656,781	\$1,706,484
12	Finance and Admin	\$6,825,093	\$7,083,391	\$7,295,893	\$7,499,093	\$7,724,066
13	Customer Service	\$3,563,452	\$3,696,907	\$3,807,814	\$3,912,365	\$4,029,736
14	Water Delivery	\$28,241,823	\$29,313,071	\$30,233,323	\$31,120,533	\$32,054,149
15	Water Purchase Costs	\$22,555,580	\$25,434,480	\$27,984,714	\$30,731,744	\$32,555,052
16	Subtotal - O&M	\$62,706,195	\$67,097,142	\$70,938,115	\$74,920,516	\$78,069,487
17						
18	Existing Debt Service	\$5,717,250	\$5,639,250	\$5,563,000	\$5,488,250	\$5,399,750
19	Proposed Debt Service	\$0	\$0	\$0	\$0	\$0
20						
21	Water Fund & CIC CIP	\$18,692,865	\$42,108,165	\$54,788,539	\$19,848,717	\$20,747,905
22	Subtotal – All Expenses	\$87,116,309	\$114,844,557	\$131,289,655	\$100,257,483	\$104,217,142
23						
24	Net Cashflow	(\$13,053,647)	(\$40,752,502)	(\$56,977,282)	(\$25,645,248)	(\$29,509,089)
25	Calculated Debt Coverage	1.99	1.24	0.61	-0.06	-0.62
26	Target Coverage	1.10	1.10	1.10	1.10	1.10

⁵ The CIC Rate Component will be absorbed into the fixed and variable rates under the proposed rate design.

2.2.7. DEBT SERVICE

Table 2-11 shows the Department's existing debt service payments. Total annual debt service for existing debt is shown in line 18 of Table 2-10 and line 19 of Table 2-14. Projected debt coverage is shown in lines 25 and 26 of Table 2-10 and Table 2-14, respectively.

Table 2-11: Existing Water Debt Service

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
2017A Water Bond					
Principal	\$670,000	\$705,000	\$740,000	\$780,000	\$820,000
Interest	\$535,250	\$501,750	\$466,500	\$429,500	\$390,500
Subtotal	\$1,205,250	\$1,206,750	\$1,206,500	\$1,209,500	\$1,210,500
2020A Water Bond					
Principal	\$1,045,000	\$1,080,000	\$1,115,000	\$1,150,000	\$1,185,000
Interest	\$1,320,750	\$1,268,500	\$1,214,500	\$1,158,750	\$1,101,250
Subtotal	\$2,365,750	\$2,348,500	\$2,329,500	\$2,308,750	\$2,286,250
2020A Water Bond					
Principal	\$1,145,000	\$1,140,000	\$1,140,000	\$1,140,000	\$1,130,000
Interest	\$1,001,250	\$944,000	\$887,000	\$830,000	\$773,000
Subtotal	\$2,146,250	\$2,084,000	\$2,027,000	\$1,970,000	\$1,903,000
Total Existing Debt Service	\$5,717,250	\$5,639,250	\$5,563,000	\$5,488,250	\$5,399,750

Table 2-12 shows the Department's proposed debt issuances and annual payments for the study period. The proposed debt funds a significant portion of capital projects and lowers customer bill increases by allowing the Department to pay for capital over 30 years. Proposed debt service is shown in line 20 of Table 2-14.

Table 2-12: Proposed Water Debt Service

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Proposed Debt Issuances	\$30,000,000	\$35,000,000			
Annual Payment	\$1,896,284	\$4,108,615	\$4,108,615	\$4,108,615	\$4,108,615

2.2.8. PROPOSED FINANCIAL PLAN AND REVENUE ADJUSTMENTS

Table 2-13 shows the proposed revenue adjustments for the Study period. The proposed financial plan incorporates the revenue adjustments on July 1 of each fiscal year beginning in FY 2025.

Table 2-13: Proposed Rate Adjustments

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Effective Date	July 1, 2024	July 1, 2025	July 1, 2026	July 1, 2027	July 1, 2028
Revenue Adjustment	13.0%	12.0%	9.0%	8.0%	7.0%

Table 2-14 shows the Department’s cash flow projection over the study period assuming the revenue adjustments from

Table 2-13 and shown in line 4 of Table 2-14. As shown below, there are wide fluctuations in yearly cashflow due to the funding of capital from reserves and debt. From FY 2025 to FY 2027, when capital is funded from debt proceeds, there are positive (black) cashflows. Under the proposed financial plan and rate increases, the Department is projected to meet its minimum debt coverage requirement in all study years which is a function of needing to have sufficient cash flow for future capital expenditures; annual revenue collection exceeds the minimum debt coverage requirements.

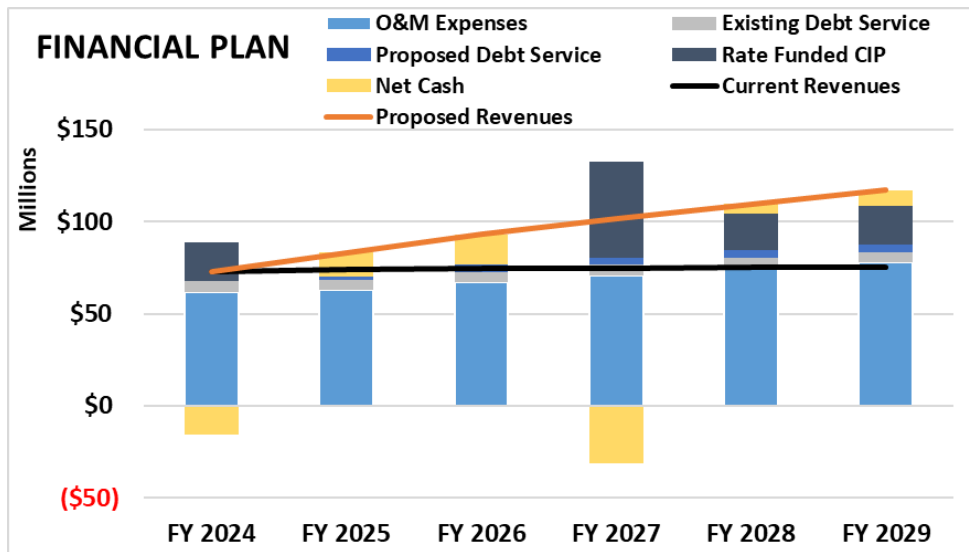
Table 2-14: Proposed Financial Plan

Line	Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
1	Revenues					
2	Rate Revenues	\$69,591,463	\$69,847,005	\$70,103,662	\$70,361,437	\$70,414,746
3	Revenue from Rate Increases	\$9,046,890	\$18,551,365	\$26,604,620	\$34,467,557	\$41,837,261
4	Miscellaneous Revenue	\$2,651,808	\$2,678,326	\$2,705,110	\$2,732,161	\$2,759,482
5	Interest Income	\$474,634	\$620,490	\$547,673	\$419,096	\$487,953
6	All Other Revenues	\$1,473,974	\$1,488,714	\$1,503,601	\$1,518,637	\$1,533,824
7	Subtotal – All Revenues	\$83,238,769	\$93,185,901	\$101,464,666	\$109,498,888	\$117,033,267
8						
9	Expenses					
10	O&M					
11	General Manager	\$1,516,225	\$1,569,293	\$1,616,371	\$1,656,781	\$1,706,484
12	Finance and Admin	\$6,825,093	\$7,083,391	\$7,295,893	\$7,499,093	\$7,724,066
13	Customer Service	\$3,563,452	\$3,696,907	\$3,807,814	\$3,912,365	\$4,029,736
14	Water Delivery	\$28,241,823	\$29,313,071	\$30,233,323	\$31,120,533	\$32,054,149
15	Water Purchase Costs	\$22,555,580	\$25,434,480	\$27,984,714	\$30,731,744	\$32,555,052
16	Subtotal – O&M	\$62,706,195	\$67,097,142	\$70,938,115	\$74,920,516	\$78,069,487
17						
18	Existing Debt Service	\$5,717,250	\$5,639,250	\$5,563,000	\$5,488,250	\$5,399,750
19	Proposed Debt Service	\$1,896,284	\$4,108,615	\$4,108,615	\$4,108,615	\$4,108,615
20						
21	Water Fund & CIC CIP			\$51,889,569	\$19,848,717	\$20,747,905
22	Subtotal – All Expenses	\$70,319,728	\$76,845,006	\$132,499,299	\$104,366,097	\$108,325,756
23						
24	Net Cashflow	\$12,919,041	\$16,340,895	(\$31,034,633)	\$5,132,790	\$8,707,510
25	Calculated Debt Coverage	2.70	2.68	3.16	3.60	4.10
26	Target Coverage	1.10	1.10	1.10	1.10	1.10

2.2.9. FINANCIAL PLAN SHOWN GRAPHICALLY

Figure 2-1 shows the proposed Financial Plan from Table 2-14 in a graphical format. For years with revenue line *below* the expense stacked bars, a drawdown of reserves is projected due to expenditures exceeding revenue. FY 2025 and FY 2026 show funding of reserves because the CIP is funded through debt proceeds. FY 2027 and beyond funds CIP through cash and thus the drawdown of reserves.

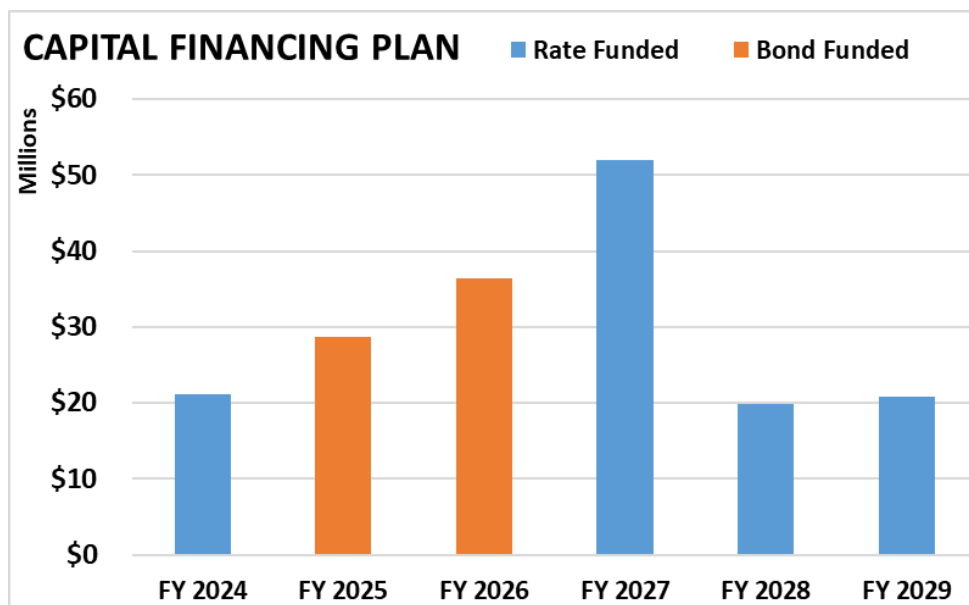
Figure 2-1: Financial Plan



2.2.10. CAPITAL FINANCING PLAN

Figure 2-2 shows the capital financing plan. Blue bars indicate rate-funded capital projects; orange bars indicate bond-funded capital projects.

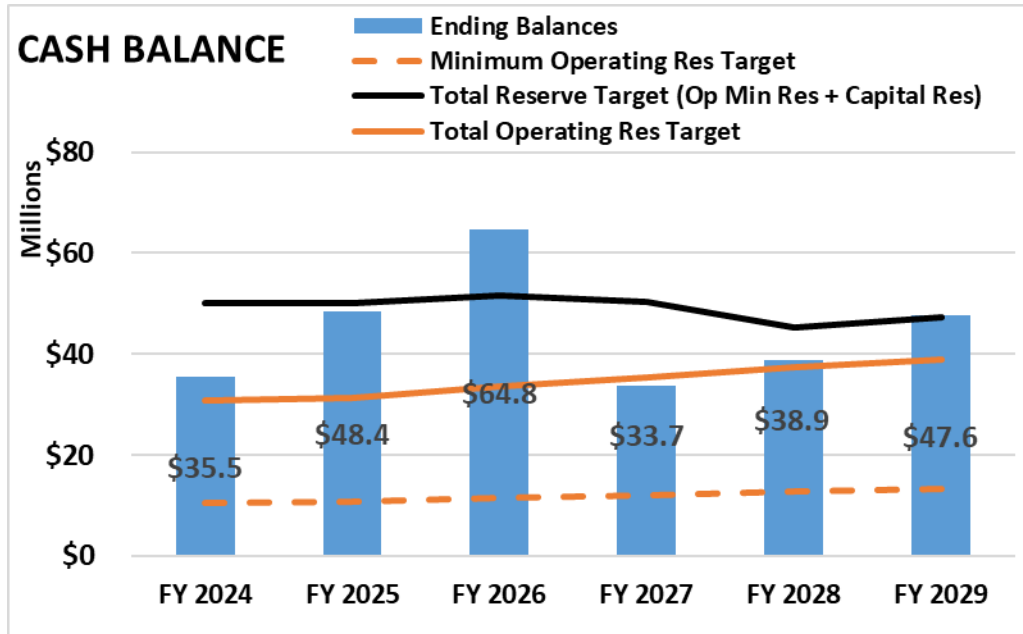
Figure 2-2: Capital Financing Plan



2.2.11. FISCAL YEAR ENDING RESERVE BALANCES

Figure 2-3 shows the fiscal year ending reserves balances. As shown, the Department is projected to reach reserve targets at the end of the study period.

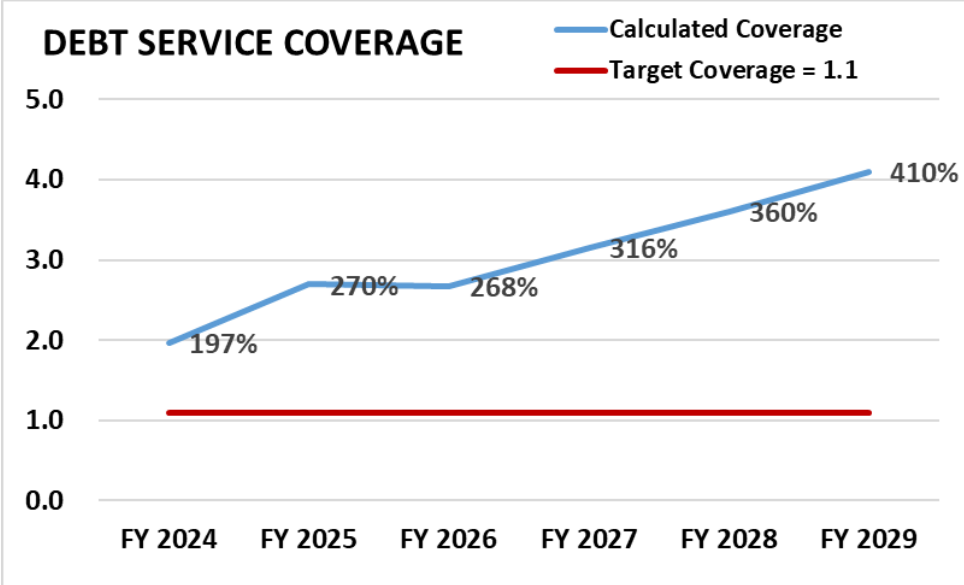
Figure 2-3: FY Ending Reserve Balance



2.2.12. DEBT COVERAGE

Figure 2-4 shows the projected debt coverage. As shown below, the Department is projected to meet its minimum coverage target in all years of the study. Debt coverage is an annual measure of operating revenue divided by the annual debt service committee for debt repayment. The “target” coverage is the floor under which the debt service coverage would violate bond covenants and impact credit. There is not a definitive target because it is related to the amount of capital which is cash funded or debt funded.

Figure 2-4: Debt Coverage



3. Water Cost of Service Analysis

3.1. Functionalization of Operating Expenses

A cost of service analysis distributes a utility's revenue requirement (yearly revenue needed to cover operating and capital costs) to each customer class. The first step is to functionalize O&M expenses. Appendix A shows the functionalization of the Department's O&M expenses.

3.2. Allocation to Cost Components

The second step is to allocate the functionalized O&M expenses to the cost causation components. These are an expanded version of the typical cost components mentioned in the AWWA Manual M1: Principles of Water Rates, Fees and Charges. For example base can be broken out into supply and base and a conservation component is added. The cost causation components and the corresponding explanations of each item are shown in Table 3-1.

Table 3-1: Description of Cost Causation Components

Line	Category	Description
1	Supply	Costs associated with obtaining water.
2	Base	Costs associated with serving water under average daily demand.
3	Max Day	Costs associated with serving water during peak water flows which involves the infrastructure required to meet system max day demand (e.g., storage tanks, pumping stations, distribution pipeline size, etc.).
4	Meter	Costs associated with meter reading, meter maintenance, and other meter-related costs
5	Customer	Costs associated with billing and customer service.
6	Fire Protection	Costs associated with the capacity to fight fires through public fire hydrants and private fire connections and the maintenance of fire hydrants and other public fire protection infrastructure.
7	General	Costs associated with general administrative and other miscellaneous expenses.
8	Conservation	Costs associated with customer conservation outreach and other conservation programs.

This method is consistent with the AWWA M1 Manual and is widely used in the water industry to perform cost of service analyses.

3.3. Allocation to Cost Components

In a cost of service analysis, expenses are allocated to the cost causation components. Table 3-2 shows the system-wide peaking factors. The system-wide peaking factors are used to derive the cost component allocation bases (i.e., percentages) and used in Table 3-3 and Table 3-4.

To understand the interpretation of the percentages, the base is first established as the average daily demand during the year – which is assigned an allocation basis of 1. If the base allocation basis is used to allocate an expense, the costs associated with that expense are to meet average daily demand (base) related costs. Expenses

that are allocated to the cost causation components using the maximum (“max”) day bases attribute 52% (1.00/1.92) of the demand (and therefore costs) to base (average daily demand) use and the remaining 48% to maximum day (peaking) use. The monthly to max day conversion factor ($1.50 = 1.92/1.28$) converts bi-monthly peaking factors by class to max day peaking factors shown in Table 3-2. The system wide monthly peaking factor is known and calculated from monthly water use data. The system is designed for max day use as evidenced by the 1.92 peaking factor. In order to assess max day use by class, we use the max day conversion factor applied to each class – this estimates the water use during the max day by class.

Table 3-2: System-Wide Peaking Factors

System Peaking	Factor	Base	Max Day	Total	Monthly to Max Day Conversion
Base	1.00	100%		100%	
Max Day	1.92 ⁶	52%	48%	100%	
System Wide Monthly Peaking	1.28				1.50

Table 3-3 shows the allocation of the Department’s functionalized O&M expenses to the cost causation components. The percentages shown in lines 1 through 9 are used to allocate the functionalized costs to each cost causation component. The allocation basis is selected based on the type of cost for each line item and the proportion of those costs associated with each cost causation component (max day, supply, general, customer, etc.). For example, Transmission & Distribution (line 13) is allocated using the max day basis; this component of the O&M is therefore allocated in proportion to max day allocations identified in Table 3-2. This is because the transmission and distribution system must be sized and operated to meet max day demands. Certain cost bases are identical to the cost causation components – such as Meter Maintenance/Meter – and are easily allocated to the cost component with the same (or similar) name. Line 20 shows the result of the allocation of all expenses to the appropriate cost causation components. The Operating portion of the revenue requirement is later allocated to the cost causation components using the allocation shown in line 21.

⁶ Per the Department’s “Water System Hydraulic Model Calibration” report performed by Carollo in December 2020.

Table 3-3: Allocation of Functionalized FY 2025 O&M Costs to Cost Components

Line	Allocation Basis	Supply	Base	Max Day	Meter	Customer	Fire Protection	General	Conservation	Total	
1	Supply	100%								100%	
2	Base		100%							100%	
3	Max Day		52%	48%						100%	
4	Meter				100%					100%	
5	Customer					100%				100%	
6	Fire Protection						100%			100%	
7	General							100%		100%	
8	Conservation								100%	100%	
9	Revenue Offset									100%	
10	Function	Allocation Basis	Supply	Base	Max Day	Meter	Customer	Fire Protection	General	Conservation	Total
11	Supply	Supply	\$23,958,570								\$23,958,570
12	Pumping	Max Day		\$2,182,444	\$2,007,849						\$4,190,293
13	Transmission & Distribution	Max Day		\$3,788,468	\$3,485,390						\$7,273,858
14	Treatment	Max Day		\$1,849,887	\$1,701,896						\$3,551,784
15	Customer Service	Customer					\$2,034,051				\$2,034,051
16	Meter Maintenance	Meter				\$83,891					\$83,891
17	Fire Protection	Fire Protection						\$122,107			\$122,107
18	General	General							\$18,720,357		\$18,720,357
19	Conservation	Conservation								\$2,771,283	\$2,771,283
20	Total O&M Expenses		\$23,958,570	\$7,820,800	\$7,195,136	\$83,891	\$2,034,051	\$122,107	\$18,720,357	\$2,771,283	\$62,706,195
21	Final Allocation		38.2%	12.5%	11.5%	0.1%	3.2%	0.2%	29.9%	4.4%	100.0%

The Department's functionalized assets are allocated to the same cost components as the O&M expenses as shown in Table 3-4. Capital costs are allocated to the cost components in proportion to the functionalized assets to recognize that all assets need to be refurbished and replaced over time. The resulting capital allocation (shown in line 19) is used to allocate the capital portion of the revenue requirement to the cost causation components later in Table 3-13.

Table 3-4: Allocation of Assets to Cost Components

Line	Description	Allocation Basis	Supply	Base	Max Day	Meter	Customer	Fire Protection	General	Conservation	Revenue Offset	Total
1	Supply		100%									100%
2	Base			100%								100%
3	Max Day			52%	48%							100%
4	Meter					100%						100%
5	Customer						100%					100%
6	Fire Protection							100%				100%
7	General								100%			100%
8	Conservation									100%		100%
9	Revenue Offset										100%	100%
10	Description	Allocation Basis	Supply	Base	Max Day	Meter	Customer	Fire Protection	General	Conservation	Revenue Offset	Total
11	Supply	Supply	\$7,803,960	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$0	\$7,803,960
12	Pumping	Max Day	\$0	\$4,472,393	\$4,114,602	\$0	\$0	\$0	\$0	\$0	\$0	\$8,586,995
13	Treatment	Max Day	\$0	\$1,128,422	\$1,038,148	\$0	\$0	\$0	\$0	\$0	\$0	\$2,166,569
14	Storage	Max Day	\$0	\$5,940,984	\$5,465,706	\$0	\$0	\$0	\$0	\$0	\$0	\$11,406,690
15	Distribution	Max Day	\$0	\$124,961,802	\$114,964,858	\$0	\$0	\$0	\$0	\$0	\$0	\$239,926,660
16	Meters	Meter	\$0	\$0	\$0	\$19,510,083	\$0	\$0	\$0	\$0	\$0	\$19,510,083
17	General	General	\$0	\$0	\$0	\$0	\$0	\$0	\$166,601,914	\$0	\$0	\$166,601,914
18	Total Assets	Supply	\$7,803,960	\$136,503,602	\$125,583,313	\$19,510,083	\$0	\$0	\$166,601,914	\$0	\$0	\$456,002,873
19	Final Allocation		1.7%	29.9%	27.5%	4.3%	0.0%	0.0%	36.5%	0.0%	0.0%	100.0%

3.4. Revenue Requirement Determination

Table 3-5 shows the revenue requirement determination for FY 2025, or the rate-setting year. Line 17 shows the total revenue required from rates – which is the total amount that rates are calculated to collect in Section 4. The revenue requirement is calculated by subtracting revenue offsets (line 11) and adjustments (line 15) from the total revenue requirements (line 5). The FY 2025 revenue requirement includes operating and maintenance (O&M) costs, water purchase costs, and existing and proposed debt service. Lines 8-11 show the revenue offsets from non-rate revenues. The adjustment in line 15 ensures the COS accounts for the annual cash balances and that the impending rate adjustment will take place at the start of FY 2025.

Table 3-5: Revenue Requirement Determination for FY 2025

Line	Description	Operating	Capital	Total
1	Revenue Requirements			
2	O&M Expenses	\$62,706,195		\$62,706,195
3	Existing Debt Service		\$5,717,250	\$5,717,250
4	Proposed Debt Service		\$1,896,284	\$1,896,284
5	Total Revenue Requirements	\$62,706,195	\$7,613,534	\$70,319,728
6				
7	Less: Revenue Offsets			
8	Miscellaneous Revenue	\$2,651,808		\$2,651,808
9	Interest Revenue	\$474,634		\$474,634
10	Non-Rate Revenues	\$1,473,974		\$1,473,974
11	Total Revenue Offsets	\$4,600,416	\$0	\$4,600,416
12				
13	Less: Adjustments			
14	Adjustment for Cash Balance		(\$12,919,041)	(\$12,919,041)
15	Total Adjustments	\$0	(\$12,919,041)	(\$12,919,041)
16				
17	Total Revenue Requirement from Rates	\$58,105,778	\$20,532,575	\$78,638,353

3.5. Equivalent Meters

The concept of equivalent meters is used to allocate meter-related costs appropriately. By using equivalent meters instead of a total meter count, the analysis accounts for the fact that larger meters impose greater demands on the system and are more expensive to install, maintain, and replace than smaller meters. Equivalent meters are used in calculating a portion of customer bills known as meter service.

Equivalent meters are based on published meter hydraulic capacity. Equivalent meters represent the potential demand on the water system in terms of the base meter size. A ratio of hydraulic capacity is calculated by dividing large meter capacities by the base meter capacity. The capacity ratio is calculated using the meter capacity in gallons per minute (GPM) provided in the AWWA M1 Manual Principles of Water Rates, Fees, and Charges (7th Edition).

The base meter is the most common smallest meter, in this case, a ¾-inch meter. The capacity ratio (in column D of Table 3-6) is proportional to the potential flow through each meter size as established by the AWWA hydraulic capacity ratios. For example, the potential flow through a 4-inch meter is 25 times that of a ¾-inch

meter, and therefore, the meter capacity component of the fixed meter charge is 25 times that of the 3/4-inch meter. Table 3-6 shows the total equivalent meters (Column E), calculated by taking the number of meters by size (Column C) and multiplied by the corresponding capacity ratio (Column D). The number of annual equivalent meters is calculated by multiplying the equivalent meters by twelve monthly billing periods. These totals are used as the denominator in developing unit costs for the rate components of the monthly fixed service charges.

Table 3-6: Water Equivalent Meters

Line [A]	Meter Size [B]	Customer Counts By Meter Size [C]	3/4" Base Factor Capacity Ratio [D]	Equivalent Meters [E]
1	All Customers			
2	5/8"	22	1.00	22
3	3/4"	20,117	1.00	20,117
4	1"	11,967	1.67	19,946
5	1 1/2"	2,203	3.33	7,343
6	2"	1,752	5.33	9,343
7	3"	257	14.50	3,724
8	4"	215	25.00	5,369
9	6"	97	53.33	5,191
10	8"	24	93.33	2,249
11	10"	4	140.00	562
12	Total	36,658		73,867

3.6. Allocation of Private Fire Costs

Water systems provide two types of fire protection: private fire protection that provides water for fires to private buildings and sprinkler systems as well as public fire protection for firefighting, visible as hydrants on the street. Raftelis uses the potential flow through private fire lines and public hydrants to determine the share of total fire costs responsible for each.

Table 3-7 shows the equivalent potential demand from *private* fire lines. Each fire connection size has a different fire flow demand factor like the hydraulic capacity factor of a water meter⁷. The Hazen-Williams equation is used to calculate equivalent potential demand by raising the pipeline’s diameter (Column D) to the power of 2.63⁸. The resulting equivalent potential demand per connection (Column E) is then multiplied by the total number of private fire lines of each size (Column C) to yield the total equivalent potential demand at each connection size (Column F). The private fire potential demand is compared to public potential demand to allocate total fire protection costs.

⁷ Total demand for fire connections is based on line diameter and will vary from potable demand, based on meter size.

⁸ Hazen-Williams equation per AWWA M1 Manual.

Table 3-7: Private Fire Connection Potential Demand

Line [A]	Meter Size [B]	No. of Private Fire Connection [C]	Diameter [D]	Potential Demand per Connection [E]	Equivalent Potential Demand [F]
1	Private Fire				
2	4"	722	4.00	38.32	27,662
3	6"	394	6.00	111.31	43,809
4	8"	144	8.00	237.21	34,056
5	10"	2	10.00	426.58	857
6	12"	3	12.00	689.04	2,075
7	16"	3	16.00	1,468.37	4,423
8	Total	36,658			112,882

Table 3-8 shows the equivalent potential demand from *public* fire hydrants. The Hazen-Williams equation is used to calculate equivalent potential demand by raising the pipeline’s diameter (Column D) to the power of 2.63⁹. The resulting equivalent potential demand per connection (Column E) is then multiplied by the total number of hydrant connections (Column C) to yield the total equivalent potential demand (Column F). The public potential fire capacity is compared to the private fire capacity to allocate fire protection costs.

Table 3-8: Public Fire Hydrants

Line [A]	Meter Size [B]	No. of Hydrant Connections [C]	Diameter [D]	Potential Demand per Connection [E]	Equivalent Potential Demand [F]
1	Public Fire				
2	6"	3,157	6.00	111.31	351,409
3	Total	3,157			351,409

Table 3-9 summarizes the equivalent potential demand through private fire connections (Table 3-7) and public hydrants (Table 3-8). The potential fire demand percentage, and therefore cost allocation to public and private fire (Column C), is calculated by dividing the equivalent potential demand (line 1 or line 2, Column C) by the total potential demand (line 3, column C). Seventy-five percent of fire capacity, and therefore costs, relate to public fire and will be recovered through the monthly fixed charges. The remaining 24.3% is attributable to private fire service and will be recovered through private fire service charges.

⁹ Hazen-Williams equation, per AWWA M1 Manual.

Table 3-9: Allocation of Private Fire Costs

Line [A]	Meter Size [B]	Potential Demand per Connection [C]
1	Total Private Fire Demand	112,882
2	Total Public Fire Demand	351,409
3	Total Potential Fire Demand	464,291
4	Percent Allocated to Public Fire Protection	75.7%
5	Percent Allocated to Private Fire Protection	24.3%

3.7. Projected Water Use under Proposed Rate Structure

Table 3-10 shows the projected water use for the study period under the proposed rate structure. The Department’s proposes to create the following customer classes: Single Family Residential, Multi-Family Residential, and Small, Medium and Large, Commercial. For Multi-Family Residential, the tier breakpoints are *per dwelling unit* rather than based on meter size. Since the breakpoints are per dwelling unit (which accounts for water needs), there is no need to break multi-family out by meter size.

Table 3-10: Projected Water Use by Customer Class (HCF), Proposed Structure

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Single Family					
Tier 1	1,802,928	1,811,942	1,821,002	1,830,107	1,830,107
Tier 2	2,237,452	2,248,639	2,259,882	2,271,182	2,271,182
Tier 3	1,043,391	1,048,608	1,053,851	1,059,120	1,059,120
Subtotal	5,083,771	5,109,190	5,134,735	5,160,409	5,160,409
Multi-Family					
Tier 1	1,201,249	1,207,256	1,213,292	1,219,358	1,219,358
Tier 2	309,080	310,625	312,179	313,739	313,739
Tier 3	373,454	375,321	377,197	379,083	379,083
Subtotal	1,883,783	1,893,202	1,902,668	1,912,181	1,912,181
Commercial Small (5/8"-1")					
Tier 1	116,410	116,992	117,577	118,165	118,165
Tier 2	148,917	149,662	150,410	151,162	151,162
Tier 3	70,679	71,033	71,388	71,745	71,745
Subtotal	336,007	337,687	339,375	341,072	341,072
Commercial Medium (1 1/2"-4")					
Tier 1	558,320	561,111	563,917	566,736	566,736
Tier 2	702,802	706,316	709,848	713,397	713,397
Tier 3	333,614	335,282	336,959	338,644	338,644
Subtotal	1,594,737	1,602,710	1,610,724	1,618,777	1,618,777
Commercial Large (6" & up)					
Tier 1	446,161	448,392	450,634	452,887	452,887
Tier 2	563,382	566,199	569,030	571,875	571,875
Tier 3	271,652	273,010	274,375	275,747	275,747
Subtotal	1,281,195	1,287,601	1,294,039	1,300,509	1,300,509
Total – Retail Sales/All Use (HCF)	10,179,493	10,230,390	10,281,541	10,332,949	10,332,949

3.8. Unit Cost Derivation

The end goal of a cost-of-service analysis is to distribute the revenue requirement to each customer class and to do so we must calculate unit costs by cost component. Raftelis calculated unit costs for each component by assessing total water demand and total bills (or the total number of accounts serviced by the Department multiplied by six billing periods) to calculate equivalent service units.

Table 3-11 shows the derivation of the units of service which are used in calculating unit costs.

Projected FY 2025 water use by customer class and tier (Column D) was divided by 365 days to determine daily use (Column E). Total capacity (Column G) was determined by multiplying the average daily use by the corresponding Max Day peaking factors shown in Column F. For a detailed explanation of how peaking factors were calculated, see Table 8-5 in Appendix B. The total number of accounts (Column I) is then multiplied by six billing periods to get the total bi-monthly annualized bills shown in Column K. Equivalent meters (calculated earlier in Table 3-6) are shown in Column J. These units (total potential demand, equivalent meters, and annual bills) represent the units of service by customer class (and tier for potential demand) that provide the basis for the cost allocation to customer classes in later sections.

Table 3-11: Derivation of FY 2025 Units of Service

Line [A]	Peaking Requirements (excluding Fire Protection) [B]	Bi-Monthly Tier Breakpoint [C]	Annual Use [D]	Average Day Use [E]	Max Day Peaking Factor [F]	Total Capacity (HCF/day) [G]	Extra Capacity (HCF/day) [H]	Number of Customers [I]	Equivalent Meters [J]	Annualized Bills [K]
1	Single Family		5,083,771	13,928	1.99	27,692	13,764	28,171	38,948	169,028
2	Tier 1	14	1,802,928	4,940	1.60	7,894	2,954			
3	Tier 2	58	2,237,452	6,130	2.03	12,469	6,339			
4	Tier 3	>58	1,043,391	2,859	2.56	7,329	4,471			
5										
6	Multi-Family		1,883,783	5,161	1.68	8,661	3,500	4,504	12,532	27,024
7	Tier 1	10	1,201,249	3,291	1.58	5,190	1,899			
8	Tier 2	20	309,080	847	1.84	1,561	714			
9	Tier 3	>20	373,454	1,023	1.87	1,910	887			
10										
11	Commercial Small (5/8"-1")		336,007	921	1.64	1,509	589	2,186	2,861	13,114
12	Tier 1	17	116,410	319	1.47	469	150			
13	Tier 2	87	148,917	408	1.75	713	305			
14	Tier 3	>87	70,679	194	1.69	328	134			
15										
16	Commercial Medium (1 1/2"-4")		1,594,737	4,369	1.88	8,196	3,827	1,696	12,806	10,175
17	Tier 1	105	558,320	1,530	1.62	2,481	952			
18	Tier 2	530	702,802	1,925	1.88	3,622	1,696			
19	Tier 3	>530	333,614	914	2.29	2,093	1,179			
20										
21	Commercial Large (6"+)		1,281,195	3,510	2.12	7,458	3,948	101	6,720	608
22	Tier 1	1,700	446,161	1,222	1.68	2,051	829			
23	Tier 2	10,100	563,382	1,544	2.08	3,218	1,675			
24	Tier 3	>10,100	271,652	744	2.94	2,189	1,445			
25	Total		10,179,493	24,743		48,305	25,629	36,658	73,867	219,949

3.9. Fire Protection Capacity

Table 3-12 shows estimated fire protection capacity in line 4. It is derived by assuming certain fire flows. Line 1 and 2 show the fire flow assumptions: two fires (one residential and one commercial). The first fire (Multi-Family Residential) is assumed to last 2 hours and have a maximum flow rate of 2,000 gallons per minute (gpm). The second fire (Commercial) is assumed to last 3 hours and have a flow rate of 3,000 gpm. These assumptions are used to calculate the fire capacity shown in line 4. Max day capacity demanded by fire protection is determined by converting 2,000 and 3,000 GPM, respectively, to gallons per hour, then multiplying by the duration of each fire (2 and 3 hours, respectively). Then, these values are converted from gallons per hour to HCF per day (line 4, Columns E and F). Column F is the Max Hour fire demand in excess of Max Day and the units are in HCF per day. The interpretation of lines 4, 5 and 6 in Table 3-12 is that line 6 shows total extra capacity (for fire and potable demands) and line 4 shows only the capacity for fire flow. Dividing line 4 into line 6, yields line 8 – the portion of extra capacity for fire protection.

The Max Day Extra Capacity without fire in E5 is the total extra capacity from line 25, Column H of Table 3-11. Raftelis estimated Max Hour demand in excess of Max Day for extra capacity (excluding capacity for fire, in E8) by multiplying Max Day extra capacity line 25, Column G of Table 3-11 by a Max Day to Max Hour conversion factor of 1.66 (to convert from Max Day to Max Hour¹⁰), then subtracting existing max day capacity (line 35, Column G of Table 3-10). The resulting Max Hour demand in excess of Max Day value is shown in line 5, Column E of Table 3-12. Total extra capacity costs are then determined by summing the values for line 4 and 5 in each column, as shown in line 6 of Table 3-12. The overall goal is to determine the percent of system capacity for fire protection. The percentages shown in line 8 were calculated by dividing line 4 into line 6. These represent the percent allocation of extra capacity to fire protection and is used to assign a cost for fire protection along with the percentages derived in Table 3-9.

¹⁰ The max day to max hour conversion factor is 1.66, which is a typical max hour design factor with which water systems are designed to ensure the system can deliver max hour flows. Max hour flows, in this case, are needed to estimate the capacity to fight fires since fires are usually high flow, short term (hours) events.

Table 3-12: Calculation of Fire Service Capacity

Line [A]	Meter Size [B]	Fire 1 MFR Residential [C]	Fire 2 Commercial [D]	Max Day Extra Capacity [E]	Max Hour Demand in Excess of Max Day [F]
1	Hours for Fire	2.0	3.0		
2	Gals/minute	2,000	3,000		
3					
4	Capacity Demanded for Fire (HCF/day)			1,043	8,582
5	Potable Extra Capacity excluding Fire Capacity			25,629	31,881
6	Total Extra Capacity - Fire and Potable (HCF/day)			26,671	40,464
7					
8	Percent of Extra Capacity Costs due to Fire Protection			3.91%	21.21%

3.10. Allocation of Revenue Requirement to Cost Components and Calculation of Unit Costs

Table 3-13 shows the revenue requirement allocation to cost components and the calculation of unit costs for each component in line 15. Lines 1-3 show the preliminary allocation of FY 2025 operating and capital revenue requirements from Table 3-5 to the cost components using the O&M and capital allocations determined earlier in Table 3-3 and Table 3-4, respectively. Lines 4-6 show the reallocation of general to the other cost components based on the resulting allocation from line 3. Adjustments are made in lines 8 to 11 as follows:

- 1) Line 8 allocates costs to the public fire protection component (col F), which is recovered through the fixed charge (derived in the following section). The amount in E8 is based on the fire calculations in Section 3.9. The percentages in line 8 of Table 3-12 are added and multiplied by line 4 of Table 3-9 and by cell E6 in Table 3-13. This yields the cost for public fire protection (\$3.4M). Direct fire protection is also added from column I.
- 2) Line 9 allocates private fire protection costs to the private fire cost component in column L. The calculations are very similar to the public fire protection allocation above. The percentages in line 8 of Table 3-12 are added and multiplied by line 5 of Table 3-9 and by cell E6 in Table 3-13. This yields the cost for private fire protection shown in cell L9.
- 3) Lines 10 and 11 reassign extra capacity and base costs to the meter cost component. These costs are considered fixed costs that are incurred regardless of water use – sometimes called Ready to Serve costs that can be collected based on meter size. The Department has selected the allocated amounts (80% and 43% of total Max Day and Base costs, respectively) to maintain revenue stability consistent with current rates.

- 4) Line 12 sums line 6 with the adjustments made in lines 8-11. The unit rates for fixed, variable, and private fire rate components are then calculated in line 15 by dividing the total cost for each component (line 12) by the appropriate units of service shown in line 13. **These unit rates are used to allocate costs to customer classes to derive rates to serve each class.**

Table 3-13: Allocation of FY 2025 Revenue Requirement to Cost Components

Line [A]	Description [B]	Supply [C]	Base [D]	Max Day [E]	Public Fire Protection [F]	Meter [G]	Customer Billing [H]	Direct Public Fire [I]	General [J]	Conservation [K]	Private Fire [L]	Total [M]
1	Operating Expenses	\$22,200,859	\$7,247,030	\$6,667,267		\$77,737	\$1,884,823	\$113,149	\$17,346,945	\$2,567,969		\$58,105,778
2	Capital Expenses	\$351,391	\$6,146,388	\$5,654,677		\$878,486	\$0	\$0	\$7,501,633	\$0		\$20,532,575
3	Total COS	\$22,552,250	\$13,393,417	\$12,321,944	\$0	\$956,223	\$1,884,823	\$113,149	\$24,848,579	\$2,567,969	\$0	\$78,638,353
4	% Alloc. w/o Gen.	41.9%	24.9%	22.9%	0.0%	1.8%	3.5%	0.2%		4.8%	0.0%	100%
5	Reallocation of General	\$0	\$16,605,363	\$5,692,212		\$441,734	\$870,708	\$52,270	(\$24,848,579)	\$1,186,292	\$0	\$78,638,353
6	Subtotal - Reallocated	\$22,552,250	\$29,998,780	\$18,014,155	\$0	\$1,397,957	\$2,755,531	\$165,419	\$0	\$3,754,261	\$0	\$78,638,353
7												
8	Alloc. Pub. Fire Cap. to Fixed			(\$3,424,897)	\$3,590,316			(\$165,419)				
9	Alloc. Priv. Fire Cap. to Priv. Fire			(\$1,100,166)							\$1,100,166	
10	Alloc. of Extra Cap. to Meter			(\$10,791,274)		\$10,791,274						
11	Alloc. of Base to Meter Cap.		(\$12,899,475)			\$12,899,475						
12	Total Adj. COS	\$22,552,250	\$17,099,305	\$2,697,818	\$3,590,316	\$25,088,706	\$2,755,531	\$0	\$0	\$3,754,261	\$1,100,166	\$78,638,353
13	Service Units	10,179,493	10,179,493	25,629	73,867	73,867	36,658			10,179,493	112,882	
14	Unit	HCF	HCF	HCF/day		equivalent meters	no. accounts			HCF	equivalent private fire connections	
15	Unit Cost	\$2.22	\$1.68	\$105.27	\$48.61	\$339.65	\$75.17			\$0.37	\$9.75	
16	Units of Service	\$/HCF	\$/HCF	\$/HCF/day	\$/equivalent meter/year	\$/equivalent meter/year	per account per year			\$/HCF	yearly	

4. Water Rate Derivation

4.1. Rate Structure Selection

The rate study considered five rate structures. They were discussed with the Municipal Services Committee (MSC);

- 1) Uniform rates,
- 2) Tiered rates by meter size (the Department's current rate structure),
- 3) (Traditional) Tiered rate by customer class (Single Family Residential is tiered, other classes are not),
- 4) Tiered rates by customer class and meter size,
- 5) Budget Based Tiered Rates (BBTRs).

At the July 25, 2023 MSC meeting, Staff and Raftelis presented the pros and cons of each of the above rate structures with an expanded discussion on BBTRs. The committee directed staff to further investigate BBTRs. At this meeting rate structures 1 and 3 were not recommended by Staff.

From July to December of 2023, Staff and Raftelis researched BBTRs by discussing BBTRs with Eastern Municipal Water District (EMWD), Las Virgenes Municipal Water District (LVMWD), and Irvine Ranch Water District (IRWD). Each provided lessons learned, pros and cons and why they felt BBTRs were right for them.

Table 4-1 provides a summary of the takeaways from these discussions.

Table 4-1: BBTRs Research Summary

Discussion Topic	EMWD, LVMWD, IRWD	Pasadena DWP
Lot Size	<ul style="list-style-type: none"> • More uniform and therefore easier to estimate irrigable area 	<ul style="list-style-type: none"> • Older and varied and therefore more variable irrigable areas and more likely to create customer variance requests
Growth Maturity	<ul style="list-style-type: none"> • Still growing and therefore more opportunity to regulate size and types of irrigable areas 	<ul style="list-style-type: none"> • More mature and therefore turf and irrigable areas don't reflect recent model landscape ordinances
Data Collection & Implementation Effort	<ul style="list-style-type: none"> • Each agency had ongoing data collections efforts regarding irrigable areas and weather data • Each agency had added additional staffing • Each agency had to modify their billing system • Variance requests: EMWD in particular mentioned over 3,000 variance requests per year, they serve over a population of over 900,000 	<ul style="list-style-type: none"> • Only 2/3 of single-family irrigable data from the state; ideally would have all single family data • No commercial irrigable area data currently • No nearby state weather station for Evapotranspiration data • Delay in AMI deployment
Implementation Time	<ul style="list-style-type: none"> • 3 to 10 years depending on customer class 	<ul style="list-style-type: none"> • DWP expects a 5-year implementation due, which includes 3 years for AMI implementation
Meter Type During BBTR Implementation	<ul style="list-style-type: none"> • Automated Meter Reading (AMR) 	<ul style="list-style-type: none"> • DWP feels AMI would be optimal since customers can get real time data to know if they are exceeding their budget
Previous Rate Structure	<ul style="list-style-type: none"> • EMWD and IRWD had uniform rates and therefore BBTRs presented more of a conservation signal 	<ul style="list-style-type: none"> • Tiered rate structure likely lessening the conservation impact from BBTRs

At the January 23, 2024 MSC meeting Staff and Raftelis presented the results of their research as summarized in Table 4-1. Staff recommended, due to the reasons mentioned in Table 4-1, tiered rates by customer class and meter size. The MSC directed staff to proceed with rate by customer class and meter size.

4.2. Existing Fixed Service Charges

The Department currently bills its water customers two fixed charges: the monthly Fixed Distribution and Customer (D&C) Charge, which includes the Public Fire Protection Surcharge.

The Fixed D&C Charge is designed to recover the costs associated with installation, maintaining, and servicing a customer's meter, as well as the customer service costs and a portion of the maintenance and repair of the distribution system. This cost is proportional to meter size and goes up with meter size according to standards set forth by the AWWA. Table 4-2 shows the current Fixed D&C Charges by meter size as of January 1, 2023 (FY 2023). All charges are shown monthly.

Table 4-2: Current Fixed Distribution & Customer Charges

Description	Current (01/01/2023)
Fixed Rates (All Customers)	
5/8"	\$26.08
3/4"	\$26.08
1"	\$49.55
1 1/2"	\$101.71
2"	\$234.75
3"	\$573.79
4"	\$881.50
6"	\$1,361.36
8"	\$2,214.32
10"	\$2,881.97

The second fixed charge is the Public Fire Protection Surcharge. This component recovers costs associated with public fire protection, or the maintenance and capacity costs required to maintain fire hydrants and public fire protection systems that all customers benefit from. These costs are proportional to meter size. For the proposed monthly Fixed charges, the Department has chosen to absorb the public fire charge into the D&C charge resulting in one fixed charge.

Table 4-3 shows the current Fire Protection Surcharges. All values are shown in monthly terms.

Table 4-3: Current Public Fire Protection Surcharges¹¹

Description	Current (01/01/2023)
Public Fire Surcharge	
5/8"	\$0.38
3/4"	\$0.38
1"	\$0.70
1 1/2"	\$2.68
2"	\$3.45
3"	\$8.13
4"	\$9.58
6"	\$22.00
8"	\$29.48
10"	\$38.20

4.3. Existing Volumetric Service Charges (\$/HCF)

The Department's current rate structure for variable (volumetric) rates is an inclining block rate structure based on meter size and a Capital Improvement Charge which is a uniform rate as a \$/HCF. That is, all customers pay the same rates for use in each tier, but have different tier breakpoints based on meter size. Table 4-4 shows the current volumetric rates¹² and the volumetric water capital improvement charge (CIC).¹³ All values are volumetric in \$/HCF.

Table 4-4: Current Variable Rates (\$/HCF)

Description	Current
Variable Rates (\$/HCF)	
Tier 1	\$1.76489
Tier 2	\$3.74827
Tier 3	\$4.39376
Tier 4	\$5.33137
Water Capital Improvement Charge (\$/HCF)	\$1.12404

¹¹ As noted above, the City will combine these costs into the Fixed Charge shown in Table 1-7.

¹² The City currently bills each tier the same \$/HCF rate, regardless of meter size. Tier breakpoints vary by meter size, however.

¹³ The CIC charge is a uniform (\$/HCF) rate designed to recover capital costs associated with water system improvements required to treat & deliver water to City customers and a portion of debt service. All customer classes and meter sizes pay the CIC charge each unit of HCF used during the respective billing period.

4.4. Proposed Fixed Service Charge

There are three cost components that comprise the monthly service charge: meter maintenance & extra capacity, public fire protection, and customer service. A description of each component of the fixed charge and the calculation of the monthly fixed service charge for each meter size is shown below.

4.4.1. METER MAINTENANCE AND EXTRA CAPACITY

The meter service component recovers two types of costs: 1) costs associated with maintaining and servicing meters (meter service component) and 2) capacity (also known as peaking) costs. Both costs increase as the meter size increases and are proportional to the AWWA hydraulic capacity ratios shown in column D of Table 3-6. The capacity ratios, which are a function of a meter's safe maximum flow rate, are used to increase the meter service component for larger capacity meters – as shown in column D of Table 4-5. This assumes that the potential capacity (peaking) demand is proportional to the potential flow through each meter size as established by the AWWA hydraulic capacity ratios. The ratios shown in column D of Table 4-5 show the ratio of potential flow through each meter size compared to the flow through a $\frac{5}{8}$ -inch meter. The $\frac{3}{4}$ -inch meter is used as the base since it is the smallest and most numerous meter size. Larger meters have the potential to demand more peak capacity. For example, column C of Table 4-5 shows that the hydraulic capacity of a 2-inch meter is 5.33 times that of a $\frac{3}{4}$ -inch meter; therefore the meter service component is 5.33 times that of the $\frac{3}{4}$ -inch meter. The unit rate from the FY 2025 COS (line 15, Column G of Table 3-13) is multiplied by the corresponding capacity ratio in Column D of Table 4-5 to derive the meter component of the monthly fixed rate for all Department customers at each meter size.

4.4.2. PUBLIC FIRE COMPONENT

The unit rate for public fire costs was derived earlier in Column F of Table 3-13. This component is also proportional to meter size and the corresponding capacity ratios; as with meter-related costs, the public fire component is calculated by multiplying the unit rate from Table 3-13 by the capacity ratios shown in Column D of Table 4-5.

4.4.3. CUSTOMER COMPONENT

The unit rate for customer costs was derived earlier in Column H of Table 3-13. Unlike meter and public fire costs, this component is not dependent on meter size and therefore equivalent to the unit cost shown in line 15, Column H of Table 3-13.

4.4.4. PROPOSED FY 2025 MONTHLY FIXED CHARGE

Table 4-5 shows the derivation of the monthly Fixed Charge. The total meter service charge is calculated by summing the meter, public fire, and customer components for each meter size (Columns E through G). Note that the Fixed Charge also includes revenues previously collected via the Capital Improvement Charge (CIC). These revenues fund capital repair and replacement (R&R) projects necessary to maintain the water system. The proposed FY 2025 COS rates (which include the 13% rate revenue increase shown for FY 2025 in Table 1-1) are shown in Column H. The difference as compared to current monthly fixed

service charges are shown in Columns I through K. The small meters ($\frac{5}{8}$ " and $\frac{3}{4}$ ") meters are increasing due to the revision of the customer service charge which better reflects customer service costs.

Table 4-5: Monthly Fixed by Meter Size

Line [A]	Meter Size [B]	No. of Meters [C]	Meter Ratio [D]	Meter Maintenance & Extra Capacity [E]	Public Fire Protection [F]	Customer [G]	Proposed Monthly Charge [H]	Current Monthly Charge [I]	Difference (\$) [J]	Difference (%) [K]
1	All Customers									
2	5/8" or 3/4"	20,139	1.00	\$28.30	\$4.05	\$6.26	\$38.62	\$26.08	\$12.54	48.1%
3	1"	11,967	1.67	\$47.17	\$6.75	\$6.26	\$60.19	\$49.55	\$10.64	21.5%
4	1 1/2"	2,203	3.33	\$94.35	\$13.50	\$6.26	\$114.11	\$101.71	\$12.40	12.2%
5	2"	1,752	5.33	\$150.95	\$21.60	\$6.26	\$178.82	\$234.75	(\$55.93)	-23.8%
6	3"	257	14.50	\$410.41	\$58.73	\$6.26	\$475.40	\$573.79	(\$98.39)	-17.1%
7	4"	215	25.00	\$707.60	\$101.26	\$6.26	\$815.13	\$881.50	(\$66.37)	-7.5%
8	6"	97	53.33	\$1,509.55	\$216.02	\$6.26	\$1,731.84	\$1,361.36	\$370.48	27.2%
9	8"	24	93.33	\$2,641.71	\$378.04	\$6.26	\$3,026.02	\$2,214.32	\$811.70	36.7%
10	10"	4	140.00	\$3,962.57	\$567.06	\$6.26	\$4,535.89	\$2,881.97	\$1,653.92	57.4%
11	Total	36,658								14.5%

4.5. Proposed Private Fire Charges

Table 4-6 shows the derivation of private fire charges. The unit rate per equivalent private fire meter, per year was calculated in Table 3-13. This unit rate is divided by twelve billing periods to get a unit rate per month, per equivalent private fire meter. The resulting rate is multiplied by the fire capacity ratios (normalized to a 6” meter) shown in Column D below. This provides the FY 2025 proposed monthly private fire service charge shown in Column E of Table 4-6. We note that the proposed charges are in proportion to potential flow according to guidance in the AWWA rate setting manual.

Table 4-6: Derivation of Private Fire Monthly Fixed Service Charge

Line [A]	Private Fire Connections [B]	No. Connections [C]	Potential Demand per Connection [D]	Monthly Private Fire Charge [E]	Monthly Current Charge [F]	Difference (\$) [G]
1	Meter Size					
4	4"	722	38.32	\$31.12	\$50.71	(\$19.59)
5	6"	394	111.31	\$90.40	\$94.82	(\$4.42)
6	8"	144	237.21	\$192.65	\$170.35	\$22.30
7	10"	2	426.58	\$346.46	\$250.53	\$95.93
8	12"	3	689.04	\$559.63	\$332.89	\$226.74
9	16"	3	1,468.37	\$1,192.58	\$332.89	\$859.69
10	Total	1,267				

4.6. Proposed Variable Rates

The variable rate includes the following cost components: wholesale supply costs, base costs (costs to serve average demand), extra capacity (peaking costs), and conservation. Each component of the variable rate is described and calculated in the sections below.

4.6.1. CUSTOMER CLASSES

As discussed above, the Department currently bills all customers the same tiered rates with tier definitions/widths varying by meter size. The Department has chosen to modify their variable rate structure based on customer classes: Single Family Residential, Multi-Family Residential, and Commercial classes. The Commercial class will include all non-residential classes except for private fire (including Commercial, Industrial, Irrigation, etc.). The Commercial customer class is further divided by meter sizes: Small (5/8"-1"), Medium (1 1/2"-4"), and Large (6" & up). The proposed tier definitions, descriptions and derivations of variable rate components, and the calculation of the FY 2025 proposed variable rates are shown in this section.

4.6.2. TIER DEFINITIONS

Tiers were defined for Single Family Residential (“SFR”) customers first. The SFR Tier 1 breakpoint is based on an estimate of indoor water use, determined using an assumption of 42 gallons per person per day and 4 persons per household. The Tier 2 breakpoint was set to the average summer use for SFR customers. Tier 3 represents any use beyond Tier 2. The remaining classes’ tier breakpoints were determined based on the resulting distribution of tiered water use for the SFR customers. For example, the Tier 1 breakpoint resulted in approximately 35% of total SFR water use; Tier 2 represents approximately 44% and Tier 3 the remaining 21%. Raftelis used these percentage distributions to determine the breakpoint of each tier for the two other classes. This promotes equity because each class is paying for the same proportion of water in each tier so that all classes are treated the same and one particular class is not paying for a disproportionate volume at Tier 3 rates. The resulting tier allocations are shown below in Table 4-7. Column C shows the total projected water use for FY 2025 by customer class and tier. All values are in HCF.

Table 4-7: Proposed Tier Breakpoints by Customer Class

Private Fire Connections [A]	Tier Breakpoints [B]	Water Use by Customer Class/Tier [C]
Single Family		5,083,771
Tier 1	14	1,802,928
Tier 2	58	2,237,452
Tier 3	>58	1,043,391
Multi-Family		1,883,783
Tier 1	10	1,201,249
Tier 2	20	309,080
Tier 3	>20	373,454
Commercial Small (5/8"-1")		336,007
Tier 1	17	116,410
Tier 2	87	148,917
Tier 3	>87	70,679
Commercial Medium (1 1/2"-4")		1,594,737
Tier 1	105	558,320
Tier 2	530	702,802
Tier 3	>530	333,614
Commercial Large (6"+)		1,281,195
Tier 1	1,700	446,161
Tier 2	10,100	563,382
Tier 3	>10,100	271,652
Total		10,179,493

4.6.3. VOLUMETRIC RATE DERIVATION

The total volumetric rate is the summation of unit rates for each cost component: Wholesale Supply, Base (average demand costs), Extra Capacity (peaking costs), and Conservation. Each cost component's unit rate is defined and calculated below.

4.6.4. WHOLESALE SUPPLY RATES

Table 4-8 derives the supply rates in column G. The Department currently relies on a combination of groundwater from the Raymond Basin and imported water from MWD. The water purchase revenue requirement is shown in column E and is allocated to groundwater and MWD costs in proportion to column D. These percentages provide the basis upon which to allocate the Wholesale Water Purchase Revenue Requirement (from line 12, Column C of Table 3-13) to each supply source. The total revenue requirement for each source is then divided by the total water sales for groundwater and MWD water, respectively, resulting in the unit supply rates listed in Column G. All values are in \$/HCF.

Table 4-8: Derivation of Unit Rates for Supply Costs by Source (\$/HCF)

Line [A]	Description [B]	Wholesale Water Purchase Costs [C]	% of Water Purchase Costs [D]	Wholesale Water Purchase Revenue Requirement [E]	Water Sales (after water loss, in HCF) [F]	Supply Rate (\$/HCF) [G]
1				\$22,552,250		
2						
3	Groundwater	\$384,909	1.7%	\$377,136	4,190,842	\$0.09
4	MWD	\$22,632,182	98.3%	\$22,175,114	5,988,651	\$3.70
5	Total	\$23,017,091	100.0%	\$22,552,250	10,179,493	

Table 4-9 shows the calculation of the tiered supply rates. Using the tier breakpoints for each customer class, total water use for all customer classes in each tier was calculated in Column C. Because groundwater supply is cheaper and Tier 1 tends to be indoor/essential use, groundwater supply cost is allocated to Tier 1 customers. The supply rate for Tier 1 is shown in column G. The remaining groundwater supply is allocated to Tier 2 until the supply is exhausted; the remaining water for Tier 2 and all of Tier 3 is supplied by MWD water. The resulting water volumes are then multiplied by the unit supply rates for each source in line 8 (from Table 4-8) by the use in each tier. The resulting values are then divided by the total use in each tier (Column F) to yield the tiered supply rates in Column G. All rates and flows are in \$/HCF or HCF, respectively.

Table 4-9: Supply Rates Derivation

Line [A]	Description [B]	Water Use (HCF) [C]	Groundwater [D]	MWD Imported Water [E]	Total [F]	Supply Rate (\$/HCF) [G]	Revenue Requirement [H]
1	Total Water Available		4,190,842	5,988,651	10,179,493		
2							
3	Tier 1	4,125,068	4,125,068	-	4,125,068	\$0.09	\$371,217
4	Tier 2	3,961,634	65,774	3,895,860	3,961,634	\$3.64	\$14,431,730
5	Tier 3	2,092,791	-	2,092,791	2,092,791	\$3.70	\$7,749,303
6	Total	10,179,493	4,190,842	5,988,651	10,179,493		
7							
8	Wholesale Supply Cost by Source		\$0.09	\$3.70			\$22,552,250

4.6.5. BASE RATE

The base unit rate was developed previously in line 15, Column D of Table 3-13. Base costs recover the costs associated with transmission, distribution, and other related processes required to meet average demand.

4.6.6. EXTRA CAPACITY (PEAKING) RATE

Table 4-10 shows the calculation of the extra capacity (also known as peaking) rates by customer class and tier. Extra capacity costs are designed to recover the costs associated with maintaining storage, and distribution capacity that meets peak daily maximums. The Max Day Extra Capacity costs shown in Column D were calculated by multiplying the unit daily rate for extra capacity (determined earlier in line 15, Column E of Table 3-13) by the total extra capacity units of service for each customer class and tier (from Column H of Table 3-11). The resulting extra capacity costs by customer class and tier (Column D below) are then divided by the total water demand for each tier in each customer class (Column C). This yields the extra capacity rates by customer class and tier, shown in Column E of Table 4-10.

Table 4-10: Derivation of Extra Capacity Rates

Line [A]	Description [B]	Water Use (HCF) [C]	Max Day Costs [D]	Extra Capacity Rate (\$/HCF) [E]
1	Single Family	5,083,771	\$1,448,895	
2	Tier 1	1,802,928	\$310,996	\$0.17
3	Tier 2	2,237,452	\$667,293	\$0.30
4	Tier 3	1,043,391	\$470,606	\$0.45
5				
6	Multi-Family	1,883,783	\$368,462	
7	Tier 1	1,201,249	\$199,894.48	\$0.17
8	Tier 2	309,080	\$75,196.19	\$0.24
9	Tier 3	373,454	\$93,371.14	\$0.25
10				
11	Commercial Small (5/8"-1")	336,007	\$61,991	
12	Tier 1	116,410	\$15,762	\$0.14
13	Tier 2	148,917	\$32,098	\$0.22
14	Tier 3	70,679	\$14,131	\$0.20
15				
16	Commercial Medium(1 1/2"-4")	1,594,737	\$402,844	
17	Tier 1	558,320	\$100,173	\$0.18
18	Tier 2	702,802	\$178,549	\$0.25
19	Tier 3	333,614	\$124,122	\$0.37
20				
21	Commercial Large(6"+)	1,281,195	\$415,627	
22	Tier 1	446,161	\$87,267	\$0.20
23	Tier 2	563,382	\$176,279	\$0.31
24	Tier 3	271,652	\$152,081	\$0.56
25	Total	10,179,493	2,697,818	

4.6.7. CONSERVATION RATE

Table 4-11 shows the calculation of the conservation rate by customer class and tier. Conservation rates recover costs associated with conservation programs, which are targeted toward higher volume users. Column C shows the water use by customer class and tier. Column C shows weighted water use to apply in each tier. Using weighted water use accounts for the fact that conservation efforts are largely focused on reducing use in Tier 3 rather than Tiers 1 or 2; by applying a weight of 200% to Tier 3 results in Tier 3 bearing slightly more of conservation costs as compared to what Tier 3 would bear if based in proportion to use. For example, SFR use in Tier 3 is approximately 21%. By weighting Tier 3 conservation use as shown in column D, Tier 3 bears 34% of conservation costs. The weighted percentages are shown in Column D. Lines 1 and 2 of Column F show the calculation of a uniform unit cost before weighting; that is, the total allocation to Conservation from line 12, Column K of Table 3-13 is divided by the resulting total conservation use (line 28, Column D of Table 4-11 below) to yield the \$/HCF unit rate for conservation shown in line 2, Column F below. This rate is then multiplied by the (weighted) conservation use (Column D) in each tier to produce the cost of service distribution shown in Column F. The resulting values (Column F) are divided by original use (Column C) to produce the final conservation rates by customer class and tier, shown in Column G.

Table 4-11: Derivation of Conservation Unit Rate

Line [A]	Description [B]	Water Use (HCF) [C]	Conservation Weighted Use [D]	Conservation Use (HCF) [E]	Conservation Costs [F]	Conservation Rate (\$/HCF) [G]
1					\$3,754,261	
2					\$0.31	
3						
4	Single Family	5,083,771		6,127,162	\$1,874,383	
5	Tier 1	1,802,928	100%	1,802,928	\$551,540	\$0.31
6	Tier 2	2,237,452	100%	2,237,452	\$684,467	\$0.31
7	Tier 3	1,043,391	200%	2,086,782	\$638,376	\$0.61
8						
9	Multi-Family	1,883,783		2,257,237	\$690,520	
10	Tier 1	1,201,249	100%	1,201,249	\$367,479	\$0.31
11	Tier 2	309,080	100%	309,080	\$94,552	\$0.31
12	Tier 3	373,454	200%	746,907	\$228,489	\$0.61
13						
14	Commercial Small (5/8"-1")	336,007		406,686	\$124,411	
15	Tier 1	116,410	100%	116,410	\$35,611	\$0.31
16	Tier 2	148,917	100%	148,917	\$45,556	\$0.31
17	Tier 3	70,679	200%	141,359	\$43,244	\$0.61
18						
19	Commercial Medium(1 1/2"-4")	1,594,737		1,928,351	\$589,909	
20	Tier 1	558,320	100%	558,320	\$170,798	\$0.31
21	Tier 2	702,802	100%	702,802	\$214,997	\$0.31
22	Tier 3	333,614	200%	667,229	\$204,114	\$0.61
23						
24	Commercial Large (6"+)	1,281,195		1,552,847	\$475,037	
25	Tier 1	446,161	100%	446,161	\$136,487	\$0.31
26	Tier 2	563,382	100%	563,382	\$172,346	\$0.31
27	Tier 3	271,652	200%	543,304	\$166,204	\$0.61
28	Total	10,179,493		12,272,284	\$3,754,261	\$0.31

4.6.8. FINAL RATE DERIVATION

Table 4-12 shows the final rate derivation by customer class and tier. Proposed rates were calculated by summing the various components (from Table 3-13, Table 4-9, Table 4-10, and Table 4-11) listed in Columns D through G. Proposed variable rates are shown in Column H; current rates and the dollar difference to proposed rates are shown in Columns I and J, respectively. Note that the Department will eliminate its fourth Tier. All values shown below are in \$/HCF and reflect the 13% revenue increase for FY 2025 from Table 1-1.

Table 4-12: Final Derivation of Variable Rates by Customer Class/Tier (HCF)

Line [A]	Description [B]	Water Use (HCF) [C]	Wholesale Supply Rate [D]	Base Rate [E]	Extra Capacity Rate [F]	Conservation Rate (\$/HCF) [G]	Proposed Rate (\$/HCF) [H]	Current Rate (\$/HCF) [I]	Difference (\$) [J]
1	Single Family	5,083,771		6,127,162	\$1,874,383	\$0.37			
2	Tier 1	1,802,928	\$0.09	\$1.68	\$0.17	\$0.31	\$2.24818	\$1.76489	\$0.48329
3	Tier 2	2,237,452	\$3.64	\$1.68	\$0.30	\$0.31	\$5.92680	\$3.74827	\$2.17853
4	Tier 3	1,043,391	\$3.70	\$1.68	\$0.45	\$0.61	\$6.44550	\$4.39376	\$2.05174
5									
6	Multi-Family	735,513							
7	Tier 1	384,509	\$0.09	\$1.68	\$0.17	\$0.31	\$2.24209	\$1.76489	\$0.47720
8	Tier 2	125,898	\$3.64	\$1.68	\$0.24	\$0.31	\$5.87186	\$3.74827	\$2.12359
9	Tier 3	225,106	\$3.70	\$1.68	\$0.25	\$0.61	\$6.24448	\$4.39376	\$1.85072
10									
11	Commercial Small (5/8"-1")	336,007							
12	Tier 1	116,410	\$0.09	\$1.68	\$0.14	\$0.31	\$2.21109	\$1.76489	\$0.44620
13	Tier 2	148,917	\$3.64	\$1.68	\$0.22	\$0.31	\$5.84411	\$3.74827	\$2.09584
14	Tier 3	70,679	\$3.70	\$1.68	\$0.20	\$0.61	\$6.19440	\$4.39376	\$1.80064
15									
16	Commercial Medium (1 1/2"-4")	1,594,737							
17	Tier 1	558,320	\$0.09	\$1.68	\$0.18	\$0.31	\$2.25510	\$1.76489	\$0.49021
18	Tier 2	702,802	\$3.64	\$1.68	\$0.25	\$0.31	\$5.88262	\$3.74827	\$2.13435
19	Tier 3	333,614	\$3.70	\$1.68	\$0.37	\$0.61	\$6.36652	\$4.39376	\$1.97276

Line [A]	Description [B]	Water Use (HCF) [C]	Wholesale Supply Rate [D]	Base Rate [E]	Extra Capacity Rate [F]	Conservation Rate (\$/HCF) [G]	Proposed Rate (\$/HCF) [H]	Current Rate (\$/HCF) [I]	Difference (\$) [J]
20	Commercial LARGE (6"+)	1,281,195							
21	Tier 1	446,161	\$0.09	\$1.68	\$0.20	\$0.31	\$2.27128	\$1.76489	\$0.50639
22	Tier 2	563,382	\$3.64	\$1.68	\$0.31	\$0.31	\$5.94146	\$3.74827	\$2.19319
23	Tier 3	271,652	\$3.70	\$1.68	\$0.56	\$0.61	\$6.55430	\$4.39376	\$2.16054
24	Total	10,179,493	\$22,552,250	\$17,099,305	\$2,697,818	\$3,754,261			

5. Proposed Five-Year Rates

5.1. Proposed Fixed Charges

Table 5-1 shows the proposed Fixed Charges by meter size for FY 2025 through FY 2029. All charges are shown in monthly terms. The Fixed Charge is designed to recover the costs associated with installation, maintaining, and servicing a customer's meter, as well as the customer service costs and a portion of extra capacity costs.

Table 5-1: Monthly Proposed Fixed Charges

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
All Customers					
5/8"	\$38.62	\$43.25	\$47.15	\$50.92	\$54.48
3/4"	\$38.62	\$43.25	\$47.15	\$50.92	\$54.48
1"	\$60.19	\$67.41	\$73.48	\$79.36	\$84.91
1 1/2"	\$114.11	\$127.81	\$139.31	\$150.45	\$160.98
2"	\$178.82	\$200.28	\$218.31	\$235.77	\$252.27
3"	\$475.40	\$532.45	\$580.37	\$626.80	\$670.68
4"	\$815.13	\$912.94	\$995.11	\$1,074.72	\$1,149.95
6"	\$1,731.84	\$1,939.66	\$2,114.23	\$2,283.37	\$2,443.20
8"	\$3,026.02	\$3,389.14	\$3,694.16	\$3,989.70	\$4,268.97
10"	\$4,535.89	\$5,080.20	\$5,537.42	\$5,980.41	\$6,399.04

5.2. Proposed Private Fire Charges

Table 5-2 shows the proposed private fire service charges for FY 2025 through FY 2029. Private fire charges recover the costs associated with maintaining private fire-fighting capacity.

Table 5-2: Monthly Proposed Fixed Service Charges

Description	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Fixed Rates (All Customers)					
4"	\$31.08	\$34.82	\$37.95	\$40.98	\$43.85
6"	\$90.30	\$101.13	\$110.23	\$119.05	\$127.39
8"	\$192.42	\$215.51	\$234.91	\$253.70	\$271.46
10"	\$346.04	\$387.57	\$422.45	\$456.25	\$488.19
12"	\$558.96	\$626.03	\$682.38	\$736.97	\$788.55
16"	\$1,191.15	\$1,334.09	\$1,454.16	\$1,570.49	\$1,680.43

5.3. Proposed Variable Rates

Table 5-2 shows the proposed private fire service charges for FY 2025 through FY 2029. Private fire charges recover the costs associated with maintaining private fire-fighting capacity.

Table 5-3: Proposed Variable Rates (\$/HCF) for All Classes

Description	Tier Breakpoints	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Single Family						
Tier 1	0-7	\$2.24818	\$2.51796	\$2.74458	\$2.96414	\$3.17163
Tier 2	7-29	\$5.92680	\$6.63802	\$7.23544	\$7.81428	\$8.36128
Tier 3	>29	\$6.44550	\$7.21896	\$7.86867	\$8.49816	\$9.09303
Multi-Family Residential						
Tier 1	0-5	\$2.24209	\$2.51114	\$2.73714	\$2.95611	\$3.16304
Tier 2	5-10	\$5.87186	\$6.57648	\$7.16836	\$7.74183	\$8.28376
Tier 3	>10	\$6.24448	\$6.99382	\$7.62327	\$8.23313	\$8.80945
Commercial Small (5/8"--1")						
Tier 1	0-8	\$2.21109	\$2.47642	\$2.69930	\$2.91524	\$3.11931
Tier 2	8-43	\$5.84411	\$6.54540	\$7.13448	\$7.70524	\$8.24461
Tier 3	>43	\$6.19440	\$6.93773	\$7.56212	\$8.16709	\$8.73879
Commercial Medium (1 1/2"--4")						
Tier 1	0-52	\$2.25510	\$2.52571	\$2.75303	\$2.97327	\$3.18140
Tier 2	52-265	\$5.88262	\$6.58853	\$7.18150	\$7.75602	\$8.29894
Tier 3	>265	\$6.36652	\$7.13050	\$7.77224	\$8.39402	\$8.98160
Commercial Large (6' & up)						
Tier 1	0-850	\$2.27128	\$2.54383	\$2.77278	\$2.99460	\$3.20422
Tier 2	850-5,050	\$5.94146	\$6.65444	\$7.25333	\$7.83360	\$8.38195
Tier 3	>5,050	\$6.55430	\$7.34082	\$8.00149	\$8.64161	\$9.24652

6. Water Bill Impacts

6.1. Single Family Residential Bill Impacts

Table 6-1 shows Single Family Residential monthly bill impacts for various use points and meter sizes. Average monthly water use was calculated based on historical data and applied to the variable component of the total charge.

Table 6-1: Single Family Monthly Bill Impacts for FY 2025

Meter Size	No. Accounts	Average Use	Proposed Bill	Current Bill	Difference (\$)
Single Family Residential					
5/8"	15	19	\$69.17	\$56.88	\$12.29
3/4"	16,880	23	\$81.03	\$66.62	\$14.40
1"	9,738	39	\$150.01	\$121.46	\$28.55
1 1/2"	1,209	83	\$340.81	\$262.96	\$77.85
2"	325	147	\$611.77	\$501.11	\$110.66
3"	4	194	\$1,059.83	\$862.15	\$197.68

6.2. Multi-Family Residential Bill Impacts

Table 6-2 shows the monthly bill impacts for Multi-Family Residential (MFR) customers at various use points and meter sizes. Average monthly water use was calculated based on historical data and applied to the variable component of the total charge.

Table 6-2: Multi-Family Monthly Bill Impacts for FY 2025

Meter Size	No. Accounts	No. EDUs	Average Use	Proposed Bill	Current Bill	Difference (\$)
Multi-Family Residential						
5/8"	2	3	39	\$98.67	\$105.60	(\$6.93)
3/4"	2,069	2	34	\$102.14	\$93.42	\$8.72
1"	1,216	4	53	\$143.20	\$155.57	(\$12.37)
1 1/2"	490	7	93	\$260.11	\$287.32	(\$27.21)
2"	563	20	168	\$367.16	\$552.27	(\$185.11)
3"	92	36	343	\$859.92	\$1,187.45	(\$327.53)
4"	47	46	424	\$1,290.45	\$1,503.53	(\$213.08)
6"	24	127	1,076	\$2,292.36	\$2,105.59	\$186.77

6.3. Commercial Bill Impacts

Table 6-3 shows the monthly bill impacts for Commercial customers at various use points and meter sizes. Average monthly water use was calculated based on historical data and applied to the variable component of the total charge.

Table 6-3: Commercial Small Monthly Bill Impacts for FY 2025

Meter Size	No. Accounts	Average Use	Proposed Bill	Current Bill	Difference (\$)
Commercial Small (5/8"--1")					
5/8"	5	7	\$46.36	\$36.57	\$9.79
3/4"	1,150	22	\$72.02	\$64.19	\$7.83
1"	902	38	\$140.35	\$119.02	\$21.32

Table 6-4 shows the monthly bill impacts for Commercial customers at various use points and meter sizes. Average monthly water use was calculated based on historical data and applied to the variable component of the total charge.

Table 6-4: Commercial Medium Monthly Bill Impacts for FY 2025

Meter Size	No. Accounts	Average Use	Proposed Bill	Current Bill	Difference (\$)
Commercial Medium (1 1/2"-4")					
1 1/2"	466	79	\$203.19	\$253.21	(\$50.02)
2"	787	151	\$432.51	\$510.86	(\$78.34)
3"	140	293	\$1,146.76	\$1,065.64	\$81.12
4"	156	497	\$2,086.51	\$1,655.59	\$430.92

Table 6-5 shows the monthly bill impacts for Commercial customers at various meter sizes with average water use. Average monthly water use was calculated based on historical data and applied to the variable component of the total charge.

Table 6-5: Commercial Large Monthly Bill Impacts for FY 2025

Meter Size	No. Accounts	Average Use	Proposed Bill	Current Bill	Difference (\$)
Commercial Large (6" & up)					
6"	59	2,236	\$5,254.74	\$5,838.91	(\$584.18)
8"	22	1,409	\$4,626.13	\$4,684.65	(\$58.52)
10"	2	12,784	\$40,216.49	\$33,072.29	\$7,144.20

7. Proposed Drought Rates

7.1. Drought Rate Background

The proposed rates include the adoption of drought rates which may be implemented during a declared water supply shortage response. This section provides an overview of the water shortage emergency stages (drought stages), corresponding revenue impacts, drought rate calculations, and a summary of proposed consumption charges at each stage (effective only if a water supply shortage is declared by City Council and the General Manager decides to implement drought rates). The drought rates calculated in this section are separate rates in addition to the water rates derived in Section 5.

The proposed drought rates are volumetric (\$/HCF). The percent reduction in water demand during each water shortage emergency stage is defined in the Department's Water Shortage Contingency Plan, which was approved by the City Council as a part of the 2020 Urban Water Management Plan (UWMP) and Municipal Code 13.10.035. The Department can establish drought rates to:

- Encourage water conservation through price signaling to meet the desired conservation goals for each tier, at each drought stage
- Recover lost revenue due to decreased consumption during a drought

The Department is subject to penalties from MWD should it exceed its water allocation. In addition, the Department may be subject to penalties from the State Water Resources Control Board if it does not reach future mandated water use reductions. Drought Rates are designed to promote conservation and maximize the probability that the Department will escape penalties. Drought Rates are needed to recover lost revenues as Department customers curtail their water consumption.

7.1.1. REVENUE COLLECTION DURING A DROUGHT

Water shortage emergencies can have significant impacts on an agency's revenue. During a drought, the Department's revenue requirement (costs) decreases along with revenue. However, the Department's revenue decreases more than its costs do. In addition, the majority of the Department's costs are fixed (salaries, benefits, debt service, etc.), and do not decrease with lower water use levels. The proposed Drought Rates are an option to recover lost revenue to cover its fixed costs. Drought rates are a mechanism to maintain revenue stability and achieve debt coverage requirements during a water shortage emergency.

7.1.2. CUSTOMER BILLS DURING A DROUGHT

Provided that customers cut back their water use in line with the drought cutback goal, their total water bill should be equal to or lower than their bill during "normal" water/rainfall years. Conversely, those that do not cut back consumption will face higher charges.

7.2. Derivation of Drought Rates

To calculate drought rates, Raftelis performed the following steps:

1. Determine target reductions for water use at each stage in the drought
2. Determine the lost revenue at each stage of reduction
3. Account for volumetric water supply cost savings (lower water purchase costs) to offset a portion of the revenue loss
4. Add additional conservation costs at each stage of drought, as applicable
5. Calculate the total revenue shortfall to be recovered via drought rates by summing total revenue losses and conservation costs, then offsetting (e.g., subtracting) decreases in volumetric supply costs
6. Calculate the % increase in revenue needed by dividing the total drought revenue requirement by expected (e.g. no drought) revenue.
7. Adjust % rate increase for each tier/class until the target revenue increase is achieved. That is, instead of applying universal % increase, the Department chose to concentrate increases in upper tiers where excessive water use typically falls and towards whom most conservation efforts are directed.
8. Apply the percentages developed in step 7 to the proposed variable rates.

Table 7-1 shows the estimated water use reductions for each customer class at each level and stage of drought.

Table 7-1: Target Reduction at Each Stage of Drought, By Customer Class/Tier

Pasadena Drought Level				Level 1	Level 2		Level 3	Level 4	
Line	Description	UWMP Level	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Residential Single Family								
2	Tier 1		0%	0%	0%	7%	10%	20%	42%
3	Tier 2		0%	18%	32%	45%	58%	65%	75%
4	Tier 3		0%	27%	65%	80%	95%	100%	100%
5									
6	Residential Multi-Family								
7	Tier 1		0%	0%	0%	7%	10%	20%	42%
8	Tier 2		0%	18%	32%	45%	58%	65%	75%
9	Tier 3		0%	27%	65%	80%	95%	100%	100%
10									
11	Commercial								
12	Tier 1		0%	0%	0%	0%	0%	0%	0%
13	Tier 2		0%	5%	10%	20%	40%	50%	60%
14	Tier 3		0%	10%	20%	40%	60%	100%	100%
15									
16	Target Reduction (Up to)			10%	20%	30%	40%	50%	> 50%
17	Total Reduction (%)			10%	20%	30%	40%	50%	60%

Table 7-2 shows the calculation of estimated water use at each stage in the drought. Water use at each stage and tier was calculated by multiplying non-drought use by the percentage reduction shown for that stage/tier, then subtracting the result from the non-drought use. These reduced water use estimates provide the basis upon which to calculate estimated lost revenue at each drought stage.

Table 7-2: Estimated Water Use (HCF) at Each Stage of Drought, By Customer Class/Tier

	Pasadena Drought Level	Baseline	Level 1	Level 2	Level 3	Level 4		
Line	Description/UWMP Level	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Residential Single Family	5,083,771	4,399,314	3,689,582	3,116,000	2,625,722	2,225,450	1,605,061
2	Tier 1	1,802,928	1,802,928	1,802,928	1,676,723	1,622,635	1,442,342	1,045,698
3	Tier 2	2,237,452	1,834,711	1,521,467	1,230,599	950,917	783,108	559,363
4	Tier 3	1,043,391	761,676	365,187	208,678	52,170	0	0
5								
6	Residential Multi-Family	1,883,783	1,727,316	1,542,133	1,361,847	1,231,156	1,069,178	773,995
7	Tier 1	1,201,249	1,201,249	1,201,249	1,117,162	1,081,125	961,000	696,725
8	Tier 2	309,080	253,446	210,174	169,994	131,359	108,178	77,270
9	Tier 3	373,454	272,621	130,709	74,691	18,673	0	0
10								
11	Commercial Small (5/8"-1")	336,007	321,493	306,979	277,952	234,032	190,869	175,977
12	Tier 1	116,410	116,410	116,410	116,410	116,410	116,410	116,410
13	Tier 2	148,917	141,471	134,026	119,134	89,350	74,459	59,567
14	Tier 3	70,679	63,612	56,544	42,408	28,272	0	0
15								
16	Commercial Medium (1 1/2"-4")	1,594,737	1,526,235	1,457,733	1,320,730	1,113,447	909,721	839,441
17	Tier 1	558,320	558,320	558,320	558,320	558,320	558,320	558,320
18	Tier 2	702,802	667,662	632,522	562,242	421,681	351,401	281,121
19	Tier 3	333,614	300,253	266,891	200,169	133,446	0	0
20								
21	Commercial Large (6" & up)	1,281,195	1,225,861	1,170,527	1,059,858	892,851	727,852	671,514
22	Tier 1	446,161	446,161	446,161	446,161	446,161	446,161	446,161
23	Tier 2	563,382	535,213	507,044	450,706	338,029	281,691	225,353
24	Tier 3	271,652	244,487	217,322	162,991	108,661	0	0
25	Total Water Use (HCF)	10,179,493	9,200,219	8,166,954	7,136,387	6,097,208	5,123,070	4,065,988
26	Overall % Reduction		10%	20%	30%	40%	50%	60%

Table 7-3 shows the total estimated revenues from reduced water use at proposed rates at each drought stage. The estimated revenue in each tier and customer class was estimated by taking the water use from

Table 7-2 and multiplying by the water rates shown in the third column listed below. The total revenue loss by stage is shown in line 36 and was calculated by subtracting baseline water use from the estimated total water use at each drought stage.

Table 7-3: Estimated Revenues at Each Stage of Drought, By Customer Class/Tier

	Pasadena Drought Level		Baseline	Level 1	Level 2	Level 3	Level 4		
Line	Description/UWMP Level	Water Rates	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Residential Single Family		\$24,039,422	\$19,836,655	\$15,424,555	\$12,408,125	\$9,620,132	\$7,883,972	\$5,666,151
2	Tier 1	\$2.25	\$4,053,303	\$4,053,303	\$4,053,303	\$3,769,572	\$3,647,973	\$3,242,643	\$2,350,916
3	Tier 2	\$5.93	\$13,260,941	\$10,873,972	\$9,017,440	\$7,293,518	\$5,635,900	\$4,641,329	\$3,315,235
4	Tier 3	\$6.45	\$6,725,177	\$4,909,379	\$2,353,812	\$1,345,035	\$336,259	\$0	\$0
5									
6	Residential Multi-Family		\$6,840,208	\$5,883,884	\$4,743,632	\$3,969,363	\$3,311,900	\$2,789,853	\$2,015,837
7	Tier 1	\$2.24	\$2,693,308	\$2,693,308	\$2,693,308	\$2,504,777	\$2,423,978	\$2,154,647	\$1,562,119
8	Tier 2	\$5.87	\$1,814,874	\$1,488,197	\$1,234,114	\$998,181	\$771,321	\$635,206	\$453,719
9	Tier 3	\$6.24	\$2,332,025	\$1,702,378	\$816,209	\$466,405	\$116,601	\$0	\$0
10									
11	Commercial Small (5/8"-1")		\$1,565,498	\$1,478,202	\$1,390,906	\$1,216,314	\$954,693	\$692,537	\$605,508
12	Tier 1	\$2.21	\$257,393	\$257,393	\$257,393	\$257,393	\$257,393	\$257,393	\$257,393
13	Tier 2	\$5.84	\$870,288	\$826,774	\$783,259	\$696,231	\$522,173	\$435,144	\$348,115
14	Tier 3	\$6.19	\$437,817	\$394,035	\$350,254	\$262,690	\$175,127	\$0	\$0
15									
16	Commercial Medium (1 1/2" to 4")		\$7,517,348	\$7,098,236	\$6,679,124	\$5,840,900	\$4,589,244	\$3,326,228	\$2,912,796
17	Tier 1	\$2.26	\$1,259,068	\$1,259,068	\$1,259,068	\$1,259,068	\$1,259,068	\$1,259,068	\$1,259,068
18	Tier 2	\$5.88	\$4,134,319	\$3,927,603	\$3,720,887	\$3,307,455	\$2,480,592	\$2,067,160	\$1,653,728
19	Tier 3	\$6.37	\$2,123,961	\$1,911,565	\$1,699,169	\$1,274,377	\$849,584	\$0	\$0
20									
21	Commercial Large (6" & up)		\$6,141,158	\$5,795,743	\$5,450,329	\$4,759,500	\$3,733,940	\$2,687,013	\$2,352,282
22	Tier 1	\$2.27	\$1,013,357	\$1,013,357	\$1,013,357	\$1,013,357	\$1,013,357	\$1,013,357	\$1,013,357
23	Tier 2	\$5.94	\$3,347,313	\$3,179,947	\$3,012,581	\$2,677,850	\$2,008,388	\$1,673,656	\$1,338,925
24	Tier 3	\$6.55	\$1,780,488	\$1,602,439	\$1,424,391	\$1,068,293	\$712,195	\$0	\$0
25	Total Variable Revenues		\$46,103,634	\$40,092,720	\$33,688,546	\$28,194,202	\$22,209,909	\$17,379,603	\$13,552,575
26	Total Revenue Losses (\$)			(\$6,010,914)	(\$12,415,088)	(\$17,909,432)	(\$23,893,725)	(\$28,724,031)	(\$32,551,059)
27	<i>Total Revenue Losses (%)</i>			13%	27%	39%	52%	62%	71%

Table 7-4 shows the calculation of the drought rate revenue requirement at each drought stage. Lines 3 shows the FY 2025 wholesale water supply costs, which may decrease due to reduced water use during a drought. The supply cost from line 3 is then multiplied by the total anticipated reduction at each drought stage (calculated above i

Table 7-2). The total supply cost in absence of drought (line 5) is then subtracted from the reduced volumetric water costs at each drought stage (line 9) to produce the estimated drought savings, due to lower water purchased costs, in line 10. Line 14 of Table 7-4 shows the revenue shortfall which is the sum of lost revenue (line 12) and water purchase savings (line 13). Line 14 is added to the expected revenues from Table 7-3 to produce the total drought rate revenue requirement shown in line 17.

Table 7-4: Calculation of Drought Rate Revenue Requirement at Each Stage

	Pasadena Drought Level	Baseline	Level 1	Level 2	Level 3	Level 4		
Line	Water Supply Mix	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	MWD Volumetric Water Purchases	\$19,815,219						
2	Groundwater Costs	\$0						
3	Subtotal Variable Costs	\$19,815,219						
4								
5	Supply Cost (No Drought)	\$19,815,219	\$19,815,219	\$19,815,219	\$19,815,219	\$19,815,219	\$19,815,219	\$19,815,219
6	Cutback (%), actual	-	10%	20%	30%	40%	50%	60%
7	Total Volumetric Drought Savings	\$0	\$1,906,236	\$3,917,572	\$5,923,656	\$7,946,502	\$9,842,742	\$11,900,440
8	Total Volumetric Supply Costs	\$19,815,219	\$17,908,982	\$15,897,647	\$13,891,562	\$11,868,717	\$9,972,476	\$7,914,779
9								
10	Decrease in Volumetric Supply Costs		(\$1,906,236)	(\$3,917,572)	(\$5,923,656)	(\$7,946,502)	(\$9,842,742)	(\$11,900,440)
11								
12	Volumetric Rate Revenue Losses		\$6,010,914	\$12,415,088	\$17,909,432	\$23,893,725	\$28,724,031	\$32,551,059
13	Decrease in Volumetric Supply Cost		(\$1,906,236)	(\$3,917,572)	(\$5,923,656)	(\$7,946,502)	(\$9,842,742)	(\$11,900,440)
14	Total Revenue Shortfall To be Recovered Via Drought Rates		\$4,104,678	\$8,497,516	\$11,985,776	\$15,947,223	\$18,881,289	\$20,650,619
15	Expected Revenue		\$40,092,720	\$33,688,546	\$28,194,202	\$22,209,909	\$17,379,603	\$13,552,575
16								
17	Total Drought Revenue Requirement		\$44,197,397	\$42,186,062	\$40,179,977	\$38,157,132	\$36,260,892	\$34,203,194

Table 7-5 shows the percentage rate increases by customer class and tier to recover the drought revenue requirement shown in line of Table 7-4. The percentage rate increases in the early drought stages reflect that most conservation will come from Tiers 2 and 3. These percentages are the percentage increase to the non-drought rate at each drought stage. For example, during a Stage 2 drought, the non-drought rates for Tier 2, would increase by 29%.

Table 7-5: Drought Percentage Increases By Customer Class/Tier

	Pasadena Drought Level	Level 1	Level 2		Level 3	Level 4	
Line	Description/UWMP Level	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Residential Single Family						
2	Tier 1	0%	0%	10%	35%	58%	125%
3	Tier 2	11%	29%	52%	89%	152%	178%
4	Tier 3	17%	51%	77%	127%	175%	225%
5							
6	Residential Multi-Family						
7	Tier 1	0%	0%	10%	35%	58%	125%
8	Tier 2	11%	29%	52%	89%	152%	178%
9	Tier 3	17%	51%	77%	127%	175%	225%
10							
11	Commercial Small (5/8"-1")						
12	Tier 1	0%	0%	10%	35%	58%	125%
13	Tier 2	11%	29%	52%	89%	152%	178%
14	Tier 3	17%	51%	77%	127%	175%	225%
15							
16	Commercial Medium (1 1/2"-4")						
17	Tier 1	0%	0%	10%	35%	58%	125%
18	Tier 2	11%	29%	52%	89%	152%	178%
19	Tier 3	17%	51%	77%	127%	175%	225%
20							
21	Commercial Large (6" & up)						
22	Tier 1	0%	0%	10%	35%	58%	125%
23	Tier 2	11%	29%	52%	89%	152%	178%
24	Tier 3	17%	51%	77%	127%	175%	225%

Table 7-6 shows the FY 2025 proposed drought rates by customer class/tier at each drought stage. The rates shown below were calculated by applying the percentages shown above in Table 7-5 by the baseline rates in Table 7-6 below. All rates are shown in \$/HCF. The percentages shown in Table 7-4 can be applied to the rates for each of the five years derived in this report. FY 2025 is shown below as an example.

Table 7-6: FY 2025 Proposed Drought Rates by Customer Class/Tier (\$/HCF)

Pasadena Drought Level		Baseline	Level 1	Level 2		Level 3	Level 4	
Line	Description/UWMP Level	Baseline	Stage 1	Stage 2	Stage 3	Stage 4	Stage 5	Stage 6
1	Residential Single Family							
2	Tier 1	\$2.25	\$2.25	\$2.25	\$2.47	\$3.04	\$3.55	\$5.06
3	Tier 2	\$5.93	\$6.58	\$7.62	\$8.98	\$11.20	\$14.94	\$16.48
4	Tier 3	\$6.45	\$7.55	\$9.73	\$11.41	\$14.63	\$17.73	\$20.95
5								
6	Residential Multi-Family							
7	Tier 1	\$2.24	\$2.24	\$2.24	\$2.47	\$3.03	\$3.54	\$5.04
8	Tier 2	\$5.87	\$6.52	\$7.55	\$8.90	\$11.10	\$14.80	\$16.32
9	Tier 3	\$6.24	\$7.32	\$9.43	\$11.05	\$14.17	\$17.17	\$20.29
10								
21	Commercial Small (5/8"-1")							
22	Tier 1	\$2.21	\$2.21	\$2.21	\$2.43	\$2.98	\$3.49	\$4.97
30	Tier 2	\$5.84	\$6.49	\$7.51	\$8.85	\$11.05	\$14.73	\$16.25
31	Tier 3	\$6.19	\$7.26	\$9.35	\$10.96	\$14.06	\$17.03	\$20.13
32								
33	Commercial Medium (1 1/2"-4")							
34	Tier 1	\$2.26	\$2.26	\$2.48	\$3.04	\$3.56	\$5.07	\$2.26
35	Tier 2	\$6.53	\$7.56	\$8.91	\$11.12	\$14.82	\$16.35	\$6.53
36	Tier 3	\$7.46	\$9.61	\$11.27	\$14.45	\$17.51	\$20.69	\$7.46
37								
38	Commercial Large (6'' & up)							
39	Tier 1	\$2.27	\$2.27	\$2.50	\$3.07	\$3.59	\$5.11	\$2.27
40	Tier 2	\$6.60	\$7.63	\$9.00	\$11.23	\$14.97	\$16.52	\$6.60
41	Tier 3	\$7.68	\$9.90	\$11.60	\$14.88	\$18.02	\$21.30	\$7.68

7.2.1. DROUGHT RATE ADOPTION

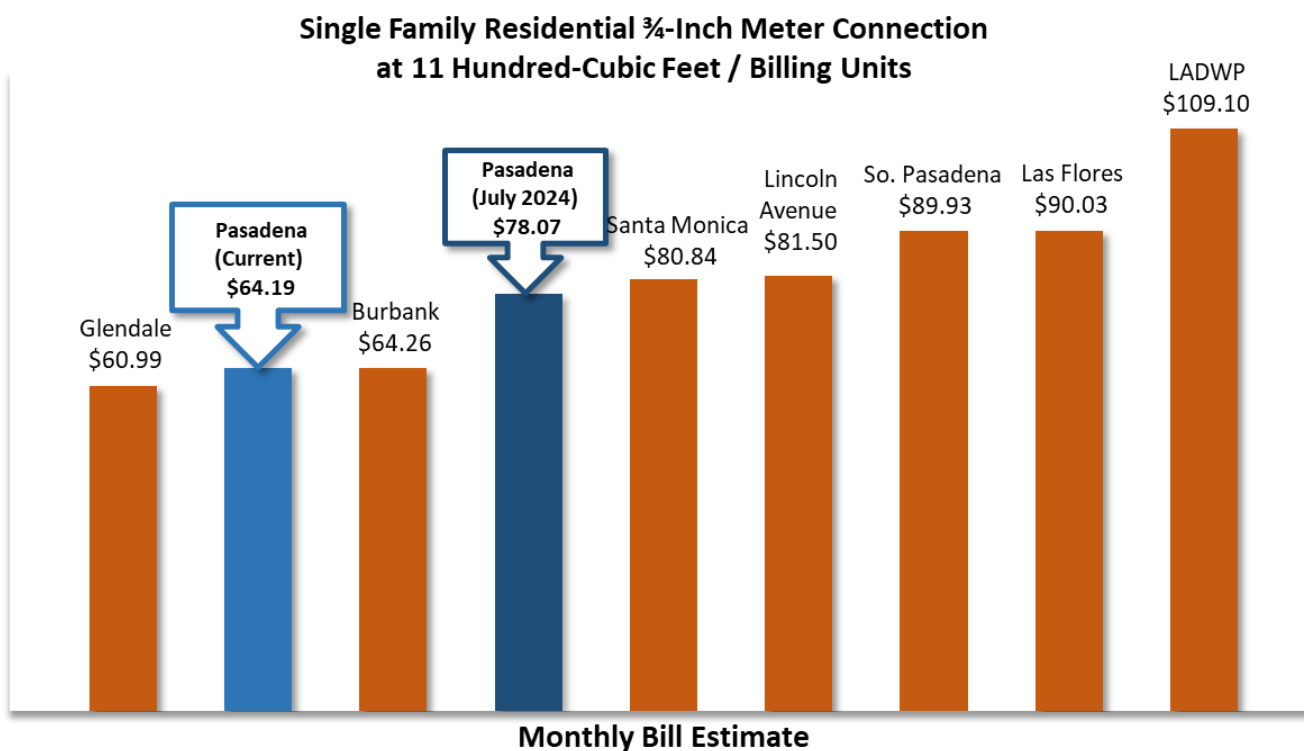
The Council could adopt the drought rates separately from any other type of rate increase. For the duration of the Study period (5 years), the Council would have the ability to implement drought rates by increasing the then-current variable rate without having to re-issue the Proposition 218 notice as long as drought rates are noticed in the Public Hearing notice.

8. Rate Comparisons

The Department conducted a rate survey to benchmark current and proposed water rates against seven neighboring water providers. While a useful benchmark, it is worth noting that such comparisons only paint a partial picture since many factors, such as water sources, age and replacement of infrastructure, service area characteristics, revenue sources, and other local conditions, affect the total cost of providing water services.

Figure 8-1 shows a monthly¹⁴ water bill comparison for the current (2024) and proposed (2025) rates against seven neighboring agencies. The survey assumes a single-family residential customer using 11 HCF of water per month, with a ¾” metered connection. This survey was conducted in January 2024 and should only be used as a reference point or as a snapshot in time.

Figure 8-1: Monthly Bill Comparisons for Neighboring Agencies



¹⁴ Agencies with a bi-monthly billing cycle are adjusted to a monthly billing cycle by dividing fixed charges and tier widths in half.

APPENDIX A:

O&M Functionalization



Table 8-1: Allocation of General Manager O&M Costs to Functional Components

General Manager	FY 2025 Cost	Supply	Pumpi ng	Transm ission & Distrib ution	Treatm ent	Customer Service	Meter Maintenanc e	Public Fire Protection	General	Conservat ion
Regular Pay - PERS	\$356,973								100%	
Non Benefit Employees	\$101,239								100%	
Overtime Pay	\$1,501								100%	
Personal Development Allowance	\$1,504								100%	
Workers Comp	\$20,792								100%	
General Liability	\$3,681								100%	
Miscellaneous Pay	\$6,339								100%	
City Portion - PERS	\$138,211								100%	
Life Insurance	\$202								100%	
Dental Insurance	\$3,981								100%	
Medicare City Contribution	\$6,676								100%	
Long Term Disability	\$214								100%	
Medical Benefits	\$61,801								100%	
Benefits Admin	\$89,244								100%	
Cell Phone	\$3,177								100%	
EE Parking	\$1,043								100%	
EE Parking	\$674								100%	
Services & Supplies	\$604,368								100%	
Internal Service Charge	\$114,607								100%	
Subtotal General Manager	\$1,516,225									

Table 8-2: Allocation of Finance & Admin O&M Costs to Functional Components

Finance & Administration	FY 2025 Cost	Supply	Pumpi ng	Transm ission & Distrib ution	Treatm ent	Customer Service	Meter Maintenanc e	Public Fire Protection	General	Conservat ion
Personnel										
Regular Pay - PERS	\$1,460,086								100%	
Overtime Pay	\$18,524								100%	
PST - Part Time Employees- PARS	\$63,988								100%	
Auto Allowance	\$2,608								100%	
Personal Development Allowance	\$6,177								100%	
Workers Comp	\$75,525								100%	
General Liability	\$13,371								100%	
Miscellaneous Pay	\$60,912								100%	
City Portion - PERS	\$551,445								100%	
Life Insurance	\$744								100%	
Dental Insurance	\$16,480								100%	
Medicare City Contribution	\$24,712								100%	
Long Term Disability	\$894								100%	
Medical Benefits	\$264,505 \$365,024								100%	
Benefits Admin	\$11,542								100%	
Cell Phone	\$3,825								100%	
EE Parking	\$782								100%	
Subtotal	\$2,941,144								100%	
Services & Supplies									100%	
Materials and Supplies	(\$134,975)								100%	
Uniforms	\$1,589								100%	
Rent	\$182,919								100%	
Equipment Lease	\$9,050								100%	
Computer Related	\$7,477								100%	
Equipment under 10000	\$25,204								100%	
Outside Printing	\$106								100%	

Legal and Other	\$792								100%	
Photo Copy Machine Maint	\$18,550								100%	
Other Contract Services	\$66,075								100%	
Consultant Services	\$661,013								100%	
Contract Maintenance	\$408,539								100%	
Outside Legal	\$18,020								100%	
Dues and Memberships	\$297								100%	
Conf & Mtgs - City Depts	\$29,828								100%	
Mileage	\$408								100%	
Training	\$27,278								100%	
Reference Materials									100%	
Subscriptions	\$1,484									
Telephone	\$12,293								100%	
Postage	\$276								100%	
Taxes Payroll	\$41,340								100%	
Fiscal Agent Bank Fees	\$583,000								100%	
Cash Over and Short	\$53								100%	
Insurance	\$478,541								100%	
Material Overhead	(\$613,970)								100%	
Program Expenditures	\$305,959								100%	
Self-Insured Retention	\$4,495								100%	
Permits and Fees	\$2,093								100%	
Overtime Meals	\$186								100%	
Vehicle Rental	\$398								100%	
Advertising	\$297								100%	
Software	\$2,597								100%	
Capital Outlay									100%	
Automotive Equipment	\$51,611								100%	
IS-Structural Maintenance	\$166,253								100%	
IS-Tenant Improvements	\$4,835								100%	
IS-Lockshop	\$0								100%	
IS-Utilities & Insurance-Hsekp	\$70,819								100%	
IS-Houskeeping Services	\$49,035								100%	
IS-Printing	\$5,724								100%	
IS-DoIt Telephone Basic	\$7,559								100%	
IS-DoIt Service Center Basic	\$16,723								100%	
IS-DoIt Radio Basic	\$3,324								100%	

IS-Auto Body Repair	\$742								100%	
IS-Fleet Maint-Equip Mainten	\$4,823								100%	
IS-Fleet Maint-Fuel	\$445								100%	
IS-DoIt NetworkSupportBasic	\$14,396								100%	
IS-Building Preventive Mainten	\$22,107								100%	
IS-DoIt Telephone Usage	\$2,748								100%	
IS-DoIt Entrprs ComputingBasic	\$30,354								100%	
IS-DoIt Applications Basic	\$23,421								100%	
IS-DoIt Program Mgmt Basic	\$4,088								100%	
IS-DoIt GIS Basic	\$17,767								100%	
IS-DoIt Desktop Rplcmnt Prog	\$5,575								100%	
CAP Allocation Expense	\$188,952								100%	
Transfer to General Fund	\$1,636,786								100%	
Warehouse Store Issues	\$2,953								100%	
Equipment Cleaning	(\$614,800)								100%	
Inventory Obsolescence	\$26,500								100%	
Subtotal Finance & Admin	\$6,825,093									

Table 8-3: Allocation of Customer Service O&M Costs to Functional Components

Customer Service	FY 2025 Cost	Supply	Pumpi ng	Transm ission & Distrib ution	Treatm ent	Customer Service	Meter Maintenanc e	Public Fire Protection	General	Conservat ion
Personnel										
Regular Pay - PERS	\$849,628					100%				
Overtime Pay	\$25,613					100%				
Auto Allowance	\$1,304					100%				
Personal Development Allowance	\$1,234					100%				
Workers Comp	\$73,952					100%				
General Liability	\$13,092					100%				
Miscellaneous Pay	\$1,279					100%				
City Portion - PERS	\$333,752					100%				
Life Insurance	\$649					100%				
Dental Insurance	\$14,785					100%				
Medicare City Contribution	\$16,298					100%				
Long Term Disability	\$524					100%				
Medical	\$259,444					100%				
Benefits	\$212,410					100%				
Benefits Admin	\$11,301					100%				
Cell Phone	\$348					100%				
EE Parking	\$1,108					100%				
Subtotal - Personnel	\$1,816,723									
Materials and Supplies										
Materials And Supplies	\$4,570					89%			11%	
Uniforms	\$1,853								100%	
Rent Expense	\$146,699								100%	
Equip Purchases Under \$10000	\$2,631					100%				
Other Contract Services	\$11,659					16%			84%	
Contract Maintenance	\$236,067								100%	
Training Costs	\$15,900					100%				
Postage	\$15,593					42%			58%	
Cash Over and Short	\$53					100%				

Self-Insured Retention	\$4,401					100%			
Internal Service Charge									
IS-Structural Maintenance	\$1,206							100%	
IS-Tenant Improvements	\$1,590					100%			
IS-Utilities & Insurance-Hsekp	\$514					100%			
IS-Houskeeping Services	\$590					100%			
IS-Printing	\$8,122					100%			
IS-DoIt Telephone Basic	\$10,176							100%	
IS-DoIt Service Center Basic	\$18,644					100%			
IS-DoIt Radio Basic	\$5,698							100%	
IS-Fleet Maint-Equip Maint.	\$14,736							100%	
IS-Fleet Maint-Fuel	\$6,278							100%	
IS-DoIt NetworkSupportBasic	\$16,052					100%			
IS-Building Preventive Mainten	\$160					100%			
IS-DoIt Telephone Usage	\$3,698							100%	
IS-DoIt Entrprs ComputingBasic	\$33,838					100%			
IS-Mail Direct Request	\$12,974					100%			
IS-DoIt Applications Basic	\$26,114					100%			
IS-DoIt Program Mgmt Basic	\$4,557					100%			
IS-DoIt GIS Basic	\$19,810					100%			
IS-Security Srvcs at CityHall	\$250					100%			
IS-DoIt Desktop Rplcmnt Prog	\$6,215					100%			
CAP Allocation Expense	\$235,632							100%	
Warehouse Store Issues	\$718					100%			
Equipment Usage	\$31,731					100%			
Bad Debt Expense	\$848,000							100%	
Subtotal Customer Service	\$3,563,452								

Table 8-4: Allocation of Water Delivery O&M Costs to Functional Components

Water Delivery	FY 2025 Cost	Supply	Pumping	Transmission & Distribution	Treatment	Customer Service	Meter Maintenance	Public Fire Protection	General	Conservation
Personnel										
Regular Pay - PERS	\$5,189,113	12%	8%	42%	21%			1%	11%	6%
Overtime Pay	\$924,255	5%	12%	32%					22%	29%
Auto Allowance	\$3,726			100%						
Personal Devlpmnt Allowance	\$15,463	13%	9%	41%	23%				9%	5%
Workers' Compensation	\$287,715	9%	6%	46%	21%			1%	10%	6%
General Liability	\$50,936	9%	6%	46%	21%			1%	10%	6%
Miscellaneous Pay	\$615,149		2%	60%	12%				15%	12%
City Portion-PERS	\$2,039,677	12%	8%	42%	21%			1%	11%	6%
Life Insurance	\$2,731	8%	7%	43%	22%			1%	13%	6%
Dental Insurance	\$57,449	8%	6%	45%	24%			2%	9%	6%
Medicare City Contribution	\$86,865	11%	8%	42%	22%			1%	10%	6%
Long Term Disability	\$3,091	10%	8%	36%	21%			1%	15%	9%
Medical	\$1,061,862	8%	6%	46%	21%			1%	10%	6%
Benefits	\$1,297,288	12%	8%	42%	21%			1%	11%	6%
Benefits Admin.	\$43,969	9%	6%	46%	21%			1%	10%	6%
CellPhone/SmartPhone Stipend	\$5,862	12%		49%	9%				12%	17%
Service and Supplies	\$11,685,151							100%		
Materials And Supplies	\$727,690	1%	4%	33%	54%				8%	
Uniforms	\$15,370								100%	
Rent Expense	\$545,226								100%	
Computer Related Supplies	\$10,600								100%	
Equip Purchases Under \$10000	\$42,400		38%		38%				25%	
Legal and Other Advertising	\$4,770								100%	
Other Contract Services	\$1,987,076	8%	2%	24%	41%				11%	14%
Consultant Services	\$249,100	5%			3%				39%	53%
Contract Maintenance	\$84,800			1%			99%			
Outside Legal Services	\$901,000								100%	
Support To Advisory Committees	\$12,720	100%								

Dues And Memberships	\$60,643								91%	9%
Special Civic Events	\$5,300								100%	
Conf & Mtgs-City Departments	\$16,430								97%	3%
Mileage	\$848								100%	
Education	\$1,060								100%	
Training Costs	\$41,870			15%					72%	13%
Video Productions	\$26,500								100%	
Reference Matls Subscriptions	\$89									100%
Water	\$22,559,601	100%								
Imported Water: MWD	\$19,815,219	100%								
MWD: Readiness-to-Serve Charge (Fixed)	\$1,829,274	100%								
MWD: Capacity Charge (Fixed)	\$530,200	100%								
Groundwater Costs	\$384,909	100%								
Telephone	\$14,840								100%	
Electric	\$3,198,365		100%							
Postage	\$37,630								90%	10%
Fiscal Agent/Bank Fees & Chgs	\$17,111								100%	
Utility Rebates	\$374,095									100%
Program Expenditures	\$282,909								100%	
Self-Insured Retention	\$17,123	9%	6%	46%	21%			1%	10%	6%
Permits and Fees	\$204,686				100%					
Overtime Meals	\$4,770				96%	4%				
Direct Installation Rebates	\$901,000									100%
Vehicle Rental	\$11,207			2%	16%				25%	56%
Software	\$1,590								100%	
Capital Outlay	\$9,798,818									
Equipment	\$200,550								100%	
Automotive Equipment	\$1,155,000								100%	
Internal Service Charge										
IS-Structural Maintenance	\$147,484								100%	
IS-Tenant Improvements	\$3,640								100%	
IS-Lockshop	\$520								100%	
IS-Utilities & Insurance-Hsekp	\$62,823								100%	
IS-Houskeeping Services	\$72,161								100%	
IS-Printing	\$57,512								9%	90%
IS-DoIt Telephone Basic	\$35,860			17%					83%	

IS-DoIt Service Center Basic	\$71,862	10%	7%	47%	20%			1%	9%	6%
IS-DoIt Radio Basic	\$43,924			88%					12%	
IS-Fleet Maint-Equip Mainten	\$629,200								99%	1%
IS-Fleet Maint-Fuel	\$200,720								98%	2%
IS-DoIt NetworkSupportBasic	\$61,860	10%	7%	47%	20%			1%	9%	6%
IS-Building Preventive Mainten	\$19,611								100%	
IS-DoIt Telephone Usage	\$13,031			17%					83%	
IS-DoIt Entrprs ComputingBasic	\$130,435	10%	7%	47%	20%			1%	9%	6%
IS-Mail Direct Request	\$312								100%	
IS-DoIt Applications Basic	\$100,638	10%	7%	47%	20%			1%	9%	6%
IS-DoIt Program Mgmt Basic	\$17,571	10%	7%	47%	20%			1%	9%	6%
IS-DoIt GIS Basic	\$76,348	10%	7%	47%	20%			1%	9%	6%
IS-DoIt Desktop Rplcmnt Prog	\$23,961	10%	7%	47%	20%			1%	9%	6%
IS-Compressed Natural Gas	\$19,968								100%	
CAP Allocation Expense	\$2,139,462								100%	
Operating Transfer Out	\$3,928,905									
Transfers to General Fund- HOC	\$371,000								100%	
Warehouse Store Issues	\$922,200			100%						
Equipment Use	\$180,200			100%						
Subtotal	\$50,801,424									

APPENDIX B:

**Max Day Peaking Factor
Derivation**



Table 8-5 shows the derivation of the FY 2025 Max Bi-Month and Max Day peaking factors. Five-year max bi-monthly usage (e.g., the highest bi-monthly usage for each customer class over the five year period of billing data, from FY 2018-2022), is shown in column C. Five-year *average* bi-monthly use (e.g., the average of bi-monthly water use from FY 2018-2022) is shown in column D. Bi-monthly peaking factors are then calculated by taking the max bi-monthly usage in column C and dividing by the average bi-monthly use in column D. The resulting bi-monthly peaking factors are shown in column E. These values are then multiplied by the Max Day conversion factor of 1.50 in Column F (derived earlier in Section 3) to yield the Max Day peaking factor values shown in Column G. These provide the basis for Max Day extra capacity allocations and other related cost of service components.

Table 8-5: Derivation of FY 2025 Peaking Factors by Customer Class

Line [A]	Customer Class [B]	Max Bi-Monthly Use, Five-Year ¹⁵ [C]	Average Bi-Monthly Use, Five-Year [D]	Bi-Monthly Peaking Factor [E]	Max Month to Day Conversion Factor [F]	Max Day Peaking Factor, = E*F [G]
1	Single Family	6,410,821	4,837,209	1.33	1.50	1.99
2	Tier 1	1,828,977	1,716,693	1.07	1.50	1.60
3	Tier 2	2,887,169	2,129,063	1.36	1.50	2.03
4	Tier 3	1,694,675	991,454	1.71	1.50	2.56
5						
6	Multi-Family	2,005,705	1,792,590	1.12	1.50	1.68
7	Tier 1	1,200,936	1,142,299	1.05	1.50	1.58
8	Tier 2	361,240	293,917	1.23	1.50	1.84
9	Tier 3	443,529	356,374	1.24	1.50	1.87
10						
11	Commercial Small (5/8"-1")	349,732	319,928	1.09	1.50	1.64
12	Tier 1	108,583	110,837	0.98	1.50	1.47
13	Tier 2	165,299	141,899	1.16	1.50	1.75
14	Tier 3	75,850	67,193	1.13	1.50	1.69
15						
16	Commercial Medium (1 1/2''-4'')	1,899,273	1,518,584	1.25	1.50	1.88
17	Tier 1	574,524	531,273	1.08	1.50	1.62
18	Tier 2	839,350	669,371	1.25	1.50	1.88
19	Tier 3	485,399	317,939	1.53	1.50	2.29
20						
21	Commercial Large (6''+)	1,728,992	1,220,306	1.42	1.50	2.12
22	Tier 1	474,882	424,454	1.12	1.50	1.68
23	Tier 2	746,039	536,737	1.39	1.50	2.08
24	Tier 3	508,071	259,115	1.96	1.50	2.94
25	Total	12,394,523	9,688,618			

¹⁵ FY 2018 through 2022.