

CITY OF
SONOMA

Water Rate Study

Final Report / June 28, 2018



June 28, 2018

Ms. Cathy Capriola
City Manager
City of Sonoma
#1 The Plaza
Sonoma, CA 94612

Subject: Water Rate Study Report

Raftelis Financial Consultants, Inc. (Raftelis) is pleased to present this water rate study (Study) to the City of Sonoma (City). The goal of the Study is to help ensure that the City is able to continue to provide high quality, dependable water service to the community while maintaining financial stability, affordability, and adequate levels of investment in infrastructure.

The Study involved a comprehensive review of the City's Financial Plan, user classifications, and various rate structures. We are confident that the analysis, based on the application of water rate industry-wide recognized Cost of Service principles, results in fair and equitable water rates for the City's customers. The report includes a brief Executive Summary followed by Study assumptions and a detailed rate derivation in subsequent sections.

It was a pleasure working with you and we wish to express our thanks for your and other staff member support during the study. If you have any questions, please call me at (510) 813-8704.

Sincerely,
RAFTELIS FINANCIAL CONSULTANTS, INC.

A handwritten signature in black ink, appearing to read 'Sally Van Etten'.

Sally Van Etten
Senior Consultant

A handwritten signature in black ink, appearing to read 'Victor Smith'.

Victor Smith
Consultant

A handwritten signature in red ink, appearing to read 'Charles Diamond'.

Charles Diamond
Associate Consultant

Table of Contents

1.	EXECUTIVE SUMMARY	1
1.1.	BACKGROUND OF THE STUDY	1
1.2.	OBJECTIVES OF THE STUDY	1
1.3.	STUDY PROCESS AND METHODOLOGY	1
1.4.	RESULTS AND RECOMMENDATIONS	2
1.4.1.	Proposed Revenue Adjustments	2
1.4.2.	Proposed Water Rates	3
2.	WATER SYSTEM	5
2.1.	WATER SYSTEM BACKGROUND.....	5
2.2.	NUMBER OF ACCOUNTS AND FIRE LINES.....	5
2.3.	WATER USE	6
2.4.	ACCOUNT AND WATER USE GROWTH ASSUMPTIONS.....	7
3.	FINANCIAL PLAN.....	9
3.1.	INFLATIONARY ASSUMPTIONS	9
3.2.	CURRENT WATER RATE REVENUE	9
3.2.1.	Fixed Charge Revenue	10
3.2.2.	Volumetric Charge Revenue.....	14
3.2.3.	Non-Operating Revenue.....	18
3.3.	WATER UTILITY EXPENSES.....	18
3.3.1.	Total O&M Budget	18
3.3.2.	Capital Expenses	20
3.3.3.	Existing and Proposed Debt Service	21
3.4.	FINANCIAL POLICIES.....	22
3.4.1.	Debt Coverage Requirement	22
3.4.2.	Reserve Policies	22
3.5.	PROPOSED FINANCIAL PLAN AND REVENUE ADJUSTMENTS	23

4.	LEGAL FRAMEWORK AND RATE SETTING METHODOLOGY	28
4.1.	LEGAL FRAMEWORK	28
4.2.	COST-BASED RATE-SETTING METHODOLOGY.....	29
5.	COST OF SERVICE ANALYSIS	30
5.1.	REVENUE REQUIREMENT DETERMINATION	31
5.2.	FUNCTIONALIZATION OF O&M EXPENSES.....	32
5.3.	ALLOCATION OF O&M EXPENSES TO COST CAUSATION COMPONENTS.....	32
5.4.	FUNCTIONALIZATION OF ASSETS.....	35
5.5.	ALLOCATION OF CAPITAL EXPENSES TO COST CAUSATION COMPONENTS.....	35
5.6.	REVENUE OFFSETS AND ADJUSTMENTS.....	37
6.	RATE DESIGN AND DERIVATION	38
6.1.	PROPOSED RATE STRUCTURE.....	38
6.2.	PROPOSED FIXED CHARGES	39
6.2.1.	Proposed Fire Line Fixed Charges.....	39
6.2.2.	Proposed Monthly Service Charges	41
6.3.	PROPOSED VOLUMETRIC CHARGE RATES	43
6.4.	PROPOSED ELEVATION CHARGE RATES.....	49
7.	CUSTOMER BILL IMPACTS	51

List of Tables

Table 1: Proposed Revenue Adjustments	2
Table 2: Proposed Monthly Service Charges through FY 2023	4
Table 3: Proposed Fire Line Fixed Charges through FY 2023	4
Table 4: Proposed Volumetric Charge Rates through FY 2023	4
Table 5: Proposed Elevation Charge through FY 2023	4
Table 6: Water Accounts by Meter Size (FY 2017 Actual).....	5
Table 7: Fire Lines by Meter Size (FY 2017 Actual)	6
Table 8: Water Use by Customer Class and Tier (FY 2017 Actual).....	7
Table 9: Account Growth and Water Use Assumptions	8
Table 10: Inflationary Assumptions	9
Table 11: CY 2017 and CY 2018 (Current) Fixed Charges.....	10
Table 12: Number of Meters through FY 2023.....	11
Table 13: Fixed Charge Revenue Projections through FY 2023	13
Table 14: CY 2017 and CY 2018 Volumetric Charge Rates (\$/kgal)	14
Table 15: Projected Annual Water Use through FY 2023.....	15
Table 16: Projected Volumetric Charge Revenue through FY 2023	17
Table 17: Projected Non-Operating Revenue through FY 2023	18
Table 18: Projected Purchased Water Cost Expenses through FY 2023	19
Table 19: Projected O&M Expenses through FY 2023	20
Table 20: Projected CIP Costs through FY 2023.....	21
Table 21: Existing Debt Service through FY 2023	21
Table 22: FY 2020 Proposed Debt Issuance.....	22
Table 23: Reserve Policy Calculation.....	23
Table 24: Proposed Revenue Adjustments through FY 2023.....	23
Table 25: Water Utility Cash Flow Detail through FY 2023	25
Table 26: FY 2019 Revenue Requirement Determination	31
Table 27: FY 2019 O&M Expenses by Functional Category	32
Table 28: System-Wide Peaking Factors and Allocation to Cost Causation Components.....	33
Table 29: Allocation of Functionalized O&M Expenses to Cost Causation Components.....	34
Table 30: Current Asset Value by Functional Category	35
Table 31: Allocation of Capital Expenses to Cost Causation Components	36
Table 32: Total Adjusted Cost of Service Calculation.....	37
Table 33: Proposed Changes to the Volumetric Charge Rate Structure	39
Table 34: Derivation of FY 2019 Fire Line Fixed Charge.....	40
Table 35: Proposed Fire Line Fixed Charges through FY 2023	41
Table 36: Monthly Service Charge Units of Service	42
Table 37: Monthly Service Charge Unit Costs	42
Table 38: Derivation of FY 2019 Monthly Service Charge.....	43
Table 39: Proposed Monthly Service Charges through FY 2023	43
Table 40: Supply Cost Unit Cost for Uniform Rates	44
Table 41: Groundwater and SCWA Unit Costs.....	45
Table 42: SFR Usage by Tier and Source of Supply.....	45
Table 43: Supply Cost Unit Cost for SFR Tiered Rates.....	46
Table 44: Derivation of Base Unit Cost.....	46
Table 45: Determination of Peaking Factors	47
Table 46: Derivation of Peaking Unit Costs.....	47

Table 47: Derivation of Conservation Unit Costs	48
Table 48: Derivation of FY 2019 Volumetric Charge Rates.....	49
Table 49: Proposed Volumetric Charge Rates through FY 2023	49
Table 50: Derivation of FY 2019 Elevation Charge	50
Table 51: Proposed Elevation Charge through FY 2023	50
Table 52: Volumetric Revenue Proof for FY 2019	2
Table 53: Fixed Charge Revenue Proof for FY 2019.....	2
Table 54: Fire Meter Revenue Proof for FY 2019	2
Table 55: Elevation Revenue Proof for FY 2019.....	3
Table 56: Aggregated Revenue Proof for FY 2019.....	3
Table 56: Projected Usage Through FY 2023	3
Table 56: Projected Volumetric Revenue Through FY 2023	3
Table 56: Projected Meters Through FY 2023	4
Table 56: Projected Fixed Charge Revenue Through FY 2023.....	4
Table 56: Projected Fire Lines Through FY 2023.....	4
Table 56: Projected Fire Line Revenue Through FY 2023.....	5
Table 56: Projected Zone 2 Usage Through FY 2023	5
Table 56: Projected Pumping Charge Revenue Through FY 2023.....	5
Table 56: Projected Pumping Charge Revenue Through FY 2023.....	5

List of Figures

Figure 1: Proposed Revenue Adjustments	26
Figure 2: Proposed Operating Financial Plan	26
Figure 3: Projected CIP and Funding Sources.....	27
Figure 4: Total Reserve Ending Balance	27
Figure 5: Single Family Residential Monthly Bill Impacts	51

List of Appendices

Appendix A: Detailed O&M Budget Projections

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1. Executive Summary

1.1. Background of the Study

In late 2017, the City of Sonoma (City) engaged Raftelis Financial Consultants (Raftelis) to conduct a Water Rate Study (Study) for the City's water utility. The Study included the development of a five-year Financial Plan, a Cost of Service (COS) analysis, and the development of proposed water rates for five years beginning in fiscal year (FY) 2019.¹ This report provides a detailed explanation of the rate setting process, and serves as the administrative record of the City's proposed changes to its water rate structure and rates.

This executive summary describes the rate study process, methodology, and recommendations for the City's water rate structure and water rates. The City strives to provide high quality, dependable water service to the community while maintaining financial stability, affordability, and adequate levels of investment in infrastructure. This Study aims to assist the City in meeting its goals for the water utility by developing fair and equitable rates that:

- » Proportionately allocate the costs of providing service in accordance with California Constitution Article XIII D, Section 6 (commonly referred to as Proposition 218)
- » Meet the City's fiscal needs in terms of operational expenses, reserve targets, and capital investment to maintain the water system

1.2. Objectives of the Study

The major objectives of the study include the following:

- » Develop a five-year financial plan for the City's water utility to ensure financial sufficiency, recover operation and maintenance (O&M) costs, ensure sufficient funding for capital projects, and improve the financial health of the water utility
- » Perform a Cost of Service (COS) analysis which calculates the cost to serve each customer class
- » Review and recommend changes to the City's current water rate structure
- » Develop water rates for FY 2019 through FY 2023 that are fair, equitable, and in proportion to the cost of providing service to the City's water customers

1.3. Study Process and Methodology

Raftelis first developed a Financial Plan for the City, which established the total revenue adjustments needed to meet capital investment, operational expenses, and debt service proposed during the five-year Study Period (FY 2019-FY 2023). After developing the Financial Plan, Raftelis performed a Cost of Service analysis to determine water rates based on the proposed Financial Plan. Raftelis met with City staff and City Council on multiple occasions over the course of the Study to discuss goals and policy objectives, and to obtain feedback on the proposed Financial Plan, rate structure, and rates. The discussions with City staff and with the City Council were detailed. The costs necessary to maintain excellent water service for City customers and appropriate fiscal stability were carefully weighed against the desire to keep necessary water rate increases as reasonable as possible. Not all goals and objectives, including construction of all desired capital improvement projects, could be met during this five-year water rate cycle. Capital improvement projects that were excluded from this study as well as further increases in reserve amounts, can be included in the next rate study and rate setting cycle.

¹ A fiscal year is assumed to begin on July 1 of the preceding calendar year and end on June 30 of the corresponding calendar year. For example, FY 2019 begins on July 1, 2018 and ends on June 30, 2019.

The water rates presented in this executive summary were developed using Cost of Service principles set forth by the American Water Works Association M1 Manual titled *Principles of Water Rates, Fees and Charges* (AWWA M1 Manual). As stated in AWWA M1 Manual, “water rates and charges should be recovered from classes of customers in proportion to the cost of serving those customers.” Raftelis follows industry standard rate setting methodologies set forth by the AWWA M1 Manual to ensure this Study meets Proposition 218 requirements and creates rates that do not exceed the proportionate cost of providing water services on a parcel basis. Cost of Service principles are described in detail in Sections 4 and 5 of this report.

Throughout the report many tables are rounded and may not add exactly due to hidden decimals.

1.4. Results and Recommendations

1.4.1. Proposed Revenue Adjustments

Table 1 shows the proposed revenue adjustment and implementation date for each fiscal year within the Study Period. The proposed revenue adjustments reflect an increase in revenue required from water rates in each fiscal year. The percentages shown in Table 1 are the annual changes in rate revenue required to maintain a financially viable water utility and to fund the planned capital projects.

Table 1: Proposed Revenue Adjustments

Fiscal Year	Proposed Revenue Adjustment	Implementation Date
FY 2019	3.5%	September 1, 2018 ²
FY 2020	7.5%	July 1, 2019
FY 2021	7.5%	July 1, 2020
FY 2022	7.5%	July 1, 2021
FY 2023	7.5%	July 1, 2022

Factors Affecting Proposed Revenue Adjustments

The following items affect the City’s water utility revenue requirement (i.e., costs) and consequently its water rates. The City’s expenses include Operation and Maintenance (O&M) expenses, capital expenses, and debt service.

- » **Water Purchase Expense:** The City currently obtains roughly 92 percent its water supply from the Sonoma County Water Agency. This amount is projected to drop to about 87 percent, starting in FY 2019 as the result of increased use of City well water.³ The rate set by the Sonoma County Water Agency for water sold to the City is expected to increase by approximately 6 percent per year between FY 2019 and FY 2023. Water purchase expenses represented over 38 percent of the City’s water utility total operating expenses as of FY 2018.
- » **O&M Expenses:** The City’s other O&M expenses are expected to increase between 4-5 percent per year between FY 2019 and FY 2023.

² Exact date may not be September 1.

³ City of Sonoma, Water Master Plan, Table 4-1

- » **Water System Capital Investment:** The City anticipates an average of approximately \$1.5 million in annual capital expenditures from FY 2019 through FY 2023. This capital investment includes replacement of key water system infrastructure, investment in meter system upgrades, and other capital projects.
- » **Existing and Proposed Debt Service:** The City anticipates an average of \$325,000 in debt service payments per year between FY 2019 and FY 2023. This includes debt service for the City's 2012 Revenue Bonds and also a proposed debt issuance in FY 2020 to finance several of the City's proposed projects including upgrading to Advanced Metering. Note that both debt services pertain to the financing of capital projects for the City's water utility only.

1.4.2. Proposed Water Rates

Table 2 shows proposed monthly service charges for the Study period. Table 3 shows proposed fire line charges for the Study period. Table 4 shows proposed volumetric rates for the study period. Table 5 shows proposed Elevation Charges for the study period.

The proposed rate structure retains the two main existing charges assessed by the City for water service: 1) a Fixed Charge assessed monthly based on meter size, and 2) a Volumetric Charge assessed per thousand gallons (kgal) of water consumed per month. The Fixed Charge is designed to primarily recover costs that are relatively fixed, such as customer service costs, and system capacity costs associated with peak water use events. The Volumetric Charge is designed to primarily recover the variable costs associated with operating the water utility, such as the cost of supplying water from SCWA. The City will discontinue tiered rates to all non-Single Family Residential customers and will reduce the number and width of residential tiers as shown in Table 4.

The City currently charges higher water rates to customers located outside of city limits. The City will discontinue charging customers outside the City 15 percent higher rates.

The City proposes to implement a new Elevation Charge to recover the cost of pumping water to customers residing in a higher elevation zone (Zone 2, shown in the City's Water Master Plan Figure 1-1, and copied in the Appendix). Customers residing inside the lower elevation zones will not pay a surcharge.

No substantial changes to the structure of the Fixed Charge are proposed in this Study. With regards to the Volumetric Charge, the City proposes to make modifications to the current rate structure. This includes reducing the four-tiered Single-Family Residential (SFR) customers' Volumetric Charge rate structure down to three tiers, and updating the tier widths (i.e. the ranges of water consumption in kgal per month to be charged at each tiered rate). Additionally, the City proposes to assess Multi-Family Residential (MFR) and Commercial customers the Volumetric Charge based on a uniform dollar per kgal rate rather than based on the current three tiered-rate structures.

Current calendar year (CY) 2018 rates and proposed rates through FY 2023 are shown in the following tables for the City's Monthly Service Charge, Fire Line Fixed Charge, and Volumetric Charge. Proposed rates for the new Elevation Charge are also shown below in Table 5.

Table 2: Proposed Monthly Service Charges through FY 2023

Meter Size	Current	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
5/8"	\$20.28	\$22.80	\$24.51	\$26.35	\$28.33	\$30.46
3/4"	\$20.28	\$22.80	\$24.51	\$26.35	\$28.33	\$30.46
1"	\$20.28	\$22.80	\$24.51	\$26.35	\$28.33	\$30.46
1 1/2"	\$30.94	\$37.57	\$40.39	\$43.42	\$46.68	\$50.19
2"	\$38.67	\$55.29	\$59.44	\$63.90	\$68.70	\$73.86
3"	\$58.01	\$102.56	\$110.26	\$118.53	\$127.42	\$136.98
4"	\$96.68	\$155.73	\$167.41	\$179.97	\$193.47	\$207.99
6"	\$154.82	\$303.43	\$326.19	\$350.66	\$376.96	\$405.24

Table 3: Proposed Fire Line Fixed Charges through FY 2023

Meter Size	Current	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
2"	\$6.97	\$0.60	\$0.65	\$0.70	\$0.76	\$0.82
4"	\$13.92	\$3.72	\$4.00	\$4.30	\$4.63	\$4.98
6"	\$27.85	\$10.78	\$11.59	\$12.46	\$13.40	\$14.41
8"	\$41.77	\$22.98	\$24.71	\$26.57	\$28.57	\$30.72
10"	\$55.69	\$41.32	\$44.42	\$47.76	\$51.35	\$55.21

Table 4: Proposed Volumetric Charge Rates through FY 2023

Meter Size	Current	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
SFR						
Tier 1	\$4.17	\$4.61	\$4.96	\$5.34	\$5.75	\$6.19
Tier 2	\$7.31	\$6.25	\$6.72	\$7.23	\$7.78	\$8.37
Tier 3	\$8.21	\$7.37	\$7.93	\$8.53	\$9.17	\$9.86
MFR		\$6.10	\$6.56	\$7.06	\$7.59	\$8.16
Commercial		\$5.92	\$6.37	\$6.85	\$7.37	\$7.93
Municipal	\$6.07	\$6.10	\$6.56	\$7.06	\$7.59	\$8.16
Irrigation	\$8.01	\$6.49	\$6.98	\$7.51	\$8.08	\$8.69
Fire & Hydrant	\$8.01	\$8.03	\$8.64	\$9.29	\$9.99	\$10.74

Table 5: Proposed Elevation Charge through FY 2023

Zone	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Zone 1	N/A	N/A	N/A	N/A	N/A
Zone 2	\$1.78	\$1.92	\$2.07	\$2.23	\$2.40
Zone 3	N/A	N/A	N/A	N/A	N/A

2. Water System

This section briefly describes the City’s water system and ratepayer base. The City provided customer account and water use data for FY 2017. FY 2017 was used as the base year for water use projections as it was the most recent fiscal year for which both complete water consumption use and actual (final) financial data was available at the time the initial analysis was conducted. Although Raftelis is recommending a modified volumetric tiered rate structure, much of the underlying analysis considers the City’s existing rate structure for the purposes of reconciling actual financial data and for comparison to the proposed rate structure presented later in the report.

2.1. Water System Background

The City provides water services to approximately 4,500 connections that serve residential, commercial, municipal, and irrigation customers as well as fire lines within city limits. The City also serves over 300 additional connections located outside of city limits. These “Outside City” customers are currently assessed water rates that are 15 percent higher than “Inside City” water rates.

Most of the City’s water supply is purchased wholesale from the Sonoma County Water Agency (SCWA). SCWA’s wholesale water rates recently increased by 6 percent, the financial plan assumes that SCWA costs will continue to increase by 6 percent annually. The City supplements its water supply purchases with groundwater produced by seven City-owned wells (not all the wells are currently operational). The City currently has a multi-tiered rate structure for residential and commercial customers that is purposefully designed to send a conservation signal. The City’s existing rate structure is based on a rate study completed in 2014, and was implemented beginning in January 2015. The most recent water rate increase went into effect in February 1, 2018.

2.2. Number of Accounts and Fire Lines

Table 6 shows the estimated number of Inside City and Outside City water accounts by meter size for FY 2017 based on account data provided by the City. Raftelis projected the number of accounts in out-years by escalating the FY 2017 account data using the growth factors described in Section 0. This projection of number of accounts is described in detail in Section 3. The number of accounts are used to forecast the amount of fixed revenue that the City will collect from Fixed Charges.

Table 6: Water Accounts by Meter Size (FY 2017 Actual)

Meter Size	Inside City Accounts	Outside City Accounts
5/8"	277	3
3/4"	2,634	204
1"	1,207	100
1 1/2"	129	12
2"	89	5
3"	22	1
4"	7	0
6"	1	0
Total	4,366	325

Table 7 shows the estimated number of Inside City and Outside City fire lines by meter size for FY 2017. Raftelis projected the number of fire lines and forecasted the amount of fixed revenue that the City will collect from Fire Line Fixed Charges using the same methods described above for water accounts. For reference: Fire Lines are private sprinkler connections or hydrants that provide additional fire suppression as a standby service.

Table 7: Fire Lines by Meter Size (FY 2017 Actual)

Meter Size	Inside City Fire Lines	Outside City Fire Lines
2"	8	4
4"	63	2
6"	54	2
8"	13	3
10"	2	1
Total	140	12

2.3. Water Use

Table 8 shows actual Inside City, Outside City, and total annual water use by customer class and tier for FY 2017 based on individual customer consumption data provided by the City and analyzed by Raftelis. The customer classes and tiers shown reflect the existing rate structure, and are described in greater detail in Section 3. Customer classes within the existing rate structure include Single-Family Residential (SFR), Multi-Family Residential (MFR), Commercial, Municipal, Irrigation, and Fire & Hydrant. Total water sales in FY 2017 were estimated at 542,962 thousand gallons (kgal) or 1,666 acre-feet (AF). Water use projections by customer class and tier in the out-years are described in detail in Section 3, and are used to forecast revenue from Volumetric Charges. Note that water use is rounded to the nearest kgal in Table 8.

Table 8: Water Use by Customer Class and Tier (FY 2017 Actual)

Customer Class/Tier	Inside City Water Use (kgal)		Outside City Water Use (kgal)		Total Water Use (kgal)	% Water Use by Class/Tier
	Jul-Dec	Jan-Jun	Jul-Dec	Jan-Jun		
SFR Tier 1	89,644	68,813	2,650	1,953	163,060	30.0%
SFR Tier 2	40,407	13,845	1,682	549	56,482	10.4%
SFR Tier 3	18,197	4,672	1,076	280	24,225	4.5%
SFR Tier 4	20,187	6,198	3,666	909	30,959	5.7%
MFR Tier 1	23,699	18,776	14,323	6,679	63,477	11.7%
MFR Tier 2	12,133	8,517	2,257	575	23,481	4.3%
MFR Tier 3	13,448	6,982	118	44	20,592	3.8%
Commercial Tier 1	21,201	17,377	651	528	39,757	7.3%
Commercial Tier 2	10,096	7,211	13	0	17,320	3.2%
Commercial Tier 3	13,370	12,015	0	0	25,385	4.7%
Municipal	24,780	17,312	358	191	42,641	7.9%
Irrigation	25,061	9,742	102	59	34,963	6.4%
Fire & Hydrant	287	320	2	13	622	0.1%
Total	312,510	191,780	26,898	11,780	542,962	100.0%

2.4. Account and Water Use Growth Assumptions

The revenue calculated for each fiscal year throughout Financial Plan Study Period (FY 2019-FY 2023) is a function of the number of accounts, account growth, water use, and rates. Account and fire line growth assumptions are based on population growth projections from the City’s most recent Water Master Plan (WMP). The population projections in the City’s WMP are shown for 5 year periods.⁴ Assumptions of estimated percent increases in account and fire line growth, as well as water sales in both AF and kgal are shown in Table 9. Average annual water use per account is expected to remain constant throughout the Study Period. As such, the percent increase in water sold in each year is equal to percent increase in number of accounts. Table 9 shows the recent and assumed water sales in kgal and AF. These amounts for FY 2017 were calculated by Raftelis using utility billing reports received in February 2018 and differ slightly from City statistical reports. For example, FY 2018 shows an anticipated 0.41% increase in both number of accounts and water use relative to FY 2017. It is expected that the City will add roughly 20 accounts annually and sell an additional 7-8 AF per year over the course of the Study Period. Note that many figures throughout this report are rounded.

⁴ 2015-2020 and 2020-2025 are different projection periods in the WMP, hence the different growth projection facts.

Table 9: Account Growth and Water Use Assumptions

	FY 2017	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Account Growth (All Classes)	N/A	0.41%	0.41%	0.41%	0.47%	0.47%	0.47%
Water Sold (kgal)	542,962	545,162	547,369	549,588	552,144	554,710	557,290
Water Sold (AF)	1,666	1,673	1,680	1,687	1,694	1,702	1,710

3. Financial Plan

This section describes the five-year Financial Plan over the FY 2019-FY 2023 Study Period. The proposed Financial Plan is used to determine the overall revenue adjustments and total amount of revenue required from rates. The revenue covers operating and maintenance (O&M), capital expenses, and reserve funding. Revenue adjustments represent the average rate increase for the City as a whole; rate changes for individual customers will depend on the Cost of Service analysis described in Section 5.

To develop the Financial Plan, Raftelis projected annual expenses and revenues, modeled reserve balances and transfers between funds, and accounted for planned capital expenditures. Expenses related to debt financing needed to fund capital improvements are included. This section of the report provides a discussion of projected revenue, O&M expenses, debt service, the Capital Improvement Plan (CIP), reserve funding under existing rates, and the revenue adjustments needed to ensure fiscal sustainability. The Financial Plan starts with current account data and water use as well as current rates to determine if the current rates are adequately meeting the revenue requirements. Although the proposed rate structure will differ significantly from the current structure, Raftelis presents and analyzes the existing rate structure in the following sections for the purposes of identifying current revenue requirements, as well as for contrast and comparison to the proposed rate structure and rates. Proposed Financial Plan revenue adjustments are thus in reference to revenues derived from current CY 2018 rates.

3.1. Inflationary Assumptions

To ensure that future costs are reasonably projected, Raftelis worked with the City to generate assumptions regarding inflationary factors. The City provided the water utility’s proposed FY 2019 budget. The inflationary factors shown in Table 10 were then applied to the FY 2019 budgeted costs for each cost category to project annual expenses in FY 2020 through FY 2023. The San Francisco area Consumer Price Index has been roughly 3 percent per year in recent years, so this factor was used for most escalation factors except for Benefits and Water Purchase Cost. Benefits escalation estimates were provided by the City.

Table 10: Inflationary Assumptions

Escalation Factors	Annual Inflation (FY 2020-FY 2023)
General	3.0%
Salary	3.0%
Benefits	8.0%
Utilities	3.0%
Construction	3.0%
Insurance	3.0%
Professional Services	3.0%
Water Purchase Cost	6.0%
No Inflation	0.0%

3.2. Current Water Rate Revenue

The City’s existing rate structure consists of two different types of charges: 1) a monthly Fixed Charge assessed base on meter size; and 2) a variable Volumetric Charge that is assessed per unit of water delivered to the customer. As shown in Table 8, the City’s current Volumetric Charge rate structure has four tiers for Single-Family Residential

(SFR) customers, three tiers for Multi-Family Residential (MFR) and Commercial customers, and uniform rates for Municipal, Irrigation, and Fire & Hydrant customers. The City’s current Fixed Charges by meter size and Volumetric Charges by customer class and tier are shown in the following subsections.

3.2.1. Fixed Charge Revenue

The City collects a monthly Fixed Charge from its customers based on meter size. The Fixed Charge is referred to as a Monthly Service Charge for all non-fire service related accounts and a Fire Line Fixed Charge for all fire lines. Calendar year (CY) 2017 and CY 2018 rates were used to project revenues in FY 2018.⁵ CY 2018 rates were used to project revenues in FY 2019 through FY 2023. CY 2017 and CY 2018 Fixed Charges are shown in Table 11 below.

Table 11: CY 2017 and CY 2018 (Current) Fixed Charges

Meter Size	Inside City CY 2017	Outside City CY 2017	Inside City CY 2018	Outside City CY 2018
MONTHLY SERVICE CHARGE				
5/8"	\$19.79	\$22.76	\$20.28	\$23.32
3/4"	\$19.79	\$22.76	\$20.28	\$23.32
1"	\$19.79	\$22.76	\$20.28	\$23.32
1 1/2"	\$30.18	\$34.71	\$30.94	\$35.58
2"	\$37.72	\$43.38	\$38.67	\$44.47
3"	\$56.58	\$65.07	\$58.01	\$66.71
4"	\$94.30	\$108.45	\$96.68	\$111.18
6"	\$151.02	\$173.67	\$154.82	\$178.04
FIRE LINE FIXED CHARGE				
2"	\$6.80	\$7.82	\$6.97	\$8.02
4"	\$13.58	\$15.62	\$13.92	\$16.01
6"	\$27.16	\$31.23	\$27.85	\$32.03
8"	\$40.75	\$46.86	\$41.77	\$48.04
10"	\$54.32	\$62.47	\$55.69	\$64.04

Before determining annual revenues from the Fixed Charges, Raftelis first forecast the number of accounts by meter size in each year. As mentioned in Section 0, based on the assumed annual percentage increases taken from the Water Master Plan, the number of accounts is projected to grow by about 20 accounts per year throughout the Study Period. The number of accounts by meter size through FY 2023 are shown in Table 12, and are projected based on growth assumptions previously defined in Table 9.

The report includes an estimate of 4,729 meters in the City in FY 2019 which encompasses current accounts and new residential units approved and/or new residential units with active building permits at this time. To be conservative in this analysis, the 4,729 estimate was used to ensure that revenue per account does not exceed the City’s projected costs.

⁵ Because the City’s FY 2018 begins on July 1, 2017 and ends on June 30, 2018, both calendar year (CY) 2017 and CY 2018 rates are needed to project FY 2018 rate revenues.

Table 12: Number of Meters through FY 2023

Meter Size	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Inside City Accounts						
5/8"	278	279	280	281	282	283
3/4"	2,645	2,656	2,667	2,679	2,691	2,704
1"	1,212	1,217	1,222	1,228	1,234	1,240
1 1/2"	130	131	132	133	134	135
2"	89	89	89	89	89	89
3"	22	22	22	22	22	22
4"	7	7	7	7	7	7
6"	1	1	1	1	1	1
Total Inside City Accounts	4,384	4,402	4,420	4,440	4,460	4,481
Outside City Accounts						
5/8"	3	3	3	3	3	3
3/4"	205	206	207	208	209	210
1"	100	100	100	100	100	100
1 1/2"	12	12	12	12	12	12
2"	5	5	5	5	5	5
3"	1	1	1	1	1	1
4"	0	0	0	0	0	0
6"	0	0	0	0	0	0
Total Outside City Accounts	326	327	328	329	330	331
Inside City Fire Lines						
2"	8	8	8	8	8	8
4"	63	63	63	63	63	63
6"	54	54	54	54	54	54
8"	13	13	13	13	13	13
10"	2	2	2	2	2	2
Total Inside City Fire Lines	140	140	140	140	140	140
Outside City Fire Lines						
2"	4	4	4	4	4	4
4"	2	2	2	2	2	2
6"	2	2	2	2	2	2
8"	3	3	3	3	3	3
10"	1	1	1	1	1	1
Total Outside City Fire Lines	12	12	12	12	12	12

The City operates on a Fiscal Year basis, but has been adopting new rates at the start of each Calendar Year. This means that the revenues collected by the City each year are derived from two different sets of rates, one for July

through December, and one for January through June. Totals collected for each set of rates in each six-month period are added together to calculate the total for the Fiscal Year.⁶

Referring to the monthly Fixed Charges and account/fire line totals in Table 11 and Table 12 respectively, the Fixed Charge revenue from Inside City accounts with a 5/8" meter for FY 2018 is calculated as follows:

$$\begin{aligned} & (\text{CY 2017 fixed charge rate for } 5/8" \text{ meter} \times \text{number of accounts with } 5/8" \text{ meter} \times 6 \text{ months}) + \\ & (\text{CY 2018 fixed charge rate for } 5/8" \text{ meter} \times \text{number of accounts with } 5/8" \text{ meter} \times 6 \text{ months}) \\ & (\$19.79 \times 278 \times 6) + (\$20.28 \times 278 \times 6) = \$66,837 \end{aligned}$$

Note that calculated Fixed Charge revenue in FY 2018 must take into account that over the course of FY 2018 (which begins on July 1, 2017 and ends on June 30, 2018), customers are assessed the Fixed Charge for six months at the CY 2017 rate and for six months at the CY 2018 rate. Fixed charge revenue in subsequent years is calculated assuming that CY 2018 rates are in effect for the entire fiscal year. For example, the Fixed Charge revenue from Inside City accounts with a 5/8" meter for FY 2019 is calculated as follows:

$$\begin{aligned} & \text{CY 2018 fixed charge rate for } 5/8" \text{ meter} \times \text{number of accounts with } 5/8" \text{ meter} \times 12 \text{ months} \\ & \$20.28 \times 278 \times 12 = \$67,897 \end{aligned}$$

Fixed Charge revenue calculations are repeated for all meter sizes for both Inside City and Outside City accounts and fire lines, and then summed to determine the total annual revenue from Fixed Charges. The result of these calculations and the sum of all fixed revenue through FY 2023 are shown in Table 13.

⁶ Going forward, the City is proposing to implement new rates at the beginning of each new fiscal year in July.

Table 13: Fixed Charge Revenue Projections through FY 2023

Meter Size	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Monthly Service Charge Revenue – Inside City						
5/8"	\$66,837	\$67,897	\$68,141	\$68,384	\$68,628	\$68,871
3/4"	\$635,911	\$646,364	\$649,041	\$651,961	\$654,882	\$658,045
1"	\$291,389	\$296,169	\$297,386	\$298,846	\$300,306	\$301,766
1 1/2"	\$47,674	\$48,638	\$49,009	\$49,380	\$49,752	\$50,123
2"	\$40,792	\$41,300	\$41,300	\$41,300	\$41,300	\$41,300
3"	\$15,126	\$15,315	\$15,315	\$15,315	\$15,315	\$15,315
4"	\$8,021	\$8,121	\$8,121	\$8,121	\$8,121	\$8,121
6"	\$1,835	\$1,858	\$1,858	\$1,858	\$1,858	\$1,858
Total	\$1,107,585	\$1,125,662	\$1,130,170	\$1,135,165	\$1,140,160	\$1,145,399

Monthly Service Charge Revenue – Outside City						
5/8"	\$829	\$840	\$840	\$840	\$840	\$840
3/4"	\$56,679	\$57,652	\$57,932	\$58,212	\$58,492	\$58,771
1"	\$27,648	\$27,986	\$27,986	\$27,986	\$27,986	\$27,986
1 1/2"	\$5,061	\$5,124	\$5,124	\$5,124	\$5,124	\$5,124
2"	\$2,635	\$2,668	\$2,668	\$2,668	\$2,668	\$2,668
3"	\$791	\$801	\$801	\$801	\$801	\$801
4"	\$0	\$0	\$0	\$0	\$0	\$0
6"	\$0	\$0	\$0	\$0	\$0	\$0
Total	\$93,644	\$95,070	\$95,350	\$95,630	\$95,910	\$96,190

Fire Line Fixed Charge Revenue - Inside City						
2"	\$661	\$669	\$669	\$669	\$669	\$669
4"	\$10,395	\$10,524	\$10,524	\$10,524	\$10,524	\$10,524
6"	\$17,823	\$18,047	\$18,047	\$18,047	\$18,047	\$18,047
8"	\$6,437	\$6,516	\$6,516	\$6,516	\$6,516	\$6,516
10"	\$1,320	\$1,337	\$1,337	\$1,337	\$1,337	\$1,337
Total	\$36,636	\$37,092	\$37,092	\$37,092	\$37,092	\$37,092

Fire Line Fixed Charge Revenue - Outside City						
2"	\$380	\$385	\$385	\$385	\$385	\$385
4"	\$380	\$384	\$384	\$384	\$384	\$384
6"	\$759	\$769	\$769	\$769	\$769	\$769
8"	\$1,708	\$1,729	\$1,729	\$1,729	\$1,729	\$1,729
10"	\$759	\$769	\$769	\$769	\$769	\$769
Total	\$3,986	\$4,035	\$4,035	\$4,035	\$4,035	\$4,035

<i>Total Monthly Service Charge</i>	\$1,201,228	\$1,220,732	\$1,225,520	\$1,230,795	\$1,236,070	\$1,241,589
<i>Total Fire Line Fixed Charge</i>	\$40,622	\$41,128	\$41,128	\$41,128	\$41,128	\$41,128
TOTAL FIXED REVENUE	\$1,241,850	\$1,261,859	\$1,266,648	\$1,271,923	\$1,277,198	\$1,282,716

3.2.2. Volumetric Charge Revenue

In addition to Fixed Charge revenue from the Monthly Service Charge and Fire Line Fixed Charge, the City also collects Volumetric Charge revenue based on water use. The City’s current Volumetric Charge rate structure has varying number of tiers and tier widths based on customer class. The current rate structure includes four tiers for SFR customers, three tiers for MFR and Commercial customers, and uniform rates for Municipal, Irrigation, and Fire & Hydrant customers. The current tier widths and CY 2017 and CY 2018 Volumetric Charge rates are shown for all customer classes and tiers in Table 14.

Table 14: CY 2017 and CY 2018 Volumetric Charge Rates (\$/kgal)

Class/Tier	Tier Width	Inside City CY 2017	Outside City CY 2017	Inside City CY 2018	Outside City CY 2018
SFR					
Tier 1	1 to 6 kgal	\$3.94	\$4.53	\$4.17	\$4.80
Tier 2	7 to 12 kgal	\$6.91	\$7.95	\$7.31	\$8.41
Tier 3	13 to 18 kgal	\$7.76	\$8.92	\$8.21	\$9.44
Tier 4	>18 kgal	\$11.22	\$12.90	\$11.86	\$13.64
MFR					
Tier 1	1 to 26 kgal	\$4.27	\$4.91	\$4.52	\$5.20
Tier 2	27 to 78 kgal	\$4.87	\$5.60	\$5.15	\$5.92
Tier 3	>78 kgal	\$5.12	\$5.89	\$5.42	\$6.23
Commercial					
Tier 1	1 to 25 kgal	\$6.27	\$7.21	\$6.63	\$7.62
Tier 2	26 to 61 kgal	\$6.60	\$7.59	\$6.98	\$8.03
Tier 3	>61 kgal	\$7.21	\$8.29	\$7.63	\$8.77
Other Uniform					
Municipal	N/A	\$5.74	\$6.60	\$6.07	\$6.98
Irrigation	N/A	\$7.57	\$8.71	\$8.01	\$9.21
Fire & Hydrant	N/A	\$7.57	\$8.71	\$8.01	\$9.21

Raftelis then projected annual water use by class and tier for FY 2018 through FY 2023 based on the FY 2017 water use data shown previously in Table 8 and annual growth factors shown in Table 9. All increases in water usage over the Study Period are assumed to result from growth in the number of accounts. Water use projections are shown in Table 15. Note that water use in FY 2017 is separated into two periods (July-December and January-June) so that the FY 2018 Volumetric Charge revenue projection accounts for the fact that both CY 2017 and CY 2018 rates were in effect during FY 2018. Water use in July through December in FY 2017 was assessed the CY 2017 rate, while water use in January through June in FY 2018 was assessed the CY 2018 rate.

Table 15: Projected Annual Water Use through FY 2023

Class/Tier	FY 2018 (Jul-Dec)	FY 2018 (Jan-Jun)	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Inside City Water Use (kgal/year)							
SFR Tier 1	90,007	69,092	159,744	160,392	161,138	161,887	162,640
SFR Tier 2	40,570	13,901	54,692	54,914	55,169	55,425	55,683
SFR Tier 3	18,271	4,690	23,054	23,147	23,255	23,363	23,471
SFR Tier 4	20,268	6,223	26,598	26,706	26,830	26,954	27,079
MFR Tier 1	23,795	18,852	42,820	42,994	43,194	43,395	43,597
MFR Tier 2	12,182	8,551	20,817	20,902	20,999	21,096	21,194
MFR Tier 3	13,503	7,010	20,596	20,680	20,776	20,873	20,970
Commercial Tier 1	21,287	17,447	38,891	39,049	39,231	39,413	39,597
Commercial Tier 2	10,136	7,240	17,446	17,516	17,598	17,680	17,762
Commercial Tier 3	13,424	12,064	25,591	25,695	25,815	25,935	26,056
Municipal	24,881	17,382	42,435	42,607	42,806	43,005	43,205
Irrigation	25,162	9,782	35,086	35,229	35,393	35,558	35,723
Fire & Hydrant	288	321	611	613	616	619	622
Total Inside City	313,774	192,555	508,381	510,444	512,820	515,203	517,599
Outside City Water Use (kgal/year)							
SFR Tier 1	2,661	1,961	4,641	4,660	4,681	4,703	4,725
SFR Tier 2	1,689	551	2,249	2,258	2,269	2,280	2,291
SFR Tier 3	1,080	281	1,366	1,371	1,377	1,383	1,389
SFR Tier 4	3,681	913	4,613	4,632	4,653	4,674	4,695
MFR Tier 1	14,381	6,706	21,172	21,258	21,356	21,456	21,556
MFR Tier 2	2,266	577	2,854	2,865	2,879	2,893	2,907
MFR Tier 3	118	44	162	162	163	164	165
Commercial Tier 1	654	530	1,189	1,194	1,199	1,204	1,210
Commercial Tier 2	13	0	13	13	13	13	13
Commercial Tier 3	0	0	0	0	0	0	0
Municipal	359	192	553	555	558	561	564
Irrigation	102	59	161	161	161	161	161
Fire & Hydrant	2	13	15	15	15	15	15
Total Outside City	27,006	11,827	38,988	39,144	39,324	39,507	39,691
TOTAL WATER SOLD	340,780	204,382	547,369	549,588	552,144	554,710	557,290

Annual projected Volumetric Charge revenues for FY 2018 through FY 2023 are shown in Table 16, and are calculated by multiplying the projected consumption found in Table 15 by the rates found in Table 14. Note that projected Volumetric Charge revenue in FY 2018 accounts for the fact July through December usage is assessed the CY 2017 rate, while January through June usage is assessed the CY 2018 rate. For example, the Volumetric Charge revenue from Inside City SFR usage in FY 2018 can be calculated as follows:

$$\begin{aligned}
 & (\text{Jul} - \text{Dec FY 2018 usage} \times \text{CY 2017 Inside City SFR Tier 1 rate}) + \\
 & (\text{Jan} - \text{Jun FY 2018 usage} \times \text{CY 2018 Inside City SFR Tier 1 rate})
 \end{aligned}$$

$$(90,007 \text{ kgal} \times \$3.94) + (69,092 \text{ kgal} \times \$4.17) = \$642,741$$

For Volumetric Charge revenue projections in FY 2019 through FY 2023, total annual usage in each class and tier is simply multiplied by the CY 2018 rate shown in Table 14. These calculations described above are repeated for all classes and tiers to determine the total Volumetric Charge revenue in each fiscal year throughout the Study Period. Again, CY 2018 rates are used to project variable revenue in the out-years in order to determine status quo rate revenue that would be generated in the absence of any proposed change to the current rates or rate structure. Please note that values shown in Table 16 are rounded. As a result, the totals may not match exactly.

Table 16: Projected Volumetric Charge Revenue through FY 2023

Class/Tier	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Projected Inside City Volumetric Charge Revenue						
SFR Tier 1	\$642,741	\$666,132	\$668,835	\$671,945	\$675,069	\$678,209
SFR Tier 2	\$381,955	\$399,799	\$401,421	\$403,285	\$405,157	\$407,043
SFR Tier 3	\$180,288	\$189,273	\$190,037	\$190,924	\$191,810	\$192,697
SFR Tier 4	\$301,212	\$315,452	\$316,733	\$318,204	\$319,674	\$321,157
MFR Tier 1	\$186,816	\$193,546	\$194,333	\$195,237	\$196,145	\$197,058
MFR Tier 2	\$103,364	\$107,208	\$107,645	\$108,145	\$108,644	\$109,149
MFR Tier 3	\$107,130	\$111,630	\$112,086	\$112,606	\$113,132	\$113,657
Commercial Tier 1	\$249,143	\$257,847	\$258,895	\$260,102	\$261,308	\$262,528
Commercial Tier 2	\$117,433	\$121,773	\$122,262	\$122,834	\$123,406	\$123,979
Commercial Tier 3	\$188,835	\$195,259	\$196,053	\$196,968	\$197,884	\$198,807
Municipal	\$248,326	\$257,580	\$258,624	\$259,832	\$261,040	\$262,254
Irrigation	\$268,830	\$281,039	\$282,184	\$283,498	\$284,820	\$286,141
Fire & Hydrant	\$4,751	\$4,894	\$4,910	\$4,934	\$4,958	\$4,982
Total Inside City	\$2,980,824	\$3,101,434	\$3,114,018	\$3,128,514	\$3,143,048	\$3,157,662
Projected Outside City Volumetric Charge Revenue						
SFR Tier 1	\$21,461	\$22,256	\$22,347	\$22,448	\$22,553	\$22,659
SFR Tier 2	\$18,054	\$18,906	\$18,982	\$19,074	\$19,167	\$19,259
SFR Tier 3	\$12,291	\$12,897	\$12,944	\$13,001	\$13,058	\$13,114
SFR Tier 4	\$59,948	\$62,917	\$63,176	\$63,462	\$63,749	\$64,035
MFR Tier 1	\$105,476	\$110,052	\$110,499	\$111,008	\$111,528	\$112,048
MFR Tier 2	\$16,108	\$16,903	\$16,968	\$17,051	\$17,134	\$17,217
MFR Tier 3	\$969	\$1,010	\$1,010	\$1,016	\$1,022	\$1,028
Commercial Tier 1	\$8,757	\$9,066	\$9,104	\$9,142	\$9,180	\$9,226
Commercial Tier 2	\$99	\$104	\$104	\$104	\$104	\$104
Commercial Tier 3	\$0	\$0	\$0	\$0	\$0	\$0
Municipal	\$3,710	\$3,860	\$3,874	\$3,895	\$3,916	\$3,937
Irrigation	\$1,431	\$1,483	\$1,483	\$1,483	\$1,483	\$1,483
Fire & Hydrant	\$137	\$138	\$138	\$138	\$138	\$138
Total Outside City	\$248,441	\$259,592	\$260,629	\$261,823	\$263,032	\$264,249
TOTAL	\$3,229,264	\$3,361,026	\$3,374,647	\$3,390,337	\$3,406,081	\$3,421,911

3.2.3. Non-Operating Revenue

In addition to the revenues from Fixed Charges and Volumetric Charges, the water utility also has several sources of non-operating revenue shown below in Table 17. Non-operating revenues shown in Table 17 are based on City's FY 2018 budget, and are not escalated in subsequent years, with the exception of "Late Fees & Shut-Off" (which is assumed to increase by 0.41% per year in FY 2018 through FY2020 and then by 0.47% through FY 2023, consistent with the projected growth in accounts).

Table 17: Projected Non-Operating Revenue through FY 2023

Revenue Source	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
New Service Fees	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000	\$10,000
Late Fees & Shut-Off	\$44,600	\$44,781	\$44,963	\$45,172	\$45,382	\$45,593
Other - Water Revenues	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000	\$1,000
Total Non-Operating Revenue	\$55,600	\$55,781	\$55,963	\$56,172	\$56,382	\$56,593

3.3. Water Utility Expenses

The City's water utility expenses include O&M expenses, capital expenses, and debt service payments. Section 3.3 provides details for each of these expenses.

3.3.1. Total O&M Budget

Water Purchase Cost

The City obtains the majority of its water from the SCWA. The City pays SCWA a dollar per AF rate for its wholesale water purchases. The City provided Raftelis with proposed and planned SCWA rates for FY 2018 and FY 2019.⁷ Beyond FY 2019, Raftelis assumes a 6 percent annual increase in SCWA wholesale rates based on actual increases in recent years. The City obtained roughly eight percent of its water from pumping groundwater from City wells in CY 2017. Costs associated with pumping groundwater from the City's wells are included in the summary of O&M expenses in the following subsection. Per the City of Sonoma Water Master Plan, the pumping of groundwater is projected to increase from 147 AF per year to 238 AF per year, starting in FY 2019. This change is also factored into the analysis. Moreover, the Study assumes a 6.3 percent water loss factor, which increases the amount of water supply required. This loss factor was generated by comparing the totals of produced and purchased water versus total metered sales over the previous calendar years. Water supply cost projections are calculated by multiplying the amount of water purchased from SCWA by the SCWA wholesale rate, and are shown in Table 18. The City can purchase a maximum of 3,000 AF per year from SCWA, but currently is well below that maximum.

⁷ The FY 2019 cost per AF for SCWA water is \$1,001 per AF.

Table 18: Projected Purchased Water Cost Expenses through FY 2023

Water Supply Information	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Water Sales	1,673 AF	1,680 AF	1,687 AF	1,694 AF	1,702 AF	1,710 AF
Total Supply Required (w/ water loss) ⁸	1,785 AF	1,792 AF	1,799 AF	1,808 AF	1,816 AF	1,825 AF
Water Supply from City Wells	147 AF	238 AF	238 AF	238 AF	238 AF	238 AF
Water Purchased from SCWA	1,638 AF	1,554 AF	1,561 AF	1,570 AF	1,578 AF	1,587 AF
SCWA Wholesale Rate (\$/AF)	\$944.56	\$1,001.06	\$1,061.12	\$1,124.79	\$1,192.28	\$1,263.82
SCWA Water Supply Costs	\$1,547,491	\$1,555,753	\$1,656,807	\$1,765,628	\$1,881,582	\$2,005,153

Pass-Through Rates

California Government Code Section 53756 allows for pass through adjustments for unforeseen increases in wholesale water costs. The City’s wholesale water provider, Sonoma County Water Agency (SCWA), increased its wholesale water rates per AF by six percent for FY 2019. Based on discussions with City Staff, the Financial Plan assumes that wholesale water rates will increase by approximately six percent per year for the duration of the study period. Should the costs of wholesale water exceed the estimated increase of six percent per year, due to drought conditions or for any other reason, the City will pass-through any wholesale water rate increases imposed on the City by SCWA that are greater than the average annual increase of six percent already included in the Financial Plan assumptions. If necessary, the exact pass-through charge for FY 2019, as well as for any subsequent fiscal years, will be calculated based on the increment of greater than anticipated wholesale purchased water costs per AF divided by the estimated water use for that FY.

O&M Expenses

The City provided Raftelis with its water utility budget in FY 2018 and FY 2019. In order to project the City’s O&M expenses in future years, Raftelis used the escalation percentages shown in Table 10 to expenses in FY 2020 through FY 2023. Detailed O&M projections on a line item basis are shown in Appendix A. A Summary of the City’s projected O&M budget is shown by fiscal year in Table 19. Note that water supply costs from Table 18 are included in the total O&M shown in Table 19. Also, water supply costs were classified in the FY 2018 budget as “Property Services”. They have since been reclassified to “Supplies” in the FY 2019 budget. The total O&M budget was approximately \$4 million for FY 2018 and is projected to increase to approximately \$5 million by FY 2023.

Table 18 also incorporates a recent Cost Allocation Plan (or CAP) Study that was prepared for the City of Sonoma. The CAP Study identified those employees directly tied to the City’s provision of water services. The time and salary costs for employees who spend part of their time for water service activities were apportioned and included in a transfer for overhead allocations. The other portion of the transfers is \$113,940 for the Water Division’s lease of City owned land for tanks in FY 2019. (See also Appendix A for detailed O&M budget assumptions.)

⁸ Total Supply Required is calculated by dividing the amount in the Water Sales row by 1 minus the water loss factor. Using FY 2018 as an example: $1,673 / (1 - 0.063) = 1,785$.

Table 19: Projected O&M Expenses through FY 2023

O&M Summary	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Salary & Wages	\$864,704	\$653,168	\$672,763	\$692,946	\$713,734	\$735,146
Employee Benefits	\$345,486	\$293,441	\$316,916	\$342,270	\$369,651	\$399,223
Professional Services	\$366,740	\$327,840	\$337,675	\$347,805	\$358,240	\$368,987
Property Services	\$1,665,191	\$149,000	\$153,470	\$158,074	\$162,816	\$167,701
Operations	\$116,700	\$200,782	\$206,805	\$213,010	\$219,400	\$225,982
Supplies	\$194,250	\$1,740,003	\$1,846,584	\$1,961,099	\$2,082,917	\$2,212,528
Capital Assets	\$4,752	\$6,252	\$6,440	\$6,633	\$6,832	\$7,037
Internal Service & Capital	\$158,874	\$163,435	\$168,338	\$173,388	\$178,590	\$183,948
Fiscal Agent Fee (for Debt Service)	2000	1650	1699.5	1750.485	1802.99955	1857.089537
Transfers	\$337,295	\$615,042	\$633,493	\$652,498	\$672,073	\$692,235
Total O&M	\$4,055,992	\$4,150,613	\$4,344,185	\$4,549,473	\$4,766,056	\$4,994,643

3.3.2. Capital Expenses

Projected Capital Improvement Program (CIP) costs throughout the Study Period are based on the City’s 2018 Water Master Plan Update, and include some modifications based on direction from City staff. Individual CIP project costs are shown in Table 20 below, and were escalated using a 3 percent annual construction cost inflation factor. This inflation factor is based on the Engineering News-Record Construction Cost Index for the San Francisco Area.

Modifications made to the City’s Water CIP schedule include the removal of FY 2021 costs for the “Renewal and Replacement of Existing Pipelines” project and FY 2019-FY 2021 costs for the “New Well No. 9” project (represented by red values in Table 20). The City does not currently expect to execute these projects as originally scheduled, but may postpone them until the next rate setting cycle or proceed if the water utility’s financial position results in additional unanticipated funding opportunities for these projects. The totals in Table 19 do not include the projects that are going to be deferred or postponed.

Another modification to the City’s Water CIP schedule includes the FY 2021 cost for the “Meter System Upgrades” (also known as “Advanced Metering Infrastructure” or the “AMI” project). The FY 2021 cost for this project was originally spread across FY 2021-FY 2023, but has been combined as allowed by suggested debt financing for this project. Note also that the FY 2021 “Meter System Upgrades” cost shown in Table 20 includes the offset of three years of monetized benefits from reduced leaks resulting from the project.⁹ Lastly, please note that FY 2020 costs for both “Fire Flow Improvements” projects shown in Table 20 are assumed to be debt-funded. Debt service payments resulting from this future debt issue are shown in Section 3.3.3.

⁹ City of Sonoma Water Master Plan, Table 8-4

Table 20: Projected CIP Costs through FY 2023

CIP Project Name	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Well 6 Groundwater Banking Project Design	\$10,000					
Well 6 Groundwater Banking Project Const/Materials	\$25,000					
W Napa St. Water System Replacement Project	\$2,800,000					
Water Services with Street Rehabilitation	\$210,800		\$233,398		\$247,612	
Condition Data - Phase 1		\$18,540				
Condition Data - Phase 2		\$118,450	\$106,811	\$49,173	\$50,648	\$52,167
Renewal and Replacement of Existing Pipelines				\$1,201,344	\$1,237,384	\$1,274,506
Condition Assessment of Aging Water Distribution Pipes		\$23,690				
Fire Flow Improvements - Upsizing Asbestos Cement Pipelines		\$164,800	\$1,060,900			
Fire Flow Improvements - Upsizing Pipelines of Unknown Material		\$72,100	\$434,969			
New Well No. 9		\$465,620	\$307,131	\$1,640,120		
2020 Urban Water Management Plan and Minor Water Master Plan Update				\$81,955		
Water Meter System Upgrades		\$25,750	\$79,568	\$2,026,939		
Total Inflated CIP	\$3,045,800	\$423,330	\$1,915,646	\$2,158,066	\$1,535,644	\$1,326,673

3.3.3. Existing and Proposed Debt Service

The water utility’s outstanding debt service payments related to its 2012 Revenue Bonds issue are shown through FY 2023 in Table 21 below. The 2012 Revenue Bonds refinanced a 2001 Bond Issuance used to finance the construction of a water tank project and the installation of water mains and laterals.

Table 21: Existing Debt Service through FY 2023

Debt Service	FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
2012 Revenue Bonds						
Principal	\$75,000	\$75,000	\$75,000	\$80,000	\$85,000	\$85,000
Interest	\$48,653	\$45,728	\$42,803	\$39,780	\$36,563	\$33,248
Total Existing Debt Service	\$123,653	\$120,728	\$117,803	\$119,780	\$121,563	\$118,248

In addition to the existing debt service related to the 2012 Revenue Bonds, the City anticipates a new debt issuance of \$3.94 million in FY 2020 to fund CIP (specifically the FY 2020 costs for both “Fire Flow Improvements” projects and the Meter System Upgrades costs in FY 2021 shown in Table 20). This proposed debt issuance assumes a 30-year term, 5 percent interest rate, and \$78,800 in issuance costs (2 percent of the debt issuance amount). The City maintains a Debt Retirement Reserve to ensure that the water utility is capable of meeting its debt service obligations

in any year. A Debt Retirement Reserve target equal to one year of debt service must be held in reserve at all times. Total debt proceeds of approximately \$3.60 million in FY 2020 is determined by subtracting the issuance costs and contributions to the Debt Retirement Reserve from the debt issuance amount. Table 22 provides the details of the proposed debt issuance in FY 2020, with annual debt service payments of \$256,303 (principal plus interest) in FY 2020 through FY 2023 shown in the last line.

Table 22: FY 2020 Proposed Debt Issuance

FY 2020 Proposed Debt Issuance	FY 2020	FY 2021	FY 2022	FY 2023
Debt Issuance Amount	\$3,940,000			
Issuance Cost	\$78,800			
Contribution to Debt Retirement Reserve	\$256,303			
Debt Proceeds to Fund CIP	\$3,604,897			
Annual Debt Service	\$256,303	\$256,303	\$256,303	\$256,303

3.4. Financial Policies

3.4.1. Debt Coverage Requirement

The City must meet or exceed a debt coverage requirement of 125 percent in each fiscal year. Debt coverage is calculated by dividing net operating revenues by total debt service in each fiscal year.

3.4.2. Reserve Policies

The City does not currently have a reserve Policy. City Staff and Raftelis worked together to derive the below financial policies. The reserves and reserve policies for the City’s water utility are outlined as follows:

- 1. Operating Reserve:** The Operating Reserve is used primarily to meet ongoing cash flow requirements. The City is establishing an Operating Reserve target level equal to two months of O&M expenses, which is used to calculate Operating Reserve target levels throughout the Study Period. However, the City plans to increase this target to three months of O&M expenses in its next financial plan process (around FY 2023) as a result of the City’s recent evaluation of current reserve policies.
- 2. Capital Reserve:** The Capital Reserve is used to cover any unexpected and unplanned infrastructure repairs and replacements not included in the CIP budget. The City is setting Capital Reserve target level of annual average CIP expenditures (averaged over the next five years). The Capital Reserve target levels do not include the debt funded CIP projects.
- 3. Rate Stabilization Reserve:** The Rate Stabilization Reserve is used during periods of short-term revenue shortages due to economic recession, drought, or other causes in order to alleviate the need to quickly implement substantial rate increases. The current proposed Rate Stabilization Reserve target level is 10 percent of annual Volumetric Charge revenue. Raftelis and the City worked to increase the target to 15 percent by FY 2023. To account for this expected increase in this Study, Raftelis assumed a 1 percent increase per annum beginning in FY 2019, resulting in a 15 percent target in FY 2023.
- 4. Emergency Reserve:** The Emergency Reserve is used as a source of funding in the event of asset failure or a natural disaster. The water utility does not currently have a target level for its Emergency Reserve. However,

the City is considering the adoption of a target level equal to 2.5 percent of net asset values during its next water rate setting cycle.

Reserve Target Calculations are shown in Table 23.

Table 23: Reserve Policy Calculation

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Operating Reserve Calculation					
Operating Reserve Target	16.67%	16.67%	16.67%	16.67%	16.67%
Operating Expenses	\$4,150,613	\$4,344,185	\$4,549,473	\$4,766,056	\$4,994,643
Total Target	\$691,769	\$724,031	\$758,245	\$794,343	\$832,441
Capital Reserve Calculation					
Capital Reserve Target	100%	100%	100%	100%	100%
Inflated PAYGO CIP	\$423,330	\$419,777	\$131,127	\$1,535,644	\$1,326,673
5 Year Rolling Average (Target)	\$767,310	\$997,731	\$1,184,200	\$1,436,512	\$1,416,277
Rate Stabilization Calculation					
Volumetric Revenue	\$3,361,026	\$3,374,647	\$3,390,337	\$3,406,081	\$3,421,911
Rate Stabilization Target	11%	12%	13%	14%	15%
Total Target	\$369,713	\$404,958	\$440,744	\$476,851	\$513,287
Total Reserve Target	\$1,814,298	\$2,125,085	\$2,381,150	\$2,705,502	\$2,759,629

3.5. Proposed Financial Plan and Revenue Adjustments

This section displays the proposed revenue adjustments necessary to ensure adequate revenue to fund operating expenses, capital expenditures, and meet reserve targets. Each revenue adjustment represents an increase in rate revenue from Fixed Charges and Volumetric Charges relative to the prior fiscal year. The Financial Plan assumes that the FY 2019 revenue adjustment occurs on or near September 1, 2018 with subsequent adjustments occurring annually on July 1 in FY 2020 through FY 2023. The proposed revenue adjustments would enable the City to meet operating costs and to execute the CIP shown in Table 20. Table 24 shows the proposed revenue adjustments over the course of the Study Period.

Table 24: Proposed Revenue Adjustments through FY 2023

Fiscal Year	Proposed Revenue Adjustment	Implementation Date
FY 2019	3.5%	September 1, 2018
FY 2020	7.5%	July 1, 2019
FY 2021	7.5%	July 1, 2020
FY 2022	7.5%	July 1, 2021
FY 2023	7.5%	July 1, 2022

Table 25 shows the cash flow detail through FY 2023 for the proposed Financial Plan. Line 5 shows total revenue, which is the sum of revenue from current rates (from Table 13 and Table 16), additional rate revenue resulting from the proposed revenue adjustments (from Table 24), non-operating revenue (from Table 17), and estimated interest earnings (calculated assuming a 1 percent rate interest rate). Line 9 shows net operating revenue, which is calculated by subtracting operating expenses in Line 7 (from Table 19) from total revenue in Line 5. Line 15 shows total debt

service, which is the sum of existing debt service in Line 12 (from Table 21) and proposed debt service in Line 14 (from Table 22).

Debt service coverage in Line 16 is calculated by dividing net operating revenue in Line 9 by total debt service in Line 16. Total CIP costs in Line 19 (from Table 20) is split between debt-funded CIP in Line 20 and rate-funded CIP (“Pay As You Go” or PAYGO) in Line 22 based on available debt proceeds shown in Line 13. Debt proceeds are assumed to be fully utilized when available before returning to PAYGO funding. Net cash changes in Line 24 are calculated by subtracting total debt service (Line 15), and PAYGO-funded CIP (Line 22) from net operating revenue (Line 9).

Ending balances for the water utility in Line 27 are determined by summing the starting balance in Line 26 and the net cash change in Line 24. The City provided the starting balance for FY 2019. Lastly, the total reserve target balance in Line 33 is the sum of the individual reserve target balances in Lines 29-32, which were calculated based on current reserve policies outlined in Section 3.4.2.

Table 25: Water Utility Cash Flow Detail through FY 2023

Line		FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
1	Current Rate Revenue	\$4,622,885	\$4,641,295	\$4,662,260	\$4,683,278	\$4,704,627
2	Revenue Adjustments	\$134,834 ¹⁰	\$522,726	\$914,138	\$1,338,374	\$1,798,158
3	Non-Operating Revenue	\$55,781	\$55,963	\$56,172	\$56,382	\$56,593
4	Interest	\$25,794	\$29,155	\$33,146	\$31,661	\$28,287
5	Total Revenue	\$4,839,295	\$5,249,139	\$5,665,716	\$6,109,695	\$6,587,666
6						
7	Operating Expenses	\$4,150,613	\$4,344,185	\$4,549,473	\$4,766,056	\$4,994,643
8						
9	Net Operating Revenue	\$688,682	\$904,954	\$1,116,243	\$1,343,639	\$1,593,022
10						
11	Debt					
12	Existing Debt Service	\$120,728	\$117,803	\$119,780	\$121,563	\$118,248
13	Debt Proceeds	\$0	\$3,604,897	\$0	\$0	\$0
14	Proposed Debt Service	\$0	\$256,303	\$256,303	\$256,303	\$256,303
15	Total Debt Service	\$120,728	\$374,105	\$376,083	\$377,865	\$374,550
16	Debt Service Coverage	570%	242%	297%	356%	425%
17						
18	CIP					
19	Total CIP	\$423,330	\$1,915,646	\$2,158,066	\$1,535,644	\$1,326,673
20	Debt Funded CIP	\$0	\$1,915,646	\$1,689,251	\$0	\$0
21	Remaining Debt Funds	\$0	\$1,689,251	\$0	\$0	\$0
22	PAYGO Funded CIP	\$423,330	\$0	\$468,814	\$1,535,644	\$1,326,673
23						
24	Net Cash Changes	\$144,625	\$530,849	\$271,346	-\$569,870	-\$108,201
25						
26	STARTING BALANCE	\$2,520,025	\$2,664,650	\$3,195,499	\$3,466,845	\$2,896,975
27	ENDING BALANCE	\$2,664,650	\$3,195,499	\$3,466,845	\$2,896,975	\$2,788,774
28						
29	Operating Reserve Target	\$691,769	\$724,031	\$758,245	\$794,343	\$832,441
30	Capital Reserve Target	\$767,310	\$997,731	\$1,184,200	\$1,436,512	\$1,416,277
31	Rate Stabilization Reserve Target	\$355,219	\$403,323	\$438,704	\$474,647	\$510,912
32	Emergency Reserve Target	\$0	\$0	\$0	\$0	\$0
33	Total Reserve Target	\$1,814,298	\$2,125,085	\$2,381,150	\$2,705,502	\$2,759,629

Figure 1 through Figure 4 display the proposed five-year Financial Plan in graphical form. Figure 1 shows proposed revenue adjustments in blue bars on the left axis, as well as calculated and required debt coverage with the orange and grey lines respectively on the right axis. Figure 1 demonstrates that with the proposed annual revenue adjustments in FY 2019 through FY 2023, the debt coverage requirement is also met or exceeded throughout the Study Period.

¹⁰ The Revenue Adjustment for FY 2019 is pro-rated based on September implementation. The revenue in this line is calculated by multiplying 3.5% by 10/12 (for the number of months the rates will be in effect in that fiscal year) by the rate revenue for that year. The example calculation for FY 2019 would be 0.035*\$4,622,885*10/12.

Figure 1: Proposed Revenue Adjustments

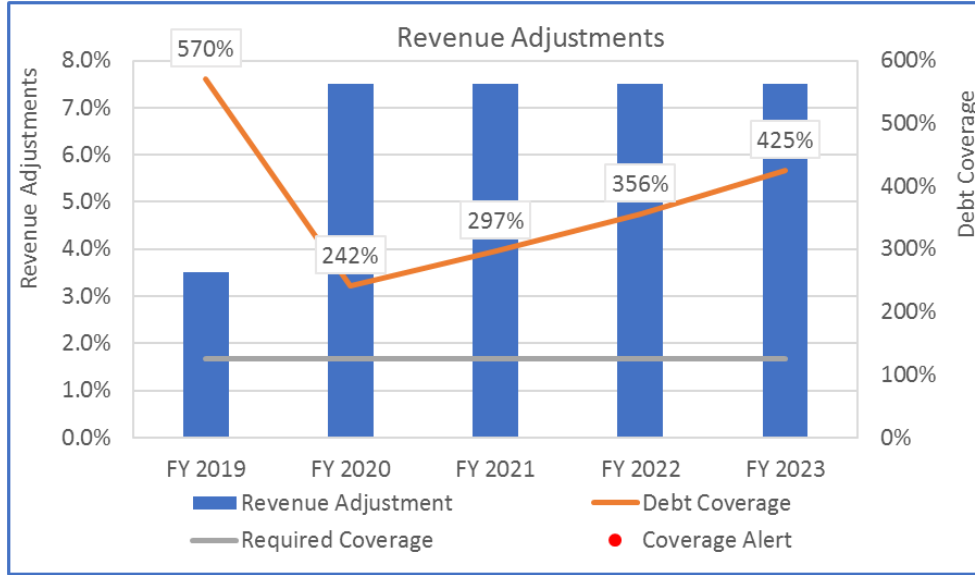


Figure 2 illustrates the Operating Financial Plan – it compares existing and proposed revenues with projected expenses. The expenses include O&M, water supply costs, debt service, PAYGO CIP funding, and reserve funding. Expenses are represented by the stacked bars. Total projected revenues at existing and proposed rates are shown by the red and blue lines respectively. Figure 2 shows that projected revenue from existing rates would fail to generate sufficient revenue to fund projected expenses over the Study Period, and clearly demonstrates the need for revenue adjustments.

Figure 2: Proposed Operating Financial Plan

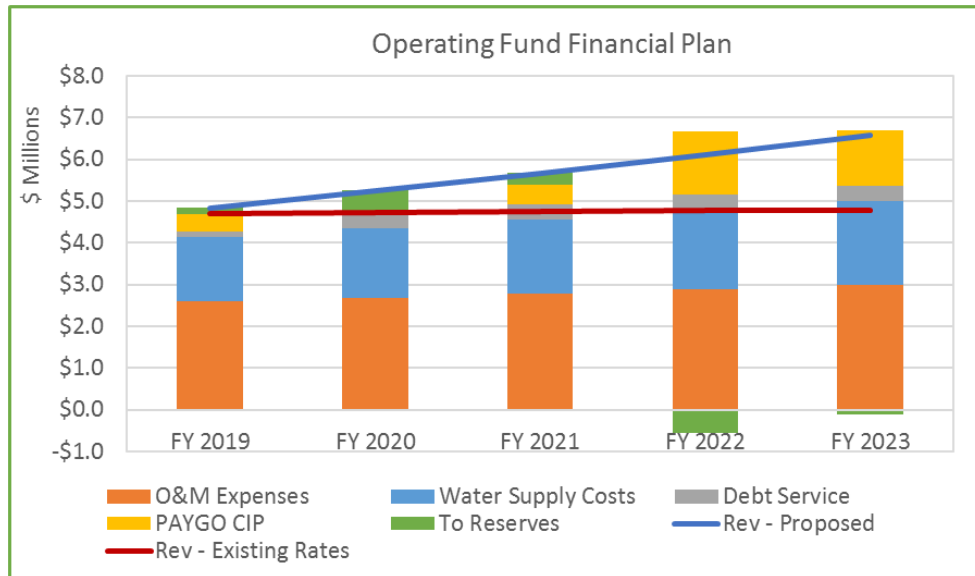


Figure 3 summarizes projected CIP expenditures by funding source: debt funded (red stacked bar) or PAYGO-funded (green stacked bar). Total CIP expenditures in millions of dollars in each fiscal year are displayed at the top of the stacked bars in Figure 3. Proceeds from the proposed FY 2020 debt issuance described in Section 3.3.3 are assumed

to provide all debt funding for CIP in FY 2020 and FY 2021 as shown in Figure 3. Remaining CIP expenditures are assumed to be PAYGO-funded.

Figure 3: Projected CIP and Funding Sources

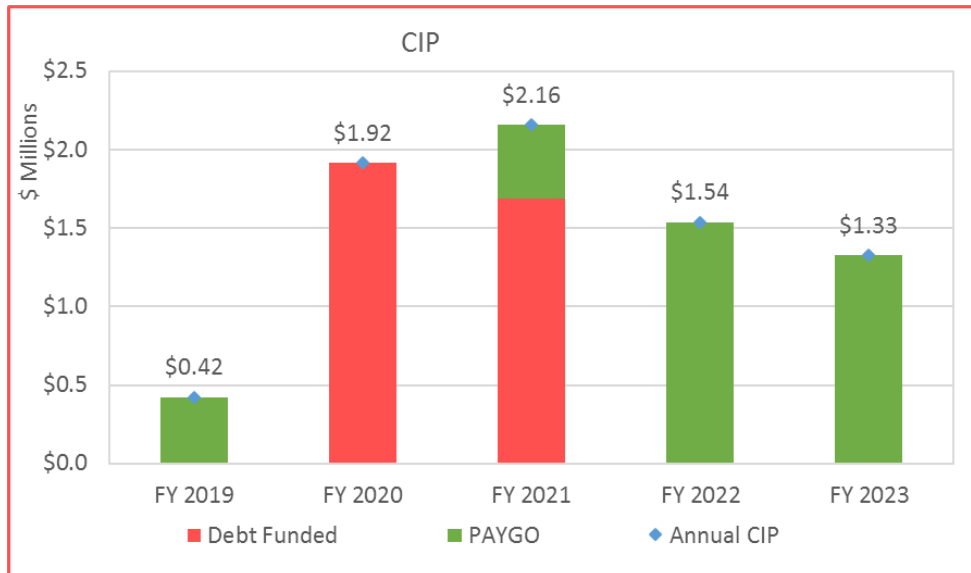
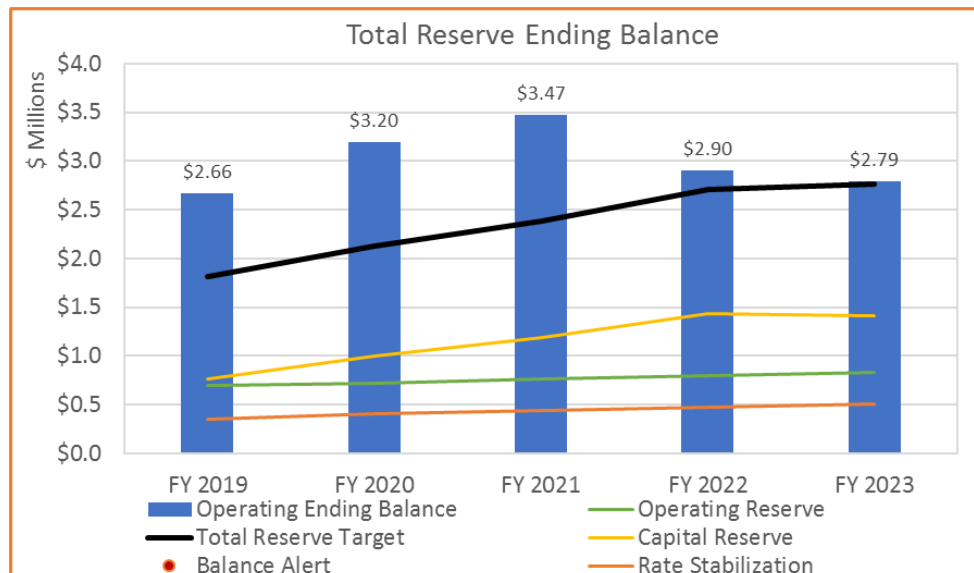


Figure 4 displays the water utility’s yearly ending balance (blue bars). The total reserve target is the sum of each individual reserve target, and is represented by the black line. Individual reserve targets are also shown for the Operating Reserve (green line), Capital Reserve (yellow line), and Rate Stabilization Reserve (orange line). Figure 4 demonstrates that under the proposed Financial Plan, the total reserve target is met over the course of the Study Period.

Figure 4: Total Reserve Ending Balance



4. Legal Framework and Rate Setting Methodology

4.1. Legal Framework

This section of the report describes the legal framework that was considered throughout the course of the Study. Raftelis ensures that its rate setting process is undertaken in accordance with the legal framework described in further detail below.

California Constitution - Article XIII D, Section 6 (Proposition 218)

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

1. A property-related charge (such as water rates) imposed by a public agency on a parcel shall not exceed the costs required to provide the property related service.
2. Revenues derived by the charge shall not be used for any other purpose other than that for which the charge was imposed.
3. The amount of the charge imposed upon any parcel shall not exceed the proportional Cost of Service attributable to the parcel.
4. No charge may be imposed for a service unless that service is actually used or immediately available to the owner of property.
5. No fee or charge may be imposed for general governmental services including, but not limited to, police, fire, ambulance or library services, where the service is available to the public at large in substantially the same manner as it is to property owners.
6. A written notice of the proposed charge shall be mailed to the record owner of each parcel at least 45 days prior to the public hearing, when the agency considers all written protests against the charge.

Prop 218 requires that water rates cannot be “arbitrary and capricious,” meaning that the rate-setting methodology must be sound and that there must be a nexus between costs and the rates charged. Raftelis followed industry standard rate setting methodologies set forth by the AWWA M1 Manual to ensure this study meets Proposition 218 requirements and creates rates that do not exceed the proportionate cost of providing water services.

California Constitution - Article X, Section 2

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

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

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

In addition, Section 106 of the Water Code declares that the highest priority use of water is for domestic purposes, with irrigation secondary. To meet the objectives of Article X, section 2, Water Code Section 375 et seq., a water purveyor may utilize its water rate design to incentivize the efficient use of water.

4.2. Cost-Based Rate-Setting Methodology

To develop utility rates that comply with Proposition 218 and industry standards while meeting other emerging goals and objectives of the utility, there are four major steps discussed below.

1) Calculate Revenue Requirement

The rate-making process starts by determining the test year revenue requirement - which for this study is FY 2019. The revenue requirement should sufficiently fund the utility's O&M, debt service (where applicable), capital expenses, and reserve funding.

2) Cost of Service Analysis (COS)

The annual cost of providing water service is distributed among customer classes commensurate with their service requirements. A COS analysis involves the following:

1. Functionalizing costs: Examples of functions are supply, treatment, transmission, distribution, storage, meter servicing, conservation, and customer billing and collection.
2. Allocating functionalized costs to rate components: Rate components include a Monthly Service Charge and a Volumetric Charge.
3. Distributing the cost components: Distribute rate components, using unit costs, in proportion to the demands on the water system. This is described in the M1 Manual published by AWWA.

3) Rate Design and Calculations

Rates do more than simply recover costs. Within the legal framework and industry standards, properly designed rates should support and optimize a blend of various utility objectives, such as conservation, affordability for essential needs and revenue stability among other objectives. Rates may also act as a public information tool in communicating these objectives to customers.

4) Rate Adoption

Rate adoption is the last step of the rate-making process to comply with Proposition 218. Raftelis documented the rate study results in this Study Report to help educate the public about the proposed changes, the rationale and justifications behind the changes and their anticipated financial impacts in lay terms.

5. Cost of Service Analysis

The principles and methodology of a Cost of Service analysis were described in Section 4. This section explains the details of the Cost of Service analysis conducted by Raftelis for the City for its water provision services to customers.

A Cost of Service analysis distributes a utility's revenue requirement (costs) to each customer class and tier. After determining a utility's revenue requirement, the next step in a Cost of Service analysis is to functionalize its O&M costs to the following **functional categories**:

1. **Source of Supply**
2. **Pumping and Conveyance**
3. **Treatment**
4. **Transmission and Distribution (T&D)**
5. **Maximum Demand Plus Fire**
6. **Storage**
7. **Billing and Collection**
8. **Operations and Administration**
9. **Meters**
10. **Conservation**

The functionalization of costs allows us to better allocate the functionalized costs to cost causation components. The **cost causation components** used in this Study are:

1. **Customer Service:** Pertains to costs directly associated with serving customers, irrespective of the amount of water used, and generally include meter reading, bill generation, accounting, customer service, and collection expenses.
2. **Meter Capacity:** Maintenance and capital costs related to water meters and associated services. Costs incurred are generally proportional to the size of the water meter.
3. **Supply Cost:** costs related to the purchase of water from SCWA and production of groundwater from City wells.
4. **Conservation:** Costs associated with the City's water conservation efforts, which include general conservation efforts and no discharge flushing of water mains for water quality purposes.
5. **Base:** Costs that vary with the total quantity of water demanded within the water system under average conditions. Costs may include O&M expenses for: supply, treatment, pumping, transmission and distribution facilities, and capital costs related to plant investment, that are associated with serving customers at a constant, or average, annual rate of use. Base costs are therefore spread over all units of water equally.
6. **Max Day:** Different facilities, such as distribution and storage facilities, and the O&M costs associated with those facilities, are designed to meet the peak demands placed on the system by customers. Peaking costs include the O&M and capital costs associated with meeting peak customer demand in excess of the average annual rate of use or base use requirements. Peaking costs are separated into max day and max hour. Max day pertains to the maximum amount of water used in a single day in a year.
7. **Max Hour:** Peaking costs pertaining to the maximum usage experienced by the system in an hourlong period. Note that the maximum hour does not necessarily occur on the maximum usage day.
8. **Fire:** Costs associated with providing fire protection services.
9. **Elevation:** Costs associated with pumping water to customers in higher elevation zones.

5.1. Revenue Requirement Determination

Table 26 shows the revenue requirement derivation with the total revenue required from rates in FY 2019 shown in Column C, Line 19. The totals shown in Column C are the total O&M and capital revenue requirements that are to be allocated to the cost causation components. Raftelis calculated the revenue requirement using FY 2019 expenses, which include O&M expenses, rate funded capital expenses, and existing and proposed debt service. To arrive at the rate revenue requirement, we subtract revenue offsets from other expenses and adjust for annual cash balances (transfers to or from reserves). The adjustments are added to arrive at the total revenue requirement from rates. This is the amount that fixed charge and commodity rates are designed to collect.

Raftelis calculated the revenue requirement using Fiscal Year 2019 expenses, which include water purchases, other operating (O&M) expenses, debt service, and rate funded capital costs. The subtotal of Operating Revenue Requirements is shown in Column A, Line 7 and the sum of Capital Revenue Requirements is shown in Column B, Line 7. Total Revenue Requirements are shown in Column C, Line 7. To arrive at the “Total Rate Revenue Required” in Line 19, we subtract revenue from other sources, (Line 12), make adjustments for annual cash balances (Line 15, equal to Table 25 line 24 in FY 19), and adjust revenue from rates based on the effective date of the proposed rates (Line 16). Adjustments shown as negative values are subtracted (therefore added as a result of subtracting a negative number) to arrive at the total revenue required from rates in Column C, Line 19. This is the amount that Fixed Charges and Volumetric Charges are designed to collect in FY 2019. Note that this amount is the annualized amount of rate revenue shown in Table 25 for FY 2019; the revenue shown in column C Line 19 is the calculated revenue that the proposed revenue adjustment would generate assuming they are in place for the entire fiscal year. The revenue requirements assume adoption of the proposed new rates starting in September 2018 and a revenue adjustment to reflect funds collected at the current water rates until that time.

Table 26: FY 2019 Revenue Requirement Determination

Line	Description	Operating (A)	Capital (B)	Total (C)
1	Revenue Requirements			
2	Water Purchases	\$1,555,753		\$1,555,753
3	Other Operating	\$2,594,860		\$2,594,860
4	Current Debt Service		\$120,728	\$120,728
5	Proposed Debt Service		\$0	\$0
6	Rate Funded Capital		\$423,330	\$423,330
7	Total	\$4,150,613	\$544,058	\$4,694,670
8	Less: Revenue from Other Sources			
9	Non-Operating Revenues	\$55,781		\$55,781
10	Interest	\$25,794		\$25,794
11	Total	\$81,575	\$0	\$81,575
12	Less: Adjustments			
13	Adjustment for Cash Balance	-\$144,625		-\$144,625
14	Adjustment for Annualizing Rate Increase ¹¹	-\$26,967		-\$26,967
15	Total	-\$171,592	\$0	-\$171,592
16	Total Rate Revenue Required	\$4,240,629¹²	\$544,058	\$4,784,686

¹¹ The annualization of the rate increase is calculated by multiplying the number of months the rate increase *is not* in effect for in FY 2019 by the rate adjustment and by the total unadjusted rate revenue, divided by 12. It is the complement to the annualized rate increase in line 2 of Table 25.

¹² The totals in this table are rounded.

5.2. Functionalization of O&M Expenses

With assistance and input from City staff, Raftelis functionalized the water utility’s projected O&M budget for FY 2019 on a line item basis. Each line item was assigned to one of the functional categories listed at the beginning of Section 5. Table 27 shows a summary of the functionalization of the City’s O&M expenses. Functionalizing O&M expenses allows Raftelis to follow the principles of rate-setting theory in which the end goal is to allocate the City’s O&M expenses to cost causation components.

“Maximum Demand Plus Fire” accounts for the costs the utility incurs to comply with a legal mandate to provide fire flows. Fire flows are the capacity of a water utility to provide water at the volumes and pressures needed to fight fires. These range from storage to transmission to distribution and are a fundamental design characteristic of the City’s – and all other – water utility.

Table 27: FY 2019 O&M Expenses by Functional Category

Functional Category	O&M Expenses by Function (\$)	O&M Expenses by Function (%)
Source of Supply ¹³	\$1,555,753	37.5%
Pumping and Conveyance	\$40,000	1.0%
Transmission and Distribution	\$221,598	5.3%
Maximum Demand Plus Fire	\$113,940	2.7%
Operations and Administration	\$2,114,322	50.9%
Conservation	\$105,000	2.5%
Total O&M (FY 2019)	\$4,150,613	100%

5.3. Allocation of O&M Expenses to Cost Causation Components

After functionalizing expenses, the next step is to allocate the functionalized expenses to cost causation components. To do so, we must identify system-wide peaking factors, which are shown in Table 28. Peaking factors represent the ratio of water moving through the system during the maximum day and maximum hour of water use relative to the water use during an average day within a year.

The system-wide peaking factors are used to derive the allocation bases (i.e., percentages) for the following cost causation components: Base, Max Day, Max Hour, and Fire. Raftelis utilized max day and max hour factors provided in the City’s most recent Water Master Plan. These factors are provided in Section 6.1, 6.2 and 7.1 of the City’s Water Master Plan in terms of million gallons per day (MGD). Per the WMP, the average flow amount is 2.08 MGD, the maximum day flow amount is 4.16 MGD and the maximum hour flow amount is 6.24 MGD. The Max Hour Plus Fire factor assumes the Max Hour capacity and adds 2,000 gallons per minute for fire needs.

To understand the interpretation of the percentages shown in Columns B-E of Table 28, we must first establish the base use equal to the average daily demand during the year, which is assigned a factor of 1.00. The base factor in Line 1 is used to determine the allocation basis for the Treatment functional category.

¹³ This cost is solely SCWA Cost.

The Maximum Day factor in Line 2 attributes 50 percent (1.00/2.00) of the demand (and therefore costs) to Base (average daily demand) use and the remaining 50 percent (1.00/2.00) goes to Max Day (peaking) use.

For the Maximum Hour factor (used to allocate Transmission and Distribution expenses to the cost causation component), expenses are allocated 33.33 percent (1.00/3.00) to Base, 33.33 percent (1.00/3.00) to Max Day, and the remaining proportion (100%-33.33%-33.33%, or, (3.00-1.00-1.00)/3.00) of costs to the Max Hour cost causation component.

For the Max Hour Plus Fire factor (used to allocate Maximum Demand Plus Fire expenses to the cost causation components), expenses are allocated 22.81 percent to Base (1.00/4.38), 22.81 percent to Max Day [(2.00-1.00)/4.38], 22.81 to Max Hour [(3.00-2.00)/4.38], and the remaining proportion (100%-22.81%-22.81%-22.81%) to the Fire cost causation component.

Table 28: System-Wide Peaking Factors and Allocation to Cost Causation Components

Line	Factor	System-Wide Factor in MGD (A)	Base (B)	Max Day (C)	Max Hour (D)	Fire (E)	Total (F)
1	Base (Average Day)	2.08	100.00%				100.00%
2	Maximum Day	4.16	50.00%	50.00%			100.00%
3	Maximum Hour	6.24	33.33%	33.33%	33.33%		100.00%
4	Max Hour Plus Fire	9.12	22.81%	22.81%	22.81%	31.58%	100.00%

Table 29 on the next page shows the allocation basis for the water utility’s O&M costs. The top row of Table 29 shows the cost causation components and Column A shows O&M expenses by functional category (from Table 27). Allocation bases for the Treatment, Storage (to be used in capital allocation), Transmission and Distribution, and Maximum Demand Plus Fire functional categories are provided in Lines 1-4 of Table 28 respectively. For example, Transmission and Distribution infrastructure has to be sized for maximum hour demands, so Transmission and Distribution costs are associated with maximum hour. All other functional categories were allocated to cost causation components by Raftelis based on industry norms and input from City staff.

Lines 1-6 in Table 29 show the allocation bases for each cost causation component in percentages. These percentages are then multiplied by the total O&M for each functional category (Column A, Lines 1-6) to determine the dollar amount to be allocated to each cost causation component in Columns B-J. For example, the \$1,555,753 in Source of Supply Costs to be allocated to the Supply Cost cost causation component (Column D, Line 7) is determined by multiplying Column D, Line 1 by Column A, Line 1. This is repeated for each functional category and cost causation component. Columns B-J in Line 13 show the allocation of the O&M revenue requirement to each cost causation component.

Table 29: Allocation of Functionalized O&M Expenses to Cost Causation Components

Line	Functional Category	O&M Expenses (A)	Customer Service (B)	Meter Capacity (C)	Supply Cost (D)	Conservation (E)	Base (F)	Max Day (G)	Max Hour (H)	Fire (I)	Elevation (J)	Total (K)
O&M Allocation by Cost Causation Component (%)												
1	Source of Supply	\$1,555,753			100.00%							100.00%
2	Pumping and Conveyance	\$40,000			77.84%						22.16%	100.00%
3	Transmission & Distribution	\$221,598					33.33%	33.33%	33.33%			100.00%
4	Maximum Demand Plus Fire	\$113,940					22.81%	22.81%	22.81%	31.58%		100.00%
5	Operations and Administration	\$2,114,322	20.00%	40.00%			40.00%					100.00%
6	Conservation	\$105,000				100.00%						100.00%
O&M Allocation by Cost Causation Component (\$)												
7	Source of Supply				\$1,555,753							\$1,555,753
8	Pumping and Conveyance				\$31,870						\$8,864	\$40,000
9	Transmission & Distribution						\$73,866	\$73,866	\$73,866			\$221,598
10	Maximum Demand Plus Fire						\$25,986	\$25,986	\$25,986	\$35,981		\$113,940
11	Operations and Administration		\$424,864	\$849,729			\$849,729					\$2,114,322
12	Conservation					\$105,000						\$105,000
13	Total	\$4,150,613	\$422,864	\$845,729	\$1,586,888	\$105,000	\$945,581	\$99,852	\$99,852	\$35,981	\$8,864	

5.4. Functionalization of Assets

Capital costs are allocated on the basis of the assets of the system in recognition of the fact that the assets need to be replaced over time and that capital expenses will over time generally match the overall asset base. This distribution of costs allows the allocation of capital expenses to the cost causation components previously defined in this section. Raftelis was provided an asset list for the City’s water utility for FY 2016. Raftelis assigned each listed asset to a functional category, and calculated the value of each asset using the Replacement Cost Less Depreciation (RCLD) valuation method. Table 30 shows a summary of water utility assets by functional category. The percentages shown provide the basis of allocating capital expenses to the various cost causation components.

Table 30: Current Asset Value by Functional Category

Assets by Functional Category	Asset Value (RCLD)	% of Total Assets
Source of Supply	\$288,336	1.33%
Transmission and Distribution	\$13,305,712	61.5%
Storage	\$4,662,981	21.6%
Meters	\$199,014	0.92%
Operation and Administration	\$3,177,768	14.69%
Total	\$21,633,812	100.00%

5.5. Allocation of Capital Expenses to Cost Causation Components

As shown in Column B, Line 7 of Table 26, the capital revenue requirement in FY 2019 equals \$544,058. This is comprised of \$120,728 of current debt service and \$423,330 in rate funded capital expenditures. Table 31 shows the allocation of capital expenses to the cost causation components. Note that the functional categories and cost causation components for both O&M and capital expenses are identical. However, functional categories with no line item expenses or assets assigned are omitted from tables in this section. Lines 1-5 in Table 31 show the allocation bases to each cost causation component in Columns B-J for the five functional categories of which functionalized assets have been assigned to. Column A in Lines 1-5 shows the percent of total assets for the five functional categories, which were shown in Table 30.

Lines 6-10 in Table 31 show the allocation basis of each functional category by cost causation component as a percentage of total asset value. This takes into account the asset distribution by functional category that was determined in Table 30. The percentages shown in Columns B-J, Lines 6-10 in Table 31 are calculated by multiplying the corresponding percentage from Columns B-J, Lines 1-4 by the corresponding functional category share of total assets values from Column A, Lines 1-4. For example, Column D, Line 5 is calculated by multiplying Column D, Line 1 by Column A, Line 1. Line 9 is simply the sum of Lines 6-10, and represents the total capital allocation percentage for each cost causation component.

Lines 10-11 show the allocation of capital expenses from current debt service and rate funded CIP to the cost causation components. This is determined for each cost causation component by multiplying the dollar amount in Column A, Lines 10-11 by the corresponding total allocation percentage in Line 9. For example, the \$3,547 in current debt service allocated to Customer Service is calculated by multiplying total current debt service (Column A, Line 12) by the total allocation percentage for the Customer Service cost causation component (Column B, Line 11). Line 14 shows the allocation of total capital expenses to each cost causation component. Line 14 is simply the sum of Lines 12-13.

Table 31: Allocation of Capital Expenses to Cost Causation Components

Line	Functional Category	% of Assets (A)	Customer Service (B)	Meter Capacity (C)	Supply Cost (D)	Conservation (E)	Base (F)	Max Day (G)	Max Hour (H)	Fire (I)	Elevation (J)
Allocation of Functional Categories to Cost Causation Components											
1	Source of Supply	1.33%			100.00%						
2	Transmission & Distribution	61.50%					33.33%	33.33%	33.33%		
3	Storage	21.55%					50.00%	50.00%			
4	Meters	0.92%		100.00%							
5	Operations and Administration	14.69%	20.00%	40.00%			40.00%				
Allocation of Capital Expenses to Cost Causation Components (%)											
6	Source of Supply				1.33%						
7	Transmission & Distribution						20.50%	20.50%	20.50%		
8	Storage						10.78%	10.78%			
9	Meters			0.92%							
10	Operations and Administration		2.94%	5.88%			5.88%				
11	Total		2.94%	6.80%	1.33%	0.00%	37.15%	31.28%	20.50%	0.00%	0.00%
Allocation of Capital Expenses to Cost Causation Components (\$)											
Line	Description	Capital Expense	Customer Service	Meter Capacity	Supply Cost	Conservation	Base	Max Day	Max Hour	Fire	Elevation
12	Current Debt Service	\$120,728	\$3,547	\$8,204	\$1,609	\$0	\$44,855	\$37,762	\$24,751	\$0	\$0
13	Rate Funded Capital	\$423,330	\$12,437	\$28,767	\$5,642	\$0	\$157,284	\$132,411	\$86,789	\$0	\$0
14	Total	\$544,058	\$15,983	\$36,971	\$7,251	\$0	\$202,139	\$170,173	\$111,539	\$0	\$0

5.6. Revenue Offsets and Adjustments

The final step of the Cost of Service analysis adds revenue offsets and adjustments previously outlined in Table 26 to the Operating Revenue Requirement (Table 29, Line 13) and the Capital Revenue Requirement (Table 31, Line 14) to yield the total Cost of Service shown in Line 7 of Table 32. Note that the total Cost of Service in Column J, Line 7 is the same as the revenue requirement shown in Column C, Line 19 of Table 26.

As shown in Line 3 of Table 32, all revenue offsets (from Column C, Line 12 in Table 26) are applied to the Supply Cost cost causation component. Lines 4 is the sum of Lines 1-3, and shows the allocation of costs to cost causation components prior to the incorporation of adjustments. Line 5 shows cost allocations to each cost causation component as a percentage of the total (Column J, Line 4). For example, Column A, Line 5 is calculated by dividing Column A, Line 4 by Column J, Line 4. The percentages calculated in Line 5 are then used to allocate the total adjustments in Column J, Line 6 (from Column C, Line 17 Table 26) proportionally to each cost causation component in Columns A-I. For example, Column A, Line 6 is calculated by multiplying Column A, Line 5 by Column J, Line 6. The total adjusted Cost of Service allocation to each cost causation component is finally determined by summing Lines 4 and 6, and is shown in Line 7.

The total adjusted Cost of Service in FY 2019 is \$4,784,686 (Column J, Line 7). This represents the amount that must be recovered by the City's Fixed Charges and Volumetric charges in FY 2019. The adjusted Cost of Service allocations to each cost causation components are used to calculate the FY 2019 proposed water rates for the City's Fixed Charges and Volumetric Charges in Section 6

Table 32: Total Adjusted Cost of Service Calculation

Line	Description	Customer Service (A)	Meter Capacity (B)	Supply Cost (C)	Conservation (D)	Base (E)	Max Day (F)	Max Hour (G)	Fire (H)	Elevation (I)	Total (J)
1	Operating Revenue Requirement	\$422,864	\$845,729	\$1,586,888	\$105,000	\$945,581	\$99,852	\$99,852	\$35,981	\$8,864	\$4,150,613
2	Capital Revenue Requirement	\$15,983	\$36,971	\$7,251	\$0	\$202,139	\$170,173	\$111,539	\$0	\$0	\$544,058
3	Revenue Offsets			-\$81,575							-\$81,575
4	Total Prior to Adjustment	\$438,848	\$882,700	\$1,512,564	\$105,000	\$1,147,720	\$270,025	\$211,392	\$35,981	\$8,864	\$4,613,095
5	Percentage of Total	9.51%	19.13%	32.79%	2.28%	24.88%	5.85%	4.58%	0.78%	0.19%	
6	Adjustments	\$16,324	\$32,833	\$56,262	\$3,906	\$42,691	\$10,044	\$7,863	\$1,338	\$330	\$171,592
7	Total COS	\$455,171	\$915,534	\$1,568,826	\$108,906	\$1,190,412	\$280,069	\$219,255	\$37,319	\$9,194	\$4,784,686

6. Rate Design and Derivation

Rate design is the process by which the cost causation components derived in Line 7 of Table 32 are converted into rates and charges that recover those costs. These rates are designed to recover the total cost of service as shown in row 7 column J of Table 32. The total in that cell is 3.5 percent greater than the revenue from water service charges shown in the FY 2019 column of line 1 of Table 25. The rates, therefore, are designed to recover 3.5 percent more revenue as a whole rather than 3.5 percent more in each category of rates. The revenue increases for subsequent years, FY 2020 – FY 2023, are projected to be 7.5 percent per year as shown in the Financial Plan displayed in Table 24. This total will be verified in the revenue proof in the Appendix.

6.1. Proposed Rate Structure

The proposed rate structure retains the two main existing charges assessed by the City for water service: 1) the Fixed Charge assessed monthly based on meter size, and 2) the Volumetric Charge assessed per kgal of water consumed per month. The Fixed Charge is designed to primarily recover costs that are relatively fixed, such as customer service costs and system capacity costs associated with peak water use events. The Volumetric Charge is designed to primarily recover the variable costs associated with operating the water utility, such as the cost of supplying water from SCWA.

The City currently charges higher water rates to customers located outside of city limits. This charge pattern will be discontinued. However, the City proposes to implement a new Elevation Charge to recover the cost of pumping water to customers residing in a higher elevation zone (Zone 2). This change will more effectively charge customers in proportion to the cost incurred by the City to provide water service in the higher elevation areas of the water service area.

No substantial changes to the structure of the Fixed Charge are proposed in this Study, with the exception of no longer charging different Inside City and Outside City rates. With regards to the Volumetric Charge, the City proposes to make some modifications to the current rate structure. This includes reducing the number of tiers within the SFR Volumetric Charge rate structure from four tiers to three tiers. Tier widths (i.e. the ranges of water consumption in kgal per month to be charged at each tiered rate) for SFR customers were also updated to reflect reduction from four to three tiers. Additionally, the City proposes to assess MFR and Commercial customers the Volumetric Charge based on a uniform dollar per kgal rate rather than based on the current three-tiered rate structures.

The first residential tier was sized as a result of analysis of the City's low-income housing water usage. Raftelis' analysis showed that low income housing accounts averaged two units (kgal) of water use per month. The City set the tier break at two thousand gallons to provide the least expensive water to those accounts in these housing units, guaranteeing that their average use would be met by the lowest cost water. The second residential tier is set to the average use of all residential accounts, which is seven thousand gallons per month. The second tier will allow customers to meet most needs with the next least cost water. The third tier and highest priced water will meet all demand beyond the second tier.

MFR and Commercial customers have different usage patterns that can differ significantly based on number of residents (for MFR) or type of business (for commercial). Sizing tiers for such different usages can be difficult to provide a rationale for under more recent Proposition 218 guidelines, so this study eliminated the current tier structure. A uniform Volumetric Charge rate means that all monthly water use is billed at the same dollar per kgal

rate. These simplifications of the Volumetric Charge rate structure for MFR and Commercial customers are intended to increase revenue stability and improve customer understanding of how monthly bills are determined. Proposed changes to the Volumetric Charge rate structure are illustrated in Table 33.

Table 33: Proposed Changes to the Volumetric Charge Rate Structure

Class/Tier	Current Rate Structure & Tier Width	Proposed Rate Structure & Tier Width	Percent of Accounts in Class
SFR	4 TIERS	3 TIERS	76.3%
Tier 1	1 to 6 kgal	1 to 2 kgal	
Tier 2	7 to 12 kgal	2 to 7 kgal	
Tier 3	13 to 18 kgal	>7 kgal	
Tier 4	>18 kgal	N/A	
MFR	3 TIERS	UNIFORM	10.3%
Tier 1	1 to 26 kgal	N/A	
Tier 2	27 to 78 kgal	N/A	
Tier 3	>78 kgal	N/A	
Commercial	UNIFORM	UNIFORM	6.8%
Tier 1	1 to 25 kgal	N/A	
Tier 2	26 to 61 kgal	N/A	
Tier 3	>61 kgal	N/A	
Other Uniform	UNIFORM	UNIFORM	
Municipal	N/A	N/A	1.4%
Irrigation	N/A	N/A	1.9%
Fire & Hydrant	N/A	N/A	3.3%

6.2. Proposed Fixed Charges

6.2.1. Proposed Fire Line Fixed Charges

The proposed Fire Line Fixed Charges are designed to recover the private fire costs associated with the Fire cost causation component (shown in Column H, Line 7 of Table 32). Note that there are both private fire costs and public fire costs. The public fire cost portion will be added to the Meter Capacity cost component and recovered on monthly fixed charges. Raftelis allocated this fire protection revenue requirement to the five different private fire line meter sizes and the public fire meters using a fire demand factor. Note that the City has 476 public fire hydrants each with a 4” and 2.5” port. These hydrants were treated as 4” meters for the purposes of calculating the public fire costs. The fire demand factor was calculated by using the following equation:

$$\text{Fire Demand Factor} = (\text{meter size in inches})^{2.63}$$

Fire Demand Factor is estimated using the Hazen-Williams formula for flow through pressure conduits. This factor is estimated by raising the nominal size of the conduit to the 2.63rd power. Using this demand factor estimates each fire line’s potential draw on the system.¹⁴

The calculated fire demand factor for each meter size is shown in Column B of Table 34. Total monthly fire line demand units by meter size was then determined in Column D by multiplying the fire demand factor in Column B by the number of fire line meters in Column C. This was then annualized in Column E by multiplying Column D by twelve months to determine annual fire line demand units for each meter size. The allocation of total fire protection costs to each meter size was determined in Column F by dividing the total demand units for each meter size in Column D by 32,113 total demand units (sum of Lines 1-8 in Column D). Fire protection costs allocated to each meter size are shown in Column G, and are calculated by multiplying the allocation percentage for each meter size by the total fire protection revenue requirement of \$37,319 (from Column H, Line 7 in Table 32). Total Public Fire Protection costs were subtracted from the Fire Protection Cost component, and will be collected by the meter service charge component of the Monthly Fixed Charge. The proposed FY 2019 Fire Line Fixed Charges are then shown in Column H of Table 34, and were determined by dividing the fire protection costs allocated to each fire line meter size in Column G by the number of fire lines of each meter size in Column C.

Table 34: Derivation of FY 2019 Fire Line Fixed Charge

Line	Meter Size	Fire Demand Factor	Number of Meters	Total Demand Units	Annual Demand Units	Percent Allocation	Fire Protection Costs	Proposed Charge	Current Inside City Charge
	(A)	(B)	(C)	(D)	(E)	(F)	(G)	(H)	(I)
	Notes:	= A ^ 2.63	Table 12	= B x C	= D x 12 months	= D / 385,362 units	= F x \$37,319	= G / C / 12 months	Table 11
1	Public								
2	4"	38.32	476	18,240	218,880	57%	\$21,197		
3	Private								
4	2"	6.19	12	74	891	0%	\$86	\$0.60	\$6.97
5	4"	38.32	65	2,491	29,889	8%	\$2,895	\$3.69	\$13.92
6	6"	111.31	56	6,233	74,801	19%	\$7,244	\$10.78	\$27.85
7	8"	237.21	16	3,795	45,544	12%	\$4,411	\$22.97	\$41.77
8	10"	426.58	3	1,280	15,357	4%	\$1,487	\$41.31	\$55.69

Table 35 shows the current Fire Line Fixed Charges and proposed Fire Line Fixed Charges for FY 2019 through FY 2023. The FY 2019 charge was determined in Column H of Table 34. These charges are increased in each subsequent year by the revenue adjustments shown in Table 24, and rounded up to the nearest cent. This methodology represents a departure from previous Fire Line calculation methodology which simply charged 17% of the corresponding water service meter charge.

¹⁴ American Water Works Association Manual of Water Supply Practice, M1 Seventh Edition, Principles of Water Rates, Fees, and Charges 7th Edition, 2017, 163

Table 35: Proposed Fire Line Fixed Charges through FY 2023

Meter Size	Current	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<i>Notes:</i>	<i>Table 10</i>	<i>Table 34</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>
2"	\$6.97	\$0.60	\$0.65	\$0.70	\$0.76	\$0.82
4"	\$13.92	\$3.72	\$4.00	\$4.30	\$4.63	\$4.98
6"	\$27.85	\$10.78	\$11.59	\$12.46	\$13.40	\$14.41
8"	\$41.77	\$22.98	\$24.71	\$26.57	\$28.57	\$30.72
10"	\$55.69	\$41.32	\$44.42	\$47.76	\$51.35	\$55.21

6.2.2. Proposed Monthly Service Charges

The proposed Monthly Service Charges are designed to recover the total amounts associated with the Customer Service and Meter Capacity cost causation components (shown in Columns A and B in Line 7 of Table 32), as well as the Public Fire Protection cost component. To calculate the Monthly Service charges, the proper denominator by which to divide the Customer Service and Meter Capacity revenue requirements must be determined. The Customer Service revenue requirement is allocated evenly to all accounts, as these costs are not related to meter size. However, the Meter Capacity revenue requirement pertains to fixed costs necessary to maintain a water system capable of operating under peak capacity conditions. As larger meter sizes have greater flow capacity, Equivalent Meter Units (EMUs) are used to allocate the Meter Capacity revenue requirement proportionally based on the flow capacity of each meter.

Table 36 shows the determination of total EMUs. Total meters in FY 2019 shown in Column A were determined previously in Table 12. Rated capacity in Column B shows the safe flow capacity of each meter size in gallons per minute (gpm). Rated capacity values are from the AWWA M1 Manual and are considered industry standard. EMU ratios shown in Column C are calculated using a 1-inch meter size as the base. Smaller meter sizes (5/8-inch and 3/4-inch) are assigned a ratio of 1 equal to that of the 1-inch base meter based on City policy.¹⁵ All other EMU ratios are determined by dividing the rated capacity for the meter size in question by the rated capacity of the 1-inch base meter. For example, the EMU ratio of 3.2 for 2-inch meters (Column C, Line 5) is determined by dividing 160 gpm (Column B, Line 5) by 50 gpm (Column B, Line 3). Total EMUs in Column D are then determined by multiplying total meters (Column A) by the EMU ratio (Column C) for each meter size in Lines 1-8. Total meters and EMUs in Line 9 are the sum of Lines 1-8. The annual total in Line 10 is simply Line 9 multiplied by twelve monthly billing periods per year to determine the units of service by which to divide the FY 2019 Customer Service and Meter Capacity revenue requirements.

¹⁵ 1" meters are the City's second most common meter size after 3/4" meters. California law currently requires new construction install 1" minimum meters for fire protection requirements. Often residential meters are upsized for this reason alone, not for additional demand reasons.

Table 36: Monthly Service Charge Units of Service

Line	Meter Size	Total Meters (A)	Rated Capacity (B)	EMU Ratio (C)	Total EMUs (D=A x C)
1	5/8"	282	20 gpm	1	282
2	3/4"	2,862	30 gpm	1	2862
3	1"	1,317	50 gpm	1	1317
4	1 1/2"	143	100 gpm	2	286
5	2"	94	160 gpm	3.2	300.8
6	3"	23	320 gpm	6.4	147.2
7	4"	7	500 gpm	10	70
8	6"	1	1000 gpm	20	20
9	Total	4,729			5,285
10	Annual Total	56,748			63,420

Table 37 shows the determination of unit costs for the Customer Service and Meter Capacity, and Public Fire Cost cost causation components, which are used to determine the proposed Monthly Service Charges. The unit costs are calculated by dividing the revenue requirement for each cost causation component in Table 32 by the units of service in Table 36. Unit costs are rounded to the nearest cent.

Table 37: Monthly Service Charge Unit Costs

Line	Description	Total	Source
1	Customer Service Cost	\$455,171	Table 32 (Column A, Line 7)
2	Total Annual Bills	56,748	Table 36 (Column A, Line 10)
3	Customer Service Unit Cost per Monthly Bill	\$8.02	Line 1 / Line 2
4	Meter Capacity Cost	\$915,534	Table 32 (Column B, Line 7)
5	Public Fire Cost	\$21,197	Table 34 (Column G Line 2)
6	Total to be Recovered	\$936,731	Line 4 + Line 5
7	Total Annual EMUs	63,420	Table 36 (Column D, Line 10)
8	Meter Capacity Unit Cost per Monthly EDU	\$14.77	Line 6 / Line 7

Table 38 shows the determination of the proposed Monthly Service Charges by meter size for FY 2019. The Meter Capacity cost by meter size in Column C is determined by multiplying the Meter Capacity unit cost by the EMU ratios previously shown in Table 36. The total proposed Monthly Service Charge by meter size for FY 2019 in Column E is determined by summing the Meter Capacity and Customer Service costs in Columns C and D. Column G shows the dollar difference between proposed FY 2019 and current Monthly Service Charges by meter size.

Table 38: Derivation of FY 2019 Monthly Service Charge

Meter Size	EMU Ratio	Meter Capacity Unit Cost	Meter Capacity Cost	Customer Service Cost	Proposed Charge	Current Inside City Charge	Difference
	(A)	(B)	(C)	(D)	(E)	(F)	(G)
Source:	Table 36	Table 37	$A \times B$	Table 37	$C + D$	Table 7	$E - F$
5/8"	1	\$14.77	\$14.77	\$8.02	\$22.80	\$20.28	\$2.52
3/4"	1	\$14.77	\$14.77	\$8.02	\$22.80	\$20.28	\$2.52
1"	1	\$14.77	\$14.77	\$8.02	\$22.80	\$20.28	\$2.52
1 1/2"	2	\$14.77	\$29.54	\$8.02	\$37.57	\$30.94	\$6.63
2"	3.2	\$14.77	\$47.26	\$8.02	\$55.29	\$38.67	\$16.62
3"	6.4	\$14.77	\$94.53	\$8.02	\$102.56	\$58.01	\$44.55
4"	10	\$14.77	\$147.70	\$8.02	\$155.73	\$96.68	\$59.05
6"	20	\$14.77	\$295.41	\$8.02	\$303.43	\$154.82	\$148.61

Table 39 shows the current Monthly Service Charge and proposed Monthly Service Charges for FY 2019 through FY 2023. The Monthly Service charge in FY 2019 was determined in Column E of Table 38. These charges are increased in each subsequent year by the revenue adjustments shown in Table 24, and rounded up to the nearest cent.

Table 39: Proposed Monthly Service Charges through FY 2023

Meter Size	Current	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Notes:	Table 11	Table 38	7.5% Adjustment	7.5% Adjustment	7.5% Adjustment	7.5% Adjustment
5/8"	\$20.28	\$22.80	\$24.51	\$26.35	\$28.33	\$30.46
3/4"	\$20.28	\$22.80	\$24.51	\$26.35	\$28.33	\$30.46
1"	\$20.28	\$22.80	\$24.51	\$26.35	\$28.33	\$30.46
1 1/2"	\$30.94	\$37.57	\$40.39	\$43.42	\$46.68	\$50.19
2"	\$38.67	\$55.29	\$59.44	\$63.90	\$68.70	\$73.86
3"	\$58.01	\$102.56	\$110.26	\$118.53	\$127.42	\$136.98
4"	\$96.68	\$155.73	\$167.41	\$179.97	\$193.47	\$207.99
6"	\$154.82	\$303.43	\$326.19	\$350.66	\$376.96	\$405.24

6.3. Proposed Volumetric Charge Rates

The following subsection describes the derivation of Volumetric Charge rates for each customer class and tier. As previously discussed in Section 6.1, the proposed changes to the rate structure include the reduction from four tiers to three tiers for SFR customers and moving to a uniform Volumetric Charge rate for MFR and Commercial customers. The proposed Volumetric Charge rates shown in this subsection reflect these proposed changes to the rate structure.

The Volumetric Charges are designed to recover the revenue requirements for the following cost causation components, **Supply Cost**, **Base**, Max Day and Max Hour (collectively referred to as **Peaking**), and **Conservation**.

These four cost causation components generally vary with the amount of water used, and are therefore allocated to be recovered by the dollar per kgal Volumetric Charges. The revenue requirement in FY 2019 for each is shown in Line 7 of Table 32. Note that the Peaking revenue requirement is the sum of the Max Day and Max Hour revenue requirements. Units of service (of which each individual cost causation component revenue requirement is divided by) must be determined for each of the four cost causation components in order to develop unit costs. The remainder of this subsection details the derivation of unit costs for each cost causation component by customer class and tier, and then sums the unit costs of the four cost causation components to determine the proposed Volumetric Charge rates.

Supply Cost Unit Cost

The Supply Cost cost causation component pertains to some costs associated with supplying water from the City’s wells and all costs associated with purchasing water from SCWA. For customer classes with uniform proposed Volumetric Charge rates (MFR, Commercial, Municipal, Irrigation, and Fire & Hydrant), the Supply Cost revenue requirement is spread evenly across all units of water consumed. This is simply calculated by dividing the Supply Cost revenue requirement (Column C, Line 7 in Table 32) by total projected water sales in FY 2019 (from Table 15).

Table 40: Supply Cost Unit Cost for Uniform Rates

Line	Description	Total	Source/Notes
1	Total Supply Cost	\$1,568,826	Table 32 (Column C, Line 7)
2	Projected Total Water Usage in FY 2019 (kgal)	547,369	Table 15
3	FY 2019 Water Supply Cost for Uniform Rates (\$/kgal)	\$2.87	Line 1 / Line 2

The Supply Cost unit cost varies by tier for SFR customers, who will be assessed the Volumetric Charge based on three tiers under the proposed rate structure. This is because greater water supply expenses are incurred when less essential water use requires the City to purchase greater quantities of relatively more expensive water from SCWA. As Tier 1 is designed to apply to essential water usage, it is appropriate that Tier 2 and Tier 3 is allocated a greater proportion of cost recovery of expenses related to the purchase of SCWA water. Therefore, the costs of relatively less expensive water supplied from the City’s wells is allocated preferentially to SFR Tier 1 customers.

Table 41 shows the determination of per kgal supply costs for water from the City’s wells and from SCWA. This must be determined in order to calculate a weighted average supply unit cost for each SFR tier. Table 41 determines the share of water supply obtained from less expensive groundwater from City wells in Line 4. This percentage is multiplied by total projected FY 2019 SFR usage in Line 5 to determine the amount of groundwater allocated to SFR customers. The Source/Notes column in Lines 8-15 of Table 41 provides a description of the determination of SCWA and City groundwater unit supply costs in Lines 16 and 17 respectively.

Table 41: Groundwater and SCWA Unit Costs

Line	Description	Total	Source/Notes
1	SCWA Purchased Water	1,554 AF	Table 18
2	Well/Groundwater	238 AF	Table 18
3	Total Purchased/Acquired Water	1,792 AF	Line 1 + Line 2
4	Groundwater as percent of total	13.28%	Line 2 / Line 3
5	SFR Usage	276,957 kgals	Table 15
6	Groundwater to Meet SFR Demand	36,781 kgals	Line 5 x Line 4
7	SCWA to Meet SFR Demand	240,176 kgals	Line 5 – Line 6
8	Total Supply Cost	\$1,568,826	Table 32 (Column C, Line 7)
9	Total Consumption	547,369 kgals	Table 15
10	Consumption met by Groundwater	72,693 kgals	Line 4 x Line 9
11	Consumption met by SCWA Import	474,676 kgals	Line 9 – Line 10
12	SCWA Portion of Supply Cost	98%	In Column D of Table 29: (Line 7 / Line 13)
13	Groundwater Portion of Supply Cost	2%	In Column D of Table 29: (Line 8 / Line 13)
14	SCWA Cost	\$1,538,045	Line 8 x Line 12
15	Groundwater Cost	\$30,781	Line 8 x Line 13
16	SCWA Import Cost (\$/kgal)	\$3.24	Line 14 / Line 11
17	Groundwater Cost (\$/kgal)	\$0.42	Line 15/ Line 10

Table 42 shows the amount of projected FY 2019 SFR water supplies provided by each source of supply. Raftelis analyzed FY 2017 water use data to determine the percentages of SFR projected usage in each proposed tier (Column A).¹⁶ These percentages were multiplied by total projected SFR usage in FY 2019 (Line 5 of Table 41) to determine FY 2019 usage within each tier (Column B). Column C, Line 1 shows that all of the City groundwater supply available to serve SFR customers (Line 6 of Table 41) is allocated to Tier 1. Because Tier 1 represents essential use, it is appropriate to allocate the less expensive supply costs preferentially to Tier 1. Column D, Line 1 shows the remaining SFR Tier 1 supply required from SCWA in FY 2019. Lines 2 and 3 demonstrate that all Tier 2 and 3 demand is assumed to be met by SCWA supplies in FY 2019.

Table 42: SFR Usage by Tier and Source of Supply

Line	Tier	% in Tier (A)	Use in Tier (B)	Groundwater Use in Tier (C)	SCWA Use in Tier (D)
1	Tier 1	27%	73,731 kgals	36,781 kgals	36,950 kgals
2	Tier 2	38%	104,259 kgals	0 kgals	104,259 kgals
3	Tier 3	36%	98,966 kgals	0 kgals	98,966 kgals

Table 43 shows the final determination of Supply Cost units cost for SFR Tiers 1 through 3. Column A is determined by dividing Column C in Table 42 by Column B in Table 42. Column B is determined by dividing Column D in

¹⁶ Usage in new tiers was projected by applying the proposed tier breaks to FY 2017 residential usage data. The percentage of usage in each proposed tier was then multiplied by projected FY 2019 usage to estimate projected tier usage in FY 2019.

Table 42 by Column B in Table 42. Unit supply costs shown in Columns C and D were determined in Lines 16-17 of Table 41. A weighted average is used to determine the final SFR Supply unit costs in Column E.

Table 43: Supply Cost Unit Cost for SFR Tiered Rates

Line	Tier	% Met by Groundwater (A)	% Met by SCWA (B)	Groundwater Cost (C)	SCWA Cost (D)	Unit Cost (E = [A x C] + [B x D])
1	Tier 1	50%	50%	\$0.42	\$3.24	\$1.84
2	Tier 2	0%	100%	\$0.42	\$3.24	\$3.24
3	Tier 3	0%	100%	\$0.42	\$3.24	\$3.24

Base Unit Cost

The Base cost causation component pertains to the costs to treat and deliver water under average daily demand conditions. By dividing Base costs by projected annual usage in FY 2019 (from Table 15), the cost to provide water delivery under average conditions is determined. The calculated Base unit cost calculation is presented in Table 50. Since the Base cost causation component is designed to recover costs incurred to meet average daily demands, the Base unit cost is uniform for all units of water regardless of customer class or tier.

Table 44: Derivation of Base Unit Cost

Line	Description	Total	Source/Notes
1	Total Base Cost	\$1,190,412	Table 32 (Column E, Line 7)
2	Projected Total Water Usage in FY 2019	547,369	Table 15
3	FY 2019 Base Unit Cost (\$/kgal)	\$2.13	Line 1 / Line 2

Peaking Unit Cost

The Peaking cost causation component is designed to recover costs incurred to meet customer peak demands in excess of average daily demand. Total Peaking costs are comprised of Max Day and Max Hour costs. The peaking costs are distributed to each tier using peaking factors derived for each class and tier.

Table 45 shows the determination of peaking factors for each customer class and tier. Each peaking factor represents the ratio of maximum monthly usage in a given year to average monthly usage in that year. Raftelis conducted a peaking analysis of FY 2017 water use data to calculate the average and maximum monthly use values shown in Columns A and B.

Table 45: Determination of Peaking Factors

Customer Class & Tier	FY 2016 Average Monthly Use (kgal) (A)	FY 2016 Max Monthly Use (kgal) (B)	Peaking Factor (C = B / A)
SFR Tier 1	6,095	6,368	1.04
SFR Tier 2	8,618	12,406	1.44
SFR Tier 3	8,181	19,474	2.38
MFR	8,962	13,458	1.50
Commercial	6,872	8,585	1.25
Municipal	3,553	5,348	1.51
Irrigation	2,914	6,006	2.06
Fire & Hydrant	52	221	4.26
Total	45,247	71,864	1.59

Table 46 shows the derivation of Peaking unit costs for each customer class and tier. Projected FY 2019 water use by customer class and tier (from Table 15) in Column A is multiplied by the corresponding peaking factor in Column B (from Table 45) to determine a weighted peaking factor in Column C. This represents the estimated proportional burden of peaking costs caused by peak usage in each customer class and tier. Column D is determined by dividing the weighted peaking factor in Column C for each class and tier by the total weighted peaking factor (869,365) to provide the percentage of Peaking costs to be allocated to each class and tier. The percentages in Column D are then multiplied by the total Peaking revenue requirement of \$499,324 (which is the total Max Day plus Max Hour revenue requirements from Table 32) to provide the Peaking costs allocated to each class and tier in Column E. Column F shows the final Peaking unit costs, which are determined by dividing the allocations in Column E by projected water use in Column A for each customer class and tier.

Table 46: Derivation of Peaking Unit Costs

Customer Class/Tier	FY 2019 Water Use (kgal) (A)	Peaking Factor (B)	Weighted Peaking Factor (C = A / B)	Percent of Peak (D = C / 869,365)	Allocation (E = D x \$499,324)	Unit Cost (F = E / A)
SFR Tier 1	73,731	1.04	77,031	8.86%	\$44,243	\$0.60
SFR Tier 2	104,259	1.44	150,075	17.26%	\$86,197	\$0.83
SFR Tier 3	98,966	2.38	235,580	27.10%	\$135,307	\$1.37
MFR	108,421	1.50	162,804	18.73%	\$93,507	\$0.86
Commercial	83,130	1.25	103,850	11.95%	\$59,647	\$0.72
Municipal	42,988	1.51	64,698	7.44%	\$37,160	\$0.86
Irrigation	35,247	2.06	72,657	8.36%	\$41,731	\$1.18
Fire & Hydrant	626	4.26	2,669	0.31%	\$1,533	\$2.45
Total	547,369	1.59	869,365	100%	\$499,324	

Conservation Unit Cost

The Conservation cost causation component pertains to costs associated with the City’s water conservation efforts, which include general conservation efforts and the extra costs associated with necessary flushing of water mains without discharging water. All customer classes are allocated Conservation costs in the same proportions used to

allocate Peaking costs in Table 46, as high peaking factors result from classes that vary in usage significantly from month to month indicating opportunities for conservation. Conservation-related costs are made increasingly necessary as a result of wasteful and/or inefficient water use, as such all Conservation costs allocated to the SFR customer class are designated to be recovered by Tier 3 (which represents all water use above average water use).

Table 47 shows the determination of Conservation unit costs for each customer class and tier. Note that water use in Column A and allocation percentages in Column B are respectively from Columns A and D of Table 46. However, note that the allocation percentage SFR Tier 3 in Column B, Line 3 of Table 47 equals the sum of the allocation percentages for SFR Tiers 1-3 in Column D of Table 46. This is because SFR Tier 3 is designated to recover all of the SFR customer classes' allocation of Conservation costs for reasons already outlined. The allocation percentages in Column B of Table 47 are then multiplied by the total Conservation revenue requirement (from Column D, Line 7 in Table 32) to determine the allocation of Conservation costs in Column E to each customer class. The Conservation unit costs in Column F are then calculated by dividing the Conservation cost allocation in Column E by projected FY 2019 water use in Column A.

Table 47: Derivation of Conservation Unit Costs

Line	Customer Class/Tier	FY 2019 Water Use (kgal) (A)	Allocation Percentage (B)	Allocation (E = D x \$108,906)	Unit Cost (F = E / A)
1	SFR Tier 1	73,731	0.00%	\$0	\$0.00
2	SFR Tier 2	104,259	0.00%	\$0	\$0.00
3	SFR Tier 3	98,966	53.22%	\$57,961	\$0.59
4	MFR	108,421	18.73%	\$20,395	\$0.19
5	Commercial	83,130	11.95%	\$13,009	\$0.16
6	Municipal	42,988	7.44%	\$8,105	\$0.19
7	Irrigation	35,247	8.36%	\$9,102	\$0.26
8	Fire & Hydrant	626	0.31%	\$334	\$0.53
9	Total	547,369	100%	\$108,906	

Derivation of Proposed FY 2019 Volumetric Charge Rates

To determine proposed FY 2019 Volumetric Charge rates, the Supply Cost, Base, Peaking, and Conservation unit costs are summed for each customer class and tier. The calculation of FY 2019 Volumetric Charge rates is shown below in Table 48.

Table 48: Derivation of FY 2019 Volumetric Charge Rates

Line	Customer Class/Tier	Supply Unit Cost	Base Unit Cost	Peaking Unit Cost	Conservation Unit Cost	Proposed FY 2019 Commodity Charge Rate
		(A)	(B)	(C)	(D)	(E = A + B + C + D)
	<i>Source:</i>	Table 40 & Table 43	Table 44	Table 46	Table 47	
1	SFR					
2	Tier 1	\$1.84	\$2.17	\$0.60	\$0.00	\$4.61
3	Tier 2	\$3.24	\$2.17	\$0.83	\$0.00	\$6.25
4	Tier 3	\$3.24	\$2.17	\$1.37	\$0.59	\$7.37
5						
6	MFR	\$2.87	\$2.17	\$0.86	\$0.19	\$6.10
7	Commercial	\$2.87	\$2.17	\$0.72	\$0.16	\$5.92
8	Municipal	\$2.87	\$2.17	\$0.86	\$0.19	\$6.10
9	Irrigation	\$2.87	\$2.17	\$1.18	\$0.26	\$6.49
10	Fire & Hydrant	\$2.87	\$2.17	\$2.45	\$0.53	\$8.03

Table 49 shows the current CY 2018 and proposed FY 2019-FY 2023 Volumetric Charge rates. The FY 2019 rates were determined in Column E of Table 48. The FY 2019 Volumetric Charge rates are then increased in each subsequent year by the revenue adjustments shown in Table 24, and rounded up to the nearest cent.

Table 49: Proposed Volumetric Charge Rates through FY 2023

Meter Size	Current	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<i>Notes:</i>	<i>Table 14</i>	<i>Table 48</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>
SFR						
Tier 1	\$4.17	\$4.61	\$4.96	\$5.34	\$5.75	\$6.19
Tier 2	\$7.31	\$6.25	\$6.72	\$7.23	\$7.78	\$8.37
Tier 3	\$8.21	\$7.37	\$7.93	\$8.53	\$9.17	\$9.86
MFR		\$6.10	\$6.56	\$7.06	\$7.59	\$8.16
Commercial		\$5.92	\$6.37	\$6.85	\$7.37	\$7.93
Municipal	\$6.07	\$6.10	\$6.56	\$7.06	\$7.59	\$8.16
Irrigation	\$8.01	\$6.49	\$6.98	\$7.51	\$8.08	\$8.69
Fire & Hydrant	\$8.01	\$8.03	\$8.64	\$9.29	\$9.99	\$10.74

6.4. Proposed Elevation Charge Rates

The proposed Elevation Charges are designed to recover the revenue requirement associated with the Elevation cost causation component. These costs are associated with pumping water to Zone 2, which is a higher elevation area within the City’s water service area. Only customers in Zone 2 will be assessed the proposed Elevation Charge.

The uniform dollar per kgal Elevation Charge rate for FY 2019 is determined by dividing the Elevation revenue requirement by the total projected water usage in Zone 2 in FY 2019. Raftelis analyzed actual FY 2017 water usage data provided by the City to determine Zone 2 water usage as a percentage of the City’s total water sales. Raftelis determined that approximately 0.94 percent of total water sales in FY 2017 were to customers in Zone 2. Raftelis then multiplied 0.94 percent by the total projected water sales in FY 2019 (from Table 15) to project water sales of 5,159 kgal to Zone 2 customers only in FY 2019. Table 50 shows the derivation of the proposed FY 2019 Elevation Charge.

Table 50: Derivation of FY 2019 Elevation Charge

Line	Description	Total	Source/Notes
1	Total Elevation Cost	\$9,194	Table 32(Column I, Line 7)
2	Projected Zone 2 Water Usage in FY 2019	5,159	547,369 kgal x 0.94%
3	Proposed FY 2019 Zone 2 Elevation Charge (\$/kgal)	\$1.78	Line 1 / Line 2

Table 51 shows the proposed Elevation Charge for FY 2019 through FY 2023. The FY 2019 charge was determined in Table 50. These charges are increased in each subsequent year by the revenue adjustments shown in Table 24, and rounded up to the nearest cent.

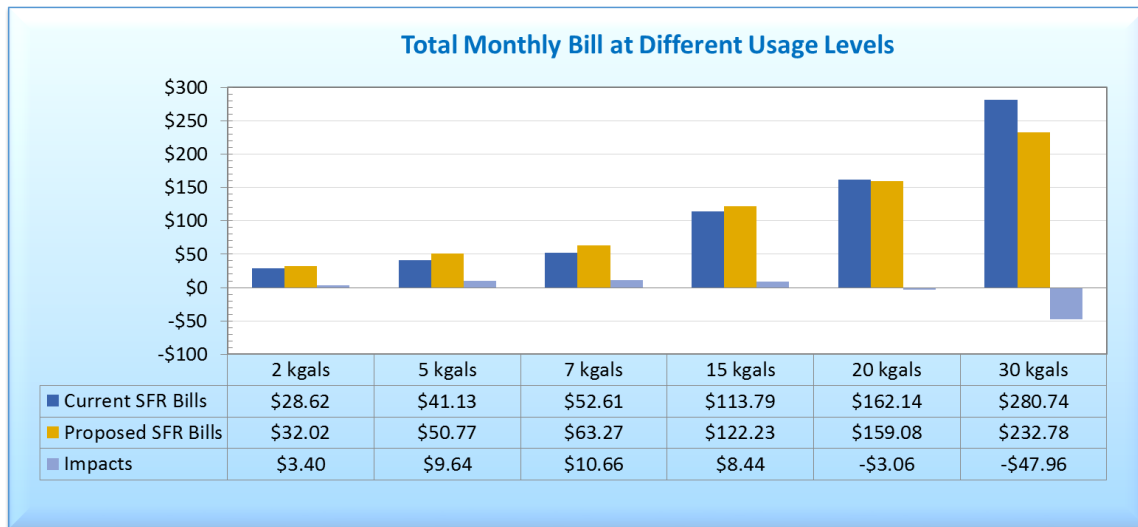
Table 51: Proposed Elevation Charge through FY 2023

Zone	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
<i>Notes:</i>	<i>Table 50</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>	<i>7.5% Adjustment</i>
Zone 1	N/A	N/A	N/A	N/A	N/A
Zone 2	\$1.78	\$1.92	\$2.07	\$2.23	\$2.40
Zone 3	N/A	N/A	N/A	N/A	N/A

7. Customer Bill Impacts

Figure 5 shows calculated monthly water bills (which includes the Monthly Service Charge and Volumetric Charge) for SFR customers at various levels of monthly water usage under current CY 2018 rates and proposed FY 2019 rates. The blue bars in Figure 5 represent monthly water bills assuming the existing rate structure is unchanged and existing CY 2018 rates for Inside City SFR customers are in effect. The gold bars show monthly water bills assuming that the proposed rate structure and FY 2019 rates are in effect, and that the customers are within Zone 1 (and are therefore not subject to the Elevation Charge). The current and proposed monthly bills in Figure 5 are calculated assuming a 1-inch meter size. The dollar difference between current and proposed monthly bills at different monthly water use levels is shown in the final row of Figure 5. These amounts were selected to give a cross-section of the City’s usage patterns. The first column, at 2 kgals of use, indicates use that is wholly contained within the first tier, the second indicates median residential usage (5 kgals), and the third is average usage for all residential customers (7 kgals). 90 percent of residential customers use 15 kgals or fewer.

Figure 5: Single Family Residential Monthly Bill Impacts



APPENDIX A:

Detailed O&M Budget Projections

		FY 2018	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
		Budget	Projected	Projected	Projected	Projected	Projected
EXPENSES							
40110	Regular Employee	\$820,503	\$633,168	\$652,163	\$671,728	\$691,880	\$712,636
40120	P/T Wrkr Salry	\$24,201	\$0	\$0	\$0	\$0	\$0
40130	Overtime	\$20,000	\$20,000	\$20,600	\$21,218	\$21,855	\$22,510
100E	SALARY & WAGES	\$864,704	\$653,168	\$672,763	\$692,946	\$713,734	\$735,146
40290	EmPLY Benefits	\$247,864	\$217,767	\$235,188	\$254,003	\$274,324	\$296,270
40291	Workers Comp	\$35,890	\$21,488	\$23,207	\$25,064	\$27,069	\$29,234
40292	PERS UAL	\$61,732	\$54,186	\$58,521	\$63,203	\$68,259	\$73,719
43999	Operating Transfer Out	\$0	\$0	\$0	\$0	\$0	\$0
200E	EMPLOYEE BENEFITS	\$345,486	\$293,441	\$316,916	\$342,270	\$369,651	\$399,223
50310	Legal	\$20,000	\$20,000	\$20,600	\$21,218	\$21,855	\$22,510
50311	Acctng/Audit	\$17,000	\$1,000	\$1,030	\$1,061	\$1,093	\$1,126
50312	Recruitment	\$0	\$100	\$103	\$106	\$109	\$113
50313	Consulting	\$150,740	\$53,240	\$54,837	\$56,482	\$58,177	\$59,922
50314	Engineering	\$25,000	\$25,000	\$25,750	\$26,523	\$27,318	\$28,138
50350	Other-Prof/Tech	\$54,000	\$123,500	\$127,205	\$131,021	\$134,952	\$139,000
50353	Water Conserv	\$100,000	\$105,000	\$108,150	\$111,395	\$114,736	\$118,178
300E	PROFESSIONAL SERVICES	\$366,740	\$327,840	\$337,675	\$347,805	\$358,240	\$368,987
60401	Utilities	\$44,200	\$40,000	\$41,200	\$42,436	\$43,709	\$45,020
60403	Custodial	\$2,000	\$2,000	\$2,060	\$2,122	\$2,185	\$2,251
60404	Repair & Mainte	\$67,000	\$74,000	\$76,220	\$78,507	\$80,862	\$83,288
60406	Rental-Equipmen	\$4,500	\$14,500	\$14,935	\$15,383	\$15,845	\$16,320
60407	Contract Svc.	\$1,547,491	\$18,500	\$19,055	\$19,627	\$20,215	\$20,822
400E	PROPERTY SERVICES	\$1,665,191	\$149,000	\$153,470	\$158,074	\$162,816	\$167,701
60452	Communications	\$8,650	\$8,650	\$8,910	\$9,177	\$9,452	\$9,736
60454	Printing & Bind	\$40,000	\$40,000	\$41,200	\$42,436	\$43,709	\$45,020
60455	Travel	\$1,000	\$1,000	\$1,030	\$1,061	\$1,093	\$1,126
60456	Memberships	\$19,050	\$14,600	\$15,038	\$15,489	\$15,954	\$16,432

60457	Training/Confer	\$12,000	\$12,000	\$12,360	\$12,731	\$13,113	\$13,506
60460	Permit/Fees/Tax	\$25,000	\$25,765	\$26,538	\$27,334	\$28,154	\$28,999
60480	Other-Services	\$10,000	\$97,767	\$100,700	\$103,721	\$106,833	\$110,038
60491	Dsastr Preprdns	\$1,000	\$1,000	\$1,030	\$1,061	\$1,093	\$1,126
450E	OPERATIONS	\$116,700	\$200,782	\$206,805	\$213,010	\$219,400	\$225,982
60410	Contract Water Propertie		\$1,555,753	\$1,656,807	\$1,765,628	\$1,881,582	\$2,005,153
70501	Gener. Supplies	\$170,000	\$160,000	\$164,800	\$169,744	\$174,836	\$180,081
70505	Gasoline	\$18,000	\$18,000	\$18,540	\$19,096	\$19,669	\$20,259
70508	Clothing/Unifor	\$6,250	\$6,250	\$6,438	\$6,631	\$6,830	\$7,034
500E	SUPPLIES	\$194,250	\$1,740,003	\$1,846,584	\$1,961,099	\$2,082,917	\$2,212,528
70606	Software	\$4,752	\$6,252	\$6,440	\$6,633	\$6,832	\$7,037
600E	CAPITAL ASSETS	\$4,752	\$6,252	\$6,440	\$6,633	\$6,832	\$7,037
70750	Longterm Bldg	\$27,138	\$35,057	\$36,109	\$37,192	\$38,308	\$39,457
70760	Vehicle Replcmt	\$43,408	\$51,358	\$52,899	\$54,486	\$56,120	\$57,804
70770	Mgmt Info Svs	\$55,403	\$40,571	\$41,788	\$43,042	\$44,333	\$45,663
70780	Ins/P & L	\$32,925	\$36,449	\$37,542	\$38,669	\$39,829	\$41,024
700E	INTERNAL SERVICE & CAPITA	\$158,874	\$163,435	\$168,338	\$173,388	\$178,590	\$183,948
80801	Principal	\$0	\$0	\$0	\$0	\$0	\$0
80802	Interest	\$0	\$0	\$0	\$0	\$0	\$0
80803	Fisca Agent Fee	\$2,000	\$1,650	\$1,700	\$1,750	\$1,803	\$1,857
80822	Depreciation Expense	\$0	\$0	\$0	\$0	\$0	\$0
800E	DEBT SERVICE	\$2,000	\$1,650	\$1,700	\$1,750	\$1,803	\$1,857
90900	Transfers-Out	\$0	\$0	\$0	\$0	\$0	\$0
	Corporation Yard	\$62,305	\$0	\$0	\$0	\$0	\$0
	Indirect - City Overhead Water Utility	\$204,990	\$477,023	\$491,334	\$506,074	\$521,256	\$536,894
	Inidrect - City Overhead Water Capital	\$0	\$24,079	\$24,801	\$25,545	\$26,312	\$27,101
	Access Road Water Tank Lease	\$0	\$37,980	\$39,119	\$40,293	\$41,502	\$42,747
	Norrhom Road Water Tank Lease	\$35,000	\$37,980	\$39,119	\$40,293	\$41,502	\$42,747
	Mountain Cemetery Water Tank Lease	\$35,000	\$37,980	\$39,119	\$40,293	\$41,502	\$42,747
90901	TRANSFERS-CIP PROJECTS	\$0	\$0	\$0	\$0	\$0	\$0
900E	TRANSFERS	\$337,295	\$615,042	\$633,493	\$652,498	\$672,073	\$692,235
40000	TOTAL EXPENSE	\$4,055,992	\$4,150,613	\$4,344,185	\$4,549,473	\$4,766,056	\$4,994,643

APPENDIX B:
Revenue Proof

The Revenue Proof Section of the appendix provides calculations that show that the proposed rates recover the amount shown in Table 25. The revenues from rates are shown against the combined amount from line 1 and line 2 of Table 25 at the end of the process. Usage totals shown in volumetric and elevation revenue proofs may be rounded.

Table 52 shows the revenues resulting from the proposed rates for FY 2019, assuming they are in place for a whole year, using the usage shown in Table 46 and the rates shown in Table 48.

Table 52: Volumetric Revenue Proof for FY 2019

Class	Proposed Rate FY 2019	Usage	Revenue
SFR Tier 1	\$4.61	73,731	\$339,902
SFR Tier 2	\$6.25	104,259	\$651,622
SFR Tier 3	\$7.37	98,966	\$729,379
MFR	\$6.10	108,421	\$661,368
Commercial	\$5.92	83,130	\$492,130
Municipal	\$6.10	42,988	\$262,227
Irrigation	\$6.49	35,247	\$228,753
Fire & Hydrant	\$8.03	626	\$5,027
Total		547,369	\$3,370,408

Table 53 shows fixed charge revenue for FY 2019 derived by multiplying the proposed monthly rates from Table 38 by the number of meters shown for FY 2019 in Table 12 by the number of bills per year (12).

Table 53: Fixed Charge Revenue Proof for FY 2019

Meter Size	Proposed Rate FY 2019	Meters	Revenue
5/8"	\$22.80	282	\$77,155
3/4"	\$22.80	2,862	\$783,043
1"	\$22.80	1,317	\$360,331
1 1/2"	\$37.57	143	\$64,470
2"	\$55.29	94	\$62,367
3"	\$102.56	23	\$28,307
4"	\$155.73	7	\$13,081
6"	\$303.43	1	\$3,641
Total		4,729	\$1,392,396

Table 54 shows the fire service meter charge revenue for FY 2019 derived by multiplying the proposed monthly fire line charges from Table 34 by the number of fire lines shown in Table 12 by the number of bills per year (12).

Table 54: Fire Meter Revenue Proof for FY 2019

Fire Line Size	Proposed Rate FY 2019	Meters	Revenue
2"	\$0.60	12	\$86
4"	\$3.72	65	\$2,902
6"	\$10.78	56	\$7,244
8"	\$22.98	16	\$4,412
10"	\$41.32	3	\$1,488
Total		152	\$16,132

Table 55 shows the revenues resulting from elevation charges shown in Table 50 multiplied by the amount of projected usage in Zone 2 in the same table.

Table 55: Elevation Revenue Proof for FY 2019

Pump Zone	Proposed Rate FY 2019	Zoned Pumping	Revenue
Zone 2	\$1.78	5,159	\$9,183
Total			\$9,183

Table 56 shows total revenues from Table 52, Table 53, Table 54, and Table 55 compared to the total shown in Table 26. The slight difference in totals is due to rounding charges up to the nearest penny.

Table 56: Aggregated Revenue Proof for FY 2019

Volumetric Table 52	Fixed Charge Table 53	Fire Service Table 54	Elevation Table 55	Total	Total from COS Table 26
\$3,370,408	\$1,392,396	\$16,132	\$9,183	\$4,788,119	\$4,784,686

Table 57 shows projected usage through FY 2023 applying the growth and water use factors shown in Table 9 to the usage shown in Table 46. These usage totals are unrounded, meaning that the totals in the subsequent table will not be even multiples of these numbers and the relevant rate.

Table 57: Projected Usage FY 2019 Through FY 2023

Class	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
SFR Tier 1	73,731	74,031	74,375	74,721	75,068
SFR Tier 2	104,259	104,683	105,169	105,659	106,150
SFR Tier 3	98,966	99,368	99,830	100,294	100,761
MFR	108,421	108,861	109,367	109,876	110,387
Commercial	83,130	83,467	83,856	84,246	84,637
Municipal	42,988	43,162	43,363	43,565	43,767
Irrigation	35,247	35,390	35,555	35,720	35,886
Fire & Hydrant	626	629	631	634	637
Total Use	547,369	549,590	552,146	554,714	557,294

Table 58 shows revenues resulting from multiplying the usage shown in Table 57 by the rates shown in Table 49.

Table 58: Projected Volumetric Revenue FY 2019 Through FY 2023

Class	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
SFR Tier 1	\$339,902	\$367,192	\$397,162	\$429,645	\$464,674
SFR Tier 2	\$651,622	\$703,467	\$760,375	\$822,024	\$888,476
SFR Tier 3	\$729,379	\$787,985	\$851,548	\$919,697	\$993,499
MFR	\$661,368	\$714,128	\$772,133	\$833,958	\$900,758
Commercial	\$492,130	\$531,687	\$574,410	\$620,890	\$671,174
Municipal	\$262,227	\$283,146	\$306,144	\$330,657	\$357,143
Irrigation	\$228,753	\$247,022	\$267,015	\$288,618	\$311,850
Fire & Hydrant	\$5,027	\$5,431	\$5,866	\$6,338	\$6,845
Total Revenue	\$3,370,408	\$3,640,057	\$3,934,654	\$4,251,826	\$4,594,418

Table 59 shows projected meters through FY 2023 as initially presented in Table 12.

Table 59: Projected Meters FY 2019 Through FY 2023

Meter Size	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
5/8"	282	283	284	285	286
3/4"	2,862	2,874	2,887	2,900	2,914
1"	1,317	1,322	1,328	1,334	1,340
1 1/2"	143	144	145	146	147
2"	94	94	94	94	94
3"	23	23	23	23	23
4"	7	7	7	7	7
6"	1	1	1	1	1

Table 60 shows projected fixed charge revenues derived by multiplying the charges in Table 39 by the number of meters shown in Table 59 by the number of bills per year (12).

Table 60: Projected Fixed Charge Revenue FY 2019 Through FY 2023

Meter Size	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
5/8"	\$77,155	\$83,236	\$89,801	\$96,889	\$104,539
3/4"	\$783,043	\$845,301	\$912,869	\$985,884	\$1,065,125
1"	\$360,331	\$388,827	\$419,914	\$453,507	\$489,797
1 1/2"	\$64,470	\$69,794	\$75,551	\$81,783	\$88,535
2"	\$62,367	\$67,048	\$72,079	\$77,494	\$83,314
3"	\$28,307	\$30,432	\$32,714	\$35,168	\$37,806
4"	\$13,081	\$14,062	\$15,117	\$16,251	\$17,471
6"	\$3,641	\$3,914	\$4,208	\$4,524	\$4,863
Total Revenue	\$1,392,396	\$1,502,614	\$1,622,253	\$1,751,499	\$1,891,451

Table 61 shows projected fire lines through FY 2023 as initially presented in Table 12.

Table 61: Projected Fire Lines FY 2019 Through FY 2023

Fire Line Size	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
2"	12	12	12	12	12
4"	65	65	65	65	65
6"	56	56	56	56	56
8"	16	16	16	16	16
10"	3	3	3	3	3

Table 62 shows projected fire line revenues derived by multiplying the charges in Table 35 by the meters shown in Table 61 and by the number of bills per year (12).

Table 62: Projected Fire Line Revenue FY 2019 Through FY 2023

Fire Line Size	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
2"	\$86	\$94	\$101	\$109	\$118
4"	\$2,902	\$3,120	\$3,354	\$3,611	\$3,884
6"	\$7,244	\$7,788	\$8,373	\$9,005	\$9,684
8"	\$4,412	\$4,744	\$5,101	\$5,485	\$5,898
10"	\$1,488	\$1,599	\$1,719	\$1,849	\$1,988
Total Revenue	\$16,132	\$17,346	\$18,649	\$20,060	\$21,572

Table 63 shows projected Zone 2 usage from FY 2019 through 2023, projected by applying the growth and water use factors shown in Table 9 to the usage shown in Table 55.

Table 63: Projected Zone 2 Usage FY 2019 Through FY 2023

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Zone 2 Usage	5,159	5,180	5,204	5,228	5,253

Table 64 shows elevation charge revenue resulting from multiplying projected usage in Table 63 by the elevation charge rates shown in Table 51.

Table 64: Projected Elevation Charge Revenue FY 2019 Through FY 2023

	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Total Revenue	\$9,183	\$9,946	\$10,772	\$11,659	\$12,606

Table 65 shows total rate revenues as calculated in Table 58, Table 60, Table 62, and Table 64 from FY 2019 through FY 2023. It compares this calculated revenue to that shown in line 1 and 2 of Table 25¹⁷ and shows the Variance, which is the result of subtracting the total from line 1 and 2 of Table 25 from the total shown in Table 65. The Variance as a percent of Total line shows the result of dividing the Variance by Total revenue. Variance as a percent of total increases slightly every year due to rates being rounded up to the nearest penny for each fiscal year.

Table 65: Projected Water Revenue FY 2019 Through FY 2023

Revenue Type	FY 2019	FY 2020	FY 2021	FY 2022	FY 2023
Volumetric Revenue	\$3,370,408	\$3,640,057	\$3,934,654	\$4,251,826	\$4,594,418
Fixed Charge Revenue	\$1,392,396	\$1,502,614	\$1,622,253	\$1,751,499	\$1,891,451
Fire Line Revenue	\$16,132	\$17,346	\$18,649	\$20,060	\$21,572
Elevation Revenue	\$9,183	\$9,946	\$10,772	\$11,659	\$12,606
Total	\$4,788,119	\$5,169,962	\$5,586,329	\$6,035,044	\$6,520,047
Rate Revenue from Cashflow	\$4,784,686	\$5,164,021	\$5,576,398	\$6,021,653	\$6,502,785
Variance	\$3,432	\$5,941	\$9,930	\$13,391	\$17,262
Variance as a percent of Total	0.07%	0.11%	0.18%	0.22%	0.26%

¹⁷ Except for FY 2019, due to the projected September implementation of the rates which reduces the "Revenue Adjustment Revenue" shown in line 2 of Table 26. The amount in Rate Revenue from Cashflow for FY 2019 is taken from Table 26 which annualizes the rate increase.

APPENDIX C:
City of Sonoma Service Area



City Limits



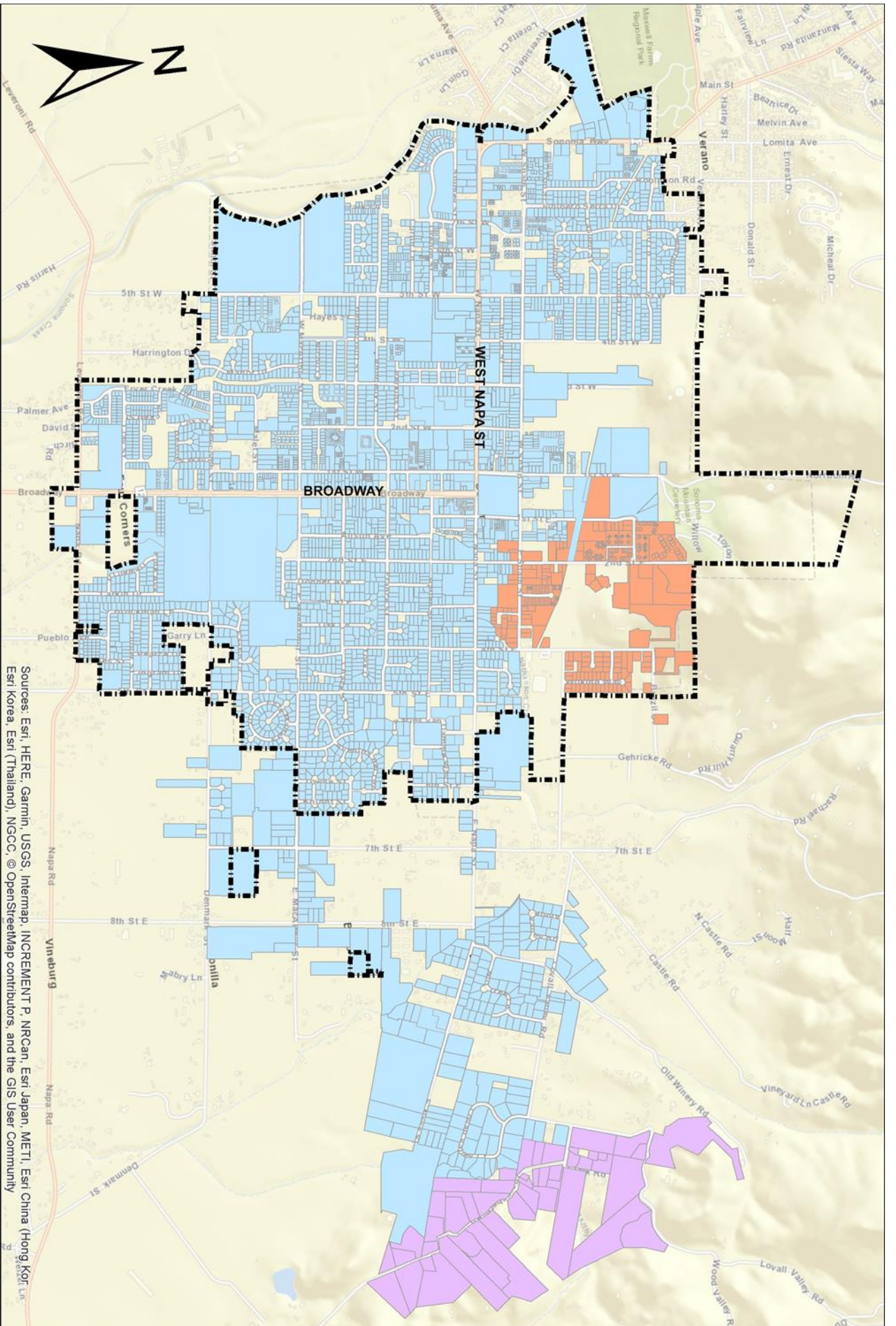
ZONE 1



ZONE 2



ZONE 3



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