

DRAFT WATER AND SEWER RATE STUDY

B&V PROJECT NO. 197743.0100

PREPARED FOR

City of Santa Clara, CA

MAY 21, 2019

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1 Executive Summary

The City of Santa Clara (City) commissioned Black & Veatch Management Consulting, LLC (Black & Veatch) to perform an update to the 2018 Water and Sewer Rate Study (Study) for the Water, Recycled Water and Sewer Utilities. Like the last Study, it included the development of a ten-year financial plan, a cost of service analysis and the design of rates. The specific objectives of the Study were to:

- Evaluate the adequacy of projected revenues under existing rates to meet projected revenue requirements;
- Develop sound financial plans for the utilities covering a ten-year Study period for both ongoing operations and planned capital improvements;
- Allocate the utilities' projected revenue requirements to the various customer classes in accordance with the respective service requirements; and
- Develop a suitable rate schedule that produces revenues adequate to meet financial needs while recognizing customer costs of service and regulatory considerations such as Proposition 218 and applicable judicial decisions.

1.1 WATER SYSTEM

The City's Water Utility provides water services to over 26,600 residential, commercial, irrigation, schools, and agricultural customers. The City obtains potable water from three primary sources: local groundwater, imported surface water from the Santa Clara Valley Water District (SCVWD), and imported water from the Hetch Hetchy watershed via the San Francisco Public Utilities Commission (SFPUC). The City's distribution system consists of 335 miles of distribution mains, 7 storage tanks totaling 28.8 million gallons of storage capacity, 21 wells, and 3 booster pump stations. The City obtains over forty-seven percent of the 7.4 billion gallons of water that flows to its customers each year from the City's wells.

1.2 RECYCLED WATER SYSTEM

The City's Recycled Water Utility provides recycled water services to over 250 commercial, irrigation, and industrial customers. The City obtains recycled water from South Bay Water Recycling. The recycled water system has been in operation since 1989. There are 33-miles of recycled water pipelines situated within City limits. Recycled water comes from the San Jose-Santa Clara Regional Wastewater Facility (RWF), an advanced tertiary treatment facility located in San Jose, of which the City is a co-owner. A portion of the recycled water from the RWF supplies the District's Silicon Valley Advanced Water Purification Center for advanced treatment (microfiltration, reverse osmosis, and advanced oxidation) to create a mix of high quality recycled water that is blended back into the recycled water system.

1.3 SEWER SYSTEM

The City's Sewer Utility provides sewer services to approximately 26,000 residential, commercial, industrial, and municipal customers. Services include the construction and maintenance of the City's sewer system and installation of sewer lateral clean-outs at the property line. Sanitary sewer flows in the City are collected and transported through more than 270 miles of sewer main by way of six pumping stations to

the San Jose/Santa Clara Regional Wastewater Facility (RWF). The RWF can treat 167 million gallons a day (MGD) of liquid waste. The plant also treats waste from other cities in Santa Clara County.

1.4 FINANCIAL PLAN

The City operates the utilities as self-supporting enterprises. As such, the utilities must develop financial plans which provide sufficient levels of revenue to meet all operation and maintenance expenses, water purchases, wastewater treatment, debt service requirements, capital improvements funded from current revenues, and other expenditures.

The Study develops financial plans that project operating revenue, expenses, and capital financing costs for the utilities over a ten-year planning period beginning July 1, 2019 and ending June 30, 2029. This report will focus on a three-year planning period beginning July 1, 2019, and ending June 30, 2022, for discussion. The full ten-year financial plans can be found in Appendix A. The financial plans project future rate revenues under existing rates, operations and maintenance (O&M) expenses, principal and interest expense on debt, transfers, and capital improvement program (CIP) requirements. In the projection of rate revenues, annual projections of customers and water consumption rely upon City estimates based on a reasonable increase from low historical demands experienced after the 2016 state-mandated drought restrictions. In addition, the Water Utility's forecast incorporates efforts to continue to meet the conservation goals as established by the State SB7x-7 and the City's Water Shortage Contingency Plan was incorporated. State SB7x-7 requires urban retail water suppliers to achieve a 20% reduction in urban per capita water use on or before December 31, 2020. The City's target was 186 gallons per capita per day (gpcd). In 2017, the City approved continuation of Stage 1 of the Water Shortage Contingency Plan and an amendment to the City's Water Use Rules and Regulations calling for an ongoing voluntary 10% reduction based on 2013 water usage. The City's 2018 gpcd was 127, well ahead of the City's target of 186 gpcd. Even with growth projections, the Water Utility will remain under the conservation levels set forth by State SB7x-7.

1.4.1 Water Utility

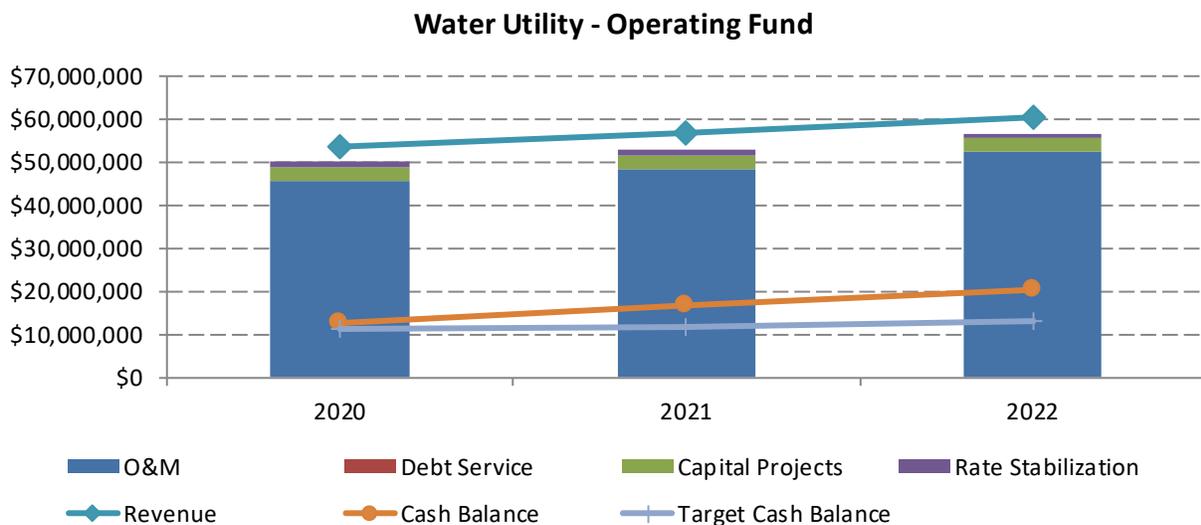
The Water Utility's revenue requirements are summarized below:

- **Operation and Maintenance Expenses:** The Water Utility anticipates O&M expenses to increase from \$45.8M in FY 2020 to \$52.4M in FY2022. Water production and water purchases account for most of this increase, representing approximately 63% of O&M expenses.
- **Debt Service:** The Water Utility has no debt service.
- **Capital Improvements:** The Water Utility plans to execute an average of \$6.5M per year in capital projects from FY 2020 to FY 2022.
- **Reserves:** The Water Utility plans to continue funding the operating fund reserve, construction fund reserve, and a rate stabilization fund reserve. The Water Utility will begin to fund a new pension reserve starting in FY 2020.
 - The operating fund reserve is to help cover fluctuations in day-to-day expenses. The scheduled target is 90 days of O&M expenses.

- The construction fund reserve is to help maintain sufficient funds on hand to help mitigate unexpected capital costs. The scheduled target is 12-months of the following year’s CIP.
- The rate stabilization fund reserve is to help mitigate future increases in drought-stricken years. The scheduled target is 10% of the prior year’s rate revenues.
- The pension fund reserve is to pay for the unfunded pension liabilities and the increase in the City’s share of pension costs due to factors such as higher CalPERS rates and negotiated pay increases

To meet the projected revenue requirements, the Water Utility is proposing revenue adjustments which would allow the Water Utility to operate the enterprise on a revenue-neutral basis as shown in Figure ES-1.

Figure ES-1 Water Operating Cash Flow



1.4.2 Recycled Water Utility

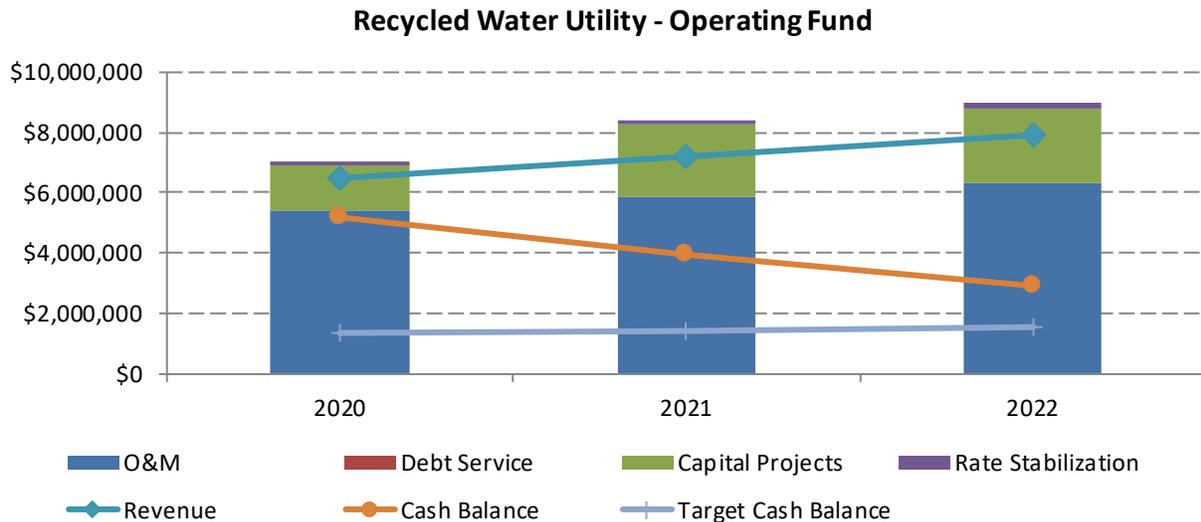
The Recycled Water Utility’s revenue requirements are summarized below:

- **Operation and Maintenance Expenses:** The Recycled Water Utility anticipates O&M expenses to increase from \$5.4M in FY 2020 to \$6.3M in FY2022. Recycled water purchase costs constitute most of the increase at approximately 82% of O&M expenses.
- **Debt Service:** The Recycled Water Utility has no debt service.
- **Capital Improvements:** The Recycled Water Utility plans to execute an average \$1.7M per year in capital projects from FY 2020 to FY 2022.
- **Reserves:** The City plans to continue funding the operating fund reserve, construction fund reserve, and a rate stabilization fund reserve. The Recycled Water Utility will begin to fund a new pension reserve starting in FY 2020.

- The operating fund reserve is to help cover fluctuations in day-to-day expenses. The scheduled target is 90 days of O&M expenses.
- The construction fund reserve is to help maintain sufficient funds on hand to help mitigate unexpected capital costs. The scheduled target is 12-months of the following year’s CIP.
- The rate stabilization fund reserve is to help mitigate future increases in drought-stricken years. The scheduled target is 10% of the prior year’s rate revenues.
- The pension fund reserve is to pay for the unfunded pension liabilities and the increase in the City’s share of pension costs due to factors such as higher CalPERS rates and negotiated pay increases

To meet the projected revenue requirements, the Recycled Water Utility is proposing revenue adjustments which would allow the utility to operate the enterprise on a revenue-neutral basis as shown in Figure ES-2.

Figure ES-2 Recycled Water Operating Cash Flow



1.4.3 Sewer Utility

The Sewer Utility’s revenue requirements are summarized below:

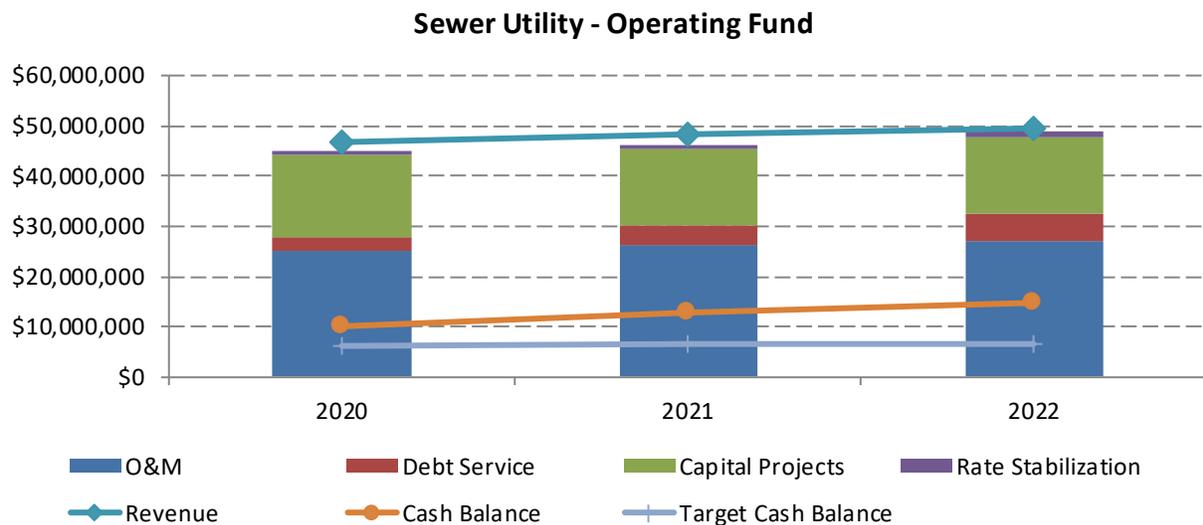
- **Operation and Maintenance Expenses:** The Sewer Utility anticipates O&M expenses to increase from \$25.2M in FY 2020 to \$27.1M in FY2022. RWF-related costs represent 65% of O&M expenses.
- **Debt Service:** The Sewer Utility anticipates an average debt service payment of \$4.0M per year from FY 2020 to FY 2022 associated with existing and proposed debt issuances. In FY 2020, the City anticipates issuance of \$40.0M.
- **Capital Improvements:** The Sewer Utility plans to execute an average \$43.0M per year in capital projects from FY 2020 to FY 2022.

■ **Reserves:** The Sewer Utility plans to continue funding the operating fund reserve, construction fund reserve, and a rate stabilization fund reserve. The Sewer Utility will begin to fund a new pension reserve starting in FY 2020.

- The operating fund reserve is to help cover fluctuations in day-to-day expenses. The scheduled target is 90 days of O&M expenses.
- The construction fund reserve is to help maintain sufficient funds on hand to help mitigate unexpected capital costs. The scheduled target is 12-months of the following year’s City CIP and 6-months of the following year’s RWF CIP.
- The rate stabilization fund reserve is to help mitigate future increases in drought-stricken years. The scheduled target is 10% of the prior year’s rate revenues.
- The pension fund reserve is to pay for the unfunded pension liabilities and the increase in the City’s share of pension costs due to factors such as higher CalPERS rates and negotiated pay increases

To meet the projected revenue requirements, the Sewer Utility is proposing revenue adjustments which would allow the Sewer Utility to operate the enterprise on a revenue-neutral basis as shown in Figure ES-3.

Figure ES-3 Sewer Operating Cash Flow



1.5 ADEQUACY OF EXISTING RATES TO MEET COSTS OF SERVICE

Based on the financial plans, Black & Veatch recommends the revenue adjustments shown in Table ES-1 to meet the projected revenue requirements for the FY 2020 to FY 2022. These do not represent proposed rate increases to customers; rather these represent the overall revenue increases needed by the utilities to meet their overall obligations and to maintain current service levels.

Table ES-1 Proposed Revenue Adjustment

Fiscal Year	Effective Month	Water Utility	Recycled Water Utility	Sewer Utility
FY 2020	July	3.25%	8.60%	3.00%
FY 2021	July	3.25%	8.60%	3.00%
FY 2022	July	3.25%	8.60%	3.00%

1.6 COST-OF-SERVICE ANALYSIS

The cost-of-service analysis allocates the costs to the various customer classes of service in a fair and equitable manner. The methodologies used in the Study are specific to the respective utility operations. Therefore, they differ in process. The following is a brief description of the methodologies.

The water cost-of-service allocation performed in this Study uses the Base-Extra Capacity Method endorsed by the American Water Works Association (AWWA) *Principles of Water Rates, Fees, and Charges*, M1 (M1) manual. Under cost-of-service principles, costs are allocated to the different customer classes in proportion to their use of the water system. As recommended by AWWA, Black & Veatch distributed functional costs to the base (average load conditions), extra capacity (peaking) and customer-related parameters. This allocation methodology produces unit costs for allocation to individual customer classes based on the projected customer service requirements.

The sewer cost-of-service allocation performed in this Study follows the Functional Cost Allocation Method endorsed by the Water Environment Federation (WEF) *Financing and Charges for Wastewater Systems, Manual of Practice (MoP) 27* manual. Similar to the methodology used for water systems, the sewer cost of service analysis allocates costs to the different customer classes in proportion to their use of the sewer system. As recommended by WEF, Black & Veatch distributed functional costs to volume, strength and customer-related parameters. This allocation methodology produces unit costs for allocation to individual customer classes based on the projected customer service requirements.

1.7 RATE DESIGN

Through the cost-of-service analysis, the allocation of costs to customer classes must meet Proposition 218 requirements. The Right to Vote on Taxes Act, also known as Proposition 218, was passed by California voters in 1996 and added Article XIIC and Article XIID to the California Constitution. These articles provide the regulatory framework that guides and informs the rate-setting process. The regulatory framework helps ensure cost recovery proportionate to the cost of providing the service.

1.7.1 Water and Recycled Water Utilities

Over the recent rate period, customer habits have changed, largely because of the State of California's drought mandates. Water usage is generally down over the last five years, but there has been an increase as the drought conditions eased. Even with the lifting of the drought restrictions on the State level, the City's Council is still calling for a voluntary 10% reduction in water usage as compared to pre-drought usage levels. Residents and businesses in the City remain more than 14% below pre-drought levels despite the lifting of drought mandates. Therefore, to continue to minimize impacts, retain simplicity, and ensure the reasonable stability of revenue, Black & Veatch recommends the following rate structure.

- **Monthly Service Charge:** The Water and Recycled Water Utilities should retain the minimum monthly service charge based on meter sizes for all customer classes. The minimum monthly service charge includes a minimum consumption allowance and recovers portions of fixed cost elements such as operating and capital components, meter maintenance and services, meter reading, issuing bills, and maintenance and capacity costs associated with public fire protection. The minimum consumption allowance accommodates water considered essential for health and safety.
- **Consumption Charge:** The Water Utility should maintain the uniform consumption charge for all customers and the Recycled Water Utility should continue to transition the different uniform consumption charges into a common uniform consumption charge for all customer classes. The consumption charge recovers costs associated with the base and extra capacity demands.
- **Fire Service Charge:** The Water Utility should continue to utilize the fire service charge based on meter size for private fire service connections. The fire service charge will recover costs of maintenance and capacity costs associated with private fire protection costs.
- **Cross Connection Charge:** The Water Utility should continue to utilize the cross-connection charge based on meter size for backflow connections. The cross-connection charge will recover costs of maintenance associated with backflow devices.

Table ES-2 summarizes the recommended three-year rate schedules for all Water Utility components.

Table ES-2 Proposed Three-Year Water Rate Schedules

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Minimum Monthly Meter Rates (\$/Month)			
5/8" x 3/4"	18.59	19.10	19.60
1"	28.95	29.76	30.60
1-1/2"	54.83	56.42	58.10
2"	85.89	88.40	91.10
3"	168.72	173.69	179.09
4"	261.90	269.64	278.08
6"	520.73	536.17	553.06
8"	831.34	856.00	883.03
10"	1,245.47	1,282.45	1,322.99
12"	1,750.20	1,802.18	1,859.20

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Fire Service (\$/Month)			
2"	2.59	2.69	2.76
4"	14.67	15.25	15.67
6"	43.14	44.85	46.08
8"	91.89	95.54	98.14
10"	165.22	171.78	176.47
12"	267.03	277.64	285.21

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Cross Connection (\$/Month)			
1"	7.81	8.12	8.30
2"	12.50	13.00	13.28
3"	25.00	26.00	26.55
4"	39.06	40.62	41.48
6"	78.13	81.24	82.97
8"	125.00	129.98	132.75
10"	187.50	194.97	199.13

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/HCF	\$/HCF	\$/HCF
Consumption Charges (\$/HCF)			
Water Utility			
General Customer	6.22	6.42	6.63

Table ES-3 summarizes the recommended three-year rate schedules for all Recycled Water Utility components. Fire Service and Cross Connection charges for Recycled Water are the same as for potable water.

Table ES-3 Proposed Three-Year Recycled Water Rate Schedules

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Minimum Monthly Meter Rates (\$/Month)			
5/8" x 3/4"	18.59	19.10	19.60
1"	28.95	29.76	30.60
1-1/2"	54.83	56.42	58.10
2"	85.89	88.40	91.10
3"	168.72	173.69	179.09
4"	261.90	269.64	278.08
6"	520.73	536.17	553.06
8"	831.34	856.00	883.03
10"	1,245.47	1,282.45	1,322.99
12"	1,750.20	1,802.18	1,859.20

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/HCF	\$/HCF	\$/HCF
Consumption Charges (\$/HCF)			
General Customers	3.74	3.91	4.25
Industrial Process	3.58	3.91	4.25
Industrial Process (Private Well)	3.08	3.91	4.25
Landscape Irrigation (Private Well)	3.35	3.91	4.25

1.7.2 Sewer Utility

Affected by the State of California’s drought mandates, sewage flow saw a decrease due to a decrease in water consumption over the past several years. Therefore, to continue to minimize impacts, retain simplicity, and ensure the reasonable stability of revenue, Black & Veatch recommends the following rate structure.

- **Monthly Service Charge:** The Sewer Utility should retain the monthly service charge based on equivalent dwelling units (EDU) for all residential customer classes. In addition, the monthly service charge serves as the base amount, or minimum, for all non-residential customer classes.
- **Consumption Charge:** The Sewer Utility should retain its uniform consumption charges for each individual non-residential customer classes. The recommended rate structure should be based on customer class.
- **Major Commercial and Industrial Users:** The Sewer Utility should retain the major commercial and industrial user charge for customers with high discharge quantities and/or high strength loadings.

Table ES-3 summarizes the recommended three-year rate schedules for all Sewer Utility components. Fire Service and Cross Connection charges for Recycled Water are the same as for potable water.

Table ES-3 Proposed Three-Year Sewer Rate Schedules

Line No.	Customer Class	Proposed		
		FY 2020	FY 2021	FY 2022
	Monthly Service Charge (\$/EDU)	\$/mo	\$/mo	\$/mo
1	Single Family	44.07	45.23	46.37
2	Multi-Family	44.07	45.23	46.37
	Minimum Bill Charge (\$/Month)	\$/mo	\$/mo	\$/mo
3	All Customers	44.07	45.23	46.37
	Commodity Charge (\$/HCF)	\$/HCF	\$/HCF	\$/HCF
1	Amusement Parks	5.92	5.96	6.25
2	Auto Dealers & Service Station	5.97	6.05	6.27
3	Churches	5.27	5.27	5.54
4	Com/Ind/Misc	5.32	5.49	5.76
5	Electric & Electronic Equip.	4.94	5.22	5.53
6	Food and Kindred Products	12.91	14.09	14.08
7	Hospitals & Convalescent Homes	6.17	6.63	6.88
8	Industrial Chemical	9.15	9.64	9.81
9	Industrial Water Treatment	3.62	3.62	3.62
10	Laundries	5.56	5.92	6.20
11	Machinery Manufacturers	7.59	7.69	7.87
12	Metal Plating	3.98	3.70	4.00
13	Motels & Hotels	6.54	7.08	7.32
14	Paper	11.05	11.05	11.05
15	Repair Shops & Car Washes	5.10	4.75	4.97
16	Restaurants	13.27	14.64	14.60
17	Schools & Colleges	5.77	5.66	5.89
	Major Commercial and Industrial Users			
	Operating and Maintenance Cost Recovery			
1	Volume (per MG)	2,373.21	2,706.24	3,086.00
2	BOD [2] (per 1,000 lbs)	370.42	417.11	469.68
3	SS [3] (per 1,000 lbs)	520.88	565.38	613.69
4	NH3 [4] (per 1,000 lbs)	4,438.06	4,810.47	5,214.13
	Annual Capital Cost Recovery			
5	Volume (per MGD)	1,138,880	1,178,456	1,219,408
6	BOD [2] (per 1,000 lbs/day)	94,070	118,761	149,933
7	SS [3] (per 1,000 lbs/day)	53,421	52,312	51,225
8	NH3 [4] (per 1,000 lbs/day)	349,107	396,310	449,894

Water and Recycled Water Rate Study

2 Revenue and Revenue Requirements

To meet the costs associated with providing water services to its customers, the Water and Recycled Water Utilities derive revenue from a variety of sources including water user charges (rates), developer contributions, solar water heating, interest earned from the investment of available funds, engineering fees, and other miscellaneous revenues. The Water Utility is also actively looking for other sources of revenue, such as grants, to fund infrastructure investments. Black & Veatch has projected the level of future revenue generated in the Study through a combination of an analysis of historical and future system growth in terms of the number of bills and water consumption. This section also projects the expenses, or revenue requirements, necessary to operate and maintain the system, invest in capital improvements, make debt service payments and cover other expenses of the water and recycled water systems.

2.1 CUSTOMER AND WATER CONSUMPTION PROJECTIONS

2.1.1 Customer Classes

The Water Utility's customer base includes both residential and non-residential accounts. The City has identified the following distinct customer classes: General Customer; Fire Service; and Cross Connection.

The Recycled Water Utility's customers are mainly non-residential. The City identified the following distinct customer classes: General Customer (all customers not identified independently); Industrial Process; Industrial Process (Private Well); and Landscape Irrigation (Private Well).

2.1.2 Minimum Bills

The City provides water services to over 26,600 customers and recycled water service to over 250 customers. All customers connected to the water and recycled water systems do so via metered-connections. Since the City bills customers based on bills generated, the analysis included a review of historical bill patterns for customers and anticipated growth within the City. The projected total number of bills are expected to increase by 3.0% per year for the Water Utility and 1.7% year for the Recycled Water Utility over the Study Period. Specifically, the City bills customers based on water consumption, but it also determines the number of bills that do not meet a consumption allowance. The City refers to these bills as minimum monthly service bills. Table 2-1 summarizes the projected number of minimum bills for the Water and Recycled Water Utilities.

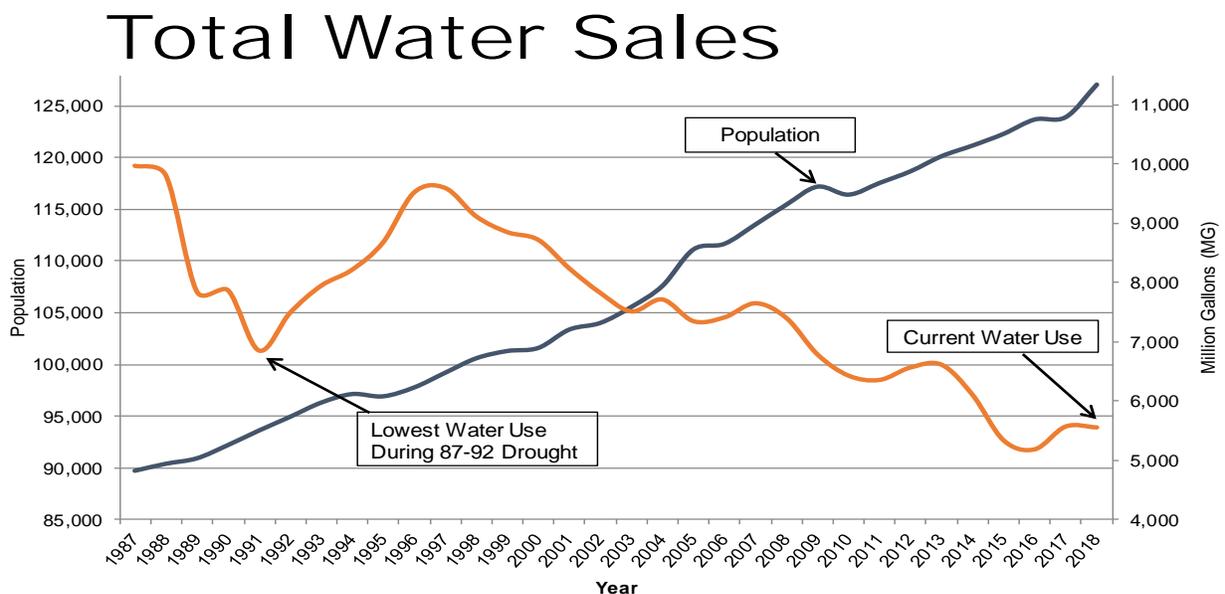
Table 2-1 Minimum Bills

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020 (Bills)	FY 2021 (Bills)	FY 2022 (Bills)
Water Utility				
1	General Customers	44,834	46,175	47,556
2	Total	44,834	46,175	47,556
Recycled Water Utility				
3	General Customers	526	535	544
4	Total	526	535	544

2.1.3 Water Consumption

Table 2-2 shows the projected water and recycled water consumption for the Study Period. In determining the projected water and recycled water consumption, Black & Veatch analyzed historical patterns of water consumption in conjunction with future water conservation requirements set by the City’s Water Shortage Contingency Plan and SB 7x-7. The State of California formally lifted the water restrictions as it declared the drought over, but still encourages utilities to continue efforts that minimize wasteful usage. The City’s primary conservation goals can be found in the Water Shortage Contingency Plan, and the continuing goal to conserve was codified by Santa Clara’s Council in July of 2017. The City offers a rain barrel rebate program and works with the SCVWD on other outreach and rebate programs for water conservation. Expanding the use of recycled water to existing and new customers is important for supplanting the use of potable water. As a result, the City has experienced a steady decline in consumption with a slight increase recently. Overall, customers have done well to increase efficiency in the use of water resources. Figure 1 below represents the population growth and a decline in water consumption.

Figure 2-1 Water Sales



On April 1, 2015, Governor Brown issued Executive Order B29-15, directing the State Water Resources Control Board (SWRCB) to impose restrictions to achieve a statewide 25% reduction in potable urban water usage through February 16, 2016. This Executive Order placed the City in a tier of agencies that were required to reduce total potable water demand by 20% from June 2015 through May 2016 compared to the same months in 2013.

On April 7, 2017, the Governor of California lifted the drought declaration associated with the Executive Order, but the water waste prohibitions remained in place, and the City is still required to report monthly usage compared to 2013. Recognizing that the City has met SB 7x-7 requirements and water consumption was at historic lows, the City anticipates a rebound of 3.0% per year for the Water Utility and 2.0% per year for the Recycled Water Utility over the Study Period. The City bills water consumption in units of hundred cubic feet (HCF).

Table 2-2 Billed Water Consumption

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020 (HCF)	FY 2021 (HCF)	FY 2022 (HCF)
Water Utility				
1	General Customers	7,876,453	8,112,428	8,355,482
2	Total Usage (HCF)	7,876,453	8,112,428	8,355,482
3	Total Usage (AF)	18,082	18,624	19,182
Recycled Water Utility				
4	General Customers	1,736,830	1,771,567	1,806,998
5	Total	1,736,830	1,771,567	1,806,998
6	Total Usage (AF)	3,987	4,067	4,148

2.2 REVENUE UNDER EXISTING RATES

Water and recycled water user rates serve as the primary source of revenue for the Water and Recycled Water Utilities. Therefore, the level of future rate revenue is important in the development of a long-range financial plan. To determine rate revenue, the projected system growth in terms of the number of minimum bills and billed water consumption is multiplied by the applicable rates to determine water and recycled water rate revenue.

Table 2-3 shows the Water and Recycled Water Utilities current schedule of charges. It is important to note that the minimum monthly service charge applies to customers that do not exceed the consumption allowance within the meter sizes. Therefore, the minimum monthly service charge serves as a baseline cost that the City needs to recover.

Table 2-3 Existing Water and Recycled Water Rates

Description	Water Allowance	All City
		FY 2019
Minimum Monthly Meter Rates		
	(HCF)	(\$/mo)
5/8" x 3/4"	3	17.87
1"	6	27.85
1-1/2"	9	52.81
2"	9	82.77
3"	9	162.64
4"	9	252.50
6"	9	502.12
8"	9	801.66
10"	9	1,201.05
12"	9	1,687.80
Fire Service Charges		
		(\$/mo)
2"		2.48
4"		14.05
6"		41.31
8"		88.00
10"		158.23
12"		255.72
Cross Connection Charges		
		(\$/mo)
1"		8.63
2"		13.81
3"		27.62
4"		43.16
6"		86.31
8"		138.10
10"		207.15
Consumption Charges		
Water Utility		(\$/HCF)
General Customers		5.98
Agricultural		5.98
Recycled Water Utility		
		(\$/HCF)
General Customers		3.58
Industrial Process		3.26
Industrial Process (Private Well)		2.26
Landscape Irrigation (Private Well)		2.79

Table 2-4 represents a summary of projected water and recycled water rate revenue under existing rates. As shown, the revenue generated is projected to increase over the Study period in conjunction with the increase in the number of minimum bills and water consumption. The projected Water Utility revenue increases from \$50.7M in FY 2020 to \$53.7M in FY 2022, representing an overall increase of 5.8% over the

three-year Study Period. The projected Recycled Water Utility revenue increases from \$5.8M in FY 2020 to \$6.0M in FY 2022, which reflects an overall increase of 4.0% over the three-year Study Period.

Table 2-4 Projected Revenue under Existing Rates

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
Water Utility				
1	General Customers	48,673,800	50,131,400	51,632,800
2	Fire Service	802,700	802,700	802,700
3	Cross Connection	1,217,400	1,217,400	1,217,400
4	Total	\$ 50,693,900	\$ 52,151,500	\$ 53,652,900
Recycled Water Utility				
5	General Customers	5,807,000	5,922,700	6,040,800
6	Total	\$ 5,807,000	\$ 5,922,700	\$ 6,040,800

2.3 OTHER REVENUE

There are other sources of operating revenue, including charges for hydrant flow tests, meter tests, engineering plan review, water installation and relocation, interest on investments, and other miscellaneous revenues. In total, other operating revenues represent less 2.3% of the Water Utility’s total revenue and 2.5% of the Recycled Water Utility’s total revenue. The City anticipates that these revenues will remain relatively constant for the duration of the Study Period.

2.4 OPERATING AND MAINTENANCE (O&M) EXPENSES

Table 2-5 summarizes the Water and Recycled Water Utilities’ projected O&M expense for the Study Period. These expenses include costs related to salaries and benefits, materials and supplies, contract and professional services, water supply costs, indirect and direct costs, and routine capital outlay. The City anticipates that all O&M expenditures, excluding water supply costs, will increase on average 4.2% annually from the FY 2020.

Water supply costs include water production and purchased water costs. In the case of the Water Utility, the City has three main sources of water: 1) City groundwater pumped from City-owned wells; 2) imported surface water from the SCVWD and; 3) imported water from the Hetch Hetchy watershed via the SFPUC. The City operates 21 groundwater wells that tap the underground aquifers which make up approximately 47% of the City's water supply. The City imports the remainder of its water supplies from the two wholesale water agencies. Based on estimates of groundwater and wholesale rates provided by SCCVWD and SFPUC, the City expects water production and purchased water costs to increase by at least 18.3% over the Study period.

In the case of the Recycled Water Utility, the City has one main source of recycled water: The San Jose/Santa Clara Regional Wastewater Facility's South Bay Recycled Water facility. This facility produces highly treated water delivered through separate pipelines. Recycled water is a reliable drought proof source of water that helps offset the use of potable sources, especially in drought-prone years in California. Based on estimates from the facility, the City expects purchased recycled water costs to increase by at least 19.0% over the Study period.

Table 2-5 O&M Expenses

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
Water Utility				
1	Salaries	5,346,679	5,560,500	5,782,800
2	Benefits	2,812,664	2,925,000	3,041,400
3	Materials/Services/Supplies	2,358,917	2,347,300	2,439,100
4	Interfund Services	6,609,859	6,910,300	7,202,000
5	Resource & Production	28,681,500	30,788,700	33,925,400
6	Capital Outlay	0	0	0
7	Total	\$ 45,809,619	\$ 48,531,800	\$ 52,390,700
Recycled Water Utility				
8	Salaries	382,800	398,100	414,000
9	Benefits	211,726	220,300	228,900
10	Materials/Services/Supplies	36,142	37,400	38,700
11	Interfund Services	352,984	369,200	386,300
12	Resource & Production	4,411,600	4,812,200	5,249,100
13	Capital Outlay	0	0	0
14	Total	\$ 5,395,252	\$ 5,837,200	\$ 6,317,000

As shown in Table 2-5, the Water Utility's O&M expenses increase from \$45.8M in FY 2020 to \$52.4M in FY 2022 while the Recycled Water Utility's O&M expenses increase from \$5.4M in FY 2020 to \$6.3M in FY 2022.

2.5 CAPITAL IMPROVEMENT PROGRAM

The Water and Recycled Water Utilities develop a five-year Capital Improvement Plan on an annual basis to identify water and recycled water system needs including assessments, inspections, maintenance, and rehabilitation and replacement requirements.

Table 2-6 summarizes the Water and Recycled Water Utilities CIP for FY 2020 through FY 2022. The Water Utility is projecting \$19.7M in CIP, and the Recycled Water Utility is projecting \$5.2M in CIP over the Study Period, which includes both capital and replacement projects. For complete details associated with each CIP project, the City has posted the CIP Budget on their website.¹

¹ The City of Santa Clara. Finance Department. < <http://santaclaraca.gov/government/departments/finance>>

Table 2-6 Capital Improvement Projects

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
Water Utility				
1	7005 Buildings and Grounds	100,000	0	0
2	7054 Distribution System Replacement/Restoration	1,630,000	1,875,000	2,000,000
3	7057 Asset Management Program	150,000	150,000	0
4	7058 SCADA Improvements	800,000	1,000,000	1,000,000
5	7059 New and Replacement Wells	1,750,000	1,100,000	1,100,000
6	7060 Tank Rehabilitation	4,000,000	1,500,000	1,500,000
7	Total	\$ 8,430,000	\$ 5,625,000	\$ 5,600,000
Recycled Water Utility				
8	7505 Recycled Water System Mains and Services	50,000	50,000	50,000
9	XXXX Recycled Water System Capacity Projects (TBD)	0	2,500,000	2,500,000
10	Total	\$ 50,000	\$ 2,550,000	\$ 2,550,000

2.5.1 Capital Improvement Financing Plan

The City funds annual expenditures for the CIP from a combination of available funds on hand, connection charges, developer contributions, and revenues derived from user rates. As shown in Tables 2-7 and 2-8, the average annual CIP expenditure is \$6.6M for the Water Utility and \$1.7M for the Recycled Water Utility. The planned average annual CIP contribution from the Water Utility Operating Fund or PAY-GO is \$3.0M per year while the contribution from the Recycled Water Utility is \$2.1M per year over the Study Period.

Table 2-7 Construction Fund Financing Plan (Water)

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
Source of Funds				
1	Intra Transfer In - Debt Financing	0	0	0
2	Intra Transfer In - Customer Service Charge	3,000,000	3,000,000	3,000,000
3	Connection Charges	0	0	0
4	Developer Contributions	0	0	0
5	Total Sources	\$ 3,000,000	\$ 3,000,000	\$ 3,000,000
Use of Funds				
6	Improvements Projects	8,430,000	5,625,000	5,600,000
7	Total Uses	\$ 8,430,000	\$ 5,625,000	\$ 5,600,000
8	Net Annual Cash Balance	(5,430,000)	(2,625,000)	(2,600,000)
9	Beginning Unrestricted Fund Balance	17,016,200	12,131,200	10,051,200
10	Net Cumulative Fund Balance	\$ 11,586,200	\$ 9,506,200	\$ 7,451,200
11	Minimum Construction Reserves	\$ 5,625,000	\$ 5,600,000	\$ 3,675,000

Table 2-8 Construction Fund Financing Plan (Recycled Water)

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
Source of Funds				
1	Intra Transfer In - Debt Financing	0	0	0
2	Intra Transfer In - Customer Service Charge	1,500,000	2,400,000	2,500,000
3	Connection Charges	0	0	0
4	Developer Contributions	0	0	0
5	Total Sources	\$ 1,500,000	\$ 2,400,000	\$ 2,500,000
Use of Funds				
6	Improvements Projects	50,000	2,550,000	2,550,000
7	Total Uses	\$ 50,000	\$ 2,550,000	\$ 2,550,000
8	Net Annual Cash Balance	1,450,000	(150,000)	(50,000)
9	Beginning Unrestricted Fund Balance	1,328,500	2,778,500	2,628,500
10	Net Cumulative Fund Balance	\$ 2,778,500	\$ 2,628,500	\$ 2,578,500
11	Minimum Construction Reserves	\$ 2,550,000	\$ 2,550,000	\$ 2,550,000

2.6 TRANSFERS

The Water and Recycled Water Utilities will each conduct two transfers over the Study period from their respective Operating Funds and other funds. The other funds consist of the Rate Stabilization Fund and Construction Fund. Since these transfers do not represent direct operating expenses for either

enterprise, Black & Veatch includes these costs as “below-the-line” cash flow items and does not include them as O&M expenses.

Table 2-9, Lines 21 and 22 for the Water Utility and Table 2-10, Lines 16 and 17 for Recycled Water Utility summarize these associated amounts, respectively. The following are a brief description of the transfers.

- Rate Stabilization Fund transfers represent funds to a reserve fund. See Section 2.7 for further explanation.
- Construction Fund transfers represent funds to cover planned CIP project expenditures.
- Pension Fund transfer represent funds to cover future pension obligations.

2.7 RESERVES

A utility typically establishes reserves for several reasons such as covering shortfalls in operating revenues, maintaining strong bond ratings, covering day-to-day operating costs, and easing the burden on ratepayers associated with large rate increases. Per the reserve level recommendations, the Water and Recycled Water Utilities will maintain the following four reserves:

- Operating Reserve represents working capital maintained by the Operating Fund to cover day-to-day expenses and maintain sufficient funds to cover accounts receivables if there are supplier issues, periods of lower than expected water sales, or unforeseen cost increases. The reserve will maintain a minimum balance of 90 days of operating expenses, once fully funded
- Construction Reserve represents funds used for unforeseen and unbudgeted capital costs. Once fully funded, this reserve will maintain a minimum balance of 12-months of the following year’s planned CIP.
- Rate Stabilization Reserve represents funds used to absorb revenue shortfall due to short-term decreases in water sales. The reserve will maintain a minimum balance of 10% of water and recycled water sales revenue when fully funded. This reserve stabilizes water and recycled water rate revenue and is an effort to avoid wide swings in rates charged to customers over time.
- Pension Reserve represents funds used to pay for the unfunded pension liabilities and the increase in the City’s share of pension costs due to factors such as higher CalPERS rates and negotiated pay increases. The reserve target is \$3.0M for the Water Utility and \$150,000 for the Recycled Water Utility by FY 2030.

Regardless of the type of reserve, appropriate reserve levels help the Water and Recycled Water Utilities attain and keep better bond ratings, which in turn, leads to lower borrowing costs.

2.8 PROJECTED OPERATING RESULTS

The revenue requirements of the Water and Recycled Water Utilities consist of O&M expenses, debt service, capital expenditures, and reserve requirements.

In order to fully understand the current condition of the Water and Recycled Water Utilities, it was important to examine the cash flow projections under the status quo scenario. In this scenario, the Water and Recycled Water Utilities would not impose any revenue increases over the Study Period and continue

to incur O&M expenses, pay for the execution of the planned CIP, and transfer to reserves. As shown in Figures 2-2 and 2-3, the status quo conditions would project that the Water and Recycled Water Utilities would operate from an annual deficit position, thus tapping into their respective reserves. By FY 2022, both Operating Funds would be below the target.

Figure 2-2 Status Quo Operating Cash Flow (Water)

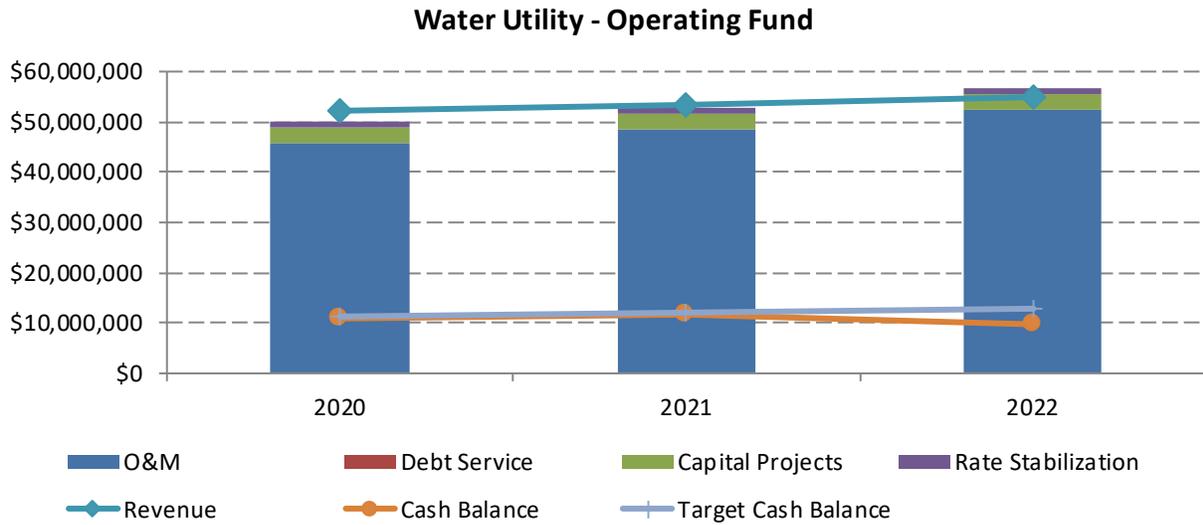
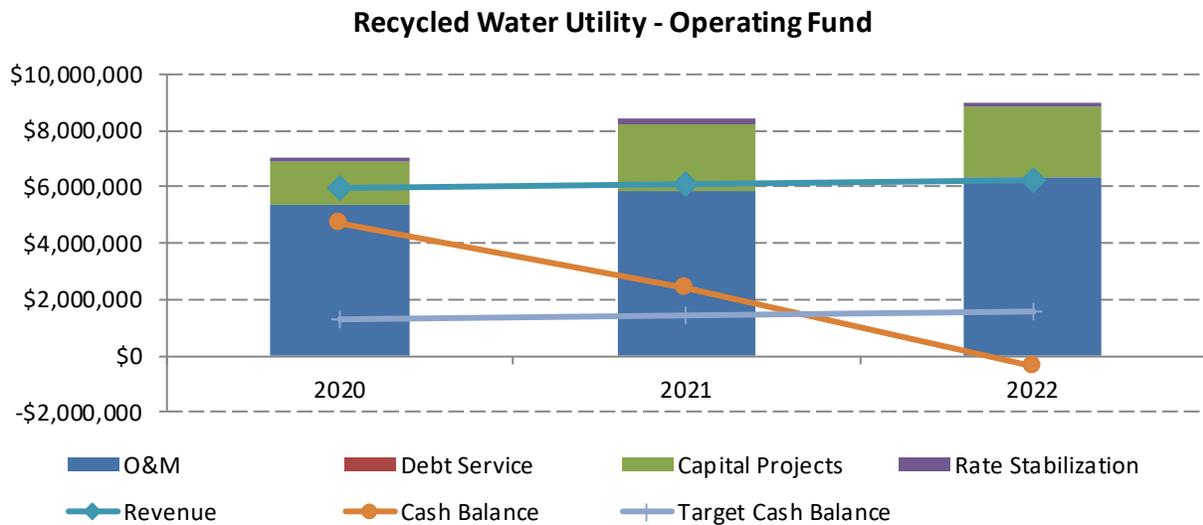


Figure 2-3 Status Quo Operating Cash Flow (Recycled Water)



To help the Water and Recycled Water Utilities maintain healthy positions, it is recommended to implement the revenue increases as shown in Table 2-9 and Table 2-10. The revenue increases represent the overall total revenue adjustment needed to meet revenue requirements. The revenue adjustment does not represent adjustments to the individual rates but reflects the overall level of revenue needed to meet the Water and Recycled Water Utilities' obligations.

The suggested revenue increases help the Water and Recycled Water Utilities meet the following goals:

- Meet budgeted operating obligations in the three FY's.
- Meet planned capital investments in the three FY's.
- Maintain an operating reserve of 90 days of operating expenses.
- Maintain construction reserve of 12-months of next year's CIP.
- Establish a rate stabilization reserve of 10% of rate revenues.

Shown in Tables 2-9 and 2-10 is a summary of the proposed Operating Funds for the Study Period. The Operating Funds consists of two parts: 1) Revenue and 2) Revenue Requirements.

Revenue

- Line 1 is the revenue under existing rates.
- Lines 2 through 4 is the additional revenue generated from the required annual revenue increases. The additional revenue generated is a direct reflection of the number of months the increase is effective for, and therefore amount might calculate at less than that stated amount.
- Line 6 is the total revenue generated from user charges.
- Line 14 for the Water Utility and Line 9 for the Recycled Water Utility represent other operating revenues.
- Line 15 for the Water Utility and Line 10 for the Recycled Water Utility represent total revenues for the enterprises.

Revenue Requirements

- Line 17 for the Water Utility and Line 12 for the Recycled Water Utility represent O&M expenses. The O&M expenses include water production and water purchase.
- Line 20 for the Water Utility and Line 15 for the Recycled Water Utility represent debt service payments. The City has no debt on the books.
- Line 25 for the Water Utility and Line 19 for the Recycled Water Utility represent transfers. The transfers include money to the Rate Stabilization Fund, Other Fund, Pension Fund and Construction Fund.
- Line 26 for the Water Utility and Line 20 for the Recycled Water Utility represent total revenue requirements for the enterprises.

Lines 29 for the Water Utility and Line 23 for the Recycled Water Utility represent the net cumulative cash balance within the Operating Funds. The net cumulative cash balance intends to match, to the extent possible, Line 30 for the Water Utility and Line 24 for the Recycled Water Utility. The reserve target minimum is 90 days of O&M expenses. The cash balance reserve is required to ensure the Operation Fund can continue in the event of a supplier interruption, market price fluctuations of critical equipment or supplies or an abrupt drop in account receivables.

Table 2-9 Operating Fund (Water)

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
Revenue				
Rate Revenue				
1	Revenue from Existing Rates	50,693,900	52,151,500	53,652,900
	Year Months Effective Rate Adj			
2	FY 2020 12 3.25%	1,647,600	1,694,900	1,743,700
3	FY 2021 12 3.25%		1,750,000	1,800,400
4	FY 2022 12 3.25%			1,858,900
5	Increased Revenue Due to Adjustments	1,647,600	3,444,900	5,403,000
6	Subtotal Rate Revenue	\$ 52,341,500	\$ 55,596,400	\$ 59,055,900
Other Operating Revenue				
7	Solar System Maintenance	73,600	73,600	73,600
8	Water System Maintenance	41,100	41,100	41,100
9	Water Construction	0	0	0
10	Water System Operations	0	0	0
11	Administration Design	1,086,600	1,098,000	1,109,600
12	Water Quality	0	0	0
13	Water Resources	70,500	70,500	70,500
14	Subtotal Other Operating Revenue	\$ 1,271,800	\$ 1,283,200	\$ 1,294,800
15	Total Revenue	\$ 53,613,300	\$ 56,879,600	\$ 60,350,700
Revenue Requirements				
Operating & Maintenance				
16	O&M Expenses	45,809,600	48,531,800	52,390,700
17	Subtotal O&M	\$ 45,809,600	\$ 48,531,800	\$ 52,390,700
Debt Service				
18	Existing Revenue Bonds	0	0	0
19	Proposed Revenue Bonds	0	0	0
20	Total Debt Service	\$ -	\$ -	\$ -
Transfers				
21	Transfer to Rate Stabilization Fund	1,225,000	1,225,000	1,225,000
22	Transfer to Other Fund	582,700	0	0
23	Transfer to Pension Fund	997,100	199,400	199,400
24	Transfer to Water Construction Fund	3,000,000	3,000,000	3,000,000
25	Total Transfers	\$ 5,804,800	\$ 4,424,400	\$ 4,424,400
26	Total Revenue Requirements	\$ 51,614,400	\$ 52,956,200	\$ 56,815,100
27	Net Annual Cash Balance	1,998,900	3,923,400	3,535,600
28	Beginning Fund Balance	9,483,700	11,482,600	15,406,000
29	Net Cumulative Fund Balance	\$ 11,482,600	\$ 15,406,000	\$ 18,941,600
30	Minimum Operating Reserves (90 Days)	\$ 11,295,500	\$ 11,966,700	\$ 12,918,300

Table 2-10 Operating Fund (Recycled Water)

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
Revenue				
Rate Revenue				
1	Revenue from Existing Rates	5,807,000	5,922,700	6,040,800
	Year Months Effective Rate Adj			
2	FY 2020 12 8.60%	499,400	509,400	519,500
3	FY 2021 12 8.60%		553,200	564,200
4	FY 2022 12 8.60%			612,700
5	Increased Revenue Due to Adjustments	499,400	1,062,600	1,696,400
6	Subtotal Rate Revenue	\$ 6,306,400	\$ 6,985,300	\$ 7,737,200
Other Operating Revenue				
7	System Maintenance	85,000	86,700	88,400
8	South Bay Water Recycling System Maintenance	95,000	95,000	95,000
9	Subtotal Other Operating Revenue	\$ 180,000	\$ 181,700	\$ 183,400
10	Total Revenue	\$ 6,486,400	\$ 7,167,000	\$ 7,920,600
Revenue Requirements				
Operating & Maintenance				
11	O&M Expenses	5,395,300	5,837,200	6,317,000
12	Subtotal O&M	5,395,300	5,837,200	6,317,000
Debt Service				
13	Existing Revenue Bonds	0	0	0
14	Proposed Revenue Bonds	0	0	0
15	Total Debt Service	0	0	0
Transfers				
16	Transfer to Rate Stabilization Fund	158,000	158,000	158,000
17	Transfer to Pension Fund	49,100	9,800	9,800
18	Transfer to Recycled Water Const Fund	1,500,000	2,400,000	2,500,000
19	Total Transfers	1,707,100	2,567,800	2,667,800
20	Total Revenue Requirements	\$ 7,102,400	\$ 8,405,000	\$ 8,984,800
21	Net Annual Cash Balance	(616,000)	(1,238,000)	(1,064,200)
22	Beginning Fund Balance	5,748,500	5,132,500	3,894,500
23	Net Cumulative Fund Balance	\$ 5,132,500	\$ 3,894,500	\$ 2,830,300
24	Minimum Operating Reserves (90 Days)	\$ 1,330,300	\$ 1,439,300	\$ 1,557,600

Figure 2-4 presents the proposed Water Utility Operating Fund, and Figure 2-5 presents the Recycled Water Utility Operating Fund.

Figure 2-4 Water Operating Cash Flow

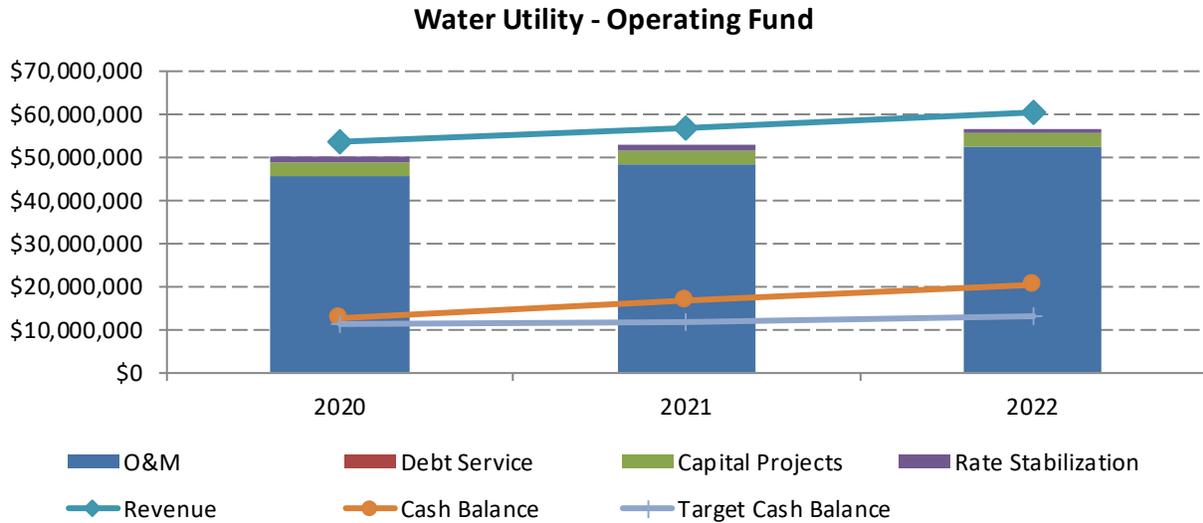
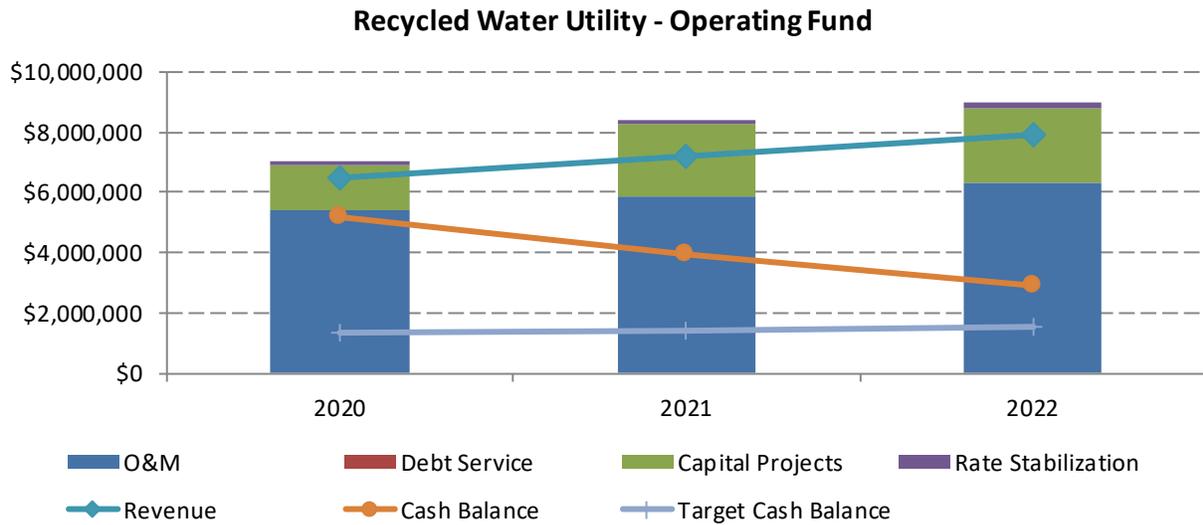


Figure 2-5 Recycled Water Operating Cash Flow



3 Cost of Service Analysis

Cost of Service analysis requires recovery of the City's needed revenues from rates for water and recycled water service, which are allocated to customer classes according to the service rendered. An equitable rate structure allocates the capture of revenue requirements to customer classes based on the quantity of water consumed; peak flows, the number of customer connections and other relevant factors.

In analyzing the Water and Recycled Water Utility cost of service for allocation to its customer classes, Black & Veatch selected the annual revenue requirements for FY 2020 as the Test Year (TY) requirements to demonstrate the development of cost-of-service water and recycled water rates. Table 3-1 summarizes the total costs of service that needs to be recovered from water user rates, and Table 3-2 summarizes the total costs of service that needs to be recovered from recycled water user rates. Both tables represent TY 2020.

Table 3-1 Cost of Service Revenue from Rates (Water)

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		(\$)	(\$)	(\$)
Revenue Requirements				
1	O&M Expenses	45,809,600	0	45,809,600
2	Debt Service	0	0	0
3	Transfers	1,807,700	3,000,000	4,807,700
4	Subtotal	47,617,300	3,000,000	50,617,300
Less Revenue Requirements Met from Other Sources				
5	Solar System Maintenance	73,600	0	73,600
6	Water System Maintenance	41,100	0	41,100
7	Water Construction	0	0	0
8	Water System Operations	0	0	0
9	Administration Design	1,086,600	0	1,086,600
10	Water Quality	0	0	0
11	Water Resources	70,500	0	70,500
12	Subtotal	1,271,800	0	1,271,800
Adjustments				
13	Adjustment for Annual Cash Balance	(2,996,000)	0	(2,996,000)
14	Adjustment to Annualize Rate Increase	0	0	0
15	Subtotal	(2,996,000)	0	(2,996,000)
16	Cost of Service to be Recovered from Rates	\$ 49,341,500	\$ 3,000,000	\$ 52,341,500

Table 3-2 Cost of Service Revenue from Rates (Recycled Water)

Line No.	Description	Operating Expense (\$)	Capital Cost (\$)	Total Cost (\$)
Revenue Requirements				
1	O&M Expenses	5,395,300	0	5,395,300
2	Debt Service	0	0	0
3	Transfers	207,100	1,500,000	1,707,100
4	Subtotal	5,602,400	1,500,000	7,102,400
Less Revenue Requirements Met from Other Sources				
5	System Maintenance	85,000	0	85,000
6	South Bay Water Recycling System Maintenance	95,000	0	95,000
7	Subtotal	180,000	0	180,000
Adjustments				
8	Adjustment for Annual Cash Balance	616,000	0	616,000
9	Adjustment to Annualize Rate Increase	0	0	0
10	Subtotal	616,000	0	616,000
11	Cost of Service to be Recovered from Rates	\$ 4,806,400	\$ 1,500,000	\$ 6,306,400

Shown in Line 4 is the total revenue requirement that corresponds with Table 2-9, Line 24 and Table 2-10, Line 19. To derive the net revenue requirement recovered via rates, it is necessary to deduct revenues from other sources as shown in Line 12 for the Water Utility and Line 7 for the Recycled Water Utility.

Line 13 for the Water Utility and Line 8 for the Recycled Water Utility represent the net annual cash balance during the TY. If the enterprise is drawing down funds already in the Operating Fund, then this number is positive. The number will be negative if the enterprise is replacing funds. In the case of the Water Utility, the \$2.0M figure indicates that the forecast is projecting a positive cash balance for the year. In the case of the Recycled Water Utility, the \$616k figure indicates that the forecast is projecting a negative cash balance for the year.

Since the City expects to implement the revenue adjustment starting in July 2019, the final cost of service recovered from rates does not require an adjustment. Therefore, Line 14 for the Water Utility and Line 9 for the Recycled Water Utility represents almost no additional revenues generated. The minimal amount represented is due to rounding in the Operating Fund.

3.1 FUNCTIONAL COST COMPONENTS

The first step in conducting a cost-of-service analysis involves analyzing the cost of providing water and recycled water service by system function to properly allocate the costs to the various customer classes and subsequently design rates. As a basis for allocating costs of service among customer classes, the study separates costs into the following four basic functional cost components: (1) "Base"; (2) "Extra Capacity"; (3) "Customer"; and (4) "Direct Assignment," described as follows:

- Base costs represent operating and capital costs of the system associated with service to customers to the extent required under constant or average annual load conditions without the elements necessary to meet water consumption variations or peak demands.
- Extra Capacity costs represent those operating and capital costs incurred in meeting peaking demands. Peaking demands represent water consumption in excess of the average rate of use.
- Customer costs are those expenditures that tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting and accounting, and maintenance and capital costs associated with meters and services.
- Directly assigned costs are costs specifically identified as those incurred to serve specific customers. These costs include fire protection and cross connections for the Water Utility. The Recycled Water Utility has no direct assigned categories.

3.2 ALLOCATION TO COST COMPONENTS

The next step of the cost-of-service process involves allocating each element of cost to functional cost components based on the parameter or parameters having the most significant influence on the magnitude of that element of cost. O&M expenses are allocated directly to appropriate cost components. A detailed allocation of related capital investment is used as a proxy for allocating capital and replacement costs. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers based on their respective responsibilities for each type of service.

3.2.1 System Base, Max Day, and Max Hour Allocations

The water and recycled water systems consist of various facilities, each designed and operated to fulfill a given function. For the systems to provide adequate service to its customers, it must be capable of meeting not only the annual volume requirements, but also the maximum demand rates placed on the system. Because not all customers and types of customers exert maximum demand at the same time, the capacities of the various facilities must meet the maximum coincidental demand of all classes of customers. Each water and recycled water service facility within the systems has an underlying average demand, exerted by the customers for whom the base cost component applies. For those facilities designed solely to meet average day demand, 100% of the costs go to the base cost component. Extra capacity requirements associated with coincidental demands in excess of average use consist of maximum daily and maximum hourly demand subcomponents.

For volume-related cost allocations, the first step in determining the allocation percentages is to assign system peaking factors. The base element is equal to the average daily demand (ADD) and assigned a value of 1.0. Based on the City's 2002 Water Master Plan, the Water Utility's maximum day (max day) demand is 1.5 times the ADD. Thus, the max day factor is assigned a value of 1.5. The maximum hourly (max hour) demand is 1.8 times the ADD. Thus, the max hour factor is assigned a value of 1.8. Black & Veatch used these same peaking factors for the Recycled Water Utility.

The costs associated with facilities required to meet maximum day demand are allocable to base and maximum day extra capacity as follows:

- Base = $(1.0/1.5) \times 100 = 66.7\%$
- Max Day = $(1.5 - 1.0)/1.5 \times 100 = 33.3\%$

These calculations indicate that the average or base use requires 66.7% of the capacity of facilities designed and generated to meet maximum day demand and the remaining 33.3% meets maximum day extra capacity requirements.

The costs associated with facilities required to meet maximum hour demand are allocable to base, maximum day extra capacity and maximum hour extra capacity as follows:

- Base = $(1.0/1.8) \times 100 = 55.6\%$
- Max Day = $(1.5 - 1.0)/1.8 \times 100 = 27.7\%$
- Max Hour = $(1.8 - 1.5)/1.8 \times 100 = 16.7\%$

3.2.2 Allocation of Operating and Maintenance (O&M) Expenses

In the allocation of O&M expenses for Test Year (2020), costs are directly allocated to the cost components to the extent possible. The Water and Recycled Water Utilities book operating costs by functional categories. Therefore, Black & Veatch used the factors noted in Section 3.1 to allocate the operating expenses to the cost components. The study based the allocation of Administration and Transfer cost elements on the average of all other costs. Tables 3-3 and 3-5 represent the allocation of O&M to the cost components. Next, revenues are subtracted from other sources as shown in Table 3-1 and 3-2, Lines 12 and 15 for the Water Utility and the analysis deducts any drawdown of available cash balances and normalizes the rate adjustments for a full year as shown in Lines 7 and 10 for the Recycled Water Utility to determine the net O&M costs for each utility. The direct assignment represents fire protection and cross connections for the Water Utility.

3.2.3 Allocation of Capital Investments

In the allocation of capital investment for Test Year (2020), the existing fixed assets (which serve as a proxy for the current capital investments) are allocated directly to cost components to the extent possible. The allocation of costs into the costs components provides a basis for annual investment in water and recycled water system facilities. Tables 3-4 and 3-6 show the total allocation of existing system investment serving water and recycled water customers. The total net system investment of \$41.8M shown on Line 11 for the Water Utility and \$1.2M in Line 9 for the Recycled Water Utility represents the Test Year original cost less accumulated depreciation of the system in service. The total net system investment reflects the Water and Recycled Water Utilities fixed asset listing ending June 30, 2016. This value represents book value of the assets. Using the distribution of total net system investment across the functional cost components, planned capital costs can then be allocated.

Table 3-3 Allocation of O&M Expenditures (Water)

Line No.	Description	Total Costs	Common to All Customers					Fire Protection	Cross Connection
			Base	Extra Capacity		Customer			
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.		
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
Water Utility									
Operating Expenses									
	1532 Solar System Maintenance	271,500	0	0	0	271,500	0	0	0
1	1422 Water System Maintenance								
2	Customer Service	245,200	0	0	0	0	245,200	0	0
3	Backflow Prevention	807,200	0	0	0	0	0	0	807,200
4	All Other	724,400	395,700	200,800	120,700	0	0	7,200	0
	1423 Water Construction	3,671,300	2,005,300	1,017,400	611,900	0	0	36,700	0
5	1424 Water System Operations								
6	Generation & Pumping	886,600	582,900	294,800	0	0	0	8,900	0
7	Customer Billing & Meter Reading	738,100	0	0	0	0	738,100	0	0
8	Meters	270,100	0	0	0	270,100	0	0	0
	Hydrants	1,022,000	0	0	0	0	0	1,022,000	0
9	All Other	4,946,200	2,701,600	1,370,700	824,400	0	0	49,500	0
10	1411 Administration Design	3,562,000	2,461,100	243,100	131,300	456,500	82,900	119,000	68,100
11	1412 Water Quality	298,100	244,400	0	0	50,700	0	3,000	0
12	1413 Water Resources								
	Water Purchase	27,794,900	22,791,900	0	0	4,725,100	0	277,900	0
13	All Other	572,100	469,100	0	0	97,300	0	5,700	0
14	Transfers	2,804,800	1,937,900	191,400	103,400	359,500	65,300	93,700	53,600
15	Total O&M Expenses	\$ 48,614,500	\$ 33,589,900	\$ 3,318,200	\$ 1,791,700	\$ 6,230,700	\$ 1,131,500	\$ 1,623,600	\$ 928,900
Less Other Revenue									
16	Miscellaneous Revenues	1,271,800	878,700	86,800	46,900	163,000	29,600	42,500	24,300
17	Other Adjustments	(1,998,900)	(1,381,100)	(136,400)	(73,700)	(256,200)	(46,500)	(66,800)	(38,200)
18	Net Operating Expenses	\$ 49,341,600	\$ 34,092,300	\$ 3,367,800	\$ 1,818,500	\$ 6,323,900	\$ 1,148,400	\$ 1,647,900	\$ 942,800

Table 3-4 Allocation of Capital Costs (Water)

Line No.	Description	Total Costs	Common to All Customers					Fire Protection	Cross Connection
			Base	Extra Capacity		Customer			
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.		
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	
Water Utility									
Plant Assets									
1	Water Production	9,771,900	8,013,000	0	0	1,661,200	0	97,700	0
2	Pumping	1,868,200	1,228,200	621,300	0	0	0	18,700	0
3	Treatment	879,400	578,100	292,500	0	0	0	8,800	0
4	Transmission & Distribution	20,761,500	11,339,900	5,753,700	3,460,300	0	0	207,600	0
5	Meters & Services	6,275,900	0	0	0	6,275,900	0	0	0
6	Fire Hydrants	532,300	0	0	0	0	0	532,300	0
7	General Plant	1,734,900	915,800	288,500	149,700	343,500	0	37,400	0
8	Total Plant Assets	\$ 41,824,100	\$ 22,075,000	\$ 6,956,000	\$ 3,610,000	\$ 8,280,600	\$ 0	\$ 902,500	\$ 0
Less Other Revenue									
9	Miscellaneous Revenues	0	0	0	0	0	0	0	0
10	Other Adjustments	0	0	0	0	0	0	0	0
11	Net Capital Expenses	\$ 41,824,100	\$ 22,075,000	\$ 6,956,000	\$ 3,610,000	\$ 8,280,600	\$ 0	\$ 902,500	\$ 0

Table 3-5 Allocation of O&M Expenditures (Recycled Water)

Line No.	Description	Total Costs	Common to All Customers				
			Base	Extra Capacity		Customer	
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Recycled Water Utility							
Operating Expenses							
1	1522 System Maintenance						
2	Water Purchase	4,411,600	4,411,600	0	0	0	0
3	Customer Billing & Meter Reading	4,200	0	0	0	0	4,200
4	Meters	318,300	0	0	0	318,300	0
5	All Other	317,500	176,600	88,000	52,900	0	0
6	1525 South Bay Water Recycling System Mai	343,700	229,400	114,300	0	0	0
7	Transfers	207,100	184,900	7,800	2,000	12,200	200
8	Total O&M Expenses	\$ 5,602,400	\$ 5,002,500	\$ 210,100	\$ 54,900	\$ 330,500	\$ 4,400
Less Other Revenue							
9	Miscellaneous Revenues	180,000	160,800	6,700	1,800	10,600	100
10	Other Adjustments	616,000	550,100	23,100	6,000	36,300	500
11	Net Operating Expenses	\$ 4,806,400	\$ 4,291,600	\$ 180,300	\$ 47,100	\$ 283,600	\$ 3,800

Table 3-6 Allocation of Capital Costs (Recycled Water)

Line No.	Description	Total Costs	Common to All Customers				
			Base	Extra Capacity		Customer	
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Recycled Water Utility							
Plant Assets							
1	Water Production	0	0	0	0	0	0
2	Pumping	0	0	0	0	0	0
3	Treatment	0	0	0	0	0	0
4	Transmission & Distribution	1,181,600	657,200	327,500	196,900	0	0
5	Meters	0	0	0	0	0	0
6	Total Plant Assets	\$ 1,181,600	\$ 657,200	\$ 327,500	\$ 196,900	\$ 0	\$ 0
Less Other Revenue							
7	Miscellaneous Revenues	0	0	0	0	0	0
8	Other Adjustments	0	0	0	0	0	0
9	Net Capital Expenses	\$ 1,181,600	\$ 657,200	\$ 327,500	\$ 196,900	\$ 0	\$ 0

3.3 UNITS OF SERVICE

Following the allocation of costs, the total cost responsibility for each customer class is developed using unit costs of service for each cost function and subsequently assigning those costs to the customer classes based on the respective service requirements of each. To properly recognize the cost of service, each customer class receives its share of base, maximum day, peak hour, and customer costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories.

Table 3-7 summarizes the estimated Test Year (2020) units of service for the various customer classes. Base costs vary with the volume of water consumed and distributed to customer classes on that basis. Extra Capacity costs are those associated with meeting peak demand rates of water use and distributed to customer classes based on the respective class capacity requirements in excess of average rates of use. Black & Veatch followed the capacity factor methodology outlined in Appendix A of the AWWA M1 Manual to derive peak consumption information from the monthly consumption records in the City's Customer Information System (CIS) which helps provide the basis for estimating maximum day and peak hour ratios. The number of bills for each customer class serves as the basis for distributing customer billing requirements. Customer meter requirements are allocated based on the number of equivalent meters serving each customer class. The estimated number of equivalent meters for each customer class relies on the total number of various sizes of meters serving respective classes and the ratio of the cost of meters for the various sizes to the cost of 5/8 x 3/4 inch meter. The equivalent meter ratios adopted in this analysis are consistent with those established in AWWA M1 Manual. Private fire protection costs allocations use equivalent fire hydrants.

3.4 COST OF SERVICE ALLOCATIONS

To determine the cost of service for each customer class, the study applies the unit costs of service to each customer classes' respective service requirements. The total unit costs of service applied to the respective requirements for each customer class results in the total cost of service for each customer class.

3.4.1 Units Costs of Service

The Test Year (2020) unit cost of service for each functional cost component is simply the total cost divided by the applicable units of service as shown in Tables 3-8 and 3-10. On Line 4, the total costs represent the cost that rates need to recover shown as demonstrated in Table 3-1, Line 16 for the Water Utility and Table 3-2, Line 11 for the Recycled Water Utility. The net O&M cost includes O&M (which includes water purchase) less revenue from other sources and adjustments. The total capital cost includes debt service payments and transfers to the Construction Fund. Line 6 represents the unit costs for the entire water and recycled water systems regardless of customer classes. After that, the unit costs are used to allocate the costs to the specific customer classes.

3.4.2 Distribution of Costs of Service to Customer Classes

Applying the unit costs to the units for each customer class produces the customer class costs. This process is illustrated in Table 3-9 and 3-11, in which unit costs are applied to the customer class units of service for Test Year (2020). The costs attributable to each customer class reflect the functional costs

components described in Section 3.1. Each customer class places a burden on the system in different ways and thus the allocation of the units is representative of this burden.

An example of the application of unit costs is shown below for illustrative purposes.

	Base Component
Unit Cost (Table 3-8, Line 6)	\$ 4.53 per HCF
General Customer Consumption (Table 3-9, Line 2)	7,876,453 HCF
Total Allocated Cost	\$ 35,675,800

Please note that the numbers within the tables are rounded, yet the calculations are done based on non-rounded values; therefore, results might vary.

Table 3-7 Units of Service (Water and Recycled Water)

Line No.	Description	Consumption		Maximum Day			Maximum Day			Meters	Cust/Bills	Fire Protection	Cross Connection
		Annual	Avg. Day	Factor	Total	Extra	Factor	Total	Extra				
	Column Reference	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
	Units of Measure	(HCF)	(HCF/day)		(HCF/day)	(HCF/day)		(HCF/day)	(HCF/day)	(EMs)	(bills)	(EHs)	(EMs)
Water Utility													
1	General Customer	7,876,453	21,579	200%	43,159	21,579	260%	56,106	12,948	46,330	328,996	0	0
2	Subtotal	7,876,453	21,579		43,159	21,579		56,106	12,948	46,330	328,996		
Fire Service													
3	Public Fire	0	0		576	576		4,611	4,035	0	0	3,501	0
4	Private Fire	0	0		266	266		2,127	1,861	0	14,497	1,615	0
5	Subtotal	0	0		842	842		6,738	5,896	0	14,497	5,116	0
Cross Connection													
6	Cross Connection										31,272	0	6,924
7	Subtotal	0	0		0	0		0	0	0	31,272	0	6,924
8	Total Water System	7,876,453	21,579		44,001	22,422		62,844	18,843	46,330	374,765	5,116	6,924
Recycled Water Utility													
9	General Customer	1,736,830	4,758	200%	9,517	4,758	260%	12,372	2,855	2,245	3,119	0	0
10	Subtotal	1,736,830	4,758		9,517	4,758		12,372	2,855	2,245	3,119	-	-

Table 3-8 Units Cost of Service (Water)

Line No.	Description	Total Costs (\$)	Common to All Customers					Fire Protection (\$)	Cross Connection
			Base	Extra Capacity		Customer			
			Base (\$)	Max. Day (\$)	Max. Hour (\$)	Meters (\$)	Cust./Bill. (\$)		
Water Utility									
1	Net Operating Expense	49,341,500	34,092,200	3,367,800	1,818,500	6,323,900	1,148,400	1,647,900	942,800
2	Debt Service	0	0	0	0	0	0	0	0
3	Capital Costs	3,000,000	1,583,500	498,900	258,900	594,000	0	64,700	0
4	Total Cost of Service	\$ 52,341,500	\$ 35,675,700	\$ 3,866,700	\$ 2,077,400	\$ 6,917,900	\$ 1,148,400	\$ 1,712,600	\$ 942,800
5	Units of Service (Total)		7,876,453	22,422	18,843	46,330	374,765	5,116	6,924
			HCF	HCF/Day	HCF/Day	Eq. Meters	Bills	Eq. Hydrants	Eq. Meters
6	Cost per Unit		\$ 4.53	\$ 172.45	\$ 110.25	\$ 149.32	\$ 3.06	\$ 334.78	\$ 136.16
			per HCF	per HCF/Day	per HCF/Day	per Eq. Meter	per Bill	per Eq. Hydrant	per Eq. Meter

Table 3-9 Distribution of Costs to Customer Classes (Water)

Line No.	Description	Total Costs (\$)	Common to All Customers					Fire Protection (\$)	Cross Connection
			Base	Extra Capacity		Customer			
			Base (\$)	Max. Day (\$)	Max. Hour (\$)	Meters (\$)	Cust./Bill. (\$)		
Water Utility									
General Customer									
1	Units		7,876,453	21,579	12,948	46,330	328,996	0	0
2	Allocation of costs of service	48,750,800	35,675,700	3,721,500	1,427,500	6,917,900	1,008,200	0	0
Public Fire									
3	Units		0	576	4,035	0	0	3,501	0
4	Allocation of costs of service	1,716,300	0	99,400	444,800	0	0	1,172,100	0
Private Fire									
5	Units		0	266	1,861	0	14,497	1,615	0
6	Allocation of costs of service	835,800	0	45,800	205,100	0	44,400	540,500	0
Cross Connection									
7	Units		0	0	0	0	31,272	0	6,924
8	Allocation of costs of service	1,038,600	0	0	0	0	95,800	0	942,800
7	TOTAL COSTS OF SERVICE	\$ 52,341,500	\$ 35,675,700	\$ 3,866,700	\$ 2,077,400	\$ 6,917,900	\$ 1,148,400	\$ 1,712,600	\$ 942,800

Table 3-10 Units Cost of Service (Recycled Water)

Line No.	Description	Total Costs	Common to All Customers				
			Base	Extra Capacity		Customer	
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Recycled Water Utility							
1	Net Operating Expense	4,806,400	4,291,600	180,300	47,100	283,600	3,800
2	Debt Service	0	0	0	0	0	0
3	Capital Costs	1,500,000	834,300	415,700	250,000	0	0
4	Total Cost of Service	\$ 6,306,400	\$ 5,125,900	\$ 596,000	\$ 297,100	\$ 283,600	\$ 3,800
5	Units of Service (Total)		1,736,830	4,758	2,855	2,245	3,119
			HCF	HCF/Day	HCF/Day	Eq. Meters	Bills
6	Cost per Unit		\$ 2.95	\$ 125.25	\$ 104.06	\$ 126.32	\$ 1.22
			per HCF	per HCF/Day	per HCF/Day	per Eq. Meter	per Bill

Table 3-11 Distribution of Costs to Customer Classes (Recycled Water)

Line No.	Description	Total Costs	Common to All Customers				
			Base	Extra Capacity		Customer	
			Base	Max. Day	Max. Hour	Meters	Cust/Bill.
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Recycled Water Utility							
General Customer							
1	Units		1,736,830	4,758	2,855	2,245	3,119
2	Allocation of costs of service	6,306,400	5,125,900	596,000	297,100	283,600	3,800
3	TOTAL COSTS OF SERVICE	\$ 6,306,400	\$ 5,125,900	\$ 596,000	\$ 297,100	\$ 283,600	\$ 3,800

4 Rate Design

The initial consideration in the derivation of rate schedules for water and recycled water service is the establishment of equitable charges to the customers commensurate with the cost of providing that service. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify rate adjustments by considering additional factors such as the extent of bill impacts, existing contracts, and historical local policies and practices.

4.1 EXISTING RATES

The Water and Recycled Water Utilities' existing rates consist of a fixed component in the form of minimum monthly service charge and a variable component in the form of a consumption charge. The minimum monthly service charge is based on meter size and applied when consumption does not exceed the consumption allowance. The consumption charge is based on units of consumption (1 unit = 1 HCF = 748 gallons). The City has separate fixed charges for fire services and cross connections. Table 2-3 presented earlier in this report summarized the existing water and recycled water rates.

4.2 PROPOSED RATES

The cost of service analysis described in preceding sections of this report provides a basis for the design of water and recycled water rates.

4.2.1 Monthly Service Charge

The minimum monthly service charge recovers a portion of the costs associated with wholesale water purchase, meter maintenance and services, meter reading, bill issuance, and maintenance and capacity costs associated with public fire protection regardless of the level of water consumed. Black & Veatch used meter ratios based on maximum operating capacities by meter size as shown in AWWA M1, Table B-1, which recognizes that as meter size increases, so does the capacity. For example, customers with a 4" meter expects to be able to use more water (at a higher flow capacity) than customers with a ¾" meter. Consequently, the City's water system must maintain assets sized accordingly and capable of providing customers the level of service expected from their meter connection when the tap turns on.

The minimum monthly service charge structure will continue to assume an approximate allowance for consumption. The allowance is designed to provide a minimum quantity of water considered to be essential for health and safety under the World Health Organization Technical Note No. 9 guidelines. Based on these recommendations, each person should have access to at least 26.4 gallons per day (gpd) which results in approximately 3 HCF per month for an average household. Therefore, the recommended minimum monthly service charge structure incorporates the following approximate allowances.

Meter Size	Existing Allowance
	(HCF)
5/8" x 3/4"	3
1"	6
1-1/2"	9
2"	9
3"	9
4"	9
6"	9
8"	9
10"	9
12"	9

The allowances increase by approximate multiples of 3 HCF up till the 1-1/2" meter size based on expected number of residents. The meter sizes between 5/8" and 1-1/2" typically represent residential customers. Residential customers rely on City services for the minimum quantity of water to survive. Therefore the allowance is targeted at the residential customer. Non-residential customers represent commercial businesses with typical meter sizes of 2" and above. These customers typically exceed the allowance and are not dependent on water quantities to survive.

Based on the changes, Table 4-1 demonstrates the cost elements incorporated into the minimum monthly service charge for FY 2020. Table 4-2 shows the three-year fixed service charge rate schedule.

Table 4-1 Costs within the Minimum Monthly Service Charge for FY 2020

Meter Size	Meter & Public Fire Protection				Billing			Total Service Charge
	Mtr Unit Cost	FP Unit Cost	Meter Ratio	Adjusted Unit Cost	Unit Cost	Bill Ratio	Adjusted Unit Cost	
	per EM	per EM		\$	per Bill		\$	\$/Month
5/8" x 3/4"	12.44	3.09	1.00	15.53	3.06	1.00	3.06	18.59
1"	12.44	3.09	1.67	25.88	3.06	1.00	3.06	28.95
1-1/2"	12.44	3.09	3.33	51.77	3.06	1.00	3.06	54.83
2"	12.44	3.09	5.33	82.83	3.06	1.00	3.06	85.89
3"	12.44	3.09	10.67	165.65	3.06	1.00	3.06	168.72
4"	12.44	3.09	16.67	258.83	3.06	1.00	3.06	261.90
6"	12.44	3.09	33.33	517.67	3.06	1.00	3.06	520.73
8"	12.44	3.09	53.33	828.27	3.06	1.00	3.06	831.34
10"	12.44	3.09	80.00	1,242.41	3.06	1.00	3.06	1,245.47
12"	12.44	3.09	112.50	1,747.14	3.06	1.00	3.06	1,750.20

Table 4-2 Proposed Minimum Monthly Service Charge

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Minimum Monthly Meter Rates (\$/Month)			
5/8" x 3/4"	18.59	19.10	19.60
1"	28.95	29.76	30.60
1-1/2"	54.83	56.42	58.10
2"	85.89	88.40	91.10
3"	168.72	173.69	179.09
4"	261.90	269.64	278.08
6"	520.73	536.17	553.06
8"	831.34	856.00	883.03
10"	1,245.47	1,282.45	1,322.99
12"	1,750.20	1,802.18	1,859.20

4.2.2 Fire Service

The fire service charge includes costs of issuing bills, as well as maintenance and capacity costs associated with private fire protection. The fire service charge increases as pipeline diameter size increases. The Water Utility provides fire service to approximately 1,208 private fire service accounts. These customers have a water line connection to the water system that is specifically for fire protection. To meet fire protection demands, the Water Utility must design, operate, and maintain a water system that can meet peak fire demand requirements. The Water Utility charges these accounts a fire service charge based on the diameter of the line that connects their fire protection system to the water system. Table 4-3 demonstrates the costs incorporated into the fire service charge, and Table 4-4 shows the three-year rate schedule based on unit costs in future years.

Table 4-3 Costs within the Fire Service Charge for FY 2020

Meter Size	Private Fire Protection			Total Service Charge
	Unit Cost	Meter Ratio	Adjusted Unit Cost	
	per EH			\$/Month
2"	43.14	0.06	2.59	2.59
4"	43.14	0.34	14.67	14.67
6"	43.14	1.00	43.14	43.14
8"	43.14	2.13	91.89	91.89
10"	43.14	3.83	165.22	165.22
12"	43.14	6.19	267.03	267.03

Table 4-4 Proposed Fire Service Charge

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Fire Service (\$/Month)			
2"	2.59	2.69	2.76
4"	14.67	15.25	15.67
6"	43.14	44.85	46.08
8"	91.89	95.54	98.14
10"	165.22	171.78	176.47
12"	267.03	277.64	285.21

4.2.3 Cross Connection

The cross-connection charge includes costs of issuing bills and maintenance and replacement costs associated with backflow devices. The cross-connection charge increases as pipeline diameter size increases. The Water Utility provides backflow services to approximately 2,606 accounts. These customers have a backflow device that prevents possible contaminated water from entering the water system. To ensure that the devices are working properly, the Water Utility maintains and replaces the devices accordingly. The Water Utility charges the accounts a cross connection charge based on the diameter of the line that connects their service to the water system. Table 4-5 demonstrates the costs incorporated into the cross-connection charge, and Table 4-6 shows the three-year rate schedule.

Table 4-5 Costs within the Cross-Connection Charge for FY 2020

Meter Size	Cross Connection			Total Service Charge
	Unit Cost	Meter Ratio	Adjusted Unit Cost	
	per EM			\$/Month
1"	12.50	0.63	7.81	7.81
2"	12.50	1.00	12.50	12.50
3"	12.50	2.00	25.00	25.00
4"	12.50	3.13	39.06	39.06
6"	12.50	6.25	78.12	78.12
8"	12.50	10.00	124.99	124.99
10"	12.50	15.00	187.48	187.48

Table 4-6 Proposed Cross Connection Charge

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/mo	\$/mo	\$/mo
Cross Connection (\$/Month)			
1"	7.81	8.12	8.30
2"	12.50	13.00	13.28
3"	25.00	26.00	26.55
4"	39.06	40.62	41.48
6"	78.13	81.24	82.97
8"	125.00	129.98	132.75
10"	187.50	194.97	199.13

4.2.4 Consumption Charge

This consumption charge is designed to recover costs associated with the base and extra capacity demands. These costs include fixed and variable costs that are incurred by the water and recycled water system while providing the average rate of use and peaking demand use. While most of the costs are fixed in nature such personnel and direct and indirect charges, variable costs represent most of the costs through water production and water purchase. Table 4-7 shows the three-year rate schedule for both the Water and Recycled Water Utilities. The Recycled Water Utility is in the process of eliminating the industrial process, industrial process (private well) and landscape irrigation (private well). It is expected that by FY 2021, all three customer classes will merge with general customers.

Table 4-7 Proposed Consumption Charges

Customer Class	Proposed		
	FY 2020	FY 2021	FY 2022
	\$/HCF	\$/HCF	\$/HCF
Consumption Charges (\$/HCF)			
Water Utility			
General Customer	6.22	6.42	6.63
Recycled Water Utility			
General Customers	3.74	3.91	4.25
Industrial Process	3.58	3.91	4.25
Industrial Process (Private Well)	3.08	3.91	4.25
Landscape Irrigation (Private Well)	3.35	3.91	4.25

4.3 TYPICAL MONTHLY COSTS UNDER PROPOSED CHARGES

Table 4-8 and 4-9 presents a comparison of typical monthly costs under existing rates and the proposed schedule of water and recycled water user rates derived in this study.

Table 4-8 Typical Monthly Bill (Water)

Customer Class	Typical Monthly Usage (HCF)	FY 2019 Existing Rates (\$)	FY 2020 Proposed Rates (\$)
Water Utility			
General Customer	0	\$17.87	\$18.59
	3	\$17.87	\$18.59
	5	\$29.90	\$31.09
	10	\$59.80	\$62.18
	15	\$89.70	\$93.27
	20	\$119.60	\$124.36
	30	\$179.40	\$186.53
	40	\$239.20	\$248.71
	50	\$299.00	\$310.89

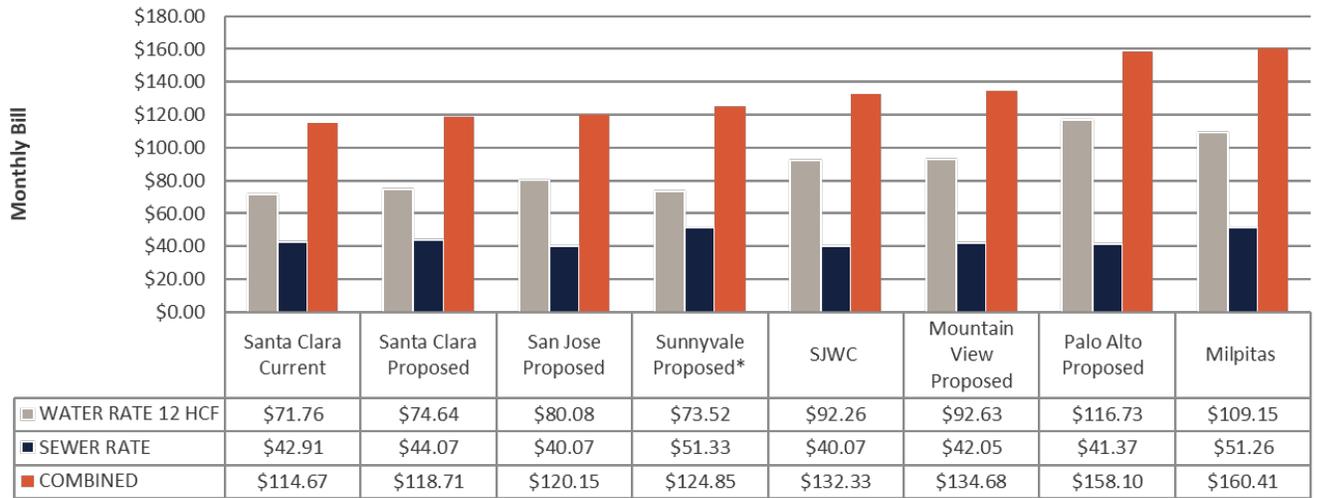
Table 4-9 Typical Monthly Bill (Recycled Water)

Customer Class	Typical Monthly Usage (HCF)	FY 2019 Existing Rates (\$)	FY 2020 Proposed Rates (\$)
Recycled Water Utility			
General Customer	0	\$17.87	\$18.59
	3	\$17.87	\$18.59
	5	\$17.90	\$17.98
	10	\$35.80	\$35.97
	15	\$53.70	\$53.95
	20	\$71.60	\$71.94
	30	\$107.40	\$107.91
	40	\$143.20	\$143.87
	50	\$179.00	\$179.84

4.4 NEIGHBORING WATER UTILITIES

Presented in Table 4-10 are the proposed rates compared to rates of neighboring cities, for a single family residential customer with a 5/8" x 3/4" meter consuming 12 units of water. Based on the comparison, the City is currently one of the lowest water providers in the area. With the proposed rate increases, the City remains the lowest water provider of the surveyed communities. All surveyed community rates are current as of May 2019.

Table 4-10 Comparison to Neighboring Water Utilities



*Sunnyvale Rates – Proposed as of May 2019

Sewer Rate Study

5 Revenue and Revenue Requirements

To meet the costs associated with providing sewer services to its customers, the Sewer Utility derives revenue from a variety of sources including sewer user charges (rates), outlet charges, conveyance fees, connection charges, interest earned from the investment of available funds, engineering fees, and other miscellaneous revenues. The Sewer Utility is also actively looking for other sources of revenue, such as grants. Black & Veatch has projected the level of future revenue generated in the Study through a combination of an analysis of historical and future system growth in terms of the number of EDUs, bills and billed sewage flow. This section also projects the expenses, or revenue requirements, necessary to operate and maintain the system, invest in capital improvements, make debt service payments and cover other expenses of the sewer system.

5.1 CUSTOMER AND WATER CONSUMPTION PROJECTIONS

5.1.1 Customer Classes

The Sewer Utility's customers include both residential and non-residential customers. The City has the following customer classes:

- Residential: Single-family residential and multi-family residential.
- Non-Residential: Amusement Parks; Auto Dealers & Service Stations; Churches; Electric & Electronic Equipment; Food & Kindred Products; Hospitals & Convalescent Homes; Industrial Chemical; Industrial Water Treatment; Laundries; Machinery Manufacturers; Metal Plating; Motels & Hotels; Paper; Repair Shops & Car Washes; Restaurants; Schools & Colleges; and Commercial/Industrial/Miscellaneous (catch-all for remainder of non-residential customers).
- Major Users: Major Users customer class is composed of major commercial and industrial users who are identified based on the following²:
 - Have a sewage discharge of at least 25,000 gallons per day (gpd); or
 - Have a daily discharge which is intermittent or irregular in strength, amount or nature.

5.1.2 Equivalent Dwelling Units (EDUs)

The City provides sewer services to over 26,600 customers. All customers generating sewage flow connect to the sewer system. Since the City bills residential customers based on EDUs, a review of historical

² City Website, Schedule S-16 Monthly Sewer Service Charges, <<http://www.santaclaraca.gov/government/departments/water-sewer-utilities/water-sewer-and-recycled-water-rates/sewer-rates>>

EDUs patterns for customers and anticipated growth within the City, the projected total number of EDUs are expected to stay relatively stable over the Study Period. An EDU represents a single family residential customer equivalent with a flow of 245 gallons per day and strengths of 250 mg/L of Biological Oxygen Demand (BOD), 250 mg/L of Total Suspended Solids (TSS) and 35 mg/L of Ammonia (NH₃). Table 5-1 summarizes the projected number of EDUs for the Sewer Utility.

Table 5-1 EDUs

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020 (EDUs)	FY 2021 (EDUs)	FY 2022 (EDUs)
1	Single Family	258,645	258,645	258,645
2	Multi Family	313,491	313,491	313,491
3	Total	572,136	572,136	572,136

5.1.3 Minimum Bills

The City bills non-residential customers primarily on sewage flow and imposes a minimum bill on these customers whose flow charges do not exceed the monthly service charge. Therefore, a review of historical minimum bills patterns for non-residential customers and anticipated growth within the City, the projected total number of minimum bills are expected to remain constant over the Study Period. The City refers to these bills as minimum monthly service bills. Table 5-2 summarizes the projected number of minimum monthly service bills for the Sewer Utility.

Table 5-2 Minimum Monthly Service Bills

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020 (Bills)	FY 2021 (Bills)	FY 2022 (Bills)
1	Amusement Parks	172	172	172
2	Auto Dealers & Service Station	567	567	567
3	Churches	416	416	416
4	Commercial/Industrial/Miscellaneous	20,548	20,548	20,548
5	Electric & Electronic Equip.	1,174	1,174	1,174
6	Food and Kindred Products	55	55	55
7	Hospitals & Convalescent Homes	521	521	521
8	Industrial Chemical	111	111	111
9	Industrial Water Treatment	0	0	0
10	Laundries	93	93	93
11	Machinery Manufacturers	1,131	1,131	1,131
12	Metal Plating	219	219	219
13	Motels & Hotels	15	15	15
14	Paper	0	0	0
15	Repair Shops & Car Washes	680	680	680
16	Restaurants	282	282	282
17	Schools & Colleges	1,378	1,378	1,378
18	Total	27,362	27,362	27,362

5.1.4 Billed Sewage Flow

The City charges all of its non-residential customers based on sewage flow, which is determined by multiplying water consumption by a return factor. In determining the projected sewage flow, Black & Veatch analyzed historical patterns of sewage flow in conjunction with a projected estimate of future water consumption. Over the past five years, water consumption has generally decreased in the City due to the implementation of conservation measures by City businesses and residents. Even with recent increases in water usage following the easing of drought restrictions, usage is still well below pre-drought levels City-wide. The decline in water consumption directly results in decreased sewer flow. While the State lifted mandatory water restrictions in April of 2017, portions of the City's Water Shortage Contingency Plan remain in effect, and City customers have made conservation a way of life. The Water Utility, therefore, expects consumption to rebound slowly. Past experience would indicate that after strict water conservation measures are lifted, the rebound in consumption is usually associated with discretionary water such as irrigation. Much of this water does not make it to the sewer system; therefore, the City projects that sewage flow will remain relatively constant over the Study period. Table 5-3 shows the projected sewage flow generated for the Study Period. The City bills sewage flow in units of hundred cubic feet (HCF) for non-residential customers.

Table 5-3 Billed Sewage Flow

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020 (HCF)	FY 2021 (HCF)	FY 2022 (HCF)
1	Amusement Parks	103,395	103,395	103,395
2	Auto Dealers & Service Station	19,669	19,669	19,669
3	Churches	22,627	22,627	22,627
4	Commercial/Industrial/Miscellaneous	1,553,939	1,553,939	1,553,939
5	Electric & Electronic Equip.	521,098	521,098	521,098
6	Food and Kindred Products	23,747	23,747	23,747
7	Hospitals & Convalescent Homes	129,053	129,053	129,053
8	Industrial Chemical	13,171	13,171	13,171
9	Industrial Water Treatment	0	0	0
10	Laundries	27,633	27,633	27,633
11	Machinery Manufacturers	44,249	44,249	44,249
12	Metal Plating	8,071	8,071	8,071
13	Motels & Hotels	59,724	59,724	59,724
14	Paper	0	0	0
15	Repair Shops & Car Washes	14,192	14,192	14,192
16	Restaurants	147,378	147,378	147,378
17	Schools & Colleges	46,609	46,609	46,609
18	Total (HCF)	2,734,555	2,734,555	2,734,555
19	Total (AF)	6,278	6,278	6,278

5.1.5 Major Users

The City charges major commercial and industrial sewer customers based on sewage flow and strength loadings. Major users are identified independently of each other as each customer places different

burdens on the sewer system. As of FY 2019, the City has one identified Major User customers. Table 5-4 shows the associated flow and loadings associated with this one customers over the Study period.

Table 5-4 Major Users

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
Major Users				
Customer 1				
Operating and Maintenance Cost Recovery				
1	Volume (MG)	106	106	106
2	BOD (1,000 lbs)	1,117	1,117	1,117
3	SS (1,000 lbs)	500	500	500
4	NH3 (1,000 lbs)	7	7	7
Annual Capital Cost Recovery				
5	Volume (MGD)	0.29	0.29	0.29
6	BOD (1,000 lbs/day)	3.06	3.06	3.06
7	SS (1,000 lbs/day)	1.37	1.37	1.37
8	NH3 (1,000 lbs/day)	0.02	0.02	0.02

5.2 REVENUE UNDER EXISTING RATES

Sewer user rates serve as the primary source of revenue for the Sewer Utility. Therefore, the level of future rate revenue is important in the development of a long-range financial plan. Rate revenue is determined by multiplying the projected system growth in terms of number of EDUs, minimum monthly service bills, billed sewage flow, and major user flow and loadings by the applicable rates to determine sewer rate revenue.

Table 5-5 shows the Sewer Utility's current schedule of charges. It is important to note that the minimum monthly service charge applies to non-residential customers that do not exceed the base amount. Therefore, the minimum monthly service charge serves a baseline cost that the City needs to recover. The City maintains a separate schedule of rates based on the customer classes identified in Section 5.1.

Table 5-5 Existing Sewer Rates

Description	Existing FY 2019
Residential	
	(\$/EDU)
Single Family	42.91
Multi-Family	42.91
Non-Residential [1]	
	(\$/HCF)
Amusement Parks	5.88
Auto Dealers & Service Station	5.90
Churches	5.26
Com/Ind/Misc	5.15
Electric & Electronic Equip.	4.65
Food and Kindred Products	11.73
Hospitals & Convalescent Homes	5.72
Industrial Chemical	8.65
Industrial Water Treatment	3.62
Laundries	5.20
Machinery Manufacturers	7.49
Metal Plating	4.25
Motels & Hotels	6.01
Paper	11.05
Repair Shops & Car Washes	5.45
Restaurants	11.90
Schools & Colleges	5.88

1. In no case shall the minimum charge be less than \$41.65 per month.

Major Commercial and Industrial Users

Annual Capital Cost Recovery	
Volume (per MGD)	1,100,633
BOD [2] (per 1,000 lbs/day)	74,512
SS [3] (per 1,000 lbs/day)	54,554
NH3 [4] (per 1,000 lbs/day)	307,527

Operating and Maintenance Cost Recovery	
Volume (per MG)	2,081.16
BOD [2] (per 1,000 lbs)	328.96
SS [3] (per 1,000 lbs)	479.88
NH3 [4] (per 1,000 lbs)	4,094.48

Table 5-6 represents a summary of projected sewer rate revenue under existing rates. As shown, the revenue generated stays flat over the Study period in conjunction with the number of EDUs, minimum bills, billed sewage flow and major user’s volume and loadings. The projected Sewer Utility revenues are a constant \$43.4M over the Study period.

Table 5-6 Projected Revenue under Existing Rates

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
1	Single Family	11,320,400	11,320,400	11,320,400
2	Multi-Family	13,720,900	13,720,900	13,720,900
3	Amusement Parks	627,600	627,600	627,600
4	Auto Dealers & Service Station	143,200	143,200	143,200
5	Churches	139,600	139,600	139,600
6	Com/Ind/Misc	9,062,100	9,062,100	9,062,100
7	Electric & Electronic Equip.	2,523,000	2,523,000	2,523,000
8	Food and Kindred Products	286,500	286,500	286,500
9	Hospitals & Convalescent Homes	775,700	775,700	775,700
10	Industrial Chemical	121,100	121,100	121,100
11	Industrial Water Treatment	0	0	0
12	Laundries	150,700	150,700	150,700
13	Machinery Manufacturers	387,600	387,600	387,600
14	Metal Plating	44,600	44,600	44,600
15	Motels & Hotels	366,800	366,800	366,800
16	Paper	0	0	0
17	Repair Shops & Car Washes	108,700	108,700	108,700
18	Restaurants	1,801,200	1,801,200	1,801,200
19	Schools & Colleges	339,800	339,800	339,800
20	Major Users - Customer 1	1,515,500	1,515,500	1,515,500
21	Major Users - Customer 2	0	0	0
22	Total	\$ 43,435,000	\$ 43,435,000	\$ 43,435,000

5.3 OTHER REVENUE

There are other operating sources which include charges for revenue from other agencies served by Santa Clara, sewer lateral video inspections, sewer cleanout installations, interest on investments, and other miscellaneous revenues. In total, other operating revenues represent 4.2% of the Sewer Utility's total revenue. The City anticipates that these revenues will remain relatively constant for the duration of the Study Period.

5.4 OPERATING AND MAINTENANCE (O&M) EXPENSES

Table 5-7 summarizes the Sewer Utility's projected O&M expenses for the Study Period. These expenses include costs related to salaries and benefits, materials and supplies, contract and professional services, RWF costs, indirect and direct costs, and routine capital outlay. The City anticipates that all O&M expenditures, excluding Water Pollution Control Plant costs, will increase on average 4.2% annually from the FY 2020.

The Sewer Utility receives treatment services from the RWF operated and maintained by the City of San Jose. While the City has an ownership stake in the RWF, the City must still pay for O&M associated with operating the facility. Based on estimates from the City of San Jose, the City expects RWF O&M costs to increase by approximately 3.5% annually over the Study period.

Table 5-7 O&M Expenses

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
1	Salaries	2,836,349	2,949,800	3,067,600
2	Benefits	1,446,135	1,503,700	1,563,400
3	Materials/Services/Supplies	525,553	546,500	568,300
4	Interfund Services	3,896,993	4,068,500	4,247,500
5	Resource & Production	16,447,982	17,023,700	17,619,600
6	Capital Outlay	0	0	0
7	Total	\$ 25,153,012	\$ 26,092,200	\$ 27,066,400

As shown in Table 5-7, the Sewer Utility’s O&M expenses increase from \$25.2M in FY 2020 to \$27.1M in FY 2022.

5.5 DEBT SERVICE REQUIREMENTS

Table 5-8 represents the Sewer Utility’s existing and proposed debt service obligations. This table shows the combined principal and interest requirements on the existing debt over the Study period. It is common practice for utilities to debt finance large capital improvement projects such as in the case of Trimble Road sewer trunk line replacement in Santa Clara. By financing the cost of the projects, the City can fund large projects immediately and spread the payment over a specified time frame, thereby helping to offset the impact on rate-payers.

Table 5-8 Long-Term Debt Service

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
1	2016 Installment Agreement (Trimble Road)	937,449	937,449	937,449
2	State Revolving Loan	0	0	0
3	2020 Future Revenue Bonds	1,752,300	3,004,000	4,537,300
4	Total	\$ 2,689,749	\$ 3,941,449	\$ 5,474,749

5.6 CAPITAL IMPROVEMENT PROGRAM

The Sewer Utility develops a five-year Capital Improvement Plan (CIP) on an annual basis to identify sewer system needs including ongoing assessments, maintenance, and renewal and replacement requirements.

Table 5-9 summarizes the Sewer Utility's CIP for FY 2020 through FY 2022. The Sewer Utility is projecting \$128.9M in CIP over the Study Period, which includes both capital and replacement projects. For complete details associated with each CIP project, the City has posted the CIP Budget on their website.³

Table 5-9 Capital Improvement Projects

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
		(\$)	(\$)	(\$)
1	1908 SJ-SC Regional Wastewater Facility	50,017,057	32,230,957	25,651,263
	1909 Sanitary Sewer Capacity			
2	Improvements	3,000,000	3,000,000	4,110,000
	1911 Sanitary Sewer System Condition			
3	Assessment	1,000,000	1,000,000	1,000,000
4	1912 Sanitary Sewer System Improvements	2,512,000	2,615,000	2,718,000
5	Total	\$ 56,529,057	\$ 38,845,957	\$ 33,479,263

5.6.1 Capital Improvement Financing Plan

The City funds annual expenditures for the CIP from a combination of available funds on hand, outlet charges, conveyance fees, debt financing, connection charges, developer contributions, and revenues derived from user rates. As shown in Table 5-10, the average annual CIP expenditure is \$43.9M for the Sewer Utility. The planned average annual CIP contribution from the Sewer Utility Operating Fund or PAY-GO is \$14.4M per year over the Study Period. Due to the large costs associated with the RWF, the City plans to issue \$40M in Revenue Bonds in FY 2020. The City expects to determine the final amount of the revenue bond by the summer of 2019 based on updated financials and advise from their financial advisor.

³ The City of Santa Clara. Finance Department. < <http://santaclaraca.gov/government/departments/finance>>

Table 5-10 Construction Fund Financing Plan

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
Source of Funds				
1	Sanitary Outlet Charge	0	0	0
2	Sewer Conveyance Fee	3,000,000	3,000,000	4,110,000
3	Intra Transfer In - Debt Financing	40,000,000	0	35,000,000
4	Intra Transfer In - Customer Service Charge	14,350,000	14,350,000	14,350,000
5	Connection Charges	1,500,000	1,000,000	1,000,000
6	Developer Contributions	0	0	0
7	Total Sources	\$ 58,850,000	\$ 18,350,000	\$ 54,460,000
Use of Funds				
8	Improvements Projects	6,512,000	6,615,000	8,128,000
9	Total Uses	\$ 6,512,000	\$ 6,615,000	\$ 8,128,000
10	Net Annual Cash Balance	52,338,000	11,735,000	46,332,000
11	Beginning Unrestricted Fund Balance	47,080,286	48,856,186	27,815,186
12	Net Cumulative Fund Balance	\$ 99,418,286	\$ 60,591,186	\$ 74,147,186
13	Minimum Construction Reserves	\$ 22,730,500	\$ 20,953,650	\$ 22,785,000

5.7 TRANSFERS

The Sewer Utility will perform transfers over the Study period from the Operating Fund and other funds. The other funds consist of the Rate Stabilization Fund and Construction Fund. Since these transfers do not represent direct operating expenses for the enterprise, Black & Veatch includes these costs as “below-the-line” cash flow items and not included as O&M expenses.

Table 5-11, Lines 19 and 20 for the Sewer Utility reflect these associated amounts. The following are a brief description of the transfers.

- Rate Stabilization Fund transfers represent funds to a reserve fund. See Section 2.8 for further explanation.
- Construction Fund transfers represent funds to cover planned CIP project expenditures.
- Pension Fund transfer represent funds to cover future pension obligations.

5.8 RESERVES

A utility typically establishes reserves for several reasons such as covering shortfalls in operating revenues, maintaining strong bond ratings, covering day-to-day operating costs, and easing the burden on ratepayers associated with large rate increases. Per the reserve policy, the Sewer Utility will maintain the following four reserves:

- Operating Reserve represents working capital maintained by the Operating Fund to cover day-to-day expenses and maintain sufficient funds to cover accounts receivables if there are supplier

issues, periods of lower than expected sewer revenues, or unforeseen cost increases. The reserve will maintain a minimum balance of 90 days of operating expenses, once fully funded

- Construction Reserve represents funds used for unforeseen and unbudgeted capital costs. Once fully funded, this reserve will maintain a minimum balance of 12-months of the following year’s planned City CIP and 6-months of the following year’s planned RWF CIP.
- Rate Stabilization Reserve represents funds used to absorb revenue shortfalls due to short-term decreases in sewer sales. The reserve will maintain a minimum balance of 10% of sewer rate revenue when fully funded. This reserve is designed to stabilize sewer rate revenue and avoid wide swings in rates charged to customers over time.
- Pension Reserve represents funds used to pay for the unfunded pension liabilities and the increase in the City’s share of pension costs due to factors such as higher CalPERS rates and negotiated pay increases. The reserve target is \$1.2M for the Sewer Utility by FY 2030.

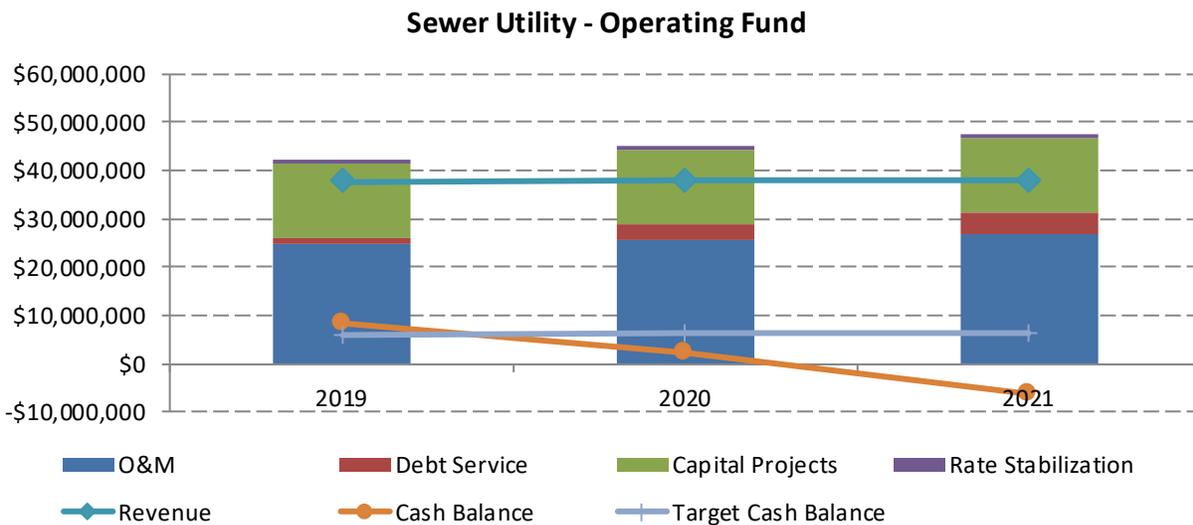
Regardless of the type of reserve, appropriate reserve levels help the Sewer Utility attain and keep better bond ratings, which in turn, leads to lower borrowing costs.

5.9 PROJECTED OPERATING RESULTS

The revenue requirements of the Sewer Utility consist of O&M expenses, debt service, capital expenditures, and reserve requirements.

It is important to examine the cash flow projections under the status quo scenario in order to fully understand the current condition of the Sewer Utility and the need for revenue adjustments. In this scenario, the Sewer Utility would not impose any revenue increases over the Study Period and continue to incur O&M expenses, pay for the execution of the planned CIP, and transfer to reserves. As shown in Figures 5-1, the status quo conditions would project that the Sewer Utility would operate from an annual deficit position, thus tapping into its reserves. By FY 2021, the Operating Fund would have a zero balance under such a scenario.

Figure 5-1 Status Quo Operating Cash Flow



The Sewer Utility will fall into a deficit position if the City does not implement the revenue increases as shown in Table 5-10. The revenue increases represent the overall total revenue adjustment needed to meet revenue requirements. The revenue adjustment does not represent adjustments to the individual rates but reflects the overall level of revenue needed to meet the Sewer Utility's obligations.

The suggested revenue increases help the Sewer Utility meet the following goals:

- Meet budgeted operating obligations in the three FY's.
- Meet planned capital investments in the three FY's.
- Maintain an operating reserve of 90 days of operating expenses.
- Maintain construction reserve of 12-months of next year's CIP for City projects and 6-months of next year's CIP for the RWF.
- Establish a rate stabilization reserve of 10% of rate revenues.

Shown in Tables 5-11 is a summary of the proposed Operating Fund for the Study Period. The Operating Fund consists of two parts: 1) Revenue and 2) Revenue Requirements.

Revenue

- Line 1 is the revenue under existing rates.
- Lines 2 through 4 is the additional revenue generated from the required annual revenue increases. The additional revenue generated is a direct reflection of the number of months the increase is effective for, and therefore amount might calculate at less than that stated amount.
- Line 6 is the total revenue generated from user charges.
- Line 12 represents other operating revenues.
- Line 13 represents total revenues for the enterprises.

Revenue Requirements

- Line 14 represents O&M expenses. The O&M expenses include RWF costs.
- Line 18 represent debt service payments.
- Line 23 represents transfers. The transfers include money to the Rate Stabilization Fund, Other Fund, Pension Fund and Construction Fund.
- Line 24 represents total revenue requirements.

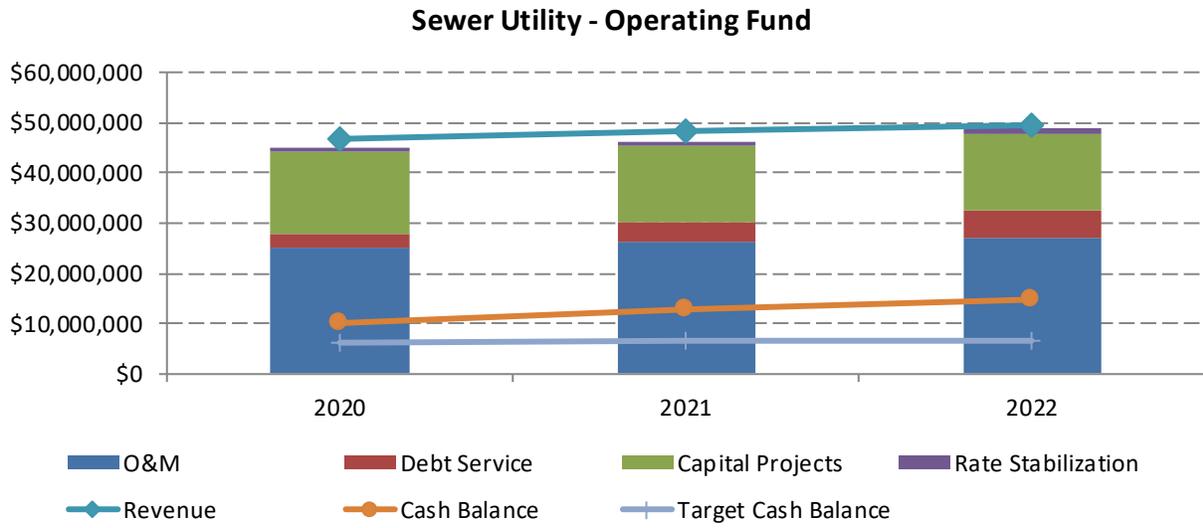
Lines 27 represents the net cumulative cash balance within the Operating Funds. The net cumulative cash balance intends to match, to the extent possible, Line 28. The reserve target minimum is 90 days of O&M expenses. The cash balance reserve is required to ensure the Operation Fund can continue in the event of a supplier interruption, market price fluctuations of critical equipment or supplies or an abrupt drop in account receivables. Line 29 represents the debt service coverage. Based on the operating cash flow, the debt service coverage of 1.25x requirement is met in all years as shown. The requirement is set forth by the lending financial institution and based on the ratio between revenues and expenses. Expenses exclude "below-the-line" items such as transfers.

Table 5-11 Operating Fund

Line No.	Description	Fiscal Year Ending June 30,		
		FY 2020	FY 2021	FY 2022
Revenue				
Rate Revenue				
1	Revenue from Existing Rates	43,435,000	43,435,000	43,435,000
	Months			
	Year	Effective	Rate Adj	
2	2020	12	3.00%	1,303,100
3	2021	12	3.00%	1,342,100
4	2022	12	3.00%	1,382,400
5	Increased Revenue Due to Adjustments			4,027,600
6	Subtotal Rate Revenue	\$ 44,738,100	\$ 46,080,200	\$ 47,462,600
Other Operating Revenue				
7	System Administration (Interest Income)	1,912,500	1,950,800	1,989,800
8	System Maintenance	90,000	90,000	90,000
9	Operations	0	0	0
10	SJ SC Water Pollution Control Plant	0	0	0
11	Storm Pump Maintenance	0	0	0
12	Subtotal Other Operating Revenue	\$ 2,002,500	\$ 2,040,800	\$ 2,079,800
13	Total Revenue	\$ 46,740,600	\$ 48,121,000	\$ 49,542,400
Revenue Requirements				
Operating & Maintenance				
14	O&M Expenses	25,153,000	26,092,200	27,066,400
15	Subtotal O&M	\$ 25,153,000	\$ 26,092,200	\$ 27,066,400
Debt Service				
16	Existing Revenue Bonds	937,400	937,400	937,400
17	Proposed Revenue Bonds	1,752,300	3,004,000	4,537,300
18	Total Debt Service	\$ 2,689,700	\$ 3,941,400	\$ 5,474,700
Transfers				
19	Transfer to Rate Stabilization Fund	950,000	950,000	950,000
20	Transfer to Other Fund	902,600	0	0
21	Transfer to Pension Fund	391,100	78,200	78,200
22	Transfer to Sewer Construction Fund	14,350,000	14,350,000	14,350,000
23	Total Transfers	\$ 16,593,700	\$ 15,378,200	\$ 15,378,200
24	Total Revenue Requirements	\$ 44,436,400	\$ 45,411,800	\$ 47,919,300
25	Net Annual Cash Balance	2,304,200	2,709,200	1,623,100
26	Beginning Fund Balance	7,427,514	9,731,714	12,440,914
27	Net Cumulative Fund Balance	\$ 9,731,714	\$ 12,440,914	\$ 14,064,014
28	Minimum Operating Reserves (90 Days)	\$ 6,202,100	\$ 6,433,700	\$ 6,673,900
29	Debt Service Coverage (Min 1.25)	8.03	5.59	4.11

Figure 5-2 presents the proposed Operating Fund.

Figure 5-2 Operating Cash Flow



6 Cost of Service Analysis

Cost of Service analysis requires that the utility recover needed revenues from rates for sewer service, which are allocated to customer classes according to the service rendered. An equitable rate structure allocates the capture of revenue requirements to customer classes based on sewage volume, strengths, number of customer connections and other relevant factors.

In analyzing the Sewer Utility's cost of service for allocation to its customer classes, Black & Veatch selected the annual revenue requirements for FY 2020 as the Test Year (TY) requirements to demonstrate the development of cost-of-service sewer rates. Table 6-1 summarizes the total costs of service that needs to be recovered from sewer user rates. The table represents TY 2020.

Table 6-1 Cost of Service Revenue from Rates

Line No.	Description	Operating Expense	Capital Cost	Total Cost
		(\$)	(\$)	(\$)
Revenue Requirements				
1	O&M Expense	25,153,000	0	25,153,000
2	Debt Service Requirements	0	2,689,700	2,689,700
3	Transfers	1,341,100	0	1,341,100
4	Subtotal	\$ 26,494,100	\$ 2,689,700	\$ 29,183,800
Less Revenue Requirements Met from Other Sources				
5	System Administration	1,912,500	0	1,912,500
6	System Maintenance	90,000	0	90,000
7	Operations	0	0	0
8	SJ SC Water Pollution Control Plant	0	0	0
9	Storm Pump Maintenance	0	0	0
10	Subtotal	\$ 2,002,500	\$ 0	\$ 2,002,500
Adjustments				
11	Adjustment for Annual Cash Balance	(2,304,200)	0	(2,304,200)
12	Adjustment to Annualize Rate Increase	0	0	0
13	Subtotal	\$ (2,304,200)	\$ 0	\$ (2,304,200)
14	Cost of Service to be Recovered from Rates	\$ 26,795,800	\$ 2,689,700	\$ 29,485,500

Shown in Line 4 is the total revenue requirement that corresponds with Table 5-11, Line 22. To derive the net revenue requirement recovered via rates, it is necessary to deduct revenues from other sources as shown in Line 12. Line 13 represents the net annual cash balance during the TY. If the enterprise is drawing down funds already in the Operating Fund, then this number is positive. The number will be negative if the enterprise is replacing funds. In the case of the Sewer Utility, the \$2.3M figure indicates that the forecast is projecting a negative cash balance for the year. Since the City expects to implement the revenue adjustment starting in July 2019, the final cost of service recovered from rates does not require an adjustment. Therefore, Line 12 represents almost no additional revenues generated. The minimal amount represented is due to rounding in the Operating Fund.

6.1 FUNCTIONAL COST COMPONENTS

The first step in conducting a cost-of-service analysis involves analyzing the cost of providing sewer service by system function to properly allocate the costs to the various customer classes and subsequently design rates. As a basis for allocating costs of service among customer classes, costs are separated into the following four basic functional cost components: (1) “Base”; (2) “Strength”; (3) “Customer”; and (4) “Direct Assignment,” described as follows:

- Base costs represent operating and capital costs of the system associated with collection. The collection costs vary directly with the quantity of sewage flow.
- Strength costs represent those operating and capital costs associated with treatment. The treatment costs are specifically related to strength parameters such as Biological Oxygen Demand (BOD), Total Suspended Solids (TSS) and Ammonia (NH₃).
- Customer costs are those expenditures that tend to vary in proportion to the number of customers connected to the system. These include meter reading, billing, collecting and accounting, and maintenance and capital costs associated with meters and services.
- Directly assigned costs are costs specifically identified as those incurred to serve specific customers. The Sewer Utility has no directly assigned categories.

6.2 ALLOCATION TO COST COMPONENTS

The next step of the cost-of-service process involves allocating each element of cost to functional cost components based on the parameter or parameters having the most significant influence on the magnitude of that element of cost. O&M expense items are allocated directly to appropriate cost components. A detailed allocation of related capital investment is used as a proxy for allocating capital and replacement costs. The separation of costs into functional components provides a means for distributing such costs to the various classes of customers based on their respective responsibilities for each type of service.

6.2.1 Volume and Strength Allocations

The sewer system consists of various facilities; each designed and operated to fulfill a given function. For the system to provide adequate service to its customers, it must be capable of meeting not only the annual volume requirements but also the strength loading demands placed on the system. Because not all customers and types of customers exert volume and strength loading demands similarly, the capacities of the various facilities must be designed to accommodate the demands of all classes of customers. Each sewer service facility within the system has an underlying volume demand, exerted by all customers for whom the base cost component applies. For those facilities designed solely to meet volume demand, 100% of the costs go to the base cost component. For those facilities designed to meet strength loading demands, the percentage of the costs all allocated to the different strength cost component based on their specific function.

6.2.2 Allocation of Operating and Maintenance (O&M) Expenses

In the allocation of O&M expense for Test Year (2020), the costs are directly allocated to the cost components to the extent possible. The Sewer Utility books operating costs by functional categories. Therefore, Black & Veatch used the factors noted in Section 5.1 to allocate the operating expenses to the

cost components. The allocation of Administration and Transfer cost elements are based on the average of all other costs. Table 6-2 represents the allocation of O&M to the cost components. Revenues are subtracted from other sources as shown in Table 6-1, Lines 10 and any drawdown of the cash balance is deducted and normalized for partial rate adjustments as shown in Line 13 to determine the net O&M costs.

6.2.3 Allocation of Capital Investments

In the allocation of capital investment for Test Year (2020), the existing fixed assets (which serve as a proxy for the current capital investments) are allocated directly to cost components to the extent possible. The allocation of costs into the cost components provides a basis for annual investment in sewer system facilities. Table 6-3 shows the total allocation of existing system investment serving sewer customers for the Test Year (2020). The total net system investment of \$29.8M shown on Line 7 represents the Test Year original cost less accumulated depreciation of the system in service. The total net system investment reflects the Sewer Utility's fixed asset listing ending June 30, 2016. This value represents book value of the assets. Using the distribution of total net system investment across the functional cost components, planned capital costs can then be allocated.

Table 6-2 Allocation of O&M Expenditures

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Operation & Maintenance							
1	1511 System Administration	3,386,500	1,658,600	544,400	554,600	569,600	59,300
2	1512 System Maintenance	2,524,800	2,524,800	0	0	0	0
3	1514 Operations	1,351,000	1,351,000	0	0	0	0
4	1515 SJ SC Water Pollution Control Plant						
5	Treatment	16,319,000	5,594,600	3,498,800	3,564,600	3,661,000	0
6	Customer Billing & Meter Reading	381,300	0	0	0	0	381,300
7	All Other	1,027,000	1,027,000	0	0	0	0
8	1516 Storm Pump Maintenance	163,300	163,300	0	0	0	0
9	Transfers	2,243,700	1,098,900	360,700	367,400	377,400	39,300
10	Total O&M Expenses	\$ 27,396,600	\$ 13,418,200	\$ 4,403,900	\$ 4,486,600	\$ 4,608,000	\$ 479,900
Less Other Revenue							
11	Miscellaneous Revenues	2,002,500	980,800	321,900	327,900	336,800	35,100
12	Other Adjustments	(2,304,200)	(1,128,400)	(370,400)	(377,400)	(387,600)	(40,400)
13	Net Operating Expenses	\$ 27,698,300	\$ 13,565,800	\$ 4,452,400	\$ 4,536,100	\$ 4,658,800	\$ 485,200

Table 6-3 Allocation of Capital Costs

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Plant Assets							
1	Collection	27,067,100	27,067,100	0	0	0	0
2	Lift Station	2,703,600	2,703,600	0	0	0	0
3	General Plant	16,100	16,100	0	0	0	0
4	Total Plant Assets	\$ 29,786,800	\$ 29,786,800	\$ 0	\$ 0	\$ 0	\$ 0
Less Other Revenue							
5	Miscellaneous Revenues	0	0	0	0	0	0
6	Other Adjustments	0	0	0	0	0	0
7	Net Operating Expenses	\$ 29,786,800	\$ 29,786,800	\$ 0	\$ 0	\$ 0	\$ 0

6.3 UNITS OF SERVICE

Following the allocation of costs, the total cost responsibility for each customer class is developed using unit costs of service for each cost function and subsequently assigning those costs to the customer classes based on the respective service requirements of each. To properly recognize the cost of service, each customer class receives its share of base, strength and customer costs. The number of units of service required by each customer class provides a means for the proportionate distribution of costs previously allocated to respective cost categories.

Table 6-4 summarizes the estimated Test Year units of service for the various customer classes. Base costs vary with the volume of sewage flow produced and distributed to customer classes on that basis. Black & Veatch derived sewage flow information from the monthly water consumption records in the City's CIS multiplied by a return factor. Strength costs are those associated with pollutant characteristics, and the Study allocated these costs to customer classes based on loadings. The pollutant loadings for each customer class come from recommendations of the State Water Resources Control Board, Revenue Program Guidelines, Appendix G and the City of San Jose. The City's commercial and industrial class consists of 17 distinct types of businesses such as retail, offices, restaurants, and hospitals. Since sampling is not an immediate possibility, the City has relied on industry standards used by the State of California. The number of bills for each customer class serves as the basis for distributing customer billing requirements.

6.4 COST OF SERVICE ALLOCATIONS

To determine the cost of service for each customer class, unit costs of service are applied to each customer classes' respective service requirements. The total unit costs of service applied to the respective requirements for each customer class results in the total cost of service for each customer class.

6.4.1 Units Costs of Service

The Test Year (2021) unit cost of service for each functional cost component is simply the total cost divided by the applicable units of service as shown in Table 6-5. The capital costs on Line 3 and 4 represent capital costs associated with City projects and RWF projects. These costs have been separated to determine the collection and treatment costs independently. On Line 5, the total costs represent the cost that rates need to recover shown as demonstrated in Table 6-1, Line 14. The net O&M cost includes O&M (which includes RWF) less revenue from other sources and adjustments. The total capital cost includes debt service payments and transfers to the Construction Fund. Line 6 represents the unit costs for the entire sewer system regardless of customer classes. After that, these unit costs are applied in allocating the costs to the specific customer classes.

6.4.2 Distribution of Costs of Service to Customer Classes

Applying the unit costs to the units for each customer class produces the customer class costs. This process is illustrated in Table 6-6, in which the study applies the unit costs to the customer class units of service. The costs attributable to each customer class are based on the functional costs components described in Section 6.1. Each customer class places a burden on the system in different ways, and thus the allocation of the units is representative of this burden.

An example of the application of unit costs is shown below for illustrative purposes.

	Vol Component
Unit Cost (Table 6-5, Line 7)	\$ 4.15 per HCF
General Customer Consumption (Table 6-6, Line 5)	103,395 HCF
Total Allocated Cost	\$ 429,000

Please note that the numbers within the tables are rounded, yet the calculations are done based on non-rounded values; therefore, results might vary.

Table 6-4 Units of Service

Line No.	Description	Contributed	Contributed	BOD Loadings		TSS Loadings		NH3 Loadings		Bills
		Units	Volume	Factor	Loading	Factor	Loading	Factor	Loading	
Units of Measure		(EDUs/M Bills)	(HCF)	(mg/L)	(lbs)	(mg/L)	(lbs)	(mg/L)	(lbs)	(bills)
1	Single Family	258,645	1,373,420	250	2,142,100	250	2,142,100	35	299,900	210,886
2	Multi-Family	313,491	1,607,165	250	2,506,700	250	2,506,700	35	350,900	43,871
3	Amusement Parks	172	103,395	130	83,900	80	51,600	11	7,100	385
4	Auto Dealers & Service Station	567	19,669	180	22,100	280	34,400	11	1,300	941
5	Churches	416	22,627	130	18,400	80	11,300	11	1,600	814
6	Com/Ind/Misc	20,548	1,553,939	130	1,260,300	80	775,600	11	106,600	53,776
7	Electric & Electronic Equip.	1,174	521,098	30	97,500	15	48,800	15	48,800	2,487
8	Food and Kindred Products	55	23,747	1,120	165,900	690	102,200	0	0	216
9	Hospitals & Convalescent Homes	521	129,053	230	185,200	85	68,400	15	12,100	1,135
10	Industrial Chemical	111	13,171	360	29,600	720	59,200	0	0	170
11	Industrial Water Treatment	0	0	130	0	80	0	11	0	0
12	Laundries	93	27,633	150	25,900	110	19,000	5	900	338
13	Machinery Manufacturers	1,131	44,249	290	80,100	550	151,800	0	0	2,229
14	Metal Plating	219	8,071	10	500	60	3,000	1	100	330
15	Motels & Hotels	15	59,724	310	115,500	121	45,100	7	2,600	96
16	Paper	0	0	1,250	0	560	0	10	0	0
17	Repair Shops & Car Washes	680	14,192	180	15,900	280	24,800	0	0	937
18	Restaurants	282	147,378	1,250	1,149,300	560	514,900	10	9,200	938
19	Schools & Colleges	1,378	46,609	130	37,800	100	29,100	30	8,700	2,001
20	Major Users - Customer 1		141,501		1,116,900		500,050		7,300	6
21	Total		5,856,641		9,053,600		7,088,050		857,100	321,556

Table 6-5 Units Cost of Service

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
1	Net Operating Expense	27,698,400	13,565,900	4,452,400	4,536,100	4,658,800	485,200
2	Debt Service	2,689,700	2,689,700	0	0	0	0
3	Capital Costs (City)	1,653,100	1,653,100	0	0	0	0
4	Capital Costs (SJSC)	12,696,900	6,388,500	4,069,700	1,043,400	1,195,300	0
5	Total Cost of Service	\$ 44,738,100	\$ 24,297,200	\$ 8,522,100	\$ 5,579,500	\$ 5,854,100	\$ 485,200
6	Units of Service		5,856,641 HCF	9,053,600 lbs	7,088,050 lbs	857,100 lbs	321,562 bills
7	Cost per Unit		\$ 4.15 per HCF	\$ 0.94 per lbs	\$ 0.79 per lbs	\$ 6.83 per lbs	\$ 1.51 per bill

Table 6-6 Distribution of Costs to Customer Classes

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
1	Cost per Unit		\$ 4.15 per HCF	\$ 0.94 per lbs	\$ 0.79 per lbs	\$ 6.83 per lbs	\$ 1.51 per bill
Single Family							
2	Units		1,373,420	2,142,100	2,142,100	299,900	210,886
3	Allocation of costs of service	11,755,100	5,685,900	2,016,200	1,686,300	2,048,400	318,300
Multi-Family							
4	Units		1,607,165	2,506,700	2,506,700	350,900	43,871
5	Allocation of costs of service	13,463,200	6,667,600	2,359,500	1,973,200	2,396,700	66,200
Amusement Parks							
6	Units		103,395	83,900	51,600	7,100	385
7	Allocation of costs of service	597,700	429,000	79,000	40,600	48,500	600

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
Auto Dealers & Service Station							
7	Units		19,669	22,100	34,400	1,300	941
8	Allocation of costs of service	139,800	81,600	20,800	27,100	8,900	1,400
Churches							
9	Units		22,627	18,400	11,300	1,600	814
10	Allocation of costs of service	132,200	93,900	17,300	8,900	10,900	1,200
Com/Ind/Misc							
11	Units		1,553,939	1,260,300	775,600	106,600	53,776
12	Allocation of costs of service	9,052,800	6,446,800	1,186,300	610,500	728,100	81,100
Electric & Electronic Equip.							
13	Units		521,098	97,500	48,800	48,800	2,487
14	Allocation of costs of service	2,629,200	2,161,900	91,800	38,400	333,300	3,800
Food and Kindred Products							
15	Units		23,747	165,900	102,200	0	216
16	Allocation of costs of service	335,400	98,500	156,200	80,400	0	300
Hospitals & Convalescent Homes							
17	Units		129,053	185,200	68,400	12,100	1,135
18	Allocation of costs of service	847,800	535,400	174,300	53,800	82,600	1,700
Industrial Chemical							
19	Units		13,171	29,600	59,200	0	170
20	Allocation of costs of service	129,400	54,600	27,900	46,600	0	300
Industrial Water Treatment							
21	Units		0	0	0	0	0
22	Allocation of costs of service	0	0	0	0	0	0

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
Laundries							
23	Units		27,633	25,900	19,000	900	338
24	Allocation of costs of service	160,600	114,600	24,400	15,000	6,100	500
Machinery Manufacturers							
25	Units		44,249	80,100	151,800	0	2,229
26	Allocation of costs of service	381,900	183,600	75,400	119,500	0	3,400
Metal Plating							
27	Units		8,071	500	3,000	100	330
28	Allocation of costs of service	37,600	33,500	500	2,400	700	500
Motels & Hotels							
29	Units		59,724	115,500	45,100	2,600	96
30	Allocation of costs of service	409,900	247,800	108,700	35,500	17,800	100
Paper							
31	Units		0	0	0	0	0
32	Allocation of costs of service	0	0	0	0	0	0
Repair Shops & Car Washes							
33	Units		14,192	15,900	24,800	0	937
34	Allocation of costs of service	94,800	58,900	15,000	19,500	0	1,400
Restaurants							
35	Units		147,378	1,149,300	514,900	9,200	938
36	Allocation of costs of service	2,162,700	611,400	1,081,800	405,300	62,800	1,400
Schools & Colleges							
37	Units		46,609	37,800	29,100	8,700	2,001
38	Allocation of costs of service	314,300	193,400	35,600	22,900	59,400	3,000

Line No.	Description	Total Cost	Common to All Customers				
			Volume	BOD	TSS	NH3	Customer
Major Users (O&M) - Customer 1							
39	Units		106	1,117	500	7	0
40	Allocation of costs of service	1,248,500	339,500	549,300	320,000	39,700	0
Major Users (Capital) - Customer 1							
41	Units		0	3	1	0	0
42	Allocation of costs of service	845,200	259,300	502,100	73,600	10,200	0
43	TOTAL COSTS OF SERVICE	\$ 44,738,100	\$ 24,297,300	\$ 8,522,100	\$ 5,579,500	\$ 5,854,000	\$ 485,200

7 Rate Design

The initial consideration in the derivation of rate schedules for sewer service is the establishment of equitable charges to the customers commensurate with the cost of providing that service. While the cost of service allocations to customer classes should not be construed as literal or exact determinations, they offer a guide to the necessity for, and the extent of, rate adjustments. Practical considerations sometimes modify rate adjustments by considering additional factors such as the extent of bill impacts, existing contracts, and historical local policies and practices.

7.1 EXISTING RATES

The Sewer Utility's existing rates consist of a fixed component in the form of monthly service charge and a variable component in the form of consumption charge. The monthly service charge is a flat fee based on EDUs and is applied to residential customers. The monthly service charge also serves as minimum charge for non-residential customers and applies when consumption does not exceed the charge. Non-residential customers also have a consumption charge based on units of water consumption (1 unit = 1 HCF = 748 gallons) multiplied by a return factor. The City has separate charges for major users consisting of O&M and capital components. Table 5-3 presented earlier in this report summarizes the existing sewer rates.

7.2 PROPOSED RATES

The costs of service analysis described in preceding sections of this report provide a basis for the design of sewer rates.

7.2.1 Monthly Service Charge

The monthly service charge is designed to recover residential costs associated with sewage flow, strength loadings, and billing, collecting and accounting, and maintenance and capital costs. The charge is a flat monthly fee based on EDUs. An EDU is defined in Section 5.1

The monthly service charge also serves as the minimum monthly service charge for non-residential customers. The minimum service charge will recover non-residential costs associated with volume, strength, and meter reading, billing, collecting and accounting, and maintenance and capital costs. The minimum monthly service charge incorporates an allowance of sewage flow. Once a customer exceeds the allowance, the minimum monthly service charge goes away.

Table 7-1 shows the forecasted proposed three-year monthly service charge rate schedule.

Table 7-1 Proposed Monthly Service Charge

Line No.	Customer Class	Proposed		
		FY 2020	FY 2021	FY 2022
	Monthly Service Charge (\$/EDU)	\$/mo	\$/mo	\$/mo
1	Single Family	44.07	45.23	46.37
2	Multi-Family	44.07	45.23	46.37
	Minimum Bill Charge (\$/Month)	\$/mo	\$/mo	\$/mo
3	All Customers	44.07	45.23	46.37

7.2.2 Consumption Charge

The consumption charges are designed to recover the remainder of the cost component costs not recovered through the monthly service charge for non-residential customers. Table 7-2 shows the forecasted proposed three-year rate schedule for the Sewer Utility.

Table 7-2 Proposed Consumption Charges

Line No.	Customer Class	Proposed		
		FY 2020	FY 2021	FY 2022
	Commodity Charge (\$/HCF)	\$/HCF	\$/HCF	\$/HCF
1	Amusement Parks	5.92	5.96	6.25
2	Auto Dealers & Service Station	5.97	6.05	6.27
3	Churches	5.27	5.27	5.54
4	Com/Ind/Misc	5.32	5.49	5.76
5	Electric & Electronic Equip.	4.94	5.22	5.53
6	Food and Kindred Products	12.91	14.09	14.08
7	Hospitals & Convalescent Homes	6.17	6.63	6.88
8	Industrial Chemical	9.15	9.64	9.81
9	Industrial Water Treatment	3.62	3.62	3.62
10	Laundries	5.56	5.92	6.20
11	Machinery Manufacturers	7.59	7.69	7.87
12	Metal Plating	3.98	3.70	4.00
13	Motels & Hotels	6.54	7.08	7.32
14	Paper	11.05	11.05	11.05
15	Repair Shops & Car Washes	5.10	4.75	4.97
16	Restaurants	13.27	14.64	14.60
17	Schools & Colleges	5.77	5.66	5.89

7.2.3 Major Users

The major commercial and industrial user charge is designed to recover the costs associated with O&M and capital for major users. Major users are classified based on requirements in Section 5.1. These customers are monitored monthly for volume and strength loadings. Major users are charged the unit charges identified in Table 6-5, Line 7. Note that the major user charges consist of specifically identified O&M and capital components. Charges for all other customers incorporate these charges as well but the

City has combined them into a single rate for simplicity. Table 7-3 shows the three-year rate schedule based on unit costs in future years.

Table 7-3 Proposed Major User Charges

Line No.	Customer Class	Proposed		
		FY 2020	FY 2021	FY 2022
Major Commercial and Industrial Users				
Operating and Maintenance Cost Recovery				
1	Volume (per MG)	2,373.21	2,706.24	3,086.00
2	BOD [2] (per 1,000 lbs)	370.42	417.11	469.68
3	SS [3] (per 1,000 lbs)	520.88	565.38	613.69
4	NH3 [4] (per 1,000 lbs)	4,438.06	4,810.47	5,214.13
Annual Capital Cost Recovery				
5	Volume (per MGD)	1,138,880	1,178,456	1,219,408
6	BOD [2] (per 1,000 lbs/day)	94,070	118,761	149,933
7	SS [3] (per 1,000 lbs/day)	53,421	52,312	51,225
8	NH3 [4] (per 1,000 lbs/day)	349,107	396,310	449,894

7.3 TYPICAL MONTHLY COSTS UNDER PROPOSED CHARGES

Table 7-4 presents a comparison of typical monthly costs under existing rates and the proposed schedule of sewer user rates derived in this study for both residential and non-residential customers.

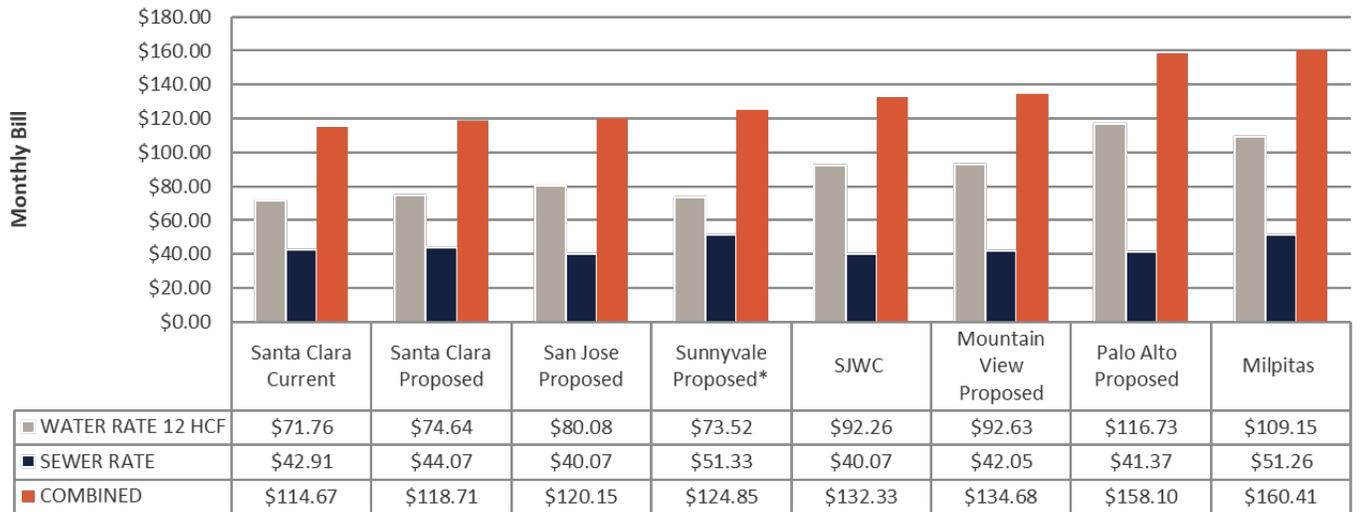
Table 7-4 Typical Monthly Bill

Customer Class	Typical Monthly Usage (HCF)	FY 2019 Existing Rates (\$)	FY 2020 Proposed Rates (\$)
Residential		\$42.91	\$44.07
Non-Residential	0	\$42.91	\$44.07
	10	\$61.72	\$63.37
	20	\$123.44	\$126.74
	30	\$185.17	\$190.10
	40	\$246.89	\$253.47
	50	\$308.61	\$316.84
	100	\$617.22	\$633.68
	250	\$1,543.05	\$1,584.20

7.4 NEIGHBORING SEWER UTILITIES

Presented in Table 7-5 is the proposed rates compared to rates of neighboring jurisdictions, for a single family residential customer. Based on the comparison, the City is currently a higher cost sewer provider in the area. With the proposed rate increases, the City remains one of the higher sewer providers of the surveyed communities. All surveyed community rates are best estimates as of May 2019.

Table 7-5 Comparison to Neighboring Sewer Utilities



*Sunnyvale Rates – Proposed as of May 2019

Appendix A – Ten-Year Financial Plan

WATER UTILITY

Line No.	Description	Fiscal Year Ending June 30,									
		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Revenue											
Rate Revenue											
1	Revenue from Existing Rates	50,693,900	52,151,500	53,652,900	55,199,200	56,791,900	58,432,300	60,122,600	61,863,700	63,657,000	65,504,500
2	Increased Revenue Due to Adjustments	1,647,600	3,444,900	5,403,000	7,533,400	9,848,300	12,361,200	15,632,600	19,203,100	23,096,400	27,337,700
3	Subtotal Rate Revenue	\$ 52,341,500	\$ 55,596,400	\$ 59,055,900	\$ 62,732,600	\$ 66,640,200	\$ 70,793,500	\$ 75,755,200	\$ 81,066,800	\$ 86,753,400	\$ 92,842,200
Other Operating Revenue											
4	Solar System Maintenance	73,600	73,600	73,600	73,600	73,600	73,600	73,600	73,600	73,600	73,600
5	Water System Maintenance	41,100	41,100	41,100	41,100	41,100	41,100	41,100	41,100	41,100	41,100
6	Water Construction	0	0	0	0	0	0	0	0	0	0
7	Water System Operations	0	0	0	0	0	0	0	0	0	0
8	Administration Design	1,086,600	1,098,000	1,109,600	1,121,500	1,133,600	1,145,900	1,158,500	1,171,300	1,184,400	1,197,800
9	Water Quality	0	0	0	0	0	0	0	0	0	0
10	Water Resources	70,500	70,500	70,500	70,500	70,500	70,500	70,500	70,500	70,500	70,500
11	Subtotal Other Operating Revenue	\$ 1,271,800	\$ 1,283,200	\$ 1,294,800	\$ 1,306,700	\$ 1,318,800	\$ 1,331,100	\$ 1,343,700	\$ 1,356,500	\$ 1,369,600	\$ 1,383,000
12	Total Revenue	\$ 53,613,300	\$ 56,879,600	\$ 60,350,700	\$ 64,039,300	\$ 67,959,000	\$ 72,124,600	\$ 77,098,900	\$ 82,423,300	\$ 88,123,000	\$ 94,225,200
Revenue Requirements											
Operating & Maintenance											
13	O&M Expenses	45,809,600	48,531,800	52,390,700	56,524,200	61,045,200	65,971,900	71,343,300	77,200,900	83,592,400	90,568,500
14	Subtotal O&M	\$ 45,809,600	\$ 48,531,800	\$ 52,390,700	\$ 56,524,200	\$ 61,045,200	\$ 65,971,900	\$ 71,343,300	\$ 77,200,900	\$ 83,592,400	\$ 90,568,500
Debt Service											
15	Existing Revenue Bonds	0	0	0	0	0	0	0	0	0	0
16	Proposed Revenue Bonds	0	0	0	0	0	0	0	0	0	0
17	Total Debt Service	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
Transfers											
18	Transfer to Rate Stabilization Fund	1,225,000	1,225,000	1,225,000	1,225,000	600,000	600,000	500,000	500,000	550,000	575,000
19	Transfer to Other Fund	582,700	0	0	0	0	0	0	0	0	0
20	Transfer to Pension Fund	997,100	199,400	199,400	199,400	199,400	199,400	199,400	199,400	199,400	199,400
21	Transfer to Water Construction Fund	3,000,000	3,000,000	3,000,000	3,000,000	4,000,000	4,000,000	4,500,000	5,000,000	5,000,000	5,000,000
22	Total Transfers	\$ 5,804,800	\$ 4,424,400	\$ 4,424,400	\$ 4,424,400	\$ 4,799,400	\$ 4,799,400	\$ 5,199,400	\$ 5,699,400	\$ 5,749,400	\$ 5,774,400
23	Total Revenue Requirements	\$ 51,614,400	\$ 52,956,200	\$ 56,815,100	\$ 60,948,600	\$ 65,844,600	\$ 70,771,300	\$ 76,542,700	\$ 82,900,300	\$ 89,341,800	\$ 96,342,900
24	Net Annual Cash Balance	1,998,900	3,923,400	3,535,600	3,090,700	2,114,400	1,353,300	556,200	(477,000)	(1,218,800)	(2,117,700)
25	Beginning Fund Balance	9,483,700	11,482,600	15,406,000	18,941,600	22,032,300	24,146,700	25,500,000	26,056,200	25,579,200	24,360,400
26	Net Cumulative Fund Balance	\$ 11,482,600	\$ 15,406,000	\$ 18,941,600	\$ 22,032,300	\$ 24,146,700	\$ 25,500,000	\$ 26,056,200	\$ 25,579,200	\$ 24,360,400	\$ 22,242,700
27	Minimum Operating Reserves (90 Days)	\$ 11,295,500	\$ 11,966,700	\$ 12,918,300	\$ 13,937,500	\$ 15,052,200	\$ 16,267,000	\$ 17,591,500	\$ 19,035,800	\$ 20,611,800	\$ 22,332,000

RECYCLED WATER UTILITY

Line No.	Description	Fiscal Year Ending June 30,									
		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
		(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)	(\$)
Revenue											
Rate Revenue											
1	Revenue from Existing Rates	5,807,000	5,922,700	6,040,800	6,161,200	6,284,100	6,409,300	6,537,300	6,667,600	6,800,600	6,936,200
2	Increased Revenue Due to Adjustments	499,400	1,062,600	1,696,400	2,408,900	3,208,600	3,780,900	4,402,200	4,489,700	4,579,500	4,670,600
3	Subtotal Rate Revenue	\$ 6,306,400	\$ 6,985,300	\$ 7,737,200	\$ 8,570,100	\$ 9,492,700	\$ 10,190,200	\$ 10,939,500	\$ 11,157,300	\$ 11,380,100	\$ 11,606,800
Other Operating Revenue											
4	System Maintenance	85,000	86,700	88,400	90,200	92,000	93,800	95,700	97,600	99,600	101,600
5	South Bay Water Recycling System Maintena	95,000	95,000	95,000	95,000	95,000	95,000	95,000	95,000	95,000	95,000
6	Subtotal Other Operating Revenue	\$ 180,000	\$ 181,700	\$ 183,400	\$ 185,200	\$ 187,000	\$ 188,800	\$ 190,700	\$ 192,600	\$ 194,600	\$ 196,600
7	Total Revenue	\$ 6,486,400	\$ 7,167,000	\$ 7,920,600	\$ 8,755,300	\$ 9,679,700	\$ 10,379,000	\$ 11,130,200	\$ 11,349,900	\$ 11,574,700	\$ 11,803,400
Revenue Requirements											
Operating & Maintenance											
8	O&M Expenses	5,395,300	5,837,200	6,317,000	6,838,200	7,399,900	8,009,900	8,672,600	9,392,600	10,175,100	11,025,500
9	Subtotal O&M	5,395,300	5,837,200	6,317,000	6,838,200	7,399,900	8,009,900	8,672,600	9,392,600	10,175,100	11,025,500
Debt Service											
10	Existing Revenue Bonds	0	0	0	0	0	0	0	0	0	0
11	Proposed Revenue Bonds	0	0	0	0	0	0	0	0	0	0
12	Total Debt Service	0	0	0	0	0	0	0	0	0	0
Transfers											
13	Transfer to Rate Stabilization Fund	158,000	158,000	158,000	158,000	100,000	100,000	110,000	25,000	25,000	20,000
14	Transfer to Pensiotn Fund	49,100	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800	9,800
15	Transfer to Recycled Water Const Fund	1,500,000	2,400,000	2,500,000	2,500,000	2,500,000	2,500,000	1,000,000	1,000,000	1,000,000	1,000,000
16	Total Transfers	1,707,100	2,567,800	2,667,800	2,667,800	2,609,800	2,609,800	1,119,800	1,034,800	1,034,800	1,029,800
17	Total Revenue Requirements	\$ 7,102,400	\$ 8,405,000	\$ 8,984,800	\$ 9,506,000	\$ 10,009,700	\$ 10,619,700	\$ 9,792,400	\$ 10,427,400	\$ 11,209,900	\$ 12,055,300
18	Net Annual Cash Balance	(616,000)	(1,238,000)	(1,064,200)	(750,700)	(330,000)	(240,700)	1,337,800	922,500	364,800	(251,900)
19	Beginning Fund Balance	5,748,500	5,132,500	3,894,500	2,830,300	2,079,600	1,749,600	1,508,900	2,846,700	3,769,200	4,134,000
20	Net Cumulative Fund Balance	\$ 5,132,500	\$ 3,894,500	\$ 2,830,300	\$ 2,079,600	\$ 1,749,600	\$ 1,508,900	\$ 2,846,700	\$ 3,769,200	\$ 4,134,000	\$ 3,882,100
21	Minimum Operating Reserves (90 Days)	\$ 1,330,300	\$ 1,439,300	\$ 1,557,600	\$ 1,686,100	\$ 1,824,600	\$ 1,975,000	\$ 2,138,400	\$ 2,316,000	\$ 2,508,900	\$ 2,718,600

SEWER UTILITY

Line No.	Description	Fiscal Year Ending June 30,									
		FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029
Revenue											
Rate Revenue											
1	Revenue from Existing Rates	43,435,000	43,435,000	43,435,000	43,435,000	43,435,000	43,435,000	43,435,000	43,435,000	43,435,000	43,435,000
2	Increased Revenue Due to Adjustments	1,303,100	2,645,200	4,027,600	5,451,500	6,918,100	6,918,100	6,918,100	6,918,100	6,918,100	6,918,100
3	Subtotal Rate Revenue	\$ 44,738,100	\$ 46,080,200	\$ 47,462,600	\$ 48,886,500	\$ 50,353,100					
Other Operating Revenue											
4	System Administration	1,912,500	1,950,800	1,989,800	2,029,600	2,070,200	2,111,600	2,153,800	2,196,900	2,240,800	2,285,600
5	System Maintenance	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000	90,000
6	Operations	0	0	0	0	0	0	0	0	0	0
7	SJ SC Water Pollution Control Plant	0	0	0	0	0	0	0	0	0	0
8	Storm Pump Maintenance	0	0	0	0	0	0	0	0	0	0
9	Subtotal Other Operating Revenue	\$ 2,002,500	\$ 2,040,800	\$ 2,079,800	\$ 2,119,600	\$ 2,160,200	\$ 2,201,600	\$ 2,243,800	\$ 2,286,900	\$ 2,330,800	\$ 2,375,600
10	Total Revenue	\$ 46,740,600	\$ 48,121,000	\$ 49,542,400	\$ 51,006,100	\$ 52,513,300	\$ 52,554,700	\$ 52,596,900	\$ 52,640,000	\$ 52,683,900	\$ 52,728,700
Revenue Requirements											
Operating & Maintenance											
11	O&M Expenses	25,153,000	26,092,200	27,066,400	28,077,500	29,127,000	30,216,000	31,346,400	32,519,400	33,736,600	35,000,100
12	Subtotal O&M	\$ 25,153,000	\$ 26,092,200	\$ 27,066,400	\$ 28,077,500	\$ 29,127,000	\$ 30,216,000	\$ 31,346,400	\$ 32,519,400	\$ 33,736,600	\$ 35,000,100
Debt Service											
13	Existing Revenue Bonds	937,400	937,400	937,400	937,400	937,400	937,400	937,400	937,400	937,400	937,400
14	Proposed Revenue Bonds	1,752,300	3,004,000	4,537,300	5,632,500	5,632,500	5,632,500	5,632,500	5,632,500	5,632,500	5,632,500
15	Total Debt Service	\$ 2,689,700	\$ 3,941,400	\$ 5,474,700	\$ 6,569,900						
Transfers											
16	Transfer to Rate Stabilization Fund	950,000	950,000	950,000	950,000	300,000	300,000	350,000	350,000	0	0
17	Transfer to Other Fund	902,600	0	0	0	0	0	0	0	0	0
18	Transfer to Pension Fund	391,100	78,200	78,200	78,200	78,200	78,200	78,200	78,200	78,200	78,200
19	Transfer to Sewer Construction Fund	14,350,000	14,350,000	14,350,000	14,350,000	14,350,000	14,500,000	14,500,000	12,750,000	12,750,000	12,750,000
20	Total Transfers	\$ 16,593,700	\$ 15,378,200	\$ 15,378,200	\$ 15,378,200	\$ 14,728,200	\$ 14,878,200	\$ 14,928,200	\$ 13,178,200	\$ 12,828,200	\$ 12,828,200
21	Total Revenue Requirements	\$ 44,436,400	\$ 45,411,800	\$ 47,919,300	\$ 50,025,600	\$ 50,425,100	\$ 51,664,100	\$ 52,844,500	\$ 52,267,500	\$ 53,134,700	\$ 54,398,200
22	Net Annual Cash Balance	2,304,200	2,709,200	1,623,100	980,500	2,088,200	890,600	(247,600)	372,500	(450,800)	(1,669,500)
23	Beginning Fund Balance	7,427,514	9,731,714	12,440,914	14,064,014	15,044,514	17,132,714	18,023,314	17,775,714	18,148,214	17,697,414
24	Net Cumulative Fund Balance	\$ 9,731,714	\$ 12,440,914	\$ 14,064,014	\$ 15,044,514	\$ 17,132,714	\$ 18,023,314	\$ 17,775,714	\$ 18,148,214	\$ 17,697,414	\$ 16,027,914
25	Minimum Operating Reserves (90 Days)	6,202,100	6,433,700	6,673,900	6,923,200	7,182,000	7,450,500	7,729,200	8,018,500	8,318,600	8,630,200
26	Debt Service Coverage (Min 1.25)	8.03	5.59	4.11	3.49	3.56	3.40	3.23	3.06	2.88	2.70

Disclaimer

Black & Veatch has prepared this report for the City, and it is based on information not within the control of Black & Veatch. The City has not requested Black & Veatch to make an independent analysis, to verify the information provided to us, or to render an independent judgment of the validity of the information provided by others. Because of this, Black & Veatch cannot, and does not, guarantee the accuracy thereof to the extent that such information, data, or opinions were based on information provided by others.

In conducting these analyses and in forming an opinion of the projection of future financial operations summarized in this report, Black & Veatch made certain assumptions on the conditions, events, and circumstances that may occur in the future. The methodology utilized in performing the analyses follows generally accepted practices for such projections. Such assumptions and methodologies are reasonable and appropriate for the purpose for which they are used. While we believe the assumptions are reasonable and the projection methodology valid, actual results may differ materially from those projected, as influenced by the conditions, events, and circumstances that occur. Such factors may include the utilities' ability to execute the capital improvement program as scheduled and within budget, regional climate and weather conditions affecting the demand for water, discharge of sewage flow and adverse legislative, regulatory, or legal decisions (including environmental laws and regulations) affecting the utilities' ability to manage the system and meet water quality requirements.