



Town of Purcellville, VA

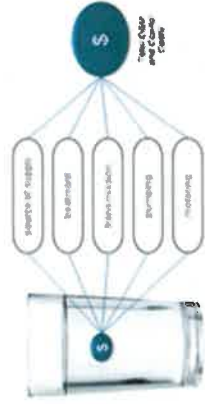
Water and Sewer Rate Study

FY21 Rate Scenarios

March 24, 2020



Summary of 2019 Effort



Financial Plan

Defines how much total revenue is needed each year



Cost of Service

Defines proportional revenue recovery between customer classes



Rate Design

Structure of how revenues are recovered by class

2019 Findings	Alternative C rate structure developed to provide sustainable rate structure
Identified additional revenue needs for water and sewer utilities	
Lack of alignment between water cost of service and revenue recovery by class	

Summary of Financial Model Updates for 2020

- Rolled model forward 1 year; updated with FY 2019 year ending balances
- Updated FY 2020 and FY 2021 Budget
- Updated FY 2020 – FY 2030 Capital Improvement Plan
 - Optimized funding using cash and debt
 - Focus on near-term needs; later years are estimates and could be impacted by changing needs
- Updated assumptions for Availability Fee revenues
- Incorporated refinancing from Davenport (estimated saving until closed)
- Rate impacts have been shown with Alternative C rate structure (per Nov 20, 2019 Council meeting)



Water Capital Improvement Program (\$M) – Updated March 2020

Description	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30
F Street Water Main Replacement	\$0.14		\$0.14								
12th Street Water Main Replacement				\$0.23	\$0.23						
Intake Structure for Hirst Reservoir	\$0.08	\$0.10	\$0.40	\$0.85							
Jeffries Filter Facility			\$0.30	\$0.30							
Cooper Springs Raw Water Main			\$0.24	\$0.88							
WTP to Town Water Main Replacement-PH 1				\$0.40	\$1.60						
Reservoir to WTP Raw Water Main					\$0.32	\$0.16	\$1.76				
Holly Lane Water Main Replacement					\$0.15	\$0.15					
G Street Water Main Replacement					\$0.15	\$0.55					
Additional Water Supply						\$0.65	\$0.65	\$0.65			
A Street Water Line Loop						\$0.13					
Water Treatment Plant Improvements										\$1.15	\$1.15
Total	\$0.22	\$0.10	\$1.08	\$2.66	\$2.45	\$1.64	\$2.41	\$0.65		\$1.15	\$1.15



Sewer Capital Improvement Program (\$M) – Updated March 2020

Description	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30
Membrane Replacement	\$0.17	\$0.17	\$0.17								
East End Pump Station									\$0.13	\$0.13	\$1.04
West End Pump Station Improvements	\$0.36										
LEAP Aeration Upgrade		\$0.16									
Sludge Storage Facility						\$0.37					
Valley Industrial Park Pump Station Upgrades						\$0.28					
12th Street Sewer Line			\$0.15								
Total	\$0.54	\$0.33	\$0.32			\$0.65			\$0.13	\$0.13	\$1.04

Summary of Financial Model Scenarios

Water and Sewer Scenarios

- 1 – New Base Model – Optimized CIP
- 2 – Debt-Funded CIP

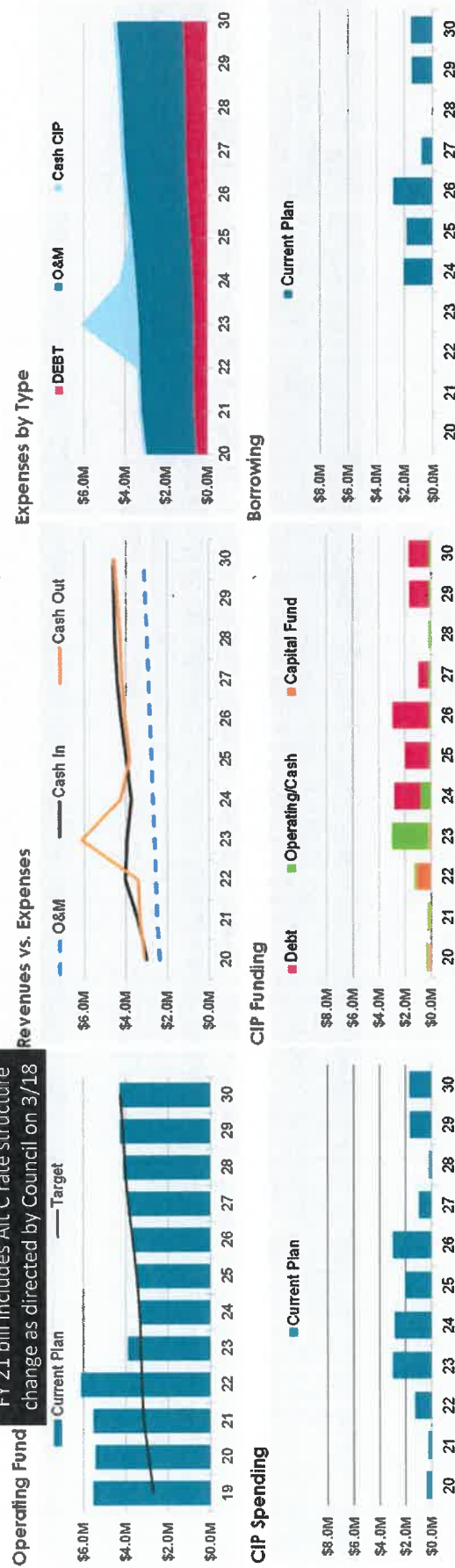
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Financial Analysis & Management System | By Stattec

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Financial Analysis & Management System | By Stattec

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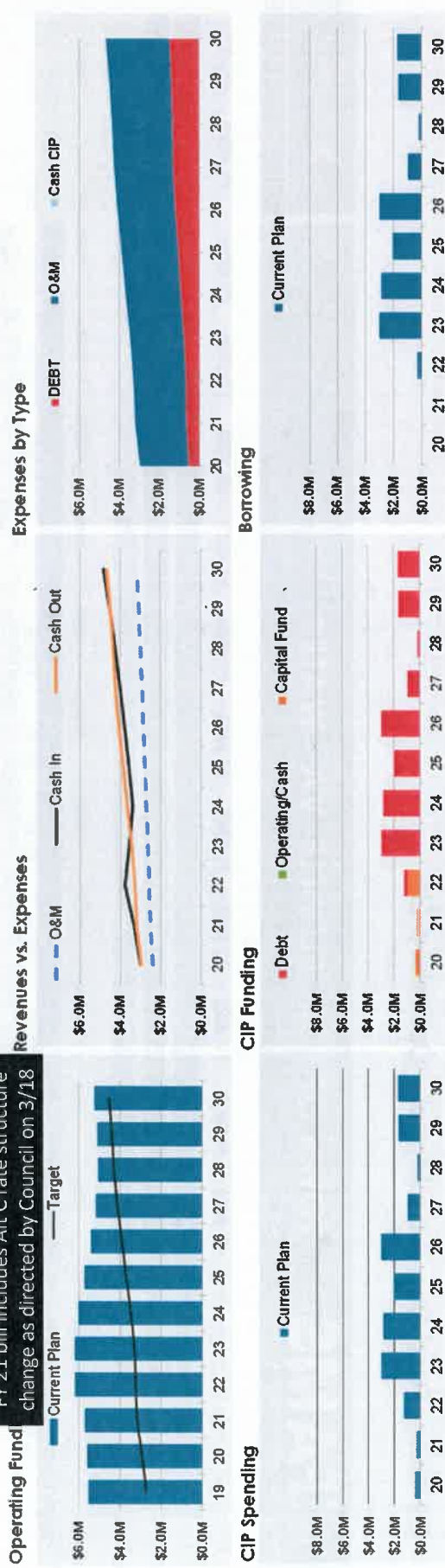
FY 21 bill includes Alt C rate structure change as directed by Council on 3/18



(2) Water Fund Debt-Funded CIP

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2030
Water Fixed Rate Plan	0.00%	5.00%	5.00%	5.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	98.40%
Water Usage Rate Plan	3.00%	5.00%	5.00%	5.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	8.00%	98.55%
Debt Coverage	1.14	1.24	1.75	1.21	0.72	0.75	0.78	0.84	0.95	1.05	1.13	Meal Tax Transfer Meal Tax Growth CIP
CIP Execution %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	No 0.00% Original
Single Family Bi-Monthly Water Bill	\$74.97	\$85.84	\$90.13	\$94.64	\$102.21	\$110.39	\$119.22	\$128.75	\$139.06	\$150.18	\$162.19	Debt 30 year
Change in Bi-Monthly Bill		\$10.87	\$4.29	\$4.51	\$7.57	\$8.18	\$8.83	\$9.54	\$10.30	\$11.12	\$12.01	CIP Funding
Cost per Day	\$1.25	\$1.43	\$1.50	\$1.58	\$1.70	\$1.84	\$1.99	\$2.15	\$2.32	\$2.50	\$2.70	Debt
Change in Cost per Day		\$0.18	\$0.07	\$0.08	\$0.13	\$0.14	\$0.15	\$0.16	\$0.17	\$0.19	\$0.20	

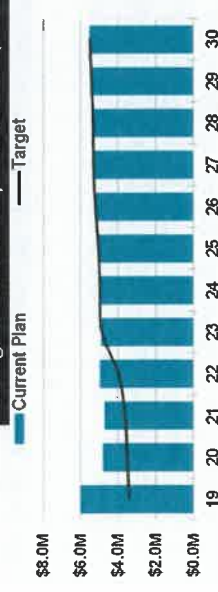
Operating Fund FY 21 includes Alt Crate structure change as directed by Council on 3/18



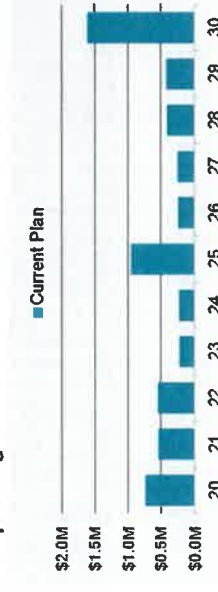
(1) Sewer Fund New Base Model – Optimized CIP

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2030
Sewer Fixed Rate Plan	0.00%	12.00%	12.00%	12.00%	12.00%	4.00%	4.00%	2.00%	2.00%	2.00%	2.00%	84.09%
Sewer Usage Rate Plan	3.00%	12.00%	12.00%	12.00%	12.00%	4.00%	4.00%	2.00%	2.00%	2.00%	2.00%	84.08%
Debt Coverage	0.74	1.43	1.59	1.09	1.10	1.13	1.12	1.11	1.14	1.13	1.10	
CIP Execution %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	
Single Family Bi-Monthly Sewer Bill	\$142.60	\$154.18	\$172.68	\$193.40	\$216.61	\$255.28	\$234.29	\$238.97	\$243.75	\$248.63	\$253.60	
Change in Bi-Monthly Bill	\$11.58	\$18.50	\$20.72	\$23.21	\$23.21	\$8.66	\$9.01	\$4.69	\$4.78	\$4.88	\$4.97	
Cost per Day	\$2.38	\$2.57	\$2.88	\$3.22	\$3.61	\$3.75	\$3.90	\$3.98	\$4.06	\$4.14	\$4.23	
Change in Cost per Day	\$0.19	\$0.31	\$0.35	\$0.39	\$0.14	\$0.15	\$0.08	\$0.08	\$0.08	\$0.08	\$0.08	

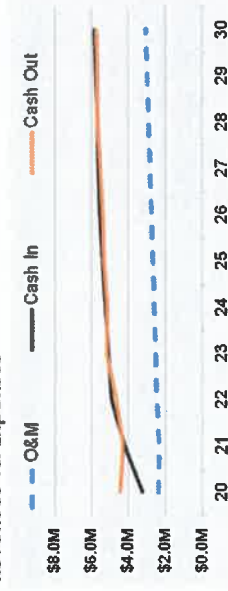
Operating Fund
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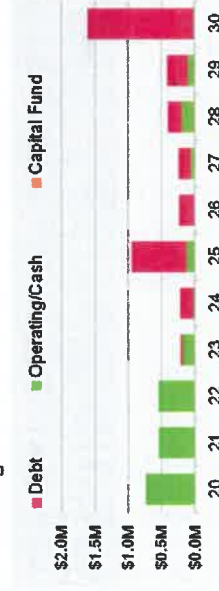
CIP Spending



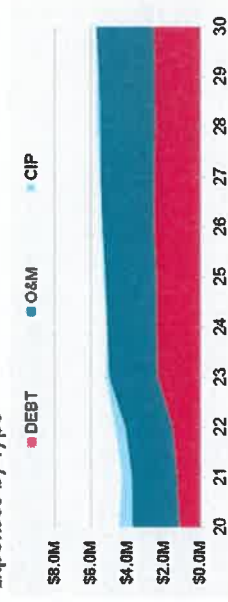
Revenues vs. Expenses



CIP Funding



Expenses by Type



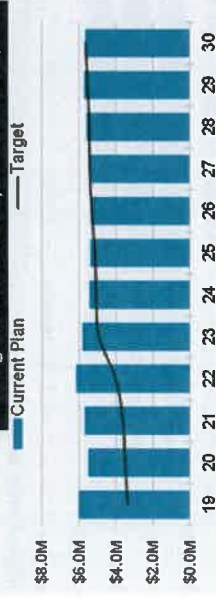
Borrowing



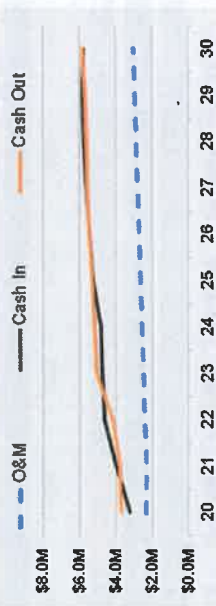
(2) Sewer Fund Debt-Funded CIP

	FY 2020	FY 2021	FY 2022	FY 2023	FY 2024	FY 2025	FY 2026	FY 2027	FY 2028	FY 2029	FY 2030	FY 2030
Sewer Fixed Rate Plan	0.00%	5.00%	11.00%	11.00%	11.00%	11.00%	5.00%	4.00%	3.00%	2.00%	0.00%	82.82%
Sewer Usage Rate Plan	3.00%	5.00%	11.00%	11.00%	11.00%	11.00%	5.00%	4.00%	3.00%	2.00%	0.00%	82.82%
Debt Coverage	0.73	1.22	1.35	0.91	0.89	1.03	1.04	1.07	1.11	1.10	1.03	No Meal Tax Transfer Meal Tax Growth
CIP Execution %	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%	CIP
Single Family Bi-Monthly Sewer Bill	\$142.60	\$144.55	\$160.45	\$178.10	\$197.69	\$219.44	\$230.41	\$239.63	\$246.81	\$251.75	\$251.75	CIP Funding
Change in Bi-Monthly Bill	\$1.95	\$15.90	\$17.65	\$19.59	\$21.75	\$10.97	\$230.41	\$239.63	\$246.81	\$251.75	\$251.75	Debt
Cost per Day	\$2.38	\$2.41	\$2.67	\$2.97	\$3.29	\$3.66	\$3.84	\$3.99	\$4.11	\$4.20	\$4.20	30 year
Change in Cost per Day	\$0.03	\$0.27	\$0.29	\$0.33	\$0.36	\$0.36	\$0.18	\$0.15	\$0.12	\$0.08	\$0.00	

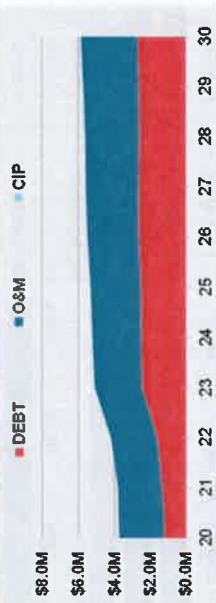
Operating Fund
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Revenues vs. Expenses



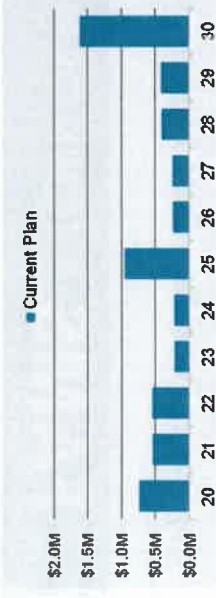
Expenses by Type



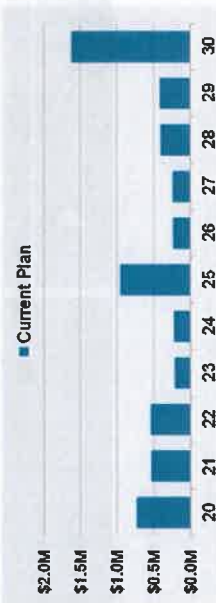
CIP Funding



CIP Spending



Borrowing



Summary of Impacts by Scenario

Scenario	FY 2021 Rate Increase	Cumulative Rate Increases (through FY 30)	Cash-Funded CIP (FY 20-FY 30)	Debt-Funded CIP (FY 20-FY 30)
Water				
1	10%	89%	\$6.8M	\$10.4M
2	5%	99%	\$1.6M*	\$15.6M
Sewer				
1	12%	84%	\$2.5M	\$3.6M
2	5%	83%	-	\$6.1M

*\$1.6M of CIP is funded by the Capital Fund.

Summary Single Family Customers Bill Impacts (FY 20 to FY 21)

Rate Scenario	Meter Size	Average Bi-Monthly Usage (1,000 gallons)	Current FY 2020 Bi-Monthly Bill	Proposed FY 2021 Bi-Monthly Bill	\$ Change in Bi-Monthly Bill	% Change in Bi-Monthly Bill	Count of Bills
1	5/8"	4	\$120.44	\$135.53	\$15.09	12.5%	1,076
	5/8"	8	\$217.57	\$244.08	\$26.51	12.2%	1,527
	5/8"	14	\$373.89	\$435.30	\$61.41	16.4%	463
	5/8"	20	\$544.05	\$651.78	\$107.73	19.8%	69
2	5/8"	4	\$120.44	\$127.93	\$7.49	6.2%	1,076
	5/8"	8	\$217.57	\$230.39	\$12.82	5.9%	1,527
	5/8"	14	\$373.89	\$411.17	\$37.28	10.0%	463
	5/8"	20	\$544.05	\$616.07	\$72.02	13.2%	69

Summary Non-Single Family Customers Bill Impacts (FY 20 to FY 21)

Rate Scenario	Meter Size	Average Bi-Monthly Usage (kgal)	Current FY 2020 Bi-Monthly Bill	Proposed FY 2021 Bi-Monthly Bill	\$ Change in Bi-Monthly Bill	% Change in Bi-Monthly Bill
1	5/8"	11	\$294	\$340	\$46	15.5%
	1.5"	91	\$3,019	\$2,828	(\$191)	-6.3%
	2"	587	\$27,146	\$21,795	(\$5,351)	-19.7%
	3"	531	\$23,707	\$17,344	(\$6,363)	-26.8%
	4"	277	\$10,951	\$8,589	(\$2,362)	-21.6%
2	5/8"	11	\$294	\$321	\$27	9.1%
	1.5"	91	\$3,019	\$2,671	(\$348)	-11.5%
	2"	587	\$27,146	\$20,631	(\$6,515)	-24.0%
	3"	531	\$23,707	\$16,394	(\$7,313)	-30.8%
	4"	277	\$10,951	\$8,106	(\$2,845)	-26.0%

Average Customer Bill Impact (8,000 gal/bi-monthly period)
Scenario 1 – Optimized CIP

	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Water	\$74.97	\$89.90	\$98.89	\$108.78	\$117.48	\$126.88
Sewer	\$142.60	\$154.18	\$172.68	\$193.40	\$216.61	\$225.28
Total	\$217.57	\$244.08	\$271.57	\$302.18	\$334.09	\$352.16
Change \$		\$26.51	\$27.49	\$30.61	\$31.91	\$18.07
Change %		12.2%	11.3%	11.3%	10.6%	5.4%

Average Customer Bill Impact (8,000 gal/bi-monthly period)
Scenario 2 – Debt-Funded CIP

	FY 20	FY 21	FY 22	FY 23	FY 24	FY 25
Water	\$74.97	\$85.84	\$90.13	\$94.64	\$102.21	\$110.39
Sewer	\$142.60	\$144.55	\$160.45	\$178.10	\$197.69	\$219.44
Total	\$217.57	\$230.39	\$252.73	\$277.30	\$304.33	\$334.08
Change \$		\$12.82	\$22.34	\$24.57	\$27.03	\$29.75
Change %		5.9%	9.7%	9.7%	9.7%	9.8%

Appendix

Bi-Monthly Water Fixed Charge Summary – FY 2021

Meter Size	Number of Water Meters	Meter Equivalencies*	Proposed Water Fixed Charge Scenario 1	Proposed Water Fixed Charge Scenario 2
5/8"	2,777	1.0	\$16.23	\$15.50
3/4"	20	3.2	51.95	49.59
1"	44	4.0	65.30	62.33
1.5"	28	6.7	109.29	104.32
2"	26	12.0	195.59	186.70
3"	5	26.3	426.76	407.37
4"	2	45.3	735.80	702.35
6"	0	102.0	1,655.55	1,580.30
8"	0	121.4	1,970.11	1,880.55

*Meter equivalencies calculated based on average billed usage (through 4" – AWWA equivalencies for 6" and 8").

Bi-Monthly Sewer Fixed Charge Summary – FY 2021

Meter Size	Number of Water Meters*	Meter Equivalencies**	Proposed Sewer Fixed Charge Scenario 1	Proposed Sewer Fixed Charge Scenario 2
5/8"	2,777	1.0	\$17.06	\$15.99
3/4"	20	3.2	54.58	51.17
1"	44	4.0	68.60	64.31
1.5"	28	6.7	114.82	107.64
2"	26	12.0	205.49	192.64
3"	5	26.3	448.35	420.33
4"	2	45.3	773.02	724.71
6"	0	102.0	1,739.30	1,630.60
8"	0	121.4	2,069.77	1,949.41

* Approximately same number of sewer meters by meter size.

** Meter equivalencies calculated based on average billed usage (through 4" – AWWA equivalencies for 6" and 8").

Volumetric Rates by Tier – FY 2021

Meter Size	Count	Water Tier 1 (kgal)	Water Tier 2 (kgal)	Water Tier 3 (kgal)	Water Tier 4 (kgal)	Sewer
Single Family	2,585	0 – 7	8 – 14	15 – 20	Over 20	
Non-Single Family						
5/8"	195	0 – 7	8 – 14	15 – 20	Over 20	
3/4"	19	0 – 22	23 – 45	46 – 64	Over 66	
1"	41	0 – 28	29 – 56	57 – 80	Over 80	
1.5"	28	0 – 47	48 – 94	95 – 135	Over 135	
2"	26	0 – 84	85 – 169	170 – 241	Over 241	
3"	5	0 – 184	185 – 368	369 – 526	Over 526	
4"	2	0 – 317	318 – 635	636 – 906	Over 906	
6"	0	0 – 713	714 – 1,429	1,430 – 2,039	Over 2,039	
8"	0	0-849	850-1,700	1,701-2,426	Over 2,426	
Rate (per kgal) Scenario 1		\$8.42	\$14.73	\$18.94	\$23.15	\$17.14
Rate (per kgal) Scenario 2		\$8.04	\$14.06	\$18.08	\$22.10	\$16.07