

NewGen Strategies & Solutions

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REPORT

WATER AND SEWER RATE STUDY

JANUARY 31, 2024



Prepared for:
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Annapolis, MD 21401

February 15, 2024

Kevin O'Sullivan
Deputy Township Manager
600 Bloomfield Ave
Verona, NJ 07044

Subject: Verona Township Water and Sewer Rate Study Report

Dear Mr. O'Sullivan:

NewGen Strategies and Solutions, LLC (NewGen) is pleased to submit to the Township of Verona (Township) our report detailing our completed Water and Sewer Rate Study. This report summarizes our study's results regarding the forecasted costs of providing water and sewer service to the Township's customers and our recommendations for recovering these costs over the next five years. Our recommendations will result in the sustainable operation of the Township's water and sewer utilities and the financial health of the Township's Water and Sewer Fund.

We appreciate the opportunity to provide our services to the Township and would like to express our sincere appreciation to Township staff. Their dedication and assistance were essential to the completion of this study. It has been a distinct pleasure to work with the Township of Verona. Please contact us if you have any questions regarding our study or our recommendations.

Very truly yours,

DocuSigned by:

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Eric Callocchia

Partner

NewGen Strategies and Solutions, LLC

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Aidan Oates

Consultant

NewGen Strategies and Solutions, LLC

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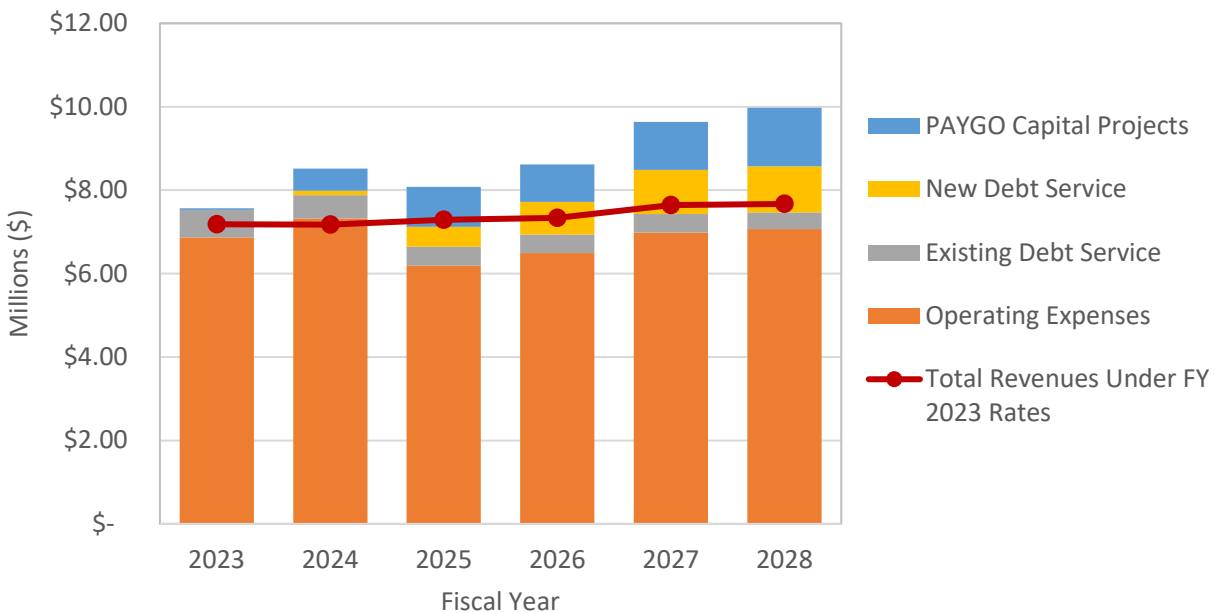
Section 1 EXECUTIVE SUMMARY

The Township of Verona provides water and sewer service to approximately 4,300 residents and businesses located within the Township. Verona also wheels (i.e., transports) water through its system to the Borough of Essex Fells. The Township engaged NewGen Strategies and Solutions, LLC (NewGen) to complete a Water and Sewer Rate Study to determine the water and sewer rates necessary to maintain the sustainable operation of its utility systems as well as the financial health of the Township’s Water and Sewer Fund. The Township operates on a calendar Fiscal Year (FY), and therefore all years in this report refer to the Township’s fiscal year beginning January 1 and ending December 31.

NewGen’s scope of work included forecasting all water and sewer system costs with a focus on the impact of improvements on the Township’s two groundwater wells to treat per-and polyfluoroalkyl substances (PFAS), which have been shown to be harmful to humans. NewGen used the Township’s FY 2023 operating budget and ten-year capital spending plan as the basis for its projections with appropriate cost escalation for future years. NewGen’s results are designed to maintain a minimum of 90 days of Water and Sewer Fund operating costs and 90 days of Pay As You GO (PAYGO), i.e., cash funded, capital improvements in the Water and Sewer Fund cash reserves.

NewGen’s study determined that the Township’s FY 2023 rates are not sufficient to maintain the financial and operational health of the Township’s Water and Sewer Fund over the next five years. Therefore, NewGen’s recommends the Township increase water and sewer rates. While this report details our study’s results for the next five fiscal years, NewGen’s ten-year model reflects the need for increases beyond the five-year period detailed in this report. The following figures show the cash flow and fund balance projections if the Township does not increase water or sewer rates over the five-year planning period.

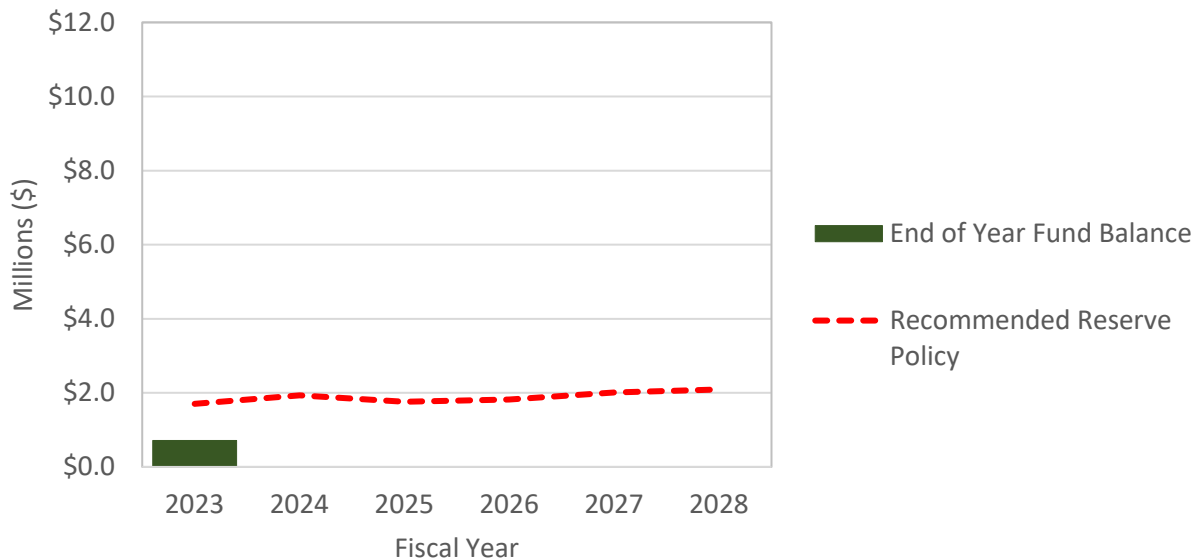
Figure 1-1: Water and Sewer Expenses vs. Revenues at FY 2023 Rates



Section 1

The Township’s FY 2023 Water and Sewer Fund budget indicated that revenues were insufficient to meet costs. In addition, the Township’s forecasted end of FY 2023 Water and Sewer Fund balance was well below NewGen’s recommended minimum policy. The Township will experience a decrease in water production costs in FY 2025 due to its wells coming back online and an increase in future debt service costs resulting from the well improvements. Based on our forecasts, the Township’s current revenue generated by FY 2023 rates will result in the depletion of the Township’s Water and Sewer Fund cash reserves in FY 2024, as demonstrated by Figure 1-2. The dotted line represents NewGen’s recommended minimum fund balance policy, which is the sum of 90 days of O&M costs and 90 days of PAYGO CIP costs.

Figure 1-2: Water and Sewer Fund Balance Projection at FY 2023 Rates



NewGen developed two scenarios for water rates during the study, both of which result in a sustainable Water and Sewer Fund. Both scenarios include the elimination of the currently effective water “capital surcharge” of \$1.00 per Kgal in FY 2024. Both scenarios increase volumetric water rates to account for the increased costs of the Township’s water system. Both scenarios implement a fixed quarterly PFAS Surcharge in FY 2025 that would generate the revenue necessary to cover the debt service and additional operating costs related to the PFAS well upgrades. Note that NewGen’s model assumes that FY 2024 rates are adopted effective April 1, 2024. All other rates are assumed to be effective on January 1 of each respective fiscal year.

Both scenarios are designed to generate the same cash flow, and therefore the volumetric water rate per 1,000 gallons (Kgal) is the same in Scenario 1 and 2. The only difference between the scenarios is the way in which the PFAS Surcharge is applied to water customers. The recommended sewer rate forecasts are the same in each scenario. NewGen’s recommended rates for each scenario are shown in Table 1-1 and Table 1-2 below. The first forecast, Scenario 1, applies the PFAS Surcharge on a per account basis.

Table 1-1
Recommended Water and Sewer Rates – Scenario 1

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
<u>Water Rates</u>						
Minimum Quarterly Fee	\$20.76	\$26.64	\$27.71	\$28.81	\$29.97	\$31.17
<i>% Increase in Minimum Fee</i>		28.3%	4.0%	4.0%	4.0%	4.0%
PFAS Surcharge (per account)	\$ -	\$ -	\$21.00	\$21.00	\$21.00	\$21.00
Volumetric Rate per Kgal	\$5.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
Capital Surcharge per Kgal	\$1.00	\$ -	\$ -	\$ -	\$ -	\$ -
Total Rate per Kgal	\$6.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
<i>% Increase in Kgal Rate</i>		28.3%	4.0%	4.0%	4.0%	4.0%
<u>Sewer Rates</u>						
Quarterly Sewer Fee	\$150	\$159	\$165	\$172	\$179	\$186
<i>% Increase</i>		6.0%	3.8%	4.2%	4.1%	3.9%

The second scenario, Scenario 2, applies the PFAS Surcharge based on account meter size, assigning more costs to larger meters based on the capacity demands of each meter.

Section 1

**Table 1-2
Recommended Water and Sewer Rates – Scenario 2**

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
<u>Water Rates</u>						
Minimum Quarterly Fee	\$20.76	\$26.64	\$27.71	\$28.81	\$29.97	\$31.17
<i>% Increase in Minimum Fee</i>		28.3%	4.0%	4.0%	4.0%	4.0%
PFAS Surcharge (per meter)						
5/8"	\$ -	\$ -	\$18.00	\$18.00	\$18.00	\$18.00
3/4"	\$ -	\$ -	\$27.00	\$27.00	\$27.00	\$27.00
1"	\$ -	\$ -	\$45.00	\$45.00	\$45.00	\$45.00
1 1/2"	\$ -	\$ -	\$90.00	\$90.00	\$90.00	\$90.00
2"	\$ -	\$ -	\$144.00	\$144.00	\$144.00	\$144.00
3"	\$ -	\$ -	\$270.00	\$270.00	\$270.00	\$270.00
4"	\$ -	\$ -	\$450.00	\$450.00	\$450.00	\$450.00
6"	\$ -	\$ -	\$900.00	\$900.00	\$900.00	\$900.00
Volumetric Rate per Kgal	\$5.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
Capital Surcharge per Kgal	\$1.00	\$ -	\$ -	\$ -	\$ -	\$ -
Total Rate per Kgal	\$6.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
<i>% Increase in Kgal Rate</i>		28.3%	4.0%	4.0%	4.0%	4.0%
<u>Sewer Rates</u>						
Quarterly Sewer Fee	\$150	\$159	\$165	\$172	\$179	\$186
<i>% Increase</i>		6.0%	3.8%	4.2%	4.1%	3.9%

Because both Scenario 1 and Scenario 2 generate the same cash flow for the Water and Sewer Fund, the following figure shows the Water and Sewer Fund cash flow forecast if the Township adopts the rates shown in either Table 1-1 or Table 1-2.

Figure 1-3: Water and Sewer Expenses vs. Revenues at Recommended Rates

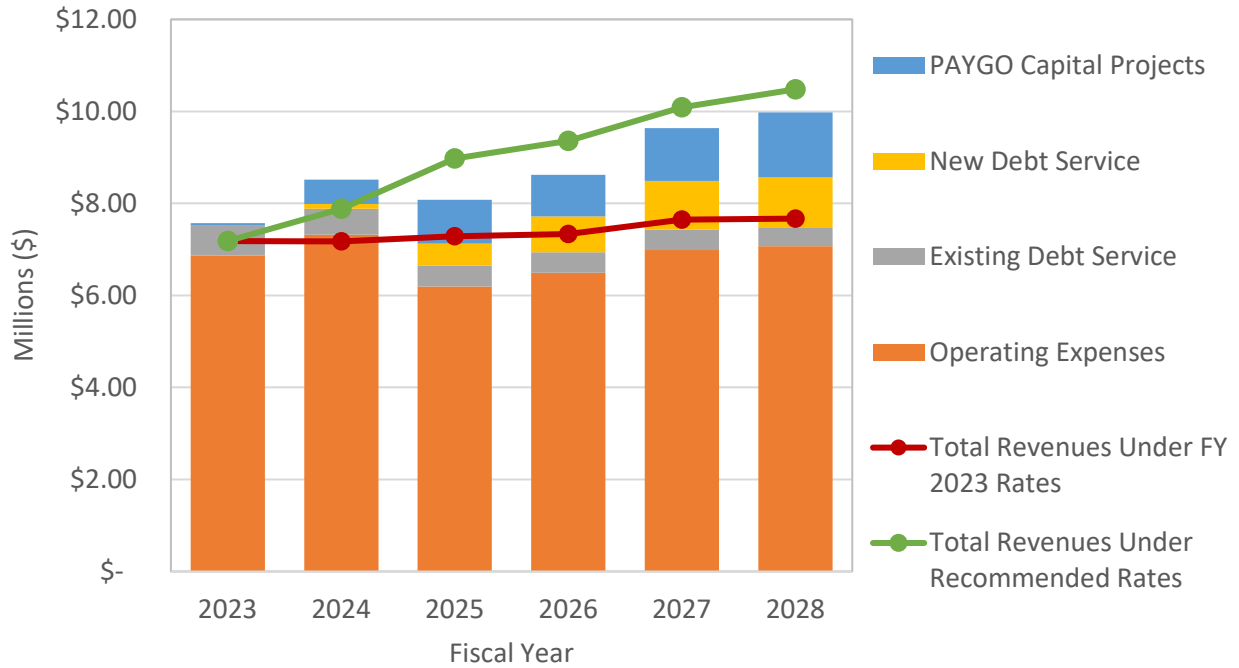
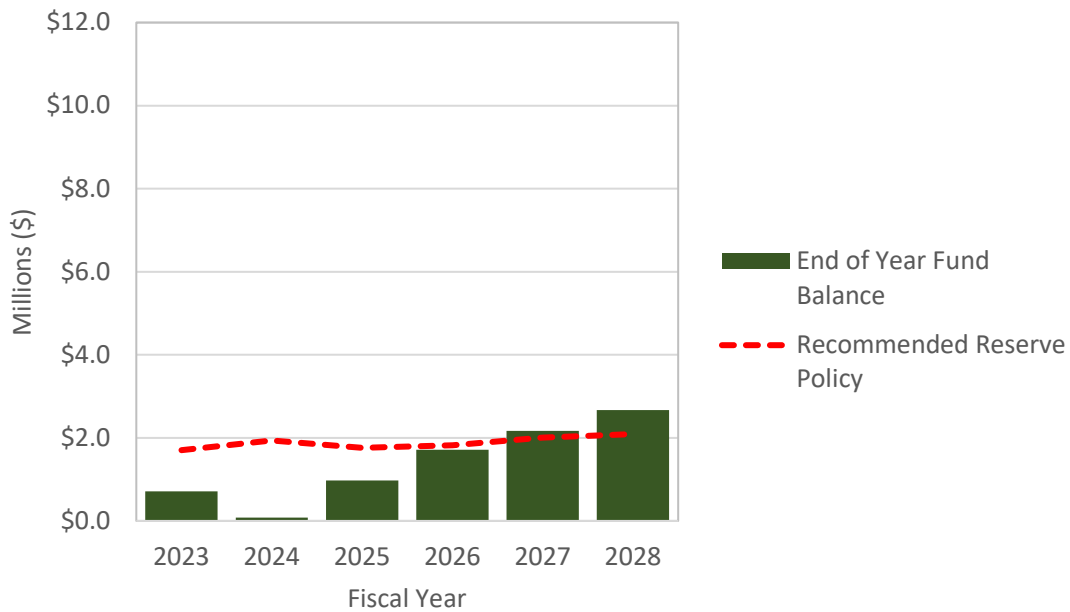


Figure 1-4 shows the forecasted Water and Sewer Fund balance if the Township adopts the rates shown in either Table 1-1 or Table 1-2. Under both recommended rate forecasts, the Water and Sewer Fund achieves the recommended minimum fund balance at the end of FY 2026. Note that the recommended FY 2024 rates are the minimum required to maintain a positive Water and Sewer Fund balance.

Figure 1-4: Water and Sewer Fund Balance Projection at Recommended Rates



Section 1

Table 1-3 and Table 1-4 below show the impact on a typical (i.e., median usage) Township residential and commercial customers of the recommended revenue increases under each scenario. Over 90% of the Township's customers are either residential or small commercial customers with 5/8" meters.

**Table 1-3
Forecasted Water and Sewer Quarterly Bills – Scenario 1**

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Res: 5/8" Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$104.12	\$107.44	\$109.90	\$113.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$269.12	\$279.44	\$288.90	\$299.50
<i>change (\$)</i>		\$26.64	\$30.20	\$10.32	\$9.46	\$10.60
<i>change (%)</i>		12.5%	12.6%	3.8%	3.4%	3.7%
Com: 5/8" Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$104.12	\$107.44	\$109.90	\$113.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$269.12	\$279.44	\$288.90	\$299.50
<i>change (\$)</i>		\$26.64	\$30.20	\$10.32	\$9.46	\$10.60
<i>change (%)</i>		12.5%	12.6%	3.8%	3.4%	3.7%
Com: 2" Meter, 40 Kgal						
Water	\$276.80	\$355.20	\$390.41	\$405.18	\$419.55	\$435.53
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$426.80	\$514.20	\$555.41	\$577.18	\$598.55	\$621.53
<i>change (\$)</i>		\$87.40	\$41.21	\$21.78	\$21.37	\$22.98
<i>change (%)</i>		20.5%	8.0%	3.9%	3.7%	3.8%

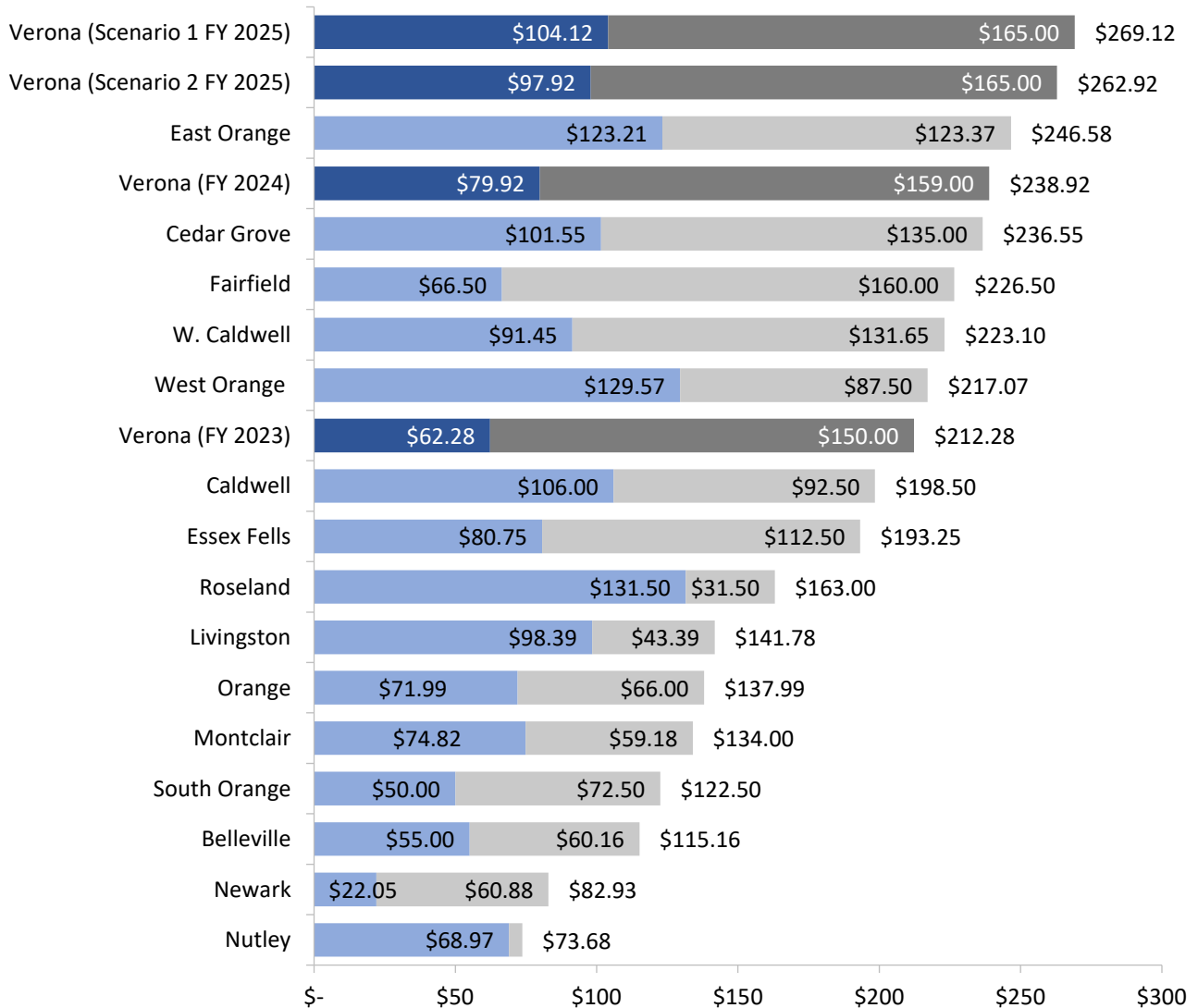
Table 1-4
Forecasted Water and Sewer Quarterly Bills – Scenario 2

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Res: 5/8" Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$101.12	\$104.44	\$107.90	\$111.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$266.12	\$276.44	\$286.90	\$297.50
<i>change (\$)</i>		\$26.64	\$27.20	\$10.32	\$10.46	\$10.60
<i>change (%)</i>		12.5%	11.4%	3.9%	3.8%	3.7%
Com: 5/8" Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$101.12	\$104.44	\$107.90	\$111.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$266.12	\$276.44	\$286.90	\$297.50
<i>change (\$)</i>		\$26.64	\$27.20	\$10.32	\$10.46	\$10.60
<i>change (%)</i>		12.5%	11.4%	3.9%	3.8%	3.7%
Com: 2" Meter, 40 Kgal						
Water	\$276.80	\$355.20	\$513.41	\$528.18	\$543.55	\$559.53
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$426.80	\$514.20	\$678.41	\$700.18	\$722.55	\$745.53
<i>change (\$)</i>		\$87.40	\$164.21	\$21.78	\$22.37	\$22.98
<i>change (%)</i>		20.5%	31.9%	3.2%	3.2%	3.2%

Figure 1-5 shows a comparison of a median Verona residential customer under the current FY 2023, recommended FY 2024, and Scenario 1 and Scenario 2 FY 2025 rates.

Section 1

Figure 1-5: Regional Bill Comparison – Quarterly Bill, 9,000 Gallons



Section 2

STUDY BACKGROUND AND SCOPE OF WORK

Study Background and Purpose

The Township Verona is in Essex County, New Jersey, about 20 miles west of New York City. The Township's Water and Sewer Department maintains watermain and sanitary sewer infrastructure serving about 4,300 customer accounts.

The Township's water comes from two different water supplies: groundwater wells that the Township of Verona owns and operates and treated surface water purchased from the Passaic Valley Water Commission (PVWC). The well water is withdrawn from the Feltsville aquifer via two deep rock wells located in Verona. The water from PVWC comes from the Wanaque Reservoir, which is owned and operated by the North Jersey District Water Supply Commission (NJDWSC) and located in Wanaque, New Jersey. PVWC can also provide water from their Little Falls Treatment plant located in Totowa, New Jersey, that utilizes water from the Passaic River and/or the Pompton River. All water sources are treated to produce safe drinking water that satisfies all state and federal standards. In addition to these water supplies, the Township has emergency water connections with both Essex Fells and the New Jersey American Water Company which can provide drinking water to Verona in the event of an interruption in normal water services.

While the scope of the study encompassed all the costs of owning and operating the Township's water and sewer systems, NewGen's primary task was to evaluate the cost and rate impact of major required upgrades to the Township's two wells to treat per- and polyfluoroalkyl substances (PFAS). Scientific studies have shown that exposure to some PFAS in the environment may be linked to harmful health effects in humans and animals.¹The New Jersey Department of Environmental Protection (NJ DEP) adopted standards, or maximum contaminant levels (MCL), for various PFAS in 2018 and 2020. MCL standards for various PFAS range from 0.013 to 0.014 parts per billion (ppb).² Compliance with the MCL is based on a running annual average (RAA) calculated quarterly. PFAS were detected in both Township wells beginning in 2020. After four quarters of exceedance of the PFAS MCL, the Township shut down both wells in August of 2021.

Typically, the Township produces about 50% of its own water supply with its two groundwater wells. However, since August of 2021, the Township has been purchasing 100% of its water supply from its wholesale provider, the Passaic Valley Water Commission (PVWC), at a cost much higher than it would incur by self-supplying with its wells. The Township is currently planning \$6.78 million in improvements to its two wells. Well 1 (Linn Drive) is expected to be back online late summer/fall of 2024 and Well 2 (Fairview Ave.) is estimated to be back online some time in latter half of 2025. In addition, cost drivers for the Township's sewer system include significant investments in its wastewater treatment plant.

The Township engaged NewGen Strategies and Solutions, LLC (NewGen) to complete a Water and Sewer Rate Study to determine the water and sewer rates necessary to maintain the sustainable operation of its utility systems as well as the financial health of the Township's Water and Sewer Fund. Our

¹ United States Environmental Protection Agency, <https://www.epa.gov/pfas/pfas-explained>

² <https://dep.nj.gov/pfas/standards/>



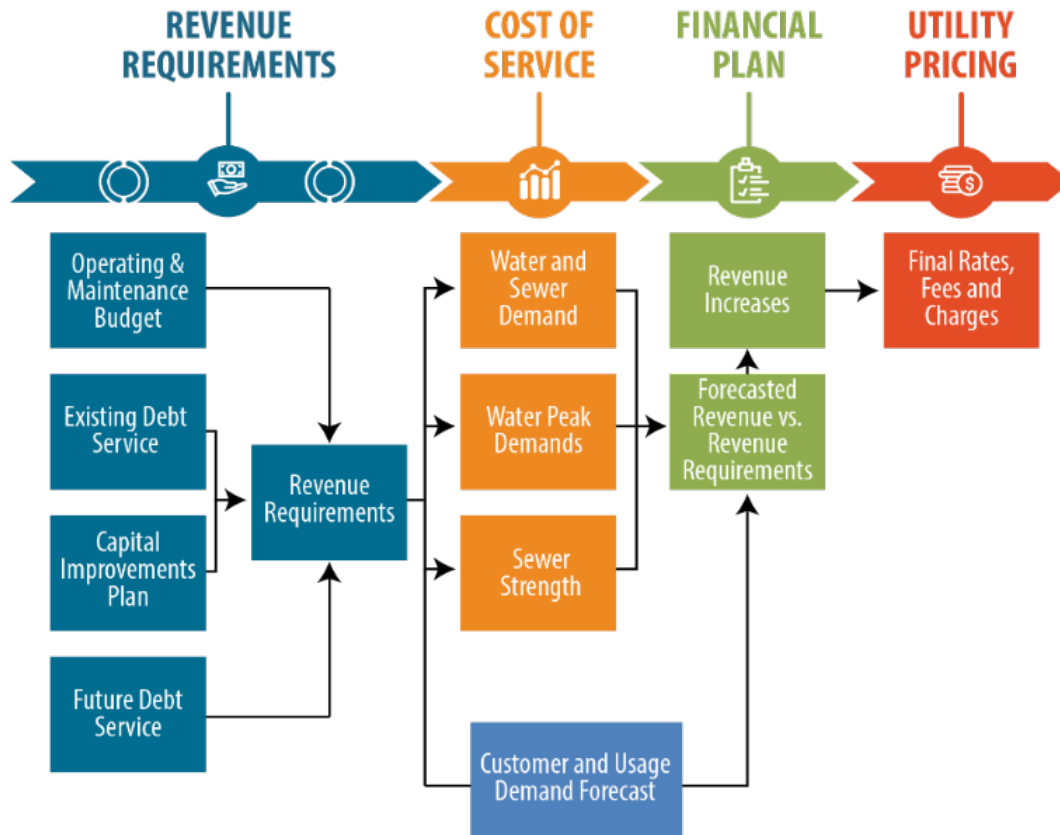
Section 2

recommendations result in water and sewer revenues that fully fund the forecasted operation, maintenance, repair, and rehabilitation of the Township's water and sewer infrastructure.

Project Approach

While each utility's budgeting, financial reporting and flow of funds is unique, a generalized schematic illustrating our approach to a cost of service / rate study is shown in the figure below.

Figure 2-1: Cost of Service Study Process



NewGen's rate study for the Township was completed using the four-step process:

- **Revenue Requirements** - Development of the full cost of providing water and sewer service to Township customers.
- **Cost of Service** - Allocation of revenue requirements to customers based on the cost of providing service.
- **Financial Plan** - Development of a financial plan to fund system revenue requirements considering customer and usage demand forecasts.
- **Utility Pricing** - Review of the current and alternative rate designs based on revenue needs with specific rate projections.

This report details the results of our rate study and our recommendations regarding water and sewer rates sufficient to meet the future costs of each utility.

Section 3

REVENUE REQUIREMENTS

The first step in the rate study was to identify and project the revenue requirements of the water and sewer systems. The revenue requirements reflect the true cost of operating and maintaining each system when accounting for day-to-day operation and maintenance (O&M) costs, existing debt service, planned capital improvements, and contributions to reserves. This section of our report will detail the full costs of each system and how those costs are reasonably expected to increase in the future.

Operating Budget Escalation Factors

NewGen's study was based on the Township's FY 2023 adopted Water and Sewer Fund budget. NewGen made reasonable assumptions to forecast future costs by applying escalation factors to each of the Township's budget line items. This ensures our recommended rates are adequate to meet the future financial needs of the systems. The study included the following operating and maintenance line-item escalation factors in Table 3-1.

Table 3-1
Operating Budget Escalation Factors

	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Chemicals	3.5%	3.5%	3.5%	3.5%	3.5%
Electricity	3.3%	3.3%	3.3%	3.3%	3.3%
General	3.7%	3.7%	3.7%	3.7%	3.7%
Salaries	2.3%	2.3%	2.3%	2.3%	2.3%
Supplies	3.5%	3.5%	3.5%	3.5%	3.5%
Services	3.5%	3.5%	3.5%	3.5%	3.5%
Benefits	4.0%	4.0%	4.0%	4.0%	4.0%

On average, NewGen projected that the water utility operating budget will increase by 3.0% per year³ and sewer operating costs will increase by 4.9% per year over the five-year projection period.

Water and Sewer Operating Costs

The primary components of the Township's day-to-day operating costs are purchased water, personnel costs including salaries, contributions to the NJ Public Employees' Retirement System (PERS), and utilities such as electricity. Other operating costs include supplies and materials, insurance, and professional and legal services.

³ Excluding the variation in water purchases and PFAS related O&M costs.

Section 3

NewGen’s forecast for purchased water was based on the fact that the Township will need to purchase 100% of its water from the Passaic Valley Water Commission (PVWC) through FY 2024. Beginning in FY 2025, the Township’s purchased water costs will drop dramatically because its two wells will become operational. However, this coincides with a large increase in debt service due to the improvements needed to the Township’s wells, which will be discussed in a later section. Table 3-2 below demonstrates the assumptions regarding purchased water from PVWC.

**Table 3-2
Projected Water Purchase Costs from PVWC**

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Total System Demand (Kgal)	527,239	551,010	552,388	552,388	553,768	553,768
Verona Wells at 90% Production	407,340	407,340	407,340	407,340	407,340	407,340
Self-Supply Percentage	0%	0%	90%	90%	90%	90%
Verona Well Supply Kgal	-	-	366,606	366,606	366,606	366,606
Net Purchased Kgal	527,239	551,010	195,424	195,424	217,905	217,905
Water Costs						
Supply Cost per Kgal	\$3.19	\$3.38	\$3.58	\$3.80	\$4.03	\$4.27
Wheeling Charge per Kgal	\$0.70	\$0.74	\$0.78	\$0.83	\$0.88	\$0.93
Total Purchase Cost per Kgal	\$3.89	\$4.12	\$4.37	\$4.63	\$4.91	\$5.20
Total Water Purchase Costs	\$2,050,000	\$2,270,972	\$853,761	\$904,987	\$1,069,640	\$1,133,819
<i>% Change</i>		10.8%	<i>(-62.4%)</i>	6.0%	18.2%	6.0%

Another key input into NewGen’s study is the fact that the well improvements necessary to treat PFAS will add two components to the Township’s water operating costs. The first is a general increase in chemical costs, which will impact day-to-day operations. The second is costs related to replacing the filter media of the two wells, which will add significant costs periodically as the filters need replacing. Tale 3-3 shows the forecasted amount of water operating costs related to these two items.

**Table 3-3
Incremental O&M Costs Resulting from PFAS Improvements**

Category	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Additional PFAS O&M	\$ -	\$ -	\$58,000	\$60,133	\$62,345	\$64,638
PFAS Filter Media Replacement	\$ -	\$ -	\$ -	\$ -	\$158,655	\$ -
Total PFAS O&M	\$ -	\$ -	\$58,000	\$60,133	\$221,000	\$64,638

Future sewer system operating costs are forecasted to be higher due to systematic staffing increases to satisfy current Township staffing deficits. It should be noted that potential sewer operating alternatives are currently being evaluated in a separate study by Boswell Engineering, and any such options will be

REVENUE REQUIREMENTS

addressed directly by Boswell’s study. However, it is reasonable to assume the immediate labor increases assumed in NewGen’s study and any potential expenses associated with Boswell’s alternatives would be balanced with efficiencies and costs savings elsewhere. Therefore, NewGen’s forecasts are reasonable regardless of operational changes that may come in the next one to three years. The Township’s FY 2023 budget and FY 2024 – FY 2028 forecasted Water and Sewer Fund O&M expenses are shown in Table 3-4.

Table 3-4
Projected Water and Sewer Operating and Maintenance Expenses

Category	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Water Purchases	\$2,050,000	\$2,270,972	\$853,761	\$904,987	\$1,069,640	\$1,133,819
Additional PFAS O&M	\$ -	\$ -	\$58,000	\$60,133	\$62,345	\$64,638
PFAS Filter Media	\$ -	\$ -	\$ -	\$ -	\$158,655	\$ -
Other Water O&M	\$2,252,467	\$2,320,669	\$2,391,032	\$2,463,626	\$2,538,526	\$2,615,808
Sewer O&M	\$2,565,711	\$2,727,945	\$2,892,945	\$3,062,680	\$3,157,295	\$3,256,938
Total O&M	\$6,868,178	\$7,319,585	\$6,195,738	\$6,491,427	\$6,986,462	\$7,071,203
<i>% Change</i>		6.6%	(-15.4%)	4.8%	7.6%	1.2%

The rates and fees developed in this study are sufficient to fund the increasing operating and maintenance costs of the water and sewer utilities.

Water and Sewer Capital Costs

There are two components to the capital costs of the water and sewer systems. The first is the existing debt obligations payable by the Water and Sewer Fund. The second is any planned capital expenditures to be paid by the Fund, which can be paid on an annual basis (i.e., PAYGO funded) or with the issuance of new debt (i.e., debt-funded). The following capital costs are included in NewGen’s revenue requirement projections for the Water and Sewer Fund.

Existing Debt Service

From time to time, the Township issues debt to fund a capital financing need of the water or sewer system. As of 2023, the Township is obligated to pay several outstanding debt issuances. Table 3-5 shows the projected loan payments over the five-year study planning period.

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**Table 3-5
Existing Debt Service Payments by Issue**

Debt Issue	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Series 2008	\$203,700	\$ -	\$ -	\$ -	\$ -	\$ -
Series 2013	\$176,442	\$171,942	\$167,442	\$162,942	\$158,442	\$121,717
Series 2017	\$129,250	\$131,175	\$128,025	\$129,800	\$131,425	\$127,975
Series 2023	\$39,007	\$151,950	\$153,850	\$155,550	\$152,150	\$148,750
Infrastructure Trust Loan A-2	\$112,254	\$107,952	\$ -	\$ -	\$ -	\$ -
Total Annual Debt Service	\$660,653	\$563,019	\$449,317	\$448,292	\$442,017	\$398,442
<i>% Change</i>		<i>(-14.8%)</i>	<i>(-20.2%)</i>	<i>(-0.2%)</i>	<i>(-1.4%)</i>	<i>(-9.9%)</i>

The payments related to existing debt obligations decrease significantly over the projection period as the Township pays off the Series 2008 and Loan A-2 obligations. The rates and fees developed in this report are sufficient to fund the above stated debt obligations now and through their maturities.

Planned Capital Improvements

A major component of owning a sustainable water and sewer utility is the planning for the rehabilitation and replacement of the Township's assets. The Township provided NewGen with a Capital Improvement Plan (CIP) that is a detailed list of projects including when they are planned to be completed and how much they are projected to cost. NewGen's study includes funding for all CIP projects. The Township can either pay cash for projects as they are completed (referred to as PAYGO funding), or the Township may issue new debt to finance projects over the long term. The major water capital projects that impact the study's forecasts are:

- **Linn Drive Well Improvements:** The improvements to the Linn Drive well to allow the treatment of PFAS is estimated to cost \$3.0 million and will be funded in FY 2024. The funding of this project will be new debt though the New Jersey Infrastructure Bank (I Bank). However, the Township will receive two revenues to offset the total cost of the project. First, the Township will receive \$1.0 million in loan forgiveness. Second, the Township is expected to receive about \$237,000 in contributions from a settlement agreement with Essex Fells (spread over FY 2023 and FY 2024) and about \$786,000 in payments resulting from a class action lawsuit with the companies liable for the PFAS contamination necessitating the well improvements.
- **Fairview Avenue Well Improvements:** The improvements to the Fairview Avenue well to allow the treatment of PFAS is estimated to cost \$3.787 million and will be funded in FY 2024. Again, this project will be funded with new debt though the I Bank. The Township will receive \$1.0 million in loan forgiveness related to this project, reducing its debt obligation accordingly.
- **Claridge Pump Station:** This project is to construct a new water pumping station to help create a booster zone to resolve water pressure issues that exist at the Claridge apartments on Claridge Drive off of Pompton Avenue. The project will cost \$1.0 million and will be funded by a new loan from the I Bank.

REVENUE REQUIREMENTS

The major sewer capital projects that impact the study's forecasts are:

- **Microscreen Improvements:** Improvements to the Township's Wastewater Treatment Plant (WWTP) microscreens is planned to occur in FY 2025 at a cost of \$4.0 million. The Township will fund this project with new debt through the I Bank.
- **UV Disinfection System:** Improvements to the WWTP UV Disinfection System is planned to occur in FY 2026 at a cost of \$1.78 million. The Township will also fund this project through the I Bank.

As part of the study NewGen worked with Township staff and consulting engineers to develop a long-term plan for the repair, rehabilitation, and replacement of buried water and sewer assets. The Township's FY 2023 budget included minimal funding for these activities. NewGen's forecast includes an annual increase of spending related to the Township's water and sewer buried assets, beginning at \$20,000 per year in FY 2023 and increasing to \$500,000 per year in FY 2028. This will allow the Township to build into the rate forecast an appropriate level of investment in its buried assets, expanding the Township's ability to be proactive in the prevention of pipe breaks and failures. Table 3-6 summarizes the projects included in the Township's CIP, developed by Township staff for the period FY 2023 – FY 2028.

**Table 3-6
Planned Capital Improvement Projects**

Project	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Water Distribution Rehab.	\$20,000	\$100,000	\$200,000	\$300,000	\$400,000	\$500,000
Sewer Collection Rehab.	\$20,000	\$100,000	\$200,000	\$300,000	\$400,000	\$500,000
Improvement to Dist. System	\$634,976					
Risk and Resilience	\$25,000					
Hydraulic Study	\$75,000					
Preliminary Planning Wells	\$500,000					
Boswell WTP	\$26,000					
Water Asset Management	\$55,000					
WWTP Storage Tank	\$150,000					
Clarifier Pump Station		\$2,000,000				
Claridge Pump Station		\$1,000,000				
Linn Drive Well		\$3,000,000				
Linn Drive Forgiveness		(\$1,000,000)				
Fairview Ave Well		\$3,787,840				
Fairview Ave Forgiveness		(\$1,000,000)				
Verona Settlements		(\$237,500)				
PFAS Class Action		(\$786,067)				
Smoke Testing		\$200,000				
I/I Study			\$274,500			
Microscreen			\$4,000,000			
UV Disinfection System				\$1,780,000		
Analysis of Clarifiers					\$50,000	
Primary Clarifiers				\$300,000		

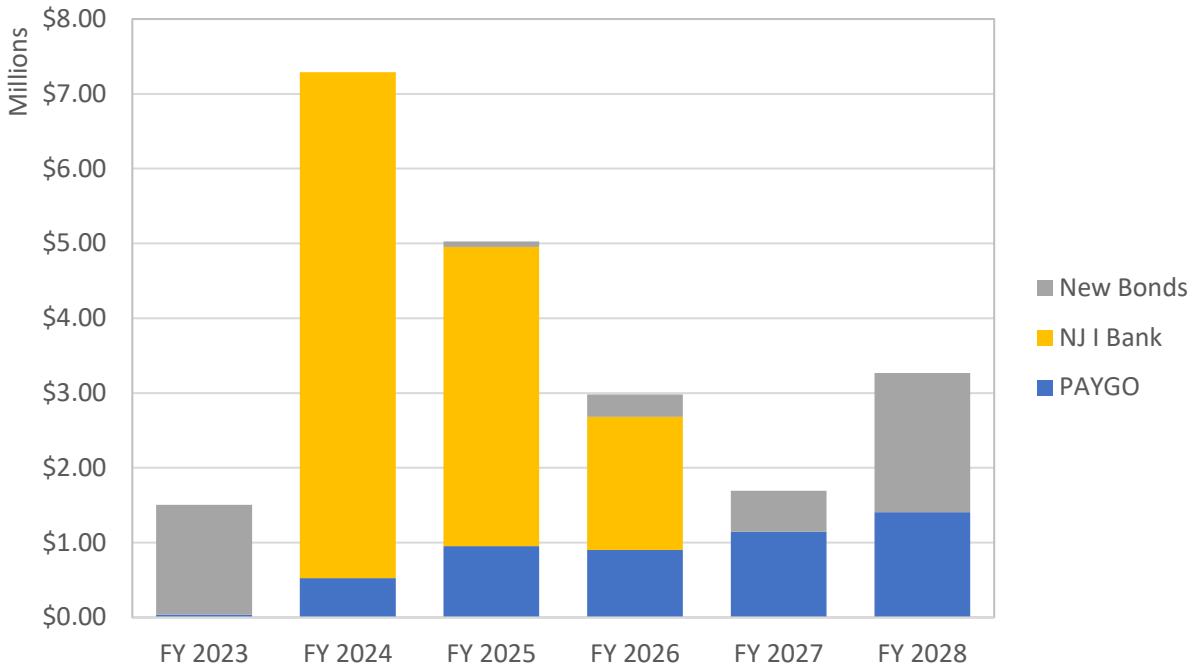
Section 3

**Table 3-6
Planned Capital Improvement Projects**

Project	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Raw Sewage Pump Station						\$360,000
Trickling Filters					\$244,800	
Secondary Clarifiers						\$1,200,000
Electrical Analysis of WTP			\$75,000			
Aerobic Digesters Design					\$250,000	
Civil Improvements Design						\$300,000
Contract Ops.		\$125,000	\$250,000	\$250,000	\$250,000	\$250,000
Total Planed CIP	\$1,505,976	\$7,289,273	\$5,027,235	\$2,981,765	\$1,692,163	\$3,266,886
Water Projects	\$1,254,976	\$4,864,273	\$206,000	\$318,270	\$437,091	\$562,754
Sewer Projects	\$251,000	\$2,425,000	\$4,821,235	\$2,663,495	\$1,255,073	\$2,704,132

Figure 3-1 shows the annual level of the Township’s planned CIP spending and the funding source assumed to develop the study’s projections. All new debt terms (Bonds and I Bank) were assumed to be 20 years at 4.0% interest.

Figure 3-1: Capital Improvement Plan Financing Forecast



REVENUE REQUIREMENTS

Miscellaneous Revenues

To determine the annual revenue needs of the water and sewer systems, non-rate revenues need to be included in the fund's revenue. Table 3-7 details these non-rate revenues, which include interest income and other miscellaneous receipts.

**Table 3-7
Projected Non-Rate Revenue**

Category	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Interest	\$44,841	\$29,061	\$3,239	\$39,989	\$70,137	\$88,722
Water/Sewer Misc.	\$218,480	\$218,480	\$218,480	\$218,480	\$218,480	\$218,480
Water/Sewer Misc. Billed	\$3,402	\$3,402	\$3,402	\$3,402	\$3,402	\$3,402
Total Non-Rate Revenues	\$266,723	\$250,943	\$225,121	\$261,871	\$292,019	\$310,604

Net Revenue Requirements

While the Township captures expenses and revenues within a single fund, namely the Water and Sewer Fund, it is important for ratemaking purposes to distinguish between the expenses and revenues of the two systems. NewGen's study is designed to set water rates to cover water costs, and sewer rates to cover sewer costs. NewGen forecasted rates such that each system is financially self-supporting, and therefore, the Water and Sewer Fund is self-supporting as a whole.

Based on the operating, debt service, and capital expense forecasts detailed above, NewGen developed a net revenue requirement forecast for the Township's water and sewer systems, shown in Table 3-8 and Table 3-9.

**Table 3-8
Water System Net Revenue Requirement Projection**

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Operating Expenses	\$4,302,467	\$4,591,641	\$3,302,793	\$3,428,746	\$3,829,167	\$3,814,265
Existing Debt Service	\$386,453	\$335,486	\$224,659	\$224,146	\$221,009	\$199,221
New Bond Debt	\$ -	\$90,872	\$90,872	\$90,872	\$90,872	\$90,872
New Debt - PFAS	\$ -	\$ -	\$150,571	\$150,571	\$276,982	\$276,982
New NJ I Bank Debt	\$ -	\$ -	\$73,582	\$73,582	\$73,582	\$73,582
PAYGO Capital	\$20,000	\$100,000	\$206,000	\$318,270	\$437,091	\$562,754
Total Rev. Req.	\$4,708,920	\$5,117,998	\$4,048,476	\$4,286,187	\$4,928,701	\$5,017,675
Less: Non-Rate Rev.	(\$167,084)	(\$157,199)	(\$141,024)	(\$164,045)	(\$182,931)	(\$194,573)
Net Rev Req.	\$4,541,836	\$4,960,799	\$3,907,452	\$4,122,141	\$4,745,770	\$4,823,102
% Change		9.2%	(21.2%)	5.5%	15.1%	1.6%

Section 3

Table 3-9
Sewer System Net Revenue Requirement Projection

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Operating Expenses	\$2,565,711	\$2,727,945	\$2,892,945	\$3,062,680	\$3,157,295	\$3,256,938
Existing Debt Service	\$274,200	\$227,534	\$224,659	\$224,146	\$221,009	\$199,221
New Bond Debt	\$ -	\$16,997	\$16,997	\$22,516	\$44,591	\$84,678
New Debt - PFAS	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
New NJ I Bank Debt	\$ -	\$ -	\$147,164	\$441,491	\$572,466	\$572,466
PAYGO Capital	\$20,000	\$425,000	\$746,235	\$583,495	\$710,273	\$844,132
Total Rev. Req.	\$2,859,911	\$3,397,475	\$4,027,999	\$4,334,328	\$4,705,633	\$4,957,435
Less: Non-Rate Rev.	(\$99,638)	(\$93,744)	(\$84,097)	(\$97,826)	(\$109,088)	(\$116,031)
Net Rev Req.	\$2,760,272	\$3,303,732	\$3,943,902	\$4,236,502	\$4,596,545	\$4,841,404
<i>% Change</i>		19.7%	19.4%	7.4%	8.5%	5.3%

The net revenue requirement is the basis upon which all rates and fees are calculated for the Township's two systems. Although the net revenue requirement varies from year to year, the financial plan developed during the study takes a long-term perspective to maintain stable rates and sufficient reserves.

Section 4

WATER AND SEWER CUSTOMERS AND USAGE

The Township's primary revenue source for the Water and Sewer Fund is the rates and fees charged to customers of the water and sewer systems. Therefore, an accounting of each system's customer base and demand must be completed before a financial plan can be developed for the Township's water and sewer systems. The Township's Water and Sewer Fund customer base includes the Township's metered water customer accounts and metered water sales, which are the basis for charges related to water service. Sewer revenues are generated by a fixed quarterly fee that is the same for all accounts. The next section of this report details the Township's water and sewer customers. The latest full year of customer and usage data available for the study was FY 2022.

Water and Sewer Customers and Usage

The Township serves 4,311 water connections, which are billed for both water and sewer service. These are the various residents and businesses within the Township as well as a small group of customers in Cedar Grove and North Caldwell. The Township also provides water service to Essex Fells as a pass-through from PVWC. The Township charges Essex Fells the PVWC supply and wheeling charge plus a 10% administration charge. Table 4-1 shows the forecasted billable water usage breakdown of the Township's water customers.

Table 4-1
Projected Water Usage in Kgal

	FY 2023 Estimate	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Inside/Outside Township Usage	376,222	376,222	383,747	383,747	399,097	399,097
Essex Fells Usage	41,416	41,416	41,416	41,416	41,416	41,416

NewGen's study assumes that there will be an increase in water demand from Township customers due to the addition of two housing developments currently planned for FY 2025 and FY 2027. The new developments are Verona Flats (95 units) and Verona Sunset / Urban Renewal (200 units). NewGen estimated that these developments would increase Township's customer base and water demand by 2.0% and 4.0% respectively based on the number of new units. NewGen assumed no increase in demand from Essex Fells.

Section 4

Customer Class Evaluation and Recommendation

One of NewGen’s tasks during the study was to evaluate the Township’s rate structure regarding the issue of customer class and make any recommendations that may result. The underlying concept in this evaluation was whether there was a clear reason the Township should charge customers in different classes (i.e., residential and commercial) different rates based on justifiable allocations of system costs. This practice is commonly referred to as identifying customer classes. The practice of distinguishing between customer classes in water rate making is well established and proper when the classes impose different costs on the utility. According to the American Water Works Association (AWWA) Manual M1 – *Principles of Water Rates, Fees, and Charges, 7th Edition* (Manual M1), “service characteristics” can be considered when establishing customer classes. An example would be classes of customers who demonstrate radically different demand patterns between their respective average and peak demands, commonly referred to as “peaking factors”.

NewGen’s ability to allocate system costs to customer classes was limited by the data available to do so. First, the Township bills on a quarterly basis, meaning that customer demand information on a monthly, daily, or hourly timeframe is not available. Such timeframes of demand are typically used to determine class peaking factors. Second, the Township only distinguishes between Residential and Commercial accounts in its billing system. Therefore, any analysis allocating costs to customer classes would be limited to these two classes. Even given these limitations, NewGen was able to conduct a reasonable allocation of system costs using the Base/Extra Capacity method described in Manual M1, which is a generally accepted method of determining cost allocations among customer classes.⁴ NewGen’s evaluation of the potential to charge class based rates was guided by several principles:

- **Equity** requires that rates and charges result in no undue discrimination among customers or customer classes.
- **Efficiency** refers to the ability of the rate schedule to encourage wise use of the resources devoted to the services that the utility provides.
 - Rates should reflect the cost of providing service.
 - Rates should be similar for customers served under similar conditions.
- **Administrative Simplicity** recognizes that the Township must be able to implement our recommendations and customers should be able to understand the rate schedules so they can make rational decisions regarding their use of utility service.

Using our professional judgement as utility rate experts, these principles as guides, and based on our cost of service analysis, NewGen does not recommend the Township begin charging different rates to residential and commercial water customers for the following reasons:

1. The Township’s customer base is relatively homogeneous, comprised of mostly residential and small commercial customers with 5/8” meters. Even when using reasonable estimates for class peaking factors, NewGen determined that because of the Township’s relatively homogenous customer base, there was no justification to allocate a material amount of cost to one class or the other, even when peaking factor estimates of 3.0 times class average were used for the residential class and 1.5 times class average was used for commercial. Put simply, even if the residential class put twice the peak

⁴ AWWA Manual M1 at p. 5.

WATER AND SEWER CUSTOMERS AND USAGE

demand (relative to their average) on the system as the commercial class, the proportional costs allocated to both classes was relatively the same to their proportional demand of the system.⁵

2. The Township bills on a quarterly basis, and therefore implementing a rate structure that sends price signals to one class with the goal to reduce demand would be, in NewGen's opinion, ineffective given the time between when a customer uses water service and when they are billed for that service. Even if there was a cost justification to charge residential customers a higher rate than commercial customers, which NewGen determined there is not, then the Township would have difficulty implementing a rate structure to encourage less demand from the residential class without transitioning to monthly billing.
3. NewGen found no cost justification or policy reason that the Township should change its rate structure, which is easy to understand, simple to administer, and not discriminatory.

⁵ NewGen's cost of service analysis using 3.0x peaking for residential and 1.5x peaking for commercial resulted in a revenue increase recommendation for the two classes differing by less than 6.0% from the overall system increase, which NewGen considers well within the margin of error of its analysis given the limitations stated herein. More robust and reliable data may return a different result.

Section 5

FINANCIAL PLAN AND CASH FLOW PROJECTIONS

NewGen developed cash flow and cash balance projections based on the revenue requirements detailed in this report and the case in which the Township does not increase water or sewer rates in any year of the five-year projection.

Minimum Fund Balance Recommendation

As part of NewGen’s study we developed a recommended minimum fund balance policy for the Township. NewGen developed this recommended policy to ensure that the rates developed during the study result in the sustainable financial health of the Township’s Water and Sewer Fund. Our recommended rates are designed such that in each year the Township maintains a minimum of 90 days of operating cash on hand and a minimum of 90 days of PAYGO CIP. The minimum fund balance policy recommendation each year of NewGen’s five-year projection is shown in Table 5-1.

Table 5-1
Minimum Fund Balance Recommendation

	FY 2023 Estimate	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected
Annual Water O&M	\$6,868,178	\$7,319,585	\$6,195,738	\$6,491,427	\$6,986,462	\$7,071,203
Days Recommended	90	90	90	90	90	90
Minimum Recommendation	\$1,693,523	\$1,804,829	\$1,527,716	\$1,600,626	\$1,722,689	\$1,743,584
Annual PAYGO Capital	\$40,000	\$525,000	\$952,235	\$901,765	\$1,147,363	\$1,406,886
Days Recommended	90	90	90	90	90	90
Minimum Recommendation	\$9,863	\$129,452	\$234,798	\$222,353	\$282,912	\$346,903
Balance Recommendation	\$1,703,386	\$1,934,281	\$1,762,514	\$1,822,979	\$2,005,601	\$2,090,488

The minimum fund balance recommendation drives our recommended rates. Our forecasted rates are designed to achieve two goals: maintain (on average) annual cash flow for both the water and sewer system and maintain an end of year Water and Sewer Fund balance of at least the recommended minimum.

Section 5

Projected Cash Flow and Fund Balance at FY 2023 Rates

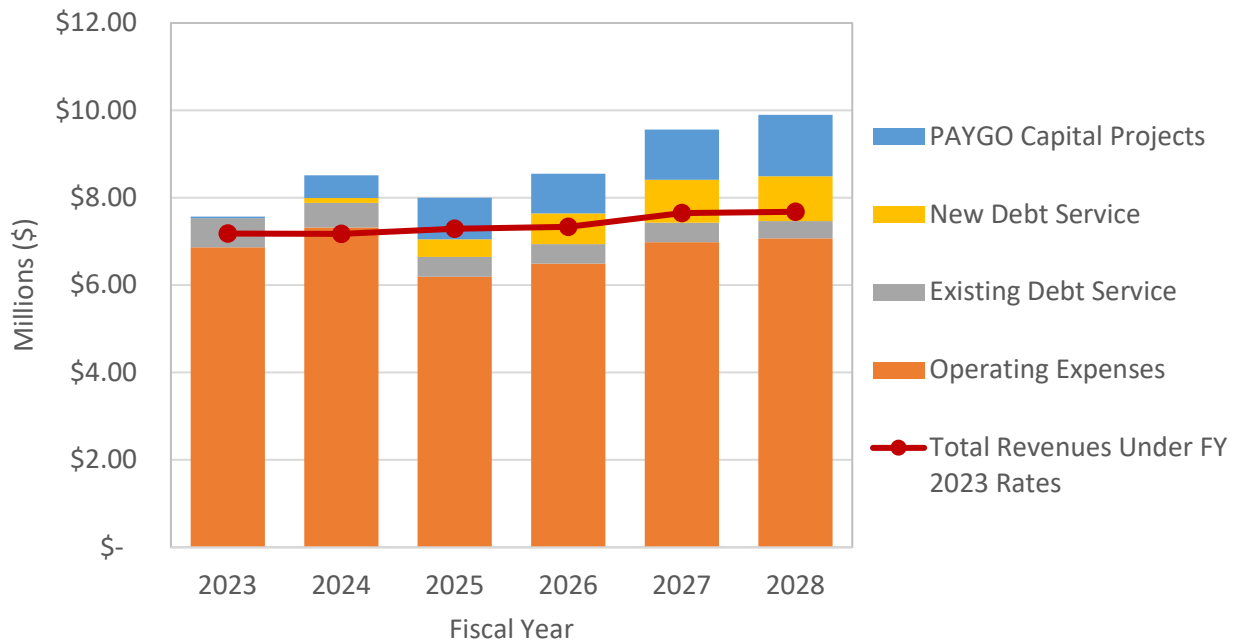
The Township's current water rate is a usage rate per one thousand gallons (kgal) that is charged to each unit of metered consumption for all water customers. The Township's sewer rate is a fixed fee applied quarterly to each account. The FY 2023 water and sewer rates are shown in Table 5-2.

Table 5-2
FY 2023 Water and Sewer Rates

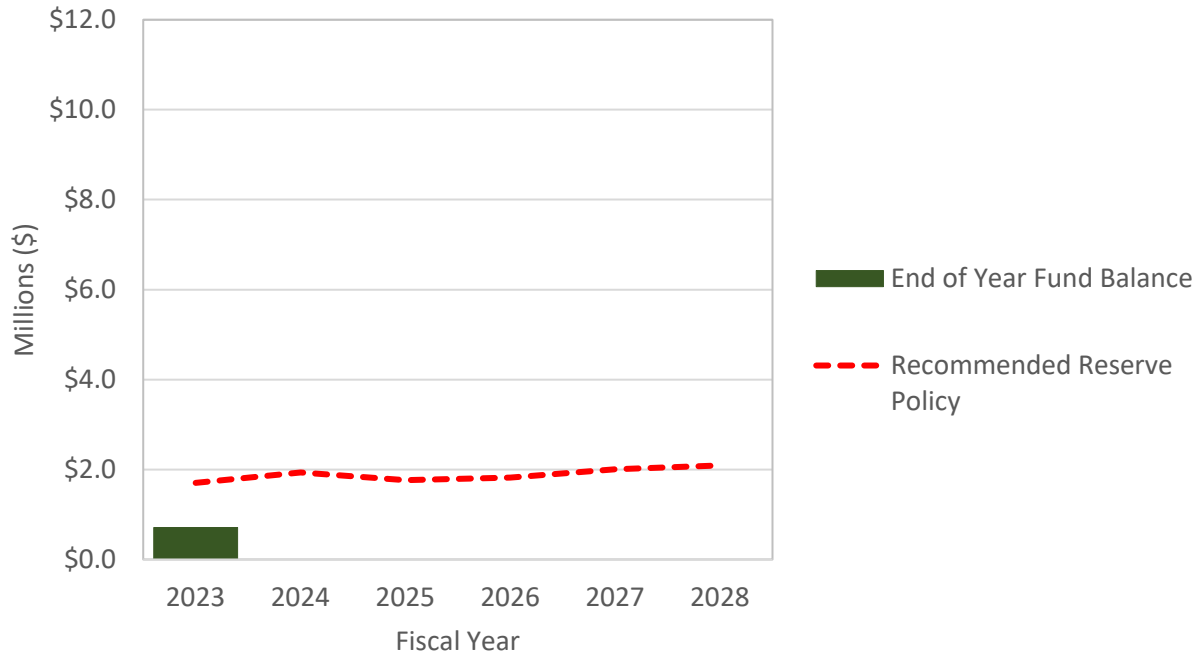
Effective January 1, 2023	
<u>Water Rates</u>	
Volumetric Rate (per Kgal)	\$5.92
Capital Surcharge (per Kgal)	\$1.00
Total Volumetric Rate (per Kgal)	\$6.92
Minimum Quarterly Water Charge ⁶	\$20.76
<u>Sewer Rates</u>	
Quarterly Sewer Fee	\$150.00

If the Township does not increase water or sewer rates from their current FY 2023 levels, the following two figures show NewGen's projected cash flow and Water and Sewer Fund balance for the period FY 2023 through FY 2028.

Figure 5-1: Water and Sewer Fund Expenses vs. Revenues Forecast



⁶ The minimum Quarterly Water Charge applies if a customer does not use enough water to achieve a bill of \$27.76, i.e., 3,000 gallons.

FINANCIAL PLAN AND CASH FLOW PROJECTIONS**Figure 5-2: Projected Water and Sewer Fund Balance at FY 2023 Rates**

As demonstrated above, the Township's current FY 2023 water and sewer rates are not sufficient to maintain the financial health of the water and sewer systems. The next sections of this report will detail the revenue increases necessary to produce sufficient cash flow to maintain the minimum required fund balance for the Township's Water and Sewer Fund.

Section 6 RECOMMENDED RATES

This section of our report details our recommended water and sewer rates and the impact on typical customer bills that will result from those recommendations. Given the timing of this report, NewGen’s model assumes that FY 2024 rates would be effective April 1, 2024. Rates for FY 2025 and beyond are assumed to be effective on January 1 of each respective fiscal year.

Recommended PFAS Surcharge

As stated previously, a key driver of the need to increase water rate revenues is the need to improve both the Township’s wells to remove PFAS. While this upgrade will reduce the Township’s operating costs for the water system by reducing the need to purchase treated water from PVWC, there are significant offsetting increases in both operating and capital costs that result from the PFAS upgrades. NewGen recommends that the Township adopt a PFAS Surcharge to generate revenue to account for the increased costs due to the PFAS upgrades. Currently the Township charges a \$1.00 per Kgal “capital surcharge” that generates about \$375,000 per year for the water system. NewGen recommends that the Township eliminate this volumetric surcharge and implement a fixed quarterly surcharge to generate revenue approximately equal to the additional operating and capital costs resulting from the PFAS upgrades. Table 6-1 below demonstrates the calculation of the revenue needed to be collected from our recommended PFAS surcharge. Note that NewGen calculated a five year average cost beginning in FY 2025 when PFAS costs are forecasted to begin.

**Table 6-1
PFAS Surcharge Revenue Calculation**

	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected	FY2029 Projected
PFAS Debt Service (Well Improvements)	\$150,571	\$150,571	\$276,982	\$276,982	\$276,982
PFAS O&M	\$58,000	\$60,133	\$62,345	\$64,638	\$67,016
Filter Media Replacement	\$ -	\$ -	\$158,655	\$ -	\$248,984
Annual PFAS Costs	\$208,571	\$210,704	\$497,982	\$341,620	\$592,982
Five Year Average (FY 2025 - FY 2029)	\$370,372	\$370,372	\$370,372	\$370,372	\$370,372

The following sections demonstrate the two approaches NewGen developed to assess this charge.

Section 6

PFAS Surcharge per Account (Scenario 1)

The first scenario developed assesses the PFAS Surcharge on a per account basis. Using the five-year average cost developed in Table 6-1, Table 6-2 shows the calculated⁷ PFAS Surcharge on a per account basis.

Table 6-2
PFAS Surcharge Calculation per Account – Scenario 1

	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected	FY2029 Projected
Five Year Average Annual PFAS Costs	\$370,372	\$370,372	\$370,372	\$370,372	\$370,372
Quarterly Water Accounts	4,311	4,311	4,311	4,311	4,311
Quarterly PFAS Surcharge per Account	\$21.00	\$21.00	\$21.00	\$21.00	\$21.00

PFAS Surcharge per Account (Scenario 2)

The second scenario developed assesses the PFAS Surcharge on a per meter basis, incrementing the surcharge based on the capacity demand of each meter. The two most commonly used ratios in the water rate-making industry are (1) equivalent meter-and-service cost ratios and (2) equivalent meter capacity ratios.⁸ Equivalent meter capacity ratios are most often used when estimating potential capacity or demand requirements for customers on the basis of the size of the water meter.⁹ The additional PFAS related O&M and capital costs are directly related to the Township's ability to provide water supply capacity, and can therefore be reasonably linked to the potential demand capacity of the Township's customers. Therefore, calculating the PFAS surcharge based on meter size is a justifiable methodology to allocate these costs. Table 6-3 provides the maximum flow capacity in gallons per minute (gpm) of each meter size, shown in Table 6-3.¹⁰

Table 6-3
AWWA Meter Flow Capacity Ratios

Meter Size	Flow Capacity (gpm)	Flow Capacity Ratio
5/8"	20	1.0
3/4"	30	1.5
1"	50	2.5
1 1/2"	100	5.0
2"	160	8.0
3"	300	15.0
4"	500	25.0
6"	1,000	50.0

⁷ Rounded to the nearest dollar.

⁸ AWWA Manual M1 at p. 383.

⁹ Id.

¹⁰ AWWA Manual M1 at p. 386, Table B-2, C712-15 Singlejet Type meter.

RECOMMENDED RATES

For example, the fee charged to a 1 ½" meter will be five times the fee calculated for a 5/8" meter, because a 1 ½" meter has five times the flow capacity of a 5/8" meter. The fees, in total, are calculated to generate the PFAS Surcharge revenue calculated in Table 6-1.

The first step is to determine the basis by which the PFAS Surcharge can be applied per meter based on the flow capacity ratios above. This required NewGen to determine how many 5/8" meter "equivalents" there are in the Township's system. This is accomplished by multiplying the number of meters in each meter size by the flow capacity ratio demonstrated in Table 6-3. Table 6-4 shows the calculation of 5/8" meter equivalents for the Township's system.

Table 6-4
5/8" Equivalent Meter Calculation

Meter Size	Number of Customers	Flow Capacity Ratio	5/8" Meter Equivalents
5/8"	4,114	1.0	4,114
3/4"	8	1.5	12
1"	114	2.5	285
1 1/2"	19	5.0	95
2"	39	8.0	312
3"	6	15.0	90
4"	9	25.0	225
6"	2	50.0	100
Total	4,311		5,233

The next step is to use the five-year average cost developed in Table 6-1 to allocate costs to each meter equivalent based on 5/8" meter equivalents developed in Table 6-4. Table 6-5 shows the calculated¹¹ PFAS Surcharge on a per meter equivalent basis.

Table 6-5
Quarterly PFAS Surcharge Calculation per 5/8" Meter Equivalent – Scenario 2

	FY 2025 Projected	FY 2026 Projected	FY2027 Projected	FY2028 Projected	FY2029 Projected
Five Year Average Annual PFAS Costs	\$370,372	\$370,372	\$370,372	\$370,372	\$370,372
Quarterly Water Meter Equivalents	5,233	5,233	5,233	5,233	5,233
Quarterly PFAS Surcharge per Account	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00

Finally, to develop the PFAS Surcharge for each meter size, the charge per meter equivalent calculated in Table 6-5 is multiplied by the flow capacity ratio shown in Table 6-4 for each meter size. The resulting Scenario 2 PFAS Surcharges are shown in Table 6-6

¹¹ Rounded to the nearest dollar.

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Table 6-6
Recommended Quarterly PFAS Surcharge Per Meter

Meter Size	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected	FY 2029 Projected
5/8"	\$18.00	\$18.00	\$18.00	\$18.00	\$18.00
3/4"	\$27.00	\$27.00	\$27.00	\$27.00	\$27.00
1"	\$45.00	\$45.00	\$45.00	\$45.00	\$45.00
1 1/2"	\$90.00	\$90.00	\$90.00	\$90.00	\$90.00
2"	\$144.00	\$144.00	\$144.00	\$144.00	\$144.00
3"	\$270.00	\$270.00	\$270.00	\$270.00	\$270.00
4"	\$450.00	\$450.00	\$450.00	\$450.00	\$450.00
6"	\$900.00	\$900.00	\$900.00	\$900.00	\$900.00

Recommended Water and Sewer Rates - Scenario 1

The following water and sewer rates shown in Table 6-7 are projected to fully support the future operating, capital, debt service, and reserve requirements of the system and include a PFAS Surcharge assessed on a per account basis.

Table 6-7
Recommended Quarterly Water and Sewer Rates – Scenario 1

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Water Rates						
Minimum Quarterly Fee	\$20.76	\$26.64	\$27.71	\$28.81	\$29.97	\$31.17
<i>% Increase in Minimum Fee</i>		28.3%	4.0%	4.0%	4.0%	4.0%
PFAS Surcharge (per account)	\$ -	\$ -	\$21.00	\$21.00	\$20.00	\$20.00
Volumetric Rate per Kgal	\$5.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
Capital Surcharge per Kgal	\$1.00	\$ -	\$ -	\$ -	\$ -	\$ -
Total Rate per Kgal	\$6.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
<i>% Increase in Kgal Rate</i>		28.3%	4.0%	4.0%	4.0%	4.0%
Sewer Rates						
Quarterly Sewer Fee	\$150	\$159	\$165	\$172	\$179	\$186
<i>% Increase</i>		6.0%	3.8%	4.2%	4.1%	3.9%

Recommended Water and Sewer Rates - Scenario 2

The following water and sewer rates shown in Table 6-8 are projected to fully support the future operating, capital, debt service, and reserve requirements of the system and include a PFAS Surcharge assessed on a per meter basis.

Table 6-8
Recommended Quarterly Water and Sewer Rates – Scenario 2

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
<u>Water Rates</u>						
Minimum Quarterly Fee	\$20.76	\$26.64	\$27.71	\$28.81	\$29.97	\$31.17
<i>% Increase in Minimum Fee</i>		28.3%	4.0%	4.0%	4.0%	4.0%
PFAS Surcharge (per meter)						
5/8"	\$ -	\$ -	\$18.00	\$18.00	\$18.00	\$18.00
3/4"	\$ -	\$ -	\$27.00	\$27.00	\$27.00	\$27.00
1"	\$ -	\$ -	\$45.00	\$45.00	\$45.00	\$45.00
1 1/2"	\$ -	\$ -	\$90.00	\$90.00	\$90.00	\$90.00
2"	\$ -	\$ -	\$144.00	\$144.00	\$144.00	\$144.00
3"	\$ -	\$ -	\$270.00	\$270.00	\$270.00	\$270.00
4"	\$ -	\$ -	\$450.00	\$450.00	\$450.00	\$450.00
6"	\$ -	\$ -	\$900.00	\$900.00	\$900.00	\$900.00
Volumetric Rate per Kgal	\$5.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
Capital Surcharge per Kgal	\$1.00	\$ -	\$ -	\$ -	\$ -	\$ -
Total Rate per Kgal	\$6.92	\$8.88	\$9.24	\$9.60	\$9.99	\$10.39
<i>% Increase in Kgal Rate</i>		28.3%	4.0%	4.0%	4.0%	4.0%
<u>Sewer Rates</u>						
Quarterly Sewer Fee	\$150	\$159	\$165	\$172	\$179	\$186
<i>% Increase</i>		6.0%	3.8%	4.2%	4.1%	3.9%

Section 6

Water Cash Flow Forecast at Recommended Rates

If the Township were to adopt either the Scenario 1 or Scenario 2 rates described in this report, both of which generate the same amount of PFAS Surcharge revenue, then the forecasted cash flow of the water system is shown in Table 6-9.

Table 6-9
Water System Cash Flow Forecast at Recommended Rates

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Net Revenue Requirement	\$4,541,836	\$4,960,799	\$3,907,452	\$4,122,141	\$4,745,770	\$4,823,102
Water Rate Revenue	\$2,806,088	\$3,276,584	\$4,136,896	\$4,287,249	\$4,592,685	\$4,762,200
Surplus / (Shortall)	(\$1,735,748)	(\$1,684,215)	\$229,444	\$165,107	(\$153,085)	(\$60,902)

Sewer Cash Flow Forecast at Recommended Rates

The sewer rates in both the Scenario 1 and Scenario 2 forecasts are the same. Therefore, if the Township were to adopt either the Scenario 1 or Scenario 2 rates, the forecasted sewer system cash flow is shown in Table 6-10.

Table 6-10
Sewer System Cash Flow Forecast at Recommended Rates

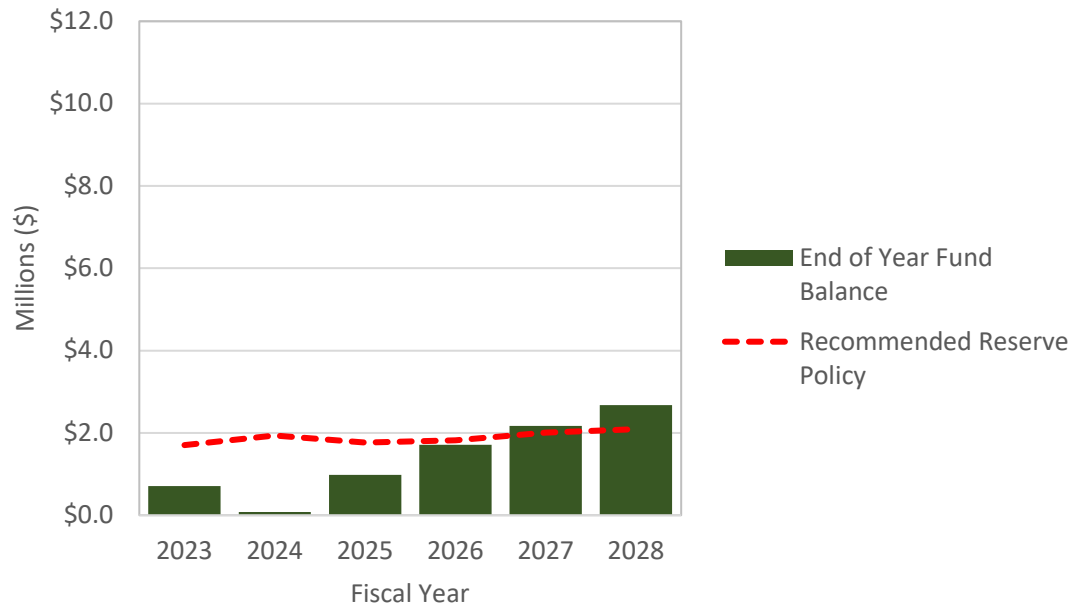
	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Net Revenue Requirement	\$2,760,272	\$3,303,732	\$3,943,902	\$4,236,502	\$4,596,545	\$4,841,404
Sewer Rate Revenue	\$4,110,600	\$4,357,236	\$4,612,093	\$4,807,758	\$5,203,559	\$5,407,050
Surplus / (Shortall)	\$1,350,328	\$1,053,504	\$668,191	\$571,256	\$607,015	\$565,647

Water and Sewer Fund Forecast at Recommended Rates

If the Township adopts either the Scenario 1 or Scenario 2 water and sewer rates shown in the tables above, the result is that the Township can fund each system's projected operating, capital, and debt service expenses while also maintaining the recommended reserves. Figure 6-1 shows the forecasted Water and Sewer Fund end of year balance under both the Scenario 1 and Scenario 2 rates.

Note that the proposed increase in FY 2024 is the absolute minimum necessary to maintain a positive Water and Sewer Fund balance.

Figure 6-1: Water and Sewer Fund Balance – Recommended Rates



Section 7

CUSTOMER BILL IMPACTS AND BENCHMARKING

This section summarizes the impact on the Township's customers and provides a comparison of a typical Township customer bill under the recommended rates with that a customer in surrounding utilities.

Customer Bills under Rate Scenario 1

The following table shows the impact of NewGen's recommended Scenario 1 rates on a Township customer. The examples chosen for the forecast are based on the actual customer data provided to NewGen as a part of the study. The median residential customer has a 5/8" meter and uses 9,000 gallons of water quarterly. A vast majority of the Township's commercial customers also have a 5/8" meter and use about 9,000 gallons of water per quarter.

Although 95% of the Township's customers are served by 5/8" meters, the Township does serve some customers with meter sizes larger than 5/8". Some of these customers are single commercial connections, such as a storefront or restaurant, but the majority are multi-use in nature, meaning that several end users (i.e., units) are served by the one larger meter. Therefore, the costs paid by larger meters are often spread among several users. For demonstration purposes, the example given to represent larger meter customers is a 2" meter customer who uses 40,000 gallons of water per quarter, which is the median for that meter size.

Table 7-1
Forecasted Water and Sewer Quarterly Bills – Scenario 1

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Res: 5/8" Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$104.12	\$107.44	\$109.90	\$113.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$269.12	\$279.44	\$288.90	\$299.50
<i>change (\$)</i>		\$26.64	\$30.20	\$10.32	\$9.46	\$10.60
<i>change (%)</i>		12.5%	12.6%	3.8%	3.4%	3.7%
Com: 5/8" Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$104.12	\$107.44	\$109.90	\$113.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$269.12	\$279.44	\$288.90	\$299.50
<i>change (\$)</i>		\$26.64	\$30.20	\$10.32	\$9.46	\$10.60
<i>change (%)</i>		12.5%	12.6%	3.8%	3.4%	3.7%
Com: 2" Meter, 40 Kgal						
Water	\$276.80	\$355.20	\$390.41	\$405.18	\$419.55	\$435.53

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Table 7-1
Forecasted Water and Sewer Quarterly Bills – Scenario 1

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$426.80	\$514.20	\$555.41	\$577.18	\$598.55	\$621.53
<i>change (\$)</i>		\$87.40	\$41.21	\$21.78	\$21.37	\$22.98
<i>change (%)</i>		20.5%	8.0%	3.9%	3.7%	3.8%

Customer Bills under Rate Scenario 2

The following table shows the impact of NewGen’s recommended Scenario 2 rates on the same sample Township customers.

Table 7-2
Forecasted Water and Sewer Quarterly Bills – Scenario 2

	FY 2023 Budget	FY 2024 Projected	FY 2025 Projected	FY 2026 Projected	FY 2027 Projected	FY 2028 Projected
Res: 5/8” Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$101.12	\$104.44	\$107.90	\$111.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$266.12	\$276.44	\$286.90	\$297.50
<i>change (\$)</i>		\$26.64	\$27.20	\$10.32	\$10.46	\$10.60
<i>change (%)</i>		12.5%	11.4%	3.9%	3.8%	3.7%
Com: 5/8” Meter, 9 Kgal						
Water	\$62.28	\$79.92	\$101.12	\$104.44	\$107.90	\$111.50
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$212.28	\$238.92	\$266.12	\$276.44	\$286.90	\$297.50
<i>change (\$)</i>		\$26.64	\$27.20	\$10.32	\$10.46	\$10.60
<i>change (%)</i>		12.5%	11.4%	3.9%	3.8%	3.7%
Com: 2” Meter, 40 Kgal						
Water	\$276.80	\$355.20	\$513.41	\$528.18	\$543.55	\$559.53
Sewer	\$150.00	\$159.00	\$165.00	\$172.00	\$179.00	\$186.00
Total Quarterly Bill	\$426.80	\$514.20	\$678.41	\$700.18	\$722.55	\$745.53
<i>change (\$)</i>		\$87.40	\$164.21	\$21.78	\$22.37	\$22.98
<i>change (%)</i>		20.5%	31.9%	3.2%	3.2%	3.2%

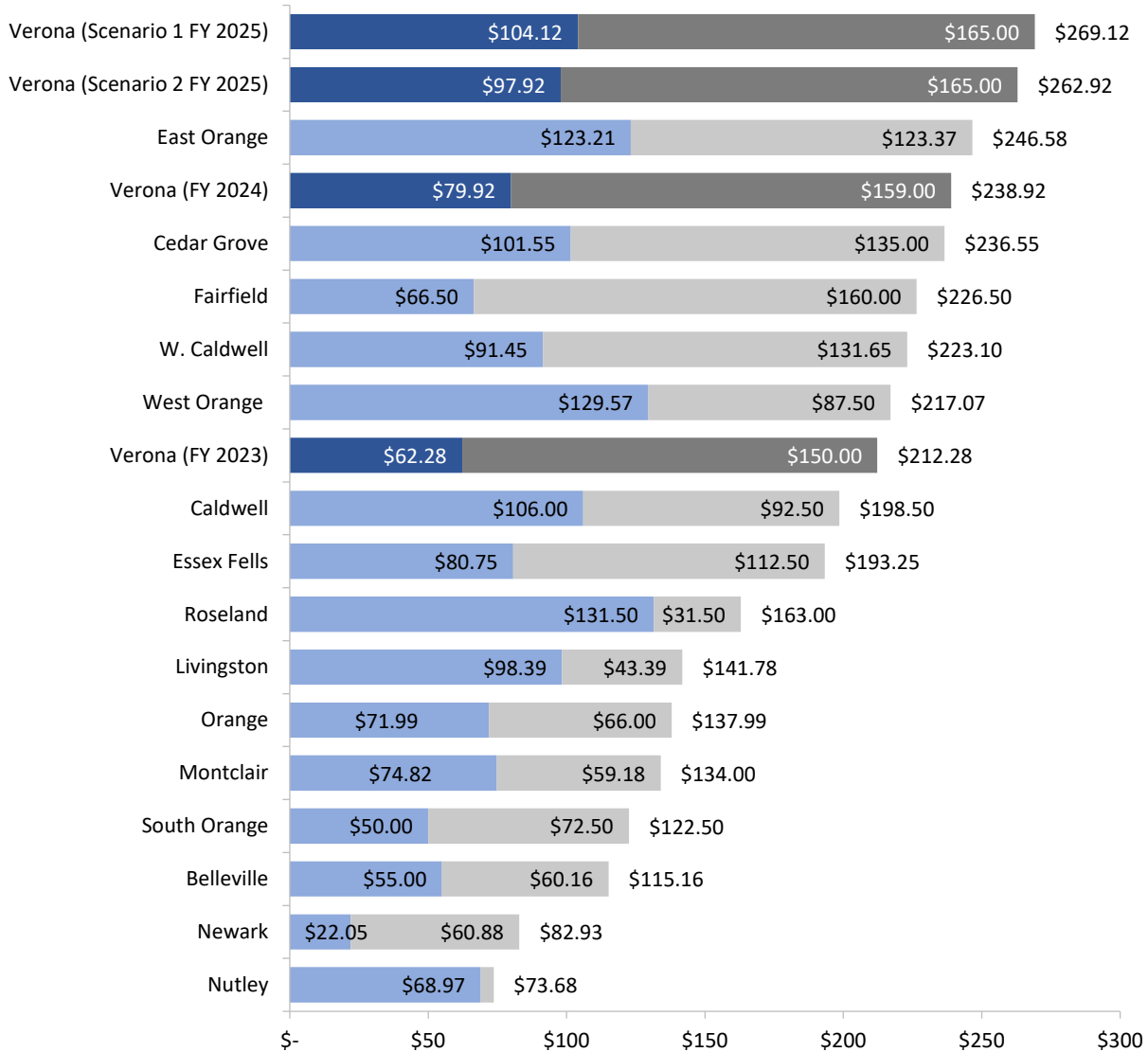
The primary difference between the two forecasts is the slightly lower bill increase for smaller meter customers and the proportionately larger increase for the large meter customers in FY 2025.

CUSTOMER BILL IMPACTS AND BENCHMARKING

Regional Bill Comparison

The following figure shows a bill for a median Township residential customer (5/8” meter, 9 Kgal Quarterly usage) in surrounding service areas.

Figure 7-1: Regional Bill Comparison – Typical Residential Customer



It should be noted that the figure above shows bills for the typical Verona customer at both the Township’s current and future rates, whereas the bills for the example customer of comparison utilities are only shown at each utility’s current rates. Given overall utility industry trends, it is highly likely that all the comparison utilities will need to implement rate increases over the next several years. It is therefore likely that the Verona customer’s bill will remain in the middle range of that same customer’s bill the comparison utilities in future years. It should also be noted that NewGen did not verify whether any of the comparison utilities are currently charging rates sufficient to meet the financial needs of their systems,

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and it may be the case that other communities are not charging the true cost of service to their customers by either not properly investing in their assets or subsidizing the utilities with other general government revenues. NewGen makes no representation as to the sustainability of the rates in other communities.

While regional comparisons may provide some context, the ranking of individual customer bills is not a consideration when developing a financial plan and rate structure. The Township's cash needs are independent of the rates in the surrounding jurisdictions, and this comparison is provided for information only.

Section 8

WASTEWATER SURCHARGE RATES

NewGen’s rate study included a task to recommend high strength wastewater surcharges based on the Township’s wastewater treatment operations. High strength surcharges are additional fees charged to large, typically industrial sewer customers to account for the fact that the wastewater they discharge into the Township’s system is of higher contaminant strength, i.e., “dirtier”, and therefore more costly to treat. The practice of establishing high strength surcharges is well established as per the Water Environment Federation’s (WEF) references to United States Environmental Protection Agency guidance in *WEF Manual of Practice 27: Financing and Charges for Wastewater Systems (Fourth Edition)*.¹²

The process of determining high strength surcharges involves allocating the Township’s sewer system costs to both volume (i.e., flow) and strength, and isolating the cost of treating specific contaminants for the purpose of charging higher rates to treat those contaminants. While there are several contaminants that Publicly Owned Treatment Works (POTW) must remove before discharging effluent into the local waterways, however surcharges are typically calculated for two primary contaminants:

- **Biochemical Oxygen Demand (BOD)** is a way to measure organic pollution in water by looking at the rate at which micro-organisms in the water use up dissolved oxygen when they metabolize the organic pollutants. BOD directly affects the amount of dissolved oxygen in rivers and streams. The greater the BOD, the more rapidly oxygen is depleted in the stream. This means less oxygen is available to higher forms of aquatic life. The consequences of high BOD are the same as those for low dissolved oxygen: aquatic organisms become stressed, suffocate, and die.
- **Total Suspended Solids (TSS)** is a measurement of the total solids in wastewater that are retained by filtration. If TSS is not removed properly through treatment, high concentrations can lower the water quality in the receiving environment. The suspended solids absorb light, causing increased water temperature and decreased oxygen which creates an unfavorable environment for aquatic life.

Wastewater strength is defined by the concentration of BOD and TSS in wastewater influent stated in milligrams per liter (mg/L). Domestic strength wastewater is typically defined as having BOD and TSS concentrations ranging from 250 mg/L to 300 mg/L.¹³ For the purpose of NewGen’s analysis, we recommend that the Township calculate surcharges based on concentrations of 250 mg/L for both BOD and TSS. The surcharge rates are stated as a cost per pound of BOD and TSS.

Functionalization of Township Sewer Costs

The first step in the surcharge calculation is to isolate the Township’s costs of treating BOD and TSS. This process requires the “functionalization” of the Township’s sewer costs. NewGen used the Township’s forecasted FY 2024 Net Revenue Requirement, detailed previously in this report, as the basis for our recommended BOD and TSS surcharges.

To complete this analysis, NewGen segregated the Township’s FY 2024 sewer Net Revenue Requirement into three cost functions: Treatment, Collection, and Customer. Treatment costs are those related to the

¹² WEF MOP 27 at p. 141

¹³ <https://www.lawinsider.com/dictionary/domestic-strength-wastewater>

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treatment of wastewater influent. Collection costs are those related to the collection and conveyance of wastewater throughout the Township's system, and costs are those related to billing, customer service, and administration of the Township's sewer system. Table 8-1 shows the results of NewGen's functionalization analysis.

Table 8-1
FY 2024 Sewer Functionalization

	FY 2024 Projected	Treatment	Collection	Customer
Salaries and Wages	\$1,101,754	\$1,023,185	\$52,192	\$26,377
Other Operating Costs	\$1,626,190	\$1,498,455	\$84,853	\$42,883
Capital Costs	\$669,531	\$633,551	\$23,901	\$12,079
Total Sewer Revenue Requirements	\$3,397,475	\$3,155,191	\$160,946	\$81,339
Less: Non-Rate Revenues	(\$93,744)	(\$87,058)	(\$4,441)	(\$2,244)
Net Sewer Revenue Requirements	\$3,303,732	\$3,068,132	\$156,505	\$79,095

Distribution of Costs to Cost Causative Components

The next step of the analysis is to allocate the system's treatment costs, as demonstrated above, into three cost causative components of the treatment process: Flow, BOD, and TSS. To guide this analysis, NewGen requested the latest available year of flow, BOD and TSS measurements from the Township's wastewater treatment plant. Table 8-2 demonstrates the information used to allocate treatment costs between flow, BOD, and TSS.

NewGen's recommendation is to allocate 50% of treatment costs to flow and the remaining 50% in a proportion of 40% to BOD (20%) and 60% to TSS (30%). Table 8-2 demonstrates the application of these allocations to the FY 2024 treatment costs results in the following allocation to the cost causative components.

Table 8-2
FY 2024 Treatment Costs per Cost Causative Component

	FY 2024 Projected	Flow	BOD	TSS
Allocation %		50%	20%	30%
Treatment Costs	\$3,068,132	\$1,534,066	\$613,626	\$920,440

Distribution of Costs to Units of Service

Finally, the costs per cost causative component must be distributed to "units of service", which is the quantity of BOD and TSS treated at the plant in a typical year. NewGen used the actual FY 2023 plant flow to develop the BOD and TSS units of service for our recommended FY 2024 surcharges, as demonstrated in Table 8-3.

WASTEWATER SURCHARGE RATES

**Table 8-3
FY 2023 Wastewater Treatment Plant Data**

	Flow (MG)	BOD (mg/L)	TSS (mg/L)
January	2.09	146.5	268.0
February	1.58	126.7	164.3
March	2.07	115.7	110.0
April	1.97	203.3	294.3
May	1.81	118.1	154.0
June	1.48	143.3	217.3
July	1.62	173.7	235.7
August	1.52	163.3	218.3
September	1.96	138.7	209.0
October	1.72	128.0	164.0
November	1.68	173.0	176.0
December	2.61	131.0	133.0
Annual Average	22.10	146.8	195.3
Average Monthly Flow (MG)	1.84		
Annual Flow (MG)	672.30		
Annual Flow (kgal)	672,300		

Table 8-4 shows the final steps to calculate a cost based surcharge for a customer who delivers high strength wastewater into the Township's treatment plant.

**Table 8-4
Treatment Plant Units of Service and Surcharge Calculation**

	Value	Note
Annual Treated Flow (Kgal)	672,300	(a)
Plant BOD Concentration (mg/L)	147	(b)
conversion of mg/L to lbs./Kgal	0.008345	(c)
BOD Pounds Removed (Units of Service)	823,458	(a) x (b) x (c) = (d)
BOD Costs	\$613,626	(e) from Table 8-2
BOD Surcharge \$/lb.	\$0.75	= (e) / (d)
Annual Treated Flow (Kgal)	672,300	(a)
Plant TSS Concentration (mg/L)	195	(b)
conversion of mg/L to lbs./Kgal	0.008345	(c)
TSS Pounds Removed (Units of Service)	1,095,840	(a) x (b) x (c) = (d)
TSS Costs	\$920,440	(e) from Table 8-2
TSS Surcharge \$/lb.	\$0.84	= (e) / (d)

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Sample Surcharge Bill Calculation

The surcharges would be applied to any excess concentration of BOD and/or TSS from a large industrial customer. The table below demonstrates a sample surcharge bill calculation for a large industrial customer using 50,000 gallons in a quarter with a BOD concentration of 750 mg/L and TSS concentration of 500 mg/L.

**Table 8-5
Sample Customer Surcharge Calculation**

Sample Customer	BOD	TSS
Customer Actual Concentration (mg/L)	750	500
Domestic Limit (mg/L)	250	250
Excess Concentration (mg/L)	500	250
Customer Quarterly Flow (gallons)	50,000	50,000
Excess lbs. (Flow x Excess mg/L x .008345)	209	104
Surcharge \$ per lb. from Table 8-4	\$0.75	\$0.84
Total Surcharge \$ (Excess lbs. x \$ per lb.)	\$155.46	\$87.62

NewGen Wastewater Surcharge Recommendation

Based on the analysis summarized in this section, NewGen recommends that the Township adopt a wastewater surcharge for BOD and TSS in excess of 250 mg/L for both contaminants. While the Township currently does not have any wastewater customers to which they apply a surcharge, NewGen recommends the Township investigate if there are any customers contributing high-strength discharge into the Township's sewer system that could potentially be surcharged based on the recommended BOD and TSS limits. The Township should evaluate the administrative costs of sampling and billing such customers before imposing the surcharge rates. However, even if the Township does not immediately identify customers to which the surcharges would apply, NewGen recommends the Township adopt the surcharges to facilitate their application in the future.

Section 9 LONG-TERM PROJECTIONS

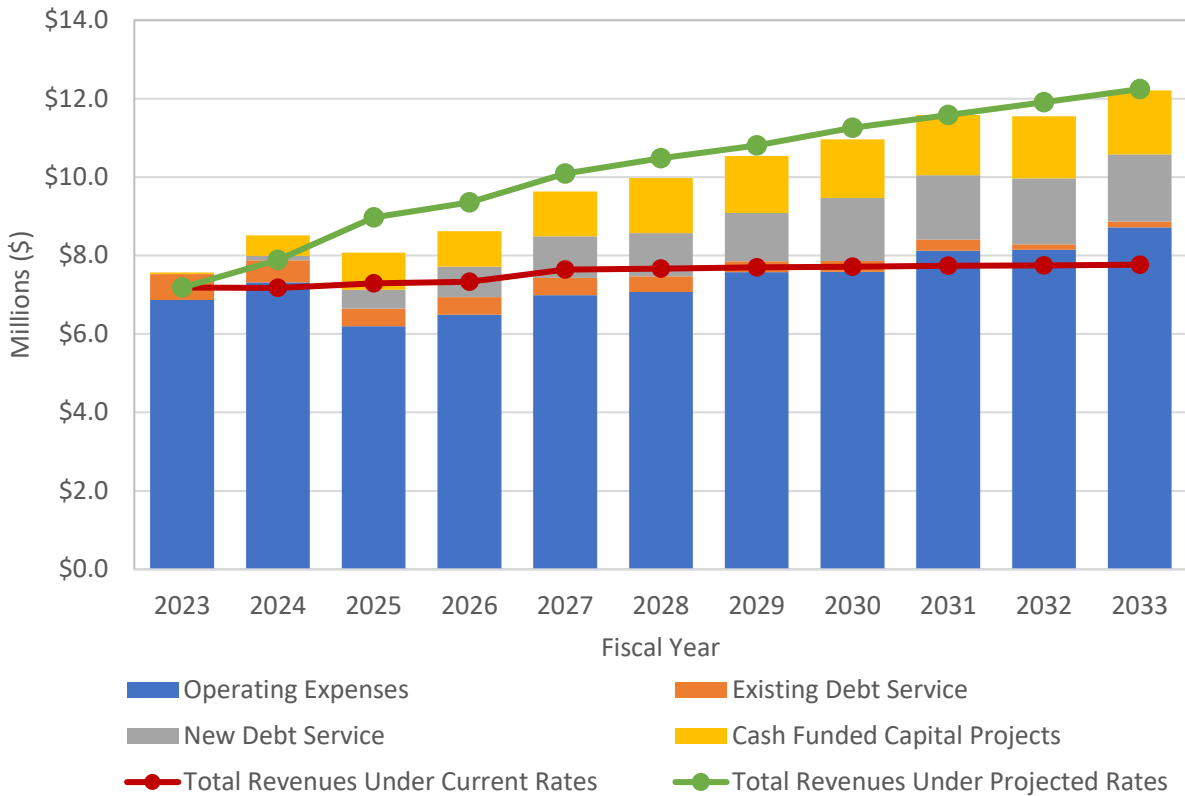
This report details the short-term, five-year impacts of the various revenue and rate options developed as a part of NewGen’s study. It is recommended that the Township re-evaluate rate increases based on the previous year’s actual data every year and re-evaluate rate structures every three to five years as a part of a full rate study. Table 9-1 shows the estimated percent increase in water and sewer rates necessary to maintain the ongoing financial health of the Township’s Water and Sewer Fund given the forecast developed during our study.

**Table 9-1
Forecasted Water and Sewer Rate Increases (FY 2029 – FY 2033)**

	FY 2029 Projected	FY 2030 Projected	FY 2031 Projected	FY 2032 Projected	FY 2033 Projected
Water Rate Increase	3.0%	3.0%	3.0%	3.0%	3.0%
Sewer Rate Increase	3.0%	3.0%	3.0%	3.0%	3.0%

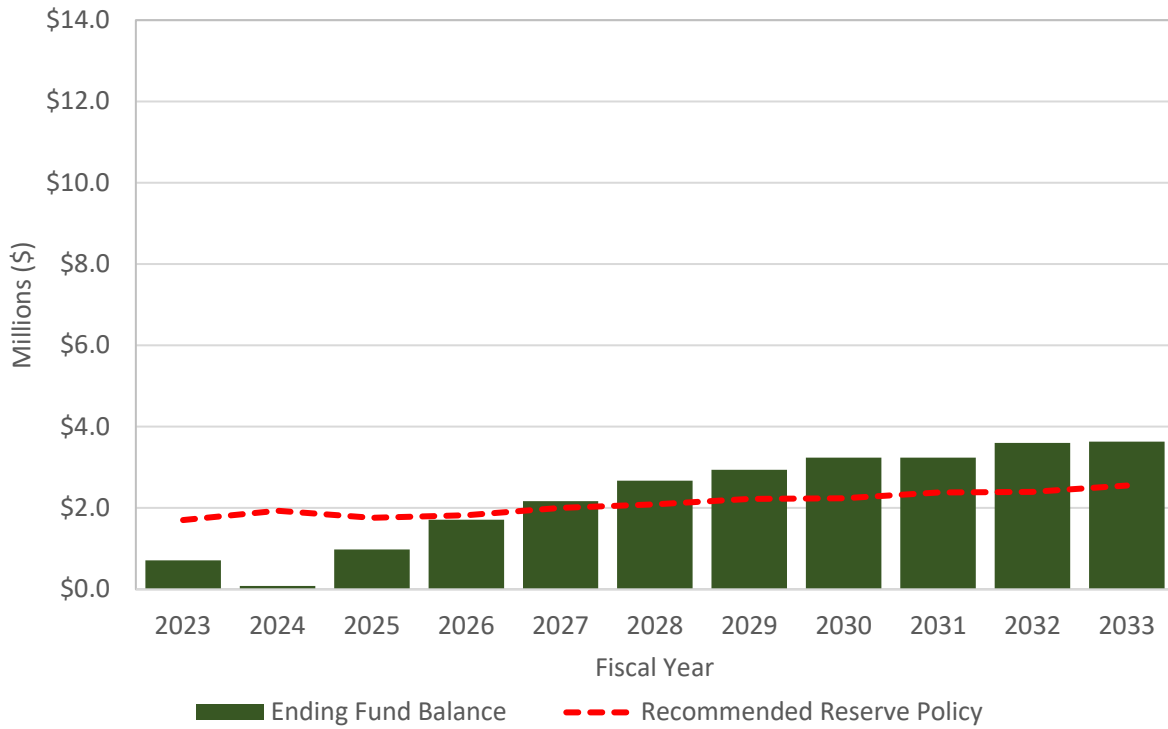
The charts below assume that the Township implements the rate increases shown in Table 7-1 in each fiscal year FY 2029 – FY 2033.

Figure 9-1: Long-Term Water and Sewer Revenues vs. Expenses Projection



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Figure 9-2: Long-Term Water and Sewer Fund Balance Projection



The above projections are preliminary in nature and there will be unanticipated conditions that will impact the projected expenses, customer demands, and revenues of the water and sewer system over the next ten years.

NewGen
Strategies & Solutions



THANK YOU!



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