TOWN OF ROUND HILL

WATER AND SEWER
RATE STUDY

ADOPTED VERSION

May 19, 2021

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1. Historical Background and Executive Summary

The current rate structure for the Town of Round Hill was set from the April 4, 2019 Water and Sewer Rate Study. That 2019 study recommended a 2.8% decrease in the overall rate for combined service users. It also recommended annual increases thereafter of 3%. It assumed $2.5M in bond financing to build the Southern Water Tank, and also recommended adjustments to availability fees. Since then the Town has set rates according to those recommendations.

This update to the rate study is to reflect several changes since the 2019 rate study:

- System growth (+136 units in 2 years) far exceeded the 30/year scenario
- Household usage has increased significantly (149 gal/day up from 134 gal/day)
- Refinancing of existing Town debt produced over $1.2M in savings
- $3M in financing was secured for the Southern Water Tank
- Major expansion in the Town 5-year CIP Plan ($9M up from $5.4M)

While most of those developments have been positive financially, the expanded capital improvement needs of the system need to be addressed. The current debt and rate structure of the Town does not support the expanded capital improvement plan. For calculation of appropriate rates, this report will assume an additional $3M in bond financing (in addition to the $3M just acquired for the Southern Tank), but scenarios from $2M-$4M of additional financing should be considered by the Town Council based on actual capital needs.

Any rate study only provides a snapshot in time of the best rates for the system. It relies on assumptions about the housing market, growth in operating expenses, inflation, the need for various capital projects, and other factors which history has proven can only be guessed. Sound annual management of the utility system is ultimately what matters most to fiscal health. Rates merely reflect the results of that management.

After analyzing the current financial position of the system, updating the user population and projected usage, incorporating a revised capital plan and reviewing various assumptions in the financial model, this 2021 Water Rate Study is submitted for adoption by the Town Council. It recommends that user fees be set as shown in Table 1 until another study is performed, and that an update be prepared after no more than five years.

No change in user rates is recommended for next fiscal year (e.g. foregoing the usual 3% escalator this year). Due to the major increase in projected water capital project spending it is recommended water availability fees be increased substantially (26%), as well as the previously planned 3% increase in sewer availability fees. All rates are then recommended to continue escalating at 3% per year from their new level.

Table 1. Recommended Usage and Availability Fees

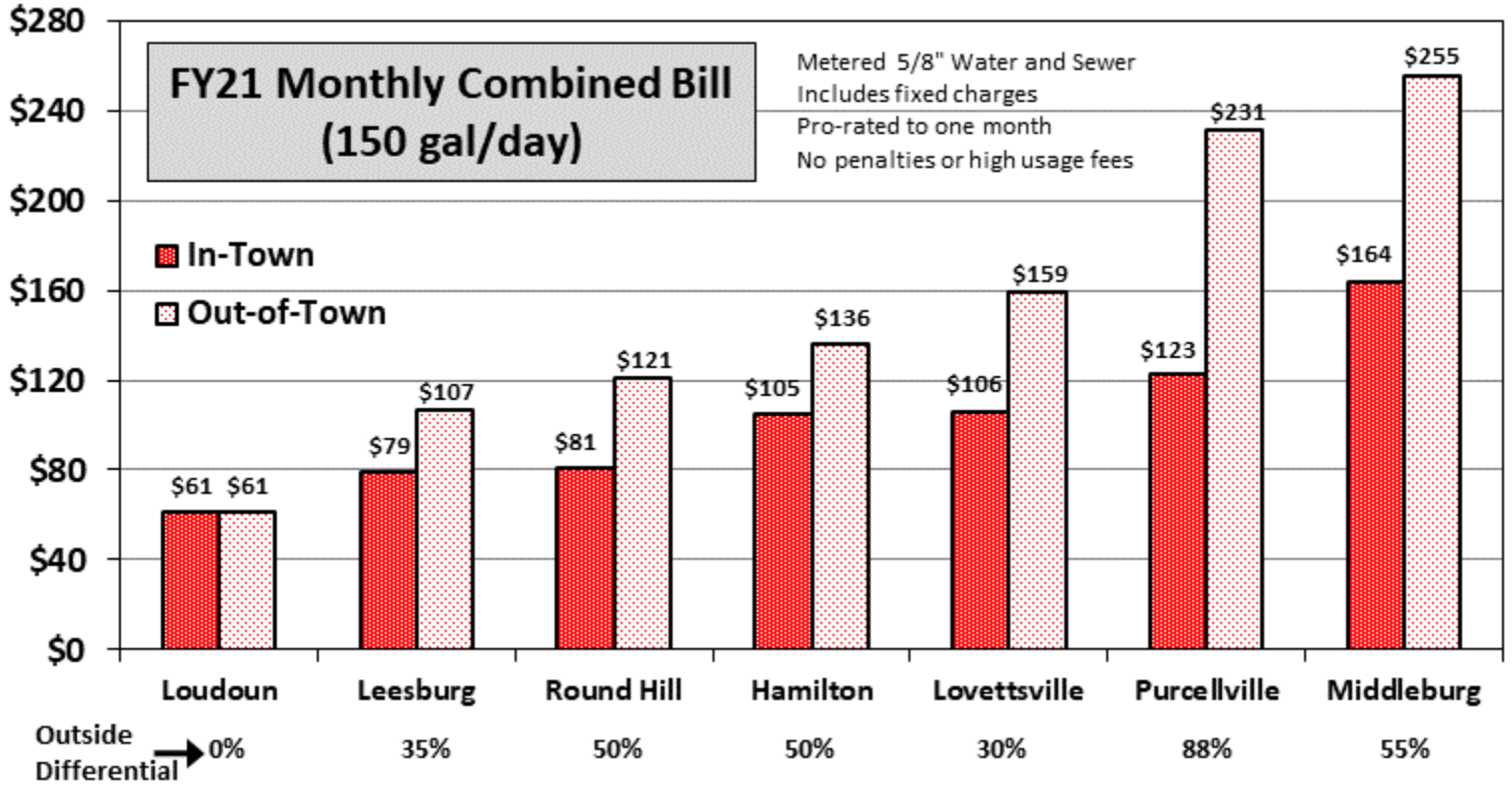
In-Town Rates	Current	FY22 Proposed	% Increase	Annual Escalator	Out-of-Town Multiplier
Water Availability	$9,167	$11,551	26.0%	3%	1.5
Sewer Availability	$13,493	$13,898	3.0%	3%	1.5
Combined Availability	$22,660	$25,449	12.3%		
Water Usage (per 1000 gal)	$7.17	$7.17	0.0%	3%	1.5
Sewer Usage (per 1000 gal)	$10.76	$10.76	0.0%	3%	1.5
Combined Usage	$17.93	$17.93	0.0%		

(1) Availability fees and user fees are recommended to increase 3% each year starting in FY23

These rates are based on a conservative growth model (30 new users/year). If user growth is substantially above or below this figure, or if other key assumptions are incorrect (such as the required capital program, or a change in town boundaries or service area), then it is recommended this study and the financial model be reviewed before five years.

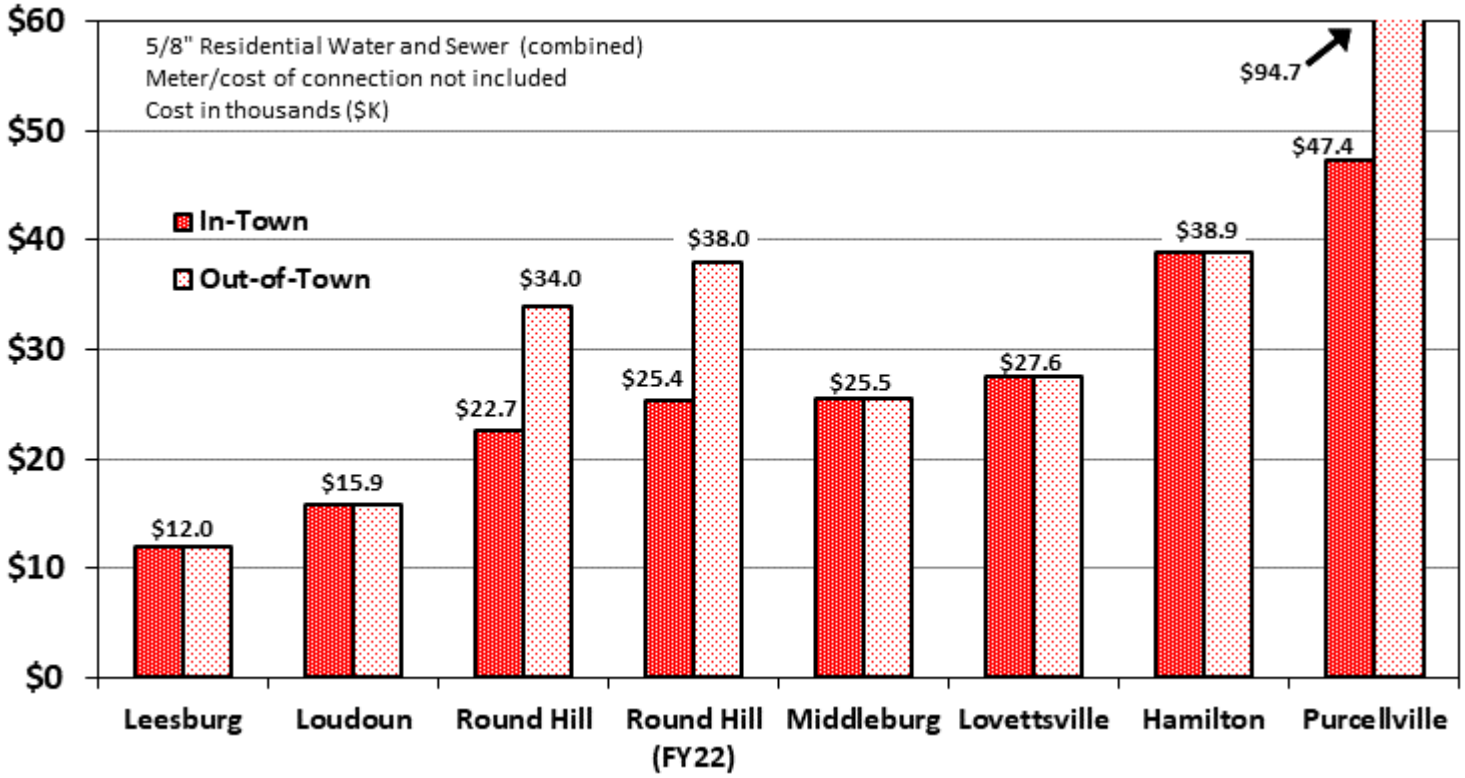
A comparison of Round Hill's combined utility rate with other Loudoun systems for the current fiscal year (FY21) is shown below. As recommended by this report, this would also be the FY22 rate for Round Hill (other systems may have planned increases for FY22). The comparison is for a 150 gallon/day user, including any fixed charges, and pro-rated to a month (Leesburg and Loudoun Water bill quarterly, most other systems bill bi-monthly). Round Hill has the lowest rates of the western towns (excluding Loudoun Water and Leesburg). At the bottom of the figure, the effective differential (difference between in-town and out-of-town bills) is shown for each system.

Figure 1. Loudoun Utility Rates (Monthly Water & Sewer, 150 gallons/day)



A comparison of availability fees with other Loudoun systems for the current fiscal year (FY21), as well as the recommended FY22 availability fees for Round Hill, is shown below. The comparison is only for availability fees and does not include connection charges or meter fees often associated with new connections (connection fees are usually set from actual costs of labor and meters and not part of capital financing). For in-town connections, Round Hill currently has the lowest availability fees of the Western towns, with only Loudoun Water and Leesburg being lower. For out-of-town connections, Round Hill availability fees are higher than Lovettsville and Middleburg but lower than Hamilton and Purcellville.

Figure 2. Loudoun Availability Fees (Residential Water & Sewer)



The remainder of this report is organized as follows:

Section 2 provides a general discussion of how rates and fees are computed. Several key terms are defined that will be used during this report.

Section 3 provides a review of the current and expected future system users.

Section 4 provides a review of the different kinds of utility revenues and how they were modeled.

Section 5 provides a review of utility expenses, including a review of the Capital Improvements Plan and existing debt.

Section 6 provides an analysis of the cost of growth and computes availability fees.

Section 7 provides an analysis of the total system finances and computes user fees under the recommended availability fees.

Section 8 provides a discussion on the financial implications of the out-of-town rate multiplier. The cost per household of the multiplier is calculated.

Section 9 includes miscellaneous tables including recommended rate and fee schedules.

2. Overview of a Rate Study

This section provides an overview of how rates and the financial model is calculated. It is for explanatory purposes and has not changed substantially from prior rate studies.

2.1. Fiscal Year

The Town of Round Hill fiscal year begins on July 1 of each year. The year beginning July 1, 2021 (e.g. 2021-2022) is designated FY22. This report recommends new rates for FY22 and beyond. For the purpose of setting availability fees, projections are made for future expenses out to FY43, which is the last year of payments for recommended debt.

2.2.Virtual Water and Sewer Funds

Because there are some users who only receive sewer service, and some who only receive water service, the Town carries separate rates for each. This study will estimate all the expenses and revenues from sewer operations to set sewer rates, and from water operations to set water rates. For the purposes of this report, there is a virtual water fund and a virtual sewer fund that are studied even though in reality the Town accounts for all utility costs and revenues in a single utility ledger.

2.3. Present Worth Analysis

System revenue comes from two primary sources: bi-monthly fees based primarily on metered usage, and availability fees from new construction. The general approach for setting rates begins with determining “fair” availability fees that recover the anticipated cost of growth from new construction.

The cost of growth expenses and revenues do not balance exactly in every year, so a method of aggregating the surpluses and deficits across the years is necessary

The present worth of a dollar amount in a future year can be computed (i.e. represented in current dollars) by applying a present worth factor. A factor of 1.5% was used for this analysis. So $1M in 20 years is worth $742K in today’s dollars ($742K x (1.015)^20 = $1M).

By adding up the present worth of projected expenses in future years over the duration of a planning period, a single present worth value of expenses can be obtained in present dollars. If this amount of money were available in cash today, and could be invested at 1.5% annual return, then all system growth costs could be paid from this pool of cash for the duration of the planning period. Using present worth analysis allows the comparison of the impact from various expenses even though they may occur in different years.

After determining fair availability fees, the bi-monthly user fees are then set so that adequate reserve levels are maintained using an annual cash-flow analysis.

2.4. System Growth Models

An important part of any rate study is an assumption about the user population and how it might grow. New users pay availability fees and increase the pool of users paying usage fees. If a system grows quickly to its total capacity, then it will collect earlier availability fees (which may be more valuable to build projects with), and will collect usage fees on a larger population for a longer period of time. If a system grows slowly and has unused capacity, then there is inadequate revenue to operate the system (as many system costs such as debt are related to total capacity more than current usage).

Round Hill receives different revenue from different users, so its growth model has to include the different categories of users:

- In-Town Users: In-Town users pay the nominal rates and fees.
- Out-of-Town Users: Out-of-Town users who are not part of the consent decree pay 1.5x the availability fees and 1.5x the usage fees of in-town users. The 1.5 factor is known as the "multiplier". Multipliers in other systems are as high as 2x, but other localities have no multiplier. There is a longer discussion of the multiplier later in this report. These users are often just referred to as Out-of-Town (even though Consent Decree users are also out-of-town).
- Consent-Decree Users: Round Hill Investors (RHI) and the Town of Round Hill entered into a 2000 legal agreement (the "consent decree") that sets asides a number of connections at pre-determined availability fees. These connections have been or will be established in the following areas: Villages of Round Hill, Mountain Valley, Greenwood Commons, Lake Point East, Lake Point West, and Upper Lakes. Consent-Decree users pay the 1.5x multiplied usage fees as currently all of them are outside town limits.

The rate study makes assumptions about how many new users from each category come on to the system each year, and what the total buildout (maximum number of connections) of each category will be. The buildout is based on a lot-by-lot analysis of all possible connections in the Round Hill service area. For commercial and civic users, an equivalent number of residential connections is allocated and included in the analysis.

This report assumes a growth rate of 30 new users per year (3 In-town, 7 Out-of-Town, 20 Consent Decree) to a buildout that is approximately 90% of possible in-town connections, 90% of possible out-of-town connections, and 100% of consent decree connections (1905 total connections).

2.5. Operating vs. Capital Expenses

Operating and Maintenance (O&M in this report) expenses are used to perform the daily functions of the system – salaries for utility system employees, supplies to treat water and wastewater, electricity to operate the facilities, replacement parts for equipment which wears out or breaks, permit fees that are paid to the state, lab equipment and testing costs to verify water quality, and many other items. Often, usage fees (i.e. the bi-monthly bill)

are associated with operating expenses. In fact, usage fees are also used to cover capital expenses, especially those that are required to improve service for current users.

Capital expenses are costs used to design and construct new or upgraded treatment facilities and lines, and to service the debt from prior facilities construction. Availability fees (i.e. an upfront fee paid when a new connection is added to the system) are often associated with capital expenses. One way to view availability fees is as a "buy-in" to the existing assets of the utility system – to pay a share of the cost of system construction. Another way to view them is as pre-payment for a share of future upgrades required by the arrival of new users. This is the approach used in this and prior Round Hill studies.

2.6. Setting Availability Fees

The standard method used to compute availability fees is to compute the cost of growth and to recover that cost through anticipated availability fees. This can be done by evaluating each capital project and debt instrument and determining what portion of that project (or that bond issue) is due to new users (growth) instead of existing users. By adding up all the projected capital costs due to growth, a total cost of growth can be calculated, and availability fees can be set to recover this cost (see Figure 3 below).

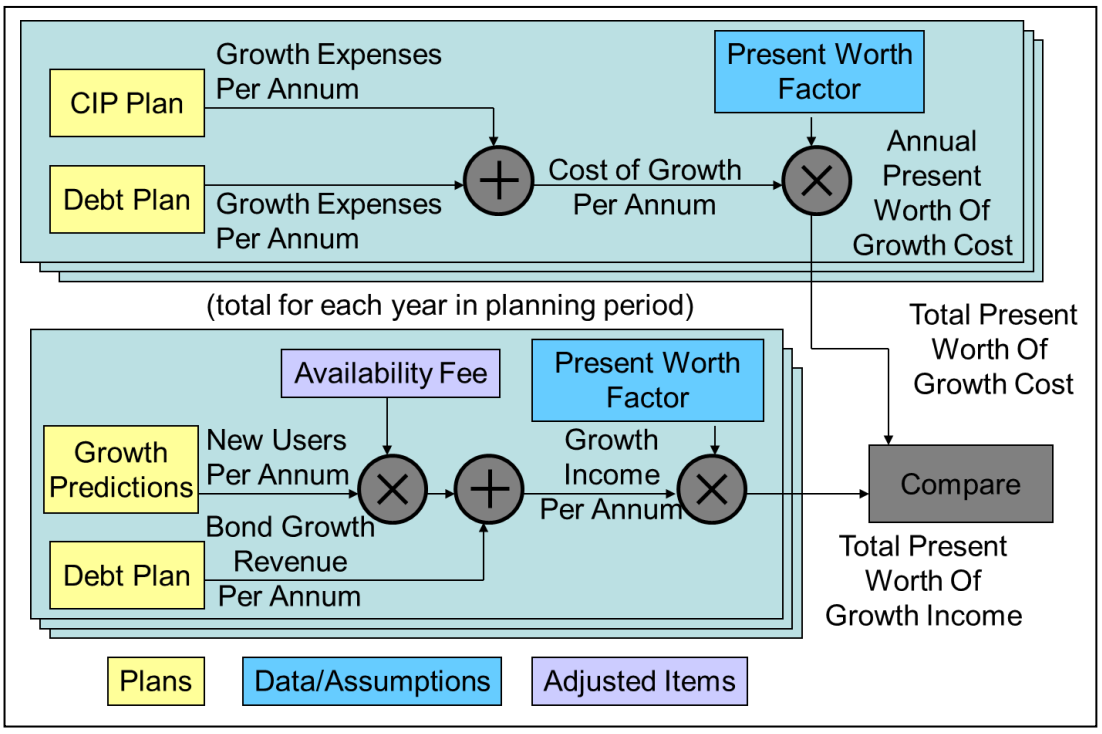


Figure 3. Setting Availability Fees

One difficulty with this approach is when it is repeated at different times during the lifecycle of a debt instrument or project, or when project costs change significantly after availability fees have been set.

For example, assume a new storage tank is budgeted for $1M to service a new neighborhood with 250 homes. The portion of the availability fee from this project is $4K (250 homes x $4K per home = $1M). After 125 homes are built and paid availability fees, the storage tank goes out for bid, and the bids come back at $2M (unfortunately for the Town, this is not entirely a hypothetical situation). If this had been known up front, the fee would have been set at $8K. If fees are now recomputed to balance out the capital budget, the next 125 homes should now pay fees of $12K (125 homes x $12K = $1.5M + $500K already collected = $2M). This disproportionately burdens later connections – the late users have to pay not only for their share, but for the uncollected share of earlier users who will also be benefiting from the project.

An alternative approach is to now call the project 50% growth – 50% existing (since half the homes are built in this example). Now $1M ($2M x 50% due to growth = $1M growth costs) needs to be raised from the remaining 125 homes, at $8K each (125 homes x $8K = $1M growth costs). While this is twice what the first 125 homes paid ($4K each), it is the "fair share". But the system now has a shortfall of $500K and cannot build the tank without raising rates on all the system users to satisfy overruns on a project required for growth. Also, each time fees are recomputed, the system has more existing users and fewer new users, and the "future" growth costs keep shrinking, so the "correct" fee under this methodology could change even if the costs did not. Continuing the prior example, if the tank were completed after 200 of the 250 homes were built, and fees were later recomputed to balance out future growth-related costs, the new costs would be zero from this project and thus no fees for the completed tank would be collected from the final 50 homes, even though prior fee computations assumed they would be collected.

As shown by this example, availability fee computation based on unknown future costs can be difficult, and the current accepted methodology does not account very well for recovering a fair share of prior paid costs from future users. A method for resolving both of these difficulties was beyond the scope of this study, which primarily is concerned with analyzing whether the projected revenues will adequately meet system costs.

In the case of Round Hill, the majority of future connections have a set availability fee due to the 2000 Consent Decree with Round Hill Investors. As a result of this agreement, as growth costs rise, there is no mechanism for the Town to recover these costs through increased availability fees on those connections. All cost increases or newly identified growth-related costs can only be offset by increasing user fees on all users, or increasing availability fees on the smaller set of future connections not covered by the consent decree.

As availability fees computed by this report will only apply to non-consent-decree users, the approach chosen was to set the availability fee by matching the non-consent portion of growth costs. This results in inadequate total availability fees (because consent decree availability fees are not adequate) that must be recovered through increased user fees. This second scenario was determined to be a more equitable distribution of system costs, and more importantly positions the utility system to rely on more stable revenue sources.

2.7. Setting Usage Fees

Usage fees are based on metered usage of water (sewer usage is billed at the metered water usage, and sewer-only users have meters installed on their wells or pay a flat rate). Usage fees are set to equalize total system costs with total system revenues (including growth costs and assumed availability fee income). This is depicted in Figure 4 below, where the connection income, the usage income and other income (minor) is balanced against O&M expenses, Capital Improvements Plan expenses, and debt expenses.

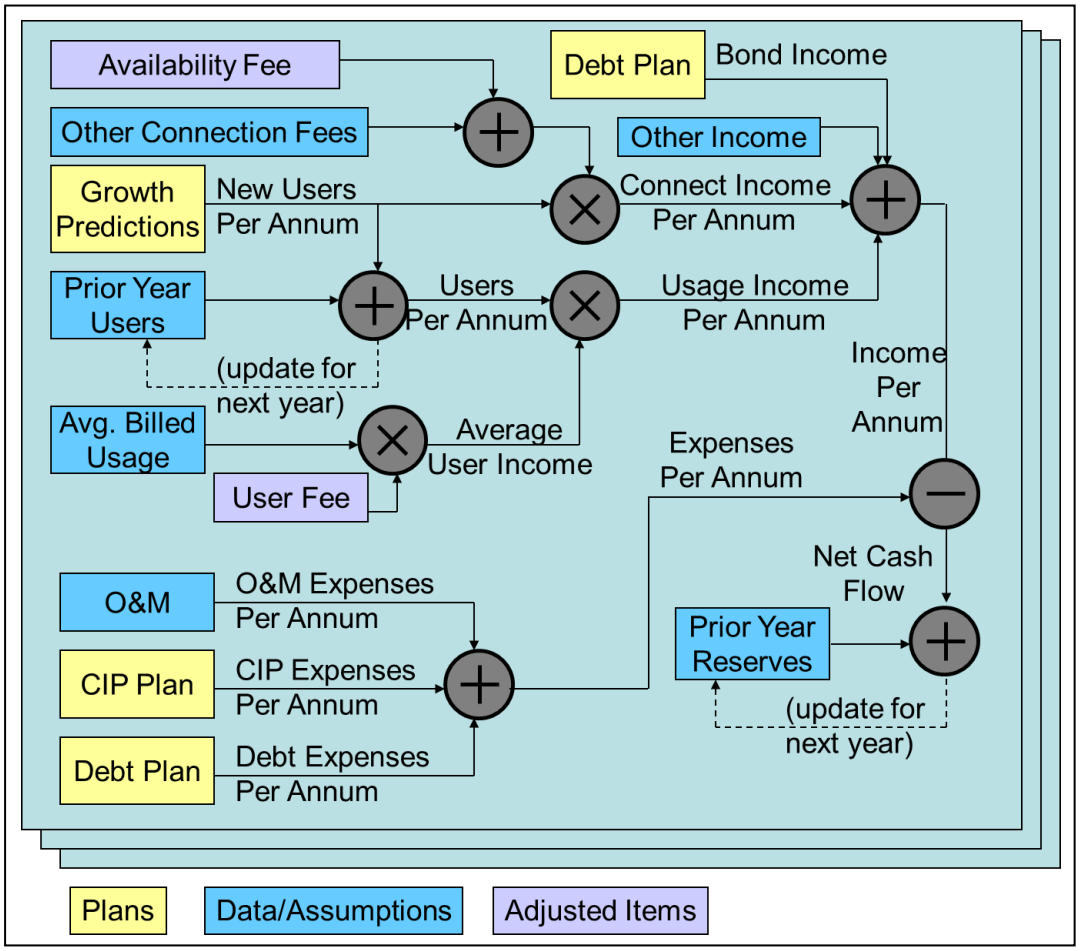


Figure 4. Setting Usage Fees

Because usage fees are set by considering total system finances, any projected shortfalls or surpluses in availability fee revenue are accounted for in the usage rate calculation.

3. System Users and Growth Model

The current system users as of January 2021, and the potential number at 100% buildout are shown in Table 2 below by neighborhood (new users off Airmont Road, West Loudoun Street, etc. are included in the Town Streets neighborhood even if they are out-of-town). The Town Streets value also includes 50 equivalent residential connections for the Eastern Commercial District. Both Out-of-Town and Consent Users pay out-of-town rates – the distinction is that Consent users pay reduced availability fees.

Note that as of January 2021, 85% of users were out-of-town, and 15% are in-town. At system buildout, this proportion will be the same unless the Town were to enlarge via annexation or boundary line adjustments. A change in boundaries was not considered by this report, but would require a rate re-evaluation.

The current values represent those lots which have been connected or paid availability fees as of January 7, 2021. Not all of them have begun usage. For the purposes of this report, it is assumed that all of these (and only these) users will be billed for water and sewer in FY22. New users are assumed to pay availability in year N and begin paying user fees in year N+1.

Table 2. System Users Current and Maximum Buildout By Neighborhood

	In-Town				Out-of-Town				Consent				Total			
1/7/2021	Current		Buildout		Current		Buildout		Current		Buildout		Current		Buildout	
	Wtr	Swr	Wtr	Swr	Wtr	Swr	Wtr	Swr	Wtr	Swr	Wtr	Swr	Wtr	Swr	Wtr	Swr
Totals By Neighborhood																
Town Streets	238	235	259	309	19	16	98	98	0	0	0	0	257	251	357	407
Brentwood Springs	0	0	0	0	95	95	95	95	0	0	0	0	95	95	95	95
Hillwood Estates	20	20	20	20	69	46	75	53	0	0	0	0	89	66	95	73
Fallswood/Poplar Hill	0	0	0	0	45	45	55	55	0	0	0	0	45	45	55	55
Stoneleigh	0	0	0	0	141	112	152	124	0	0	0	0	141	112	152	124
Villages	0	0	0	0	18	18	18	18	436	436	436	436	454	454	454	454
Mountain Valley	0	0	0	0	0	0	0	0	222	222	222	222	222	222	222	222
Greenwood Commons	0	0	0	0	0	0	0	0	40	40	40	40	40	40	40	40
Lake Point East	0	0	0	0	0	0	0	0	303	303	303	303	303	303	303	303
Lake Point West	0	0	0	0	0	0	0	0	0	0	77	77	0	0	77	77
Upper Lakes	0	0	0	0	0	0	0	0	85	85	87	87	85	85	87	87
Overall Total	258	255	279	329	387	332	493	443	1086	1086	1165	1165	1731	1673	1937	1937

Table 3. Growth Model

	Water				Sewer			
	In-Town	Out	Consent	Total	In-Town	Out	Consent	Total
New Users Per Year	3	7	20	30	3	7	20	30
Final Buildout	273	472	1165	1910	307	421	1165	1893

The final buildout is assumed to be slightly below the maximum buildout of 1937 total connections. A more conservative assumption is that a small portion of lots will not be developed to their maximum density during the next 20 years.

The historical growth of the system over the past five years is shown in the figure below. Nearly 300 users have been added to the system in five years, and there are fewer than 200 new connections remaining if the assumed buildout of approximately 1900 is

accurate (and approximately 250 connections remaining if every lot in the service area was developed to its maximum density and connected). In other words, Round Hill is already at 85% of maximum buildout, and is at 90% of the projected final buildout.

Annual average daily usage (over the past 12 months, or 6 billing periods) has risen from 134 gallons-per-day to 149 gallons-per-day over the past two years. Newer homes tend to use more water than older homes, and due to the coronavirus pandemic there are more residents in their homes during the daytime hours than ever before. Daily usage had already increased to 140 gpd before the pandemic. This rate study assumes 145 gpd per account.

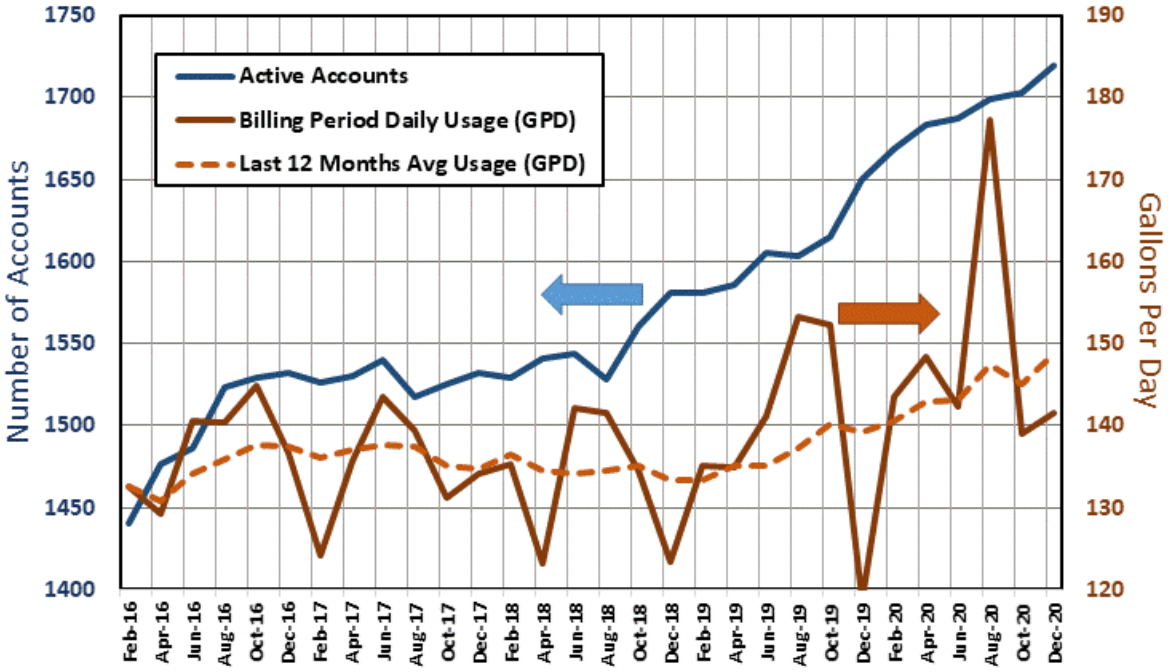


Figure 5. Five-year history of User Accounts and Usage Per Account

4. Revenue Model

There are six categories of revenue that are covered by the current model:

Usage Fees: System users at the start of the fiscal year are each assumed to use 145 gal/day (up from 132 gal/day used in the 2019 Study). All users are expected to pay their bills in full (bad debt is assumed to be offset by late fees and penalties). The consumption of 145 gal/day only represents the amount of system water that is billed. The water system must be able to generate more to allow for seasonal variations, system waste, fire suppression, and unmetered connections. The sewer system must also be able to treat more than billed usage to allow for seasonal variations, system infiltration, system return, and unmetered connections.

Availability Fees: New users in a given fiscal year are assumed to pay the going availability fee and begin usage a year later. Consent decree connections pay a different rate under a legal agreement with Round Hill Investors (RHI).

Connection Fees: All users will pay a water connection fee of $500 and a sewer connection fee of $825. These fees recover actual costs (such as purchasing a meter) incurred by the town to connect the user to the system. The model currently does not assume these amounts to increase over time – if they did increase it would be only to offset additional costs incurred by the Town.

Other Income: Accrued interest on reserves result in additional income which is relatively minor each year. This is assumed at $20,000 per year for each fund (water and sewer) and increasing at 3% per year.

Balance Forward: These are the existing cash reserves of the utility fund, totaling approximately $6.0M, as projected for the end of the current fiscal year. Any annual surplus adds to these reserves, and annual deficits draw from them. Approximately $2.7M of this reserve balance was assigned as a starting water fund balance, and $3.3M as the starting sewer fund balance, based on accruals since the 2019 Rate Study.

Bond Revenue: This report assumes a new 20-year $3M water bond is closed at a 2.0% rate in FY22 in order to fund construction of the Southern Water Tank project (this financing has already been approved but the Town has not yet closed). An additional 20-year $3M water bond at 2.5% is assumed in FY23 to fund construction of the Evening Star Water Treatment Plant.

5. Expenses

There are three categories of utility expenses for both the water and sewer fund: O&M costs, CIP expenses, and debt expenses. CIP expenses can be further subdivided into specified CIP (named projects) and unspecified CIP (unnamed projects).

5.1. O&M Costs

Projected FY22 O&M costs are approximately $820,000 for water and $1,360,000 for sewer, neglecting transfers to and from reserves. These costs are assumed to increase at 2% per year. This is below the historical growth rate of operating expenses so tracking future growth in operating expenses will be necessary to verify this assumption.

Currently, 58% of O&M costs are salaries and benefits for utility system employees and time spent by general fund staff on utility matters. Another 13% are maintenance costs of utility buildings, easements, wells and lift stations, 8% are for supplies and equipment, 7% are energy costs, 3% are chemicals, and the remaining 11% are professional services, administrative costs, postage, insurance, and other miscellaneous expenditures.

5.2. Capital Improvements Plan (CIP) Costs

The projects in the Utility Capital Improvements Plan are listed in Table 4 below:

Table 4. Capital Improvements 5-Year Plan Project List

Abbreviation	Water Project	%Growth
WellUpgrades	Connect Well 22A to Westlake WTP	10%
Well-D	Well RND-D Acquisition and Development	30%
SthrnTank	New Storage Tank in Southern Zone	30%
SLPWater	Lakefield to SLP Water Main	10%
Valves	Ongoing valve replacements	10%
StoneleighTank	Repaint and repair Stoneleigh Tank	10%
EveningStarWTP	Replace ESTP to incorporate RND-D	30%
WWBldg	New WWTP office (water portion)	10%
Unspecified	Miscellaneous or unspecified CIP	20%
Abbreviation	**Sewer Project**	**%Growth**
Safety	Safety upgrades at WWTP	10%
DumpTruck	New Dump Truck for Sludge	10%
WWTPUpgrades	Equipment upgrades at WWTP	10%
WWBldg	Security upgrades and new WWTP office	10%
Unspecified	Miscellaneous or unspecified CIP	20%

The costs for each fiscal year used for this report are shown in Table 5 below. The percentage value is the portion of the cost attributable to growth. This growth cost is used to calculate availability fees.

Table 5. Projected Capital Costs By Year

		Estimated	Projected	Projected	Projected	Projected	Projected
Abbreviation	**Total**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
WellUpgrades	$ 41,500	$ 41,500					
Well-D	$ 575,000	$ 100,000	$ 100,000	$ 375,000			
SthrnTank	$ 3,295,000	$ 45,000	$ 250,000	$ 2,000,000	$ 1,000,000		
SLPWater	$ 255,000	$ 105,000	$ 150,000				
Valves	$ 180,000	$ 100,000	$ 40,000	$ 40,000			
StoneleighTank	$ 72,000	$ 72,000					
EveningStarWTP	$ 2,500,000	$ 50,000	$ 250,000	$ 1,500,000	$ 700,000		
WWBldg	$ 200,000	$ 10,000	$ 10,000	$ 20,000	$ 160,000		
Unspecified	$ 500,000	$ 50,000	$ 50,000	$ 50,000	$ 50,000	$ 100,000	$ 200,000
Total	**$ 7,618,500**	**$ 573,500**	**$ 850,000**	**$ 3,985,000**	**$ 1,910,000**	**$ 100,000**	**$ 200,000**
Abbreviation	**Total**	**2021**	**2022**	**2023**	**2024**	**2025**	**2026**
Safety	$ 80,000	$ 80,000					
DumpTruck	$ 100,000		$ 100,000				
WWTPUpgrades	$ 170,000	$ 90,000	$ 80,000				
WWBldg	$ 800,000	$ 40,000	$ 40,000	$ 80,000	$ 640,000		
Unspecified	$ 1,050,000	$ 100,000	$ 100,000	$ 100,000	$ 200,000	$ 250,000	$ 300,000
Total	**$ 2,200,000**	**$ 310,000**	**$ 320,000**	**$ 180,000**	**$ 840,000**	**$ 250,000**	**$ 300,000**

In addition to the named projects, there are unspecified CIP expenses for years beyond that shown in the Tables above. For the water fund, unspecified CIP expenses were estimated at $250K/year starting in 2027. This accounts for developing new water sources as needed, replacement and upgrading of water lines and treatment facilities, and other unknown future capital costs. For the sewer fund, unspecified CIP expenses were estimated at $300K/year starting in 2027. This accounts for future treatment plant upgrades, replacing major equipment, and building a reserve to prepare for the end of the wastewater treatment plant's expected useful life in 10-15 years. For unspecified CIP costs, the portion attributable to growth is estimated at 20%.

To keep the value of these allocations from eroding over time, they are assumed to increase at 3%/year for the duration of the planning period.

5.3. Debt Costs

The costs to service debt are the third major expense category. The town currently has one outstanding utility bond, which was a restructured bond from two separate earlier bonds (2001 VRA in the amount of $5.5M and 2003 VRA in the amount of $2.6M, which 2003 VRA bond included debt from an even earlier GMAC sewer bond). The Town recently refinanced this bond to take advantage of lower interest rates, though it is still referred to here as the 2009 VRA Bond for continuity reasons.

- 2009 VRA Bond: Originally a $6.9M loan, with annual payments of approximately $500K/year until 2034, this bond was refinanced in 2020 (same term) to reduce annual payments to $400K/year. The principal balance was reduced from $5.1M to $4.0M in the refinancing. This bond is the blending of three original bonds (a small GMAC sewer bond, the 2001 VRA sewer bond, and the 2003 VRA water bond). The bulk of the 2003 VRA water bond monies were repurposed (with VRA concurrence) for WWTP improvements, and combined with the GMAC and 2001 sewer bond loans, makes this single merged bond 85% sewer/15% water. This split is relevant as it determines to which pool of users (sewer vs. water) the interest payments are charged.
- 2021 VRDW Loan: Projected 20-year $3.0M loan from the Virginia Revolving Drinking Water Fund. This loan has already been approved to build the Southern Water Tank but the Town has not yet closed. A closing interest rate of 2.0% was assumed in this study based on the most recent projections. Annual payments are assumed to be $180K/year.
- 2022 Water Bond: Projected 20-year $3.0M loan for additional water projects, in particular the new Well D and a replacement of the Evening Star Water Treatment Plant. A conservative rate of 2.5% was assumed in this study. Annual payments are assumed to be $190K/year.
- All other future capital projects are assumed to be funded from cash reserves.

6. Availability Fee Analysis

These calculations are done using a present worth analysis as described earlier in this report. The present worth of all costs attributable to growth over the planning period are compared to the present worth of anticipated availability fees.

Calculations are first performed treating all users in a single pool. Then calculations are shown for the method preferred by the Town, which is to treat consent decree and non-consent decree users as separate pools, as the availability fees calculated herein can only be levied on non-consent decree users.

6.1.Water Availability Fee

The water expenses attributable to growth are summarized in Table 6 below. These are totals over FY16 through FY42.

Table 6. Summary Water Expenses Attributable to Growth

CIP	Debt	Total Present Worth
$2,779,048	$258,167	$3,037,216

The water "growth" revenue (availability fee income) using the escalated current fee is summarized in Table 7. As shown in the table, there is a deficit of over $1.7M in unmet growth expenses using the current escalated fee.

Table 7. Single Pool Water Growth Net – Escalated Current Fee ($9,442)

Water Due to Growth			
Expenses	**Income**	**Balance**	**Net**
($3,037,216)	$1,454,406	$0	**($1,582,810)**

Considering a single pool of growth costs and fees, to match the cost of growth with anticipated availability and other growth income requires an escalating water availability fee of $19,800 (around 2.2x the current fee) with a 3% increase each year. The results with this much higher hypothetical availability fee are shown in Table 8 below.

Table 8. Single Pool Water Growth Net – Single Pool Fee ($19,800)

Water Due to Growth			
Expenses	**Income**	**Balance**	**Net**
($3,037,216)	$3,049,548	$0	**$12,333**

Such a large increase would be needed because consent decree users do not pay water availability fees (as part of the consent decree, RHI agreed to provide wells, a water storage tank, and other infrastructure to the Town). As costs rise on water projects, there is no way to spread that cost increase to those future connections covered by the consent decree. Only the smaller pool of non-consent decree users would pay this availability fee.

Referring back to Table 2 and Table 3, under the assumed growth model there are 15 future town connections, 85 future out-of-town connections, and 79 future consent-decree

connections, for a total of 179 future water connections. Only 56% of those 179 connections will pay water availability fees.

As in previous rate studies, the recommended approach to computing availability fees is to allocate future growth costs to two pools of future users – consent decree and non-consent decree. The non-consent decree availability fees are then set based on their portion of growth costs. The consent decree portion of growth costs that is not met by the lower consent availability fees is recovered through system wide user fees.

The results of this approach are summarized in Table 9. The "N-C Expenses" column shows the share of growth expenses remaining after removing bond revenues, and allocating the remainder to the proportion of future non-consent decree user connections (both in-town and out-of-town). The "N-C Income" column shows the amount of availability fee income from non-consent-decree connections, and the "Non-Con Net" shows the net balance. The final column shows the underpayment of availability fees from consent decree users that must be recovered through higher user fees system-wide.

As shown in the table, the water availability fee is recommended to increase to $11,551 for FY22, which is a 26% increase. This increase is due to increases in water-related capital projects identified in the updated CIP plan.

Table 9. Non-Consent Decree Water Growth Net – Recommended Fee ($11,551)

Non-Consent Water Due to Growth		
N-C Expenses	N-C Income	Non-Con Net
($1,737,213)	$1,779,169	**$41,956**

Under this scenario, there will still be a substantial deficit in growth-related costs of $1.4M, as shown in Table 9. This deficit will be considered when setting user fees.

6.2. Sewer Availability Fee

The sewer expenses attributable to growth are summarized in Table 10 below. There are no major sewer CIP projects in the 5-year planning horizon other than the construction of expanded office space at the Wastewater Treatment Plant.

Table 10. Summary Sewer Expenses Attributable to Growth

CIP	Debt	Total Present Worth
$1,271,933	$3,118,759	$4,390,692

The sewer "growth" revenue (availability fee) using the current fees is summarized in Table 11.

Table 11. Single Pool Sewer Growth Net – Escalated Current Fee ($13,898)

Sewer Due to Growth			
Expenses	Income	Balance	Net
($4,390,692)	$3,407,956	$0	**($982,736)**

Considering a single pool of growth costs and fees, to match the cost of growth with anticipated availability and other growth income requires an escalating sewer availability fee of $18,711 (about 1.4x the current escalated $13,493), with a 3% increase each year. The results for this increased fee are shown in Table 12 below.

Table 12. Single Pool Sewer Growth Net – Hypothetical Raised Fee ($18,711)

Sewer Due to Growth			
Expenses	**Income**	**Balance**	**Net**
($4,390,692)	$4,392,278	$0	**$1,586**

As done for water availability, the recommended approach to computing availability fees is to calculate non-consent decree availability fees based on their portion of growth costs. The consent decree growth costs that are not met by consent availability fees (about $1.0M as shown in Table 13) will be recovered through user fees. The results are summarized in Table 13, whose columns have the same meaning as Table 9.

As shown in the table, the recommended sewer availability fee for FY22 is $13,898, which represents an increase of 3%.

Table 13. Non-Consent Decree Sewer Growth Net – Recommended Fee ($13,898)

Non-Consent Sewer Due to Growth			
N-C Expenses	**N-C Income**	**Non-Con Net**	**Consent Net**
($2,814,034)	$2,842,508	**$28,474**	**($1,011,210)**

7. Usage Fee Analysis

After setting availability fees, usage fees are set based on a cash-flow analysis to ensure that targets for reserve levels are met. This analysis covers a 5-year and 10-year window. The primary target is the reserve ratio, which is the ratio of the end-of-year cash reserves of the system relative to its operating costs plus debt servicing costs. Two other fiscal policies that are tracked for the utility system are debt servicing ratio (no more than 30% of expenses used for debt service) and the debt limit (system debt no greater than 2% of pro-rata property assessments). The debt-related policies have ample margin at this time.

7.1. Historical Cash Flow Analysis

The cash flow analysis from the previous three audited fiscal years, along with estimates for the current fiscal year is shown in Table 14 below.

Table 14. Historical Cash Flow Analysis

	Historical			
Current Rates and Fees	**Actual 2018**	**Actual 2019**	**Actual 2020**	**Projected 2021**
Water Operating Receipts	$ 886,024	$ 984,728	$ 908,925	$ 932,711
Sewer Operating Receipts	$ 985,474	$ 1,121,328	$ 1,277,699	$ 1,341,378
Operating Receipts	**$ 1,871,498**	**$ 2,106,056**	**$ 2,186,624**	**$ 2,274,089**
Water Operating Payments	$ (681,588)	$ (721,634)	$ (716,092)	$ (802,023)
Sewer Operating Payments	$ (1,015,745)	$ (896,939)	$ (1,188,136)	$ (1,330,712)
Operating Payments	**$ (1,697,333)**	**$ (1,618,573)**	**$ (1,904,228)**	**$ (2,132,735)**
Operating Surplus/(Deficit)	**$ 174,165**	**$ 487,483**	**$ 282,396**	**$ 141,354**
Total Debt Service (P+I)	**$ (497,880)**	**$ (495,452)**	**$ (493,073)**	**$ (418,100)**
Water Cash-funded Capital	$ (161,759)	$ (393,514)	$ (190,732)	$ (553,500)
Sewer Cash-funded Capital	$ (43,452)	$ (152,609)	$ (70,507)	$ (290,000)
Cash-funded capital	**$ (205,211)**	**$ (546,123)**	**$ (261,239)**	**$ (843,500)**
Availability fees	**$ 596,256**	**$ 1,615,527**	**$ 787,100**	**$ 590,325**
Non-Operating Surplus/(Deficit)	**$ (106,835)**	**$ 573,952**	**$ 32,788**	**$ (671,275)**
Total Cash Surplus/(Deficit)	**$ 67,330**	**$ 1,061,435**	**$ 315,184**	**$ (529,921)**
Water Cash Reserves	$ 2,375,846	$ 2,574,991	$ 2,699,906	$ 2,361,961
Sewer Cash Reserves	$ 2,258,114	$ 3,120,404	$ 3,310,673	$ 3,118,697
Total Cash Reserves	**$ 4,633,963**	**$ 5,695,398**	**$ 6,010,582**	**$ 5,480,661**
Reserve Target (Op Pmts + Debt)	$ 2,195,213	$ 2,114,025	$ 2,397,301	$ 2,550,835
Reserve Ratio (>1)	**2.11**	**2.69**	**2.51**	**2.15**
Total Expenditures	$ 2,400,424	$ 2,660,148	$ 2,658,540	$ 3,394,335
Debt Servicing Ratio (<0.3)	**0.21**	**0.19**	**0.19**	**0.12**
Total Debt	**$ 5,620,000**	**$ 5,380,000**	**$ 5,130,000**	**$ 3,970,000**
Pro-Rata Debt	$ 899,200	$ 860,800	$ 820,800	$ 635,200
Debt vs. Assessments (<2%)	**0.9%**	**0.9%**	**0.8%**	**0.6%**

Operating Receipts: Income from usage fees, connection fees, and other operations.
Operating Payments: Payments to employees, suppliers, contractors, etc. for operations.
Total Debt Service: Total principal and interest paid on debt.
Cash-funded Capital: Non-operating costs paid from cash reserves.
Availability Fees: Income from availability fees paid by new users.
Water Cash Reserves: Portion of cash reserves attributed to the virtual water fund.
Sewer Cash Reserves: Portion of cash reserves attributed to the virtual sewer fund.
Total Cash Reserves: Unassigned fund balances, including certificates of deposit. Does not include escrow accounts or customer deposits.
Reserve Target: 12 months operating costs plus debt service costs.
Reserve Ratio: Cash reserves divided by reserve target.
Income available for debt service: Operating surplus/deficit plus availability fee income.
Debt Coverage Ratio: Income available for debt service divided by total debt service.
Total Debt: Principal value of outstanding debt.
Pro-Rata Debt: Total debt pro-rated to the in-town user population.
Debt vs. Assessments: Ratio of Pro-rata debt to the in-town property assessment valuation. A value of 2% is considered low-debt.

As shown above, the utility system has healthy reserve and debt servicing ratios, and cash surpluses due to higher availability fee income than projected. The utility system has excess cash reserves of approximately $3M and a modest operating surplus.

7.2. Recommended Water and Sewer Fees

There is significant uncertainty in the projections due to estimated capital project costs, but the Town can adjust its borrowing in reaction to actual construction bids. The Town currently has $3M in secured financing for the Southern Tank project, and this study assumes another $3M to fund a total of $6M of the upcoming $9M in capital project spending (the remainder to come from reserves).

If this additional financing will be secured, the Town can safely pause the planned 3% increase for the next fiscal year with the intention of resuming 3% increases afterwards. While reserve levels are above the recommended target at this time, this is entirely due to unanticipated early collection of availability fees, which will be needed to fund the remainder of the capital program.

The operating budget is only projected to generate mild surpluses going forward ($200K-$300K per annum) that would not be sufficient to pay the projected debt servicing costs ($800K per annum including principal). The Town will remain dependent on incoming availability income to service debt. While growth projections of 30/year are considered conservative for the next few years, they may be too aggressive later and without sustained availability income the utility fund will run a structural deficit. For this reason even with the current operating surplus and healthy reserves it is not recommended to lower rates until the major capital projects facing the Town have more certain costs.

7.3. Five-Year Forecast (Recommended Scenario)

Using the recommended availability fees and water and sewer user fees already presented, the five-year cash-flow forecast is shown in Table 15 below:

Table 15. Five-Year Cash Flow Forecast (Recommended Scenario 3+3)

	5-year Projection				
Recommended (3+3)	**Projected 2022**	**Projected 2023**	**Projected 2024**	**Projected 2025**	**Projected 2026**
Water Operating Receipts	$ 951,738	$ 997,489	$ 1,044,253	$ 1,092,493	$ 1,133,954
Sewer Operating Receipts	$ 1,381,235	$ 1,447,085	$ 1,516,105	$ 1,586,767	$ 1,644,133
Operating Receipts	**$ 2,332,972**	**$ 2,444,574**	**$ 2,560,358**	**$ 2,679,260**	**$ 2,778,086**
Water Operating Payments	$ (818,063)	$ (834,425)	$ (851,113)	$ (868,135)	$ (885,498)
Sewer Operating Payments	$ (1,357,327)	$ (1,384,473)	$ (1,412,163)	$ (1,440,406)	$ (1,469,214)
Operating Payments	**$ (2,175,390)**	**$ (2,218,898)**	**$ (2,263,276)**	**$ (2,308,541)**	**$ (2,354,712)**
Operating Surplus/(Deficit)	**$ 157,582**	**$ 225,676**	**$ 297,082**	**$ 370,719**	**$ 423,374**
Total Debt Service (P+I)	**$ (415,197)**	**$ (592,008)**	**$ (787,278)**	**$ (789,337)**	**$ (790,628)**
Water Cash-funded Capital	$ (388,400)	$ (288,782)	$ (124,145)	$ (77,490)	$ (176,815)
Sewer Cash-funded Capital	$ (299,400)	$ (158,782)	$ (818,145)	$ (227,490)	$ (276,815)
Cash-funded capital	**$ (687,800)**	**$ (447,564)**	**$ (942,291)**	**$ (304,980)**	**$ (453,629)**
Availability fees	**$ 487,762**	**$ 499,518**	**$ 511,598**	**$ 516,589**	**$ 386,721**
Non-Operating Surplus/(Deficit)	**$ (615,236)**	**$ (540,055)**	**$ (1,217,970)**	**$ (577,727)**	**$ (857,536)**
Total Cash Surplus/(Deficit)	**$ (457,653)**	**$ (314,379)**	**$ (920,888)**	**$ (207,008)**	**$ (434,161)**
Water Cash Reserves	$ 2,200,894	$ 1,991,048	$ 1,787,868	$ 1,667,222	$ 1,476,271
Sewer Cash Reserves	$ 2,822,110	$ 2,717,577	$ 1,999,869	$ 1,913,508	$ 1,670,297
Total Cash Reserves	**$ 5,023,007**	**$ 4,708,628**	**$ 3,787,740**	**$ 3,580,732**	**$ 3,146,571**
Reserve Target (Op Pmts + Debt)	$ 2,590,587	$ 2,810,906	$ 3,050,553	$ 3,097,878	$ 3,145,340
Reserve Ratio (>1)	**1.94**	**1.68**	**1.24**	**1.16**	**1.00**
Total Expenditures	$ 3,278,387	$ 3,258,470	$ 3,992,844	$ 3,402,858	$ 3,598,969
Debt Servicing Ratio (<0.3)	**0.13**	**0.18**	**0.20**	**0.23**	**0.22**
Total Debt	**$ 6,745,000**	**$ 9,391,530**	**$ 8,903,149**	**$ 8,394,313**	**$ 7,864,899**
Pro-Rata Debt	$ 1,016,506	$ 1,407,103	$ 1,326,377	$ 1,243,689	$ 1,159,651
Debt vs. Assessments (<2%)	**0.9%**	**1.2%**	**1.1%**	**1.0%**	**0.9%**

This forecast assumes most upcoming capital costs are funded via $6M in new borrowing. System reserves are projected to slowly decrease from the current $5.5M down to $3.1M by 2026, bringing the reserve ratio down to the target 1.0.

Due to the issuance of new bonds in 2022 and 2023, the debt servicing ratio increases to 23% which is still well below the Fiscal Policy limit of 30%.

7.4. Ten-Year Forecast (Recommended Scenario)

The forecast for the recommended scenario is shown extended out to ten years in Table 16 below:

Table 16. Ten-Year Forecast (Recommended Scenario 3+3)

	10-year Projection				
Recommended (3+3)	**Projected 2027**	**Projected 2028**	**Projected 2029**	**Projected 2030**	**Projected 2031**
Water Operating Receipts	$ 1,171,932	$ 1,212,225	$ 1,253,792	$ 1,295,647	$ 1,338,791
Sewer Operating Receipts	$ 1,701,706	$ 1,761,567	$ 1,822,925	$ 1,887,588	$ 1,953,796
Operating Receipts	**$ 2,873,638**	**$ 2,973,792**	**$ 3,076,717**	**$ 3,183,235**	**$ 3,292,588**
Water Operating Payments	$ (903,208)	$ (921,272)	$ (939,698)	$ (958,492)	$ (977,661)
Sewer Operating Payments	$ (1,498,598)	$ (1,528,570)	$ (1,559,142)	$ (1,590,325)	$ (1,622,131)
Operating Payments	**$ (2,401,806)**	**$ (2,449,843)**	**$ (2,498,839)**	**$ (2,548,816)**	**$ (2,599,793)**
Operating Surplus/(Deficit)	**$ 471,831**	**$ 523,950**	**$ 577,878**	**$ 634,419**	**$ 692,795**
Total Debt Service (P+I)	**$ (786,278)**	**$ (791,159)**	**$ (785,271)**	**$ (788,615)**	**$ (781,190)**
Water Cash-funded Capital	$ (226,119)	$ (232,903)	$ (239,890)	$ (247,086)	$ (254,499)
Sewer Cash-funded Capital	$ (276,119)	$ (284,403)	$ (292,935)	$ (301,723)	$ (310,774)
Cash-funded capital	**$ (502,238)**	**$ (517,305)**	**$ (532,824)**	**$ (548,809)**	**$ (565,273)**
Availability fees	**$ 358,166**	**$ 368,921**	**$ 379,991**	**$ 391,400**	**$ 403,161**
Non-Operating Surplus/(Deficit)	**$ (930,350)**	**$ (939,543)**	**$ (938,104)**	**$ (946,024)**	**$ (943,302)**
Total Cash Surplus/(Deficit)	**$ (458,519)**	**$ (415,593)**	**$ (360,226)**	**$ (311,605)**	**$ (250,507)**
Water Cash Reserves	$ 1,222,035	$ 986,734	$ 772,818	$ 578,749	$ 406,974
Sewer Cash Reserves	$ 1,466,014	$ 1,285,722	$ 1,139,412	$ 1,021,876	$ 943,144
Total Cash Reserves	**$ 2,688,052**	**$ 2,272,459**	**$ 1,912,233**	**$ 1,600,627**	**$ 1,350,121**
Reserve Target (Op Pmts + Debt)	$ 3,188,084	$ 3,241,001	$ 3,284,110	$ 3,337,431	$ 3,380,982
Reserve Ratio (>1)	**0.84**	**0.70**	**0.58**	**0.48**	**0.40**
Total Expenditures	$ 3,690,322	$ 3,758,306	$ 3,816,934	$ 3,886,240	$ 3,946,255
Debt Servicing Ratio (<0.3)	**0.21**	**0.21**	**0.21**	**0.20**	**0.20**
Total Debt	**$ 7,319,779**	**$ 6,748,825**	**$ 6,161,903**	**$ 5,548,879**	**$ 4,919,613**
Pro-Rata Debt	$ 1,085,374	$ 1,001,592	$ 915,283	$ 824,934	$ 732,007
Debt vs. Assessments (<2%)	**0.8%**	**0.7%**	**0.6%**	**0.6%**	**0.5%**

As shown in the ten-year forecast, system reserves slowly dwindle until at the end of ten years there are only 5 months of reserve instead of the target 12 months. The stress on the system finances in this period would be potential CIP expenses without a continuing source of availability fees or new bond revenues. There would be debt margin under the Fiscal Policy to use new debt to fund emerging capital projects by 2028 as this rate study assumes steady repayment of existing debt principal.

Figure 6. Cash-Flow 5-Year Detail (Recommended Scenario 3+3)

	Historical				5-year Projection				
Recommended (3+3)	**Actual 2018**	**Actual 2019**	**Actual 2020**	**Projected 2021**	**Projected 2022**	**Projected 2023**	**Projected 2024**	**Projected 2025**	**Projected 2026**
Water Operating Receipts	$ 886,024	$ 984,728	$ 908,925	$ 932,711	$ 951,738	$ 997,489	$ 1,044,253	$ 1,092,493	$ 1,133,954
Sewer Operating Receipts	$ 985,474	$ 1,121,328	$ 1,277,699	$ 1,341,378	$ 1,381,235	$ 1,447,085	$ 1,516,105	$ 1,586,767	$ 1,644,133
Operating Receipts	**$ 1,871,498**	**$ 2,106,056**	**$ 2,186,624**	**$ 2,274,089**	**$ 2,332,972**	**$ 2,444,574**	**$ 2,560,358**	**$ 2,679,260**	**$ 2,778,086**
Water Operating Payments	$ (681,588)	$ (721,634)	$ (716,092)	$ (802,023)	$ (818,063)	$ (834,425)	$ (851,113)	$ (868,135)	$ (885,498)
Sewer Operating Payments	$ (1,015,745)	$ (896,939)	$ (1,188,136)	$ (1,330,712)	$ (1,357,327)	$ (1,384,473)	$ (1,412,163)	$ (1,440,406)	$ (1,469,214)
Operating Payments	**$ (1,697,333)**	**$ (1,618,573)**	**$ (1,904,228)**	**$ (2,132,735)**	**$ (2,175,390)**	**$ (2,218,898)**	**$ (2,263,276)**	**$ (2,308,541)**	**$ (2,354,712)**
Operating Surplus/(Deficit)	**$ 174,165**	**$ 487,483**	**$ 282,396**	**$ 141,354**	**$ 157,582**	**$ 225,676**	**$ 297,082**	**$ 370,719**	**$ 423,374**
Water Debt Service (P+I)	$ (74,682)	$ (74,318)	$ (73,961)	$ (62,715)	$ (62,280)	$ (244,751)	$ (437,616)	$ (437,925)	$ (438,119)
Sewer Debt Service (P+I)	$ (423,198)	$ (421,134)	$ (419,112)	$ (355,385)	$ (352,917)	$ (347,257)	$ (349,661)	$ (351,411)	$ (352,509)
Total Debt Service (P+I)	**$ (497,880)**	**$ (495,452)**	**$ (493,073)**	**$ (418,100)**	**$ (415,197)**	**$ (592,008)**	**$ (787,278)**	**$ (789,337)**	**$ (790,628)**
Water Cash-funded Capital	$ (161,759)	$ (393,514)	$ (190,732)	$ (553,500)	$ (388,400)	$ (288,782)	$ (124,145)	$ (77,490)	$ (176,815)
Sewer Cash-funded Capital	$ (43,452)	$ (152,609)	$ (70,507)	$ (290,000)	$ (299,400)	$ (158,782)	$ (818,145)	$ (227,490)	$ (276,815)
Cash-funded capital	**$ (205,211)**	**$ (546,123)**	**$ (261,239)**	**$ (843,500)**	**$ (687,800)**	**$ (447,564)**	**$ (942,291)**	**$ (304,980)**	**$ (453,629)**
Availability fees	**$ 596,256**	**$ 1,615,527**	**$ 787,100**	**$ 590,325**	**$ 487,762**	**$ 499,518**	**$ 511,598**	**$ 516,589**	**$ 386,721**
Non-Operating Surplus/(Deficit)	**$ (106,835)**	**$ 573,952**	**$ 32,788**	**$ (671,275)**	**$ (615,236)**	**$ (540,055)**	**$ (1,217,970)**	**$ (577,727)**	**$ (857,536)**
Water Surplus/Deficit (Cash Flow)	$ 117,059	$ 199,144	$ 124,916	$ (337,945)	$ (161,067)	$ (209,846)	$ (203,180)	$ (120,647)	$ (190,951)
Sewer Surplus/Deficit (Cash Flow)	$ (49,729)	$ 862,291	$ 190,268	$ (191,976)	$ (296,586)	$ (104,533)	$ (717,708)	$ (86,361)	$ (243,211)
Total Cash Surplus/(Deficit)	**$ 67,330**	**$ 1,061,435**	**$ 315,184**	**$ (529,921)**	**$ (457,653)**	**$ (314,379)**	**$ (920,888)**	**$ (207,008)**	**$ (434,161)**
Water Cash Reserves	$ 2,375,846	$ 2,574,991	$ 2,699,906	$ 2,361,961	$ 2,200,894	$ 1,991,048	$ 1,787,868	$ 1,667,222	$ 1,476,271
Sewer Cash Reserves	$ 2,258,114	$ 3,120,404	$ 3,310,673	$ 3,118,697	$ 2,822,110	$ 2,717,577	$ 1,999,869	$ 1,913,508	$ 1,670,297
Total Cash Reserves	**$ 4,633,963**	**$ 5,695,398**	**$ 6,010,582**	**$ 5,480,661**	**$ 5,023,007**	**$ 4,708,628**	**$ 3,787,740**	**$ 3,580,732**	**$ 3,146,571**
Reserve Target (Op Pmts + Debt)	$ 2,195,213	$ 2,114,025	$ 2,397,301	$ 2,550,835	$ 2,590,587	$ 2,810,906	$ 3,050,553	$ 3,097,878	$ 3,145,340
Reserve Ratio (>1)	**2.11**	**2.69**	**2.51**	**2.15**	**1.94**	**1.68**	**1.24**	**1.16**	**1.00**
Total Expenditures	$ 2,400,424	$ 2,660,148	$ 2,658,540	$ 3,394,335	$ 3,278,387	$ 3,258,470	$ 3,992,844	$ 3,402,858	$ 3,598,969
Debt Servicing Ratio (<0.3)	**0.21**	**0.19**	**0.19**	**0.12**	**0.13**	**0.18**	**0.20**	**0.23**	**0.22**
Total Debt	**$ 5,620,000**	**$ 5,380,000**	**$ 5,130,000**	**$ 3,970,000**	**$ 6,745,000**	**$ 9,391,530**	**$ 8,903,149**	**$ 8,394,313**	**$ 7,864,899**
Assessed Property	$100,000,580	$ 98,744,470	$109,165,430	$112,440,393	$ 115,813,605	$ 119,288,013	$ 122,866,653	$ 126,552,653	$ 130,349,232
Debt Ratio (no pro-rating)	**5.6%**	**5.4%**	**4.7%**	**3.5%**	**5.8%**	**7.9%**	**7.2%**	**6.6%**	**6.0%**
%Customers In-Town	**16%**	**16%**	**16%**	**16%**	**15%**	**15%**	**15%**	**15%**	**15%**
Pro-Rata Debt	$ 899,200	$ 860,800	$ 820,800	$ 635,200	$ 1,016,506	$ 1,407,103	$ 1,326,377	$ 1,243,689	$ 1,159,651
Debt vs. Assessments (<2%)	**0.9%**	**0.9%**	**0.8%**	**0.6%**	**0.9%**	**1.2%**	**1.1%**	**1.0%**	**0.9%**

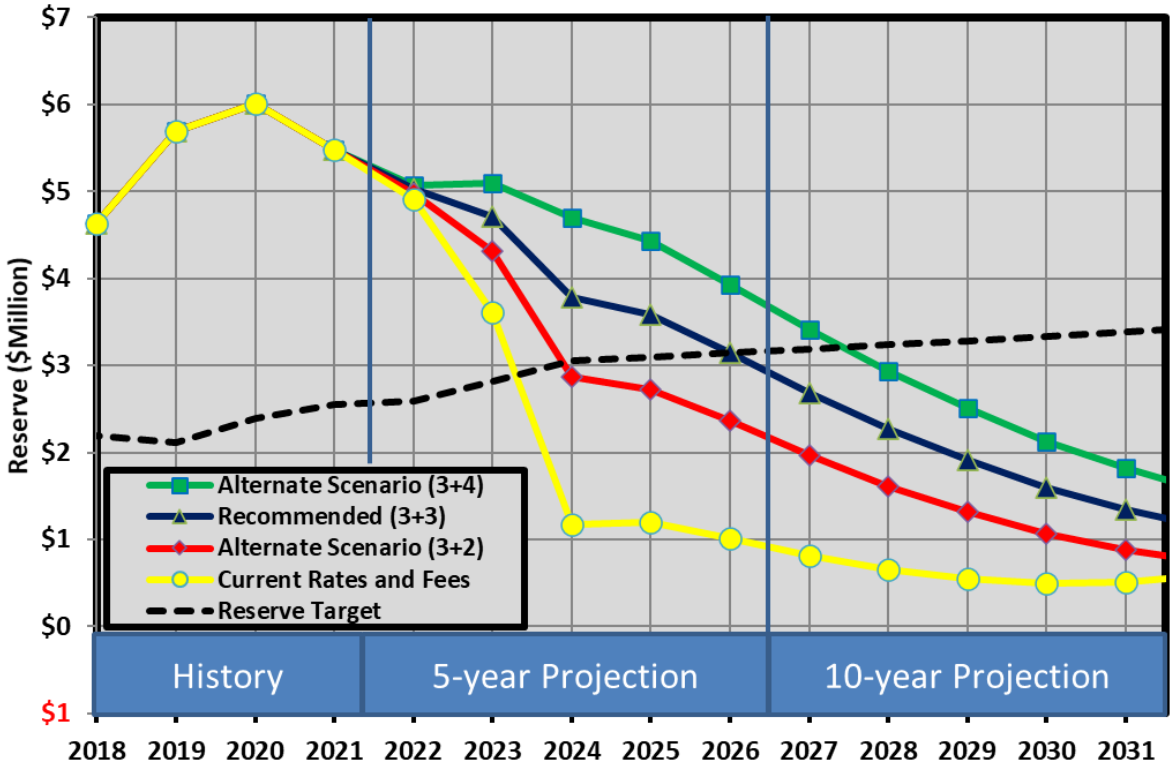
Figure 7. Cash Flow 10-Year Detail (Recommended Scenario 3+3)

	5-year Projection					10-year Projection				
Recommended (3+3)	**Projected 2022**	**Projected 2023**	**Projected 2024**	**Projected 2025**	**Projected 2026**	**Projected 2027**	**Projected 2028**	**Projected 2029**	**Projected 2030**	**Projected 2031**
Water Operating Receipts	$ 951,738	$ 997,489	$ 1,044,253	$ 1,092,493	$ 1,133,954	$ 1,171,932	$ 1,212,225	$ 1,253,792	$ 1,295,647	$ 1,338,791
Sewer Operating Receipts	$ 1,381,235	$ 1,447,085	$ 1,516,105	$ 1,586,767	$ 1,644,133	$ 1,701,706	$ 1,761,567	$ 1,822,925	$ 1,887,588	$ 1,953,796
Operating Receipts	**$ 2,332,972**	**$ 2,444,574**	**$ 2,560,358**	**$ 2,679,260**	**$ 2,778,086**	**$ 2,873,638**	**$ 2,973,792**	**$ 3,076,717**	**$ 3,183,235**	**$ 3,292,588**
Water Operating Payments	$ (818,063)	$ (834,425)	$ (851,113)	$ (868,135)	$ (885,498)	$ (903,208)	$ (921,272)	$ (939,698)	$ (958,492)	$ (977,661)
Sewer Operating Payments	$ (1,357,327)	$ (1,384,473)	$ (1,412,163)	$ (1,440,406)	$ (1,469,214)	$ (1,498,598)	$ (1,528,570)	$ (1,559,142)	$ (1,590,325)	$ (1,622,131)
Operating Payments	**$ (2,175,390)**	**$ (2,218,898)**	**$ (2,263,276)**	**$ (2,308,541)**	**$ (2,354,712)**	**$ (2,401,806)**	**$ (2,449,843)**	**$ (2,498,839)**	**$ (2,548,816)**	**$ (2,599,793)**
Operating Surplus/(Deficit)	**$ 157,582**	**$ 225,676**	**$ 297,082**	**$ 370,719**	**$ 423,374**	**$ 471,831**	**$ 523,950**	**$ 577,878**	**$ 634,419**	**$ 692,795**
Water Debt Service (P+I)	$ (62,280)	$ (244,751)	$ (437,616)	$ (437,925)	$ (438,119)	$ (437,466)	$ (438,199)	$ (437,315)	$ (437,817)	$ (436,703)
Sewer Debt Service (P+I)	$ (352,917)	$ (347,257)	$ (349,661)	$ (351,411)	$ (352,509)	$ (348,811)	$ (352,960)	$ (347,955)	$ (350,798)	$ (344,486)
Total Debt Service (P+I)	**$ (415,197)**	**$ (592,008)**	**$ (787,278)**	**$ (789,337)**	**$ (790,628)**	**$ (786,278)**	**$ (791,159)**	**$ (785,271)**	**$ (788,615)**	**$ (781,190)**
Water Cash-funded Capital	$ (388,400)	$ (288,782)	$ (124,145)	$ (77,490)	$ (176,815)	$ (226,119)	$ (232,903)	$ (239,890)	$ (247,086)	$ (254,499)
Sewer Cash-funded Capital	$ (299,400)	$ (158,782)	$ (818,145)	$ (227,490)	$ (276,815)	$ (276,119)	$ (284,403)	$ (292,935)	$ (301,723)	$ (310,774)
Cash-funded capital	**$ (687,800)**	**$ (447,564)**	**$ (942,291)**	**$ (304,980)**	**$ (453,629)**	**$ (502,238)**	**$ (517,305)**	**$ (532,824)**	**$ (548,809)**	**$ (565,273)**
Availability fees	**$ 487,762**	**$ 499,518**	**$ 511,598**	**$ 516,589**	**$ 386,721**	**$ 358,166**	**$ 368,921**	**$ 379,991**	**$ 391,400**	**$ 403,161**
Non-Operating Surplus/(Deficit)	**$ (615,236)**	**$ (540,055)**	**$ (1,217,970)**	**$ (577,727)**	**$ (857,536)**	**$ (930,350)**	**$ (939,543)**	**$ (938,104)**	**$ (946,024)**	**$ (943,302)**
Water Surplus/Deficit (Cash Flow)	$ (161,067)	$ (209,846)	$ (203,180)	$ (120,647)	$ (190,951)	$ (254,235)	$ (235,301)	$ (213,916)	$ (194,069)	$ (171,774)
Sewer Surplus/Deficit (Cash Flow)	$ (296,586)	$ (104,533)	$ (717,708)	$ (86,361)	$ (243,211)	$ (204,283)	$ (180,292)	$ (146,310)	$ (117,536)	$ (78,732)
Total Cash Surplus/(Deficit)	**$ (457,653)**	**$ (314,379)**	**$ (920,888)**	**$ (207,008)**	**$ (434,161)**	**$ (458,519)**	**$ (415,593)**	**$ (360,226)**	**$ (311,605)**	**$ (250,507)**
Water Cash Reserves	$ 2,200,894	$ 1,991,048	$ 1,787,868	$ 1,667,222	$ 1,476,271	$ 1,222,035	$ 986,734	$ 772,818	$ 578,749	$ 406,974
Sewer Cash Reserves	$ 2,822,110	$ 2,717,577	$ 1,999,869	$ 1,913,508	$ 1,670,297	$ 1,466,014	$ 1,285,722	$ 1,139,412	$ 1,021,876	$ 943,144
Total Cash Reserves	**$ 5,023,007**	**$ 4,708,628**	**$ 3,787,740**	**$ 3,580,732**	**$ 3,146,571**	**$ 2,688,052**	**$ 2,272,459**	**$ 1,912,233**	**$ 1,600,627**	**$ 1,350,121**
Reserve Target (Op Pmts + Debt)	$ 2,590,587	$ 2,810,906	$ 3,050,553	$ 3,097,878	$ 3,145,340	$ 3,188,084	$ 3,241,001	$ 3,284,110	$ 3,337,431	$ 3,380,982
Reserve Ratio (>1)	**1.94**	**1.68**	**1.24**	**1.16**	**1.00**	**0.84**	**0.70**	**0.58**	**0.48**	**0.40**
Total Expenditures	$ 3,278,387	$ 3,258,470	$ 3,992,844	$ 3,402,858	$ 3,598,969	$ 3,690,322	$ 3,758,306	$ 3,816,934	$ 3,886,240	$ 3,946,255
Debt Servicing Ratio (<0.3)	**0.13**	**0.18**	**0.20**	**0.23**	**0.22**	**0.21**	**0.21**	**0.21**	**0.20**	**0.20**
Total Debt	**$ 6,745,000**	**$ 9,391,530**	**$ 8,903,149**	**$ 8,394,313**	**$ 7,864,899**	**$ 7,319,779**	**$ 6,748,825**	**$ 6,161,903**	**$ 5,548,879**	**$ 4,919,613**
Assessed Property	$ 115,813,605	$ 119,288,013	$ 122,866,653	$ 126,552,653	$ 130,349,232	$ 134,259,709	$ 138,287,501	$ 142,436,126	$ 146,709,209	$ 151,110,486
Debt Ratio (no pro-rating)	**5.8%**	**7.9%**	**7.2%**	**6.6%**	**6.0%**	**5.5%**	**4.9%**	**4.3%**	**3.8%**	**3.3%**
%Customers In-Town	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**
Pro-Rata Debt	$ 1,016,506	$ 1,407,103	$ 1,326,377	$ 1,243,689	$ 1,159,651	$ 1,085,374	$ 1,001,592	$ 915,283	$ 824,934	$ 732,007
Debt vs. Assessments (<2%)	**0.9%**	**1.2%**	**1.1%**	**1.0%**	**0.9%**	**0.8%**	**0.7%**	**0.6%**	**0.6%**	**0.5%**

7.5. Alternate Debt Scenarios

The cash flow analysis above was under the assumption that $3M in additional debt will be secured to finance the Evening Star Water Treatment Plant (and Well D). This is in addition to the $3M already secured for the Southern Tank (3+3 Scenario). Cash flow was also analyzed for $2M and $4M in debt (3+2 and 3+4). Using the recommended availability fees and water and sewer user fees already presented, the reserve forecasts are shown below for each alternative. The current rates and fees scenario assumes no new debt is secured for ESTP and Well D (3+0 scenario).

Figure 8. Reserve Level Comparison for Debt Scenarios



As illustrated above, without additional debt financing the planned capital program will drain system reserves below the target level. $2M may be adequate (3+2) to maintain reserves over the next 5 years, but given the current interest rate environment and the goal of doing a one-year pause in user rate increases, a $3M loan is assumed by this rate study. The Town Council should consider a range of $2M-$4M of additional financing to execute the 5-year Capital Improvement Program.

8. Multiplier Analysis

The Town currently has a 1.5x multiplier for calculating out-of-town rates and fees. While this report has not studied the justifications for the existing multiplier, rationales include: uncompensated subsidies from the Town general fund, the use of the Town general fund to "float" utility system balances when reserves are low, the additional risk to the Town associated with securing debt for the system (utility bonds, while repaid by usage revenues, are general obligation bonds that are guaranteed by the town taxing authority), the inadequate availability fees that can be recovered from consent-decree users, and the increased costs to deliver service to dispersed out-of-town areas.

This study recommends that the Town maintain the current 1.5 multiplier for now, but that the Town reevaluate periodically. This report contributes an analysis of the average household cost of the multiplier, as in prior reports, as well as an analysis of the multiplier from the standpoint of an enterprise rate of return to the in-town owners.

For FY22, the projected user revenue is approximately $2.3M. Using the current proportion of in-town to out-of-town plus consent decree users, the usage revenue from each pool can be calculated, as shown in the first row of Table 17 below.

The rates that would be required to raise the same amount of revenue for each value of the multiplier is also shown. For example, while the combined rate is $17.93 with a 1.5x multiplier, if the multiplier were eliminated the combined rate would need to be increased to $25.54 to produce the same revenue. Thus while all users would pay the same rate, that common rate would be very close to the existing out-of-town rate of $26.90.

As shown below, eliminating the multiplier would cause a one-time reduction in out-of-town rates of 5% and a one-time increase in in-town rates of 42%. The total dollar value of the multiplier (in shifting revenues from one pool of users to another) is shown in the right-hand column. For next fiscal year, the multiplier raises an additional $106K from out-of-town users and reduces in-town revenues by the same amount. Averaging this value across the number of current households in each pool gives an average annual household cost of the multiplier of $74 per out-of-town household ($12/bi-monthly bill), and a $415 benefit per in-town household ($69/bi-monthly bill).

Table 17. Out-of-Town Multiplier Financial Impact

	In-town		Out-of-town		In-town	Out-of-Town	Multiplier	Multiplier
Multiplier	Combined Rate	% Change	Combined Rate	% Change	Annual Revenue	Annual Revenue	Annual Revenue	Cost %
1.50	$17.93	0.0%	$26.90	0.0%	$250,398	$2,111,087	$106,289	5.0%
1.40	$19.07	6.3%	$26.69	-0.8%	$266,267	$2,095,218	$90,420	4.3%
1.30	$20.36	13.5%	$26.46	-1.6%	$284,284	$2,077,202	$72,403	3.5%
1.20	$21.83	21.8%	$26.20	-2.6%	$304,915	$2,056,570	$51,772	2.5%
1.10	$23.54	31.3%	$25.90	-3.7%	$328,775	$2,032,710	$27,912	1.4%
1.00	$25.54	42.4%	$25.54	-5.0%	$356,687	$2,004,798	$0	0.0%

1) This table assumes for simplicity 256 combined town users and 1440 combined out-of-town users – there are actually slightly more water users and slightly fewer sewer users in each pool.

The final column in Table 17 takes the benefit that accrues to in-town users in the form of below-normalized rates ($106K at the current 1.5x multiplier) and expresses it as a ratio of out-of-town user revenues. This can be viewed as the rate of return of the utility system when viewed as an enterprise fund, where the return is calculated as a commission on out-of-town revenues and realized in the form of the multiplier. In the case of the 1.5x multiplier, the $106K annual benefit corresponds to a return to in-town users of only 5% as a percentage of out-of-town revenues. An alternate method of calculation might be a return on investment calculation that would be based on the value of utility system assets after depreciation, debt and operating expenses are accounted for, but it would be far more complex to produce accurately and difficult to understand.

If a system had a small number of out-of-town users and a 2x multiplier, the return on out-of-town users is nearly 100% (e.g. out-of-town users are paying twice the average cost of service). However, because Round Hill has a relatively small number of in-town users who benefit from the smaller rate (and because our multiplier is only 1.5x), the ratio of out-of-town revenues that funds the in-town multiplier is very small (5%).

Stated another way, of the payments made by out-of-town users, 95% are for their equal share of operating and capital costs, and 5% are used to fund the multiplier (and therefore lower in-town rates) to recompense in-town users who assume ownership risk of the system, guarantee the general obligation bonds, and take responsibility for managing the system. If it were instead expressed as a surcharge on out-of-town users and a rebate for in-town users, each out-of-town customer has an effective surcharge of $12 per bi-monthly bill and each in-town customer has an effective bi-monthly rebate of $69.

9. Reference Tables

Table 18. User Fee Schedule – Recommended Fees (per 1,000 gallons)

	Water		Sewer	
	In	Out	In	Out
2022	$7.17	$10.76	$10.76	$16.14
2023	$7.39	$11.09	$11.09	$16.64
2024	$7.62	$11.43	$11.43	$17.15
2025	$7.85	$11.78	$11.78	$17.67
2026	$8.09	$12.14	$12.14	$18.21
2027	$8.34	$12.51	$12.51	$18.77
2028	$8.60	$12.90	$12.89	$19.34
2029	$8.86	$13.29	$13.28	$19.92
2030	$9.13	$13.70	$13.68	$20.52

In = in-town users, Out = out-of-town users

Table 19. Availability Fee Schedule – Recommended Fees

	Water		Sewer	
	In	Out	In	Out
2022	$11,551	$17,327	$13,898	$20,847
2023	$11,898	$17,847	$14,315	$21,473
2024	$12,255	$18,383	$14,745	$22,118
2025	$12,623	$18,935	$15,188	$22,782
2026	$13,002	$19,503	$15,644	$23,466
2027	$13,393	$20,090	$16,114	$24,171
2028	$13,795	$20,693	$16,598	$24,897
2029	$14,209	$21,314	$17,096	$25,644
2030	$14,636	$21,954	$17,609	$26,414

In = in-town users, Out = out-of-town users

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