# Issue Analysis Form

**Date:** June 23, 2020

**Item:** Utility Rate Analysis Presentation

**Lead Department:** Engineering & Utilities

**Contact Persons:** Frank Haltom, Director

## Description and Current Status

GettingGreatRates.com was procured to perform a utility rate analysis. The analysis was completed on March 25th. Carl Brown will present to the Board his findings and recommendations for potential future adjustments to the utility rates and connection fees. A copy of the rate study and his presentation is attached.

## The Government Path

| | | |
|---|---|---|
| **Does this require IDA action?** | ☐ Yes | ☒ No |
| **Does this require BZA action?** | ☐ Yes | ☒ No |
| **Does this require Planning Commission action?** | ☐ Yes | ☒ No |
| **Does this require Board of Supervisors action?** | ☐ Yes | ☒ No |

**Board Action Requested:**
Receive the presentation.

## Fiscal Impact Statement

No adjustment to the utility rates is proposed for FY 2021.

## Prince George County Impact

None.

## Notes

None.

March 25, 2020

Frank Haltom, PE
Director of Engineering & Utilities
Prince George County
PO Box 68
Prince George, VA 23875

Subject: Water and Sewer Rate Analysis Report

Dear Mr. Haltom:

Attached is the rate analysis report for the Authority's water and sewer utilities. Before I address the report, I have some observations for all who will read this.

This is the third set of rate analyses I have done for the Authority. You were my main contact person for this one. Frank, you have been wonderful to work with – always responsive with data and information. You gave me good insights into what the utilities need to do, when and why. Such information always helps me to tailor rates to the needs of the utility and its customers. Thank you for that help. I think the County is well-served by having you.

Deenie Anderson and Mary Jones also provided data and information that I could not do without. Even though some of that data was very difficult to get out of the billing program, they found ways to accomplish it. And they, too, were always a joy to work with. I thank them, too. The County is well-served by having them, too.

Now, on to the report.

With this set of recommended water and sewer rate adjustments, you will be quite close to "cost-to-serve" rates. Water rates need to go up significantly now, and in future years. Sewer rate revenues are close to adequate now, but the structure needs to be adjusted.

The recommended rates will fully fund the utilities, with one big caveat. That is, some significant improvement needs starting about five years out will dramatically increase debt costs. Without big increases in five to seven years, or a big intervention like larger grants, the Authority will not be able to tackle those projects as planned.

Once the initial water and sewer rate adjustments are in place, you should monitor cash flow and reserve accumulation carefully. Over the next several years, if revenues and costs – especially capital improvement costs – and reserves come in as projected, great. Do the inflationary style increases I recommend in the report. If reserves fall short of their targets and if it appears that will not be a temporary situation, give me a call to discuss the situation. If you need to make further adjustments to get reserves back on track, I can probably help you do that quickly and for no additional fee. Having models of your new conditions makes it easy to change a factor and re-run the rates to cover the change.

The Authority engaged me to make an on-site visit to present my report and results to the board and answer questions. COVID-19 may prevent that. If it does, I know I can at least call in to a meeting by phone or perhaps I could join by Skype connection. We will just have to see how it plays out.

Finally, I am sure you and the board members know of other authorities and cities that also need rate setting help. That will become even more acute with the effects of COVID-19. As you contact these folks, and eventually run into them at municipal rural water association meetings and other venues, I hope you will tell them about my services. I get much of my business by referral from past clients and I hope to be able to trace several future clients back to my work with Prince George.

Best regards,
GettingGreatRates.com

Carl E. Brown
President

Enclosure

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# Water and Sewer Rate Analysis Report

# Prince George County Water Authority

# Prince George, Virginia

Prepared March 25, 2020

Carl Brown, President
GettingGreatRates.com, LLC

## Table of Contents

## Index of Model Tables and Charts

## *Executive Summary*

*These analyses calculate cost-to-serve water and sewer rates for the Authority.*

*The initial water rate adjustments will result in an overall revenue increase of 24.6 percent. The Authority bills bi-monthly. Therefore, the water bill equivalent for a 5,000 gallon per month residential customer will rise from $24.41 per month to $31.02.*

*The initial sewer rate adjustments will result in an overall revenue increase of 2.1 percent. The equivalent sewer bill for a 5,000 gallon per month residential customer will rise from $56.56 per month to $60.59.*

*In future years, it is projected water and sewer rates will need to be increased across-the-board by 3.0 percent to match inflation. Water rates will need to be increased an additional 2.0 percent to enable reserves to hit their targets.*

*Several very expensive capital improvements scheduled to occur five to seven years from now will necessitate additional rate increases or interventions like higher grants.*

*COVID-19 may affect bill collections (revenues), at least temporarily.*

## The Meaning of This Report, in a Nutshell

The Prince George County Water Authority, later called "the Authority" or "you," hired GettingGreatRates.com, later called "me," "we" or "I," to perform analysis of its water and sewer rates; to produce a report of my findings and recommendations; and to provide guidance on rate setting. (As background, I performed similar rate analyses for the Authority in 2014 and 2016.)

This report is detailed. The math behind the report is complex. Assumptions had to be made about some data. And the current water rates are complex. These things make the modeling complex and interpreting the models difficult. Following is the "Cliff's Notes" version of what the calculated rates will do and what they mean to customers.

The idea the rate calculations in this report are based on is called, "cost-of-service" or "cost-to-serve" rates. This is the prime industry standard for utility rate analysis. Quite simply, if a customer causes the utility to incur a cost, that customer should reimburse the utility for that cost.

Overall, revenues for the water utility need to go up moderately and stay about the same for the sewer utility. With restructuring to bring rates closer to a cost-to-serve structure, bills for some meter sizes in different ranges of volume use will go up while bills for others will go down. Similar changes will happen to sewer bills. That is what happens when rates are restructured to achieve fairness. That is not to say the rates were unfair two years and four years ago, when I last modeled them. It is to say that the nature and amounts of your costs have changed. With those changes, the rate structure should be adjusted to match. When all adjustments are considered, the resulting rates will be better related to the nature of the costs to serve customers.

## Introduction

Overall, water and sewer rate revenues are about on track with current financial needs. But needs have changed and the rate setting work continues.

"Test year" is the one-year period from which data was used as the starting place for the analysis.

Having adequate rates is rate setting job one. But, having fairly structured rates is very important, too. Cost-to-serve rates are the clearest way to achieve both goals. Your rates are already on that path.

This report is the culmination of a process where I submitted information and data requests to Frank Haltom, Deenie Anderson and Mary Jones. They replied. We went through this step several times. As I received information and data, I modeled the Authority's finances and rates and submitted drafts for review and feedback. These staff reviewed those drafts to assure accuracy, and in some instances, they corrected data.

With that feedback, I prepared and submitted a draft final report. Again, staff reviewed and gave me feedback, from which I revised the full report to arrive at this, hopefully, the final report.

The report is in two parts. The first is this narrative report that tells readers what should be done to the utility's rates and why and interprets much of the mathematical modeling. The second is a printout of the modeling spreadsheets, all built on the same template. The models are called:

- "Prince George County, VA, 2020 Water Rates Model 1," and
- "Prince George County, VA, 2020 Sewer Rates Model 2."

Later in the report I will call these the "Water Model" and the "Sewer Model," or simply "the Model" within each report section.

The models are sets of integrated calculations that mathematically depict the utilities' situations – incomes, expenses, capital improvement needs, debt and more.

As you read this report, please keep this in mind. The report does not *direct* the Authority to do anything. Actions you take or do not take are strictly up to you. The report is meant to inform and educate so you can then make well-informed decisions about actions to take. And the report and models are not legal recommendations. For legal issues consult your attorney.

## Important Assumptions, Details and Caveats

### COVID-19 (the corona virus)

I am confident COVID-19 will reduce revenues, at least temporarily. Many jobs in the U.S., and I am sure this is the case in Prince George County, are service-based – restaurants, general retail and the like. Because of the need to practice social distancing, and because of reduced demand for many products and services, many businesses have shut down or have markedly curtailed their hours and the services and products they provide. Many workers in such businesses are either off the job, or their hours have been curtailed.

No one knows how long this will last or how severe it will get. But clearly, many people are bringing in less income. That reduces what they have available to spend for necessities like water and sewer service. I suspect the Authority has already felt this effect. I suspect it will get worse before it gets better. And collections, when recovery comes, may not fully rebound. Some people may lose their jobs during this event and be permanently out of work or out of work that paid as well as it used to.

I cannot predict the degree to which the unfolding events will affect your revenues. I can only warn you that this will affect the Authority, so you need to monitor the situation closely and be prepared to take actions. That might include instituting a bill assistance program of some sort.

There are various ways to help customers with their bills. My favorite is adopting a rate structure that is based on cost-to-serve principles and mathematics. My thinking is, if the math favors those customers that have the hardest time paying, go with the mathematical solution. Except for the inclining water unit charges and a few special rates, I have calculated and recommend cost-to-serve rates for you.

I will not discuss other forms of bill assistance in this report because I cover them in Chapter 4 of my "Rate Setting Issues Guide." That is available for free download at https://gettinggreatrates.com/freebies/RSIG.pdf.

You will soon face a choice: postpone rate adjustments, which would leave the utilities underfunded; or proceed with adjustments, which could be difficult for some customers to pay. That would especially be true for those impacted by COVID-19.

I am always in favor of utilities being properly funded. Without a properly funded utility, if the utility fails, the rich and the poor would all be without those services. I recommend you proceed with rate "increases" promptly, and if you must, adopt a bill assistance program at the same time. In that way, the utilities could get what they need – better funding. And the difficult-to-pay customers could get what they need – bill relief.

Capital Improvement Program (CIP) Costs and Grants

Capital improvements and debt are covered in Table 5, page 47. You have debt and a broad slate of expensive improvement projects, so these costs will impact rates significantly.

Based on the Affordability Index (AI), discussed more later, your current water rates are a bit lower than the national average, but sewer rates are higher. When the water and sewer bill for a median household income residential customer that uses 5,000 gallons per month (the benchmark customer and usage) is added together, the combined bill is a bit high.

You have some expensive CIP costs looming in the next few years. I modeled ways to pay for these costs:

- "Paying cash" for everything is out of the question, but that is normal.

- Were you to cover all CIP costs with debt, which I initially modeled, that would run the combined water and sewer bill for the benchmark customer very high. I discarded that option.
- I next modeled getting 50 percent of the several highest cost projects paid with grants but the benchmark water and sewer bill would still be quite high. I discarded that option, too.
- Finally, I modeled receiving grants of 50 percent on all CIP projects from 2021, going forward. The benchmark water and sewer bill would still be somewhat high but manageable for most customers. Fifty-percent grants are not unheard of, but these days they are rare. Still, that is the assumed funding mix I settled upon in the models.

I tell you about the things that do not appear in this report to emphasize that the rates I have modeled and recommend are closer to a best-case scenario than they are to a worst-case scenario. You need to adopt the rates I am recommending or something close to them if you are to cash-flow well and maintain reasonable reserves, if things go well. While this is a pretty negative message, there is a possible bright spot.

Part of the federal government's recovery effort for the 2008 recession was to pump large grants into water and sewer capital improvement projects. That created lots of well-paying jobs, but for those utilities, it built lots of needed improvements at very low cost, sparing a big hit to rates.

In 2008, 2009 and 2010, I had several client utilities that had "shovel-ready" projects. They thought they would have to debt finance most of those costs and I modeled their rates that way. Instead, most of those costs were grant funded. I do not want to give you false hope, but if you are ready to move on some capital improvement projects, you may get a chance at strong grant funding, at least temporarily. That could significantly reduce your need to raise rates in the future.

Equipment Repair and Replacement

It appears you handle equipment repair and replacement (R&R) by a combination of capital improvement planning and annual budgeting. I could not, with certainty, identify R&R cost items but I saw few items that appear to be R&R. Therefore, I assumed you simply had few R&R items during the test year.

I find that most water and sewer systems experience R&R costs at a rate of approximately 15 percent of their annual operating costs. I assumed that is the case for you, too, so I modeled what you call "Replacement Reserve" deposits plus an additional amount to total approximately 15 percent of your operating costs for the test year. Thus, the item near the bottom of Table 4 in each model called, "Annual Payment to the R&R Reserve" is the total amount I estimate you need to set aside for R&R needs. Because you were not making these deposits before, I "backed" the deposit amount out for last year and this year and I assumed you would start making these deposits at the same time you adopt rate adjustments.

Hotel Rates and Fire Hydrant Users

You have several hotels that are assessed special rates. It is my understanding that prior agreements prevent you from assessing the same rates to these hotels that you assess to regular customers. I assumed in my rate modeling that the hotel rates would be increased by the same overall percentage that the bills of all other customers will go up. Thus, the hotels' bills would be increased, but they would stay in the same relationship to the bills of all other customers.

I would normally recommend you change how you bill hydrant users. I prefer that they pay bills structured like regular customers: a minimum charge per billing period and unit charges for actual use on a metered basis. However, as a revenue source, hydrant rates are not important. Therefore, I modeled the hydrant use rate to be adjusted as I just described for the special hotel rates.

## Rate Setting Resources Beyond This Report

Over the years, I have found that several topics are common to many utilities. Others can be important to a utility at certain times in their development. In the past, I wrote about such issues in each rate analysis report. Now, I cover such issues in separate guides, all available for FREE download at https://gettinggreatrates.com/freebies/freebies.shtml. Following is a listing of a few those guides and resources:

1. How to Get Great Rates© (e-book)
2. Rate Setting Issues Guide©
3. Replacement Scheduler©
4. CIP Scheduler©

How to Get Great Rates focuses on rate setting for smaller systems. The Rate Setting Issues Guide expands upon the book to cover affordability, sustainability, bill assistance programs, meter size-based system development fees and minimum charges, and more.

The last two items in the list above are spreadsheet applications that enable users to build their own equipment repair and replacement and capital improvement schedules, calculate their costs and calculate revenues needed to pay those costs. In fact, these spreadsheets were extracted from my model template and made a bit more user-friendly for do-it-yourselfers. I encourage the Authority to use these two sheets so you can make repair and replacement and capital improvement plans more formal, more forward-looking and less reactive.

There are other guides and resources on this site. All are FREE, so check them out.

## Cost-based Rate Calculations

To give you a synopsis of rate analysis, as I do it, and to make it easier for you to read and understand my findings and recommendations, a tutorial on my methodology is in order. Your situation is simple enough that I did not need to use all the methods I normally employ for calculating fair and adequate rates.

When I analyze rates for a government-owned water-based utility, and other utilities that are empowered to assess cost-of-service rates, I use the cost-needs approach. The approach is exhaustively described in the American Water Works Association's "M1 Manual, Principles of Water Rates, Fees and Charges," Seventh Edition. This manual, in use since the 1960s and periodically updated, is considered by many to be the "Bible" of water rate setting best practices. The cost-needs approach is a static (one year) rate calculation. I enhance that approach by projecting costs and revenues into the future.

The cost-needs approach results in rates that are called, "cost-to-serve" or "cost-of-service" rates. Simply stated, the costs for a targeted time period, usually in the near future, are classified as "fixed," "variable," "capacity-to-serve," or some combination of the three. Fixed costs are converted to a minimum charge. Variable costs are converted to a unit charge. Capacity costs are converted to some combination of system development fees and surcharges to the minimum charge.

The first step in calculating cost-to-serve rates is to classify costs, which is done in Table 8. The "Average Fixed Cost/User/Month" from Table 8 is used for calculating the base minimum charge. Also, from Table 8, the "Average Variable Cost to Produce/1,000 gallons (or other units)" is the basis for calculating unit charges. I classify costs for a year in the near future that appears to be typical of what the utility can expect in a few years.

**Rate Analysis, in a Nutshell**

At its simplest, rate analysis helps a utility arrive at rates and fees that are adequate – they will pay all the utility's costs. The next level of complexity is to arrive at rates that, on an average cost basis, will enable the utility to recover fixed and variable costs "fairly." Most small water and sewer utilities need analysis only to this level of complexity – doing more than that results in rates that are impractical for small systems.

Another level of complexity includes calculation of meter size-based minimum surcharges and system development (connection) fees. Another includes calculation of rates on a "marginal" cost basis, for special groups of customers. Yet another level is marginal cost basis calculation of rates for individual customers, such as a wholesale customer. These facets of analysis result in accurate but complex rate structures; appropriate for the larger utility with diverse customers.

Analysis can and should provide a sound basis for advising the utility to "go or don't go" concerning various actions it might take. Some of these actions are purely financial. Some, like the decision to enter into, or not enter into, a wholesale supply agreement, for example, include "hassle factor" and other non-financial issues. And because such are agreements are made for nearly forever, a mistake made in the beginning can hamstring a utility for years or decades to come. Regardless of system size, thorough analysis should always be done before entering into such agreements.

*An aside, but an important one in my mind, is this. The M1 Manual describes how to calculate cost-to-serve rates down to the customer class level. If a rate analyst classifies costs to that level and the utility sets rates that achieve that result, it can correctly be said that the utility has cost-to-serve rates. Those rates will be fairly structured, but only at the customer class level.*

*I take cost classification one step further, to the customer level. Thus, rates that I calculate are cost-to-serve to the customer level. My reasoning for doing this is, rate structure fairness if felt at the customer level, not at the customer class level. Customers pay utility bills. Classes do not.*

The second step is to arrive at capacity costs.

The third step is to project costs ten years into the future. Generally, this is done by applying an expected inflationary factor to each cost. Some expenses, like postage, treatment chemicals and electricity, rise with inflation plus growth in the customer base or use. Those were increased in future years by both factors.

*Rate analysis, or a rate study, often considers the rates needed to fund one year, usually the coming fiscal year. Utilities need to plan farther into the future than that, so I calculate rates for ten years into the future.*

The fourth step is to set reserve goals, through the tenth year, in my case. Those goals will only be met if (primarily) rates are set high enough and/or (secondarily) grants and subsidized loans are large enough to enable the utility to generate net revenues over the modeling period.

The fifth step is to arrive at the full suite of rates needed to fully fund the utility. This is a dynamic set of calculations, too complex to completely explain here. I will leave out some details. The "Cliff's Notes" version is this:

- The calculated bases for fixed costs and variable costs (Table 8) establish a ratio of the revenues that each rate component would generate in a cost-to-serve structure.
- To increase (or very rarely decrease) overall revenues to a target, each revenue stream is increased or decreased by the same percentage. Thus, the revenue streams remain in the same ratio to each other. That means they retain their cost-to-serve proportions.
- Once the overall revenue increase (or decrease) need is established, the base minimum charge to set initially is "back calculated" from the adjusted minimum charge revenue amount. The unit charge is "back calculated" from the adjusted unit charge revenue amount. The resulting rates are the starting user charge rates, what you will (hopefully) adopt initially. In later years, you will increase these starter rates and fees across-the-board by an inflationary factor, to keep them tracking with rising costs.
- Of course, system development fees, minimum charge surcharges, investment earnings, penalties collected, and other income sources generate revenues. Those are calculated and added to rate revenues for each year. And, I assumed future inflationary rate increases, so those revenues are added over the years, as well. Without explaining the details, you should have a sense that, while the math is complex, the rates are calculated to be proportionate to the costs each customer causes and the revenues will be adequate to cover all costs for the next ten years.

**Cost-to-serve rates are considered by many, including me, to be the most mathematically fair and defensible rate structure.** However, there are often good reasons to adopt rates that are at least somewhat different from true cost-to-serve rates. A few such issues are in play for you, so departures are explained later in this report.

Your utilities should have meter size-based minimum charges composed of two parts:

- One is the basic cost to make any level of service available to any customer. These are the so-called, "fixed costs" that come from the classification exercise. Billing, general administration and similar costs that are the same for all customers, regardless of "size," make up the base minimum charge. To make it easier to understand this concept, and related concepts, I use catch phrases. For this type of cost, the phrase is: ***Fixed costs are related to the fact that you have customers.*** For every customer, you incur one increment of this type of cost. **In your case, all fixed costs were considered to be equally shared by all customers.**

  For the techie reader, the analysis model we use – a Microsoft Excel spreadsheet application we call, "CBGreatRates" – is usually 3.8 mega-bites in size. Each rate analysis includes one of these sheets.

  For a 1,000-connection utility, for example, we use another spreadsheet, 12.1 mega-bites in size, to sort and calculate customer volume use. We use one of these sheets for each rate class. There are usually five or so for the simplest rates. Each of these sheets is linked to the client's usage data file, usually a few mega-bites in size, for importing usage data. Thus, an analysis for a 1,000 connection utility totals 65 or so mega-bites in size.

  For some of our larger client utilities with more rate classes and more customers, total size of all the linked spreadsheets runs over 250 mega-bites. We run computers with lots of RAM and memory but some of the calculations for a larger utility can take around 90 minutes to run. When usage data sheet runtimes get long we usually switch to a database format application to speed up the heavy number crunching.

- The other part of the minimum charge is a surcharge intended to recover all or part of peak flow or unusual capacity costs. These are almost always based upon water meter size because the larger a meter is, the greater is its capacity to sustainably pass peak flows (as determined by American Water Works Association studies). This peak flow capacity relates well to the cost of building infrastructure "big enough" to handle peak flows. ***Capacity costs are related to the fact that a particular customer has a certain capacity to demand flow or service, regardless of how much flow or service they actually use.*** The surcharges are added to the base minimum charge to arrive at the surcharged, or full minimum charge for each meter size.

***Unit charges are related to the volume of service received.*** While unit charges can be structured in various ways, the revenues they generate should be adequate to pay those costs that are related to the flow that customers use.

There are three, unit charge structures that I commonly recommend, depending on the situation:

- Some systems need "conservation rates," or, their administrations simply like the notion of encouraging customers to use less of the utility's services. In this rate structure, the unit charge goes up as volume used goes up. Most of us respond to, or at least we think twice about it, when we are assessed a higher price to buy more of something. Conservation rates are most appropriate in areas with limited water supplies or in a utility that is bumping up against its capacity to produce water.

- Most systems use, and should use, level unit charges – a unit charge that is the same regardless of how much volume a customer uses. With level unit charges, customers are assessed unit charges on an average unit cost basis. Such rates are the easiest to calculate, they are the easiest for a clerk to explain to a complaining customer on the phone and the revenues such rates will produce next year are the easiest to accurately predict. I like to tell most of my clients that if they are going to err either on the side of complex rates that precisely assess costs to each customer or simpler rates that round off some of the accuracy corners but are easier to administer, choose simple rates. Most water, and almost all sewer service is assessed using level unit charges.
- The last major unit charge structure is called, "declining" rates. These are the reverse of conservation rates. I often call them, "use encouragement" rates. It is popular these days for many to belittle those who do not conserve resources at every opportunity. Declining rates are often scorned for that reason. However, if a system has an ample water supply and ample infrastructure to produce and distribute it, doing so will not cause unintended bad (mostly environmental) consequences; and if the governing body wants to encourage high use (which often entails such users hiring more or better paid workers), declining rates make good sense. Declining rates are most appropriate in areas that have many high-volume industrial users or folks in that area want to attract such users.

To complicate the aforesaid just a bit, rate setting is first about recovering costs. Job one of utility rates is to pay the utility's costs. But usually proper rate setting is also about building adequate reserves; funding a capital improvements program (CIP); catching up on needed equipment repair and replacement (R&R); and covering similar needs. Thus, these soon-to-be-experienced costs or likely-to-be-experienced costs need to be factored into rates and fees, as well. Because time marches on and costs usually inflate over time, rate setting should account for the need for future incremental increases to cover inflation. And, you cannot just assume that because the utility needs more revenue that your ratepayers will be glad to pay higher rates. Rate affordability, and the public's perception of affordability, must be addressed, too.

Even the simplest rates situation requires some complex and integrated calculations to account for these factors. For that reason, I build a spreadsheet for each analysis that depicts, in virtual reality, the utility's real-life financial and rates situation.

These models are dynamic. When the initial rate increase is set higher, future inflationary increases can be lower. When minimum charges are set lower, unit or other charges need to be set higher to make up the shortfall. When future expenses need to be higher, or lower, or of a different nature, the models adjust rates and fees accordingly. Such modeling enables me to do dynamic "what-if" scenario calculations. That enables me to arrive quickly at the "best fit" rates for each utility.

Coincidentally, such a dynamic model makes it easy to calculate rate and other changes over the next two or three years, too. If a change does not affect the cost structure drastically, I can do the same for almost any cost or rate change. If, one, two or three years from now, you discover your costs or incomes will be different from what I had assumed, you can call me up, tell me what is different, I will enter the changes into the Model(s) and re-run the rates. If the change is small and quick to model, I do that for no charge. If it is more complex and will take some time and usually a written report, I do those projects on an hourly basis. Fees for those usually come in at $500 – $1,000. Some of my clients find that to be a very accurate and cost-effective way to maintain good rates.

Two final thoughts on the rate modeling and adjustment topic:

- Almost always, rate adjustments include bill increases. Thus, time is money, often big money, to the utility. A rate increase delayed is a rate increase that must be even higher to reach the same reserve target. Get to know this report well but do not spend months mulling it over. Time will not make your rate setting task easier. Proceed deliberately but quickly and make the needed changes. If you cannot make all the needed changes at the same time, make those that you can as soon as you can.
- You will get complaints about customers' bills going up. In my experience, most of the time, when the math is laid out for all to see, most people are understanding. Cost-to-serve rate analysis does not arrive at unfair rates. It arrives at fair rates. The degree by which some customers' bills change highlights the fact that rates are unfairly structured right now. Cost-to-serve rate adjustments are aimed at correcting that unfairness.
    - These statements do not mean "do-it-yourself" rate adjustments are always unfair or insufficient, or that "rate analyst" calculated rate adjustments always are. I always try to calculate and advocate for rates that are fairly structured. But over time, costs and other conditions change, so even cost-to-serve rates I have calculated will become unfair after some years.

Please keep the above summary of cost-based rate calculations in mind as you read on.

## Principles

I use several guiding principles when I help systems set their utility rates, fees and policies. As you read the report and models, keep in mind that my recommendations have been weighed against these principles:

1. Water, sewer and all other utilities are businesses, regardless of who owns them. The first order of business is, stay in business. Your customers want you to do that. They do not want to be left high and dry without utility services to support their investments.

2. The second order of business is, perform in a business-like manner. First, be effective. Second, be as efficient as is reasonably possible. Those two attributes fight against each other. In most utility services and situations, effectiveness trumps efficiency. It does not benefit water customers if you pump lots of water to them cheaply, if that water will make them sick. And, customers gain more benefit from water rates that are a bit higher than they like, but that fund the utility sustainably.

3. If a service costs the utility money, the utility should recover that cost from the most logical "person" if that makes good business and community administration sense. For example, generally "growth should pay for growth." Developers should fairly pay for their consumption of utility capacity by paying commensurate system development fees. Likewise, service users should pay for what they use. Each user or class of users should pay their fair share of service costs.

4. It sometimes contradicts point number 3 above, but if adjusting a rate, fee or policy will turn currently "good" customers into "bad" customers, or discourage development that the community desires, you should consider the necessity of making the change carefully before doing it. For example, while it may be warranted, raising the minimum charge markedly to your residential customers may make it very difficult for fixed, low-income customers to pay their utility bill. That may cause more of them to pay late or not pay at all. That may trigger the utility's attorney to write collection letters to those customers and eventually require shutoff of service. Thus, in the attempt to generate more net revenue by raising rates, net revenues may go down due to non-payment and payment collection costs. Likewise, stifling development with uncompetitive system development fees costs a utility in the form of additional paying customers. That forces existing customers to pay all the costs of the utility rather than sharing them with new customers.

5. While cost-based rates are the most demonstrably fair rate structure, purely cost-to-serve rates can be impractical for some utilities. Consider this: a large city with thousands of customers served by a wide range of meter sizes and a wide range of use by its customers, needs rates that are cost-based and, necessarily, those rates will be complicated. Such rate complexity is worthwhile because the utility's situation is complicated. But a small town serving only a few meter sizes and few, if any, customers that use high volumes would not be well-served by complicated rates. Simpler rates are better for them.

## General Issues

Concerning construction of the models, they were built to match the systems' financial statements and other data as much as possible. However, the intent of rate modeling is to see to it that the resulting rates are adequate to pay all system expenses for the next ten years, build and maintain responsible reserves and collect fees from customers on a fair basis. Because incomes and expenses in standard financial statements, and other data, are seldom grouped in such a way as to enable the required rate calculation methodology, the models do not always match your statements.

For modeling purposes, it does not matter whether funds are held in the general system account, a debt service sinking fund, repair and replacement fund, etc. Therefore, the models account for funds in a more simplified way than you do. When it comes to segregating funds, staff knows best how to do that, so the models do little in this regard and leave the segregating up to staff.

Several line graph charts in the models graphically depict some things which would be difficult to pick out of the tables. In all the charts, the **blue line** represents what would happen under the **recommended** rates and the **red line** under the **current** rates. Financial trends for the red lines are (generally) bad. Those for the blue lines are (generally) good. Review the definitions section of the Main Water Model, to learn the meaning of terms used in the charts of both analysis models.

I will say it simply, like this. Chart 8 depicts reserve levels under the existing rates (red line) and the Modeled rates (blue line). When the blue line goes up, that is a good thing for the utility. When the red line goes down, that is a bad thing, at least, if you decide to keep your current rates. If either line is headed down toward zero, that is a very bad thing that needs to change by reducing costs, if you prudently can, or increasing rates.

In contrast to Chart 8, Charts 3 and 4 in the models depict user rates. When the Chart 3 and 4 blue lines go up, meaning rates are going up, customers don't like that. But the utility will be better funded as a result of those higher rates and that benefits ratepayers because it makes their utility more resilient and able to make improvements that will serve them better.

One thing you will notice in viewing the charts in the models is this. Sometimes, only one of the lines shows up. When that occurs, it means that all the lines are taking the same path (one line is covering up the others). For example, sometimes Chart 5 shows only one line – the working capital goal amount. When that happens both the current rates and the Modeled rates' net revenues are adequate to satisfy the goal, so those two lines are hidden by the line for the goal. That is because, in the models, I programmed all funds that exceed what is needed to meet the working capital goal to "spill over" into the CIP and Debt Service fund reserve. When that happens, rest assured, the other two lines are underneath the goal line and that is a good thing.

Charts 6 and 7 can do the same thing, making it seem like the current rates are "just as good as" the Modeled rates. But, Chart 8 will spell the difference between the two sets of rates. The Modeled rates will generate more revenue and, thus, produce stronger total reserves. Since the working capital reserve gets truncated at a certain level, the differences in the total reserves show up in the CIP and Debt Service fund balances. These balances appear near the bottom of Table 6 of each model, and they are included in the Chart 8 amounts of each model, too.

As you set and later reset rates, I suggest you follow the guidance I give in my book, "How to Get Great Rates." This book is one of the rate setting resources I mentioned earlier.

## Action Recommendations for Policy and General Issues

Use the following as a checklist of "to-do" tasks. Many if not all these things you are already doing, but they bear repeating:

1. Periodically determine how long, on average, it takes to perform the various services you provide in the field, such as after-hours service, meter disconnects and reconnects, special meter readings, etc. Be sure to include all the time you actually pay staff for performing these services. Then determine how much it costs the utility per hour, on average, to have staff perform these services. This includes benefits, taxes, use of utility vehicles, tools and minor equipment, etc. It should also include a fair amount to cover the time that office staff devotes to working on these services to track them, bill for them, etc. This should be the hourly rate or a set fee you will charge for these services. In addition, set a minimum that you will charge for showing up, whether the service takes an hour to perform or 10 minutes. In essence, set your fees in the same way plumbers and similar technicians do – a set fee for showing up, which buys the customer a set amount of time, and an hourly rate if the job takes longer than the show up charge will cover. While accounting for time and other investments in the various functions is important, do not make the process burdensome. For many functions you likely can just estimate your time occasionally and charge fees based upon those estimates.
2. Retain required funds in interest bearing debt service and debt reserve accounts when required by your lender(s).
3. Have me conduct a full rate analysis again when the actual financial performance and my projection of future performance diverge significantly. Conditions should dictate rate analysis frequency, but you will likely need the next analysis in about five years.
4. Fully adopt management strategies that are included in what is most commonly called, "advanced asset management." These strategies can yield better service and reduced costs for a utility, especially those looking to build new facilities or replace existing facilities soon. At a basic level, you can use my free spreadsheet tools to do capital improvement and equipment repair and replacement scheduling, costing and annuity calculations. These are at the core of asset management.
5. Track volume usage, incomes and expenses on a regular basis so the data and information you generate will support future rate analyses.

6. As a reminder, check with your attorney for language and legality of all charges and issues discussed.

The remainder of this report directly addresses the analysis findings and my recommendations, first for water and later for sewer. Several issues affect both water and sewer rates. Thus, to keep the report shorter and simpler, I will cover such issues in the water subsection. In the sewer subsection, I will just refer readers back to the water subsection for those issues.

## Water Rates

### Recommended Rate Structures

I recommend your rates include:

1. System development fees that graduate with meter size, based on the cost of capacity to serve different meter sizes. You do this now.
2. A minimum charge that is also based on meter size for the same reason. You do this now.
3. A unit charge that mirrors your current inclining rate structure, with no usage allowance.

I would not normally recommend inclining rates with rate blocks that change depending upon meter size. I prefer that rate blocks not be dependent upon meter size because the costs to produce and sell 1,000,000 gallons through a two-inch meter are not different, or much different, from cost to produce through a four-inch meter. However, you are facing many challenges in the coming years and I did not want to compound that by adding even more structure changes now. But I suggest you add to your next rate analysis "to-do" list, simplifying rate blocks.

Most of these things are fairly easy to understand but I will expound upon meter size-based rates a bit more in the next subsection.

### Meter Size-based Water Rates

Due in part to previous analyses and recommendations, you now have meter size-based minimum charges. Those serve the Authority and its customers well and fairly, so stay with that structure. I expound upon that structure here to reinforce the need for such a structure.

I calculated meter size-based rates for two types of costs – system development (capacity) costs and operating costs. And, I calculated system development costs to be paid for partly with up-front fees at the time of connection of a new customer, and partly with on-going surcharges to the minimum charge. This simply means that, a new customer will pay for some of their system development costs up-front and some over time in the form of surcharges.

This is a bit complicated but just keep in mind, all the math is done on a cost-to-serve basis.

I almost always recommend meter size-based system development fees (connection fees) and minimum charges for both water and sewer utilities. Both of your utilities are large enough, and customers are diverse enough to warrant them, so I recommend both for you, too.

Where are these things covered in the Water Model (and the Sewer Model)?

- Tables 12 through 16, starting on page 59, cover regular water customer rates.
- The revenues that result from these rates and fees are brought back to Table 3, page 44.

In Tables 13 through 16, you will see that small meters have low capacities to pass flow, so they are assessed low levels of capacity costs.

There is a lot of math to such calculations. If you want to research this further, please read Chapter 12 of the "Rate Setting Issues Guide" cited in the subsection called, "Rate Setting Resources Beyond This Report" on page 8.

## Volume Usage

Table 2, page 39, shows the total volumes used by each rate class of customers. These volumes are used to calculate revenue projections from the rates I modeled.

## Expected Incomes

Table 3, page 44, shows the various past incomes and future incomes to expect, as well as several other things related to revenues.

In Table 3, near the top, on the line called, "Rate Increases Projected for Future Years," note that I show a five-percent annual across-the-board rate increase in future years. That means, in years after the initial rate adjustments, you will need to raise all important rates and fees by five percent each year to enable incomes to keep up with the expected average inflation rate of three-percent, pay for improvements and achieve the target reserves level in ten years.

Future inflationary-type increases need to be calculated this way. I assumed system operating costs will rise by three percent per year. If that happens in a future year – the budget for that year needs to go up by three percent over the prior year – you should increase rates by five percent. In other words, by whatever percentage each year's budget needs to rise, add two percentage points to that to get the percentage by which you need to raise rates that year.

***Note: This is different from my recommendation for future sewer rate increases where you only will need to match rate increases to inflation.***

I call these "back-loaded" rate increases. That means, the initial rates I calculated are not high enough to enable you to increase rates in the future to only match cost inflation. You will need to raise rates more on the back end, the later years, to catch up to the goal reserves level.

Backloading is often, but not always a bad thing. Foot racers do it all the time to win.

## Expected Operating Costs

Table 4, page 45, shows expected operating costs. In that table, nearly all costs rise due to inflation. Some, highlighted in yellow, also rise due to growth in the customer base and use.

## Target Reserve Levels

Your current total reserves exceed what I normally recommend. In such cases, I almost always recommend rates that will retain that level of reserves ten years out, indexed up for inflation.

In your case, because I have assumed a high level of grant funding and I assume the grant agency or agencies will not want to maximize your grants if you retain high reserves (they want you to spend your own money first), I modeled lower reserves:

1. Unobligated cash and cash equivalent reserves commonly should be equal to at least 35 percent of the annual operating costs, not including debt service and general administration costs. *This is common and accepted target, so I recommend the same for you.*
2. A 20-year repair and replacement (R&R) schedule reserve, in the 20th year equal to at least one average year's cost of R&R. *I recommend the same for you,* and
3. Capital improvement and debt reserves at the end of the tenth year, after debt is paid, equal to that year's debt payments plus cash-paid capital improvement expenses. *I recommend the same for you.*

The recommended rates will result in your reserves, ten years from now, being almost what they are now, indexed up to cover some of the inflation that will likely occur.

The lines on the bottom of Table 17, page 64, and several of the charts at the end of the Model show the reserve balances to expect for the next ten years. The last line of Table 17, the "Sum of All Reserves," is the critical one.

***Chart 8, page 74, shows how reserves will grow for about seven years, but then start to decline rapidly. That is because of new debt payments needed to pay for an expensive project. This project is highlighted in yellow in Table 5, page 47. If this project happens as planned, rates will need to be increased significantly or there will have to be a major intervention (higher grants) to pay for more of it.***

Projecting budgets and ending balances for next year is a difficult task. Doing the same five years out, I can usually get close. Ten-years out, there are so many assumptions we must make now that will not pan out years from now that you should not bank on those numbers. But they serve as good planning targets. In most cases, a utility will see big cost, income, growth, debt and other changes looming on the horizon a few years out. When that happens, it is time to do a new rate analysis to get rates back on track to meet those challenges. Thus, target balances give you something to aim for, but the target will move over time. With each new rate analysis, we will bring you back on course.

## Rate Affordability

Rate affordability, often measured by the Affordability Index (AI), is an important indicator to which you should pay attention. Grant agencies pay close attention to the AI.

In Table 17, near the top, I show the estimated AI. The AI is also shown graphically in Chart 4, page 72.

In the table, the AI calculation for the test year was at 0.68 percent. That means, such a customer paid 0.68 percent of their monthly household income to pay their equivalent monthly water bill (you bill bi-monthly, so I converted your rates to their monthly equivalent). The national average is around 1.0 percent and that is considered affordable, so your current rates are a bit more affordable than average.

> Affordability Index: The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. The Affordability index is a primary factor in determining grant and loan eligibility and grant amount.

Under the recommended rates, this customer's AI would rise to 0.86 percent. That is less affordable than the current bill, but still cheaper than the average. And, the AI is projected to rise slowly over the years due to the backloaded rate adjustments I modeled. Thus, rates will be a bit less affordable over the years.

Affordability is important because most grant programs that have an AI eligibility criterion try to keep rates, after a capital improvement is completed and debt is in place, below 1.5 to 2.0 percent. Your water rates are far from satisfying such a criterion. But grant agencies also consider the affordability of combined water and sewer bills. Because your sewer rates are higher (less affordable) and that will grow worse over the years, based on combined bills, you may well be eligible for grants on water system improvements, too.

In Table 17, in the section below the AI information, I calculated bill affordability for a low-income, low-volume customer. Their bill is and will be less affordable than the Authority's average residential customer's bill.

The affordability index is useful, but it does not depict how new rates will affect customer types or those using different volumes. Table 18, page 65, shows how customers' bills at different volumes of use and different meter sizes will be affected by the recommended rates. Table 18 gives ratepayers useful information. It is one of the few tables from the Model that I recommend you copy and bring to the board meeting where we will discuss rates. Because most customers are concerned about what will happen to their bills, you should give this table to everyone who wants a copy.

## Recommendations for Adjusting Water Rates

The Water Model contains all my rates-related recommendations and shows what they are built upon. I have discussed many recommendations earlier in this narrative report, too. In the following, I summarized most of those recommendations. In the table that follows, I list the rates and fees you should adopt:

1. Tables A and B that follow this list state the recommended rates and fees.
2. The calculations assumed you would have made these adjustments early enough, by approximately June 30, 2020, to enable you to collect at these rates for billings starting after July 1, 2020.
3. You would need to satisfy all Statutory requirements for making rate adjustments in advance of the adjustment date. That is coming up soon, so if you want to make that date, you will need to move promptly.
4. Approximately one full year after the initial rate adjustments, examine the costs and incomes the utility experienced during that year, plus the balances that have accrued. Compare those items to the same items in Tables 3, 4, 5 and 17, of the Model.
    a) If all accrued close to the values in the Model, raise all rates by 5.0 percent, as shown near the top of Table 3, page 44.
    b) If balances did not accrue as shown at the bottom of Table 17, but they are not egregiously too low, follow the instructions in Chapter 9 of the book, "How to Get Great Rates" for how to make inflationary increases correctly.
    c) If balances were too low by an amount that is troubling to you, call me to discuss the situation. It is likely I will be able to "talk you through" how to make appropriate rate adjustments to correct the situation.
5. Repeat recommendation Number 4 each following year until you have raised rates and fees by a cumulative 20 percent, which should occur in about four years from now. At that time, have me or another rate analyst of your choice perform a new rate analysis, so rate structure and adequacy can be adjusted again. If you need capital improvements or repair and replacements that are quite different from those assumed, you will need a new rate analysis sooner than that. In fact, your largest capital improvements are planned to occur in four to five years, so that would be an opportune time to revisit rates anyway.

Table A: Recommended Water System Development Fees and Minimum Charges

Table A: System Development Fees and Minimum Charges; With Zero Usage Allowance, Calculated by the Prince George County, VA, 2020 Water Rates Model 1

| Water Meter Size in Inches | Meter Type | Fee per New Tap, Excluding Out-of-pocket Costs | Bi-monthly Minimum Charge Each Meter Size |
|---|---|---|---|
| 0.625 | Displacement | $4,000 | $23.44 |
| 0.750 | Displacement | $4,000 | $23.44 |
| 1.000 | Displacement | $10,000 | $36.63 |
| 1.500 | Displacement | $19,999 | $58.60 |
| 2.000 | Displacement | $31,998 | $84.97 |
| 2.500 | Displacement | $49,998 | $124.52 |
| 3.000 | Singlet | $63,997 | $155.28 |
| 3.000 | Compound, Class I | $63,997 | $155.28 |
| 3.000 | Turbine, Class I | $69,997 | $168.47 |
| 4.000 | Singlet | $99,995 | $234.39 |
| 4.000 | Compound, Class I | $99,995 | $234.39 |
| 4.000 | Turbine, Class I | $123,994 | $287.12 |
| 6.000 | Singlet | $199,990 | $454.12 |
| 6.000 | Compound, Class I | $199,990 | $454.12 |
| 6.000 | Turbine, Class I | $259,987 | $585.96 |
| 8.000 | Compound, Class I | $319,984 | $717.80 |
| 8.000 | Turbine, Class I | $559,972 | $1,245.15 |
| 10.000 | Turbine, Class II | $839,958 | $1,860.40 |
| | Hotels 1 | N.A. | $0.00 |
| | Hotels 2 | N.A. | $0.00 |
| | Hydrants | N.A. | $0.00 |

## Table B: Recommended Unit Charges

| Table B: Prince George County, VA Water Modeled Rate Blocks and Unit Charges for All Meter Types | | | |
|---|---|---|---|
| Water Meter Size in Inches | Rate Block Ranges, in Gallons | | Unit Charge per 1,000 Gallons Used in Each Block |
| | Bottom | Top | |
| 0.625 | 0 | 5,999 | $3.86 |
| | 6,000 | 19,999 | $4.83 |
| | 20,000 | and greater | $6.03 |
| 0.750 | 0 | 5,999 | $3.86 |
| | 6,000 | 19,999 | $4.83 |
| | 20,000 | and greater | $6.03 |
| 1.000 | 0 | 7,999 | $3.86 |
| | 8,000 | 24,999 | $4.83 |
| | 25,000 | and greater | $6.03 |
| 1.500 | 0 | 14,999 | $3.86 |
| | 15,000 | 60,999 | $4.83 |
| | 61,000 | and greater | $6.03 |
| 2.000 | 0 | 29,999 | $3.86 |
| | 30,000 | 93,999 | $4.83 |
| | 94,000 | and greater | $6.03 |
| 2.500 | 0 | 5,999 | $3.86 |
| | 6,000 | 19,999 | $4.83 |
| | 20,000 | and greater | $6.03 |
| 3.000 | 0 | 69,999 | $3.86 |
| | 70,000 | 214,999 | $4.83 |
| | 215,000 | and greater | $6.03 |
| 4.000 | 0 | 127,999 | $3.86 |
| | 128,000 | 384,999 | $4.83 |
| | 385,000 | and greater | $6.03 |
| 6.000 | 0 | 288,999 | $3.86 |
| | 289,000 | 866,999 | $4.83 |
| | 867,000 | and greater | $6.03 |
| 8.000 | 0 | 288,999 | $3.86 |
| | 289,000 | 866,999 | $4.83 |
| | 867,000 | and greater | $6.03 |
| 10.000 | 0 | 288,999 | $3.86 |
| | 289,000 | 866,999 | $4.83 |
| | 867,000 | and greater | $6.03 |
| Hotels 1 | 0 | and greater | $3.39 |
| Hotels 2 | 0 | and greater | $4.16 |
| Hydrants | 0 | and greater | $18.40 |

## Closing

**I recommend you adopt the rates calculated in the Model and discussed in several subsections above. The recommended rates are shown in Tables A and B immediately above.** These rates are, for the most part, in a cost-to-serve structure. They will fully fund the utility over the long term.

It is important that you examine accrual of balances each year to assure the rates are bringing in adequate revenue. If they are not, increase rates across the board by a percentage that will bring the balances up to where I calculated they need to be each year. If you proceed with the capital improvements in Table 5 as laid out, it is also important that you assure adequate grant funding will be available to help fund these projects.

This combination of adjustments will result in a moderate overall increase in water rate revenues and a fairly substantial increase in the average residential customer's water bill. Future inflationary increases will raise all bills by 5.0 percent per year.

## Sewer Rates

Most water issues apply to the sewer utility, too. Therefore, you can generally apply what I said about those rates to sewer rates, too.

### Recommended Rate Structures

I recommend your rates include:

1. System development fees that graduate with meter size, based on the cost of capacity to serve different meter sizes.
2. A minimum charge that is also based on meter size for the same reason.
3. A level unit charge, with no usage allowance, which is your current structure, too.

You have such a structure now, so you should adjust rate amounts but stick with the same basic structure.

### Meter Size-based Sewer Rates

So long as a sewer customer received metered water service, meter size-based rates apply to their sewer rates, as well.

### Expected Incomes

Table 3, page 82, shows the various past incomes and future incomes to expect, as well as several other things related to revenues. The income amounts are different but generally, the categories are the same as for water. And like the water rates, incomes will rise more rapidly in future years because the sewer rates are "back loaded," too.

### Expected Operating Costs

Table 4, page 83, shows expected operating costs. In that table, nearly all costs rise due to inflation. Some, highlighted in yellow, also rise due to growth in the customer base and use.

### Capital Improvements

Capital improvements and debt are covered in Table 5, page 85. Capital improvements and related debt repayment will be the big drivers of rates. I modeled sewer system capital improvements and debt using the same types of assumptions as for water.

### Target Reserve Levels

While the amounts are different, the same principles apply to sewer system reserves as for water reserves. The lines on the bottom of Table 17, page 101, and several of the charts at the end of the Model show the reserve balances to expect for the next ten years. The last line of Table 17, the "Sum of All Reserves," is the critical one.

## Rate Affordability

In Table 17, near the top, I show the estimated AI. The AI is also shown graphically in Chart 4, page 108.

In the table, the AI for the test year was at 1.58 percent. That is much higher you're your water rates and moderately higher than the national average. Under the recommended rates, the AI would rise to 1.67 percent. That is not a big increase on a percentage basis, but it makes already somewhat high rates even higher.

Table 18, page 102, shows how customers' bills at different volumes of use and different meter sizes will be affected by the recommended rates.

## Target Reserve Levels

The reserves situation for sewer is the same as for water.

Lines on the bottom of Table 17, page 101, and several of the charts at the end of the Model show the reserve balances to expect for the next ten years. The last line of Table 17, the "Sum of All Reserves," is the critical one.

***Chart 8, page 110, shows how reserves will grow for about five years, but then start to decline rapidly. That is because of new debt payments needed to pay for three expensive projects. These projects are highlighted in yellow in Table 5, page 85. If these projects happen as planned, rates will need to be increased significantly or there will have to be a major intervention (higher grants) to pay for more of them.***

## Recommendations for Adjusting Sewer Rates

In the following, I summarized most of my sewer rates recommendations. In the table that follows, I list the rates and fees you should adopt:

1. Table C that follows this list states the recommended rates and fees.
2. The calculations assumed you would have made these adjustments early enough, by approximately June 30, 2020, to enable you to collect at these rates for billings starting after July 1, 2020.
3. You would need to satisfy all Statutory requirements for making rate adjustments in advance of the adjustment date. That is coming up soon, so if you want to make that date, you will need to move promptly.
4. Approximately one full year after the initial rate adjustments, examine the costs and incomes the utility experienced during that year, plus the balances that have accrued. Compare those items to the same items in Tables 3, 4, 5 and 17, of the Model.
    a) If all accrued close to the values in the Model, raise all rates by 5.0 percent, as shown near the top of Table 3, page 82.

b) If balances did not accrue as shown at the bottom of Table 17, but they are not egregiously too low, follow the instructions in Chapter 9 of the book, "How to Get Great Rates" for how to make inflationary increases correctly.

c) If balances were too low by an amount that is troubling to you, call me to discuss the situation. It is likely I will be able to "talk you through" how to make appropriate rate adjustments to correct the situation.

5. Repeat recommendation Number 4 each following year until you have raised rates and fees by a cumulative 20 percent, which should occur in about four years from now. At that time, have me or another rate analyst of your choice perform a new rate analysis, so rate structure and adequacy can be adjusted again. If you need to capital improvements or repair and replacements that are quite different from those assumed, you will need a new rate analysis sooner than that. In fact, your largest capital improvements are planned to occur in four to five years, so that would be an opportune time to revisit rates anyway.

Table C: Recommended Sewer Rates

Table C: System Development Fees; Minimum and Unit Charges; With Zero Usage Allowance, Calculated by the Prince George County, VA, 2020 Sewer Rates Model 2

| Water Meter Size in Inches | Meter Type | Fee per New Tap, Excluding Out-of-pocket Costs | Bi-monthly Minimum Charge Each Meter Size | Unit Charge per 1,000 Gallons |
|---|---|---|---|---|
| 0.625 | Displacement | $5,000 | $33.28 | $8.79 |
| 0.750 | Displacement | $5,000 | $33.28 | $8.79 |
| 1.000 | Displacement | $12,500 | $42.64 | $8.79 |
| 1.500 | Displacement | $24,999 | $58.25 | $8.79 |
| 2.000 | Displacement | $39,999 | $76.98 | $8.79 |
| 2.500 | Displacement | $62,498 | $105.08 | $8.79 |
| 3.000 | Singlet | $79,998 | $126.93 | $8.79 |
| 3.000 | Compound, Class I | $79,998 | $126.93 | $8.79 |
| 3.000 | Turbine, Class I | $87,497 | $136.30 | $8.79 |
| 4.000 | Singlet | $124,996 | $183.13 | $8.79 |
| 4.000 | Compound, Class I | $124,996 | $183.13 | $8.79 |
| 4.000 | Turbine, Class I | $154,995 | $220.59 | $8.79 |
| 6.000 | Singlet | $249,992 | $339.22 | $8.79 |
| 6.000 | Compound, Class I | $249,992 | $339.22 | $8.79 |
| 6.000 | Turbine, Class I | $324,990 | $432.88 | $8.79 |
| 8.000 | Compound, Class I | $399,988 | $526.53 | $8.79 |
| 8.000 | Turbine, Class I | $699,979 | $901.16 | $8.79 |
| 10.000 | Turbine, Class II | $1,049,968 | $1,338.22 | $8.79 |
| | Hotels 1 | N.A. | $0.00 | $2.60 |
| | Hotels 2 | N.A. | $0.00 | $3.19 |

## Closing

**I recommend you adopt the rates calculated in the Model and discussed in several subsections above. The recommended rates are shown in Table C immediately above.** Like the recommended water rates, the sewer rates are in a cost-to-serve structure and will perform like the water rates. As with the water rates, in future years you will need to follow up with across-the-board sewer rate increases that match inflation in the operating budget plus two percentage points.

## Conclusion

"Conclusion" is a misnomer here. This report provides information upon which the Authority can make decisions. Thus, it begins the process by which you will initially adjust rates and fees and take other actions. I will continue to help you as you do that, so always feel free to call me to discuss any concerns you have as the years pass. Having the Model available to track your progress and determine the effect of condition changes later, I should be able to test changes easily and advise you quickly.

As time passes you will need to adjust rates incrementally as recommended in this report and as described in more detail in my book. Eventually, you will start this cycle over.

As you take on the initial adjustments, keep the following in mind.

- Everyone impacted by the Authority's water and sewer rates should at least be made aware of the results of this report.
- My default recommendation is to give any customer as much information as they want. If they want a copy of the full report, give them that.
- Give the media a copy of the full report so they can quote the report directly and accurately rather than be forced to "figure things out." Much of this is very complex. Few people know how to, or have the time to, calculate utility rates. Make it easy for everyone to get the facts right.
- For most customers, what would happen to their bills is as much as they will care to know about these analyses. To satisfy those information needs, the Authority can publicize the current and recommended rates and/or the bill comparisons.
- A few customers will want to know more, especially high-volume customers. Give them the full report, if that is what they want.
- A good way to accomplish these things is to post the report on the Authority's Web site, Facebook page or other media, so everyone can see for themselves what the report says. That way, no one would have to print out a long document, unless they wanted to. Publicize the posting widely and publicly. Information is a good thing. ***Being seen*** as trying hard to get information out to folks is also a good thing.

You have engaged me pay one visit to the board to discuss my findings and recommendations. I look forward to meeting with the board, answering everyone's questions and helping you get on your way to the next generation of great rates.

# Prince George County, VA, 2020 Water Rates Model 1

This model calculated cost-to-serve rates with only minor variances to better suit the utility's needs.

March 25, 2020

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Note: This document is a print out of the spreadsheet model used to calculate new user charge and other rates and fees for the next 10 years. These calculations are complex and are based upon many conditions and assumtions. These issues, and others, are described in a narrative report that accompanies this model.

# Definitions

| | |
|---|---|
| Affordability Index | The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. Affordability index is often a factor in determining grant and loan eligibility and grant amount. |
| Analysis Year | The year following the "test year." Generally, rate analysis is done during the year following the "test year" and intial rate adjustments are done later still during the analysis year or sometime during the following year once the analysis shows how rates should be adjusted. See related "test year." |
| Capital Improvement Plan or Program (CIP) | A schedule of anticipated capital improvements. These are the more expensive items such as treatment plants, lines and other expensive infrastructure that generally requires bond or grant funding. |
| Capital Improvement Reserves | Cash reserves dedicated to funding the CIP |
| Comprehensive Rate Analysis | A thorough examination of a system's operating, capital improvement, equipment replacement and other costs, revenues, current rates, number of users and their use of the system, growth rates and all other key issues surrounding the system. This examination will determine how rates and fees should be set in the future to cash-flow the system properly, to build appropriate reserves and to be fair to ratepayers. It also will determine how policies should be adjusted to enable the system to operate well now, operate well in the medium-range future (about 10 years) and prepare for expected and expectable events such as capital improvements and equipment replacement. |
| Connection Charge | See system development fee |
| Conservation (Inclining) Rates | Unit charges that go up as the volume used goes up |
| Cost-to-produce | There are several ways to define and calculate cost-to-produce. Each is acceptable for different purposes. Generally, cost-to-produce is the total of all variable costs required to get service to a utility's customers during one year divided by the total units of service delivered during that year. This calculation will yield the average cost-to-produce. In a proportional to use rate structure, this is the unit charge. See "Cost Calculations" at the bottom of Table 19. |
| Cost-to-serve Rates | Rates where, at the customer class level, fixed and variable costs caused by each customer class are paid by that class with minimum and unit charges, respectively. However, this analysis models takes it one step further and calculated cost-to-serve rates at the individual customer level. |
| Cost Types; Fixed and Variable | The two main types of costs are fixed - those that are related to the fact that someone is a customer; and variable - those that are related to the volume of the commodity delivered to customers. Generally, fixed costs should be recovered with minimum charges and variable costs with unit charges. |
| Coverage Ratio (CR) | Incomes available to pay debt divided by the amount of the debt for that year. A CR of 1.0 is "break-even." Most systems should have a CR greater than 1.25. |
| Current Position | For purposes of this report, for one year, the sum of all incomes and undedicated reserves minus all current financial obligations for that year. Future obligations (next year's loan payments) and depreciation are not included. Current position is a good measure of overall financial health. |
| Declining Rates | Rates where unit charges go down as the volume used goes up |
| Fire Sprinkler Systems and Related Costs | Generally, fire suppression in businesses is provided by a built-in system of fire sprinklers. "Service" to such systems is primarily in the form of peak flow capacity availability to fight a fire. Capacity costs money, so larger, more sophisticated water systems should assess at least part of such costs to fire suppression systems. |
| Flat Rates | Rates where all users pay exactly the same fee regardless of the volume of service they use |
| Equivalent Dwelling Unit (EDU) or Equivalent Residential Unit (ERU) | This definition is for water and sewer service. Based upon number of water using fixtures, average flow, potential flow or similar criteria; the consumption rate of the average single family home is rated at one ERU. All other types of customers are then compared on this basis and multiples or parts of an ERU are assigned to each for billing purposes. |

# Definitions

| | |
|---|---|
| Equivalent Residential Unit (ERU) for Stormwater | This definition is for stormwater. As compared to water and sewer, that are concerned with water flow, one ERU of stormwater service is the average square footage of impervious surface of a single family home. Then, larger and non-residential properties are rated by their multiples or parts of an ERU of impervious surface area for the purpose of billing for stormwater cost impacts. When there is a large variation in single family home size and impervious surface area, some cities and similar places use the smaller size range of homes as their ERU standard and assess larger homes at multiples of that ERU basis, as well. |
| Incremental Rate Increases (Inflationary Increases) | Rate increases done, generally annually, following the initial rate adjustment. The usual goal of such increases is to keep the system's incomes on track with inflation. Such increases are usually small, in the two to five percent per year range. |
| Initial Rate Adjustments | Rate adjustments done in response to the comprehensive rate analysis. Generally, the goal of such adjustments is to establish rates that cover the system's short-term expected costs and do it with a structure that is fair to ratepayers. Initial adjustments should be followed in subsequent years with incremental rate increases. |
| Inflow & Infiltration (I&I) | In a sewer system, water that gets into the collection system by way of illicit connections (inflow) such as gutter downspouts, plus leaks in manholes and sewer lines (infiltration) |
| Infrastructure | Most commonly thought of as the hard assets, such as buildings, treatment plants and lines needed to provide service to customers connected to the system. In reality, staff, software and other "soft" assets should be thought of as infrastructure, as well. |
| Life-cycle Cost | The total cost to design, build, operate, maintain and eventually dispose of, or decommission, an asset. One asset may cost less to build but it may be more expensive to operate and maintain, yielding a higher total life-cycle cost. |
| Marginal Costs | The parts of a utility's costs that are unavoidable in the course of serving a particular customer, a group of customers, more volume to all customers or some other marginal use of the system. Such customer(s) or extra use could be added at a discounted but still profitable fee, if desired. Generally marginal costs are less than the average costs but when extra use requires a system upsizing, they can be greater. These costs are especially useful when considering selling service at wholesale or charging "snow birds" while they are away. |
| Operating Costs | Definitions and calculations vary. For rate setting purposes operating costs are costs incurred because a system is operated. Such costs are usually recovered primarily through unit charges. |
| Operating Reserves or Working Capital | Analogous to current position, this is the net revenues generated during "profitable" years and retained to fund operating costs during times when costs exceed incomes. |
| Operating Revenues | Revenues collected in the form of user fees and similar operating cost-related fees |
| Operating Ratio (OR) | Current incomes divided by current expenses, not including debt. An OR of 1.0 is "break even." Most systems should have an OR of 1.25 or higher. |
| Payback Period | In this case, time required for the investment made to get this analysis done to return that investment through increased user and other fees. |
| Peak Flow Capacity or Demand | The volume of service that a user could demand for a short period of time at full volume use. In water systems, and generally in sewer systems, too, the peak flow capacity limiting factor is usually the size of the customer's meter or service line. In electric systems, demand for each commercial and industrial customer (and sometimes others) is usually calculated annually based upon the peak energy usage during a defined short period. |
| Proportional to Use Rates | Rates where the minimum charge recovers all fixed costs, the unit charge recovers all variable costs, the unit charge is the same for all volume sold, and there is no usage allowance in the minimum charge. This rate structure is similar to and often the same as cost-to-serve rates. |
| Replacement Schedule | A timetable that describes equipment replacement and important repairs that are too infrequent and/or too expensive to cover as annual operating costs but not so expensive that they need to be covered as capital improvements. |
| Replacement Reserves | Cash reserves used to fund the Replacement Schedule |
| Return on Investment | In this case, the dollar amount or percentage of revenue gain enabled by this rate analysis. Related to payback period. |

# Definitions

| | |
|---|---|
| Snow Bird | A customer, usually residential, that goes away during part of the year. Most commonly, these are people of "means" who live in the north who "fly south" for the winter. But, this category includes everyone who is absent for a significant part of the year but returns to their permanent residence. |
| Stormwater | Precipitation that falls on and then leaves a site, flows elsewhere, potentially causing or adding to flooding and often carries with it sediment and pollutants. |
| Stormwater Management | The practice of reducing and mitigating off-site stormwater flows and impacts. |
| System Development Charge, or Fee | Fee assessed to pay for at least part of the cost to build system capacity. For purposes of this model, all charges related to connecting new customers will be "rolled together" into a system development charge, usually including a charge that buys a new customer system capacity. This combined charge may be a few hundred dollars for a residential customer, if little or no capacity costs are included, to many thousands of dollars for a large industrial customer with capacity costs included. Similar terms in common use include "tap-on fee," "connection fee or charge," "hook-up fee," "impact fee," "availability charge," and "capacity charge." |
| Test Year | The one year period from which data was gathered to be the basis of the rate analysis, which is usually the last completed fiscal year. See related "analysis year." |
| Usage Allowance | The volume, if any, that is "given away" with the minimum charge. Most systems give away no volume. Those that give away an unlimited volume have what are called "flat rates" - a minimum charge only. |
| User Fee, User Charge, User Rates | Fees assessed to customers for use of the system. This does not include system development charges, late payment penalties or other types of charges. |
| Water Loss | Measured by volume or percent, the part of a water system's net water production that does not reach customers or is not billed to customers. This loss also includes billable volume lost due to under-registering customer meters. |
| Working Capital, Net Income | The amount left in the operating fund after paying all costs due during that month, year or other time period. |
| Working Capital Goal or Operating Reserves Goal | The desired operating fund reserve, in dollars or percent, at a stated point in time. Small systems (1,000 connections) generally should target 35 percent or greater. Larger systems can target a lower percentage. The goal for each system should be based upon the needs of that system and the risk the customers are willing to take. |

# Table and Chart Descriptions

Note: When a numbered table or chart listed below is not in the package, that was not a mistake. It simply means that table or chart from our master program was not needed in this situation so it was left out to prevent confusion.

| Name | What Each is or Does |
|---|---|
| Definitions (List) | The meaning of terms used in this report and in rate setting generally |
| Return on Investment (Calculation) | A summary of financial outcomes enabled by the proposed rates |
| Table 1 - Rates | User rates in effect at the end of the test year. Unless rates were recently changed, these are the current rates. |
| Table 2 - Test Year Usage | Compilation of actual volume of service used by customers during the test year |
| Table 3 - Basic User Data and Operating Incomes | Basic user statistics and operating revenues, projected for 10 years, based on the assumption the modeled rates and future inflationary increases will ber adopted |
| Table 4 - Operating Costs and Net Income | Operating costs projected for 10 years |
| Table 5 - Capital Improvements Program (CIP) | Capital improvements and how they will be paid over next 10 years, including debt service |
| Table 6 - Equipment Replacement Schedule - Detailed | If applicable, detailed schedule of equipment replacements for next 20 years |
| Table 7 - Equipment Replacement Annuity Calculation | If applicable, calculation of the annual annuity (yearly savings amount) needed to pay for all equipment replacements as they come due and ending with the desired balance |
| Table 8 - Average Cost Classification | Sumation of a target year's costs and calculation of the "cost-of-service" rate structure basis for recovery of fixed costs and variable costs. Unless directed to do otherwise, this analysis developed cost-to-serve rates based on cost classification in this table. |
| Table 9 - Marginal Cost Classification | If applicable, calculation of costs incurred to serve a specified type of customer |
| Table 10 - Initial Rate Adjustments and Resulting Revenues | These are the modeled user rates and the resulting "blended" revenues they, and the current rates, will generate during the rate adjustment year |
| Table 11 - AWWA Safe Operating Flow by Meter Size | If applicable, this table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees, surcharges and revenues in Tables 13 through 16 for water meters, and when applicable, capacity costs for fire sprinklers. |
| Table 11B - Fire Sprinkler Peak Flow Capacity Factor | If applicable, this table shows peak flow capacity shares of various size fire sprinkler systems. |
| Table 12 - Flow Capacity Costs | If applicable, calculation of the various costs to build base and peak flow capacity to serve customers, when such fees will be based on water meter size |
| Table 12B - Capacity Costs Attributable to Fire Sprinkler Systems | If applicable, nearly the same as Table 12, except it applies to fire suppression systems. |
| Table 13 - System Development Fees | If applicable, calculation of meter size-based system development fees needed to recover costs calculated in Table 11, when such fees will be based on water meter size. |
| Table 13B - System Development Fees for Fire Sprinkler Systems | If applicable, nearly the same as Table 13, except it applies to fire suppression systems |
| Table 14 - Revenues From System Development Fees | If applicable, calculation of total fee revenues that would be generated during one full year at the fees in Table 13. |
| Table 14B - Revenues From System Development Fees for Fire Sprinkler Systems | If applicable, nearly the same as Table 14, except it applies to fire suppression systems |
| Table 15 - Minimum Charge Fees, Including Capacity Surcharges | If applicable, calculation of meter size-based capacity surcharges and minimum charges to recover costs calculated in Table 11, when such fees will be based on water meter size |
| Table 15B - Sprinkler System Capacity Charges | Nearly the same as Table 15, except it applies to fire suppression systems. |
| Table 16 - Revenues From Minimum Charge Surcharges | If applicable, calculation of total fee revenues that would be generated during one full year at the fees in Table 15. |

| | |
|---|---|
| Table 16B - Revenues From Sprinkler System Charges | Nearly the same as Table 16, except it applies to fire suppression systems |
| Table 17 - Financial Capacity Indicators and Reserves | Shows the financial effects of the modeled rates, costs, etc. on the utility and on the benchmark 5,000 gallon per month residential water or sewer customer, as appropriate |
| Table 18 - Bills Before and After Rate Adjustments | Bills at the modeled rates are compared to those under the current rates. Note: the modeled bills do not include capacity surcharges to the minimum charges unless they are included in the minimum charges column of Table 10. |
| Table 19 - User Statistics | If included, this table shows volumes and percentages of use, revenue generated and other statistics |
| *Chart 1 - Operating Ratio* | *Graph of operating ratio for 10 years as a result of the modeled rates and the current rates* |
| *Chart 2 - Coverage Ratio* | *Graph of coverage ratios for 10 years of the modeled rates and the current rates* |
| *Chart 3 - 5,000 Gallon Residential User's Bill* | *Graph of the bill for the benchmark 5,000 gallon per month residential user, with smallest available meter size (used in grant and loan eligibility determinations) as a result of the modeled rates, and the current rates* |
| *Chart 4 - Affordability Index* | *Graph of the affordability index for 10 years of the benchmark residential user's bill (used in grant and loan eligibility determinations)* |
| *Chart 5 - Working Capital vs Goal* | *Graph for 10 years of total (unobligated) cash assets at modeled rates compared to the goal for total cash assets* |
| *Chart 6 - Value of Cash Assets Before Inflation* | *Graph for 10 years of unobligated cash assets NOT adjusted for inflation at modeled rates and current rates* |
| *Chart 7 - Value of Cash Assets After Inflation* | *Graph for 10 years of unobligated cash assets adjusted for inflation at modeled rates and current rates. This is the real buying power of cash reserves.* |
| *Chart 8 - Sum of All Reserves* | *Graph of all reserves of all kinds at the modeled rates and at the current rates* |

## Table 1 - Rates

# Prince George County, VA, 2020 Water Rates Model 1

Unless rates were recently changed, these are the current rates. At the least, these rates were in effect at the end of the test year. If a volume range was left out of the table, in order to make it shorter, the unit charge that shows for the next lowest volume range also applies to the hidden volume range.

## Rates in Effect at End of Test Year

| Customer Type, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Billing Cycle Minimum Charge | Usage Allowance in 1,000s | Unit Charge per 1,000 Gallons |
|---|---|---|---|---|
| .625 Inch Meter Size | 0 | $19.12 | 0.000 | $2.97 |
| | 1,000 | $19.12 | 0.000 | $2.97 |
| | 2,000 | $19.12 | 0.000 | $2.97 |
| | 5,000 | $19.12 | 0.000 | $2.97 |
| | 6,000 | $19.12 | 0.000 | $3.72 |
| | 20,000 | $19.12 | 0.000 | $4.64 |
| | 5,000,000 | $19.12 | 0.000 | $4.64 |
| 1 Inch Meter Size | 0 | $34.68 | 0.000 | $2.97 |
| | 8,000 | $34.68 | 0.000 | $3.72 |
| | 25,000 | $34.68 | 0.000 | $4.64 |
| | 5,000,000 | $34.68 | 0.000 | $4.64 |
| 1.5 Inch Meter Size | 0 | $66.66 | 0.000 | $2.97 |
| | 15,000 | $66.66 | 0.000 | $3.72 |
| | 61,000 | $66.66 | 0.000 | $4.64 |
| | 5,000,000 | $66.66 | 0.000 | $4.64 |
| 2 Inch Meter Size | 0 | $119.38 | 0.000 | $2.97 |
| | 30,000 | $119.38 | 0.000 | $3.72 |
| | 94,000 | $119.38 | 0.000 | $4.64 |
| | 5,000,000 | $119.38 | 0.000 | $4.64 |

## Table 1 - Rates

### Rates in Effect at End of Test Year

| Customer Type, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Billing Cycle Minimum Charge | Usage Allowance in 1,000s | Unit Charge per 1,000 Gallons |
|---|---|---|---|---|
| 3 Inch Meter Size | 0 | $239.24 | 0.000 | $2.97 |
| | 70,000 | $239.24 | 0.000 | $3.72 |
| | 215,000 | $239.24 | 0.000 | $4.64 |
| | 5,000,000 | $239.24 | 0.000 | $4.64 |
| 4 Inch Meter Size | 0 | $418.18 | 0.000 | $2.97 |
| | 128,000 | $418.18 | 0.000 | $3.72 |
| | 385,000 | $418.18 | 0.000 | $4.64 |
| | 5,000,000 | $418.18 | 0.000 | $4.64 |
| 6 Inch Meter Size | 0 | $929.52 | 0.000 | $2.97 |
| | 289,000 | $929.52 | 0.000 | $3.72 |
| | 867,000 | $929.52 | 0.000 | $4.64 |
| | 5,000,000 | $929.52 | 0.000 | $4.64 |
| 8 Inch Meter Size | 0 | $1,645.42 | 0.000 | $2.97 |
| | 289,000 | $1,645.42 | 0.000 | $3.72 |
| | 867,000 | $1,645.42 | 0.000 | $4.64 |
| | 5,000,000 | $1,645.42 | 0.000 | $4.64 |
| Hotels 1 | 0 | $0.00 | 0.000 | $2.61 |
| | 5,000,000 | $0.00 | 0.000 | $2.61 |
| Hotels 2 | 0 | $0.00 | 0.000 | $3.20 |
| | 5,000,000 | $0.00 | 0.000 | $3.20 |
| Hydrants | 0 | $0.00 | 0.000 | $14.16 |
| | 5,000,000 | $0.00 | 0.000 | $14.16 |

# Table 2 - Test Year Usage

## Prince George County, VA, 2020 Water Rates Model 1

This table shows usage by all customers during the test year.

Test year = the one-year period being analyzed starts: 7/1/2018

Date this model created: 2/12/2020

Residential meter readings per year: 6

Other customer readings per year: 6

Bills per year: 6

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Billable Units Conversion Factor | Use Within Each Range in 1,000 Gallons | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|---|---|
| .625 Inch Meter Size | -55,170 | -1 | 1,000 | -5 | 27 | -137,130 | 27 | -137,130 | 5 | 0.1% | 0.0% |
| | 0 | 999 | 1,000 | 1 | 17,778 | 17,102,939 | 963 | 287,939 | 161 | 5.1% | 0.1% |
| | 1,000 | 1,999 | 1,000 | 1 | 16,815 | 16,519,805 | 662 | 1,028,805 | 110 | 3.5% | 0.3% |
| | 2,000 | 4,999 | 1,000 | 3 | 16,153 | 42,851,876 | 4,166 | 15,222,876 | 694 | 22.1% | 3.9% |
| | 5,000 | 5,999 | 1,000 | 1 | 11,987 | 11,113,187 | 1,677 | 9,188,187 | 280 | 8.9% | 2.4% |
| | 6,000 | 7,999 | 1,000 | 2 | 10,310 | 17,450,758 | 3,086 | 21,518,758 | 514 | 16.4% | 5.5% |
| | 8,000 | 9,999 | 1,000 | 2 | 7,224 | 11,890,994 | 2,392 | 21,362,994 | 399 | 12.7% | 5.5% |
| | 10,000 | 14,999 | 1,000 | 3 | 4,832 | 15,279,469 | 3,026 | 36,509,469 | 504 | 16.0% | 9.4% |
| | 15,000 | 19,999 | 1,000 | 3 | 1,806 | 6,206,548 | 967 | 16,516,548 | 161 | 5.1% | 4.2% |
| | 20,000 | 24,999 | 1,000 | 4 | 839 | 3,039,985 | 398 | 8,794,985 | 66 | 2.1% | 2.3% |
| | 25,000 | 29,999 | 1,000 | 4 | 441 | 1,734,863 | 160 | 4,329,863 | 27 | 0.8% | 1.1% |
| | 30,000 | 49,999 | 1,000 | 10 | 281 | 2,925,872 | 204 | 7,505,872 | 34 | 1.1% | 1.9% |
| | 50,000 | 60,999 | 1,000 | 9 | 77 | 658,633 | 32 | 1,763,633 | 5 | 0.2% | 0.5% |
| | 61,000 | 69,999 | 1,000 | 8 | 45 | 339,275 | 10 | 634,275 | 2 | 0.1% | 0.2% |
| | 70,000 | 93,999 | 1,000 | 17 | 35 | 590,732 | 20 | 1,630,732 | 3 | 0.1% | 0.4% |
| | 94,000 | 99,999 | 1,000 | 5 | 15 | 75,515 | 3 | 285,515 | 1 | 0.0% | 0.1% |
| | 100,000 | 127,999 | 1,000 | 21 | 12 | 254,490 | 4 | 430,490 | 1 | 0.0% | 0.1% |
| | 128,000 | 199,999 | 1,000 | 33 | 8 | 267,207 | 6 | 891,207 | 1 | 0.0% | 0.2% |
| | 200,000 | 214,999 | 1,000 | 5 | 2 | 9,150 | 2 | 409,150 | 0 | 0.0% | 0.1% |
| | | | Monthly and Annual Subtotals: | | 88,687 | 148,174,168 | 17,805 | 148,174,168 | 2,968 | 94.4% | 38.1% |
| 1 Inch Meter Size | -31,720 | -1 | 1,000 | -32 | 1 | -31,720 | 1 | -31,720 | 0 | 0.0% | 0.0% |
| | 0 | 999 | 1,000 | 1 | 425 | 368,812 | 69 | 12,812 | 12 | 0.4% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 356 | 345,218 | 21 | 31,218 | 4 | 0.1% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 335 | 941,158 | 45 | 161,158 | 8 | 0.2% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 290 | 279,185 | 19 | 103,185 | 3 | 0.1% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 271 | 506,591 | 34 | 236,591 | 6 | 0.2% | 0.1% |
| | 8,000 | 9,999 | 1,000 | 2 | 237 | 444,804 | 30 | 270,804 | 5 | 0.2% | 0.1% |
| | 10,000 | 14,999 | 1,000 | 4 | 207 | 926,396 | 40 | 491,396 | 7 | 0.2% | 0.1% |
| | 15,000 | 19,999 | 1,000 | 5 | 167 | 767,184 | 25 | 432,184 | 4 | 0.1% | 0.1% |
| | 20,000 | 24,999 | 1,000 | 5 | 142 | 655,663 | 20 | 445,663 | 3 | 0.1% | 0.1% |
| | 25,000 | 29,999 | 1,000 | 5 | 122 | 569,583 | 16 | 439,583 | 3 | 0.1% | 0.1% |
| | 30,000 | 49,999 | 1,000 | 16 | 106 | 1,709,031 | 32 | 1,189,031 | 5 | 0.2% | 0.3% |
| | 50,000 | 60,999 | 1,000 | 9 | 74 | 685,695 | 21 | 1,152,695 | 4 | 0.1% | 0.3% |
| | 61,000 | 69,999 | 1,000 | 9 | 53 | 450,594 | 7 | 463,594 | 1 | 0.0% | 0.1% |
| | 70,000 | 93,999 | 1,000 | 21 | 46 | 964,259 | 14 | 1,176,259 | 2 | 0.1% | 0.3% |
| | 94,000 | 99,999 | 1,000 | 6 | 32 | 182,742 | 3 | 290,742 | 1 | 0.0% | 0.1% |
| | 100,000 | 127,999 | 1,000 | 25 | 29 | 713,011 | 7 | 797,011 | 1 | 0.0% | 0.2% |
| | 128,000 | 199,999 | 1,000 | 59 | 22 | 1,289,746 | 11 | 1,905,746 | 2 | 0.1% | 0.5% |
| | 200,000 | 214,999 | 1,000 | 15 | 11 | 160,579 | 1 | 210,579 | 0 | 0.0% | 0.1% |
| | 215,000 | 288,999 | 1,000 | 59 | 10 | 587,321 | 4 | 1,003,321 | 1 | 0.0% | 0.3% |
| | 289,000 | 299,999 | 1,000 | 11 | 6 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 1,000 | 29 | 6 | 173,855 | 6 | 1,973,855 | 1 | 0.0% | 0.5% |
| | | | Monthly and Annual Subtotals: | | 2,948 | 12,755,707 | 426 | 12,755,707 | 71 | 2.3% | 3.3% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Billable Units Conversion Factor | Use Within Each Range in 1,000 Gallons | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.5 Inch Meter Size | 0 | 999 | 1,000 | 1 | 209 | 193,467 | 20 | 4,467 | 3 | 0.1% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 189 | 186,573 | 6 | 9,573 | 1 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 183 | 508,439 | 28 | 99,439 | 5 | 0.1% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 155 | 148,631 | 10 | 53,631 | 2 | 0.1% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 145 | 282,577 | 11 | 80,577 | 2 | 0.1% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 134 | 262,730 | 6 | 54,730 | 1 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 128 | 589,911 | 18 | 219,911 | 3 | 0.1% | 0.1% |
| | 15,000 | 19,999 | 1,000 | 5 | 110 | 522,069 | 12 | 212,069 | 2 | 0.1% | 0.1% |
| | 20,000 | 24,999 | 1,000 | 5 | 98 | 476,934 | 8 | 186,934 | 1 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 90 | 436,617 | 6 | 166,617 | 1 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 18 | 84 | 1,533,024 | 15 | 603,024 | 3 | 0.1% | 0.2% |
| | 50,000 | 60,999 | 1,000 | 10 | 69 | 713,714 | 10 | 564,714 | 2 | 0.1% | 0.1% |
| | 61,000 | 69,999 | 1,000 | 8 | 59 | 474,823 | 12 | 783,823 | 2 | 0.1% | 0.2% |
| | 70,000 | 93,999 | 1,000 | 18 | 47 | 848,430 | 22 | 1,788,430 | 4 | 0.1% | 0.5% |
| | 94,000 | 99,999 | 1,000 | 5 | 25 | 133,500 | 4 | 383,500 | 1 | 0.0% | 0.1% |
| | 100,000 | 127,999 | 1,000 | 24 | 21 | 494,000 | 6 | 674,000 | 1 | 0.0% | 0.2% |
| | 128,000 | 199,999 | 1,000 | 53 | 15 | 797,500 | 8 | 1,317,500 | 1 | 0.0% | 0.3% |
| | 200,000 | 214,999 | 1,000 | 14 | 7 | 97,500 | 1 | 207,500 | 0 | 0.0% | 0.1% |
| | 215,000 | 288,999 | 1,000 | 74 | 6 | 444,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 289,000 | 299,999 | 1,000 | 11 | 6 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 1,000 | 85 | 6 | 510,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 385,000 | 399,999 | 1,000 | 15 | 6 | 90,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 400,000 | 499,999 | 1,000 | 100 | 6 | 600,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 500,000 | 866,999 | 1,000 | 262 | 6 | 1,571,000 | 6 | 4,571,000 | 1 | 0.0% | 1.2% |
| | | | Monthly and Annual Subtotals: | | 1,804 | 11,981,439 | 209 | 11,981,439 | 35 | 1.1% | 3.1% |
| 2 Inch Meter Size | 0 | 999 | 1,000 | 1 | 214 | 193,405 | 24 | 3,405 | 4 | 0.1% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 190 | 189,500 | 1 | 1,500 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 189 | 565,249 | 1 | 3,249 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 188 | 188,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 188 | 369,373 | 5 | 33,373 | 1 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 183 | 357,173 | 10 | 91,173 | 2 | 0.1% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 173 | 820,530 | 16 | 195,530 | 3 | 0.1% | 0.1% |
| | 15,000 | 19,999 | 1,000 | 5 | 157 | 762,459 | 8 | 137,459 | 1 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 149 | 729,601 | 5 | 109,601 | 1 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 144 | 688,788 | 16 | 448,788 | 3 | 0.1% | 0.1% |
| | 30,000 | 49,999 | 1,000 | 18 | 128 | 2,241,468 | 32 | 1,281,468 | 5 | 0.2% | 0.3% |
| | 50,000 | 60,999 | 1,000 | 10 | 96 | 968,749 | 12 | 644,749 | 2 | 0.1% | 0.2% |
| | 61,000 | 69,999 | 1,000 | 9 | 84 | 734,250 | 3 | 188,250 | 1 | 0.0% | 0.0% |
| | 70,000 | 93,999 | 1,000 | 23 | 81 | 1,851,981 | 9 | 753,981 | 2 | 0.0% | 0.2% |
| | 94,000 | 99,999 | 1,000 | 6 | 72 | 424,164 | 4 | 392,164 | 1 | 0.0% | 0.1% |
| | 100,000 | 127,999 | 1,000 | 26 | 68 | 1,783,941 | 6 | 647,941 | 1 | 0.0% | 0.2% |
| | 128,000 | 199,999 | 1,000 | 64 | 62 | 3,987,708 | 13 | 2,123,708 | 2 | 0.1% | 0.5% |
| | 200,000 | 214,999 | 1,000 | 15 | 49 | 711,926 | 3 | 621,926 | 1 | 0.0% | 0.2% |
| | 215,000 | 288,999 | 1,000 | 65 | 46 | 2,968,344 | 10 | 2,454,344 | 2 | 0.1% | 0.6% |
| | 289,000 | 299,999 | 1,000 | 11 | 36 | 396,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 1,000 | 70 | 36 | 2,533,651 | 11 | 3,708,651 | 2 | 0.1% | 1.0% |
| | 385,000 | 399,999 | 1,000 | 14 | 25 | 359,000 | 2 | 784,000 | 0 | 0.0% | 0.2% |
| | 400,000 | 499,999 | 1,000 | 84 | 23 | 1,927,475 | 7 | 3,127,475 | 1 | 0.0% | 0.8% |
| | 500,000 | 866,999 | 1,000 | 265 | 16 | 4,243,402 | 6 | 3,573,402 | 1 | 0.0% | 0.9% |
| | 867,000 | 999,999 | 1,000 | 105 | 10 | 1,045,700 | 3 | 2,715,700 | 1 | 0.0% | 0.7% |
| | 1,000,000 | 4,999,999 | 1,000 | 414 | 7 | 2,900,700 | 7 | 9,900,700 | 1 | 0.0% | 2.5% |
| | 5,000,000 | 15,000,000 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | | | Monthly and Annual Subtotals: | | 2,614 | 33,942,537 | 214 | 33,942,537 | 36 | 1.1% | 8.7% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Billable Units Conversion Factor | Use Within Each Range in 1,000 Gallons | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | 1,000 | 1 | 30 | 28,000 | 2 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 28 | 28,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 28 | 80,250 | 2 | 6,250 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 26 | 26,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 26 | 52,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 26 | 51,050 | 1 | 9,050 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 25 | 120,000 | 1 | 10,000 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 1,000 | 5 | 24 | 120,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 24 | 119,150 | 1 | 24,150 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 23 | 115,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 19 | 23 | 433,900 | 3 | 123,900 | 1 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 1,000 | 11 | 20 | 213,500 | 1 | 54,500 | 0 | 0.0% | 0.0% |
| | 61,000 | 69,999 | 1,000 | 9 | 19 | 167,000 | 1 | 66,000 | 0 | 0.0% | 0.0% |
| 3 Inch Meter Size | 70,000 | 93,999 | 1,000 | 23 | 18 | 414,500 | 1 | 76,500 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 1,000 | 6 | 17 | 102,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 1,000 | 28 | 17 | 476,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 1,000 | 71 | 17 | 1,209,200 | 1 | 185,200 | 0 | 0.0% | 0.0% |
| | 200,000 | 214,999 | 1,000 | 15 | 16 | 240,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 215,000 | 288,999 | 1,000 | 74 | 16 | 1,184,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 289,000 | 299,999 | 1,000 | 10 | 16 | 167,359 | 1 | 291,359 | 0 | 0.0% | 0.1% |
| | 300,000 | 384,999 | 1,000 | 61 | 15 | 922,079 | 6 | 1,957,079 | 1 | 0.0% | 0.5% |
| | 385,000 | 399,999 | 1,000 | 15 | 9 | 135,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 400,000 | 499,999 | 1,000 | 89 | 9 | 804,392 | 1 | 404,392 | 0 | 0.0% | 0.1% |
| | 500,000 | 866,999 | 1,000 | 357 | 8 | 2,855,850 | 1 | 786,850 | 0 | 0.0% | 0.2% |
| | 867,000 | 999,999 | 1,000 | 119 | 7 | 834,100 | 1 | 903,100 | 0 | 0.0% | 0.2% |
| | 1,000,000 | 4,999,999 | 1,000 | 865 | 6 | 5,191,779 | 6 | 11,191,779 | 1 | 0.0% | 2.9% |
| | 5,000,000 | 15,000,000 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | | | Monthly and Annual Subtotals: | | 493 | 16,090,109 | 30 | 16,090,109 | 5 | 0.2% | 4.1% |
| | 0 | 999 | 1,000 | 1 | 66 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 66 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 66 | 198,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 66 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 66 | 132,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 66 | 132,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 66 | 330,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 1,000 | 5 | 66 | 322,400 | 4 | 72,400 | 1 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 62 | 307,300 | 1 | 22,300 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 61 | 303,490 | 1 | 28,490 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 19 | 60 | 1,154,200 | 4 | 154,200 | 1 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 1,000 | 10 | 56 | 582,430 | 7 | 393,430 | 1 | 0.0% | 0.1% |
| | 61,000 | 69,999 | 1,000 | 9 | 49 | 438,920 | 1 | 67,920 | 0 | 0.0% | 0.0% |
| 4 Inch Meter Size | 70,000 | 93,999 | 1,000 | 24 | 48 | 1,152,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 1,000 | 6 | 48 | 288,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 1,000 | 28 | 48 | 1,344,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 1,000 | 72 | 48 | 3,456,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 200,000 | 214,999 | 1,000 | 15 | 48 | 720,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 215,000 | 288,999 | 1,000 | 74 | 48 | 3,552,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 289,000 | 299,999 | 1,000 | 11 | 48 | 528,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 1,000 | 85 | 48 | 4,080,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 385,000 | 399,999 | 1,000 | 15 | 48 | 720,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 400,000 | 499,999 | 1,000 | 100 | 48 | 4,800,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 500,000 | 866,999 | 1,000 | 338 | 48 | 16,214,323 | 11 | 8,135,323 | 2 | 0.1% | 2.1% |
| | 867,000 | 999,999 | 1,000 | 126 | 37 | 4,674,460 | 5 | 4,753,460 | 1 | 0.0% | 1.2% |
| | 1,000,000 | 4,999,999 | 1,000 | 845 | 32 | 27,031,554 | 32 | 59,031,554 | 5 | 0.2% | 15.2% |
| | 5,000,000 | 15,000,000 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | | | Monthly and Annual Subtotals: | | 1,413 | 72,659,077 | 66 | 72,659,077 | 11 | 0.3% | 18.7% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Billable Units Conversion Factor | Use Within Each Range in 1,000 Gallons | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | 1,000 | 1 | 42 | 37,049 | 5 | 49 | 1 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 37 | 111,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 37 | 74,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 37 | 74,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 37 | 180,712 | 1 | 10,712 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 1,000 | 5 | 36 | 180,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 36 | 180,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 36 | 180,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 20 | 36 | 720,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 1,000 | 11 | 36 | 381,447 | 2 | 107,447 | 0 | 0.0% | 0.0% |
| | 61,000 | 69,999 | 1,000 | 9 | 34 | 306,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| 6 Inch Meter Size | 70,000 | 93,999 | 1,000 | 24 | 34 | 816,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 1,000 | 6 | 34 | 204,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 1,000 | 28 | 34 | 952,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 1,000 | 69 | 34 | 2,361,216 | 2 | 313,216 | 0 | 0.0% | 0.1% |
| | 200,000 | 214,999 | 1,000 | 15 | 32 | 471,545 | 1 | 206,545 | 0 | 0.0% | 0.1% |
| | 215,000 | 288,999 | 1,000 | 74 | 31 | 2,287,185 | 1 | 282,185 | 0 | 0.0% | 0.1% |
| | 289,000 | 299,999 | 1,000 | 11 | 30 | 330,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 1,000 | 80 | 30 | 2,385,163 | 4 | 1,375,163 | 1 | 0.0% | 0.4% |
| | 385,000 | 399,999 | 1,000 | 15 | 26 | 385,787 | 1 | 395,787 | 0 | 0.0% | 0.1% |
| | 400,000 | 499,999 | 1,000 | 97 | 25 | 2,433,714 | 1 | 433,714 | 0 | 0.0% | 0.1% |
| | 500,000 | 866,999 | 1,000 | 361 | 24 | 8,658,900 | 1 | 717,900 | 0 | 0.0% | 0.2% |
| | 867,000 | 999,999 | 1,000 | 132 | 23 | 3,028,650 | 1 | 969,650 | 0 | 0.0% | 0.2% |
| | 1,000,000 | 4,999,999 | 1,000 | 1,323 | 22 | 29,103,792 | 16 | 21,103,792 | 3 | 0.1% | 5.4% |
| | 5,000,000 | 15,000,000 | 1,000 | 4,501 | 6 | 27,006,934 | 6 | 57,006,934 | 1 | 0.0% | 14.6% |
| | | | Monthly and Annual Subtotals: | | 863 | 82,923,094 | 42 | 82,923,094 | 7 | 0.2% | 21.3% |
| | 0 | 999 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| 8 Inch Meter Size | 5,000,000 | 15,000,000 | 1,000 | 0 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | | | Monthly and Annual Subtotals: | | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 0 | 999 | 1,000 | 1 | 25 | 25,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 25 | 25,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 25 | 75,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 25 | 25,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 25 | 50,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 25 | 50,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 1,000 | 5 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 20 | 25 | 500,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 1,000 | 11 | 25 | 275,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| Hotels 1 | 61,000 | 69,999 | 1,000 | 9 | 25 | 225,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 70,000 | 93,999 | 1,000 | 24 | 25 | 600,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 1,000 | 6 | 25 | 150,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 1,000 | 28 | 25 | 700,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 1,000 | 70 | 25 | 1,756,700 | 1 | 156,700 | 0 | 0.0% | 0.0% |
| | 200,000 | 214,999 | 1,000 | 15 | 24 | 360,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 215,000 | 288,999 | 1,000 | 72 | 24 | 1,738,800 | 4 | 1,118,800 | 1 | 0.0% | 0.3% |
| | 289,000 | 299,999 | 1,000 | 11 | 20 | 211,000 | 2 | 591,000 | 0 | 0.0% | 0.2% |
| | 300,000 | 384,999 | 1,000 | 63 | 18 | 1,131,000 | 9 | 3,066,000 | 2 | 0.0% | 0.8% |
| | 385,000 | 399,999 | 1,000 | 14 | 9 | 122,000 | 1 | 387,000 | 0 | 0.0% | 0.1% |
| | 400,000 | 499,999 | 1,000 | 51 | 8 | 410,000 | 6 | 2,610,000 | 1 | 0.0% | 0.7% |
| | 500,000 | 866,999 | 1,000 | 161 | 2 | 321,000 | 2 | 1,321,000 | 0 | 0.0% | 0.3% |
| | | | Monthly and Annual Subtotals: | | 530 | 9,250,500 | 25 | 9,250,500 | 4 | 0.1% | 2.4% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Billable Units Conversion Factor | Use Within Each Range in 1,000 Gallons | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Hotels 2 | 0 | 999 | 1,000 | 1 | 6 | 6,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 6 | 6,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 6 | 18,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 6 | 6,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 2 | 6 | 12,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 6 | 12,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 5 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 1,000 | 5 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 20 | 6 | 120,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 1,000 | 11 | 6 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 61,000 | 69,999 | 1,000 | 9 | 6 | 54,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 70,000 | 93,999 | 1,000 | 24 | 6 | 144,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 1,000 | 6 | 6 | 36,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 1,000 | 28 | 6 | 168,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 1,000 | 37 | 6 | 221,500 | 4 | 589,500 | 1 | 0.0% | 0.2% |
| | 200,000 | 214,999 | 1,000 | 15 | 2 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 215,000 | 288,999 | 1,000 | 74 | 2 | 148,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 289,000 | 299,999 | 1,000 | 11 | 2 | 22,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 1,000 | 28 | 2 | 56,000 | 2 | 656,000 | 0 | 0.0% | 0.2% |
| | | | Monthly and Annual Subtotals: | | 110 | 1,245,500 | 6 | 1,245,500 | 1 | 0.0% | 0.3% |
| Hydrants | 0 | 999 | 1,000 | 0 | 43 | 8,000 | 35 | 0 | 6 | 0.2% | 0.0% |
| | 1,000 | 1,999 | 1,000 | 1 | 8 | 7,300 | 1 | 1,300 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 1,000 | 3 | 7 | 21,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 1,000 | 1 | 7 | 6,100 | 1 | 5,100 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 1,000 | 1 | 6 | 8,800 | 2 | 12,800 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 1,000 | 2 | 4 | 6,200 | 1 | 8,200 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 1,000 | 4 | 3 | 11,200 | 1 | 11,200 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 1,000 | 5 | 2 | 10,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 1,000 | 5 | 2 | 10,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 1,000 | 5 | 2 | 10,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 1,000 | 20 | 2 | 40,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 1,000 | 11 | 2 | 22,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 61,000 | 69,999 | 1,000 | 9 | 2 | 18,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 70,000 | 93,999 | 1,000 | 24 | 2 | 48,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 1,000 | 4 | 2 | 7,900 | 1 | 95,900 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 1,000 | 28 | 1 | 28,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 1,000 | 56 | 1 | 56,100 | 1 | 184,100 | 0 | 0.0% | 0.0% |
| | | | Monthly and Annual Subtotals: | | 96 | 318,600 | 43 | 318,600 | 7 | 0.2% | 0.1% |
| | | | | Grand Totals: | 99,558 | 389,340,731 | 18,866 | 389,340,731 | 3,144 | 100% | 100% |

# Table 3 - Operating Incomes and Basic User Data

# Prince George County, VA, 2020 Water Rates Model 1

This table depicts user statistics, customer growth, and system incomes and across the board "inflationary" style rate increases through the 10th year.

## Annual Median Household Income (AMHI)

| | | |
|---|---|---|
| $42,589 | Census Bureau estimate of AMHI for the year | 2017 |
| $42,161 | Census Bureau estimate of AMHI for the year | 2016 |
| $428 | AMHI growth during this time period | |
| 1.02% | Simple annual income growth rate during this time period (used to project incomes into the future) | |

## Test Year Growth of Customer Base and Average Tap Fee Paid per Connection

10 Number of new connections made during the test year

$17,214 Average tap or connection fee assessed during the test year

This model is programmed for rates to be reset in the "Analysis Year," also called the "0 Year" column below (heading highlighted blue). Revenues will be collected at the now-current rates for the first part of the analysis year and the modeled rates for the last part of the analysis year. Thus, the revenues shown in the last column of that table are "blended" revenues; part collected at the old rates and part collected at the new rates. It was then assumed that all rate adjustments made after the initial (major) adjustment will be done annually on approximately the anniversary of the first adjustment. If rates will not be adjusted during the "0 Year," an adjustment (normally a revenue reduction) was calculated below to account for the late start in making the first adjustments.

## Basic User (Customer) Data

| (First year balances and incomes are actual, subsequent years are projected.) | Inflation/ Deflation (–) Factor | Test Year | Analysis Year 0 Year | Years Following the Analysis Year (for Which Results Have Been Projected) 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | 6th Year | 7th Year | 8th Year | 9th Year | 10th Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Starting 7/1/18 | Starting 7/1/19 | Starting 7/1/20 | Starting 7/1/21 | Starting 7/1/22 | Starting 7/1/23 | Starting 7/1/24 | Starting 7/1/25 | Starting 7/1/26 | Starting 7/1/27 | Starting 7/1/28 | Starting 7/1/29 |
| Rate Increases Projected for Future Years | N.A. | N.A. | N.A. | | 5.0% | 5.0% | 5.0% | 5.0% | 5.0% | 5.0% | 5.0% | 5.0% | 5.0% |
| | | | | The row above shows the rate at which user charge fees should be increased for each year beyond the initial rate adjustment year. Unless stated otherwise, these should be across-the-board increases to all rates and fees and that should continue until a new rate analysis is done. | | | | | | | | | |
| Average Number of Customers | N.A. | 3,144 | 3,154 | 3,164 | 3,174 | 3,184 | 3,194 | 3,204 | 3,214 | 3,224 | 3,234 | 3,244 | 3,254 |
| Customers Added or Lost ( - ) Each Year | N.A. | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Customer Growth or Loss ( - ) Rate | N.A. | 0.32% | 0.32% | 0.32% | 0.32% | 0.31% | 0.31% | 0.31% | 0.31% | 0.31% | 0.31% | 0.31% | 0.31% |
| Actual (Test Year) and Projected Service, in Gallons | N.A. | 389,340,731 | 390,578,961 | 391,817,191 | 393,055,420 | 394,293,650 | 395,531,880 | 396,770,110 | 398,008,340 | 399,246,570 | 400,484,799 | 401,723,029 | 402,961,259 |
| **How User Charge Fees Were Calculated, Accounting for New Customers and Future Rate Increases** | | | | | | | | | | | | | |
| Actual or Calculated Sales Revenues | | $1,980,876 | $1,982,207 | $2,591,611 | $2,729,791 | $2,875,339 | $3,028,587 | $3,189,971 | $3,359,923 | $3,538,895 | $3,727,364 | $3,925,832 | $4,134,830 |
| Additional Sales Revenues From New Customers | | | $17 | $8,190 | $8,627 | $9,030 | $9,481 | $9,955 | $10,453 | $10,976 | $11,524 | $12,101 | $12,706 |
| Total Calculated Revenues (User Charge Fees) | | $1,980,876 | $1,982,224 | $2,599,801 | $2,738,418 | $2,884,368 | $3,038,068 | $3,199,927 | $3,370,376 | $3,549,870 | $3,738,888 | $3,937,933 | $4,147,535 |
| **Operating Incomes** | | | | | | | | | | | | | |
| User Charge Fees (Tables 10, 12, 12B, 15, 15B, 16, 16B) | N.A. | $1,977,225 | $1,900,000 | $2,491,959 | $2,624,826 | $2,764,722 | $2,912,046 | $3,067,191 | $3,230,570 | $3,402,618 | $3,583,796 | $3,774,584 | $3,975,492 |
| Late Payment Charge | N.A. | $185,078 | $37,500 | $37,619 | $37,737 | $37,856 | $37,974 | $38,093 | $38,211 | $38,330 | $38,448 | $38,567 | $38,685 |
| New Water Taps or Connections (Current Rate Structure) | % Above | $172,140 | $150,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $1 | $2 |
| Meter Size-based System Development Fees (Tables 13, 14) | % Above | $0 | $109 | $41,998 | $44,098 | $46,303 | $48,618 | $51,049 | $53,601 | $56,281 | $59,095 | $62,050 | $65,153 |
| Interest Income | N.A. | $8,901 | $0 | $5,304 | $6,552 | $6,715 | $6,921 | $7,058 | $7,237 | $7,462 | $7,611 | $7,807 | $8,053 |
| RENTAL OF GEN. PROPERTY | N.A. | $65,791 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 | $35,000 |
| RECONNECTION CHARGES | N.A. | $18,263 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 |
| MISCELLANEOUS | N.A. | $23,499 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 |
| SALE OF VEHICLE | N.A. | $1,057 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Revenue Loss Because Rate Adjustments Made This Number of Months Late | 6.0 | $0 | $0 | -$243,663 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Revenue Loss ( - ) Due to Conservation | 10.0% | $0 | $0 | -$59,196 | -$13,287 | -$13,990 | -$14,732 | -$15,514 | -$16,338 | -$17,205 | -$18,118 | -$19,079 | -$20,091 |
| **Total Operating Incomes** | | **$2,451,953** | **$2,153,859** | **$2,340,271** | **$2,766,176** | **$2,907,856** | **$3,057,077** | **$3,214,126** | **$3,379,531** | **$3,553,737** | **$3,737,083** | **$3,930,181** | **$4,133,546** |

# Table 4 - Operating Costs and Net Income

## Prince George County, VA, 2020 Water Rates Model 1

This table depicts expenses during the test year, this year and for the next 10 years. Some future costs will experience inflation. Those costs that go up as use goes up are increased by the cost inflation factor plus the growth rate in users.

| (First year costs and net incomes are actual, subsequent years are projected.) | | | Analysis Year | Years Following the Analysis Year (for Which Results Have Been Projected) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inflation/ Deflation (–) Factor | Test Year Starting 7/1/18 | 0 Year Starting 7/1/19 | 1st Year Starting 7/1/20 | 2nd Year Starting 7/1/21 | 3rd Year Starting 7/1/22 | 4th Year Starting 7/1/23 | 5th Year Starting 7/1/24 | 6th Year Starting 7/1/25 | 7th Year Starting 7/1/26 | 8th Year Starting 7/1/27 | 9th Year Starting 7/1/28 | 10th Year Starting 7/1/29 |
| ACNT & AUDIT SRVC | 3.0% | $7,500 | $8,668 | $8,928 | $9,195 | $9,471 | $9,755 | $10,048 | $10,349 | $10,660 | $10,980 | $11,309 | $11,648 |
| BOOKS & SUBS | 3.0% | $143 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| BUILDING SUPPLIES | 3.0% | $2,045 | $2,500 | $2,575 | $2,652 | $2,732 | $2,814 | $2,898 | $2,985 | $3,075 | $3,167 | $3,262 | $3,360 |
| CAREER DEVELOPMENT | 3.0% | $0 | $5,000 | $5,150 | $5,305 | $5,464 | $5,628 | $5,796 | $5,970 | $6,149 | $6,334 | $6,524 | $6,720 |
| CHEMICALS | 3.0% | $12,358 | $7,500 | $7,749 | $8,007 | $8,273 | $8,548 | $8,832 | $9,126 | $9,429 | $9,742 | $10,065 | $10,399 |
| CONTRACT FEES / ADMIN | 3.0% | $58,343 | $41,800 | $43,054 | $44,346 | $45,676 | $47,046 | $48,458 | $49,911 | $51,409 | $52,951 | $54,540 | $56,176 |
| CONVENTION & ED | 3.0% | $3,396 | $3,750 | $3,863 | $3,978 | $4,098 | $4,221 | $4,347 | $4,478 | $4,612 | $4,750 | $4,893 | $5,040 |
| DEPRECIATION EXPENS | 3.0% | $393,812 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| DISABILITY INSUR | 3.0% | $244 | $490 | $505 | $520 | $535 | $551 | $568 | $585 | $603 | $621 | $639 | $659 |
| DUES AND MEMBERSHIP | 3.0% | $704 | $750 | $773 | $796 | $820 | $844 | $869 | $896 | $922 | $950 | $979 | $1,008 |
| ELECTRICAL | 3.0% | $55,809 | $51,700 | $53,420 | $55,196 | $57,032 | $58,927 | $60,885 | $62,907 | $64,996 | $67,154 | $69,382 | $71,684 |
| EQUIP PARTS & SUPPLIES | 3.0% | $10,103 | $8,350 | $8,601 | $8,859 | $9,124 | $9,398 | $9,680 | $9,970 | $10,269 | $10,578 | $10,895 | $11,222 |
| FICA | 3.0% | $23,021 | $29,482 | $30,366 | $31,277 | $32,215 | $33,182 | $34,177 | $35,202 | $36,259 | $37,346 | $38,467 | $39,621 |
| FIRST AID/SAFETY | 3.0% | $1,978 | $1,000 | $1,030 | $1,061 | $1,093 | $1,126 | $1,159 | $1,194 | $1,230 | $1,267 | $1,305 | $1,344 |
| FOOD SUPPLIES | 3.0% | $433 | $400 | $412 | $424 | $437 | $450 | $464 | $478 | $492 | $507 | $522 | $538 |
| GROUP LIFE INSUR | 3.0% | $3,953 | $4,839 | $4,984 | $5,134 | $5,288 | $5,446 | $5,610 | $5,778 | $5,951 | $6,130 | $6,314 | $6,503 |
| HOSPITAL/MEDICAL | 3.0% | $155,728 | $82,625 | $85,104 | $87,657 | $90,287 | $92,995 | $95,785 | $98,659 | $101,618 | $104,667 | $107,807 | $111,041 |
| LEASE/RENT OF BUILD | 3.0% | $25,996 | $30,078 | $30,980 | $31,909 | $32,866 | $33,852 | $34,868 | $35,914 | $36,992 | $38,101 | $39,244 | $40,422 |
| MOTOR POOL | 3.0% | $3,814 | $2,500 | $2,575 | $2,652 | $2,732 | $2,814 | $2,898 | $2,985 | $3,075 | $3,167 | $3,262 | $3,360 |
| MTR VEH INSURANCE | 3.0% | $3,032 | $3,150 | $3,245 | $3,342 | $3,442 | $3,545 | $3,652 | $3,761 | $3,874 | $3,990 | $4,110 | $4,233 |
| OFFICE SUPPLIES | 3.0% | $3,178 | $2,550 | $2,627 | $2,705 | $2,786 | $2,870 | $2,956 | $3,045 | $3,136 | $3,230 | $3,327 | $3,427 |
| OPERATING SUPPLIES | 3.0% | $55,635 | $33,300 | $34,299 | $35,328 | $36,388 | $37,479 | $38,604 | $39,762 | $40,955 | $42,183 | $43,449 | $44,752 |
| OVERTIME | 3.0% | $3,724 | $10,000 | $10,300 | $10,609 | $10,927 | $11,255 | $11,593 | $11,941 | $12,299 | $12,668 | $13,048 | $13,439 |
| PARTS & SUPPLIES | 3.0% | $22 | $300 | $309 | $318 | $328 | $338 | $348 | $358 | $369 | $380 | $391 | $403 |
| POSTAL SERVICE | 3.0% | $8,237 | $10,000 | $10,333 | $10,676 | $11,031 | $11,398 | $11,777 | $12,168 | $12,572 | $12,989 | $13,420 | $13,865 |
| PROF SERVICES | 3.0% | $131 | $2,500 | $2,575 | $2,652 | $2,732 | $2,814 | $2,898 | $2,985 | $3,075 | $3,167 | $3,262 | $3,360 |
| PUMPING STATION SUPPLIES | 3.0% | $573,254 | $687,000 | $707,610 | $728,838 | $750,703 | $773,225 | $796,421 | $820,314 | $844,923 | $870,271 | $896,379 | $923,271 |
| RETIREMENT-VRS | 3.0% | $24,700 | $53,745 | $55,357 | $57,018 | $58,728 | $60,490 | $62,305 | $64,174 | $66,099 | $68,082 | $70,124 | $72,228 |
| SAL & WAGE | 3.0% | $318,038 | $364,378 | $375,309 | $386,568 | $398,165 | $410,110 | $422,413 | $435,086 | $448,138 | $461,583 | $475,430 | $489,693 |
| TELEPHONE | 3.0% | $9,512 | $8,750 | $9,013 | $9,283 | $9,561 | $9,848 | $10,144 | $10,448 | $10,761 | $11,084 | $11,417 | $11,759 |
| UNIFORM/APPAREL | 3.0% | $2,796 | $3,750 | $3,863 | $3,978 | $4,098 | $4,221 | $4,347 | $4,478 | $4,612 | $4,750 | $4,893 | $5,040 |
| VEHICLE EQUIP. SUP | 3.0% | $763 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| VEHICLE/EQUIP FUEL | 3.0% | $12,954 | $12,500 | $12,875 | $13,261 | $13,659 | $14,069 | $14,491 | $14,926 | $15,373 | $15,835 | $16,310 | $16,799 |
| WORKER'S COMP | 3.0% | $10,683 | $11,217 | $11,554 | $11,900 | $12,257 | $12,625 | $13,004 | $13,394 | $13,795 | $14,209 | $14,636 | $15,075 |
| ADVERTISING | 3.0% | $0 | $2,000 | $2,060 | $2,122 | $2,185 | $2,251 | $2,319 | $2,388 | $2,460 | $2,534 | $2,610 | $2,688 |
| BILLING SUPPLIES | 3.0% | $3,710 | $2,250 | $2,325 | $2,402 | $2,482 | $2,565 | $2,650 | $2,738 | $2,829 | $2,923 | $3,020 | $3,120 |
| PERMITS LICENSES RNWLS | 3.0% | $11,081 | $11,000 | $11,330 | $11,670 | $12,020 | $12,381 | $12,752 | $13,135 | $13,529 | $13,934 | $14,353 | $14,783 |
| PART-TIME SALARIES | 3.0% | $6,777 | $6,000 | $6,180 | $6,365 | $6,556 | $6,753 | $6,956 | $7,164 | $7,379 | $7,601 | $7,829 | $8,063 |

# Table 4 - Operating Costs and Net Income

| | Inflation/ Deflation (–) Factor | Test Year Starting 7/1/18 | 0 Year Starting 7/1/19 | 1st Year Starting 7/1/20 | 2nd Year Starting 7/1/21 | 3rd Year Starting 7/1/22 | 4th Year Starting 7/1/23 | 5th Year Starting 7/1/24 | 6th Year Starting 7/1/25 | 7th Year Starting 7/1/26 | 8th Year Starting 7/1/27 | 9th Year Starting 7/1/28 | 10th Year Starting 7/1/29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REPL RESERVES (0610-7002) | 3.0% | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 |
| SURCHARGE CAP RESERVES | 3.0% | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 |
| TRANS CAP RESERVES | 3.0% | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 |
| **One-time Reduction of R&R Annuity** | 0.0% | -$320,647 | -$320,647 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **Annual Payment to R&R Reserve (Table 7)** | 0.0% | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 | $320,647 |
| **User Charge Analysis Services** | 5.0% | $0 | $9,642 | $0 | $0 | $10,631 | $0 | $0 | $11,720 | $0 | $0 | $12,922 | $0 |
| Total CIP-related Payouts | N.A. | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 |
| **Total Operating Costs** | | **$1,807,606** | **$1,515,462** | **$1,871,875** | **$1,918,652** | **$1,977,471** | **$2,016,481** | **$2,067,619** | **$2,132,019** | **$2,174,566** | **$2,230,471** | **$2,300,983** | **$2,347,388** |
| Net Income (or Loss) | | $644,347 | $638,397 | $468,396 | $847,524 | $930,385 | $1,040,596 | $1,146,507 | $1,247,512 | $1,379,170 | $1,506,612 | $1,629,198 | $1,786,158 |
| Working Capital Goal: 35% | In Dollars, That is: | $632,662 | $530,412 | $655,156 | $671,528 | $692,115 | $705,768 | $723,667 | $746,207 | $761,098 | $780,665 | $805,344 | $821,586 |

Notes: The yellow highlighted cost items above will rise due to inflation and due to the additional cost of serving new customers. The Authority made transfers to a capital reserves fund. Those items are listed above without the dollar amounts. This table automatically transfers any net income in excess of the working capital reserve goal to Table 5, so the transfers above have been "zeroed out" but are covered by the modeling.

# Table 5 - Capital Improvement Program (CIP)

## Prince George County, VA, 2020 Water Rates Model 1

This table depicts capital improvements and their funding. Costs reflect inflation.

| | Test Year | Analysis Year | Years Following the Analysis Year (for Which Improvement Projects, Costs, Funding, etc. Have Been Projected) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 0 Year Starting | 1st Year Starting | 2nd Year Starting | 3rd Year Starting | 4th Year Starting | 5th Year Starting | 6th Year Starting | 7th Year Starting | 8th Year Starting | 9th Year Starting | 10th Year Starting |
| | 7/1/18 | 7/1/19 | 7/1/20 | 7/1/21 | 7/1/22 | 7/1/23 | 7/1/24 | 7/1/25 | 7/1/26 | 7/1/27 | 7/1/28 | 7/1/29 |
| **Planned Spending, Debt-paid Portion of Projects** (CIP costs to be funded with loans are shown in this section.) | | | | | | | | | | | | |
| SCADA Implementation Water | $0 | $0 | $75,000 | $75,000 | $75,000 | $75,000 | $75,000 | $0 | $0 | $0 | $0 | $0 |
| Middle Road Booster Station Upgrades | $0 | $0 | $0 | $0 | $15,000 | $112,500 | $0 | $0 | $0 | $0 | $0 | $0 |
| JOJ Greensand Filter System and MCC Replacement and Roof replacement | $0 | $0 | $60,000 | $0 | $0 | $56,250 | $0 | $0 | $0 | $0 | $0 | $0 |
| Cedarwood Well Facility Improvements | $0 | $0 | $0 | $0 | $0 | $37,500 | $0 | $0 | $0 | $0 | $0 | $0 |
| Route 301 Well Facility Improvements | $0 | $0 | $0 | $45,000 | $0 | $75,000 | $22,500 | $0 | $0 | $0 | $0 | $0 |
| Lemonwood Well Facility Improvements | $0 | $0 | $82,500 | $0 | $0 | $22,500 | $0 | $0 | $0 | $0 | $0 | $0 |
| Rivers Edge Well Facility Improvements | $0 | $0 | $0 | $0 | $0 | $15,000 | $0 | $168,750 | $0 | $0 | $0 | $0 |
| Prince George Woods Well Facility Improvements | $0 | $0 | $30,000 | $0 | $375,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Appomattox River Water Treatment Plant | $0 | $0 | $0 | $112,500 | $150,000 | $0 | $0 | $450,000 | $26,250,000 | $18,750,000 | $0 | $0 |
| Extension to Connect Food Lion System & Facility Improvements | $0 | $0 | $1,380,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| ARWA Supply Central Water Supply Extension to Route 10 (w01-A-01) modified | $0 | $0 | $37,500 | $300,000 | $1,875,000 | $3,375,000 | $0 | $0 | $0 | $0 | $0 | $0 |
| Route 156 Extension Mt. Sinai to Pine Ridge MHP | $0 | $0 | $1,800,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Temple Avenue Tank & Booster Station | $0 | $0 | $187,500 | $2,250,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total Debt-paid Portion of Projects | $0 | $0 | $3,652,500 | $2,782,500 | $2,490,000 | $3,768,750 | $97,500 | $618,750 | $26,250,000 | $18,750,000 | $0 | $0 |
| **Planned Spending, Grant-paid Portion of Projects** (CIP costs to be grant-funded are shown here.) | | | | | | | | | | | | |
| SCADA Implementation Water | $0 | $0 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $0 | $0 | $0 | $0 | $0 |
| Middle Road Booster Station Upgrades | $0 | $0 | $0 | $0 | $5,000 | $37,500 | $0 | $0 | $0 | $0 | $0 | $0 |
| JOJ Greensand Filter System and MCC Replacement and Roof replacement | $0 | $0 | $20,000 | $0 | $0 | $18,750 | $0 | $0 | $0 | $0 | $0 | $0 |
| Cedarwood Well Facility Improvements | $0 | $0 | $0 | $0 | $0 | $12,500 | $0 | $0 | $0 | $0 | $0 | $0 |
| Route 301 Well Facility Improvements | $0 | $0 | $0 | $15,000 | $0 | $25,000 | $7,500 | $0 | $0 | $0 | $0 | $0 |
| Lemonwood Well Facility Improvements | $0 | $0 | $27,500 | $0 | $0 | $7,500 | $0 | $0 | $0 | $0 | $0 | $0 |
| Rivers Edge Well Facility Improvements | $0 | $0 | $0 | $0 | $0 | $5,000 | $0 | $56,250 | $0 | $0 | $0 | $0 |
| Prince George Woods Well Facility Improvements | $0 | $0 | $10,000 | $0 | $125,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Appomattox River Water Treatment Plant | $0 | $0 | $0 | $37,500 | $50,000 | $0 | $0 | $150,000 | $8,750,000 | $6,250,000 | $0 | $0 |
| Extension to Connect Food Lion System & Facility Improvements | $0 | $0 | $460,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| ARWA Supply Central Water Supply Extension to Route 10 (w01-A-01) modified | $0 | $0 | $12,500 | $100,000 | $625,000 | $1,125,000 | $0 | $0 | $0 | $0 | $0 | $0 |
| Route 156 Extension Mt. Sinai to Pine Ridge MHP | $0 | $0 | $600,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Temple Avenue Tank & Booster Station | $0 | $0 | $62,500 | $750,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total Grant-paid Portion of Projects | $0 | $0 | $1,217,500 | $927,500 | $830,000 | $1,256,250 | $32,500 | $206,250 | $8,750,000 | $6,250,000 | $0 | $0 |
| **Planned Spending, Cash-paid Portion of Projects** (CIP costs to be funded from reserves are shown here.) | | | | | | | | | | | | |
| ARWA 2017: Plant Rehab/Replacement Capital | $0 | $0 | $0 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 | $25,000 |
| ARWA 2020: PAC System Addition | $0 | $0 | $0 | $0 | $0 | $0 | $5,154 | $5,154 | $5,154 | $5,154 | $5,154 | $5,154 |
| ARWA 2030: Clearwell #4 Addition | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| ARWA 2030: Transmission Main Replacement | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| ARWA 2035: Raw Water Storage | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total Cash-paid Portion of Projects | $0 | $0 | $0 | $25,000 | $25,000 | $25,000 | $30,154 | $30,154 | $30,154 | $30,154 | $30,154 | $30,154 |
| **Total CIP Costs** | **$0** | **$0** | **$4,870,000** | **$3,735,000** | **$3,345,000** | **$5,050,000** | **$160,154** | **$855,154** | **$35,030,154** | **$25,030,154** | **$30,154** | **$30,154** |

# Table 5 - Capital Improvement Program (CIP)

This table depicts capital improvements and their funding. Costs reflect inflation.

| | Test Year | Analysis Year | Years Following the Analysis Year (for Which Improvement Projects, Costs, Funding, etc. Have Been Projected) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Test Year Starting | 0 Year Starting | 1st Year Starting | 2nd Year Starting | 3rd Year Starting | 4th Year Starting | 5th Year Starting | 6th Year Starting | 7th Year Starting | 8th Year Starting | 9th Year Starting | 10th Year Starting |
| | 7/1/18 | 7/1/19 | 7/1/20 | 7/1/21 | 7/1/22 | 7/1/23 | 7/1/24 | 7/1/25 | 7/1/26 | 7/1/27 | 7/1/28 | 7/1/29 |
| **Debt Repayment** | | | | | | | | | | | | |
| **Existing Debt Payments** (Following is debt that was initiated during the test year or earlier.) | | | | | | | | | | | | |
| 2015A Series, 2006C Refund of Exit 45 Water System | $2,542 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 | $56,272 |
| 2016 ARWA CIP DEBT SERVICE | $109,574 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 | $99,703 |
| **New Debt Payments** (Following are payments for projects to be paid with new debt. It is assumed these will be loan/lease-financed for a term of: 20 years at a 2.0% interest rate.) | | | | | | | | | | | | |
| Loan Originated in 1st Year | | | | $223,375 | $223,375 | $223,375 | $223,375 | $223,375 | $223,375 | $223,375 | $223,375 | $223,375 |
| Loan Originated in 2nd Year | | | | | $170,169 | $170,169 | $170,169 | $170,169 | $170,169 | $170,169 | $170,169 | $170,169 |
| Loan Originated in 3rd Year | | | | | | $152,280 | $152,280 | $152,280 | $152,280 | $152,280 | $152,280 | $152,280 |
| Loan Originated in 4th Year | | | | | | | $230,484 | $230,484 | $230,484 | $230,484 | $230,484 | $230,484 |
| Loan Originated in 6th Year | | | | | | | | | $37,841 | $37,841 | $37,841 | $37,841 |
| Loan Originated in 7th Year | | | | | | | | | | $1,605,364 | $1,605,364 | $1,605,364 |
| Loan Originated in 8th Year | | | | | | | | | | | $1,146,688 | $1,146,688 |
| Total Debt Payments | $112,116 | $155,975 | $155,975 | $379,350 | $549,519 | $701,799 | $932,283 | $938,246 | $976,087 | $2,581,451 | $3,728,139 | $3,728,139 |
| **Total CIP-related Payouts** | **$112,116** | **$155,975** | **$5,025,975** | **$4,114,350** | **$3,894,519** | **$5,751,799** | **$1,092,437** | **$1,793,400** | **$36,006,241** | **$27,611,605** | **$3,758,293** | **$3,758,293** |
| (This is the total cash required for this CIP and debt payment schedule. These amounts must come from utility income, reserves or outside sources, as shown in the next section.) | | | | | | | | | | | | |
| **CIP Fund Sources** (Following are the sources and amounts of funds expected to pay for the above CIP schedule.) | | | | | | | | | | | | |
| **Cash Reserves** (Internal Funds) | | | | | | | | | | | | |
| Debt and CIP Reserves Starting Balance | $0 | $4,916,143 | $5,599,138 | $5,898,797 | $6,443,575 | $6,907,726 | $7,346,024 | $7,659,116 | $8,068,870 | $8,588,285 | $7,635,490 | $5,634,426 |
| Working Capital Transferred in | $5,028,259 | $740,648 | $343,652 | $831,152 | $909,799 | $1,026,942 | $1,128,609 | $1,224,972 | $1,364,278 | $1,487,045 | $1,604,519 | $1,769,917 |
| Debt and CIP Reserves Interest Earned (or Paid) | $0 | $98,323 | $111,983 | $117,976 | $128,871 | $138,155 | $146,920 | $153,182 | $161,377 | $171,766 | $152,710 | $112,689 |
| Total Available Internal Funds | $5,028,259 | $5,755,114 | $6,054,773 | $6,847,925 | $7,482,245 | $8,072,823 | $8,621,553 | $9,037,270 | $9,594,526 | $10,247,095 | $9,392,719 | $7,517,031 |
| **Grant and Loan Proceeds** (External Funds) | | | | | | | | | | | | |
| Grants Assumed in Second Sub-section Above | $0 | $0 | $1,217,500 | $927,500 | $830,000 | $1,256,250 | $32,500 | $206,250 | $8,750,000 | $6,250,000 | $0 | $0 |
| Loan Originated in 1st Year | | | $3,652,500 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 2nd Year | | | | $2,782,500 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 3rd Year | | | | | $2,490,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 4th Year | | | | | | $3,768,750 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 6th Year | | | | | | | | $618,750 | $0 | $0 | $0 | $0 |
| Loan Originated in 7th Year | | | | | | | | | $26,250,000 | $0 | $0 | $0 |
| Loan Originated in 8th Year | | | | | | | | | | $18,750,000 | $0 | $0 |
| Total Available External Funds | $0 | $0 | $4,870,000 | $3,710,000 | $3,320,000 | $5,025,000 | $130,000 | $825,000 | $35,000,000 | $25,000,000 | $0 | $0 |
| **Total Available Funds** | **$5,028,259** | **$5,755,114** | **$10,924,773** | **$10,557,925** | **$10,802,245** | **$13,097,823** | **$8,751,553** | **$9,862,270** | **$44,594,526** | **$35,247,095** | **$9,392,719** | **$7,517,031** |
| **Outcomes** (This CIP spending and funding plan will result in the following cash needs and ending balances each year.) | | | | | | | | | | | | |
| **Total Available Funds** | **$5,028,259** | **$5,755,114** | **$10,924,773** | **$10,557,925** | **$10,802,245** | **$13,097,823** | **$8,751,553** | **$9,862,270** | **$44,594,526** | **$35,247,095** | **$9,392,719** | **$7,517,031** |
| **Total CIP-related Payouts** | **$112,116** | **$155,975** | **$5,025,975** | **$4,114,350** | **$3,894,519** | **$5,751,799** | **$1,092,437** | **$1,793,400** | **$36,006,241** | **$27,611,605** | **$3,758,293** | **$3,758,293** |
| **Debt and CIP Reserves Ending Balances** | **$4,916,143** | **$5,599,138** | **$5,898,797** | **$6,443,575** | **$6,907,726** | **$7,346,024** | **$7,659,116** | **$8,068,870** | **$8,588,285** | **$7,635,490** | **$5,634,426** | **$3,758,737** |

Notes: The Authority needs to undertake many projects, some like those in the 7th and 8th years above, will be quite expensive. Debt payments in the 8th and 9th years will jump markedly. Those project costs that originate with ARWA or SCWWA will be paid for, on a percentage share basis, and that debt cost will be added to the fees the Authority pays to those suppliers. The amounts to plan on adding to those fees are included above in the "Planned Spending, Cash-paid Portion of Projects" section.

## Table 6 - Equipment Replacement Schedule - Detailed

## Prince George County, VA, 2020 Water Rates Model 1

| Year Beginning | REPL RESERVES (0610-7002) From Table 4 | Reasonable Additional Replacement Needs | | | | | | | Total Annual Replacement Costs |
|---|---|---|---|---|---|---|---|---|---|
| 7/1/18 | $84,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $84,000 |
| 7/1/19 | $129,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $129,000 |
| 7/1/20 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/21 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/22 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/23 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/24 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/25 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/26 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/27 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/28 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/29 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/30 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/31 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/32 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/33 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/34 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/35 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/36 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/37 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/38 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/39 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/40 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/41 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |
| 7/1/42 | $129,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $229,000 |

# Table 7 - Equipment Replacement Annuity Calculation

## Prince George County, VA, 2020 Water Rates Model 1

This table calculates the annual annuity (savings deposit) needed to build replacement (R&R) reserves. This annuity amount should actually be deposited in a savings account. The annuity amount, called the "Required Annual Deposit (Annuity) to Replacement Account" below, should be included in the utility's general budget as a cost. As a result, all replacement and refurbishment scheduled in Table 6, the detailed replacement schedule, would be paid for out of R&R reserves and not out of the utility's general budget.

In simple terms, the annuity at the bottom of this table should be deposited into an account each year and R&R projects should be paid for out of that account.

3.00% Average Inflation Rate for the Following Water System Equipment for the Term of This Replacement Schedule

2.00% Average Interest Rate on Balances Invested for the Term of This Replacement Schedule

2.00% Average Interest Rate on Amounts Borrowed for the Term of This Replacement Schedule

| Year Beginning | Schedule Year | This Year's Costs in Current Dollars | Future Annual Inflated Net Costs | Interest Earned on Prior Balance | End of Year Balance in Future Dollars | Minimum Desired End of Year Balance in Future Dollars |
|---|---|---|---|---|---|---|
| 7/1/18 | Analysis Year | $84,000 | $84,000 | $0 | -$84,000 | $212,550 |
| 7/1/19 | 1st Year | $129,000 | $132,870 | -$1,680 | $102,097 | $218,927 |
| 7/1/20 | 2nd Year | $229,000 | $242,946 | $2,042 | $181,841 | $225,494 |
| 7/1/21 | 3rd Year | $229,000 | $250,234 | $3,637 | $255,890 | $232,259 |
| 7/1/22 | 4th Year | $229,000 | $257,742 | $5,118 | $323,914 | $239,227 |
| 7/1/23 | 5th Year | $229,000 | $265,474 | $6,478 | $385,566 | $246,404 |
| 7/1/24 | 6th Year | $229,000 | $273,438 | $7,711 | $440,487 | $253,796 |
| 7/1/25 | 7th Year | $229,000 | $281,641 | $8,810 | $488,303 | $261,410 |
| 7/1/26 | 8th Year | $229,000 | $290,090 | $9,766 | $528,626 | $269,252 |
| 7/1/27 | 9th Year | $229,000 | $298,793 | $10,573 | $561,053 | $277,330 |
| 7/1/28 | 10th Year | $229,000 | $307,757 | $11,221 | $585,164 | $285,649 |
| 7/1/29 | 11th Year | $229,000 | $316,990 | $11,703 | $600,526 | $294,219 |
| 7/1/30 | 12th Year | $229,000 | $326,499 | $12,011 | $606,684 | $303,045 |
| 7/1/31 | 13th Year | $229,000 | $336,294 | $12,134 | $603,171 | $312,137 |
| 7/1/32 | 14th Year | $229,000 | $346,383 | $12,063 | $589,499 | $321,501 |
| 7/1/33 | 15th Year | $229,000 | $356,775 | $11,790 | $565,162 | $331,146 |
| 7/1/34 | 16th Year | $229,000 | $367,478 | $11,303 | $529,635 | $341,080 |
| 7/1/35 | 17th Year | $229,000 | $378,502 | $10,593 | $482,373 | $351,313 |
| 7/1/36 | 18th Year | $229,000 | $389,857 | $9,647 | $422,810 | $361,852 |
| 7/1/37 | 19th Year | $229,000 | $401,553 | $8,456 | $350,361 | $372,708 |

Notes: There is currently no R&R schedule. Average R&R costs were instead estimated. A Discretionary Annuity amount was added so that at the end of the 20-year modeling period, the balance will equal the average of the annual replacement cost amounts, less interest paid for borrowing during the negative balance years.

| | | |
|---|---|---|
| Starting Account Balance | $0 | $212,550 |
| Minimum Annual Annuity | $305,308 | Minimum Desired Balance in Today's Dollars |
| Discretionary Annuity | $15,339 | |

**Required Annual Deposit (Annuity) to Replacement Account** **$320,647**

(This amount is included in Table 4 as an operating cost.)

# Table 8 - Average Cost Classification

## Prince George County, VA, 2020 Water Rates Model 1

This table distributes costs from a representative year (the "average rate structure basis year) to fixed and variable categories (see Definitions) in order to calculate the "cost of service" rate structure for that year.

The average rate structure basis year runs from: 7/1/2023 through 6/30/2024

| Cost Items | Cost During Rate Structure Basis Year | Fixed Cost % | Variable Cost % | Fixed Cost | Variable Cost |
|---|---|---|---|---|---|
| ACNT & AUDIT SRVC | $9,755 | 100.0% | 0.0% | $9,755 | $0 |
| BOOKS & SUBS | $0 | 100.0% | 0.0% | $0 | $0 |
| BUILDING SUPPLIES | $2,814 | 100.0% | 0.0% | $2,814 | $0 |
| CAREER DEVELOPMENT | $5,628 | 15.5% | 84.5% | $872 | $4,755 |
| CHEMICALS | $8,548 | 100.0% | 0.0% | $8,548 | $0 |
| CONTRACT FEES / ADMIN | $47,046 | 100.0% | 0.0% | $47,046 | $0 |
| CONVENTION & ED | $4,221 | 15.5% | 84.5% | $654 | $3,566 |
| DEPRECIATION EXPENS | $0 | 27.1% | 72.9% | $0 | $0 |
| DISABILITY INSUR | $551 | 15.5% | 84.5% | $85 | $466 |
| DUES AND MEMBERSHIP | $844 | 15.5% | 84.5% | $131 | $713 |
| ELECTRICAL | $58,927 | 0.0% | 100.0% | $0 | $58,927 |
| EQUIP PARTS & SUPPLIES | $9,398 | 15.5% | 84.5% | $1,457 | $7,941 |
| FICA | $33,182 | 15.5% | 84.5% | $5,143 | $28,039 |
| FIRST AID/SAFETY | $1,126 | 27.1% | 72.9% | $305 | $820 |
| FOOD SUPPLIES | $450 | 27.1% | 72.9% | $122 | $328 |
| GROUP LIFE INSUR | $5,446 | 15.5% | 84.5% | $844 | $4,602 |
| HOSPITAL/MEDICAL | $92,995 | 15.5% | 84.5% | $14,414 | $78,581 |
| LEASE/RENT OF BUILD | $33,852 | 27.1% | 72.9% | $9,174 | $24,678 |
| MOTOR POOL | $2,814 | 15.5% | 84.5% | $436 | $2,378 |
| MTR VEH INSURANCE | $3,545 | 15.5% | 84.5% | $550 | $2,996 |
| OFFICE SUPPLIES | $2,870 | 100.0% | 0.0% | $2,870 | $0 |
| OPERATING SUPPLIES | $37,479 | 15.5% | 84.5% | $5,809 | $31,670 |
| OVERTIME | $11,255 | 15.5% | 84.5% | $1,745 | $9,511 |
| PARTS & SUPPLIES | $338 | 15.5% | 84.5% | $52 | $285 |
| POSTAL SERVICE | $11,398 | 15.5% | 84.5% | $1,767 | $9,631 |
| PROF SERVICES | $2,814 | 27.1% | 72.9% | $763 | $2,051 |
| PUMPING STATION SUPPLIES | $773,225 | 0.0% | 100.0% | $0 | $773,225 |

## Table 8 - Average Cost Classification

| Cost Items | Cost During Rate Structure Basis Year | Fixed Cost % | Variable Cost % | Fixed Cost | Variable Cost |
|---|---|---|---|---|---|
| RETIREMENT-VRS | $60,490 | 100.0% | 0.0% | $60,490 | $0 |
| SAL & WAGE | $410,110 | 15.5% | 84.5% | $63,567 | $346,543 |
| TELEPHONE | $9,848 | 100.0% | 0.0% | $9,848 | $0 |
| UNIFORM/APPAREL | $4,221 | 27.1% | 72.9% | $1,144 | $3,077 |
| VEHICLE EQUIP. SUP | $0 | 15.5% | 84.5% | $0 | $0 |
| VEHICLE/EQUIP FUEL | $14,069 | 15.5% | 84.5% | $2,181 | $11,888 |
| WORKER'S COMP | $12,625 | 15.5% | 84.5% | $1,957 | $10,668 |
| ADVERTISING | $2,251 | 100.0% | 0.0% | $2,251 | $0 |
| BILLING SUPPLIES | $2,565 | 100.0% | 0.0% | $2,565 | $0 |
| PERMITS LICENSES RNWLS | $12,381 | 27.1% | 72.9% | $3,355 | $9,025 |
| PART-TIME SALARIES | $6,753 | 15.5% | 84.5% | $1,047 | $5,706 |
| REPL RESERVES (0610-7002) | Table 6 | 15.5% | 84.5% | $0 | $0 |
| SURCHARGE CAP RESERVES | Table 5 | 15.5% | 84.5% | $0 | $0 |
| TRANS CAP RESERVES | Table 5 | 15.5% | 84.5% | $0 | $0 |
| **Annual Payment to R&R Reserve (Table 7)** | $320,647 | 15.5% | 84.5% | $49,700 | $270,947 |
| **User Charge Analysis Services** | $0 | 27.1% | 72.9% | $0 | $0 |
| **Total CIP-related Payouts, Less Capacity Charges From Tables 14 & 16 (This value can be negative)** | $457,744 | 15.5% | 84.5% | $70,950 | $386,793 |
| Grand Total Costs, Weighted Avg Percentages | $2,474,225 | 15.5% | 84.5% | $384,412 | $2,089,813 |

| Bases for Cost to Serve Rate Structure | | 100% | $2,474,225 |
|---|---|---|---|
| Number Customers During Year Defined Above | 3,194 | Unbilled-for Water is Estimated at | 0% |
| Billed Volume, in Gallons, During Year Defined Above | 395,531,880 | Unbilled-for Water is Estimated at This Percentage of Average Cost | 57% |
| Average Fixed Cost/User Every Other Month | $20.06 | Resulting Cost of Unbilled-for Water | $0 |
| Average Variable Cost to Produce per 1,000 Gallons During Year Defined Above | $5.28 | Test Year Customer Volume, in Gallons | 389,340,731 |
| Gallons per Billing Cycle Used by Average Residential Customer | 8,322 | + Test Year Unbilled-for Water, in Gallons | 0 |
| Note: Master metered volume was questionable, so unbilled-for water and its cost were not calculated. | | Total Test Year Volume, in Gallons, From Master Meter Readings | 389,340,731 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues
# Prince George County, VA, 2020 Water Rates Model 1

This table calculates a new set of user charge rates and the revenues they would generate.

If there are no special costs to consider and before capacity costs are added, if appropriate, rates for a 5/8" meter would be in a "cost-to-serve" structure when: there is no usage allowance,
the base minimum charge is $14.65 Bi-monthly, and the unit charge is set at $3.86 per 1,000 Gallons.

After rate adjustments are made, customers will be billed every other month.

Following are Blended Sales Revenues: Sales at the current (Test Year) rates (gray highlighted column) will apply until rates are adjusted. Sales at the modeled rates (yellow highlighted column) would apply after the modeled rates are adopted. Adding both together, the "blended" sales revenues show in the right-most column.

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| .625 Inch Meter Size | -55,170 | -1 | $109 | $23.44 | 0.000 | $3.86 | $0 | $109 |
| | 0 | 999 | $69,019 | $23.44 | 0.000 | $3.86 | $242 | $69,261 |
| | 1,000 | 1,999 | $61,553 | $23.44 | 0.000 | $3.86 | $217 | $61,769 |
| | 2,000 | 4,999 | $206,359 | $23.44 | 0.000 | $3.86 | $719 | $207,077 |
| | 5,000 | 5,999 | $64,893 | $23.44 | 0.000 | $3.86 | $225 | $65,117 |
| | 6,000 | 7,999 | $123,583 | $23.44 | 0.000 | $4.83 | $428 | $124,011 |
| | 8,000 | 9,999 | $89,724 | $23.44 | 0.000 | $4.83 | $310 | $90,034 |
| | 10,000 | 14,999 | $114,383 | $23.44 | 0.000 | $4.83 | $396 | $114,779 |
| | 15,000 | 19,999 | $41,464 | $23.44 | 0.000 | $4.83 | $144 | $41,608 |
| | 20,000 | 24,999 | $21,656 | $23.44 | 0.000 | $6.03 | $76 | $21,732 |
| | 25,000 | 29,999 | $11,079 | $23.44 | 0.000 | $6.03 | $39 | $11,117 |
| | 30,000 | 49,999 | $17,429 | $23.44 | 0.000 | $6.03 | $61 | $17,490 |
| | 50,000 | 60,999 | $3,658 | $23.44 | 0.000 | $6.03 | $13 | $3,671 |
| | 61,000 | 69,999 | $1,761 | $23.44 | 0.000 | $6.03 | $6 | $1,767 |
| | 70,000 | 93,999 | $3,115 | $23.44 | 0.000 | $6.03 | $11 | $3,126 |
| | 94,000 | 99,999 | $407 | $23.44 | 0.000 | $6.03 | $1 | $408 |
| | 100,000 | 127,999 | $1,254 | $23.44 | 0.000 | $6.03 | $4 | $1,258 |
| | 128,000 | 199,999 | $1,351 | $23.44 | 0.000 | $6.03 | $5 | $1,356 |
| | 200,000 | 214,999 | $80 | $23.44 | 0.000 | $6.03 | $0 | $81 |
| 1 Inch Meter Size | -31,720 | -1 | -$59 | $36.63 | 0.000 | $3.86 | $0 | -$60 |
| | 0 | 999 | $3,479 | $36.63 | 0.000 | $3.86 | $11 | $3,490 |
| | 1,000 | 1,999 | $1,749 | $36.63 | 0.000 | $3.86 | $6 | $1,755 |
| | 2,000 | 4,999 | $4,344 | $36.63 | 0.000 | $3.86 | $14 | $4,358 |
| | 5,000 | 5,999 | $1,484 | $36.63 | 0.000 | $3.86 | $5 | $1,489 |
| | 6,000 | 7,999 | $2,676 | $36.63 | 0.000 | $3.86 | $9 | $2,685 |
| | 8,000 | 9,999 | $2,688 | $36.63 | 0.000 | $4.83 | $9 | $2,697 |
| | 10,000 | 14,999 | $4,820 | $36.63 | 0.000 | $4.83 | $16 | $4,836 |
| | 15,000 | 19,999 | $3,711 | $36.63 | 0.000 | $4.83 | $13 | $3,723 |
| | 20,000 | 24,999 | $3,124 | $36.63 | 0.000 | $4.83 | $11 | $3,135 |
| | 25,000 | 29,999 | $3,189 | $36.63 | 0.000 | $6.03 | $11 | $3,200 |
| | 30,000 | 49,999 | $9,015 | $36.63 | 0.000 | $6.03 | $31 | $9,046 |
| | 50,000 | 60,999 | $3,899 | $36.63 | 0.000 | $6.03 | $13 | $3,913 |
| | 61,000 | 69,999 | $2,327 | $36.63 | 0.000 | $6.03 | $8 | $2,335 |
| | 70,000 | 93,999 | $4,946 | $36.63 | 0.000 | $6.03 | $17 | $4,963 |
| | 94,000 | 99,999 | $949 | $36.63 | 0.000 | $6.03 | $3 | $953 |
| | 100,000 | 127,999 | $3,541 | $36.63 | 0.000 | $6.03 | $12 | $3,554 |
| | 128,000 | 199,999 | $6,349 | $36.63 | 0.000 | $6.03 | $22 | $6,371 |
| | 200,000 | 214,999 | $778 | $36.63 | 0.000 | $6.03 | $3 | $780 |
| | 215,000 | 288,999 | $2,856 | $36.63 | 0.000 | $6.03 | $10 | $2,866 |
| | 289,000 | 299,999 | $305 | $36.63 | 0.000 | $6.03 | $1 | $306 |
| | 300,000 | 384,999 | $1,012 | $36.63 | 0.000 | $6.03 | $3 | $1,015 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | $1,903 | $58.60 | 0.000 | $3.86 | $5 | $1,908 |
| | 1,000 | 1,999 | $951 | $58.60 | 0.000 | $3.86 | $3 | $954 |
| | 2,000 | 4,999 | $3,367 | $58.60 | 0.000 | $3.86 | $10 | $3,377 |
| | 5,000 | 5,999 | $1,105 | $58.60 | 0.000 | $3.86 | $3 | $1,108 |
| | 6,000 | 7,999 | $1,568 | $58.60 | 0.000 | $3.86 | $5 | $1,573 |
| | 8,000 | 9,999 | $1,177 | $58.60 | 0.000 | $3.86 | $4 | $1,181 |
| | 10,000 | 14,999 | $2,944 | $58.60 | 0.000 | $3.86 | $9 | $2,953 |
| | 15,000 | 19,999 | $2,735 | $58.60 | 0.000 | $4.83 | $9 | $2,743 |
| | 20,000 | 24,999 | $2,301 | $58.60 | 0.000 | $4.83 | $8 | $2,309 |
| | 25,000 | 29,999 | $2,019 | $58.60 | 0.000 | $4.83 | $7 | $2,025 |
| | 30,000 | 49,999 | $6,684 | $58.60 | 0.000 | $4.83 | $23 | $6,707 |
| 1.5 Inch Meter Size | 50,000 | 60,999 | $3,313 | $58.60 | 0.000 | $4.83 | $11 | $3,324 |
| | 61,000 | 69,999 | $2,995 | $58.60 | 0.000 | $6.03 | $10 | $3,005 |
| | 70,000 | 93,999 | $5,388 | $58.60 | 0.000 | $6.03 | $18 | $5,406 |
| | 94,000 | 99,999 | $884 | $58.60 | 0.000 | $6.03 | $3 | $886 |
| | 100,000 | 127,999 | $2,685 | $58.60 | 0.000 | $6.03 | $9 | $2,694 |
| | 128,000 | 199,999 | $4,222 | $58.60 | 0.000 | $6.03 | $14 | $4,237 |
| | 200,000 | 214,999 | $518 | $58.60 | 0.000 | $6.03 | $2 | $519 |
| | 215,000 | 288,999 | $2,055 | $58.60 | 0.000 | $6.03 | $7 | $2,062 |
| | 289,000 | 299,999 | $305 | $58.60 | 0.000 | $6.03 | $1 | $306 |
| | 300,000 | 384,999 | $2,360 | $58.60 | 0.000 | $6.03 | $8 | $2,368 |
| | 385,000 | 399,999 | $416 | $58.60 | 0.000 | $6.03 | $1 | $418 |
| | 400,000 | 499,999 | $2,776 | $58.60 | 0.000 | $6.03 | $10 | $2,786 |
| | 500,000 | 866,999 | $7,668 | $58.60 | 0.000 | $6.03 | $27 | $7,695 |
| | 0 | 999 | $3,430 | $84.97 | 0.000 | $3.86 | $8 | $3,438 |
| | 1,000 | 1,999 | $680 | $84.97 | 0.000 | $3.86 | $2 | $683 |
| | 2,000 | 4,999 | $1,793 | $84.97 | 0.000 | $3.86 | $6 | $1,799 |
| | 5,000 | 5,999 | $557 | $84.97 | 0.000 | $3.86 | $2 | $559 |
| | 6,000 | 7,999 | $1,689 | $84.97 | 0.000 | $3.86 | $5 | $1,694 |
| | 8,000 | 9,999 | $2,248 | $84.97 | 0.000 | $3.86 | $6 | $2,255 |
| | 10,000 | 14,999 | $4,335 | $84.97 | 0.000 | $3.86 | $12 | $4,348 |
| | 15,000 | 19,999 | $3,211 | $84.97 | 0.000 | $3.86 | $10 | $3,221 |
| | 20,000 | 24,999 | $2,756 | $84.97 | 0.000 | $3.86 | $9 | $2,765 |
| | 25,000 | 29,999 | $3,945 | $84.97 | 0.000 | $3.86 | $11 | $3,956 |
| | 30,000 | 49,999 | $12,125 | $84.97 | 0.000 | $4.83 | $37 | $12,162 |
| | 50,000 | 60,999 | $5,023 | $84.97 | 0.000 | $4.83 | $16 | $5,038 |
| 2 Inch Meter Size | 61,000 | 69,999 | $3,081 | $84.97 | 0.000 | $4.83 | $10 | $3,092 |
| | 70,000 | 93,999 | $7,942 | $84.97 | 0.000 | $4.83 | $27 | $7,969 |
| | 94,000 | 99,999 | $2,439 | $84.97 | 0.000 | $6.03 | $8 | $2,447 |
| | 100,000 | 127,999 | $8,969 | $84.97 | 0.000 | $6.03 | $31 | $9,000 |
| | 128,000 | 199,999 | $20,000 | $84.97 | 0.000 | $6.03 | $69 | $20,069 |
| | 200,000 | 214,999 | $3,651 | $84.97 | 0.000 | $6.03 | $12 | $3,664 |
| | 215,000 | 288,999 | $14,926 | $84.97 | 0.000 | $6.03 | $51 | $14,977 |
| | 289,000 | 299,999 | $1,832 | $84.97 | 0.000 | $6.03 | $7 | $1,839 |
| | 300,000 | 384,999 | $13,034 | $84.97 | 0.000 | $6.03 | $44 | $13,078 |
| | 385,000 | 399,999 | $1,899 | $84.97 | 0.000 | $6.03 | $6 | $1,906 |
| | 400,000 | 499,999 | $9,752 | $84.97 | 0.000 | $6.03 | $33 | $9,786 |
| | 500,000 | 866,999 | $20,350 | $84.97 | 0.000 | $6.03 | $71 | $20,421 |
| | 867,000 | 999,999 | $5,196 | $84.97 | 0.000 | $6.03 | $18 | $5,214 |
| | 1,000,000 | 4,999,999 | $14,256 | $84.97 | 0.000 | $6.03 | $49 | $14,305 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | $560 | $155.28 | 0.000 | $3.86 | $1 | $561 |
| | 1,000 | 1,999 | $83 | $155.28 | 0.000 | $3.86 | $0 | $83 |
| | 2,000 | 4,999 | $715 | $155.28 | 0.000 | $3.86 | $2 | $717 |
| | 5,000 | 5,999 | $77 | $155.28 | 0.000 | $3.86 | $0 | $77 |
| | 6,000 | 7,999 | $154 | $155.28 | 0.000 | $3.86 | $1 | $155 |
| | 8,000 | 9,999 | $390 | $155.28 | 0.000 | $3.86 | $1 | $391 |
| | 10,000 | 14,999 | $594 | $155.28 | 0.000 | $3.86 | $2 | $596 |
| | 15,000 | 19,999 | $355 | $155.28 | 0.000 | $3.86 | $1 | $357 |
| | 20,000 | 24,999 | $591 | $155.28 | 0.000 | $3.86 | $2 | $593 |
| | 25,000 | 29,999 | $341 | $155.28 | 0.000 | $3.86 | $1 | $342 |
| | 30,000 | 49,999 | $2,001 | $155.28 | 0.000 | $3.86 | $6 | $2,007 |
| | 50,000 | 60,999 | $871 | $155.28 | 0.000 | $3.86 | $3 | $874 |
| 3 Inch Meter Size | 61,000 | 69,999 | $733 | $155.28 | 0.000 | $3.86 | $2 | $735 |
| | 70,000 | 93,999 | $1,776 | $155.28 | 0.000 | $4.83 | $6 | $1,782 |
| | 94,000 | 99,999 | $378 | $155.28 | 0.000 | $4.83 | $1 | $380 |
| | 100,000 | 127,999 | $1,766 | $155.28 | 0.000 | $4.83 | $6 | $1,772 |
| | 128,000 | 199,999 | $4,725 | $155.28 | 0.000 | $4.83 | $16 | $4,741 |
| | 200,000 | 214,999 | $890 | $155.28 | 0.000 | $4.83 | $3 | $894 |
| | 215,000 | 288,999 | $5,479 | $155.28 | 0.000 | $6.03 | $20 | $5,498 |
| | 289,000 | 299,999 | $1,013 | $155.28 | 0.000 | $6.03 | $3 | $1,016 |
| | 300,000 | 384,999 | $5,698 | $155.28 | 0.000 | $6.03 | $18 | $5,716 |
| | 385,000 | 399,999 | $625 | $155.28 | 0.000 | $6.03 | $2 | $627 |
| | 400,000 | 499,999 | $3,961 | $155.28 | 0.000 | $6.03 | $14 | $3,974 |
| | 500,000 | 866,999 | $13,454 | $155.28 | 0.000 | $6.03 | $47 | $13,501 |
| | 867,000 | 999,999 | $4,098 | $155.28 | 0.000 | $6.03 | $14 | $4,112 |
| | 1,000,000 | 4,999,999 | $25,456 | $155.28 | 0.000 | $6.03 | $88 | $25,544 |
| | 0 | 999 | $195 | $234.39 | 0.000 | $3.86 | $1 | $196 |
| | 1,000 | 1,999 | $195 | $234.39 | 0.000 | $3.86 | $1 | $196 |
| | 2,000 | 4,999 | $586 | $234.39 | 0.000 | $3.86 | $2 | $589 |
| | 5,000 | 5,999 | $195 | $234.39 | 0.000 | $3.86 | $1 | $196 |
| | 6,000 | 7,999 | $391 | $234.39 | 0.000 | $3.86 | $1 | $392 |
| | 8,000 | 9,999 | $391 | $234.39 | 0.000 | $3.86 | $1 | $392 |
| | 10,000 | 14,999 | $977 | $234.39 | 0.000 | $3.86 | $3 | $981 |
| | 15,000 | 19,999 | $2,623 | $234.39 | 0.000 | $3.86 | $6 | $2,629 |
| | 20,000 | 24,999 | $1,327 | $234.39 | 0.000 | $3.86 | $4 | $1,331 |
| | 25,000 | 29,999 | $1,316 | $234.39 | 0.000 | $3.86 | $4 | $1,320 |
| | 30,000 | 49,999 | $5,087 | $234.39 | 0.000 | $3.86 | $15 | $5,101 |
| | 50,000 | 60,999 | $4,644 | $234.39 | 0.000 | $3.86 | $11 | $4,655 |
| 4 Inch Meter Size | 61,000 | 69,999 | $1,717 | $234.39 | 0.000 | $3.86 | $5 | $1,722 |
| | 70,000 | 93,999 | $3,412 | $234.39 | 0.000 | $3.86 | $12 | $3,424 |
| | 94,000 | 99,999 | $853 | $234.39 | 0.000 | $3.86 | $3 | $856 |
| | 100,000 | 127,999 | $3,981 | $234.39 | 0.000 | $3.86 | $14 | $3,995 |
| | 128,000 | 199,999 | $12,821 | $234.39 | 0.000 | $4.83 | $46 | $12,867 |
| | 200,000 | 214,999 | $2,671 | $234.39 | 0.000 | $4.83 | $10 | $2,681 |
| | 215,000 | 288,999 | $13,177 | $234.39 | 0.000 | $4.83 | $47 | $13,224 |
| | 289,000 | 299,999 | $1,959 | $234.39 | 0.000 | $4.83 | $7 | $1,966 |
| | 300,000 | 384,999 | $15,136 | $234.39 | 0.000 | $4.83 | $54 | $15,190 |
| | 385,000 | 399,999 | $3,332 | $234.39 | 0.000 | $6.03 | $12 | $3,344 |
| | 400,000 | 499,999 | $22,211 | $234.39 | 0.000 | $6.03 | $79 | $22,290 |
| | 500,000 | 866,999 | $79,616 | $234.39 | 0.000 | $6.03 | $274 | $79,891 |
| | 867,000 | 999,999 | $23,715 | $234.39 | 0.000 | $6.03 | $80 | $23,796 |
| | 1,000,000 | 4,999,999 | $138,429 | $234.39 | 0.000 | $6.03 | $466 | $138,895 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| 6 Inch Meter Size | 0 | 999 | $4,745 | $454.12 | 0.000 | $3.86 | $7 | $4,751 |
| | 1,000 | 1,999 | $110 | $454.12 | 0.000 | $3.86 | $0 | $110 |
| | 2,000 | 4,999 | $329 | $454.12 | 0.000 | $3.86 | $1 | $330 |
| | 5,000 | 5,999 | $110 | $454.12 | 0.000 | $3.86 | $0 | $110 |
| | 6,000 | 7,999 | $219 | $454.12 | 0.000 | $3.86 | $1 | $220 |
| | 8,000 | 9,999 | $219 | $454.12 | 0.000 | $3.86 | $1 | $220 |
| | 10,000 | 14,999 | $1,462 | $454.12 | 0.000 | $3.86 | $3 | $1,465 |
| | 15,000 | 19,999 | $533 | $454.12 | 0.000 | $3.86 | $2 | $535 |
| | 20,000 | 24,999 | $533 | $454.12 | 0.000 | $3.86 | $2 | $535 |
| | 25,000 | 29,999 | $533 | $454.12 | 0.000 | $3.86 | $2 | $535 |
| | 30,000 | 49,999 | $2,133 | $454.12 | 0.000 | $3.86 | $8 | $2,140 |
| | 50,000 | 60,999 | $2,984 | $454.12 | 0.000 | $3.86 | $7 | $2,990 |
| | 61,000 | 69,999 | $906 | $454.12 | 0.000 | $3.86 | $3 | $910 |
| | 70,000 | 93,999 | $2,417 | $454.12 | 0.000 | $3.86 | $9 | $2,426 |
| | 94,000 | 99,999 | $604 | $454.12 | 0.000 | $3.86 | $2 | $606 |
| | 100,000 | 127,999 | $2,820 | $454.12 | 0.000 | $3.86 | $10 | $2,830 |
| | 128,000 | 199,999 | $8,848 | $454.12 | 0.000 | $3.86 | $27 | $8,875 |
| | 200,000 | 214,999 | $2,324 | $454.12 | 0.000 | $3.86 | $6 | $2,330 |
| | 215,000 | 288,999 | $7,701 | $454.12 | 0.000 | $3.86 | $25 | $7,727 |
| | 289,000 | 299,999 | $1,224 | $454.12 | 0.000 | $4.83 | $4 | $1,229 |
| | 300,000 | 384,999 | $12,556 | $454.12 | 0.000 | $4.83 | $36 | $12,593 |
| | 385,000 | 399,999 | $2,358 | $454.12 | 0.000 | $4.83 | $6 | $2,365 |
| | 400,000 | 499,999 | $9,956 | $454.12 | 0.000 | $4.83 | $33 | $9,989 |
| | 500,000 | 866,999 | $33,050 | $454.12 | 0.000 | $4.83 | $116 | $33,166 |
| | 867,000 | 999,999 | $14,942 | $454.12 | 0.000 | $6.03 | $51 | $14,993 |
| | 1,000,000 | 4,999,999 | $149,504 | $454.12 | 0.000 | $6.03 | $499 | $150,004 |
| | 5,000,000 | 15,000,000 | $130,532 | $454.12 | 0.000 | $6.03 | $452 | $130,984 |
| 8 Inch Meter Size | 0 | 999 | $0 | $717.80 | 0.000 | $3.86 | $0 | $0 |
| | 5,000,000 | 15,000,000 | $0 | $717.80 | 0.000 | $6.03 | $0 | $0 |
| Hotels 1 | 0 | 999 | $65 | $0.00 | 0.000 | $3.39 | $0 | $65 |
| | 1,000 | 1,999 | $65 | $0.00 | 0.000 | $3.39 | $0 | $65 |
| | 2,000 | 4,999 | $195 | $0.00 | 0.000 | $3.39 | $1 | $196 |
| | 5,000 | 5,999 | $65 | $0.00 | 0.000 | $3.39 | $0 | $65 |
| | 6,000 | 7,999 | $130 | $0.00 | 0.000 | $3.39 | $0 | $131 |
| | 8,000 | 9,999 | $130 | $0.00 | 0.000 | $3.39 | $0 | $131 |
| | 10,000 | 14,999 | $325 | $0.00 | 0.000 | $3.39 | $1 | $327 |
| | 15,000 | 19,999 | $325 | $0.00 | 0.000 | $3.39 | $1 | $327 |
| | 20,000 | 24,999 | $325 | $0.00 | 0.000 | $3.39 | $1 | $327 |
| | 25,000 | 29,999 | $325 | $0.00 | 0.000 | $3.39 | $1 | $327 |
| | 30,000 | 49,999 | $1,301 | $0.00 | 0.000 | $3.39 | $5 | $1,306 |
| | 50,000 | 60,999 | $716 | $0.00 | 0.000 | $3.39 | $3 | $718 |
| | 61,000 | 69,999 | $586 | $0.00 | 0.000 | $3.39 | $2 | $588 |
| | 70,000 | 93,999 | $1,562 | $0.00 | 0.000 | $3.39 | $6 | $1,567 |
| | 94,000 | 99,999 | $390 | $0.00 | 0.000 | $3.39 | $1 | $392 |
| | 100,000 | 127,999 | $1,822 | $0.00 | 0.000 | $3.39 | $6 | $1,828 |
| | 128,000 | 199,999 | $4,572 | $0.00 | 0.000 | $3.39 | $16 | $4,589 |
| | 200,000 | 214,999 | $937 | $0.00 | 0.000 | $3.39 | $3 | $940 |
| | 215,000 | 288,999 | $4,526 | $0.00 | 0.000 | $3.39 | $16 | $4,542 |
| | 289,000 | 299,999 | $549 | $0.00 | 0.000 | $3.39 | $2 | $551 |
| | 300,000 | 384,999 | $2,944 | $0.00 | 0.000 | $3.39 | $10 | $2,954 |
| | 385,000 | 399,999 | $318 | $0.00 | 0.000 | $3.39 | $1 | $319 |
| | 400,000 | 499,999 | $1,067 | $0.00 | 0.000 | $3.39 | $4 | $1,071 |
| | 500,000 | 866,999 | $836 | $0.00 | 0.000 | $3.39 | $3 | $838 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | $19 | $0.00 | 0.000 | $4.16 | $0 | $19 |
| | 1,000 | 1,999 | $19 | $0.00 | 0.000 | $4.16 | $0 | $19 |
| | 2,000 | 4,999 | $57 | $0.00 | 0.000 | $4.16 | $0 | $58 |
| | 5,000 | 5,999 | $19 | $0.00 | 0.000 | $4.16 | $0 | $19 |
| | 6,000 | 7,999 | $38 | $0.00 | 0.000 | $4.16 | $0 | $38 |
| | 8,000 | 9,999 | $38 | $0.00 | 0.000 | $4.16 | $0 | $38 |
| | 10,000 | 14,999 | $96 | $0.00 | 0.000 | $4.16 | $0 | $96 |
| | 15,000 | 19,999 | $96 | $0.00 | 0.000 | $4.16 | $0 | $96 |
| | 20,000 | 24,999 | $96 | $0.00 | 0.000 | $4.16 | $0 | $96 |
| | 25,000 | 29,999 | $96 | $0.00 | 0.000 | $4.16 | $0 | $96 |
| Hotels 2 | 30,000 | 49,999 | $383 | $0.00 | 0.000 | $4.16 | $1 | $384 |
| | 50,000 | 60,999 | $211 | $0.00 | 0.000 | $4.16 | $1 | $211 |
| | 61,000 | 69,999 | $172 | $0.00 | 0.000 | $4.16 | $1 | $173 |
| | 70,000 | 93,999 | $460 | $0.00 | 0.000 | $4.16 | $2 | $461 |
| | 94,000 | 99,999 | $115 | $0.00 | 0.000 | $4.16 | $0 | $115 |
| | 100,000 | 127,999 | $536 | $0.00 | 0.000 | $4.16 | $2 | $538 |
| | 128,000 | 199,999 | $707 | $0.00 | 0.000 | $4.16 | $3 | $709 |
| | 200,000 | 214,999 | $96 | $0.00 | 0.000 | $4.16 | $0 | $96 |
| | 215,000 | 288,999 | $472 | $0.00 | 0.000 | $4.16 | $2 | $474 |
| | 289,000 | 299,999 | $70 | $0.00 | 0.000 | $4.16 | $0 | $70 |
| | 300,000 | 384,999 | $179 | $0.00 | 0.000 | $4.16 | $1 | $179 |
| | 0 | 999 | $113 | $0.00 | 0.000 | $18.40 | $0 | $113 |
| | 1,000 | 1,999 | $103 | $0.00 | 0.000 | $18.40 | $0 | $103 |
| | 2,000 | 4,999 | $297 | $0.00 | 0.000 | $18.40 | $1 | $298 |
| | 5,000 | 5,999 | $86 | $0.00 | 0.000 | $18.40 | $0 | $86 |
| | 6,000 | 7,999 | $124 | $0.00 | 0.000 | $18.40 | $0 | $125 |
| | 8,000 | 9,999 | $88 | $0.00 | 0.000 | $18.40 | $0 | $88 |
| | 10,000 | 14,999 | $158 | $0.00 | 0.000 | $18.40 | $1 | $159 |
| | 15,000 | 19,999 | $141 | $0.00 | 0.000 | $18.40 | $1 | $142 |
| Hydrants | 20,000 | 24,999 | $141 | $0.00 | 0.000 | $18.40 | $1 | $142 |
| | 25,000 | 29,999 | $141 | $0.00 | 0.000 | $18.40 | $1 | $142 |
| | 30,000 | 49,999 | $565 | $0.00 | 0.000 | $18.40 | $2 | $567 |
| | 50,000 | 60,999 | $311 | $0.00 | 0.000 | $18.40 | $1 | $312 |
| | 61,000 | 69,999 | $254 | $0.00 | 0.000 | $18.40 | $1 | $255 |
| | 70,000 | 93,999 | $678 | $0.00 | 0.000 | $18.40 | $2 | $680 |
| | 94,000 | 99,999 | $112 | $0.00 | 0.000 | $18.40 | $0 | $112 |
| | 100,000 | 127,999 | $395 | $0.00 | 0.000 | $18.40 | $1 | $397 |
| | 128,000 | 199,999 | $792 | $0.00 | 0.000 | $18.40 | $3 | $795 |
| Total Rate Revenue at Current Rates | | | $1,975,464 | Total Rate Revenue at Modeled Rates | | | $6,744 | |
| | | | | | | | Total Blended Rate Revenues for the Year | $1,982,207 |

Note: New Minimum Charge Base Rates: If meter size-based minimum charges are to be used, and the user classes modeled above include meter or connection sizes, the amounts shown in this column include meter size surcharges as calculated in Table 16. Either way, the narrative report includes the rates and surcharges to assess.

12.0 months at the old user charge rates and 0.0 months at the new user charge rates.

# Table 11 - AWWA Safe Operating Flow by Meter Size

## Prince George County, VA, 2020 Water Rates Model 1

Water meter data source: Table VII.2-5, page 338, American Water Works Association Manual M1, Principles of Water Rates, Fees and Charges, Seventh Edition

Fire sprinkler data source: National Fire Protection Association

This table calculates the meter equivalent ratio, which is used for calculating peak flow capacity-based system development fees, surcharges and revenues in Tables 13 through 16 for water meters, and when applicable, capacity costs for fire sprinklers.

| Meter Size, in Inches | Meter Type | Maximum-Rated Safe Operating Flow, in gallons per minute | Meter Equivalent Ratio (Capacity Shares) | Equivalent Fire Sprinkler Square Footage* |
|---|---|---|---|---|
| Five Eighths | Displacement | 20 | 1.0 | 100 |
| Three Quarters | Displacement | 30 | 1.5 | 150 |
| One Inch | Displacement | 50 | 2.5 | 250 |
| One & a Half Inch | Displacement | 100 | 5.0 | 500 |
| Two Inch | Displacement | 160 | 8.0 | 800 |
| Three | Singlet | 320 | 16.0 | 1,600 |
| Three | Compound, Class I | 320 | 16.0 | 1,600 |
| Three | Turbine, Class I | 350 | 17.5 | 1,750 |
| Four | Singlet | 500 | 25.0 | 2,500 |
| Four | Compound, Class I | 500 | 25.0 | 2,500 |
| Four | Turbine, Class I | 630 | 31.0 | 3,150 |
| Six | Singlet | 1,000 | 50.0 | 5,000 |
| Six | Compound, Class I | 1,000 | 50.0 | 5,000 |
| Six | Turbine, Class I | 1,300 | 65.0 | 6,500 |
| Eight | Compound, Class I | 1,600 | 80.0 | 8,000 |
| Eight | Turbine, Class I | 2,800 | 140.0 | 14,000 |
| Ten | Turbine, Class II | 4,200 | 210.0 | 21,000 |
| Twelve | Turbine, Class II | 5,300 | 265.0 | 26,500 |

* If applicable, see Table 12B for sprinkler calculations and explanations.

# Table 12 - Flow Capacity Costs

## Prince George County, VA, 2020 Water Rates Model 1

Building system capacity and connecting new customers to the system costs money. Those costs must be recovered. That can be done on the "front end" with system development fees and connection fees. It can be done later with system development surcharges to the minimum charge. It is usually most practical to use a blend of both. This table shows capacity costs. From these costs, system development fees and surcharges were developed in Tables 13 through 16.

### Peak and Base Flow Capacity Costs

| | Costs Related to Water Service | | | | | | |
|---|---|---|---|---|---|---|---|
| Fixed Assets Original Value (Capacity Cost) | % of That Value Attributable to Regular Water Service | % Attributable to Water Peak Capacity | Peak Water Capacity Cost | Annual Water Peak Capacity Cost (40-year Depreciation) | % of Value Attributable to Water Base Flow Capacity | Base Flow Capacity Cost for Water Service | Annual Water Base Capacity Cost (40-year Depreciation) |
| $15,721,667 | 100.0% | 50.0% | $7,860,833 | $458,115 | 50.0% | $7,860,833 | $458,115 |

### How Water System Capacity Costs Will Be Recovered

These costs are modeled to be recovered from system development fees in Tables 13 and 14

Part of Peak Flow Capacity Costs to be Recovered by System Development Fees

8.731% Target Percentage of Annualized Costs to Recover

$39,998.01 Target Portion of Annualized Costs to Recover

$3,999.80 Peak Capacity Cost per Capacity Share

Part of Base Flow Capacity Costs to be Recovered by System Development Fees, if Any

0.0% Target Percentage of Annualized Costs to Recover

$0.00 Target Portion of Annualized Costs to Recover

$0.00 Base Capacity Cost per New Capacity Share

Note: Base flow costs exist, but they will not be recovered with system development fees. Rather, they will be recovered by default from regular user charge fees.

In addition to peak and base flow-based system development fees caculated above, each new connection should reimburse the utility for all "out-of-pocket" connection costs it incurs, estimated as follows:

$0 Average Field Cost per New Connection

$0 Average Administration Cost per New Connection

$0 Average "Out-of-Pocket" Cost per New Connection

These costs are modeled to be recovered from minimum charge surcharges in Tables 15 and 16

Part of Peak Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

50.000% Target Percentage of Costs to Recover

$229,057.46 Target Portion of Costs to Recover in One Full Year

$38,176.24 Target Portion of Costs to Recover in Bi-monthly Surcharges

$8.79 Bi-monthly Surcharge per Peak Capacity Share

Note: "Out-of-pocket" connection costs are in addition to peak and base flow capacity costs. All of these costs have been added together in Table 13, to arrive at the grand total fee to assess to each meter size and type.

## Table 13 - System Development Fees

# Prince George County, VA, 2020 Water Rates Model 1

This table calculates system development fees to assess to each meter size.

Note: Larger meter sizes are available in two or more types, some having different flow capacities. To be conservative when projecting revenues, it was assumed all meters in use are of the lowest capacity types. However, when setting fees, they should be based upon the type of meter in use at each location.

| Meter Size | Meter Type | Meter Size in Inches | Meter Size in Square Inches | New Taps (Customer Growth) in a Typical Year | AWWA Capacity "Share" Factor, Compared to 5/8 Inch Meter | Foot Notes | Peak Capacity Cost per Capacity Share From Table 11 | Peak Capacity Cost per Meter This Class | Average "Out-of-Pocket" Cost per New Connection | **Fee per New Tap for Peak, Base and Out-of-pocket Costs** |
|---|---|---|---|---|---|---|---|---|---|---|
| In-Authority | | | | | | | | | | |
| Five Eighths | Displacement | 0.625 | 0.307 | 10.0 | 1.0 | | $4,000 | $4,000 | $0 | **$4,000** |
| Three Quarters | Displacement | 0.750 | 0.442 | 0.0 | 1.0 | 1 | $4,000 | $4,000 | $0 | **$4,000** |
| One Inch | Displacement | 1.000 | 0.785 | 0.0 | 2.5 | | $4,000 | $10,000 | $0 | **$10,000** |
| One & a Half Inch | Displacement | 1.500 | 1.767 | 0.0 | 5.0 | | $4,000 | $19,999 | $0 | **$19,999** |
| Two Inch | Displacement | 2.000 | 3.142 | 0.0 | 8.0 | | $4,000 | $31,998 | $0 | **$31,998** |
| Two & a Half Inch | Displacement | 2.500 | 4.909 | 0.0 | 12.5 | 2 | $4,000 | $49,998 | $0 | **$49,998** |
| Three Inch | Singlet | 3.000 | 7.069 | 0.0 | 16.0 | | $4,000 | $63,997 | $0 | **$63,997** |
| Three Inch | Compound, Class I | 3.000 | 7.069 | 0.0 | 16.0 | | $4,000 | $63,997 | $0 | **$63,997** |
| Three Inch | Turbine, Class I | 3.000 | 7.069 | 0.0 | 17.5 | | $4,000 | $69,997 | $0 | **$69,997** |
| Four Inch | Singlet | 4.000 | 12.566 | 0.0 | 25.0 | | $4,000 | $99,995 | $0 | **$99,995** |
| Four Inch | Compound, Class I | 4.000 | 12.566 | 0.0 | 25.0 | | $4,000 | $99,995 | $0 | **$99,995** |
| Four Inch | Turbine, Class I | 4.000 | 12.566 | 0.0 | 31.0 | | $4,000 | $123,994 | $0 | **$123,994** |
| Six Inch | Singlet | 6.000 | 28.274 | 0.0 | 50.0 | | $4,000 | $199,990 | $0 | **$199,990** |
| Six Inch | Compound, Class I | 6.000 | 28.274 | 0.0 | 50.0 | | $4,000 | $199,990 | $0 | **$199,990** |
| Six Inch | Turbine, Class I | 6.000 | 28.274 | 0.0 | 65.0 | | $4,000 | $259,987 | $0 | **$259,987** |
| Eight Inch | Compound, Class I | 8.000 | 50.266 | 0.0 | 80.0 | | $4,000 | $319,984 | $0 | **$319,984** |
| Eight Inch | Turbine, Class I | 8.000 | 50.266 | 0.0 | 140.0 | | $4,000 | $559,972 | $0 | **$559,972** |
| | | | | 10.0 | | | | | | |

**Foot Notes, which apply to Tables 14, 15 and 16, as well:**

[1] The Three-Quarter-Inch meter capacity share factor is 1.5. However, it was set equal to the Five-eighths-Inch meter because most such meters are used for residential connections. This enables a uniform system development fee for almost all residential customers.

[2] These meter sizes were not included in AWWA study results, so these values are estimates.

[3] Economy of Scale Adjustments: As meter size rises, capacity to pass peak flow rises. However, costs to build that capacity do not rise as rapidly. Therefore, peak flow capacity shares were adjusted downward by an estimated cost savings factor to account for that savings. Economy of scale savings do not apply to base costs because all connections are afforded the same level of base flow capacity.

# Table 14 - Revenues From System Development Fees
## Prince George County, VA, 2020 Water Rates Model 1

This table calculates total fee revenues that would be generated during one full year at the fees in Table 13.

| Meter Size | Meter Type | New Taps (Customer Growth) in a Typical Year | Fee per New Tap for Peak, Base and Out-of-pocket Costs | Total Annual System Development Fees |
|---|---|---|---|---|
| **In-Authority** | | | | |
| Five Eighths | Displacement | 10.0 | $4,000 | $39,998 |
| Three Quarters | Displacement | 0.0 | $4,000 | $0 |
| One Inch | Displacement | 0.0 | $10,000 | $0 |
| One & a Half Inch | Displacement | 0.0 | $19,999 | $0 |
| Two Inch | Displacement | 0.0 | $31,998 | $0 |
| Two & a Half Inch | Displacement | 0.0 | $49,998 | $0 |
| Three Inch | Singlet | 0.0 | $63,997 | $0 |
| Three Inch | Compound, Class I | 0.0 | $63,997 | $0 |
| Three Inch | Turbine, Class I | 0.0 | $69,997 | $0 |
| Four Inch | Singlet | 0.0 | $99,995 | $0 |
| Four Inch | Compound, Class I | 0.0 | $99,995 | $0 |
| Four Inch | Turbine, Class I | 0.0 | $123,994 | $0 |
| Six Inch | Singlet | 0.0 | $199,990 | $0 |
| Six Inch | Compound, Class I | 0.0 | $199,990 | $0 |
| Six Inch | Turbine, Class I | 0.0 | $259,987 | $0 |
| Eight Inch | Compound, Class I | 0.0 | $319,984 | $0 |
| | Total: | 10.0 | | $39,998 |

**This is the amount used to calculate the "Meter Size-based System Development Fees" income in Table 3.**

## Table 15 - Minimum Charge Fees, Including Capacity Surcharges

# Prince George County, VA, 2020 Water Rates Model 1

This table does, essentially, the same thing as Table 13, except costs are recovered over time as minimum charge surcharges.

| Meter Size | Meter Type | Capacity Shares Each Meter Size After Adjustment | Bi-monthly Surcharge per Peak Capacity Share (Table 11) | Annual Base Charges Revenue | Total Annual Minimum Charges Revenue | Peak Capacity Cost per Meter Size | Cost-to-Serve Minimum Charge From Table 10 | **Bi-monthly Minimum Charge Each Meter Size** | **Bi-monthly Snowbird Fee** |
|---|---|---|---|---|---|---|---|---|---|
| In-Authority | | | | | | | | | |
| Five Eighths | Displacement | 1.0 | $8.79 | $261,380 | $418,163 | $8.79 | $14.65 | **$23.44** | **$21.87** |
| Three Quarters | Displacement | 1.0 | $8.79 | $0 | $0 | $8.79 | $14.65 | **$23.44** | **$21.87** |
| One Inch | Displacement | 2.5 | $8.79 | $6,242 | $15,603 | $21.97 | $14.65 | **$36.63** | **$34.16** |
| One & a Half Inch | Displacement | 5.0 | $8.79 | $3,077 | $12,306 | $43.95 | $14.65 | **$58.60** | **$54.66** |
| Two Inch | Displacement | 8.0 | $8.79 | $3,165 | $18,353 | $70.31 | $14.65 | **$84.97** | **$79.25** |
| Two & a Half Inch | Displacement | 12.5 | $8.79 | $0 | $0 | $109.87 | $14.65 | **$124.52** | **$116.14** |
| Three Inch | Singlet | 16.0 | $8.79 | $440 | $4,658 | $140.63 | $14.65 | **$155.28** | **$144.84** |
| Three Inch | Compound, Class I | 16.0 | $8.79 | $0 | $0 | $140.63 | $14.65 | **$155.28** | **$144.84** |
| Three Inch | Turbine, Class I | 17.5 | $8.79 | $0 | $0 | $153.81 | $14.65 | **$168.47** | **$157.13** |
| Four Inch | Singlet | 25.0 | $8.79 | $1,055 | $16,876 | $219.73 | $14.65 | **$234.39** | **$218.62** |
| Four Inch | Compound, Class I | 25.0 | $8.79 | $0 | $0 | $219.73 | $14.65 | **$234.39** | **$218.62** |
| Four Inch | Turbine, Class I | 31.0 | $8.79 | $0 | $0 | $272.47 | $14.65 | **$287.12** | **$267.81** |
| Six Inch | Singlet | 50.0 | $8.79 | $615 | $19,073 | $439.46 | $14.65 | **$454.12** | **$423.57** |
| Six Inch | Compound, Class I | 50.0 | $8.79 | $0 | $0 | $439.46 | $14.65 | **$454.12** | **$423.57** |
| Six Inch | Turbine, Class I | 65.0 | $8.79 | $0 | $0 | $571.30 | $14.65 | **$585.96** | **$546.54** |
| Eight Inch | Compound, Class I | 80.0 | $8.79 | $0 | $0 | $703.14 | $14.65 | **$717.80** | **$669.51** |

# Table 16 - Revenues From Minimum Charge Surcharges
# Prince George County, VA, 2020 Water Rates Model 1

This table calculates total minimum charge surcharge revenues that would be generated during one full year at the fees in Table 15.

| Meter Size | Meter Type | Number Meters This Size | Total Adjusted Capacity Shares | Annual Peak Capacity Surcharge Revenues |
|---|---|---|---|---|
| **In-Authority** | | | | |
| Five Eighths | Displacement | 2,973 | 1 | $156,783 |
| Three Quarters | Displacement | 0 | 1 | $0 |
| One Inch | Displacement | 71 | 3 | $9,361 |
| One & a Half Inch | Displacement | 35 | 5 | $9,229 |
| Two Inch | Displacement | 36 | 8 | $15,188 |
| Two & a Half Inch | Displacement | 0 | 13 | $0 |
| Three Inch | Singlet | 5 | 16 | $4,219 |
| Three Inch | Compound, Class I | 0 | 16 | $0 |
| Three Inch | Turbine, Class I | 0 | 18 | $0 |
| Four Inch | Singlet | 12 | 25 | $15,821 |
| Four Inch | Compound, Class I | 0 | 25 | $0 |
| Four Inch | Turbine, Class I | 0 | 31 | $0 |
| Six Inch | Singlet | 7 | 50 | $18,457 |
| Six Inch | Compound, Class I | 0 | 50 | $0 |
| Six Inch | Turbine, Class I | 0 | 65 | $0 |
| Eight Inch | Compound, Class I | 0 | 80 | $0 |
| | | 3,139 | 3,925 | $229,057 |

# Table 17 - Financial Capacity Indicators and Reserves

## Prince George County, VA, 2020 Water Rates Model 1

This table depicts the affordability of future rates, the financial health of the system and the ending balances in various (assumed) accounts for the test year and the next 10 years.

| Capacity Indicators | Test Year Starting 7/1/18 | 0 Year Starting 7/1/19 | 1st Year Starting 7/1/20 | 2nd Year Starting 7/1/21 | 3rd Year Starting 7/1/22 | 4th Year Starting 7/1/23 | 5th Year Starting 7/1/24 | 6th Year Starting 7/1/25 | 7th Year Starting 7/1/26 | 8th Year Starting 7/1/27 | 9th Year Starting 7/1/28 | 10th Year Starting 7/1/29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Customary Affordability Index: Monthly Bill for a 5,000 gal per Month, Small Meter Residential Customer | $24.41 | $31.02 | $32.57 | $34.20 | $35.91 | $37.71 | $39.59 | $41.57 | $43.65 | $45.83 | $48.12 | $50.53 |
| AMHI Within Service Area | $43,021 | $43,458 | $43,899 | $44,345 | $44,795 | $45,250 | $45,709 | $46,173 | $46,642 | $47,115 | $47,594 | $48,077 |
| **Affordability Index:** Current Rates First Column, Modeled Rates After That | 0.68% | 0.86% | 0.89% | 0.93% | 0.96% | 1.00% | 1.04% | 1.08% | 1.12% | 1.17% | 1.21% | 1.26% |
| Affordability Index (AI) goes to the willingness and ability of customers to pay. AI is the cost of 60,000 gallons of residential service per year (5,000 gallons per month) divided by the Annual Median Household Income (AMHI) in the service area (gleaned from Census data or a survey). Rates near 1.0% are common in the U.S. and are generally considered affordable. Most grant agencies will not consider awarding grants if this indicator is less than 1.5 to 2.0%. | | | | | | | | | | | | |
| Low-income, Low-volume Affordability Index: Monthly Bill for a 2,000 gal per Month, Low-income Residential Customer | $15.50 | $19.44 | $20.41 | $21.43 | $22.51 | $23.63 | $24.81 | $26.05 | $27.36 | $28.72 | $30.16 | $31.67 |
| Income at One-half the AMHI and Rising at One-half the Rate Above | $21,511 | $21,620 | $21,730 | $21,840 | $21,951 | $22,062 | $22,174 | $22,287 | $22,400 | $22,514 | $22,628 | $22,743 |
| **Affordability for Low-income, Low-volume:** Current Rates First Column, Modeled Rates After That | 0.86% | 1.08% | 1.13% | 1.18% | 1.23% | 1.29% | 1.34% | 1.40% | 1.47% | 1.53% | 1.60% | 1.67% |
| This additional indicator of affordability assumes a residential customer with income at one-half of the median household income above, that income is growing at one-half the rate of the median household income and the customer uses 2,000 gallons per month. Such a customer is likely either a minimum wage or near-minimum wage worker, or is retired and living only on Social Security benefits. Such customers are more commonly the "slow pays" and "no pays" compared to others. | | | | | | | | | | | | |
| **Estimated Operating Ratio:** Current Rates First Column, Modeled Rates After That | 1.36 | 1.42 | 1.25 | 1.44 | 1.47 | 1.52 | 1.55 | 1.59 | 1.63 | 1.68 | 1.71 | 1.76 |
| Operating ratio (OR) is a measure of the utility's ability to pay its operating expenses using only current incomes. A 1.0 OR is break even. Below 1.0 indicates operating in the "red." Generally, the OR should be at least 1.15 for large systems, 1.30 or more for medium-sized systems and perhaps as high as 2.0 for small systems. Note: If the utility has or will have reserves (below,) it has more ability to pay its operating costs than the OR implies. | | | | | | | | | | | | |
| **Estimated Coverage Ratio:** Current Rates First Column, Modeled Rates After That | 44.85 | 4.75 | 2.20 | 2.19 | 1.66 | 1.46 | 1.21 | 1.31 | 1.40 | 0.58 | 0.43 | 0.47 |
| Coverage Ratio (CR) goes to the ability of the utility to pay its debt payments out of current incomes. OR applies only to years with debt service. 1.0 is break even. Generally, the CR should be at least 1.25. Note: If the utility has or will have reserves (shown below,) it has more ability to make debt payments than the CR implies. | | | | | | | | | | | | |

| Reserves | Balance Ending on 6/30/18 | Balance Ending on 6/30/19 | Balance Ending on 6/30/20 | Balance Ending on 6/30/21 | Balance Ending on 6/30/22 | Balance Ending on 6/30/23 | Balance Ending on 6/30/24 | Balance Ending on 6/30/25 | Balance Ending on 6/30/26 | Balance Ending on 6/30/27 | Balance Ending on 6/30/28 | Balance Ending on 6/30/29 | Balance Ending on 6/30/30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash and Cash Equivalents | $5,016,574 | $632,662 | $530,412 | $655,156 | $671,528 | $692,115 | $705,768 | $723,667 | $746,207 | $761,098 | $780,665 | $805,344 | $821,586 |
| Other Liquid Assets | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total Undedicated Cash Assets | $5,016,574 | $632,662 | $530,412 | $655,156 | $671,528 | $692,115 | $705,768 | $723,667 | $746,207 | $761,098 | $780,665 | $805,344 | $821,586 |
| Total Cash Assets Discounted for Inflation (Future Unrestricted Purchasing Power) | $5,016,574 | $632,662 | $530,412 | $635,501 | $631,841 | $631,675 | $624,812 | $621,437 | $621,569 | $614,954 | $611,841 | $612,248 | $624,595 |
| Repair & Replacement | $0 | -$84,000 | $102,097 | $181,841 | $255,890 | $323,914 | $385,566 | $440,487 | $488,303 | $528,626 | $561,053 | $585,164 | $600,526 |
| Debt and CIP Reserves | $0 | $4,916,143 | $5,599,138 | $5,898,797 | $6,443,575 | $6,907,726 | $7,346,024 | $7,659,116 | $8,068,870 | $8,588,285 | $7,635,490 | $5,634,426 | $3,758,737 |
| **Sum of All Reserves** | **$5,016,574** | **$5,464,805** | **$6,231,647** | **$6,735,794** | **$7,370,993** | **$7,923,755** | **$8,437,358** | **$8,823,269** | **$9,303,379** | **$9,878,009** | **$8,977,208** | **$7,024,934** | **$5,180,849** |

# Table 18 - Bills Before and After Rate Adjustments
## Prince George County, VA, 2020 Water Rates Model 1

Revenue increase to be generated by the modeled rates 24.6%

If applicable, the revenue increase above includes meter size-based minimum charges calculated in Table 15. If rate classes shown below do not include meter size, the modeled bills below do not include those surcharges.

To reduce its size and still cover many customers, this table shows bills for only the most common or extraordinary classes.

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill, Bi-monthly | Modeled Bill, Bi-monthly | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| .625 Inch Meter Size | 0 | 161 | 165 | 2,963 | $19.12 | $23.44 | $4.32 |
| | 1,000 | 110 | 275 | 2,803 | $22.09 | $27.30 | $5.21 |
| | 2,000 | 694 | 970 | 2,692 | $25.06 | $31.16 | $6.10 |
| | 5,000 | 280 | 1,249 | 1,998 | $33.97 | $42.74 | $8.77 |
| | 6,000 | 514 | 1,764 | 1,718 | $37.69 | $47.58 | $9.89 |
| | 8,000 | 399 | 2,162 | 1,204 | $45.13 | $57.25 | $12.12 |
| | 10,000 | 504 | 2,667 | 805 | $52.57 | $66.92 | $14.35 |
| | 15,000 | 161 | 2,828 | 301 | $71.17 | $91.09 | $19.92 |
| | 20,000 | 66 | 2,894 | 140 | $94.37 | $121.24 | $26.87 |
| | 25,000 | 27 | 2,921 | 74 | $117.57 | $151.39 | $33.82 |
| | 30,000 | 34 | 2,955 | 47 | $140.77 | $181.55 | $40.78 |
| | 50,000 | 5 | 2,960 | 13 | $233.57 | $302.16 | $68.59 |
| | 61,000 | 2 | 2,962 | 8 | $284.61 | $368.49 | $83.88 |
| | 70,000 | 3 | 2,965 | 6 | $326.37 | $422.76 | $96.39 |
| | 94,000 | 1 | 2,966 | 3 | $437.73 | $567.49 | $129.76 |
| | 100,000 | 1 | 2,966 | 2 | $465.57 | $603.68 | $138.11 |
| | 128,000 | 1 | 2,967 | 1 | $595.49 | $772.53 | $177.04 |
| | 200,000 | 0 | 2,968 | 0 | $929.57 | $1,206.72 | $277.15 |
| 1 Inch Meter Size | 0 | 12 | 12 | 71 | $34.68 | $36.63 | $1.95 |
| | 1,000 | 4 | 15 | 59 | $37.65 | $40.49 | $2.84 |
| | 2,000 | 8 | 23 | 56 | $40.62 | $44.35 | $3.73 |
| | 5,000 | 3 | 26 | 48 | $49.53 | $55.93 | $6.40 |
| | 6,000 | 6 | 32 | 45 | $52.50 | $59.79 | $7.29 |
| | 8,000 | 5 | 37 | 40 | $59.94 | $69.46 | $9.52 |
| | 10,000 | 7 | 43 | 35 | $67.38 | $79.13 | $11.75 |
| | 15,000 | 4 | 47 | 28 | $85.98 | $103.30 | $17.32 |
| | 20,000 | 3 | 51 | 24 | $104.58 | $127.47 | $22.89 |
| | 25,000 | 3 | 53 | 20 | $127.78 | $157.62 | $29.84 |
| | 30,000 | 5 | 59 | 18 | $150.98 | $187.78 | $36.80 |
| | 50,000 | 4 | 62 | 12 | $243.78 | $308.39 | $64.61 |
| | 61,000 | 1 | 63 | 9 | $294.82 | $374.72 | $79.90 |
| | 70,000 | 2 | 66 | 8 | $336.58 | $428.99 | $92.41 |
| | 94,000 | 1 | 66 | 5 | $447.94 | $573.73 | $125.79 |
| | 100,000 | 1 | 67 | 5 | $475.78 | $609.91 | $134.13 |
| | 128,000 | 2 | 69 | 4 | $605.70 | $778.76 | $173.06 |
| | 200,000 | 0 | 69 | 2 | $939.78 | $1,212.95 | $273.17 |
| | 215,000 | 1 | 70 | 2 | $1,009.38 | $1,303.41 | $294.03 |
| | 289,000 | 0 | 70 | 1 | $1,352.74 | $1,749.66 | $396.92 |
| | 300,000 | 1 | 71 | 1 | $1,403.78 | $1,816.00 | $412.22 |

## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill, Bi-monthly | Modeled Bill, Bi-monthly | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| 1.5 Inch Meter Size | 0 | 3 | 3 | 35 | $66.66 | $58.60 | -$8.06 |
| | 1,000 | 1 | 4 | 32 | $69.63 | $62.46 | -$7.17 |
| | 2,000 | 5 | 9 | 31 | $72.60 | $66.32 | -$6.28 |
| | 5,000 | 2 | 11 | 26 | $81.51 | $77.90 | -$3.61 |
| | 6,000 | 2 | 13 | 24 | $84.48 | $81.76 | -$2.72 |
| | 8,000 | 1 | 14 | 22 | $90.42 | $89.48 | -$0.94 |
| | 10,000 | 3 | 17 | 21 | $96.36 | $97.20 | $0.84 |
| | 15,000 | 2 | 19 | 18 | $114.96 | $121.37 | $6.41 |
| | 20,000 | 1 | 20 | 16 | $133.56 | $145.55 | $11.99 |
| | 25,000 | 1 | 21 | 15 | $152.16 | $169.72 | $17.56 |
| | 30,000 | 3 | 23 | 14 | $170.76 | $193.89 | $23.13 |
| | 50,000 | 2 | 25 | 12 | $245.16 | $290.59 | $45.43 |
| | 61,000 | 2 | 27 | 10 | $296.20 | $356.92 | $60.72 |
| | 70,000 | 4 | 31 | 8 | $337.96 | $411.20 | $73.24 |
| | 94,000 | 1 | 31 | 4 | $449.32 | $555.93 | $106.61 |
| | 100,000 | 1 | 32 | 4 | $477.16 | $592.11 | $114.95 |
| | 128,000 | 1 | 34 | 3 | $607.08 | $760.96 | $153.88 |
| | 200,000 | 0 | 34 | 1 | $941.16 | $1,195.15 | $253.99 |
| | 215,000 | 0 | 34 | 1 | $1,010.76 | $1,285.61 | $274.85 |
| | 289,000 | 0 | 34 | 1 | $1,354.12 | $1,731.86 | $377.74 |
| | 300,000 | 0 | 34 | 1 | $1,405.16 | $1,798.20 | $393.04 |
| | 385,000 | 0 | 34 | 1 | $1,799.56 | $2,310.79 | $511.23 |
| 2 Inch Meter Size | 0 | 4 | 4 | 36 | $119.38 | $84.97 | -$34.41 |
| | 1,000 | 0 | 4 | 32 | $122.35 | $88.83 | -$33.52 |
| | 2,000 | 0 | 4 | 32 | $125.32 | $92.69 | -$32.63 |
| | 5,000 | 0 | 4 | 31 | $134.23 | $104.27 | -$29.96 |
| | 6,000 | 1 | 5 | 31 | $137.20 | $108.13 | -$29.07 |
| | 8,000 | 2 | 7 | 31 | $143.14 | $115.85 | -$27.29 |
| | 10,000 | 3 | 10 | 29 | $149.08 | $123.57 | -$25.51 |
| | 15,000 | 1 | 11 | 26 | $163.93 | $142.87 | -$21.06 |
| | 20,000 | 1 | 12 | 25 | $178.78 | $162.17 | -$16.61 |
| | 25,000 | 3 | 14 | 24 | $193.63 | $181.47 | -$12.16 |
| | 30,000 | 5 | 20 | 21 | $212.23 | $205.64 | -$6.59 |
| | 50,000 | 2 | 22 | 16 | $286.63 | $302.34 | $15.71 |
| | 61,000 | 1 | 22 | 14 | $327.55 | $355.52 | $27.97 |
| | 70,000 | 2 | 24 | 14 | $361.03 | $399.03 | $38.00 |
| | 94,000 | 1 | 24 | 12 | $472.39 | $543.76 | $71.37 |
| | 100,000 | 1 | 25 | 11 | $500.23 | $579.94 | $79.71 |
| | 128,000 | 2 | 28 | 10 | $630.15 | $748.80 | $118.65 |
| | 200,000 | 1 | 28 | 8 | $964.23 | $1,182.99 | $218.76 |
| | 215,000 | 2 | 30 | 8 | $1,033.83 | $1,273.44 | $239.61 |
| | 289,000 | 0 | 30 | 6 | $1,377.19 | $1,719.70 | $342.51 |
| | 300,000 | 2 | 32 | 6 | $1,428.23 | $1,786.03 | $357.80 |
| | 385,000 | 0 | 32 | 4 | $1,822.63 | $2,298.62 | $475.99 |
| | 400,000 | 1 | 33 | 4 | $1,892.23 | $2,389.08 | $496.85 |
| | 500,000 | 1 | 34 | 3 | $2,356.23 | $2,992.12 | $635.89 |
| | 867,000 | 1 | 35 | 2 | $4,059.11 | $5,205.29 | $1,146.18 |
| | 1,000,000 | 1 | 36 | 1 | $4,676.23 | $6,007.34 | $1,331.11 |

## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill, Bi-monthly | Modeled Bill, Bi-monthly | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| 3 Inch Meter Size | 0 | 0 | 0 | 5 | $239.24 | $155.28 | -$83.96 |
| | 1,000 | 0 | 0 | 5 | $242.21 | $159.14 | -$83.07 |
| | 2,000 | 0 | 1 | 5 | $245.18 | $163.00 | -$82.18 |
| | 5,000 | 0 | 1 | 4 | $254.09 | $174.58 | -$79.51 |
| | 6,000 | 0 | 1 | 4 | $257.06 | $178.44 | -$78.62 |
| | 8,000 | 0 | 1 | 4 | $263.00 | $186.16 | -$76.84 |
| | 10,000 | 0 | 1 | 4 | $268.94 | $193.88 | -$75.06 |
| | 15,000 | 0 | 1 | 4 | $283.79 | $213.18 | -$70.61 |
| | 20,000 | 0 | 1 | 4 | $298.64 | $232.48 | -$66.16 |
| | 25,000 | 0 | 1 | 4 | $313.49 | $251.78 | -$61.71 |
| | 30,000 | 1 | 2 | 4 | $328.34 | $271.08 | -$57.26 |
| | 50,000 | 0 | 2 | 3 | $387.74 | $348.28 | -$39.46 |
| | 61,000 | 0 | 2 | 3 | $420.41 | $390.74 | -$29.67 |
| | 70,000 | 0 | 2 | 3 | $453.89 | $434.25 | -$19.64 |
| | 94,000 | 0 | 2 | 3 | $543.17 | $550.29 | $7.12 |
| | 100,000 | 0 | 2 | 3 | $565.49 | $579.30 | $13.81 |
| | 128,000 | 0 | 2 | 3 | $669.65 | $714.67 | $45.02 |
| | 200,000 | 0 | 2 | 3 | $937.49 | $1,062.77 | $125.28 |
| | 215,000 | 0 | 2 | 3 | $1,007.09 | $1,153.23 | $146.14 |
| | 289,000 | 0 | 3 | 3 | $1,350.45 | $1,599.48 | $249.03 |
| | 300,000 | 1 | 4 | 3 | $1,401.49 | $1,665.82 | $264.33 |
| | 385,000 | 0 | 4 | 2 | $1,795.89 | $2,178.40 | $382.51 |
| | 400,000 | 0 | 4 | 2 | $1,865.49 | $2,268.86 | $403.37 |
| | 500,000 | 0 | 4 | 1 | $2,329.49 | $2,871.90 | $542.41 |
| | 867,000 | 0 | 4 | 1 | $4,032.37 | $5,085.07 | $1,052.70 |
| | 1,000,000 | 1 | 5 | 1 | $4,649.49 | $5,887.12 | $1,237.63 |
| 4 Inch Meter Size | 0 | 0 | 0 | 11 | $418.18 | $234.39 | -$183.79 |
| | 1,000 | 0 | 0 | 11 | $421.15 | $238.25 | -$182.90 |
| | 2,000 | 0 | 0 | 11 | $424.12 | $242.11 | -$182.01 |
| | 5,000 | 0 | 0 | 11 | $433.03 | $253.69 | -$179.34 |
| | 6,000 | 0 | 0 | 11 | $436.00 | $257.55 | -$178.45 |
| | 8,000 | 0 | 0 | 11 | $441.94 | $265.27 | -$176.67 |
| | 10,000 | 0 | 0 | 11 | $447.88 | $272.99 | -$174.89 |
| | 15,000 | 1 | 1 | 11 | $462.73 | $292.29 | -$170.44 |
| | 20,000 | 0 | 1 | 10 | $477.58 | $311.59 | -$165.99 |
| | 25,000 | 0 | 1 | 10 | $492.43 | $330.89 | -$161.54 |
| | 30,000 | 1 | 2 | 10 | $507.28 | $350.19 | -$157.09 |
| | 50,000 | 1 | 3 | 9 | $566.68 | $427.39 | -$139.29 |
| | 61,000 | 0 | 3 | 8 | $599.35 | $469.85 | -$129.50 |
| | 70,000 | 0 | 3 | 8 | $626.08 | $504.59 | -$121.49 |
| | 94,000 | 0 | 3 | 8 | $697.36 | $597.23 | -$100.13 |
| | 100,000 | 0 | 3 | 8 | $715.18 | $620.39 | -$94.79 |
| | 128,000 | 0 | 3 | 8 | $819.34 | $755.76 | -$63.58 |
| | 200,000 | 0 | 3 | 8 | $1,087.18 | $1,103.86 | $16.68 |
| | 215,000 | 0 | 3 | 8 | $1,142.98 | $1,176.38 | $33.40 |
| | 289,000 | 0 | 3 | 8 | $1,418.26 | $1,534.15 | $115.89 |
| | 300,000 | 0 | 3 | 8 | $1,459.18 | $1,587.33 | $128.15 |
| | 385,000 | 0 | 3 | 8 | $1,853.58 | $2,099.92 | $246.34 |
| | 400,000 | 0 | 3 | 8 | $1,923.18 | $2,190.38 | $267.20 |
| | 500,000 | 2 | 5 | 8 | $2,387.18 | $2,793.42 | $406.24 |
| | 867,000 | 1 | 6 | 6 | $4,090.06 | $5,006.59 | $916.53 |
| | 1,000,000 | 5 | 11 | 5 | $4,707.18 | $5,808.64 | $1,101.46 |

## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill, Bi-monthly | Modeled Bill, Bi-monthly | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| 6 Inch Meter Size | 0 | 1 | 1 | 7 | $929.52 | $454.12 | -$475.40 |
| | 1,000 | 0 | 1 | 6 | $932.49 | $457.98 | -$474.51 |
| | 2,000 | 0 | 1 | 6 | $935.46 | $461.84 | -$473.62 |
| | 5,000 | 0 | 1 | 6 | $944.37 | $473.42 | -$470.95 |
| | 6,000 | 0 | 1 | 6 | $947.34 | $477.28 | -$470.06 |
| | 8,000 | 0 | 1 | 6 | $953.28 | $485.00 | -$468.28 |
| | 10,000 | 0 | 1 | 6 | $959.22 | $492.72 | -$466.50 |
| | 15,000 | 0 | 1 | 6 | $974.07 | $512.02 | -$462.05 |
| | 20,000 | 0 | 1 | 6 | $988.92 | $531.32 | -$457.60 |
| | 25,000 | 0 | 1 | 6 | $1,003.77 | $550.62 | -$453.15 |
| | 30,000 | 0 | 1 | 6 | $1,018.62 | $569.92 | -$448.70 |
| | 50,000 | 0 | 1 | 6 | $1,078.02 | $647.12 | -$430.90 |
| | 61,000 | 0 | 1 | 6 | $1,110.69 | $689.58 | -$421.11 |
| | 70,000 | 0 | 1 | 6 | $1,137.42 | $724.32 | -$413.10 |
| | 94,000 | 0 | 1 | 6 | $1,208.70 | $816.96 | -$391.74 |
| | 100,000 | 0 | 1 | 6 | $1,226.52 | $840.12 | -$386.40 |
| | 128,000 | 0 | 2 | 6 | $1,309.68 | $948.20 | -$361.48 |
| | 200,000 | 0 | 2 | 5 | $1,523.52 | $1,226.12 | -$297.40 |
| | 215,000 | 0 | 2 | 5 | $1,568.07 | $1,284.02 | -$284.05 |
| | 289,000 | 0 | 2 | 5 | $1,843.35 | $1,641.79 | -$201.56 |
| | 300,000 | 1 | 3 | 5 | $1,884.27 | $1,694.97 | -$189.30 |
| | 385,000 | 0 | 3 | 4 | $2,200.47 | $2,105.92 | -$94.55 |
| 8 Inch Meter Size | 0 | 0 | 0 | 0 | $1,645.42 | $717.80 | -$927.62 |
| | 5,000,000 | 0 | 0 | 0 | $24,224.17 | $30,062.57 | $5,838.40 |

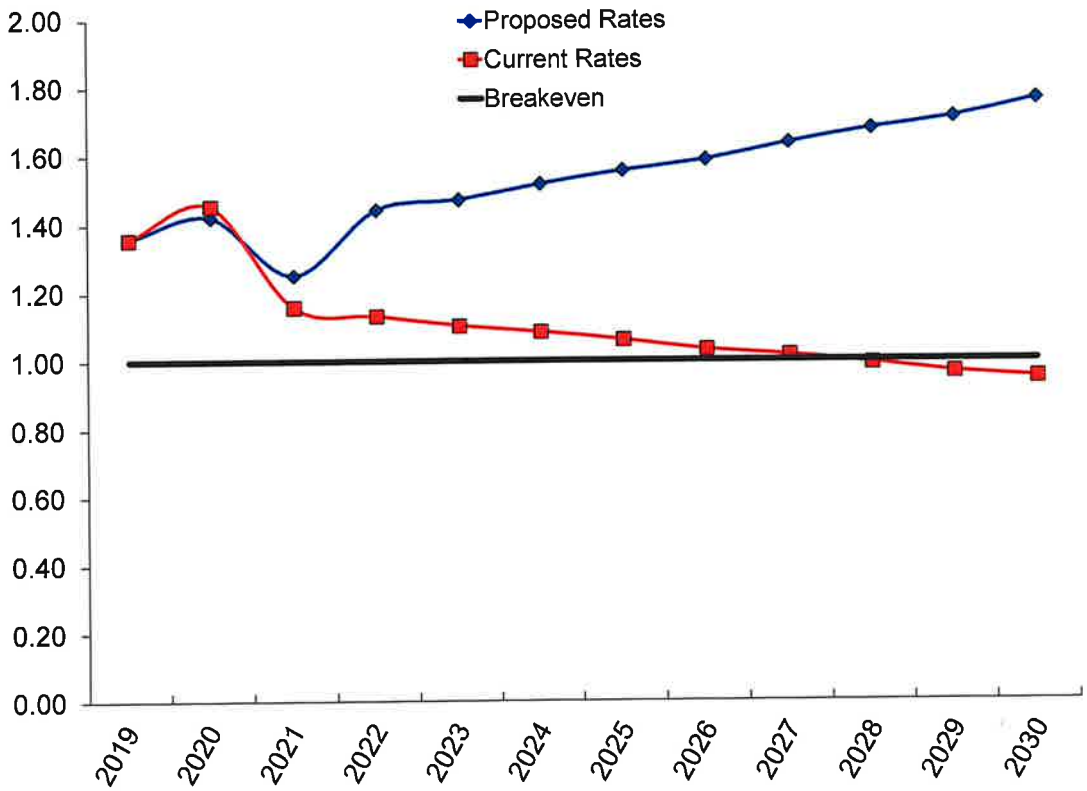
## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill, Bi-monthly | Modeled Bill, Bi-monthly | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| Hotels 1 | 0 | 0 | 0 | 4 | $0.00 | $0.00 | $0.00 |
| | 1,000 | 0 | 0 | 4 | $2.61 | $3.39 | $0.78 |
| | 2,000 | 0 | 0 | 4 | $5.22 | $6.78 | $1.56 |
| | 5,000 | 0 | 0 | 4 | $13.05 | $16.96 | $3.91 |
| | 6,000 | 0 | 0 | 4 | $15.66 | $20.35 | $4.69 |
| | 8,000 | 0 | 0 | 4 | $20.88 | $27.14 | $6.26 |
| | 10,000 | 0 | 0 | 4 | $26.10 | $33.92 | $7.82 |
| | 15,000 | 0 | 0 | 4 | $39.15 | $50.88 | $11.73 |
| | 20,000 | 0 | 0 | 4 | $52.20 | $67.84 | $15.64 |
| | 25,000 | 0 | 0 | 4 | $65.25 | $84.80 | $19.55 |
| | 30,000 | 0 | 0 | 4 | $78.30 | $101.76 | $23.46 |
| | 50,000 | 0 | 0 | 4 | $130.50 | $169.61 | $39.11 |
| | 61,000 | 0 | 0 | 4 | $159.21 | $206.92 | $47.71 |
| | 70,000 | 0 | 0 | 4 | $182.70 | $237.45 | $54.75 |
| | 94,000 | 0 | 0 | 4 | $245.34 | $318.86 | $73.52 |
| | 100,000 | 0 | 0 | 4 | $261.00 | $339.21 | $78.21 |
| | 128,000 | 0 | 0 | 4 | $334.08 | $434.19 | $100.11 |
| | 200,000 | 0 | 0 | 4 | $522.00 | $678.42 | $156.42 |
| | 215,000 | 1 | 1 | 4 | $561.15 | $729.31 | $168.16 |
| | 289,000 | 0 | 1 | 3 | $754.29 | $980.32 | $226.03 |
| | 300,000 | 2 | 3 | 3 | $783.00 | $1,017.64 | $234.64 |
| | 385,000 | 0 | 3 | 2 | $1,004.85 | $1,305.97 | $301.12 |
| | 400,000 | 1 | 4 | 1 | $1,044.00 | $1,356.85 | $312.85 |
| | 500,000 | 0 | 4 | 0 | $1,305.00 | $1,696.06 | $391.06 |
| Hotels 2 | 0 | 0 | 0 | 1 | $0.00 | $0.00 | $0.00 |
| | 1,000 | 0 | 0 | 1 | $3.20 | $4.16 | $0.96 |
| | 2,000 | 0 | 0 | 1 | $6.40 | $8.32 | $1.92 |
| | 5,000 | 0 | 0 | 1 | $16.00 | $20.79 | $4.79 |
| | 6,000 | 0 | 0 | 1 | $19.20 | $24.95 | $5.75 |
| | 8,000 | 0 | 0 | 1 | $25.60 | $33.27 | $7.67 |
| | 10,000 | 0 | 0 | 1 | $32.00 | $41.59 | $9.59 |
| | 15,000 | 0 | 0 | 1 | $48.00 | $62.38 | $14.38 |
| | 20,000 | 0 | 0 | 1 | $64.00 | $83.18 | $19.18 |
| | 25,000 | 0 | 0 | 1 | $80.00 | $103.97 | $23.97 |
| | 30,000 | 0 | 0 | 1 | $96.00 | $124.77 | $28.77 |
| | 50,000 | 0 | 0 | 1 | $160.00 | $207.95 | $47.95 |
| | 61,000 | 0 | 0 | 1 | $195.20 | $253.69 | $58.49 |
| | 70,000 | 0 | 0 | 1 | $224.00 | $291.12 | $67.12 |
| | 94,000 | 0 | 0 | 1 | $300.80 | $390.94 | $90.14 |
| | 100,000 | 0 | 0 | 1 | $320.00 | $415.89 | $95.89 |
| | 128,000 | 1 | 1 | 1 | $409.60 | $532.34 | $122.74 |
| | 200,000 | 0 | 1 | 0 | $640.00 | $831.78 | $191.78 |
| | 215,000 | 0 | 1 | 0 | $688.00 | $894.17 | $206.17 |
| | 289,000 | 0 | 1 | 0 | $924.80 | $1,201.93 | $277.13 |
| | 300,000 | 0 | 1 | 0 | $960.00 | $1,247.68 | $287.68 |

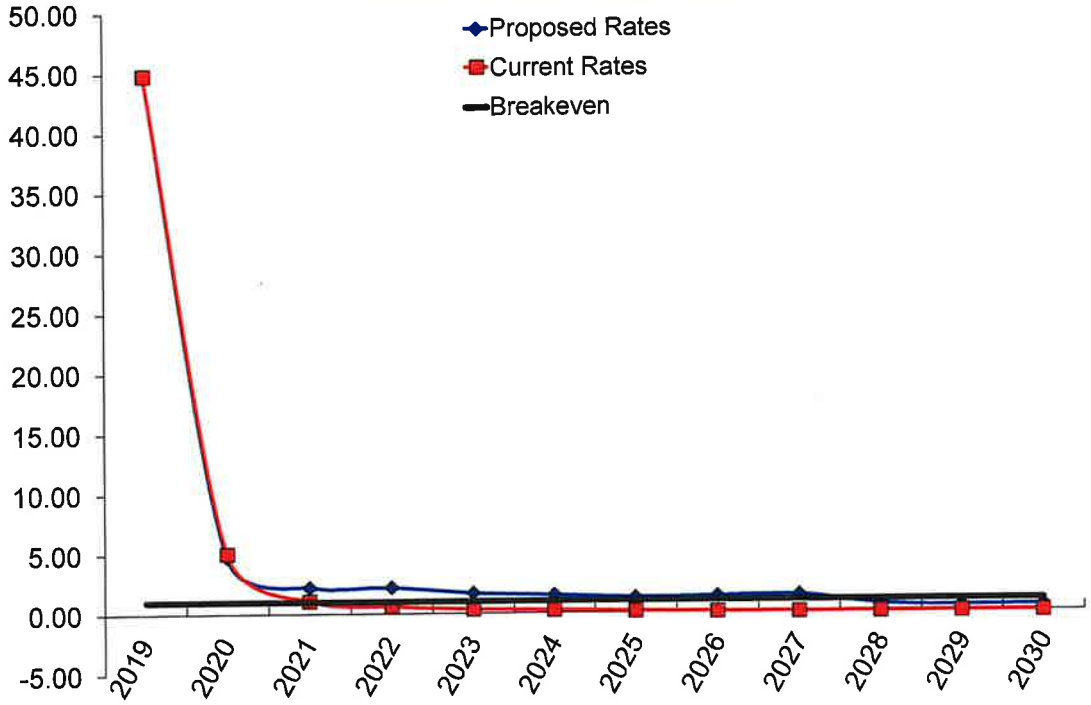
## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill, Bi-monthly | Modeled Bill, Bi-monthly | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| | 0 | 6 | 6 | 7 | $0.00 | $0.00 | $0.00 |
| | 1,000 | 0 | 6 | 1 | $14.16 | $18.40 | $4.24 |
| | 2,000 | 0 | 6 | 1 | $28.32 | $36.81 | $8.49 |
| | 5,000 | 0 | 6 | 1 | $70.80 | $92.02 | $21.22 |
| | 6,000 | 0 | 7 | 1 | $84.96 | $110.42 | $25.46 |
| | 8,000 | 0 | 7 | 1 | $113.28 | $147.23 | $33.95 |
| | 10,000 | 0 | 7 | 1 | $141.60 | $184.03 | $42.43 |
| | 15,000 | 0 | 7 | 0 | $212.40 | $276.05 | $63.65 |
| Hydrants | 20,000 | 0 | 7 | 0 | $283.20 | $368.06 | $84.86 |
| | 25,000 | 0 | 7 | 0 | $354.00 | $460.08 | $106.08 |
| | 30,000 | 0 | 7 | 0 | $424.80 | $552.10 | $127.30 |
| | 50,000 | 0 | 7 | 0 | $708.00 | $920.16 | $212.16 |
| | 61,000 | 0 | 7 | 0 | $863.76 | $1,122.60 | $258.84 |
| | 70,000 | 0 | 7 | 0 | $991.20 | $1,288.23 | $297.03 |
| | 94,000 | 0 | 7 | 0 | $1,331.04 | $1,729.90 | $398.86 |
| | 100,000 | 0 | 7 | 0 | $1,416.00 | $1,840.32 | $424.32 |
| | 128,000 | 0 | 7 | 0 | $1,812.48 | $2,355.61 | $543.13 |

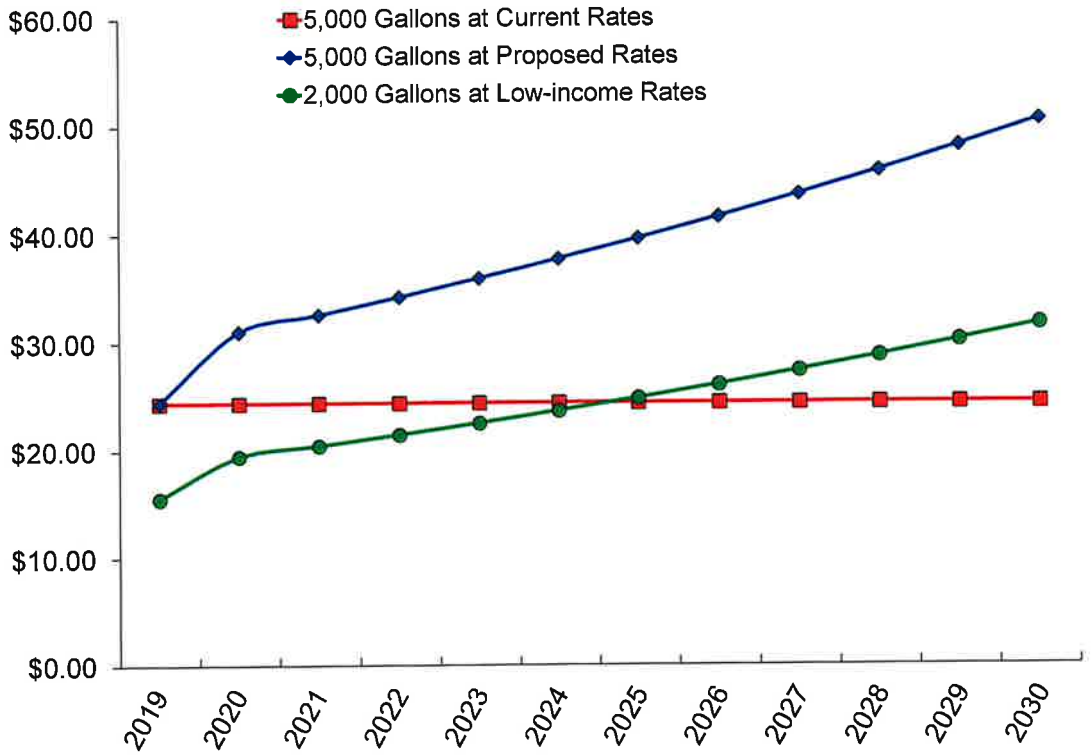
## Chart 1 - Operating Ratio



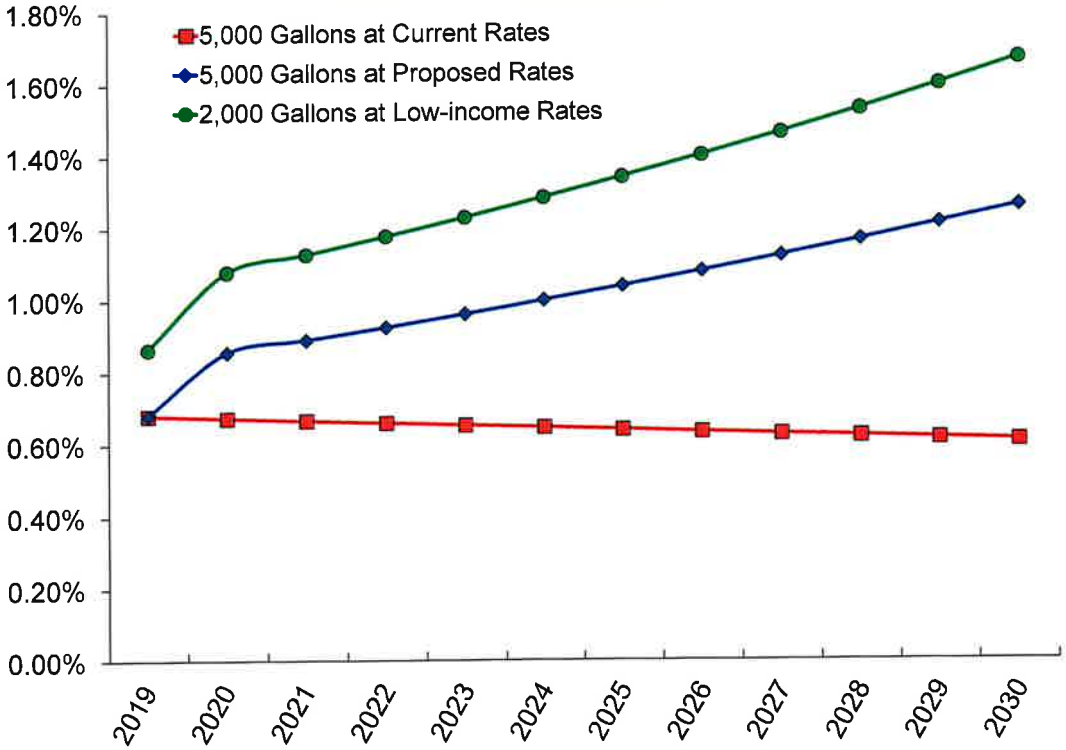

## Chart 2 - Coverage Ratio



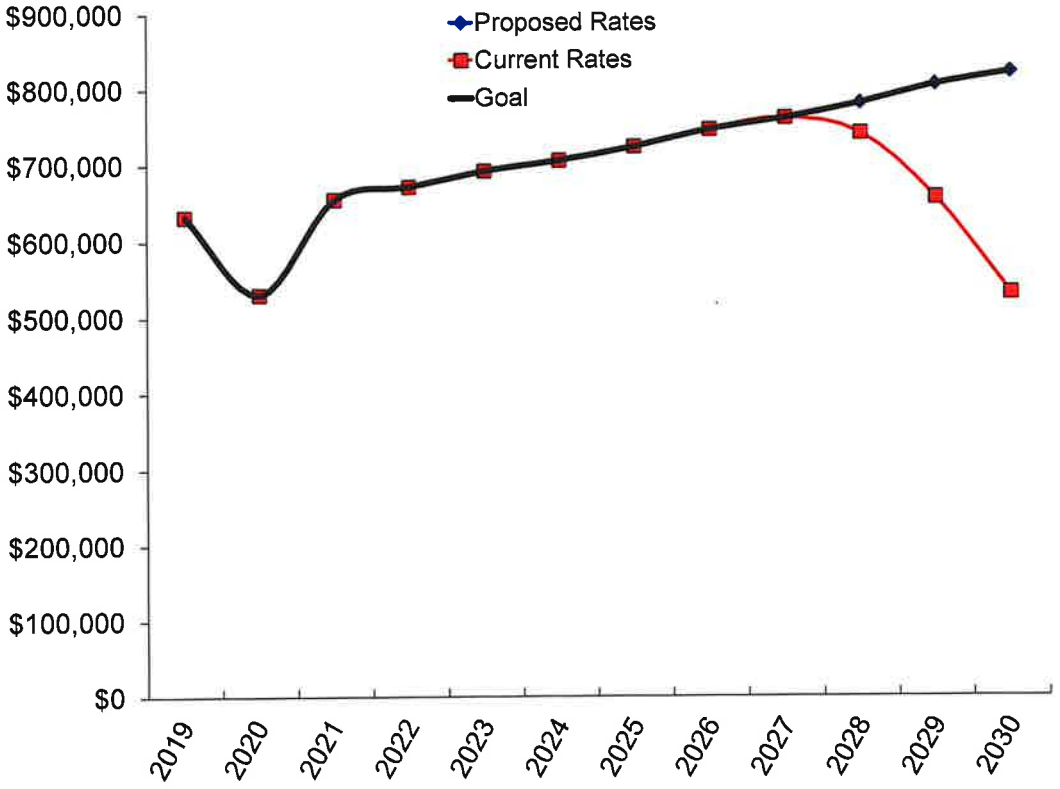
## Chart 3 - Residential Users' Bills



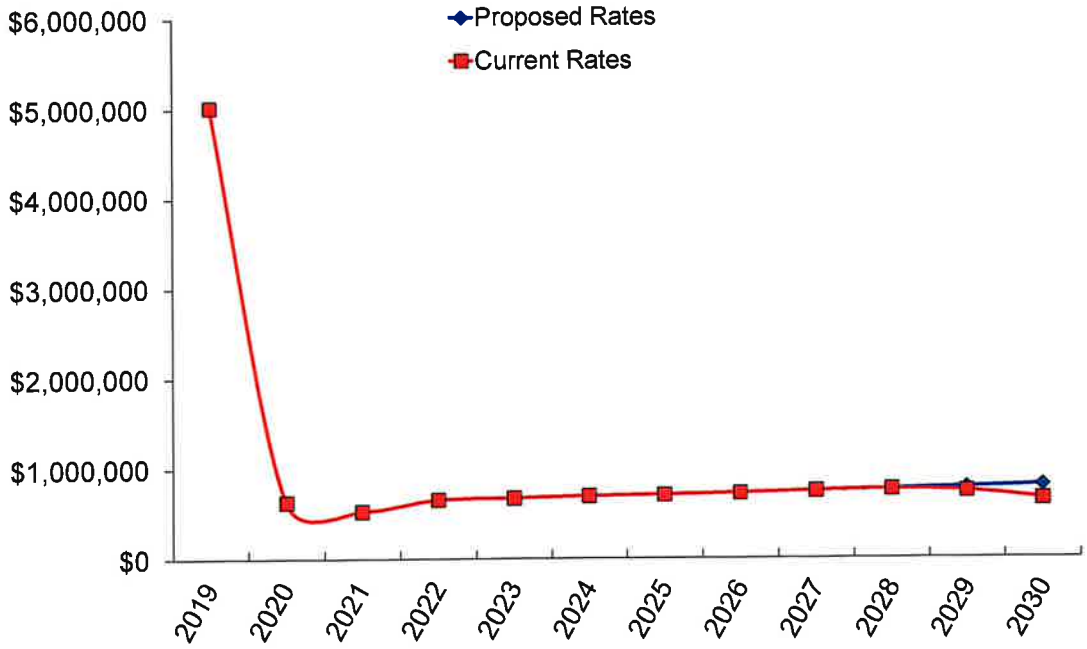

## Chart 4 - Affordability



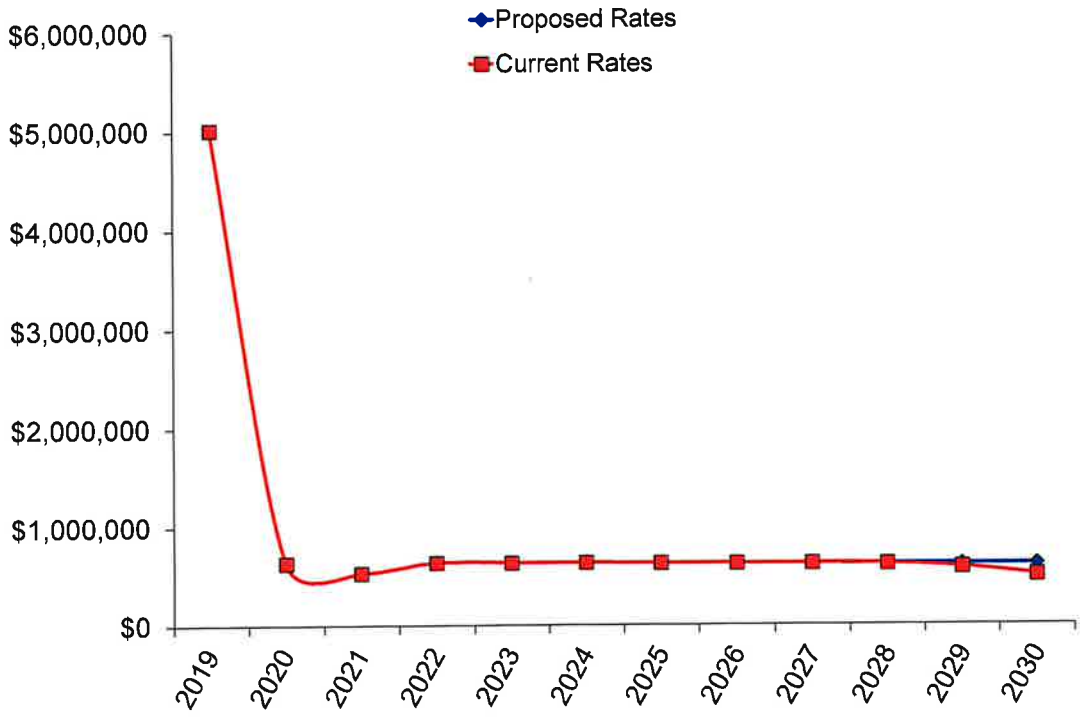
## Chart 5 - Working Capital vs Goal



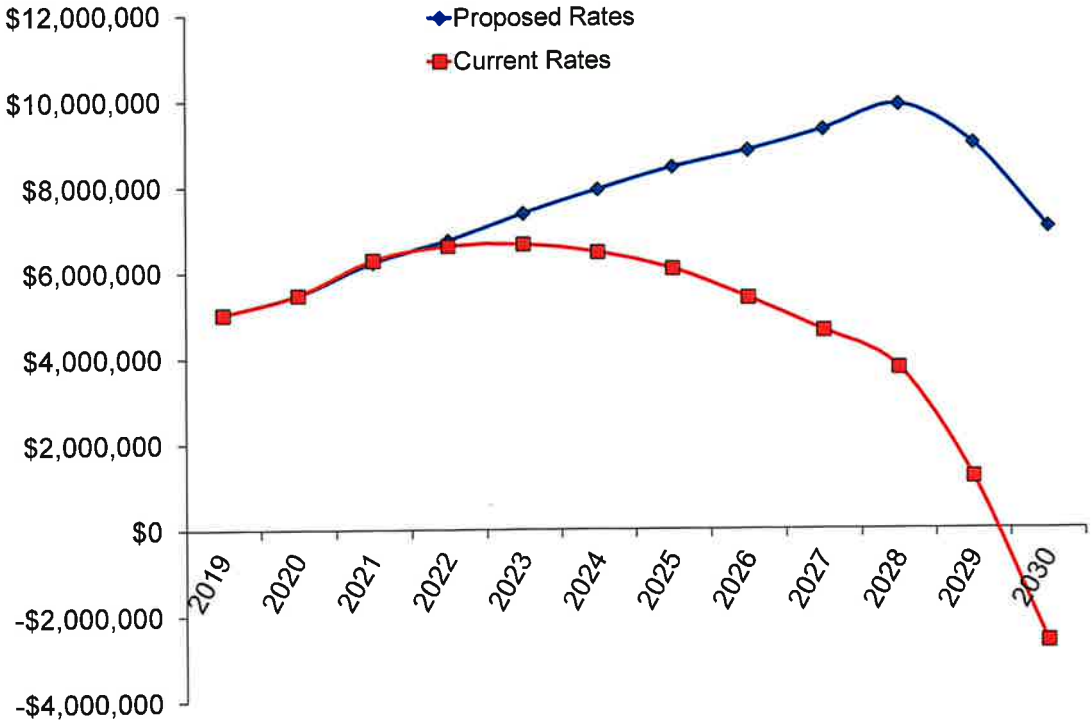

## Chart 6 - Value of Cash Assets Before Inflation



## Chart 7 - Value of Cash Assets After Inflation




## Chart 8 - Sum of All Reserves



# Prince George County, VA, 2020 Sewer Rates Model 2

This model calculated cost-to-serve rates with only minor variances to better suit the utility's needs.

March 25, 2020
This rate analysis model was produced by
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Note: This document is a print out of the spreadsheet model used to calculate new user charge and other rates and fees for the next 10 years. These calculations are complex and are based upon many conditions and assumtions. These issues, and others, are described in a narrative report that accompanies this model.

# Table 1 - Rates

## Prince George County, VA, 2020 Sewer Rates Model 2

Unless rates were recently changed, these are the current rates. At the least, these rates were in effect at the end of the test year. If a volume range was left out of the table, in order to make it shorter, the unit charge that shows for the next lowest volume range also applies to the hidden volume range.

### Rates in Effect at End of Test Year

| Customer Type, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Billing Cycle Minimum Charge | Usage Allowance in 1,000s | Unit Charge per 1,000 Gallons |
|---|---|---|---|---|
| .625 Inch Meter Size | 0 | $24.82 | 0.000 | $8.83 |
| | 1,000 | $24.82 | 0.000 | $8.83 |
| | 1,000,000 | $24.82 | 0.000 | $8.83 |
| 1 Inch Meter Size | 0 | $39.08 | 0.000 | $8.83 |
| | 1,000 | $39.08 | 0.000 | $8.83 |
| | 1,000,000 | $39.08 | 0.000 | $8.83 |
| 1.5 Inch Meter Size | 0 | $68.34 | 0.000 | $8.83 |
| | 1,000 | $68.34 | 0.000 | $8.83 |
| | 1,000,000 | $68.34 | 0.000 | $8.83 |
| 2 Inch Meter Size | 0 | $109.30 | 0.000 | $8.83 |
| | 1,000 | $109.30 | 0.000 | $8.83 |
| | 1,000,000 | $109.30 | 0.000 | $8.83 |
| 3 Inch Meter Size | 0 | $226.38 | 0.000 | $8.83 |
| | 1,000 | $226.38 | 0.000 | $8.83 |
| | 1,000,000 | $226.38 | 0.000 | $8.83 |
| 4 Inch Meter Size | 0 | $390.22 | 0.000 | $8.83 |
| | 1,000 | $390.22 | 0.000 | $8.83 |
| | 1,000,000 | $390.22 | 0.000 | $8.83 |
| 6 Inch Meter Size | 0 | $858.38 | 0.000 | $8.83 |
| | 1,000 | $858.38 | 0.000 | $8.83 |
| | 1,000,000 | $858.38 | 0.000 | $8.83 |
| 8 Inch Meter Size | 0 | $1,513.82 | 0.000 | $8.83 |
| | 1,000 | $1,513.82 | 0.000 | $8.83 |
| | 5,000,000 | $1,513.82 | 0.000 | $8.83 |
| Hotels 1 | 0 | $0.00 | 0.000 | $2.61 |
| | 5,000,000 | $0.00 | 0.000 | $2.61 |
| Hotels 2 | 0 | $0.00 | 0.000 | $3.20 |
| | 5,000,000 | $0.00 | 0.000 | $3.20 |
| Hydrants | 0 | $0.00 | 0.000 | $14.16 |
| | 5,000,000 | $0.00 | 0.000 | $14.16 |

# Table 2 - Test Year Usage
# Prince George County, VA, 2020 Sewer Rates Model 2

This table shows usage by all customers during the test year.

Test year = the one-year period being analyzed starts: 7/1/2018

Date this model created: 2/20/2020

Residential meter readings per year: 6

Other customer readings per year: 6

Bills per year: 6

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|
| .625 Inch Meter Size | -55,170 | -1 | 43 | -284,330 | 43 | -284,330 | 7 | 0.2% | -0.1% |
| | 0 | 999 | 22,092 | 21,195,884 | 1,270 | 373,884 | 212 | 5.4% | 0.1% |
| | 1,000 | 1,999 | 20,822 | 20,417,012 | 883 | 1,361,012 | 147 | 3.8% | 0.3% |
| | 2,000 | 2,999 | 19,939 | 19,222,114 | 1,465 | 3,678,114 | 244 | 6.2% | 0.7% |
| | 3,000 | 3,999 | 18,474 | 17,556,711 | 1,851 | 6,486,711 | 309 | 7.9% | 1.2% |
| | 4,000 | 4,999 | 16,623 | 15,475,248 | 2,235 | 10,027,248 | 373 | 9.5% | 1.9% |
| | 5,000 | 5,999 | 14,388 | 13,262,533 | 2,137 | 11,696,533 | 356 | 9.1% | 2.2% |
| | 6,000 | 6,999 | 12,251 | 11,413,570 | 1,206 | 7,604,570 | 201 | 5.1% | 1.4% |
| | 7,000 | 7,999 | 11,045 | 10,386,672 | 1,548 | 11,725,672 | 258 | 6.6% | 2.2% |
| | 8,000 | 8,999 | 9,497 | 8,575,685 | 1,687 | 14,261,685 | 281 | 7.2% | 2.7% |
| | 9,000 | 9,999 | 7,810 | 7,064,107 | 1,431 | 13,564,107 | 239 | 6.1% | 2.6% |
| | 10,000 | 24,999 | 6,379 | 32,510,547 | 5,780 | 81,325,547 | 963 | 24.6% | 15.4% |
| | 25,000 | 49,999 | 599 | 6,754,595 | 475 | 15,529,595 | 79 | 2.0% | 2.9% |
| | 50,000 | 74,999 | 124 | 1,909,905 | 79 | 4,734,905 | 13 | 0.3% | 0.9% |
| | 75,000 | 99,999 | 45 | 800,162 | 22 | 1,875,162 | 4 | 0.1% | 0.4% |
| | 100,000 | 124,999 | 23 | 461,190 | 8 | 886,190 | 1 | 0.0% | 0.2% |
| | 125,000 | 149,999 | 15 | 264,890 | 10 | 1,389,890 | 2 | 0.0% | 0.3% |
| | 150,000 | 174,999 | 5 | 110,800 | 2 | 335,800 | 0 | 0.0% | 0.1% |
| | 175,000 | 199,999 | 3 | 66,357 | 1 | 191,357 | 0 | 0.0% | 0.0% |
| | 200,000 | 224,999 | 2 | 9,150 | 2 | 409,150 | 0 | 0.0% | 0.1% |
| | | | 160,179 | 187,172,802 | 22,135 | 187,172,802 | 3,689 | 94.3% | 35.4% |
| 1 Inch Meter Size | -31,720 | -1 | 1 | -31,720 | 1 | -31,720 | 0 | 0.0% | 0.0% |
| | 0 | 999 | 540 | 483,812 | 69 | 12,812 | 12 | 0.3% | 0.0% |
| | 1,000 | 1,999 | 471 | 460,125 | 22 | 33,125 | 4 | 0.1% | 0.0% |
| | 2,000 | 2,999 | 449 | 439,450 | 19 | 47,450 | 3 | 0.1% | 0.0% |
| | 3,000 | 3,999 | 430 | 423,149 | 16 | 57,149 | 3 | 0.1% | 0.0% |
| | 4,000 | 4,999 | 414 | 403,390 | 24 | 109,390 | 4 | 0.1% | 0.0% |
| | 5,000 | 5,999 | 390 | 378,085 | 21 | 114,085 | 4 | 0.1% | 0.0% |
| | 6,000 | 6,999 | 369 | 358,706 | 21 | 136,706 | 4 | 0.1% | 0.0% |
| | 7,000 | 7,999 | 348 | 339,502 | 19 | 143,502 | 3 | 0.1% | 0.0% |
| | 8,000 | 8,999 | 329 | 316,554 | 21 | 176,554 | 4 | 0.1% | 0.0% |
| | 9,000 | 9,999 | 308 | 300,650 | 19 | 182,650 | 3 | 0.1% | 0.0% |
| | 10,000 | 24,999 | 289 | 3,397,091 | 111 | 1,837,091 | 19 | 0.5% | 0.3% |
| | 25,000 | 49,999 | 178 | 3,261,585 | 82 | 2,911,585 | 14 | 0.3% | 0.6% |
| | 50,000 | 74,999 | 96 | 1,739,259 | 41 | 2,414,259 | 7 | 0.2% | 0.5% |
| | 75,000 | 99,999 | 55 | 1,122,461 | 20 | 1,747,461 | 3 | 0.1% | 0.3% |
| | 100,000 | 124,999 | 35 | 795,317 | 5 | 545,317 | 1 | 0.0% | 0.1% |
| | 125,000 | 149,999 | 30 | 672,784 | 4 | 522,784 | 1 | 0.0% | 0.1% |
| | 150,000 | 174,999 | 26 | 583,027 | 5 | 808,027 | 1 | 0.0% | 0.2% |
| | 175,000 | 199,999 | 21 | 503,736 | 5 | 978,736 | 1 | 0.0% | 0.2% |
| | 200,000 | 224,999 | 16 | 341,131 | 3 | 616,131 | 1 | 0.0% | 0.1% |
| | 225,000 | 249,999 | 13 | 282,755 | 4 | 957,755 | 1 | 0.0% | 0.2% |
| | 250,000 | 274,999 | 9 | 209,521 | 2 | 534,521 | 0 | 0.0% | 0.1% |
| | 275,000 | 299,999 | 7 | 156,753 | 1 | 281,753 | 0 | 0.0% | 0.1% |
| | 300,000 | 324,999 | 6 | 136,122 | 4 | 1,286,122 | 1 | 0.0% | 0.2% |
| | 325,000 | 349,999 | 2 | 37,733 | 2 | 687,733 | 0 | 0.0% | 0.1% |
| | | | 4,832 | 17,110,978 | 541 | 17,110,978 | 90 | 2.3% | 3.2% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | 253 | 237,467 | 20 | 4,467 | 3 | 0.1% | 0.0% |
| | 1,000 | 1,999 | 233 | 230,573 | 6 | 9,573 | 1 | 0.0% | 0.0% |
| | 2,000 | 2,999 | 227 | 219,668 | 10 | 22,668 | 2 | 0.0% | 0.0% |
| | 3,000 | 3,999 | 217 | 215,258 | 6 | 22,258 | 1 | 0.0% | 0.0% |
| | 4,000 | 4,999 | 211 | 205,513 | 12 | 54,513 | 2 | 0.1% | 0.0% |
| | 5,000 | 5,999 | 199 | 192,631 | 10 | 53,631 | 2 | 0.0% | 0.0% |
| | 6,000 | 6,999 | 189 | 188,800 | 1 | 6,800 | 0 | 0.0% | 0.0% |
| | 7,000 | 7,999 | 188 | 181,632 | 11 | 81,632 | 2 | 0.0% | 0.0% |
| | 8,000 | 8,999 | 177 | 176,400 | 1 | 8,400 | 0 | 0.0% | 0.0% |
| | 9,000 | 9,999 | 176 | 171,266 | 8 | 75,266 | 1 | 0.0% | 0.0% |
| | 10,000 | 10,999 | 168 | 164,806 | 4 | 40,806 | 1 | 0.0% | 0.0% |
| | 11,000 | 24,999 | 164 | 1,997,662 | 38 | 651,662 | 6 | 0.2% | 0.1% |
| | 25,000 | 49,999 | 126 | 2,787,441 | 27 | 987,441 | 5 | 0.1% | 0.2% |
| 1.5 Inch Meter Size | 50,000 | 74,999 | 99 | 2,087,137 | 32 | 2,012,137 | 5 | 0.1% | 0.4% |
| | 75,000 | 99,999 | 67 | 1,215,958 | 34 | 2,940,958 | 6 | 0.1% | 0.6% |
| | 100,000 | 124,999 | 33 | 695,949 | 9 | 995,949 | 2 | 0.0% | 0.2% |
| | 125,000 | 149,999 | 24 | 543,300 | 7 | 993,300 | 1 | 0.0% | 0.2% |
| | 150,000 | 174,999 | 17 | 383,600 | 5 | 833,600 | 1 | 0.0% | 0.2% |
| | 175,000 | 199,999 | 12 | 248,700 | 4 | 748,700 | 1 | 0.0% | 0.1% |
| | 200,000 | 224,999 | 8 | 182,500 | 1 | 207,500 | 0 | 0.0% | 0.0% |
| | 225,000 | 249,999 | 7 | 175,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 250,000 | 274,999 | 7 | 175,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 275,000 | 299,999 | 7 | 175,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 324,999 | 7 | 175,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 325,000 | 349,999 | 7 | 175,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 350,000 | 999,999 | 7 | 2,519,970 | 7 | 4,969,970 | 1 | 0.0% | 0.9% |
| | 1,000,000 | 6,000,000 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | | | 2,830 | 15,721,231 | 253 | 15,721,231 | 42 | 1.1% | 3.0% |
| | 0 | 999 | 341 | 320,405 | 24 | 3,405 | 4 | 0.1% | 0.0% |
| | 1,000 | 1,999 | 317 | 316,500 | 1 | 1,500 | 0 | 0.0% | 0.0% |
| | 2,000 | 2,999 | 316 | 316,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 3,000 | 3,999 | 316 | 315,249 | 1 | 3,249 | 0 | 0.0% | 0.0% |
| | 4,000 | 4,999 | 315 | 315,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 315 | 314,200 | 1 | 5,200 | 0 | 0.0% | 0.0% |
| | 6,000 | 6,999 | 314 | 311,973 | 3 | 18,973 | 1 | 0.0% | 0.0% |
| | 7,000 | 7,999 | 311 | 308,300 | 4 | 29,300 | 1 | 0.0% | 0.0% |
| | 8,000 | 8,999 | 307 | 304,833 | 4 | 33,833 | 1 | 0.0% | 0.0% |
| | 9,000 | 9,999 | 303 | 298,440 | 8 | 75,440 | 1 | 0.0% | 0.0% |
| | 10,000 | 10,999 | 295 | 292,266 | 7 | 74,266 | 1 | 0.0% | 0.0% |
| | 11,000 | 24,999 | 288 | 3,606,572 | 48 | 774,572 | 8 | 0.2% | 0.1% |
| | 25,000 | 49,999 | 240 | 5,273,256 | 54 | 1,973,256 | 9 | 0.2% | 0.4% |
| 2 Inch Meter Size | 50,000 | 74,999 | 186 | 4,201,099 | 27 | 1,576,099 | 5 | 0.1% | 0.3% |
| | 75,000 | 99,999 | 159 | 3,694,045 | 25 | 2,219,045 | 4 | 0.1% | 0.4% |
| | 100,000 | 124,999 | 134 | 3,223,541 | 7 | 748,541 | 1 | 0.0% | 0.1% |
| | 125,000 | 149,999 | 127 | 3,078,267 | 8 | 1,103,267 | 1 | 0.0% | 0.2% |
| | 150,000 | 174,999 | 119 | 2,906,100 | 4 | 631,100 | 1 | 0.0% | 0.1% |
| | 175,000 | 199,999 | 115 | 2,750,647 | 10 | 1,875,647 | 2 | 0.0% | 0.4% |
| | 200,000 | 224,999 | 105 | 2,449,639 | 13 | 2,749,639 | 2 | 0.1% | 0.5% |
| | 225,000 | 249,999 | 92 | 2,154,931 | 10 | 2,354,931 | 2 | 0.0% | 0.4% |
| | 250,000 | 274,999 | 82 | 1,996,091 | 5 | 1,321,091 | 1 | 0.0% | 0.2% |
| | 275,000 | 299,999 | 77 | 1,803,050 | 9 | 2,578,050 | 2 | 0.0% | 0.5% |
| | 300,000 | 324,999 | 68 | 1,523,452 | 12 | 3,723,452 | 2 | 0.1% | 0.7% |
| | 325,000 | 349,999 | 56 | 1,341,886 | 5 | 1,691,886 | 1 | 0.0% | 0.3% |
| | 350,000 | 999,999 | 51 | 10,258,498 | 44 | 21,108,498 | 7 | 0.2% | 4.0% |
| | 1,000,000 | 5,000,000 | 7 | 2,900,700 | 7 | 9,900,700 | 1 | 0.0% | 1.9% |
| | | | 5,356 | 56,574,940 | 341 | 56,574,940 | 57 | 1.5% | 10.7% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | 42 | 40,000 | 2 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 40 | 40,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 2,999 | 40 | 39,650 | 1 | 2,650 | 0 | 0.0% | 0.0% |
| | 3,000 | 3,999 | 39 | 38,600 | 1 | 3,600 | 0 | 0.0% | 0.0% |
| | 4,000 | 4,999 | 38 | 38,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 38 | 38,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 6,999 | 38 | 38,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 7,000 | 7,999 | 38 | 38,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 8,999 | 38 | 38,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 9,000 | 9,999 | 38 | 37,050 | 1 | 9,050 | 0 | 0.0% | 0.0% |
| | 10,000 | 10,999 | 37 | 36,000 | 1 | 10,000 | 0 | 0.0% | 0.0% |
| | 11,000 | 24,999 | 36 | 503,150 | 1 | 24,150 | 0 | 0.0% | 0.0% |
| | 25,000 | 49,999 | 35 | 848,900 | 3 | 123,900 | 1 | 0.0% | 0.0% |
| 3 Inch Meter Size | 50,000 | 74,999 | 32 | 770,500 | 2 | 120,500 | 0 | 0.0% | 0.0% |
| | 75,000 | 99,999 | 30 | 726,500 | 1 | 76,500 | 0 | 0.0% | 0.0% |
| | 100,000 | 124,999 | 29 | 723,900 | 1 | 123,900 | 0 | 0.0% | 0.0% |
| | 125,000 | 149,999 | 28 | 646,600 | 4 | 546,600 | 1 | 0.0% | 0.1% |
| | 150,000 | 174,999 | 24 | 568,000 | 2 | 318,000 | 0 | 0.0% | 0.1% |
| | 175,000 | 199,999 | 22 | 535,200 | 1 | 185,200 | 0 | 0.0% | 0.0% |
| | 200,000 | 224,999 | 21 | 517,500 | 1 | 217,500 | 0 | 0.0% | 0.0% |
| | 225,000 | 249,999 | 20 | 500,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 250,000 | 274,999 | 20 | 466,800 | 2 | 516,800 | 0 | 0.0% | 0.1% |
| | 275,000 | 299,999 | 18 | 441,359 | 1 | 291,359 | 0 | 0.0% | 0.1% |
| | 300,000 | 324,999 | 17 | 351,961 | 5 | 1,551,961 | 1 | 0.0% | 0.3% |
| | 325,000 | 349,999 | 12 | 284,550 | 1 | 334,550 | 0 | 0.0% | 0.1% |
| | 350,000 | 999,999 | 11 | 4,970,910 | 5 | 2,820,910 | 1 | 0.0% | 0.5% |
| | 1,000,000 | 5,000,000 | 6 | 5,191,779 | 6 | 11,191,779 | 1 | 0.0% | 2.1% |
| | | | 787 | 18,468,909 | 42 | 18,468,909 | 7 | 0.2% | 3.5% |
| | 0 | 999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 2,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 3,000 | 3,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 4,000 | 4,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 6,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 7,000 | 7,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 8,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 9,000 | 9,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 10,999 | 84 | 84,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 11,000 | 24,999 | 84 | 1,145,700 | 5 | 94,700 | 1 | 0.0% | 0.0% |
| | 25,000 | 49,999 | 79 | 1,907,690 | 5 | 182,690 | 1 | 0.0% | 0.0% |
| 4 Inch Meter Size | 50,000 | 74,999 | 74 | 1,711,350 | 8 | 461,350 | 1 | 0.0% | 0.1% |
| | 75,000 | 99,999 | 66 | 1,650,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 124,999 | 66 | 1,650,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 125,000 | 149,999 | 66 | 1,650,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 150,000 | 174,999 | 66 | 1,650,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 175,000 | 199,999 | 66 | 1,650,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 200,000 | 224,999 | 66 | 1,650,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 225,000 | 249,999 | 66 | 1,636,000 | 1 | 236,000 | 0 | 0.0% | 0.0% |
| | 250,000 | 274,999 | 65 | 1,618,300 | 1 | 268,300 | 0 | 0.0% | 0.1% |
| | 275,000 | 299,999 | 64 | 1,575,500 | 1 | 275,500 | 0 | 0.0% | 0.1% |
| | 300,000 | 324,999 | 63 | 1,557,800 | 2 | 632,800 | 0 | 0.0% | 0.1% |
| | 325,000 | 349,999 | 61 | 1,517,400 | 1 | 342,400 | 0 | 0.0% | 0.1% |
| | 350,000 | 999,999 | 60 | 35,658,963 | 17 | 13,658,963 | 3 | 0.1% | 2.6% |
| | 1,000,000 | 11,000,000 | 43 | 81,018,323 | 43 | 124,018,323 | 7 | 0.2% | 23.5% |
| | | | 1,979 | 140,171,026 | 84 | 140,171,026 | 14 | 0.4% | 26.5% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | 42 | 37,049 | 5 | 49 | 1 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 2,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 3,000 | 3,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 4,000 | 4,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 6,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 7,000 | 7,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 8,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 9,000 | 9,999 | 37 | 37,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 10,999 | 37 | 36,712 | 1 | 10,712 | 0 | 0.0% | 0.0% |
| | 11,000 | 24,999 | 36 | 504,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 49,999 | 36 | 900,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| 6 Inch Meter Size | 50,000 | 74,999 | 36 | 857,447 | 2 | 107,447 | 0 | 0.0% | 0.0% |
| | 75,000 | 99,999 | 34 | 850,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 124,999 | 34 | 850,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 125,000 | 149,999 | 34 | 844,646 | 1 | 144,646 | 0 | 0.0% | 0.0% |
| | 150,000 | 174,999 | 33 | 818,570 | 1 | 168,570 | 0 | 0.0% | 0.0% |
| | 175,000 | 199,999 | 32 | 800,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 200,000 | 224,999 | 32 | 781,545 | 1 | 206,545 | 0 | 0.0% | 0.0% |
| | 225,000 | 249,999 | 31 | 775,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 250,000 | 274,999 | 31 | 775,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 275,000 | 299,999 | 31 | 757,185 | 1 | 282,185 | 0 | 0.0% | 0.1% |
| | 300,000 | 324,999 | 30 | 728,174 | 1 | 303,174 | 0 | 0.0% | 0.1% |
| | 325,000 | 349,999 | 29 | 702,336 | 1 | 327,336 | 0 | 0.0% | 0.1% |
| | 350,000 | 999,999 | 28 | 15,461,704 | 6 | 3,261,704 | 1 | 0.0% | 0.6% |
| | 1,000,000 | 12,000,000 | 22 | 56,110,726 | 22 | 78,110,726 | 4 | 0.1% | 14.8% |
| | | | 921 | 82,923,094 | 42 | 82,923,094 | 7 | 0.2% | 15.7% |
| | 0 | 999 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| 8 Inch Meter Size | 5,000,000 | 15,000,000 | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | | | 0 | 0 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 0 | 999 | 25 | 25,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 25 | 25,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 25 | 75,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 25 | 25,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 25 | 50,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 25 | 50,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 25 | 125,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 25 | 500,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 25 | 275,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| Hotels 1 | 61,000 | 69,999 | 25 | 225,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 70,000 | 93,999 | 25 | 600,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 25 | 150,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 25 | 700,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 25 | 1,756,700 | 1 | 156,700 | 0 | 0.0% | 0.0% |
| | 200,000 | 214,999 | 24 | 360,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 215,000 | 288,999 | 24 | 1,738,800 | 4 | 1,118,800 | 1 | 0.0% | 0.2% |
| | 289,000 | 299,999 | 20 | 211,000 | 2 | 591,000 | 0 | 0.0% | 0.1% |
| | 300,000 | 384,999 | 18 | 1,131,000 | 9 | 3,066,000 | 2 | 0.0% | 0.6% |
| | 385,000 | 399,999 | 9 | 122,000 | 1 | 387,000 | 0 | 0.0% | 0.1% |
| | 400,000 | 499,999 | 8 | 410,000 | 6 | 2,610,000 | 1 | 0.0% | 0.5% |
| | 500,000 | 866,999 | 2 | 321,000 | 2 | 1,321,000 | 0 | 0.0% | 0.2% |
| | | | 530 | 9,250,500 | 25 | 9,250,500 | 4 | 0.1% | 1.7% |

# Table 2 - Test Year Usage

| Customer, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Count of Bills With ANY Use in Each Range | Use in Each Range in Gallons | Count of Bills That "Maxed Out" in Each Range | Volume of Bills That "Maxed Out" in Each Range | # of Customers That "Maxed Out" in Each Range | % of Customers That "Maxed Out" in Each Range | % of Total Use in Each Range |
|---|---|---|---|---|---|---|---|---|---|
| Hotels 2 | 0 | 999 | 6 | 6,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 1,000 | 1,999 | 6 | 6,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 2,000 | 4,999 | 6 | 18,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 5,000 | 5,999 | 6 | 6,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 6,000 | 7,999 | 6 | 12,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 8,000 | 9,999 | 6 | 12,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 10,000 | 14,999 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 15,000 | 19,999 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 20,000 | 24,999 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 25,000 | 29,999 | 6 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 30,000 | 49,999 | 6 | 120,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 50,000 | 60,999 | 6 | 66,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 61,000 | 69,999 | 6 | 54,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 70,000 | 93,999 | 6 | 144,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 94,000 | 99,999 | 6 | 36,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 100,000 | 127,999 | 6 | 168,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 128,000 | 199,999 | 6 | 221,500 | 4 | 589,500 | 1 | 0.0% | 0.1% |
| | 200,000 | 214,999 | 2 | 30,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 215,000 | 288,999 | 2 | 148,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 289,000 | 299,999 | 2 | 22,000 | 0 | 0 | 0 | 0.0% | 0.0% |
| | 300,000 | 384,999 | 2 | 56,000 | 2 | 656,000 | 0 | 0.0% | 0.1% |
| | | | 110 | 1,245,500 | 6 | 1,245,500 | 1 | 0.0% | 0.2% |
| | | Grand Totals: | 177,524 | 528,638,980 | 23,469 | 528,638,980 | 3,912 | 100% | 100% |

# Table 3 - Operating Incomes and Basic User Data

# Prince George County, VA, 2020 Sewer Rates Model 2

This table depicts user statistics, customer growth, and system incomes and across the board "inflationary" style rate increases through the 10th year.

## Annual Median Household Income (AMHI)

| | | |
|---|---|---|
| $42,589 | Census Bureau estimate of AMHI for the year | 2017 |
| $42,161 | Census Bureau estimate of AMHI for the year | 2016 |
| $428 | AMHI growth during this time period | |
| 1.02% | Simple annual income growth rate during this time period (used to project incomes into the future) | |

## Test Year Growth of Customer Base and Average Tap Fee Paid per Connection

10 Number of new connections made during the test year

$14,705 Average tap or connection fee assessed during the test year

This model is programmed for rates to be reset in the "Analysis Year," also called the "0 Year" column below (heading highlighted blue). Revenues will be collected at the now-current rates for the first part of the analysis year and the modeled rates for the last part of the analysis year. Thus, the revenues shown in the last column of that table are "blended" revenues; part collected at the old rates and part collected at the new rates. It was then assumed that all rate adjustments made after the initial (major) adjustment will be done annually on approximately the anniversary of the first adjustment. If rates will not be adjusted during the "0 Year," an adjustment (normally a revenue reduction) was calculated below to account for the late start in making the first adjustments.

## Basic User (Customer) Data

| (First year balances and incomes are actual, subsequent years are projected.) | Inflation/ Deflation (–) Factor | Test Year | Analysis Year 0 Year | Years Following the Analysis Year (for Which Results Have Been Projected) 1st Year | 2nd Year | 3rd Year | 4th Year | 5th Year | 6th Year | 7th Year | 8th Year | 9th Year | 10th Year |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Starting 7/1/18 | Starting 7/1/19 | Starting 7/1/20 | Starting 7/1/21 | Starting 7/1/22 | Starting 7/1/23 | Starting 7/1/24 | Starting 7/1/25 | Starting 7/1/26 | Starting 7/1/27 | Starting 7/1/28 | Starting 7/1/29 |
| Rate Increases Projected for Future Years | N.A. | N.A. | N.A. | | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% | 3.0% |
| | | | | The row above shows the rate at which user charge fees should be increased for each year beyond the initial rate adjustment year. Unless stated otherwise, these should be across-the-board increases to all rates and fees and that should continue until a new rate analysis is done. | | | | | | | | | |
| Average Number of Customers | N.A. | 3,912 | 3,922 | 3,932 | 3,942 | 3,952 | 3,962 | 3,972 | 3,982 | 3,992 | 4,002 | 4,012 | 4,022 |
| Customers Added or Lost ( - ) Each Year | N.A. | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 | 10.0 |
| Customer Growth or Loss ( - ) Rate | N.A. | 0.26% | 0.26% | 0.25% | 0.25% | 0.25% | 0.25% | 0.25% | 0.25% | 0.25% | 0.25% | 0.25% | 0.25% |
| Actual (Test Year) and Projected Service, in Gallons | N.A. | 528,638,980 | 529,990,479 | 531,341,979 | 532,693,478 | 534,044,977 | 535,396,477 | 536,747,976 | 538,099,476 | 539,450,975 | 540,802,474 | 542,153,974 | 543,505,473 |
| **How User Charge Fees Were Calculated, Accounting for New Customers and Future Rate Increases** | | | | | | | | | | | | | |
| Actual or Calculated Sales Revenues | | $5,306,765 | $5,307,037 | $5,568,687 | $5,750,337 | $5,937,912 | $6,131,527 | $6,331,415 | $6,537,778 | $6,750,824 | $6,970,770 | $7,197,836 | $7,432,252 |
| Additional Sales Revenues From New Customers | | | $37 | $14,164 | $14,626 | $15,027 | $15,478 | $15,942 | $16,420 | $16,913 | $17,420 | $17,943 | $18,481 |
| Total Calculated Revenues (User Charge Fees) | | $5,306,765 | $5,307,074 | $5,582,851 | $5,764,963 | $5,952,939 | $6,147,005 | $6,347,357 | $6,554,198 | $6,767,737 | $6,988,190 | $7,215,779 | $7,450,733 |
| **Operating Incomes** | | | | | | | | | | | | | |
| User Charge Fees (Tables 10, 12, 12B, 15, 15B, 16, 16B) | N.A. | $4,261,549 | $4,185,000 | $4,402,470 | $4,546,078 | $4,694,310 | $4,847,344 | $5,005,336 | $5,168,445 | $5,336,835 | $5,510,678 | $5,690,147 | $5,875,426 |
| Late Payment Charge | N.A. | $185,078 | $37,500 | $37,595 | $37,691 | $37,786 | $37,882 | $37,977 | $38,073 | $38,168 | $38,263 | $38,359 | $38,454 |
| New Sewer Taps or Connections (Current Rate Structure) | % Above | $147,050 | $160,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $1 | $2 |
| Meter Size-based System Development Fees (Tables 13, 14) | % Above | $0 | $0 | $51,567 | $53,114 | $54,707 | $56,348 | $58,039 | $59,780 | $61,573 | $63,420 | $65,323 | $67,283 |
| Interest Income | N.A. | $0 | $0 | $11,098 | $13,012 | $13,378 | $13,789 | $14,144 | $14,546 | $14,997 | $15,388 | $15,829 | $16,325 |
| RECONNECTION CHARGES | N.A. | $18,263 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 | $12,500 |
| MISCELLANEOUS | N.A. | $23,475 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 | $18,750 |
| SALE OF VEHICLE | N.A. | $1,057 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Income | N.A. | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Revenue Loss Because Rate Adjustments Made This Number of Months Late | 6.0 | $0 | $0 | -$49,864 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **Total Operating Incomes** | | $4,636,472 | $4,413,750 | $4,484,116 | $4,681,145 | $4,831,431 | $4,986,613 | $5,146,746 | $5,312,093 | $5,482,824 | $5,658,999 | $5,840,910 | $6,028,741 |

# Table 4 - Operating Costs and Net Income

## Prince George County, VA, 2020 Sewer Rates Model 2

This table depicts expenses during the test year, this year and for the next 10 years. Some future costs will experience inflation. Those costs that go up as use goes up are increased by the cost inflation factor plus the growth rate in users.

(First year costs and net incomes are actual, subsequent years are projected.)

| | | | Analysis Year | Years Following the Analysis Year (for Which Results Have Been Projected) | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Inflation/ Deflation (–) Factor | Test Year Starting 7/1/18 | 0 Year Starting 7/1/19 | 1st Year Starting 7/1/20 | 2nd Year Starting 7/1/21 | 3rd Year Starting 7/1/22 | 4th Year Starting 7/1/23 | 5th Year Starting 7/1/24 | 6th Year Starting 7/1/25 | 7th Year Starting 7/1/26 | 8th Year Starting 7/1/27 | 9th Year Starting 7/1/28 | 10th Year Starting 7/1/29 |
| ACNT & AUDIT SRVC | 3.0% | $7,500 | $8,668 | $8,928 | $9,195 | $9,471 | $9,755 | $10,048 | $10,349 | $10,660 | $10,980 | $11,309 | $11,648 |
| BOOKS & SUBS | 3.0% | $143 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| BUILDING SUPPLIES | 3.0% | $159 | $1,000 | $1,030 | $1,061 | $1,093 | $1,126 | $1,159 | $1,194 | $1,230 | $1,267 | $1,305 | $1,344 |
| CAREER DEVELOPMENT | 3.0% | $0 | $5,000 | $5,150 | $5,305 | $5,464 | $5,628 | $5,796 | $5,970 | $6,149 | $6,334 | $6,524 | $6,720 |
| CONTRACT FEES / ADMIN | 3.0% | $74,327 | $59,000 | $60,770 | $62,593 | $64,471 | $66,405 | $68,397 | $70,449 | $72,563 | $74,739 | $76,982 | $79,291 |
| CONVENTION & ED | 3.0% | $3,396 | $3,750 | $3,863 | $3,978 | $4,098 | $4,221 | $4,347 | $4,478 | $4,612 | $4,750 | $4,893 | $5,040 |
| DEPRECIATION EXPENS | 3.0% | $393,812 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| DISABILITY INSUR | 3.0% | $244 | $490 | $505 | $520 | $535 | $551 | $568 | $585 | $603 | $621 | $639 | $659 |
| DUES AND MEMBERSHIP | 3.0% | $704 | $750 | $773 | $796 | $820 | $844 | $869 | $896 | $922 | $950 | $979 | $1,008 |
| ELECTRICAL | 3.0% | $61,560 | $50,750 | $52,406 | $54,115 | $55,880 | $57,703 | $59,584 | $61,526 | $63,531 | $65,601 | $67,737 | $69,943 |
| EQUIP PARTS & SUPPLIES | 3.0% | $9,517 | $8,250 | $8,498 | $8,752 | $9,015 | $9,285 | $9,564 | $9,851 | $10,146 | $10,451 | $10,764 | $11,087 |
| FICA | 3.0% | $23,021 | $29,482 | $30,366 | $31,277 | $32,215 | $33,182 | $34,177 | $35,202 | $36,259 | $37,346 | $38,467 | $39,621 |
| FIRST AID/SAFETY | 3.0% | $1,978 | $1,000 | $1,030 | $1,061 | $1,093 | $1,126 | $1,159 | $1,194 | $1,230 | $1,267 | $1,305 | $1,344 |
| FOOD SUPPLIES | 3.0% | $433 | $400 | $412 | $424 | $437 | $450 | $464 | $478 | $492 | $507 | $522 | $538 |
| GROUP LIFE INSUR | 3.0% | $3,953 | $4,839 | $4,984 | $5,134 | $5,288 | $5,446 | $5,610 | $5,778 | $5,951 | $6,130 | $6,314 | $6,503 |
| HOPE CHG PD TO | 3.0% | $1,348,772 | $1,675,000 | $1,729,649 | $1,786,070 | $1,844,332 | $1,904,469 | $1,966,555 | $2,030,652 | $2,096,825 | $2,165,140 | $2,235,667 | $2,308,478 |
| HOSPITAL/MEDICAL | 3.0% | $155,728 | $82,625 | $85,104 | $87,657 | $90,287 | $92,995 | $95,785 | $98,659 | $101,618 | $104,667 | $107,807 | $111,041 |
| LEASE/RENT OF BUILD | 3.0% | $25,996 | $30,078 | $30,980 | $31,909 | $32,866 | $33,852 | $34,868 | $35,914 | $36,992 | $38,101 | $39,244 | $40,422 |
| MOTOR POOL | 3.0% | $3,814 | $2,500 | $2,575 | $2,652 | $2,732 | $2,814 | $2,898 | $2,985 | $3,075 | $3,167 | $3,262 | $3,360 |
| MTR VEH INSURANCE | 3.0% | $3,032 | $3,150 | $3,245 | $3,342 | $3,442 | $3,545 | $3,652 | $3,761 | $3,874 | $3,990 | $4,110 | $4,233 |
| OFFICE SUPPLIES | 3.0% | $3,060 | $2,350 | $2,421 | $2,493 | $2,568 | $2,645 | $2,724 | $2,806 | $2,890 | $2,977 | $3,066 | $3,158 |
| OPERATING SUPPLIES | 3.0% | $65,809 | $37,500 | $38,625 | $39,784 | $40,977 | $42,207 | $43,473 | $44,777 | $46,120 | $47,504 | $48,929 | $50,397 |
| OVERTIME | 3.0% | $3,724 | $10,000 | $10,300 | $10,609 | $10,927 | $11,255 | $11,593 | $11,941 | $12,299 | $12,668 | $13,048 | $13,439 |
| POSTAL SERVICE | 3.0% | $8,237 | $10,000 | $10,326 | $10,663 | $11,011 | $11,370 | $11,741 | $12,123 | $12,518 | $12,926 | $13,347 | $13,782 |
| PROF SERVICES | 3.0% | $131 | $2,500 | $2,575 | $2,652 | $2,732 | $2,814 | $2,898 | $2,985 | $3,075 | $3,167 | $3,262 | $3,360 |
| PUMPING PETERSBURG | 3.0% | $606,678 | $670,000 | $691,860 | $714,428 | $737,733 | $761,788 | $786,622 | $812,261 | $838,730 | $866,056 | $894,267 | $923,391 |
| RETIREMENT-VRS | 3.0% | $24,700 | $53,745 | $55,357 | $57,018 | $58,728 | $60,490 | $62,305 | $64,174 | $66,099 | $68,082 | $70,124 | $72,228 |
| SAL & WAGE | 3.0% | $318,038 | $364,378 | $375,309 | $386,568 | $398,165 | $410,110 | $422,413 | $435,086 | $448,138 | $461,583 | $475,430 | $489,693 |
| SANITATION SVC DUMP | 3.0% | $1,424 | $480 | $496 | $512 | $529 | $546 | $564 | $582 | $601 | $620 | $641 | $662 |
| TELEPHONE | 3.0% | $9,512 | $8,750 | $9,013 | $9,283 | $9,561 | $9,848 | $10,144 | $10,448 | $10,761 | $11,084 | $11,417 | $11,759 |
| UNIFORM/APPAREL | 3.0% | $2,796 | $3,750 | $3,863 | $3,978 | $4,098 | $4,221 | $4,347 | $4,478 | $4,612 | $4,750 | $4,893 | $5,040 |
| VEH&EQUIP FUEL | 3.0% | $226 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| VEHICLE EQUIP. SUP | 3.0% | $763 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| VEHICLE/EQUIP FUEL | 3.0% | $12,954 | $12,500 | $12,875 | $13,261 | $13,659 | $14,069 | $14,491 | $14,926 | $15,373 | $15,835 | $16,310 | $16,799 |
| WORKER'S COMP | 3.0% | $10,683 | $11,217 | $11,554 | $11,900 | $12,257 | $12,625 | $13,004 | $13,394 | $13,795 | $14,209 | $14,636 | $15,075 |
| BILLING SUPPLIES | 3.0% | $3,710 | $2,250 | $2,323 | $2,399 | $2,477 | $2,558 | $2,642 | $2,728 | $2,817 | $2,908 | $3,003 | $3,101 |
| PART-TIME SALARIES | 3.0% | $6,777 | $6,000 | $6,180 | $6,365 | $6,556 | $6,753 | $6,956 | $7,164 | $7,379 | $7,601 | $7,829 | $8,063 |

# Table 4 - Operating Costs and Net Income

| | Inflation/ Deflation (–) Factor | Test Year Starting 7/1/18 | 0 Year Starting 7/1/19 | 1st Year Starting 7/1/20 | 2nd Year Starting 7/1/21 | 3rd Year Starting 7/1/22 | 4th Year Starting 7/1/23 | 5th Year Starting 7/1/24 | 6th Year Starting 7/1/25 | 7th Year Starting 7/1/26 | 8th Year Starting 7/1/27 | 9th Year Starting 7/1/28 | 10th Year Starting 7/1/29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| REPL RESERVES (0610-7002) | 3.0% | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 | Table 6 |
| SURCHARGE CAP RESERVES | 3.0% | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 |
| TRANS CAP RESERVES | 3.0% | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 |
| | 3.0% | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **One-time Reduction of R&R Annuity** | 0.0% | -$454,497 | -$454,497 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| **Annual Payment to R&R Reserve (Table 7)** | 0.0% | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 | $454,497 |
| **User Charge Analysis Services** | 5.0% | $0 | $8,780 | $0 | $0 | $9,680 | $0 | $0 | $10,672 | $0 | $0 | $11,766 | $0 |
| Total CIP-related Payouts | N.A. | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 | Table 5 |
| **Total Operating Costs** | | **$3,197,310** | **$3,170,930** | **$3,717,837** | **$3,822,253** | **$3,939,694** | **$4,041,192** | **$4,155,913** | **$4,284,961** | **$4,396,436** | **$4,522,475** | **$4,664,294** | **$4,786,723** |
| Net Income (or Loss) | | $1,439,161 | $1,242,821 | $766,279 | $858,892 | $891,737 | $945,421 | $990,833 | $1,027,132 | $1,086,388 | $1,136,524 | $1,176,616 | $1,242,019 |
| Working Capital Goal: 35% | In Dollars, That is: | $1,119,059 | $1,109,825 | $1,301,243 | $1,337,789 | $1,378,893 | $1,414,417 | $1,454,570 | $1,499,736 | $1,538,753 | $1,582,866 | $1,632,503 | $1,675,353 |

Notes: The yellow highlighted cost items above will rise due to inflation and due to the additional cost of serving new customers. The Authority made transfers to a capital reserves fund. Those items are listed above without the dollar amounts. This table automatically transfers any net income in excess of the working capital reserve goal to Table 5, so the transfers above have been "zeroed out" but are covered by the modeling.

# Table 5 - Capital Improvement Program (CIP)

## Prince George County, VA, 2020 Sewer Rates Model 2

This table depicts capital improvements and their funding. Costs reflect inflation.

| | Test Year Starting | Analysis Year 0 Year Starting | 1st Year Starting | 2nd Year Starting | 3rd Year Starting | 4th Year Starting | 5th Year Starting | 6th Year Starting | 7th Year Starting | 8th Year Starting | 9th Year Starting | 10th Year Starting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/1/18 | 7/1/19 | 7/1/20 | 7/1/21 | 7/1/22 | 7/1/23 | 7/1/24 | 7/1/25 | 7/1/26 | 7/1/27 | 7/1/28 | 7/1/29 |
| **Planned Spending, Debt-paid Portion of Projects** (CIP costs to be funded with loans are shown in this section.) | | | | | | | | | | | | |
| SCADA Implementation Sewer | $0 | $0 | $25,000 | $0 | $50,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Fountain Ridge Sewer rehabilitation | $0 | $0 | $0 | $25,000 | $25,000 | $25,000 | $25,000 | $0 | $0 | $0 | $0 | $0 |
| SPS 17 (Jordan on the James) Equipment Replacement & Station Rehab | $0 | $0 | $0 | $37,500 | $325,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS16 (Cedarwood) Rehabilitation | $0 | $0 | $0 | $30,000 | $150,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Route 460 Gravity Sewer Inspection & Rehab | $0 | $0 | $0 | $75,000 | $0 | $75,000 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS 7 (Johnson Road) Replacement | $0 | $0 | $165,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS 8 (Wildwood Farms) Replacement | $0 | $0 | $0 | $20,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS11 (Beechwood) Rebuild (Sub Pump Repl, piping, valves, elec.) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $25,000 | $200,000 | $0 |
| SPS9 (Rt460/Jail) Replacement | $0 | $0 | $0 | $0 | $0 | $25,000 | $200,000 | $0 | $0 | $0 | $0 | $0 |
| SPS13 (Bull Hill) Replacement | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $250,000 |
| SPS12 (Crossings) Replacement | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Gravity Extension and Decomission of SPS1 | $0 | $0 | $0 | $0 | $0 | $0 | $75,000 | $0 | $0 | $750,000 | $0 | $0 |
| Gravity Extension & Decommission of SPS2 | $0 | $0 | $0 | $0 | $0 | $0 | $50,000 | $0 | $400,000 | $0 | $0 | $0 |
| Gravity Extension & SPS3 Rehabilitation | $0 | $0 | $0 | $37,500 | $250,000 | $0 | $75,000 | $1,500,000 | $0 | $0 | $0 | $0 |
| New Blackwater Regional Interceptor and Sewer Facilities (sCEN-A-01) modified | $0 | $0 | $0 | $125,000 | $125,000 | $2,500,000 | $2,500,000 | $0 | $0 | $0 | $0 | $0 |
| New 8 MGD Wastewater Treatment Plant | $0 | $0 | $75,000 | $150,000 | $0 | $10,000,000 | $7,500,000 | $0 | $0 | $0 | $0 | $0 |
| Puddledock Regional SPS | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Second Swamp Regional Interceptor & Pump Station Phase I (sCEN-B-01&02) | $0 | $0 | $0 | $50,000 | $125,000 | $2,500,000 | $2,500,000 | $0 | $0 | $0 | $0 | $0 |
| Total Debt-paid Portion of Projects | $0 | $0 | $265,000 | $550,000 | $1,150,000 | $15,125,000 | $12,925,000 | $1,500,000 | $400,000 | $775,000 | $200,000 | $250,000 |
| **Planned Spending, Grant-paid Portion of Projects** (CIP costs to be grant-funded are shown here.) | | | | | | | | | | | | |
| SCADA Implementation Sewer | $0 | $0 | $25,000 | $0 | $50,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Fountain Ridge Sewer rehabilitation | $0 | $0 | $0 | $25,000 | $25,000 | $25,000 | $25,000 | $0 | $0 | $0 | $0 | $0 |
| SPS 17 (Jordan on the James) Equipment Replacement & Station Rehab | $0 | $0 | $0 | $37,500 | $325,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS16 (Cedarwood) Rehabilitation | $0 | $0 | $0 | $30,000 | $150,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Route 460 Gravity Sewer Inspection & Rehab | $0 | $0 | $0 | $75,000 | $0 | $75,000 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS 7 (Johnson Road) Replacement | $0 | $0 | $165,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS 8 (Wildwood Farms) Replacement | $0 | $0 | $0 | $20,000 | $100,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| SPS11 (Beechwood) Rebuild (Sub Pump Repl, piping, valves, elec.) | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $25,000 | $200,000 | $0 |
| SPS9 (Rt460/Jail) Replacement | $0 | $0 | $0 | $0 | $0 | $25,000 | $200,000 | $0 | $0 | $0 | $0 | $0 |
| SPS13 (Bull Hill) Replacement | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $250,000 |
| SPS12 (Crossings) Replacement | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Gravity Extension and Decomission of SPS1 | $0 | $0 | $0 | $0 | $0 | $0 | $75,000 | $0 | $0 | $750,000 | $0 | $0 |
| Gravity Extension & Decommission of SPS2 | $0 | $0 | $0 | $0 | $0 | $0 | $50,000 | $0 | $400,000 | $0 | $0 | $0 |
| Gravity Extension & SPS3 Rehabilitation | $0 | $0 | $0 | $37,500 | $250,000 | $0 | $75,000 | $1,500,000 | $0 | $0 | $0 | $0 |
| New Blackwater Regional Interceptor and Sewer Facilities (sCEN-A-01) modified | $0 | $0 | $0 | $125,000 | $125,000 | $2,500,000 | $2,500,000 | $0 | $0 | $0 | $0 | $0 |
| New 8 MGD Wastewater Treatment Plant | $0 | $0 | $75,000 | $150,000 | $0 | $10,000,000 | $7,500,000 | $0 | $0 | $0 | $0 | $0 |
| Puddledock Regional SPS | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Second Swamp Regional Interceptor & Pump Station Phase I (sCEN-B-01&02) | $0 | $0 | $0 | $50,000 | $125,000 | $2,500,000 | $2,500,000 | $0 | $0 | $0 | $0 | $0 |
| Total Grant-paid Portion of Projects | $0 | $0 | $265,000 | $550,000 | $1,150,000 | $15,125,000 | $12,925,000 | $1,500,000 | $400,000 | $775,000 | $200,000 | $250,000 |

# Table 5 - Capital Improvement Program (CIP)

This table depicts capital improvements and their funding. Costs reflect inflation.

| | Test Year Starting | Analysis Year: 0 Year Starting | 1st Year Starting | 2nd Year Starting | 3rd Year Starting | 4th Year Starting | 5th Year Starting | 6th Year Starting | 7th Year Starting | 8th Year Starting | 9th Year Starting | 10th Year Starting |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 7/1/18 | 7/1/19 | 7/1/20 | 7/1/21 | 7/1/22 | 7/1/23 | 7/1/24 | 7/1/25 | 7/1/26 | 7/1/27 | 7/1/28 | 7/1/29 |
| **Planned Spending, Cash-paid Portion of Projects** (CIP costs to be funded from reserves are shown here.) | | | | | | | | | | | | |
| SCWWA 2019: Nutrient Removal Upgrade (est $78M) | $0 | $0 | $0 | $0 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 |
| Total Cash-paid Portion of Projects | $0 | $0 | $0 | $0 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 | $418,752 |
| **Total CIP Costs** | **$0** | **$0** | **$530,000** | **$1,100,000** | **$2,718,752** | **$30,668,752** | **$26,268,752** | **$3,418,752** | **$1,218,752** | **$1,968,752** | **$818,752** | **$918,752** |
| **Debt Repayment** | | | | | | | | | | | | |
| Existing Debt Payments (Following is debt that was initiated during the test year or earlier.) | | | | | | | | | | | | |
| 2015B Series (Sewer) Rehab | $9,239 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 | $36,396 |
| New Debt Payments (Following are payments for projects to be paid with new debt. It is assumed these will be loan/lease-financed for a term of: 20 years at a 2.0% interest rate.) | | | | | | | | | | | | |
| Loan Originated in 1st Year | | | | $16,207 | $16,207 | $16,207 | $16,207 | $16,207 | $16,207 | $16,207 | $16,207 | $16,207 |
| Loan Originated in 2nd Year | | | | | $33,636 | $33,636 | $33,636 | $33,636 | $33,636 | $33,636 | $33,636 | $33,636 |
| Loan Originated in 3rd Year | | | | | | $70,330 | $70,330 | $70,330 | $70,330 | $70,330 | $70,330 | $70,330 |
| Loan Originated in 4th Year | | | | | | | $924,995 | $924,995 | $924,995 | $924,995 | $924,995 | $924,995 |
| Loan Originated in 5th Year | | | | | | | | $790,451 | $790,451 | $790,451 | $790,451 | $790,451 |
| Loan Originated in 6th Year | | | | | | | | | $91,735 | $91,735 | $91,735 | $91,735 |
| Loan Originated in 7th Year | | | | | | | | | | $24,463 | $24,463 | $24,463 |
| Loan Originated in 8th Year | | | | | | | | | | | $47,396 | $47,396 |
| Total Debt Payments | $9,239 | $36,396 | $36,396 | $52,603 | $86,239 | $156,569 | $1,081,564 | $1,872,015 | $1,963,750 | $1,988,213 | $2,035,609 | $2,047,841 |
| **Total CIP-related Payouts** | **$9,239** | **$36,396** | **$566,396** | **$1,152,603** | **$2,804,991** | **$30,825,321** | **$27,350,316** | **$5,290,767** | **$3,182,502** | **$3,956,965** | **$2,854,361** | **$2,966,593** |
| (This is the total cash required for this CIP and debt payment schedule. These amounts must come from utility income, reserves or outside sources, as shown in the next section.) | | | | | | | | | | | | |
| **CIP Fund Sources** (Following are the sources and amounts of funds expected to pay for the above CIP schedule.) | | | | | | | | | | | | |
| Cash Reserves (Internal Funds) | | | | | | | | | | | | |
| Debt and CIP Reserves Starting Balance | $0 | $5,327,437 | $6,649,644 | $7,321,102 | $8,237,267 | $8,747,655 | $9,257,184 | $8,892,692 | $7,761,744 | $6,581,848 | $5,398,930 | $4,179,527 |
| Working Capital Transferred in | $5,336,677 | $1,252,054 | $574,861 | $822,346 | $850,633 | $909,897 | $950,681 | $981,965 | $1,047,371 | $1,092,411 | $1,126,979 | $1,199,169 |
| Debt and CIP Reserves Interest Earned (or Paid) | $0 | $106,549 | $132,993 | $146,422 | $164,745 | $174,953 | $185,144 | $177,854 | $155,235 | $131,637 | $107,979 | $83,591 |
| Total Available Internal Funds | $5,336,677 | $6,686,040 | $7,357,498 | $8,289,870 | $9,252,646 | $9,832,505 | $10,393,008 | $10,052,511 | $8,964,350 | $7,805,895 | $6,633,888 | $5,462,286 |
| Grant and Loan Proceeds (External Funds) | | | | | | | | | | | | |
| Grants Assumed in Second Sub-section Above | $0 | $0 | $265,000 | $550,000 | $1,150,000 | $15,125,000 | $12,925,000 | $1,500,000 | $400,000 | $775,000 | $200,000 | $250,000 |
| Loan Originated in 1st Year | | | $265,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 2nd Year | | | | $550,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 3rd Year | | | | | $1,150,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 4th Year | | | | | | $15,125,000 | $0 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 5th Year | | | | | | | $12,925,000 | $0 | $0 | $0 | $0 | $0 |
| Loan Originated in 6th Year | | | | | | | | $1,500,000 | $0 | $0 | $0 | $0 |
| Loan Originated in 7th Year | | | | | | | | | $400,000 | $0 | $0 | $0 |
| Loan Originated in 8th Year | | | | | | | | | | $775,000 | $0 | $0 |
| Total Available External Funds | $0 | $0 | $530,000 | $1,100,000 | $2,300,000 | $30,250,000 | $25,850,000 | $3,000,000 | $800,000 | $1,550,000 | $400,000 | $500,000 |
| **Total Available Funds** | **$5,336,677** | **$6,686,040** | **$7,887,498** | **$9,389,870** | **$11,552,646** | **$40,082,505** | **$36,243,008** | **$13,052,511** | **$9,764,350** | **$9,355,895** | **$7,033,888** | **$5,962,286** |
| **Outcomes** (This CIP spending and funding plan will result in the following cash needs and ending balances each year.) | | | | | | | | | | | | |
| **Total Available Funds** | **$5,336,677** | **$6,686,040** | **$7,887,498** | **$9,389,870** | **$11,552,646** | **$40,082,505** | **$36,243,008** | **$13,052,511** | **$9,764,350** | **$9,355,895** | **$7,033,888** | **$5,962,286** |
| **Total CIP-related Payouts** | **$9,239** | **$36,396** | **$566,396** | **$1,152,603** | **$2,804,991** | **$30,825,321** | **$27,350,316** | **$5,290,767** | **$3,182,502** | **$3,956,965** | **$2,854,361** | **$2,966,593** |
| **Debt and CIP Reserves Ending Balances** | **$5,327,437** | **$6,649,644** | **$7,321,102** | **$8,237,267** | **$8,747,655** | **$9,257,184** | **$8,892,692** | **$7,761,744** | **$6,581,848** | **$5,398,930** | **$4,179,527** | **$2,995,694** |

Notes: The Authority needs to undertake many projects, some like those in the 4th and 5th years above, will be quite expensive. Debt payments in the 5th and 6th years will jump markedly. Those project costs that originate with ARWA or SCWWA will be paid for, on a percentage share basis, and that debt cost will be added to the fees the Authority pays to those suppliers. The amounts to plan on adding to those fees are included above in the "Planned Spending, Cash-paid Portion of Projects" section.

## Table 6 - Equipment Replacement Schedule - Detailed

## Prince George County, VA, 2020 Sewer Rates Model 2

| Year Beginning | REPL RESERVES (0610-7002) From Table 4 | Reasonable Additional Replacement Needs | | | | | | | Total Annual Replacement Costs |
|---|---|---|---|---|---|---|---|---|---|
| 7/1/18 | $84,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $84,000 |
| 7/1/19 | $129,000 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $129,000 |
| 7/1/20 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/21 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/22 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/23 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/24 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/25 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/26 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/27 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/28 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/29 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/30 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/31 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/32 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/33 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/34 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/35 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/36 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/37 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/38 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/39 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/40 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/41 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |
| 7/1/42 | $129,000 | $200,000 | $0 | $0 | $0 | $0 | $0 | $0 | $329,000 |

# Table 7 - Equipment Replacement Annuity Calculation

## Prince George County, VA, 2020 Sewer Rates Model 2

This table calculates the annual annuity (savings deposit) needed to build replacement (R&R) reserves. This annuity amount should actually be deposited in a savings account. The annuity amount, called the "Required Annual Deposit (Annuity) to Replacement Account" below, should be included in the utility's general budget as a cost. As a result, all replacement and refurbishment scheduled in Table 6, the detailed replacement schedule, would be paid for out of R&R reserves and not out of the utility's general budget.

In simple terms, the annuity at the bottom of this table should be deposited into an account each year and R&R projects should be paid for out of that account.

3.00% Average Inflation Rate for the Following Sewer System Equipment for the Term of This Replacement Schedule

2.00% Average Interest Rate on Balances Invested for the Term of This Replacement Schedule

2.00% Average Interest Rate on Amounts Borrowed for the Term of This Replacement Schedule

| Year Beginning | Schedule Year | This Year's Costs in Current Dollars | Future Annual Inflated Net Costs | Interest Earned on Prior Balance | End of Year Balance in Future Dollars | Minimum Desired End of Year Balance in Future Dollars |
|---|---|---|---|---|---|---|
| 7/1/18 | Analysis Year | $84,000 | $84,000 | $0 | -$84,000 | $302,550 |
| 7/1/19 | 1st Year | $129,000 | $132,870 | -$1,680 | $235,947 | $311,627 |
| 7/1/20 | 2nd Year | $329,000 | $349,036 | $4,719 | $346,127 | $320,975 |
| 7/1/21 | 3rd Year | $329,000 | $359,507 | $6,923 | $448,039 | $330,605 |
| 7/1/22 | 4th Year | $329,000 | $370,292 | $8,961 | $541,205 | $340,523 |
| 7/1/23 | 5th Year | $329,000 | $381,401 | $10,824 | $625,125 | $350,738 |
| 7/1/24 | 6th Year | $329,000 | $392,843 | $12,502 | $699,281 | $361,261 |
| 7/1/25 | 7th Year | $329,000 | $404,629 | $13,986 | $763,135 | $372,098 |
| 7/1/26 | 8th Year | $329,000 | $416,767 | $15,263 | $816,128 | $383,261 |
| 7/1/27 | 9th Year | $329,000 | $429,270 | $16,323 | $857,677 | $394,759 |
| 7/1/28 | 10th Year | $329,000 | $442,148 | $17,154 | $887,179 | $406,602 |
| 7/1/29 | 11th Year | $329,000 | $455,413 | $17,744 | $904,007 | $418,800 |
| 7/1/30 | 12th Year | $329,000 | $469,075 | $18,080 | $907,509 | $431,364 |
| 7/1/31 | 13th Year | $329,000 | $483,148 | $18,150 | $897,009 | $444,305 |
| 7/1/32 | 14th Year | $329,000 | $497,642 | $17,940 | $871,804 | $457,634 |
| 7/1/33 | 15th Year | $329,000 | $512,571 | $17,436 | $831,166 | $471,363 |
| 7/1/34 | 16th Year | $329,000 | $527,948 | $16,623 | $774,338 | $485,504 |
| 7/1/35 | 17th Year | $329,000 | $543,787 | $15,487 | $700,535 | $500,069 |
| 7/1/36 | 18th Year | $329,000 | $560,100 | $14,011 | $608,942 | $515,071 |
| 7/1/37 | 19th Year | $329,000 | $576,903 | $12,179 | $498,714 | $530,523 |

Notes: There is currently no R&R schedule. Average R&R costs were instead estimated. A Discretionary Annuity amount was added so that at the end of the 20-year modeling period, the balance will equal the average of the annual replacement cost amounts, less interest paid for borrowing during the negative balance years.

| | | |
|---|---|---|
| Starting Account Balance | $0 | $302,550 |
| Minimum Annual Annuity | $432,662 | Minimum Desired Balance in Today's Dollars |
| Discretionary Annuity | $21,835 | |

**Required Annual Deposit (Annuity) to Replacement Account** **$454,497**

(This amount is included in Table 4 as an operating cost.)

# Table 8 - Average Cost Classification

## Prince George County, VA, 2020 Sewer Rates Model 2

This table distributes costs from a representative year (the "average rate structure basis year) to fixed and variable categories (see Definitions) in order to calculate the "cost of service" rate structure for that year.

The average rate structure basis year runs from: 7/1/2024 through 6/30/2025

| Cost Items | Cost During Rate Structure Basis Year | Fixed Cost % | Variable Cost % | Fixed Cost | Variable Cost |
|---|---|---|---|---|---|
| ACNT & AUDIT SRVC | $10,048 | 100.0% | 0.0% | $10,048 | $0 |
| BOOKS & SUBS | $0 | 100.0% | 0.0% | $0 | $0 |
| BUILDING SUPPLIES | $1,159 | 100.0% | 0.0% | $1,159 | $0 |
| CAREER DEVELOPMENT | $5,796 | 25.0% | 75.0% | $1,449 | $4,347 |
| CONTRACT FEES / ADMIN | $68,397 | 14.6% | 85.4% | $9,986 | $58,411 |
| CONVENTION & ED | $4,347 | 25.0% | 75.0% | $1,087 | $3,260 |
| DEPRECIATION EXPENS | $0 | 14.6% | 85.4% | $0 | $0 |
| DISABILITY INSUR | $568 | 25.0% | 75.0% | $142 | $426 |
| DUES AND MEMBERSHIP | $869 | 25.0% | 75.0% | $217 | $652 |
| ELECTRICAL | $59,584 | 0.0% | 100.0% | $0 | $59,584 |
| EQUIP PARTS & SUPPLIES | $9,564 | 100.0% | 0.0% | $9,564 | $0 |
| FICA | $34,177 | 25.0% | 75.0% | $8,544 | $25,633 |
| FIRST AID/SAFETY | $1,159 | 14.6% | 85.4% | $169 | $990 |
| FOOD SUPPLIES | $464 | 14.6% | 85.4% | $68 | $396 |
| GROUP LIFE INSUR | $5,610 | 25.0% | 75.0% | $1,402 | $4,207 |
| HOPE CHG PD TO | $1,966,555 | 0.0% | 100.0% | $0 | $1,966,555 |
| HOSPITAL/MEDICAL | $95,785 | 25.0% | 75.0% | $23,946 | $71,839 |
| LEASE/RENT OF BUILD | $34,868 | 14.6% | 85.4% | $5,091 | $29,777 |
| MOTOR POOL | $2,898 | 25.0% | 75.0% | $725 | $2,174 |
| MTR VEH INSURANCE | $3,652 | 25.0% | 75.0% | $913 | $2,739 |
| OFFICE SUPPLIES | $2,724 | 100.0% | 0.0% | $2,724 | $0 |
| OPERATING SUPPLIES | $43,473 | 25.0% | 75.0% | $10,868 | $32,605 |
| OVERTIME | $11,593 | 25.0% | 75.0% | $2,898 | $8,695 |
| POSTAL SERVICE | $11,741 | 100.0% | 0.0% | $11,741 | $0 |
| PROF SERVICES | $2,898 | 14.6% | 85.4% | $423 | $2,475 |
| PUMPING PETERSBURG | $786,622 | 0.0% | 100.0% | $0 | $786,622 |

# Table 8 - Average Cost Classification

| Cost Items | Cost During Rate Structure Basis Year | Fixed Cost % | Variable Cost % | Fixed Cost | Variable Cost |
|---|---|---|---|---|---|
| RETIREMENT-VRS | $62,305 | 25.0% | 75.0% | $15,576 | $46,728 |
| SAL & WAGE | $422,413 | 25.0% | 75.0% | $105,603 | $316,810 |
| SANITATION SVC DUMP | $564 | 0.0% | 100.0% | $0 | $564 |
| TELEPHONE | $10,144 | 100.0% | 0.0% | $10,144 | $0 |
| UNIFORM/APPAREL | $4,347 | 14.6% | 85.4% | $635 | $3,713 |
| VEH&EQUIP FUEL | $0 | 14.6% | 85.4% | $0 | $0 |
| VEHICLE EQUIP. SUP | $0 | 14.6% | 85.4% | $0 | $0 |
| VEHICLE/EQUIP FUEL | $14,491 | 14.6% | 85.4% | $2,116 | $12,375 |
| WORKER'S COMP | $13,004 | 25.0% | 75.0% | $3,251 | $9,753 |
| BILLING SUPPLIES | $2,642 | 100.0% | 0.0% | $2,642 | $0 |
| PART-TIME SALARIES | $6,956 | 25.0% | 75.0% | $1,739 | $5,217 |
| REPL RESERVES (0610-7002) | Table 6 | 25.0% | 75.0% | $0 | $0 |
| SURCHARGE CAP RESERVES | Table 5 | 25.0% | 75.0% | $0 | $0 |
| TRANS CAP RESERVES | Table 5 | 25.0% | 75.0% | $0 | $0 |
| **Annual Payment to R&R Reserve (Table 7)** | $454,497 | 25.0% | 75.0% | $113,624 | $340,873 |
| **User Charge Analysis Services** | $0 | 14.6% | 85.4% | $0 | $0 |
| **Total CIP-related Payouts, Less Capacity Charges From Tables 14 & 16 (This value can be negative)** | $1,165,308 | 25.0% | 75.0% | $291,327 | $873,981 |
| Grand Total Costs, Weighted Avg Percentages | $5,321,221 | 12.2% | 87.8% | $649,821 | $4,671,400 |

## Bases for Cost to Serve Rate Structure

| | |
|---|---|
| Number Customers During Year Defined Above | 3,962 |
| Billed Volume, in Gallons, During Year Defined Above | 535,396,477 |
| Average Fixed Cost/User Every Other Month | $27.34 |
| Average Variable Cost to Produce per 1,000 Gallons During Year Defined Above | $8.73 |
| Gallons per Billing Cycle Used by Average Residential Customer | 8,456 |

Note: Master metered volume was questionable, so unbilled-for water and its cost were not calculated.

| | | |
|---|---|---|
| | 100% | $5,321,221 |
| Inflow and Infiltration is Estimated at | | 0% |
| Inflow and Infiltration is Estimated at This Percentage of Average Cost | | 39% |
| Resulting Cost of Inflow and Infiltration | | $0 |
| Test Year Customer Volume, in Gallons | | 528,638,980 |
| + Test Year Inflow and Infiltration, in Gallons | | 0 |
| Total Test Year Volume, in Gallons, From Master Meter Readings | | 528,638,980 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

## Prince George County, VA, 2020 Sewer Rates Model 2

This table calculates a new set of user charge rates and the revenues they would generate.

If there are no special costs to consider and before capacity costs are added, if appropriate, rates for a 5/8" meter would be in a "cost-to-serve" structure when: there is no usage allowance,
the base minimum charge is $27.42 Bi-monthly, and the unit charge is set at $8.75 per 1,000 Gallons.

After rate adjustments are made, customers will be billed every other month.

Following are Blended Sales Revenues. Sales at the current (Test Year) rates (gray highlighted column) will apply until rates are adjusted. Sales at the modeled rates (yellow highlighted column) would apply after the modeled rates are adopted. Adding both together, the "blended" sales revenues show in the right-most column.

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| .625 Inch Meter Size | -55,170 | -1 | -$1,439 | $33.67 | 0.000 | $8.75 | -$3 | -$1,442 |
| | 0 | 999 | $218,084 | $33.67 | 0.000 | $8.75 | $624 | $218,707 |
| | 1,000 | 1,999 | $201,646 | $33.67 | 0.000 | $8.75 | $569 | $202,215 |
| | 2,000 | 2,999 | $205,529 | $33.67 | 0.000 | $8.75 | $594 | $206,124 |
| | 3,000 | 3,999 | $200,418 | $33.67 | 0.000 | $8.75 | $590 | $201,008 |
| | 4,000 | 4,999 | $191,594 | $33.67 | 0.000 | $8.75 | $576 | $192,170 |
| | 5,000 | 5,999 | $169,684 | $33.67 | 0.000 | $8.75 | $514 | $170,197 |
| | 6,000 | 6,999 | $130,358 | $33.67 | 0.000 | $8.75 | $384 | $130,741 |
| | 7,000 | 7,999 | $129,780 | $33.67 | 0.000 | $8.75 | $391 | $130,171 |
| | 8,000 | 8,999 | $117,273 | $33.67 | 0.000 | $8.75 | $360 | $117,634 |
| | 9,000 | 9,999 | $97,626 | $33.67 | 0.000 | $8.75 | $301 | $97,927 |
| | 10,000 | 24,999 | $429,351 | $33.67 | 0.000 | $8.75 | $1,309 | $430,660 |
| | 25,000 | 49,999 | $71,237 | $33.67 | 0.000 | $8.75 | $205 | $71,443 |
| | 50,000 | 74,999 | $18,774 | $33.67 | 0.000 | $8.75 | $53 | $18,827 |
| | 75,000 | 99,999 | $7,591 | $33.67 | 0.000 | $8.75 | $21 | $7,612 |
| | 100,000 | 124,999 | $4,259 | $33.67 | 0.000 | $8.75 | $12 | $4,271 |
| | 125,000 | 149,999 | $2,580 | $33.67 | 0.000 | $8.75 | $7 | $2,587 |
| | 150,000 | 174,999 | $1,025 | $33.67 | 0.000 | $8.75 | $3 | $1,028 |
| | 175,000 | 199,999 | $609 | $33.67 | 0.000 | $8.75 | $2 | $611 |
| | 200,000 | 224,999 | $130 | $33.67 | 0.000 | $8.75 | $0 | $130 |
| 1 Inch Meter Size | -31,720 | -1 | -$240 | $43.05 | 0.000 | $8.75 | -$1 | -$241 |
| | 0 | 999 | $6,950 | $43.05 | 0.000 | $8.75 | $20 | $6,969 |
| | 1,000 | 1,999 | $4,909 | $43.05 | 0.000 | $8.75 | $14 | $4,923 |
| | 2,000 | 2,999 | $4,610 | $43.05 | 0.000 | $8.75 | $13 | $4,623 |
| | 3,000 | 3,999 | $4,350 | $43.05 | 0.000 | $8.75 | $12 | $4,362 |
| | 4,000 | 4,999 | $4,488 | $43.05 | 0.000 | $8.75 | $12 | $4,500 |
| | 5,000 | 5,999 | $4,148 | $43.05 | 0.000 | $8.75 | $12 | $4,159 |
| | 6,000 | 6,999 | $3,977 | $43.05 | 0.000 | $8.75 | $11 | $3,988 |
| | 7,000 | 7,999 | $3,730 | $43.05 | 0.000 | $8.75 | $10 | $3,740 |
| | 8,000 | 8,999 | $3,606 | $43.05 | 0.000 | $8.75 | $10 | $3,616 |
| | 9,000 | 9,999 | $3,388 | $43.05 | 0.000 | $8.75 | $9 | $3,397 |
| | 10,000 | 24,999 | $34,240 | $43.05 | 0.000 | $8.75 | $94 | $34,335 |
| | 25,000 | 49,999 | $31,917 | $43.05 | 0.000 | $8.75 | $88 | $32,005 |
| | 50,000 | 74,999 | $16,914 | $43.05 | 0.000 | $8.75 | $46 | $16,960 |
| | 75,000 | 99,999 | $10,664 | $43.05 | 0.000 | $8.75 | $29 | $10,693 |
| | 100,000 | 124,999 | $7,198 | $43.05 | 0.000 | $8.75 | $20 | $7,218 |
| | 125,000 | 149,999 | $6,080 | $43.05 | 0.000 | $8.75 | $17 | $6,097 |
| | 150,000 | 174,999 | $5,329 | $43.05 | 0.000 | $8.75 | $15 | $5,343 |
| | 175,000 | 199,999 | $4,631 | $43.05 | 0.000 | $8.75 | $13 | $4,643 |
| | 200,000 | 224,999 | $3,121 | $43.05 | 0.000 | $8.75 | $9 | $3,129 |
| | 225,000 | 249,999 | $2,646 | $43.05 | 0.000 | $8.75 | $7 | $2,653 |
| | 250,000 | 274,999 | $1,923 | $43.05 | 0.000 | $8.75 | $5 | $1,928 |
| | 275,000 | 299,999 | $1,419 | $43.05 | 0.000 | $8.75 | $4 | $1,423 |
| | 300,000 | 324,999 | $1,355 | $43.05 | 0.000 | $8.75 | $4 | $1,358 |
| | 325,000 | 349,999 | $410 | $43.05 | 0.000 | $8.75 | $1 | $411 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| 1.5 Inch Meter Size | 0 | 999 | $3,454 | $58.68 | 0.000 | $8.75 | $9 | $3,463 |
| | 1,000 | 1,999 | $2,439 | $58.68 | 0.000 | $8.75 | $6 | $2,446 |
| | 2,000 | 2,999 | $2,616 | $58.68 | 0.000 | $8.75 | $7 | $2,623 |
| | 3,000 | 3,999 | $2,304 | $58.68 | 0.000 | $8.75 | $6 | $2,311 |
| | 4,000 | 4,999 | $2,628 | $58.68 | 0.000 | $8.75 | $7 | $2,634 |
| | 5,000 | 5,999 | $2,378 | $58.68 | 0.000 | $8.75 | $6 | $2,384 |
| | 6,000 | 6,999 | $1,731 | $58.68 | 0.000 | $8.75 | $5 | $1,735 |
| | 7,000 | 7,999 | $2,349 | $58.68 | 0.000 | $8.75 | $6 | $2,355 |
| | 8,000 | 8,999 | $1,622 | $58.68 | 0.000 | $8.75 | $4 | $1,626 |
| | 9,000 | 9,999 | $2,053 | $58.68 | 0.000 | $8.75 | $5 | $2,059 |
| | 10,000 | 10,999 | $1,724 | $58.68 | 0.000 | $8.75 | $5 | $1,728 |
| | 11,000 | 24,999 | $20,181 | $58.68 | 0.000 | $8.75 | $54 | $20,235 |
| | 25,000 | 49,999 | $26,386 | $58.68 | 0.000 | $8.75 | $71 | $26,457 |
| | 50,000 | 74,999 | $20,560 | $58.68 | 0.000 | $8.75 | $55 | $20,615 |
| | 75,000 | 99,999 | $13,025 | $58.68 | 0.000 | $8.75 | $35 | $13,059 |
| | 100,000 | 124,999 | $6,742 | $58.68 | 0.000 | $8.75 | $18 | $6,760 |
| | 125,000 | 149,999 | $5,261 | $58.68 | 0.000 | $8.75 | $14 | $5,275 |
| | 150,000 | 174,999 | $3,719 | $58.68 | 0.000 | $8.75 | $10 | $3,729 |
| | 175,000 | 199,999 | $2,463 | $58.68 | 0.000 | $8.75 | $7 | $2,469 |
| | 200,000 | 224,999 | $1,675 | $58.68 | 0.000 | $8.75 | $5 | $1,680 |
| | 225,000 | 249,999 | $1,541 | $58.68 | 0.000 | $8.75 | $4 | $1,545 |
| | 250,000 | 274,999 | $1,541 | $58.68 | 0.000 | $8.75 | $4 | $1,545 |
| | 275,000 | 299,999 | $1,541 | $58.68 | 0.000 | $8.75 | $4 | $1,545 |
| | 300,000 | 324,999 | $1,541 | $58.68 | 0.000 | $8.75 | $4 | $1,545 |
| | 325,000 | 349,999 | $1,541 | $58.68 | 0.000 | $8.75 | $4 | $1,545 |
| | 350,000 | 999,999 | $22,668 | $58.68 | 0.000 | $8.75 | $61 | $22,729 |
| | 1,000,000 | 6,000,000 | $0 | $58.68 | 0.000 | $8.75 | $0 | $0 |
| 2 Inch Meter Size | 0 | 999 | $5,437 | $77.43 | 0.000 | $8.75 | $13 | $5,450 |
| | 1,000 | 1,999 | $2,896 | $77.43 | 0.000 | $8.75 | $8 | $2,904 |
| | 2,000 | 2,999 | $2,783 | $77.43 | 0.000 | $8.75 | $8 | $2,790 |
| | 3,000 | 3,999 | $2,885 | $77.43 | 0.000 | $8.75 | $8 | $2,893 |
| | 4,000 | 4,999 | $2,774 | $77.43 | 0.000 | $8.75 | $8 | $2,781 |
| | 5,000 | 5,999 | $2,876 | $77.43 | 0.000 | $8.75 | $8 | $2,884 |
| | 6,000 | 6,999 | $3,074 | $77.43 | 0.000 | $8.75 | $8 | $3,082 |
| | 7,000 | 7,999 | $3,151 | $77.43 | 0.000 | $8.75 | $8 | $3,159 |
| | 8,000 | 8,999 | $3,120 | $77.43 | 0.000 | $8.75 | $8 | $3,128 |
| | 9,000 | 9,999 | $3,500 | $77.43 | 0.000 | $8.75 | $9 | $3,509 |
| | 10,000 | 10,999 | $3,337 | $77.43 | 0.000 | $8.75 | $8 | $3,345 |
| | 11,000 | 24,999 | $36,991 | $77.43 | 0.000 | $8.75 | $96 | $37,087 |
| | 25,000 | 49,999 | $52,322 | $77.43 | 0.000 | $8.75 | $137 | $52,459 |
| | 50,000 | 74,999 | $39,937 | $77.43 | 0.000 | $8.75 | $106 | $40,044 |
| | 75,000 | 99,999 | $35,254 | $77.43 | 0.000 | $8.75 | $94 | $35,348 |
| | 100,000 | 124,999 | $29,149 | $77.43 | 0.000 | $8.75 | $79 | $29,228 |
| | 125,000 | 149,999 | $27,979 | $77.43 | 0.000 | $8.75 | $75 | $28,054 |
| | 150,000 | 174,999 | $26,027 | $77.43 | 0.000 | $8.75 | $70 | $26,097 |
| | 175,000 | 199,999 | $25,312 | $77.43 | 0.000 | $8.75 | $68 | $25,380 |
| | 200,000 | 224,999 | $22,986 | $77.43 | 0.000 | $8.75 | $61 | $23,050 |
| | 225,000 | 249,999 | $20,066 | $77.43 | 0.000 | $8.75 | $54 | $20,120 |
| | 250,000 | 274,999 | $18,122 | $77.43 | 0.000 | $8.75 | $49 | $18,171 |
| | 275,000 | 299,999 | $16,858 | $77.43 | 0.000 | $8.75 | $45 | $16,903 |
| | 300,000 | 324,999 | $14,723 | $77.43 | 0.000 | $8.75 | $39 | $14,762 |
| | 325,000 | 349,999 | $12,361 | $77.43 | 0.000 | $8.75 | $33 | $12,395 |
| | 350,000 | 999,999 | $95,131 | $77.43 | 0.000 | $8.75 | $255 | $95,386 |
| | 1,000,000 | 5,000,000 | $26,306 | $77.43 | 0.000 | $8.75 | $71 | $26,377 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| 3 Inch Meter Size | 0 | 999 | $804 | $127.45 | 0.000 | $8.75 | $2 | $805 |
| | 1,000 | 1,999 | $352 | $127.45 | 0.000 | $8.75 | $1 | $353 |
| | 2,000 | 2,999 | $575 | $127.45 | 0.000 | $8.75 | $1 | $576 |
| | 3,000 | 3,999 | $566 | $127.45 | 0.000 | $8.75 | $1 | $567 |
| | 4,000 | 4,999 | $335 | $127.45 | 0.000 | $8.75 | $1 | $336 |
| | 5,000 | 5,999 | $335 | $127.45 | 0.000 | $8.75 | $1 | $336 |
| | 6,000 | 6,999 | $335 | $127.45 | 0.000 | $8.75 | $1 | $336 |
| | 7,000 | 7,999 | $335 | $127.45 | 0.000 | $8.75 | $1 | $336 |
| | 8,000 | 8,999 | $335 | $127.45 | 0.000 | $8.75 | $1 | $336 |
| | 9,000 | 9,999 | $552 | $127.45 | 0.000 | $8.75 | $1 | $553 |
| | 10,000 | 10,999 | $543 | $127.45 | 0.000 | $8.75 | $1 | $544 |
| | 11,000 | 24,999 | $4,656 | $127.45 | 0.000 | $8.75 | $12 | $4,669 |
| | 25,000 | 49,999 | $8,153 | $127.45 | 0.000 | $8.75 | $21 | $8,174 |
| | 50,000 | 74,999 | $7,236 | $127.45 | 0.000 | $8.75 | $19 | $7,256 |
| | 75,000 | 99,999 | $6,623 | $127.45 | 0.000 | $8.75 | $18 | $6,641 |
| | 100,000 | 124,999 | $6,600 | $127.45 | 0.000 | $8.75 | $18 | $6,618 |
| | 125,000 | 149,999 | $6,597 | $127.45 | 0.000 | $8.75 | $17 | $6,614 |
| | 150,000 | 174,999 | $5,453 | $127.45 | 0.000 | $8.75 | $14 | $5,468 |
| | 175,000 | 199,999 | $4,939 | $127.45 | 0.000 | $8.75 | $13 | $4,952 |
| | 200,000 | 224,999 | $4,783 | $127.45 | 0.000 | $8.75 | $13 | $4,796 |
| | 225,000 | 249,999 | $4,403 | $127.45 | 0.000 | $8.75 | $12 | $4,415 |
| | 250,000 | 274,999 | $4,562 | $127.45 | 0.000 | $8.75 | $12 | $4,574 |
| | 275,000 | 299,999 | $4,112 | $127.45 | 0.000 | $8.75 | $11 | $4,123 |
| | 300,000 | 324,999 | $4,228 | $127.45 | 0.000 | $8.75 | $10 | $4,238 |
| | 325,000 | 349,999 | $2,731 | $127.45 | 0.000 | $8.75 | $7 | $2,739 |
| | 350,000 | 999,999 | $44,902 | $127.45 | 0.000 | $8.75 | $121 | $45,023 |
| | 1,000,000 | 5,000,000 | $47,073 | $127.45 | 0.000 | $8.75 | $126 | $47,199 |
| 4 Inch Meter Size | 0 | 999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 1,000 | 1,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 2,000 | 2,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 3,000 | 3,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 4,000 | 4,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 5,000 | 5,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 6,000 | 6,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 7,000 | 7,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 8,000 | 8,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 9,000 | 9,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 10,000 | 10,999 | $740 | $183.72 | 0.000 | $8.75 | $2 | $742 |
| | 11,000 | 24,999 | $12,035 | $183.72 | 0.000 | $8.75 | $30 | $12,065 |
| | 25,000 | 49,999 | $18,745 | $183.72 | 0.000 | $8.75 | $48 | $18,793 |
| | 50,000 | 74,999 | $18,183 | $183.72 | 0.000 | $8.75 | $45 | $18,228 |
| | 75,000 | 99,999 | $14,530 | $183.72 | 0.000 | $8.75 | $39 | $14,569 |
| | 100,000 | 124,999 | $14,530 | $183.72 | 0.000 | $8.75 | $39 | $14,569 |
| | 125,000 | 149,999 | $14,530 | $183.72 | 0.000 | $8.75 | $39 | $14,569 |
| | 150,000 | 174,999 | $14,530 | $183.72 | 0.000 | $8.75 | $39 | $14,569 |
| | 175,000 | 199,999 | $14,530 | $183.72 | 0.000 | $8.75 | $39 | $14,569 |
| | 200,000 | 224,999 | $14,530 | $183.72 | 0.000 | $8.75 | $39 | $14,569 |
| | 225,000 | 249,999 | $14,796 | $183.72 | 0.000 | $8.75 | $40 | $14,835 |
| | 250,000 | 274,999 | $14,640 | $183.72 | 0.000 | $8.75 | $39 | $14,679 |
| | 275,000 | 299,999 | $14,263 | $183.72 | 0.000 | $8.75 | $38 | $14,301 |
| | 300,000 | 324,999 | $14,496 | $183.72 | 0.000 | $8.75 | $38 | $14,534 |
| | 325,000 | 349,999 | $13,751 | $183.72 | 0.000 | $8.75 | $37 | $13,788 |
| | 350,000 | 999,999 | $320,624 | $183.72 | 0.000 | $8.75 | $861 | $321,485 |
| | 1,000,000 | 11,000,000 | $730,171 | $183.72 | 0.000 | $8.75 | $1,958 | $732,129 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| 6 Inch Meter Size | 0 | 999 | $4,606 | $340.02 | 0.000 | $8.75 | $6 | $4,612 |
| | 1,000 | 1,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 2,000 | 2,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 3,000 | 3,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 4,000 | 4,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 5,000 | 5,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 6,000 | 6,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 7,000 | 7,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 8,000 | 8,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 9,000 | 9,999 | $326 | $340.02 | 0.000 | $8.75 | $1 | $327 |
| | 10,000 | 10,999 | $1,179 | $340.02 | 0.000 | $8.75 | $2 | $1,181 |
| | 11,000 | 24,999 | $4,438 | $340.02 | 0.000 | $8.75 | $12 | $4,450 |
| | 25,000 | 49,999 | $7,925 | $340.02 | 0.000 | $8.75 | $22 | $7,947 |
| | 50,000 | 74,999 | $9,263 | $340.02 | 0.000 | $8.75 | $22 | $9,285 |
| | 75,000 | 99,999 | $7,485 | $340.02 | 0.000 | $8.75 | $20 | $7,505 |
| | 100,000 | 124,999 | $7,485 | $340.02 | 0.000 | $8.75 | $20 | $7,505 |
| | 125,000 | 149,999 | $8,294 | $340.02 | 0.000 | $8.75 | $21 | $8,315 |
| | 150,000 | 174,999 | $8,064 | $340.02 | 0.000 | $8.75 | $20 | $8,085 |
| | 175,000 | 199,999 | $7,045 | $340.02 | 0.000 | $8.75 | $19 | $7,064 |
| | 200,000 | 224,999 | $7,738 | $340.02 | 0.000 | $8.75 | $20 | $7,758 |
| | 225,000 | 249,999 | $6,825 | $340.02 | 0.000 | $8.75 | $19 | $6,843 |
| | 250,000 | 274,999 | $6,825 | $340.02 | 0.000 | $8.75 | $19 | $6,843 |
| | 275,000 | 299,999 | $7,524 | $340.02 | 0.000 | $8.75 | $19 | $7,543 |
| | 300,000 | 324,999 | $7,268 | $340.02 | 0.000 | $8.75 | $18 | $7,287 |
| | 325,000 | 349,999 | $7,041 | $340.02 | 0.000 | $8.75 | $18 | $7,058 |
| | 350,000 | 999,999 | $141,290 | $340.02 | 0.000 | $8.75 | $375 | $141,665 |
| | 1,000,000 | 12,000,000 | $512,937 | $340.02 | 0.000 | $8.75 | $1,362 | $514,299 |
| 8 Inch Meter Size | 0 | 999 | $0 | $527.58 | 0.000 | $8.75 | $0 | $0 |
| | 5,000,000 | 15,000,000 | $0 | $527.58 | 0.000 | $8.75 | $0 | $0 |
| Hotels 1 | 0 | 999 | $65 | $0.00 | 0.000 | $2.59 | $0 | $65 |
| | 1,000 | 1,999 | $65 | $0.00 | 0.000 | $2.59 | $0 | $65 |
| | 2,000 | 4,999 | $195 | $0.00 | 0.000 | $2.59 | $1 | $196 |
| | 5,000 | 5,999 | $65 | $0.00 | 0.000 | $2.59 | $0 | $65 |
| | 6,000 | 7,999 | $130 | $0.00 | 0.000 | $2.59 | $0 | $130 |
| | 8,000 | 9,999 | $130 | $0.00 | 0.000 | $2.59 | $0 | $130 |
| | 10,000 | 14,999 | $325 | $0.00 | 0.000 | $2.59 | $1 | $326 |
| | 15,000 | 19,999 | $325 | $0.00 | 0.000 | $2.59 | $1 | $326 |
| | 20,000 | 24,999 | $325 | $0.00 | 0.000 | $2.59 | $1 | $326 |
| | 25,000 | 29,999 | $325 | $0.00 | 0.000 | $2.59 | $1 | $326 |
| | 30,000 | 49,999 | $1,301 | $0.00 | 0.000 | $2.59 | $4 | $1,305 |
| | 50,000 | 60,999 | $716 | $0.00 | 0.000 | $2.59 | $2 | $718 |
| | 61,000 | 69,999 | $586 | $0.00 | 0.000 | $2.59 | $2 | $587 |
| | 70,000 | 93,999 | $1,562 | $0.00 | 0.000 | $2.59 | $4 | $1,566 |
| | 94,000 | 99,999 | $390 | $0.00 | 0.000 | $2.59 | $1 | $391 |
| | 100,000 | 127,999 | $1,822 | $0.00 | 0.000 | $2.59 | $5 | $1,827 |
| | 128,000 | 199,999 | $4,572 | $0.00 | 0.000 | $2.59 | $12 | $4,585 |
| | 200,000 | 214,999 | $937 | $0.00 | 0.000 | $2.59 | $3 | $940 |
| | 215,000 | 288,999 | $4,526 | $0.00 | 0.000 | $2.59 | $12 | $4,538 |
| | 289,000 | 299,999 | $549 | $0.00 | 0.000 | $2.59 | $1 | $551 |
| | 300,000 | 384,999 | $2,944 | $0.00 | 0.000 | $2.59 | $8 | $2,952 |
| | 385,000 | 399,999 | $318 | $0.00 | 0.000 | $2.59 | $1 | $318 |
| | 400,000 | 499,999 | $1,067 | $0.00 | 0.000 | $2.59 | $3 | $1,070 |
| | 500,000 | 866,999 | $836 | $0.00 | 0.000 | $2.59 | $2 | $838 |

# Table 10 - Initial Rate Adjustments and Resulting Revenues

| Customer Class, Rate Class or Meter Size | Volume Range Bottom (in Gallons) | Volume Range Top (in Gallons) | Sales This Year at Current Rates | Minimum Charge for Calculation Purposes | New Usage Allowance in 1,000s | New Unit Charge per 1,000 Gallons | Sales This Year at Modeled Rates | Total "Blended" Sales This Year |
|---|---|---|---|---|---|---|---|---|
| | 0 | 999 | $19 | $0.00 | 0.000 | $3.17 | $0 | $19 |
| | 1,000 | 1,999 | $19 | $0.00 | 0.000 | $3.17 | $0 | $19 |
| | 2,000 | 4,999 | $57 | $0.00 | 0.000 | $3.17 | $0 | $58 |
| | 5,000 | 5,999 | $19 | $0.00 | 0.000 | $3.17 | $0 | $19 |
| | 6,000 | 7,999 | $38 | $0.00 | 0.000 | $3.17 | $0 | $38 |
| | 8,000 | 9,999 | $38 | $0.00 | 0.000 | $3.17 | $0 | $38 |
| | 10,000 | 14,999 | $96 | $0.00 | 0.000 | $3.17 | $0 | $96 |
| | 15,000 | 19,999 | $96 | $0.00 | 0.000 | $3.17 | $0 | $96 |
| | 20,000 | 24,999 | $96 | $0.00 | 0.000 | $3.17 | $0 | $96 |
| | 25,000 | 29,999 | $96 | $0.00 | 0.000 | $3.17 | $0 | $96 |
| Hotels 2 | 30,000 | 49,999 | $383 | $0.00 | 0.000 | $3.17 | $1 | $384 |
| | 50,000 | 60,999 | $211 | $0.00 | 0.000 | $3.17 | $1 | $211 |
| | 61,000 | 69,999 | $172 | $0.00 | 0.000 | $3.17 | $0 | $173 |
| | 70,000 | 93,999 | $460 | $0.00 | 0.000 | $3.17 | $1 | $461 |
| | 94,000 | 99,999 | $115 | $0.00 | 0.000 | $3.17 | $0 | $115 |
| | 100,000 | 127,999 | $536 | $0.00 | 0.000 | $3.17 | $1 | $538 |
| | 128,000 | 199,999 | $707 | $0.00 | 0.000 | $3.17 | $2 | $709 |
| | 200,000 | 214,999 | $96 | $0.00 | 0.000 | $3.17 | $0 | $96 |
| | 215,000 | 288,999 | $472 | $0.00 | 0.000 | $3.17 | $1 | $474 |
| | 289,000 | 299,999 | $70 | $0.00 | 0.000 | $3.17 | $0 | $70 |
| | 300,000 | 384,999 | $179 | $0.00 | 0.000 | $3.17 | $0 | $179 |
| Total Rate Revenue at Current Rates | | | $5,292,265 | Total Rate Revenue at Modeled Rates | | | $14,772 | |
| | | | | | | | Total Blended Rate Revenues for the Year | $5,307,037 |

Note: New Minimum Charge Base Rates: If meter size-based minimum charges are to be used, and the user classes modeled above include meter or connection sizes, the amounts shown in this column include meter size surcharges as calculated in Table 16. Either way, the narrative report includes the rates and surcharges to assess.

12.0 months at the old user charge rates and 0.0 months at the new user charge rates.

# Table 12 - Flow Capacity Costs

## Prince George County, VA, 2020 Sewer Rates Model 2

Building system capacity and connecting new customers to the system costs money. Those costs must be recovered. That can be done on the "front end" with system development fees and connection fees. It can be done later with system development surcharges to the minimum charge. It is usually most practical to use a blend of both. This table shows capacity costs. From these costs, system development fees and surcharges were developed in Tables 13 through 16.

### Peak and Base Flow Capacity Costs

| | Costs Related to Sewer Service | | | | | | |
|---|---|---|---|---|---|---|---|
| Fixed Assets Original Value (Capacity Cost) | % of That Value Attributable to Regular Sewer Service | % Attributable to Sewer Peak Capacity | Peak Sewer Capacity Cost | Annual Sewer Peak Capacity Cost (40-year Depreciation) | % of Value Attributable to Sewer Base Flow Capacity | Base Flow Capacity Cost for Sewer Service | Annual Sewer Base Capacity Cost (40-year Depreciation) |
| $19,557,500 | 100.0% | 50.0% | $9,778,750 | $569,888 | 50.0% | $9,778,750 | $569,888 |

### How Sewer System Capacity Costs Will Be Recovered

These costs are modeled to be recovered from system development fees in Tables 13 and 14

Part of Peak Flow Capacity Costs to be Recovered by System Development Fees

8.785% Target Percentage of Annualized Costs to Recover

$50,064.62 Target Portion of Annualized Costs to Recover

$5,006.46 Peak Capacity Cost per Capacity Share

Part of Base Flow Capacity Costs to be Recovered by System Development Fees, if Any

0.0% Target Percentage of Annualized Costs to Recover

$0.00 Target Portion of Annualized Costs to Recover

$0.00 Base Capacity Cost per New Capacity Share

Note: Base flow costs exist, but they will not be recovered with system development fees. Rather, they will be recovered by default from regular user charge fees.

In addition to peak and base flow-based system development fees caculated above, each new connection should reimburse the utility for all "out-of-pocket" connection costs it incurs, estimated as follows:

$0 Average Field Cost per New Connection

$0 Average Administration Cost per New Connection

$0 Average "Out-of-Pocket" Cost per New Connection

These costs are modeled to be recovered from minimum charge surcharges in Tables 15 and 16

Part of Peak Flow Capacity Costs to be Recovered by Minimum Charge Surcharges

50.000% Target Percentage of Costs to Recover

$284,943.78 Target Portion of Costs to Recover in One Full Year

$47,490.63 Target Portion of Costs to Recover in Bi-monthly Surcharges

$6.25 Bi-monthly Surcharge per Peak Capacity Share

Note: "Out-of-pocket" connection costs are in addition to peak and base flow capacity costs. All of these costs have been added together in Table 13, to arrive at the grand total fee to assess to each meter size and type.

## Table 13 - System Development Fees

# Prince George County, VA, 2020 Sewer Rates Model 2

This table calculates system development fees to assess to each meter size.

Note: Larger meter sizes are available in two or more types, some having different flow capacities. To be conservative when projecting revenues, it was assumed all meters in use are of the lowest capacity types. However, when setting fees, they should be based upon the type of meter in use at each location.

| Meter Size | Meter Type | Meter Size in Inches | Number Meters This Size | New Taps (Customer Growth) in a Typical Year | AWWA Capacity "Share" Factor, Compared to 5/8 Inch Meter | Foot Notes | Peak Capacity Cost per Capacity Share From Table 11 | Peak Capacity Cost per Meter This Class | Average "Out-of-Pocket" Cost per New Connection | **Fee per New Tap for Peak, Base and Out-of-pocket Costs** |
|---|---|---|---|---|---|---|---|---|---|---|
| **In-Authority** | | | | | | | | | | |
| Five Eighths | Displacement | 0.625 | 2,965 | 10.0 | 1.0 | | $5,006 | $5,006 | $0 | **$5,006** |
| Three Quarters | Displacement | 0.750 | 0 | 0.0 | 1.0 | 1 | $5,006 | $5,006 | $0 | **$5,006** |
| One Inch | Displacement | 1.000 | 127 | 0.0 | 2.5 | | $5,006 | $12,516 | $0 | **$12,516** |
| One & a Half Inch | Displacement | 1.500 | 577 | 0.0 | 5.0 | | $5,006 | $25,032 | $0 | **$25,032** |
| Two Inch | Displacement | 2.000 | 91 | 0.0 | 8.0 | | $5,006 | $40,052 | $0 | **$40,052** |
| Two & a Half Inch | Displacement | 2.500 | 0 | 0.0 | 12.5 | 2 | $5,006 | $62,581 | $0 | **$62,581** |
| Three Inch | Singlet | 3.000 | 5 | 0.0 | 16.0 | | $5,006 | $80,103 | $0 | **$80,103** |
| Three Inch | Compound, Class I | 3.000 | 0 | 0.0 | 16.0 | | $5,006 | $80,103 | $0 | **$80,103** |
| Three Inch | Turbine, Class I | 3.000 | 0 | 0.0 | 17.5 | | $5,006 | $87,613 | $0 | **$87,613** |
| Four Inch | Singlet | 4.000 | 15 | 0.0 | 25.0 | | $5,006 | $125,162 | $0 | **$125,162** |
| Four Inch | Compound, Class I | 4.000 | 0 | 0.0 | 25.0 | | $5,006 | $125,162 | $0 | **$125,162** |
| Four Inch | Turbine, Class I | 4.000 | 0 | 0.0 | 31.0 | | $5,006 | $155,200 | $0 | **$155,200** |
| Six Inch | Singlet | 6.000 | 5 | 0.0 | 50.0 | | $5,006 | $250,323 | $0 | **$250,323** |
| Six Inch | Compound, Class I | 6.000 | 0 | 0.0 | 50.0 | | $5,006 | $250,323 | $0 | **$250,323** |
| Six Inch | Turbine, Class I | 6.000 | 0 | 0.0 | 65.0 | | $5,006 | $325,420 | $0 | **$325,420** |
| Eight Inch | Compound, Class I | 8.000 | 0 | 0.0 | 80.0 | | $5,006 | $400,517 | $0 | **$400,517** |
| Eight Inch | Turbine, Class I | 8.000 | 0 | 0.0 | 140.0 | | $5,006 | $700,905 | $0 | **$700,905** |
| | | | 3,784 | 10.0 | | | | | | |

**Foot Notes, which apply to Tables 14, 15 and 16, as well:**

[1] The Three-Quarter-Inch meter capacity share factor is 1.5. However, it was set equal to the Five-eighths-Inch meter because most such meters are used for residential connections. This enables a uniform system development fee for almost all residential customers.

[2] These meter sizes were not included in AWWA study results, so these values are estimates.

[3] Economy of Scale Adjustments: As meter size rises, capacity to pass peak flow rises. However, costs to build that capacity do not rise as rapidly. Therefore, peak flow capacity shares were adjusted downward by an estimated cost savings factor to account for that savings. Economy of scale savings do not apply to base costs because all connections are afforded the same level of base flow capacity.

# Table 14 - Revenues From System Development Fees
## Prince George County, VA, 2020 Sewer Rates Model 2

This table calculates total fee revenues that would be generated during one full year at the fees in Table 13.

| Meter Size | Meter Type | New Taps (Customer Growth) in a Typical Year | Fee per New Tap for Peak, Base and Out-of-pocket Costs | Total Annual System Development Fees |
|---|---|---|---|---|
| **In-Authority** | | | | |
| Five Eighths | Displacement | 10.0 | $5,006 | $50,065 |
| Three Quarters | Displacement | 0.0 | $5,006 | $0 |
| One Inch | Displacement | 0.0 | $12,516 | $0 |
| One & a Half Inch | Displacement | 0.0 | $25,032 | $0 |
| Two Inch | Displacement | 0.0 | $40,052 | $0 |
| Two & a Half Inch | Displacement | 0.0 | $62,581 | $0 |
| Three Inch | Singlet | 0.0 | $80,103 | $0 |
| Three Inch | Compound, Class I | 0.0 | $80,103 | $0 |
| Three Inch | Turbine, Class I | 0.0 | $87,613 | $0 |
| Four Inch | Singlet | 0.0 | $125,162 | $0 |
| Four Inch | Compound, Class I | 0.0 | $125,162 | $0 |
| Four Inch | Turbine, Class I | 0.0 | $155,200 | $0 |
| Six Inch | Singlet | 0.0 | $250,323 | $0 |
| Six Inch | Compound, Class I | 0.0 | $250,323 | $0 |
| Six Inch | Turbine, Class I | 0.0 | $325,420 | $0 |
| Eight Inch | Compound, Class I | 0.0 | $400,517 | $0 |
| | Total: | 10.0 | | $50,065 |

This is the amount used to calculate the "Meter Size-based System Development Fees" income in Table 3.

## Table 15 - Minimum Charge Fees, Including Capacity Surcharges

# Prince George County, VA, 2020 Sewer Rates Model 2

This table does, essentially, the same thing as Table 13, except costs are recovered over time as minimum charge surcharges.

| Meter Size | Meter Type | Capacity Shares Each Meter Size After Adjustment | Bi-monthly Surcharge per Peak Capacity Share (Table 11) | Annual Base Charges Revenue | Total Annual Minimum Charges Revenue | Peak Capacity Cost per Meter Size | Cost-to-Serve Minimum Charge From Table 10 | **Bi-monthly Minimum Charge Each Meter Size** | **Bi-monthly Snowbird Fee** |
|---|---|---|---|---|---|---|---|---|---|
| **In-Authority** | | | | | | | | | |
| Five Eighths | Displacement | 1.0 | $6.25 | $487,803 | $599,038 | $6.25 | $27.42 | **$33.67** | **$31.98** |
| Three Quarters | Displacement | 1.0 | $6.25 | $0 | $0 | $6.25 | $27.42 | **$33.67** | **$31.98** |
| One Inch | Displacement | 2.5 | $6.25 | $20,809 | $32,673 | $15.63 | $27.42 | **$43.05** | **$40.89** |
| One & a Half Inch | Displacement | 5.0 | $6.25 | $94,890 | $203,081 | $31.26 | $27.42 | **$58.68** | **$55.73** |
| Two Inch | Displacement | 8.0 | $6.25 | $14,915 | $42,123 | $50.02 | $27.42 | **$77.43** | **$73.55** |
| Two & a Half Inch | Displacement | 12.5 | $6.25 | $0 | $0 | $78.15 | $27.42 | **$105.57** | **$100.27** |
| Three Inch | Singlet | 16.0 | $6.25 | $823 | $3,823 | $100.03 | $27.42 | **$127.45** | **$121.05** |
| Three Inch | Compound, Class I | 16.0 | $6.25 | $0 | $0 | $100.03 | $27.42 | **$127.45** | **$121.05** |
| Three Inch | Turbine, Class I | 17.5 | $6.25 | $0 | $0 | $109.41 | $27.42 | **$136.83** | **$129.96** |
| Four Inch | Singlet | 25.0 | $6.25 | $2,468 | $16,535 | $156.30 | $27.42 | **$183.72** | **$174.50** |
| Four Inch | Compound, Class I | 25.0 | $6.25 | $0 | $0 | $156.30 | $27.42 | **$183.72** | **$174.50** |
| Four Inch | Turbine, Class I | 31.0 | $6.25 | $0 | $0 | $193.81 | $27.42 | **$221.23** | **$210.13** |
| Six Inch | Singlet | 50.0 | $6.25 | $823 | $10,200 | $312.60 | $27.42 | **$340.02** | **$322.96** |
| Six Inch | Compound, Class I | 50.0 | $6.25 | $0 | $0 | $312.60 | $27.42 | **$340.02** | **$322.96** |
| Six Inch | Turbine, Class I | 65.0 | $6.25 | $0 | $0 | $406.38 | $27.42 | **$433.80** | **$412.03** |
| Eight Inch | Compound, Class I | 80.0 | $6.25 | $0 | $0 | $500.16 | $27.42 | **$527.58** | **$501.10** |

# Table 16 - Revenues From Minimum Charge Surcharges
# Prince George County, VA, 2020 Sewer Rates Model 2

This table calculates total minimum charge surcharge revenues that would be generated during one full year at the fees in Table 15.

| Meter Size | Meter Type | Number Meters This Size | Total Adjusted Capacity Shares | Annual Peak Capacity Surcharge Revenues |
|---|---|---|---|---|
| **In-Authority** | | | | |
| Five Eighths | Displacement | 2,965 | 1 | $111,235 |
| Three Quarters | Displacement | 0 | 1 | $0 |
| One Inch | Displacement | 127 | 3 | $11,863 |
| One & a Half Inch | Displacement | 577 | 5 | $108,191 |
| Two Inch | Displacement | 91 | 8 | $27,209 |
| Two & a Half Inch | Displacement | 0 | 13 | $0 |
| Three Inch | Singlet | 5 | 16 | $3,001 |
| Three Inch | Compound, Class I | 0 | 16 | $0 |
| Three Inch | Turbine, Class I | 0 | 18 | $0 |
| Four Inch | Singlet | 15 | 25 | $14,067 |
| Four Inch | Compound, Class I | 0 | 25 | $0 |
| Four Inch | Turbine, Class I | 0 | 31 | $0 |
| Six Inch | Singlet | 5 | 50 | $9,378 |
| Six Inch | Compound, Class I | 0 | 50 | $0 |
| Six Inch | Turbine, Class I | 0 | 65 | $0 |
| Eight Inch | Compound, Class I | 0 | 80 | $0 |
| | | 3,784 | 3,925 | $284,944 |

# Table 17 - Financial Capacity Indicators and Reserves

## Prince George County, VA, 2020 Sewer Rates Model 2

This table depicts the affordability of future rates, the financial health of the system and the ending balances in various (assumed) accounts for the test year and the next 10 years.

| Capacity Indicators | Test Year Starting 7/1/18 | 0 Year Starting 7/1/19 | 1st Year Starting 7/1/20 | 2nd Year Starting 7/1/21 | 3rd Year Starting 7/1/22 | 4th Year Starting 7/1/23 | 5th Year Starting 7/1/24 | 6th Year Starting 7/1/25 | 7th Year Starting 7/1/26 | 8th Year Starting 7/1/27 | 9th Year Starting 7/1/28 | 10th Year Starting 7/1/29 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Customary Affordability Index: Monthly Bill for a 5,000 gal per Month, Small Meter Residential Customer | $56.56 | $60.58 | $62.40 | $64.27 | $66.20 | $68.19 | $70.23 | $72.34 | $74.51 | $76.75 | $79.05 | $81.42 |
| AMHI Within Service Area | $43,021 | $43,458 | $43,899 | $44,345 | $44,795 | $45,250 | $45,709 | $46,173 | $46,642 | $47,115 | $47,594 | $48,077 |
| **Affordability Index:** Current Rates First Column, Modeled Rates After That | 1.58% | 1.67% | 1.71% | 1.74% | 1.77% | 1.81% | 1.84% | 1.88% | 1.92% | 1.95% | 1.99% | 2.03% |
| Affordability Index (AI) goes to the willingness and ability of customers to pay. AI is the cost of 60,000 gallons of residential service per year (5,000 gallons per month) divided by the Annual Median Household Income (AMHI) in the service area (gleaned from Census data or a survey). Rates near 1.0% are common in the U.S. and are generally considered affordable. Most grant agencies will not consider awarding grants if this indicator is less than 1.5 to 2.0%. | | | | | | | | | | | | |
| Low-income, Low-volume Affordability Index: Monthly Bill for a 2,000 gal per Month, Low-income Residential Customer | $30.07 | $34.33 | $35.36 | $36.43 | $37.52 | $38.64 | $39.80 | $41.00 | $42.23 | $43.49 | $44.80 | $46.14 |
| Income at One-half the AMHI and Rising at One-half the Rate Above | $21,511 | $21,620 | $21,730 | $21,840 | $21,951 | $22,062 | $22,174 | $22,287 | $22,400 | $22,514 | $22,628 | $22,743 |
| **Affordability for Low-Income, Low-volume:** Current Rates First Column, Modeled Rates After That | 1.68% | 1.91% | 1.95% | 2.00% | 2.05% | 2.10% | 2.15% | 2.21% | 2.26% | 2.32% | 2.38% | 2.43% |
| This additional indicator of affordability assumes a residential customer with income at one-half of the median household income above, that income is growing at one-half the rate of the median household income and the customer uses 2,000 gallons per month. Such a customer is likely either a minimum wage or near-minimum wage worker, or is retired and living only on Social Security benefits. Such customers are more commonly the "slow pays" and "no pays" compared to others. | | | | | | | | | | | | |
| **Estimated Operating Ratio:** Current Rates First Column, Modeled Rates After That | 1.45 | 1.39 | 1.21 | 1.22 | 1.23 | 1.23 | 1.24 | 1.24 | 1.25 | 1.25 | 1.25 | 1.26 |
| Operating ratio (OR) is a measure of the utility's ability to pay its operating expenses using only current incomes. A 1.0 OR is break even. Below 1.0 indicates operating in the "red." Generally, the OR should be at least 1.15 for large systems, 1.30 or more for medium-sized systems and perhaps as high as 2.0 for small systems. Note: If the utility has or will have reserves (below,) it has more ability to pay its operating costs than the OR implies. | | | | | | | | | | | | |
| **Estimated Coverage Ratio:** Current Rates First Column, Modeled Rates After That | 577.61 | 34.40 | 15.79 | 15.63 | 9.86 | 5.81 | 0.88 | 0.52 | 0.53 | 0.55 | 0.55 | 0.59 |
| Coverage Ratio (CR) goes to the ability of the utility to pay its debt payments out of current incomes. OR applies only to years with debt service. 1.0 is break even. Generally, the CR should be at least 1.25. Note: If the utility has or will have reserves (shown below,) it has more ability to make debt payments than the CR implies. | | | | | | | | | | | | |

| Reserves | Balance Ending on 6/30/18 | Balance Ending on 6/30/19 | Balance Ending on 6/30/20 | Balance Ending on 6/30/21 | Balance Ending on 6/30/22 | Balance Ending on 6/30/23 | Balance Ending on 6/30/24 | Balance Ending on 6/30/25 | Balance Ending on 6/30/26 | Balance Ending on 6/30/27 | Balance Ending on 6/30/28 | Balance Ending on 6/30/29 | Balance Ending on 6/30/30 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Cash and Cash Equivalents | $5,016,574 | $1,119,059 | $1,109,825 | $1,301,243 | $1,337,789 | $1,378,893 | $1,414,417 | $1,454,570 | $1,499,736 | $1,538,753 | $1,582,866 | $1,632,503 | $1,675,353 |
| Other Liquid Assets | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 | $0 |
| Total Undedicated Cash Assets | $5,016,574 | $1,119,059 | $1,109,825 | $1,301,243 | $1,337,789 | $1,378,893 | $1,414,417 | $1,454,570 | $1,499,736 | $1,538,753 | $1,582,866 | $1,632,503 | $1,675,353 |
| Total Cash Assets Discounted for Inflation (Future Unrestricted Purchasing Power) | $5,016,574 | $1,119,059 | $1,109,825 | $1,262,206 | $1,258,725 | $1,258,478 | $1,252,173 | $1,249,088 | $1,249,238 | $1,243,286 | $1,240,561 | $1,241,079 | $1,273,655 |
| Repair & Replacement | $0 | -$84,000 | $235,947 | $346,127 | $448,039 | $541,205 | $625,125 | $699,281 | $763,135 | $816,128 | $857,677 | $887,179 | $904,007 |
| Debt and CIP Reserves | $0 | $5,327,437 | $6,649,644 | $7,321,102 | $8,237,267 | $8,747,655 | $9,257,184 | $8,892,692 | $7,761,744 | $6,581,848 | $5,398,930 | $4,179,527 | $2,995,694 |
| **Sum of All Reserves** | **$5,016,574** | **$6,362,496** | **$7,995,416** | **$8,968,472** | **$10,023,095** | **$10,667,752** | **$11,296,726** | **$11,046,543** | **$10,024,616** | **$8,936,728** | **$7,839,474** | **$6,699,209** | **$5,575,054** |

# Table 18 - Bills Before and After Rate Adjustments

## Prince George County, VA, 2020 Sewer Rates Model 2

Revenue increase to be generated by the modeled rates 1.9%

If applicable, the revenue increase above includes meter size-based minimum charges calculated in Table 15. If rate classes shown below do not include meter size, the modeled bills below do not include those surcharges.

To reduce its size and still cover many customers, this table shows bills for only the most common or extraordinary classes.

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill | Modeled Bill | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| .625 Inch Meter Size | 0 | 212 | 219 | 3,682 | $24.82 | $33.67 | $8.85 |
| | 1,000 | 147 | 366 | 3,470 | $33.65 | $42.42 | $8.77 |
| | 2,000 | 244 | 610 | 3,323 | $42.48 | $51.17 | $8.69 |
| | 3,000 | 309 | 919 | 3,079 | $51.31 | $59.92 | $8.61 |
| | 4,000 | 373 | 1,291 | 2,771 | $60.14 | $68.67 | $8.53 |
| | 5,000 | 356 | 1,647 | 2,398 | $68.97 | $77.42 | $8.45 |
| | 6,000 | 201 | 1,848 | 2,042 | $77.80 | $86.17 | $8.37 |
| | 7,000 | 258 | 2,106 | 1,841 | $86.63 | $94.92 | $8.29 |
| | 8,000 | 281 | 2,388 | 1,583 | $95.46 | $103.67 | $8.21 |
| | 9,000 | 239 | 2,626 | 1,302 | $104.29 | $112.42 | $8.13 |
| | 10,000 | 963 | 3,589 | 1,063 | $113.12 | $121.17 | $8.05 |
| | 25,000 | 79 | 3,669 | 100 | $245.57 | $252.42 | $6.85 |
| | 50,000 | 13 | 3,682 | 21 | $466.32 | $471.17 | $4.85 |
| | 75,000 | 4 | 3,685 | 8 | $687.07 | $689.92 | $2.85 |
| | 100,000 | 1 | 3,687 | 4 | $907.82 | $908.67 | $0.85 |
| | 125,000 | 2 | 3,688 | 3 | $1,128.57 | $1,127.42 | -$1.15 |
| | 150,000 | 0 | 3,689 | 1 | $1,349.32 | $1,346.17 | -$3.15 |
| | 175,000 | 0 | 3,689 | 1 | $1,570.07 | $1,564.92 | -$5.15 |
| | 200,000 | 0 | 3,689 | 0 | $1,790.82 | $1,783.67 | -$7.15 |
| 1 Inch Meter Size | 0 | 12 | 12 | 90 | $39.08 | $43.05 | $3.97 |
| | 1,000 | 4 | 15 | 79 | $47.91 | $51.80 | $3.89 |
| | 2,000 | 3 | 19 | 75 | $56.74 | $60.55 | $3.81 |
| | 3,000 | 3 | 21 | 72 | $65.57 | $69.30 | $3.73 |
| | 4,000 | 4 | 25 | 69 | $74.40 | $78.05 | $3.65 |
| | 5,000 | 4 | 29 | 65 | $83.23 | $86.80 | $3.57 |
| | 6,000 | 4 | 32 | 62 | $92.06 | $95.55 | $3.49 |
| | 7,000 | 3 | 35 | 58 | $100.89 | $104.30 | $3.41 |
| | 8,000 | 4 | 39 | 55 | $109.72 | $113.05 | $3.33 |
| | 9,000 | 3 | 42 | 51 | $118.55 | $121.80 | $3.25 |
| | 10,000 | 19 | 61 | 48 | $127.38 | $130.55 | $3.17 |
| | 25,000 | 14 | 74 | 30 | $259.83 | $261.80 | $1.97 |
| | 50,000 | 7 | 81 | 16 | $480.58 | $480.55 | -$0.03 |
| | 75,000 | 3 | 84 | 9 | $701.33 | $699.30 | -$2.03 |
| | 100,000 | 1 | 85 | 6 | $922.08 | $918.05 | -$4.03 |
| | 125,000 | 1 | 86 | 5 | $1,142.83 | $1,136.80 | -$6.03 |
| | 150,000 | 1 | 87 | 4 | $1,363.58 | $1,355.55 | -$8.03 |
| | 175,000 | 1 | 88 | 4 | $1,584.33 | $1,574.30 | -$10.03 |
| | 200,000 | 1 | 88 | 3 | $1,805.08 | $1,793.05 | -$12.03 |
| | 225,000 | 1 | 89 | 2 | $2,025.83 | $2,011.80 | -$14.03 |
| | 250,000 | 0 | 89 | 2 | $2,246.58 | $2,230.55 | -$16.03 |
| | 275,000 | 0 | 89 | 1 | $2,467.33 | $2,449.30 | -$18.03 |
| | 300,000 | 1 | 90 | 1 | $2,688.08 | $2,668.05 | -$20.03 |

## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill | Modeled Bill | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| | 0 | 3 | 3 | 42 | $68.34 | $58.68 | -$9.66 |
| | 1,000 | 1 | 4 | 39 | $77.17 | $67.43 | -$9.74 |
| | 2,000 | 2 | 6 | 38 | $86.00 | $76.18 | -$9.82 |
| | 3,000 | 1 | 7 | 36 | $94.83 | $84.93 | -$9.90 |
| | 4,000 | 2 | 9 | 35 | $103.66 | $93.68 | -$9.98 |
| | 5,000 | 2 | 11 | 33 | $112.49 | $102.43 | -$10.06 |
| | 6,000 | 0 | 11 | 32 | $121.32 | $111.18 | -$10.14 |
| | 7,000 | 2 | 13 | 31 | $130.15 | $119.93 | -$10.22 |
| | 8,000 | 0 | 13 | 30 | $138.98 | $128.68 | -$10.30 |
| | 9,000 | 1 | 14 | 29 | $147.81 | $137.43 | -$10.38 |
| | 10,000 | 1 | 15 | 28 | $156.64 | $146.18 | -$10.46 |
| | 11,000 | 6 | 21 | 27 | $165.47 | $154.93 | -$10.54 |
| 1.5 Inch Meter Size | 25,000 | 5 | 26 | 21 | $289.09 | $277.43 | -$11.66 |
| | 50,000 | 5 | 31 | 17 | $509.84 | $496.18 | -$13.66 |
| | 75,000 | 6 | 37 | 11 | $730.59 | $714.93 | -$15.66 |
| | 100,000 | 2 | 38 | 6 | $951.34 | $933.68 | -$17.66 |
| | 125,000 | 1 | 39 | 4 | $1,172.09 | $1,152.43 | -$19.66 |
| | 150,000 | 1 | 40 | 3 | $1,392.84 | $1,371.18 | -$21.66 |
| | 175,000 | 1 | 41 | 2 | $1,613.59 | $1,589.93 | -$23.66 |
| | 200,000 | 0 | 41 | 1 | $1,834.34 | $1,808.68 | -$25.66 |
| | 225,000 | 0 | 41 | 1 | $2,055.09 | $2,027.43 | -$27.66 |
| | 250,000 | 0 | 41 | 1 | $2,275.84 | $2,246.18 | -$29.66 |
| | 275,000 | 0 | 41 | 1 | $2,496.59 | $2,464.93 | -$31.66 |
| | 300,000 | 0 | 41 | 1 | $2,717.34 | $2,683.68 | -$33.66 |
| | 325,000 | 0 | 41 | 1 | $2,938.09 | $2,902.43 | -$35.66 |
| | 350,000 | 1 | 42 | 1 | $3,158.84 | $3,121.18 | -$37.66 |
| | 0 | 4 | 4 | 57 | $109.30 | $77.43 | -$31.87 |
| | 1,000 | 0 | 4 | 53 | $118.13 | $86.18 | -$31.95 |
| | 2,000 | 0 | 4 | 53 | $126.96 | $94.93 | -$32.03 |
| | 3,000 | 0 | 4 | 53 | $135.79 | $103.68 | -$32.11 |
| | 4,000 | 0 | 4 | 53 | $144.62 | $112.43 | -$32.19 |
| | 5,000 | 0 | 5 | 53 | $153.45 | $121.18 | -$32.27 |
| | 6,000 | 1 | 5 | 52 | $162.28 | $129.93 | -$32.35 |
| | 7,000 | 1 | 6 | 52 | $171.11 | $138.68 | -$32.43 |
| | 8,000 | 1 | 6 | 51 | $179.94 | $147.43 | -$32.51 |
| | 9,000 | 1 | 8 | 51 | $188.77 | $156.18 | -$32.59 |
| | 10,000 | 1 | 9 | 49 | $197.60 | $164.93 | -$32.67 |
| | 11,000 | 8 | 17 | 48 | $206.43 | $173.68 | -$32.75 |
| | 25,000 | 9 | 26 | 40 | $330.05 | $296.18 | -$33.87 |
| 2 Inch Meter Size | 50,000 | 5 | 30 | 31 | $550.80 | $514.93 | -$35.87 |
| | 75,000 | 4 | 35 | 27 | $771.55 | $733.68 | -$37.87 |
| | 100,000 | 1 | 36 | 22 | $992.30 | $952.43 | -$39.87 |
| | 125,000 | 1 | 37 | 21 | $1,213.05 | $1,171.18 | -$41.87 |
| | 150,000 | 1 | 38 | 20 | $1,433.80 | $1,389.93 | -$43.87 |
| | 175,000 | 2 | 39 | 19 | $1,654.55 | $1,608.68 | -$45.87 |
| | 200,000 | 2 | 42 | 18 | $1,875.30 | $1,827.43 | -$47.87 |
| | 225,000 | 2 | 43 | 15 | $2,096.05 | $2,046.18 | -$49.87 |
| | 250,000 | 1 | 44 | 14 | $2,316.80 | $2,264.93 | -$51.87 |
| | 275,000 | 2 | 46 | 13 | $2,537.55 | $2,483.68 | -$53.87 |
| | 300,000 | 2 | 48 | 11 | $2,758.30 | $2,702.43 | -$55.87 |
| | 325,000 | 1 | 48 | 9 | $2,979.05 | $2,921.18 | -$57.87 |
| | 350,000 | 7 | 56 | 9 | $3,199.80 | $3,139.93 | -$59.87 |
| | 1,000,000 | 1 | 57 | 1 | $8,939.30 | $8,827.43 | -$111.87 |

## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill | Modeled Bill | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| | 0 | 0 | 0 | 7 | $226.38 | $127.45 | -$98.93 |
| | 1,000 | 0 | 0 | 7 | $235.21 | $136.20 | -$99.01 |
| | 2,000 | 0 | 1 | 7 | $244.04 | $144.95 | -$99.09 |
| | 3,000 | 0 | 1 | 7 | $252.87 | $153.70 | -$99.17 |
| | 4,000 | 0 | 1 | 6 | $261.70 | $162.45 | -$99.25 |
| | 5,000 | 0 | 1 | 6 | $270.53 | $171.20 | -$99.33 |
| | 6,000 | 0 | 1 | 6 | $279.36 | $179.95 | -$99.41 |
| | 7,000 | 0 | 1 | 6 | $288.19 | $188.70 | -$99.49 |
| | 8,000 | 0 | 1 | 6 | $297.02 | $197.45 | -$99.57 |
| | 9,000 | 0 | 1 | 6 | $305.85 | $206.20 | -$99.65 |
| | 10,000 | 0 | 1 | 6 | $314.68 | $214.95 | -$99.73 |
| | 11,000 | 0 | 1 | 6 | $323.51 | $223.70 | -$99.81 |
| | 25,000 | 1 | 2 | 6 | $447.13 | $346.20 | -$100.93 |
| 3 Inch Meter Size | 50,000 | 0 | 2 | 5 | $667.88 | $564.95 | -$102.93 |
| | 75,000 | 0 | 2 | 5 | $888.63 | $783.70 | -$104.93 |
| | 100,000 | 0 | 2 | 5 | $1,109.38 | $1,002.45 | -$106.93 |
| | 125,000 | 1 | 3 | 5 | $1,330.13 | $1,221.20 | -$108.93 |
| | 150,000 | 0 | 3 | 4 | $1,550.88 | $1,439.95 | -$110.93 |
| | 175,000 | 0 | 4 | 4 | $1,771.63 | $1,658.70 | -$112.93 |
| | 200,000 | 0 | 4 | 4 | $1,992.38 | $1,877.45 | -$114.93 |
| | 225,000 | 0 | 4 | 3 | $2,213.13 | $2,096.20 | -$116.93 |
| | 250,000 | 0 | 4 | 3 | $2,433.88 | $2,314.95 | -$118.93 |
| | 275,000 | 0 | 4 | 3 | $2,654.63 | $2,533.70 | -$120.93 |
| | 300,000 | 1 | 5 | 3 | $2,875.38 | $2,752.45 | -$122.93 |
| | 325,000 | 0 | 5 | 2 | $3,096.13 | $2,971.20 | -$124.93 |
| | 350,000 | 1 | 6 | 2 | $3,316.88 | $3,189.95 | -$126.93 |
| | 1,000,000 | 1 | 7 | 1 | $9,056.38 | $8,877.45 | -$178.93 |
| | 0 | 0 | 0 | 14 | $390.22 | $183.72 | -$206.50 |
| | 1,000 | 0 | 0 | 14 | $399.05 | $192.47 | -$206.58 |
| | 2,000 | 0 | 0 | 14 | $407.88 | $201.22 | -$206.66 |
| | 3,000 | 0 | 0 | 14 | $416.71 | $209.97 | -$206.74 |
| | 4,000 | 0 | 0 | 14 | $425.54 | $218.72 | -$206.82 |
| | 5,000 | 0 | 0 | 14 | $434.37 | $227.47 | -$206.90 |
| | 6,000 | 0 | 0 | 14 | $443.20 | $236.22 | -$206.98 |
| | 7,000 | 0 | 0 | 14 | $452.03 | $244.97 | -$207.06 |
| | 8,000 | 0 | 0 | 14 | $460.86 | $253.72 | -$207.14 |
| | 9,000 | 0 | 0 | 14 | $469.69 | $262.47 | -$207.22 |
| | 10,000 | 0 | 0 | 14 | $478.52 | $271.22 | -$207.30 |
| | 11,000 | 1 | 1 | 14 | $487.35 | $279.97 | -$207.38 |
| | 25,000 | 1 | 2 | 13 | $610.97 | $402.47 | -$208.50 |
| 4 Inch Meter Size | 50,000 | 1 | 3 | 12 | $831.72 | $621.22 | -$210.50 |
| | 75,000 | 0 | 3 | 11 | $1,052.47 | $839.97 | -$212.50 |
| | 100,000 | 0 | 3 | 11 | $1,273.22 | $1,058.72 | -$214.50 |
| | 125,000 | 0 | 3 | 11 | $1,493.97 | $1,277.47 | -$216.50 |
| | 150,000 | 0 | 3 | 11 | $1,714.72 | $1,496.22 | -$218.50 |
| | 175,000 | 0 | 3 | 11 | $1,935.47 | $1,714.97 | -$220.50 |
| | 200,000 | 0 | 3 | 11 | $2,156.22 | $1,933.72 | -$222.50 |
| | 225,000 | 0 | 3 | 11 | $2,376.97 | $2,152.47 | -$224.50 |
| | 250,000 | 0 | 3 | 11 | $2,597.72 | $2,371.22 | -$226.50 |
| | 275,000 | 0 | 4 | 11 | $2,818.47 | $2,589.97 | -$228.50 |
| | 300,000 | 0 | 4 | 11 | $3,039.22 | $2,808.72 | -$230.50 |
| | 325,000 | 0 | 4 | 10 | $3,259.97 | $3,027.47 | -$232.50 |
| | 350,000 | 3 | 7 | 10 | $3,480.72 | $3,246.22 | -$234.50 |
| | 1,000,000 | 7 | 14 | 7 | $9,220.22 | $8,933.72 | -$286.50 |

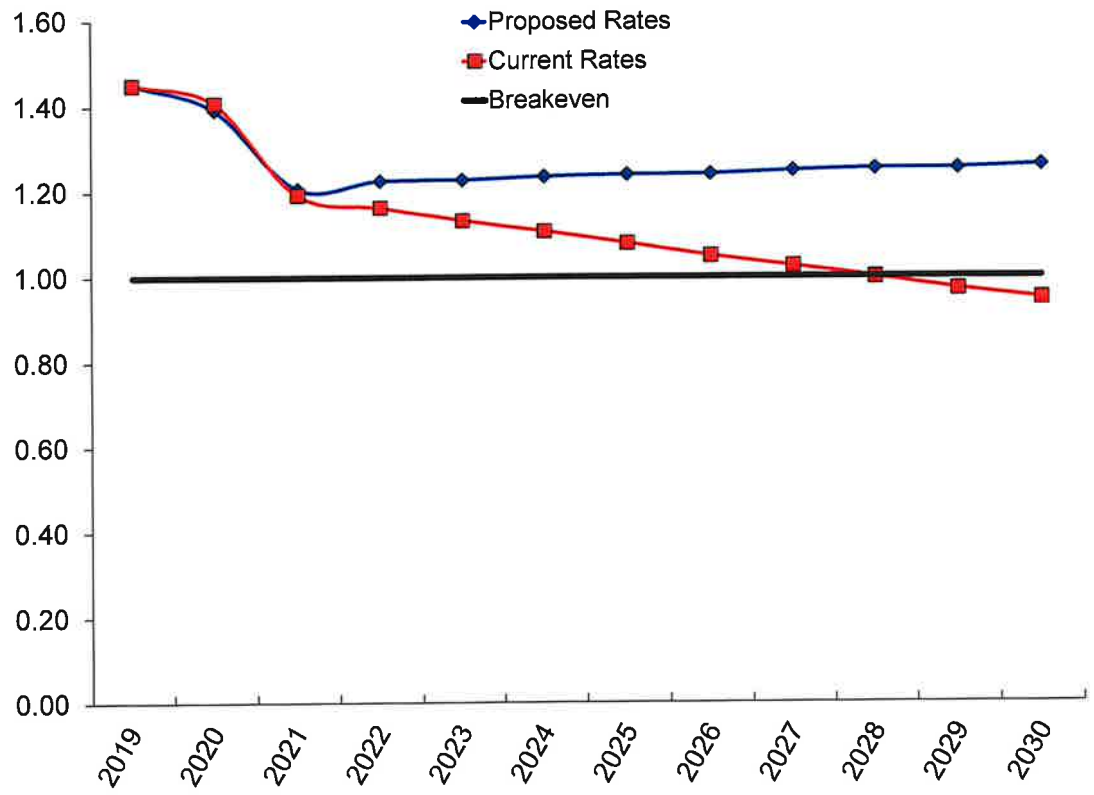
## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill | Modeled Bill | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| 6 Inch Meter Size | 0 | 1 | 1 | 7 | $858.38 | $340.02 | -$518.36 |
| | 1,000 | 0 | 1 | 6 | $867.21 | $348.77 | -$518.44 |
| | 2,000 | 0 | 1 | 6 | $876.04 | $357.52 | -$518.52 |
| | 3,000 | 0 | 1 | 6 | $884.87 | $366.27 | -$518.60 |
| | 4,000 | 0 | 1 | 6 | $893.70 | $375.02 | -$518.68 |
| | 5,000 | 0 | 1 | 6 | $902.53 | $383.77 | -$518.76 |
| | 6,000 | 0 | 1 | 6 | $911.36 | $392.52 | -$518.84 |
| | 7,000 | 0 | 1 | 6 | $920.19 | $401.27 | -$518.92 |
| | 8,000 | 0 | 1 | 6 | $929.02 | $410.02 | -$519.00 |
| | 9,000 | 0 | 1 | 6 | $937.85 | $418.77 | -$519.08 |
| | 10,000 | 0 | 1 | 6 | $946.68 | $427.52 | -$519.16 |
| | 11,000 | 0 | 1 | 6 | $955.51 | $436.27 | -$519.24 |
| | 25,000 | 0 | 1 | 6 | $1,079.13 | $558.77 | -$520.36 |
| | 50,000 | 0 | 1 | 6 | $1,299.88 | $777.52 | -$522.36 |
| | 75,000 | 0 | 1 | 6 | $1,520.63 | $996.27 | -$524.36 |
| | 100,000 | 0 | 1 | 6 | $1,741.38 | $1,215.02 | -$526.36 |
| | 125,000 | 0 | 2 | 6 | $1,962.13 | $1,433.77 | -$528.36 |
| | 150,000 | 0 | 2 | 6 | $2,182.88 | $1,652.52 | -$530.36 |
| | 175,000 | 0 | 2 | 5 | $2,403.63 | $1,871.27 | -$532.36 |
| | 200,000 | 0 | 2 | 5 | $2,624.38 | $2,090.02 | -$534.36 |
| | 225,000 | 0 | 2 | 5 | $2,845.13 | $2,308.77 | -$536.36 |
| | 250,000 | 0 | 2 | 5 | $3,065.88 | $2,527.52 | -$538.36 |
| | 275,000 | 0 | 2 | 5 | $3,286.63 | $2,746.27 | -$540.36 |
| | 300,000 | 0 | 2 | 5 | $3,507.38 | $2,965.02 | -$542.36 |
| | 325,000 | 0 | 2 | 5 | $3,728.13 | $3,183.77 | -$544.36 |
| | 350,000 | 1 | 3 | 5 | $3,948.88 | $3,402.52 | -$546.36 |
| 8 Inch Meter Size | 0 | 0 | 0 | 0 | $1,513.82 | $527.58 | -$986.24 |
| | 5,000,000 | 0 | 0 | 0 | $45,663.82 | $44,277.58 | -$1,386.24 |

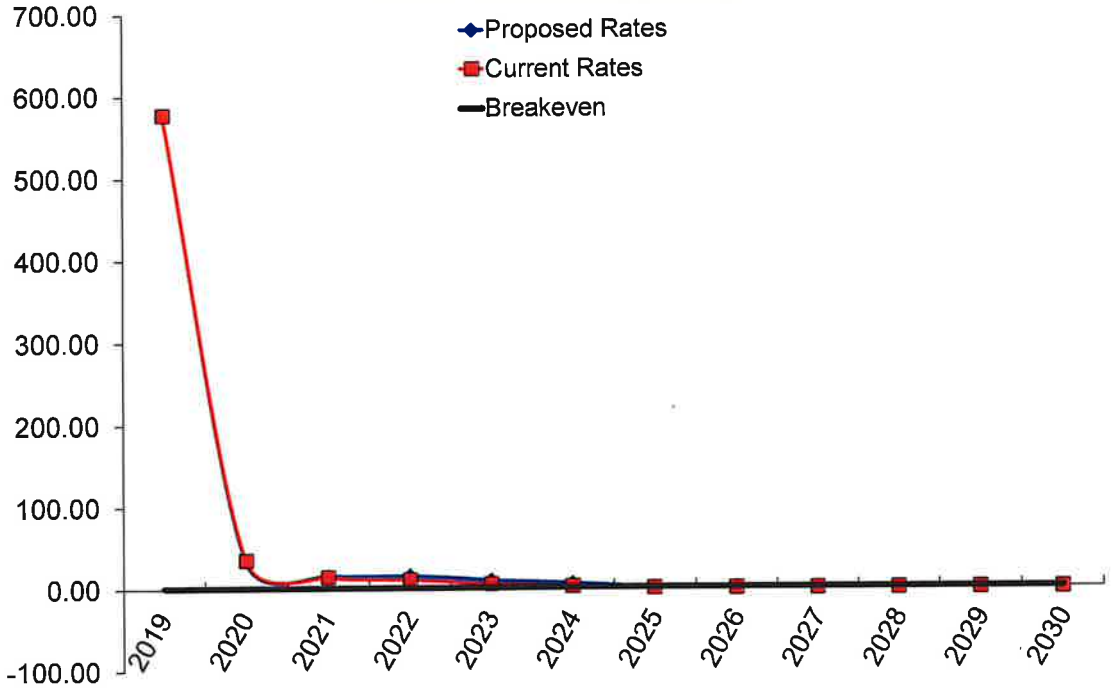
## Table 18 - Bills Before and After Rate Adjustments

| Customer, Rate Class or Meter Size | Gallons of Use | Customers at or Above This Volume But Below the Next | Customers Using This Volume or Less | Customers Using This Volume or More | Current Bill | Modeled Bill | Modeled Bill Increase or Decrease (-) |
|---|---|---|---|---|---|---|---|
| Hotels 1 | 0 | 0 | 0 | 4 | $0.00 | $0.00 | $0.00 |
| | 1,000 | 0 | 0 | 4 | $2.61 | $2.59 | -$0.02 |
| | 2,000 | 0 | 0 | 4 | $5.22 | $5.17 | -$0.05 |
| | 5,000 | 0 | 0 | 4 | $13.05 | $12.93 | -$0.12 |
| | 6,000 | 0 | 0 | 4 | $15.66 | $15.52 | -$0.14 |
| | 8,000 | 0 | 0 | 4 | $20.88 | $20.69 | -$0.19 |
| | 10,000 | 0 | 0 | 4 | $26.10 | $25.86 | -$0.24 |
| | 15,000 | 0 | 0 | 4 | $39.15 | $38.80 | -$0.35 |
| | 20,000 | 0 | 0 | 4 | $52.20 | $51.73 | -$0.47 |
| | 25,000 | 0 | 0 | 4 | $65.25 | $64.66 | -$0.59 |
| | 30,000 | 0 | 0 | 4 | $78.30 | $77.59 | -$0.71 |
| | 50,000 | 0 | 0 | 4 | $130.50 | $129.32 | -$1.18 |
| | 61,000 | 0 | 0 | 4 | $159.21 | $157.77 | -$1.44 |
| | 70,000 | 0 | 0 | 4 | $182.70 | $181.04 | -$1.66 |
| | 94,000 | 0 | 0 | 4 | $245.34 | $243.12 | -$2.22 |
| | 100,000 | 0 | 0 | 4 | $261.00 | $258.64 | -$2.36 |
| | 128,000 | 0 | 0 | 4 | $334.08 | $331.05 | -$3.03 |
| | 200,000 | 0 | 0 | 4 | $522.00 | $517.27 | -$4.73 |
| | 215,000 | 1 | 1 | 4 | $561.15 | $556.07 | -$5.08 |
| | 289,000 | 0 | 1 | 3 | $754.29 | $747.46 | -$6.83 |
| | 300,000 | 2 | 3 | 3 | $783.00 | $775.91 | -$7.09 |
| | 385,000 | 0 | 3 | 2 | $1,004.85 | $995.75 | -$9.10 |
| | 400,000 | 1 | 4 | 1 | $1,044.00 | $1,034.54 | -$9.46 |
| | 500,000 | 0 | 4 | 0 | $1,305.00 | $1,293.18 | -$11.82 |
| Hotels 2 | 0 | 0 | 0 | 1 | $0.00 | $0.00 | $0.00 |
| | 1,000 | 0 | 0 | 1 | $3.20 | $3.17 | -$0.03 |
| | 2,000 | 0 | 0 | 1 | $6.40 | $6.34 | -$0.06 |
| | 5,000 | 0 | 0 | 1 | $16.00 | $15.86 | -$0.14 |
| | 6,000 | 0 | 0 | 1 | $19.20 | $19.03 | -$0.17 |
| | 8,000 | 0 | 0 | 1 | $25.60 | $25.37 | -$0.23 |
| | 10,000 | 0 | 0 | 1 | $32.00 | $31.71 | -$0.29 |
| | 15,000 | 0 | 0 | 1 | $48.00 | $47.57 | -$0.43 |
| | 20,000 | 0 | 0 | 1 | $64.00 | $63.42 | -$0.58 |
| | 25,000 | 0 | 0 | 1 | $80.00 | $79.28 | -$0.72 |
| | 30,000 | 0 | 0 | 1 | $96.00 | $95.13 | -$0.87 |
| | 50,000 | 0 | 0 | 1 | $160.00 | $158.55 | -$1.45 |
| | 61,000 | 0 | 0 | 1 | $195.20 | $193.43 | -$1.77 |
| | 70,000 | 0 | 0 | 1 | $224.00 | $221.97 | -$2.03 |
| | 94,000 | 0 | 0 | 1 | $300.80 | $298.07 | -$2.73 |
| | 100,000 | 0 | 0 | 1 | $320.00 | $317.10 | -$2.90 |
| | 128,000 | 1 | 1 | 1 | $409.60 | $405.89 | -$3.71 |
| | 200,000 | 0 | 1 | 0 | $640.00 | $634.20 | -$5.80 |
| | 215,000 | 0 | 1 | 0 | $688.00 | $681.77 | -$6.23 |
| | 289,000 | 0 | 1 | 0 | $924.80 | $916.42 | -$8.38 |
| | 300,000 | 0 | 1 | 0 | $960.00 | $951.30 | -$8.70 |

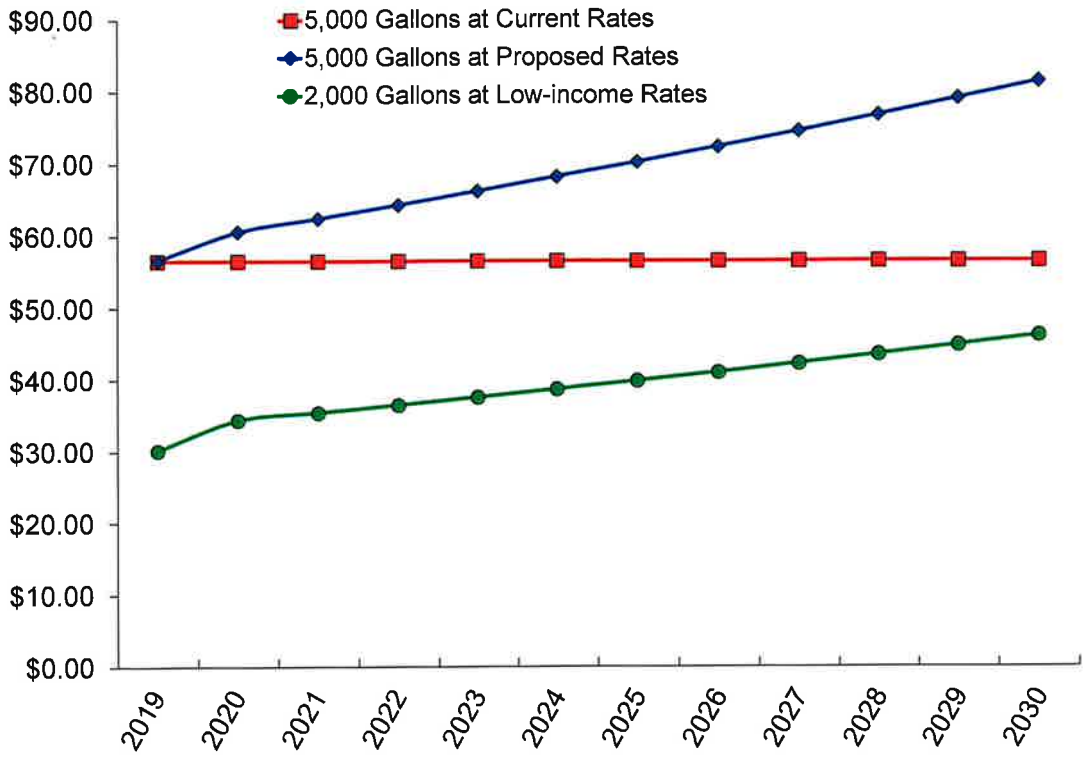
## Chart 1 - Operating Ratio



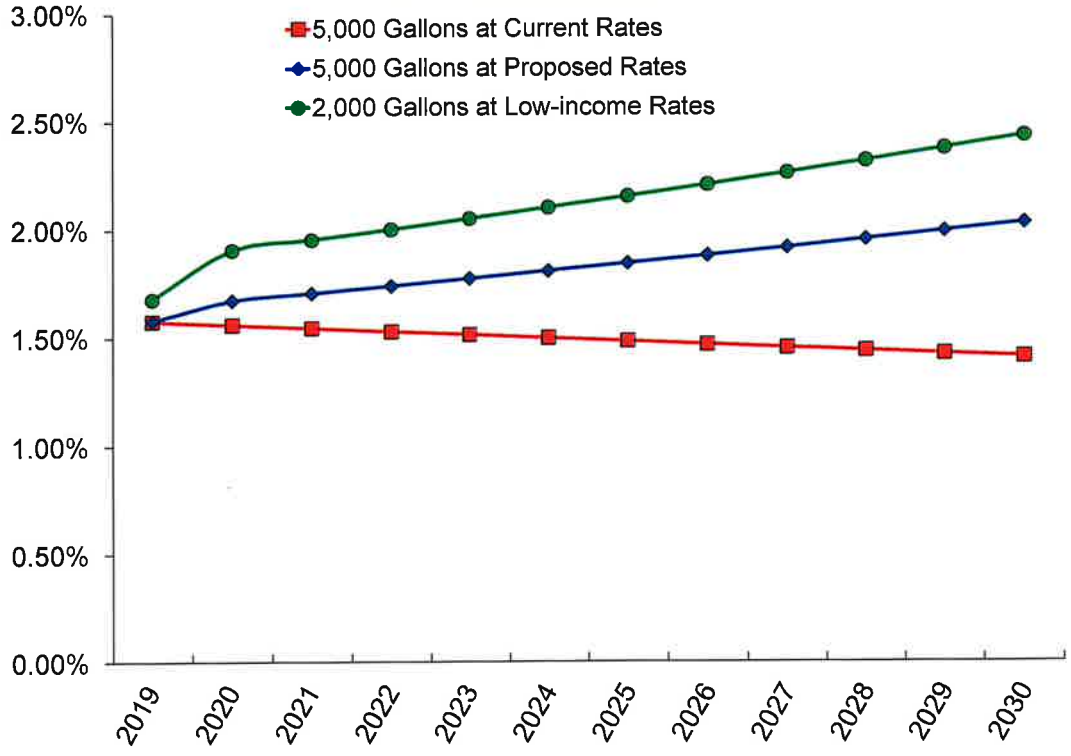

## Chart 2 - Coverage Ratio



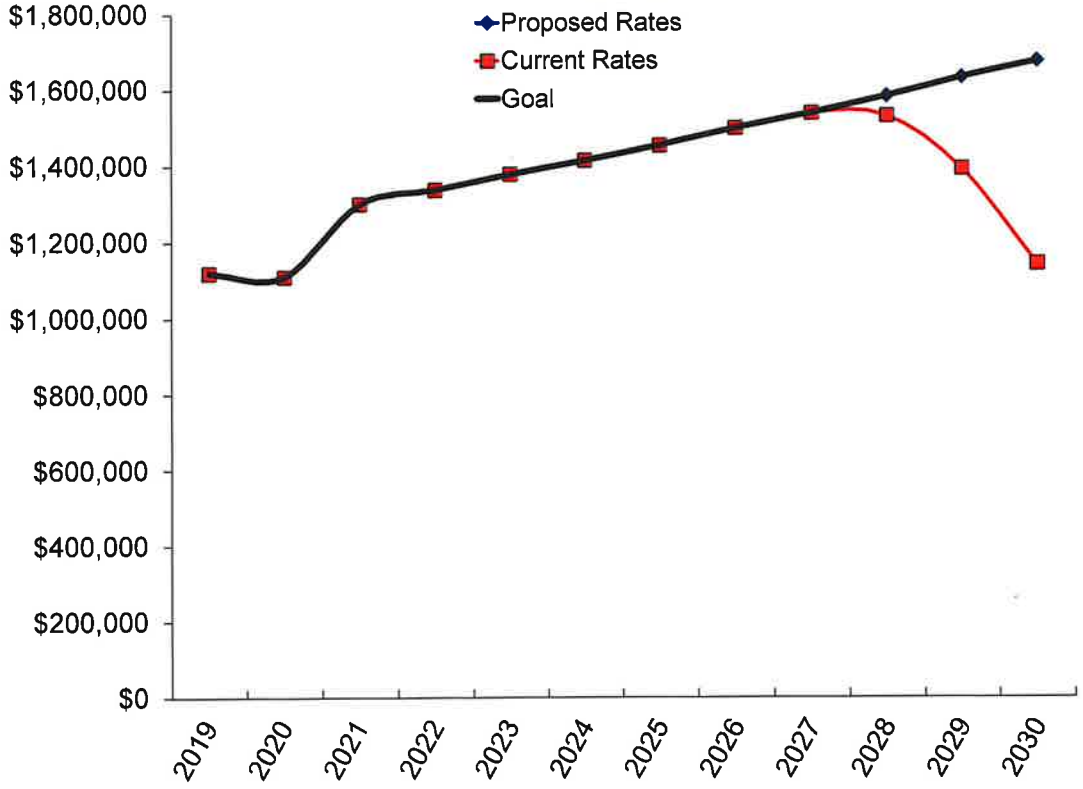
## Chart 3 - Residential Users' Bills



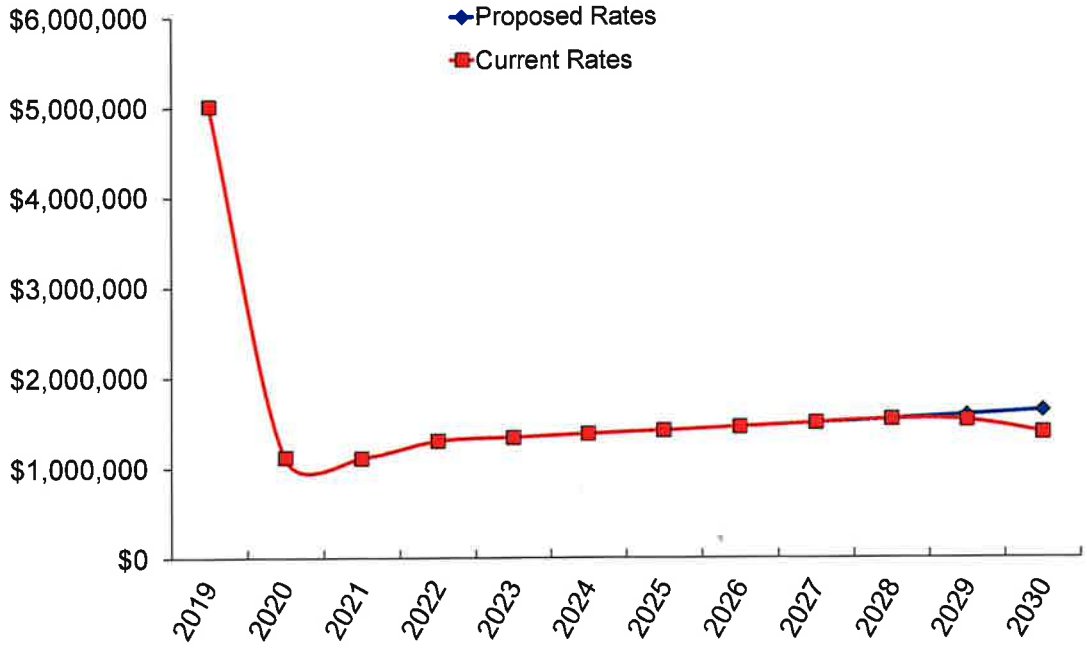

## Chart 4 - Affordability



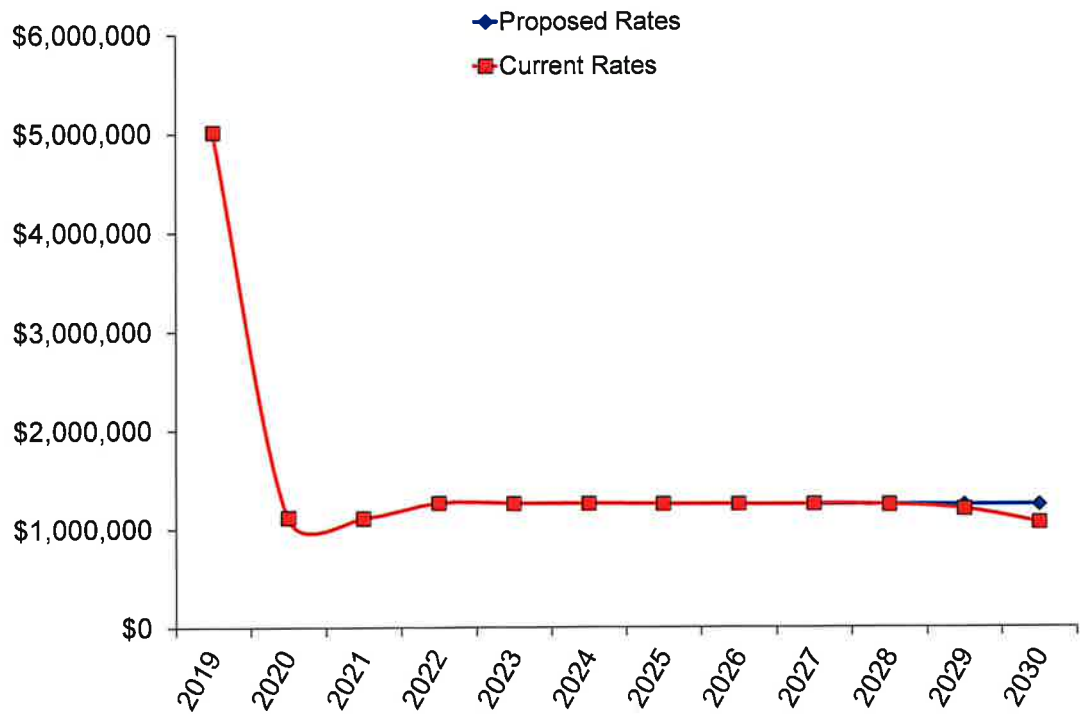
## Chart 5 - Working Capital vs Goal



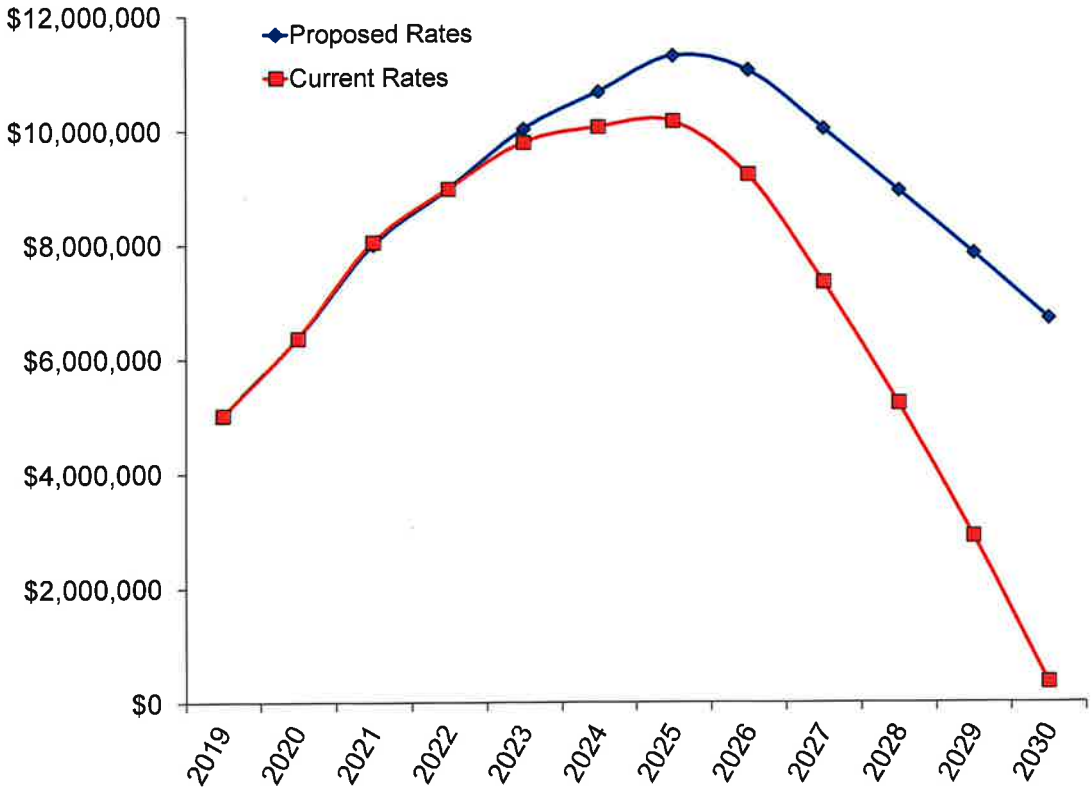

## Chart 6 - Value of Cash Assets Before Inflation



## Chart 7 - Value of Cash Assets After Inflation




## Chart 8 - Sum of All Reserves



# Water and Sewer Rate Analysis Report Synopsis

# Prince George County Water Authority

# Prince George, Virginia

Prepared May 18, 2020

Carl Brown, President
GettingGreatRates.com, LLC

## *Executive Summary*

*These analyses calculate cost-to-serve water and sewer rates for the Authority.*

*The initial water rate adjustments will result in an overall revenue increase of 24.6 percent. The Authority bills bi-monthly. Therefore, the water bill equivalent for a 5,000 gallon per month residential customer will rise from $24.41 per month to $31.02.*

*The initial sewer rate adjustments will result in an overall revenue increase of 1.8 percent. The equivalent sewer bill for a 5,000 gallon per month residential customer will rise from $56.56 per month to $59.78.*

*In future years, it is projected water rates will need to be increased across-the-board by 5.0 percent to match inflation and to reach the reserves target. Sewer rates will need to rise by 3.0 percent, just to match inflation.*

*Several very expensive capital improvements scheduled to occur five to seven years from now will necessitate additional rate increases or interventions, like higher grants, in the near future.*

*COVID-19 may affect bill collections (revenues), at least temporarily.*

## Capital Improvement Program (CIP) Costs and Grants

You have some expensive CIP costs looming in the next few years. I modeled ways to pay for these costs:

- "Paying cash" for everything is out of the question, but that is normal.
- Were you to cover all CIP costs with debt, which I initially modeled, that would run the combined water and sewer bill for the benchmark customer very high. I discarded that option.
- I next modeled getting 50 percent of the several highest cost projects paid with grants but the benchmark water and sewer bill would still be quite high. I discarded that option, too.
- Finally, I modeled receiving grants of 50 percent on all CIP projects from 2021, going forward. The benchmark water and sewer bill would still be somewhat high but manageable for most customers. Fifty-percent grants are not unheard of, but these days they are rare. Still, that is the assumed funding mix I settled upon in the models.

The rates I have modeled and recommend are closer to a best-case scenario than they are to a worst-case scenario.

If the economic problems of the pandemic are anything like those of the 2008 financial crisis, and they seem to be far worse so far, I suspect the U.S. government will issue grants to help build infrastructure, including water and sewer. This is where the Authority may have an opportunity to build substantial improvements at low cost to the ratepayers, keeping rates lower than they otherwise would need to be.

# Water Rates

## Recommended Rate Structures

I recommend your rates include:

1. System development fees that graduate with meter size, based on the cost of capacity to serve different meter sizes. You do this now.
2. A minimum charge that is also based on meter size for the same reason. You do this now.
3. A unit charge that mirrors your current inclining rate structure, with no usage allowance.

I would not normally recommend inclining rates with rate blocks that change depending upon meter size, however, you are facing many challenges in the coming years and I did not want to compound that with more structure changes now.

## Expected Incomes

Future inflationary-type increases were "back-loaded." That means, the initial rates I calculated are not high enough to enable you to increase rates in the future to only match cost inflation. You will need to raise rates more on the back end, the later years, to catch up to the goal reserves level. Backloading is often, but not always a bad thing. Foot racers do it all the time to win.

## Rate Affordability

In Table 17, the AI calculation for the test year was at 0.68 percent. The national average is around 1.0 percent. Under the recommended rates, this customer's AI would rise to 0.86 percent. That is less affordable than the current bill, but still cheaper than average.

Affordability Index: The monthly charge for (typically) 5,000 gallons of residential service divided by the median monthly household income for the area served by the system. An index of 1.0, meaning a household pays one percent of its income to pay its bill for 5,000 gallons of service, is generally considered affordable. The Affordability index is a primary factor in determining grant and loan eligibility and grant amount.

## Recommendations for Adjusting Water Rates

In the table that follows, I list the rates and fees you should adopt:

1. Tables A and B that follow this list state the recommended rates and fees.
2. The calculations assumed you would have made these adjustments early enough, by approximately June 30, 2020, to enable you to collect at these rates for billings starting after July 1, 2020.
3. You would need to satisfy all Statutory requirements for making rate adjustments in advance of the adjustment date. That is coming up soon, so if you want to make that date, you will need to move promptly.
4. Approximately one full year after the initial rate adjustments, examine the costs and incomes the utility experienced during that year, plus the balances that have accrued. Compare those items to the same items in Tables 3, 4, 5 and 17, of the Model.
   a) If all accrued close to the values in the Model, raise all rates by 5.0 percent, as shown near the top of Table 3, page 44.
   b) If balances did not accrue as shown at the bottom of Table 17, but they are not egregiously too low, follow the instructions in Chapter 9 of the book, "How to Get Great Rates" for how to make inflationary increases correctly.
   c) If balances were too low by an amount that is troubling to you, call me to discuss the situation. It is likely I will be able to "talk you through" how to make appropriate rate adjustments to correct the situation.

5. Repeat recommendation Number 4 each following year until you have raised rates and fees by a cumulative 20 percent, then have me or another rate analyst of your choice perform a new rate analysis. In fact, your largest capital improvements are planned to occur in four to five years, so that would be an opportune time to revisit rates anyway.

Table A: Recommended Water System Development Fees and Minimum Charges

Table A: System Development Fees and Minimum Charges; With Zero Usage Allowance, Calculated by the Prince George County, VA, 2020 Water Rates Model 1

| Water Meter Size in Inches | Meter Type | Fee per New Tap, Excluding Out-of-pocket Costs | Bi-monthly Minimum Charge Each Meter Size |
|---|---|---|---|
| 0.625 | Displacement | $4,000 | $23.44 |
| 0.750 | Displacement | $4,000 | $23.44 |
| 1.000 | Displacement | $10,000 | $36.63 |
| 1.500 | Displacement | $19,999 | $58.60 |
| 2.000 | Displacement | $31,998 | $84.97 |
| 2.500 | Displacement | $49,998 | $124.52 |
| 3.000 | Singlet | $63,997 | $155.28 |
| 3.000 | Compound, Class I | $63,997 | $155.28 |
| 3.000 | Turbine, Class I | $69,997 | $168.47 |
| 4.000 | Singlet | $99,995 | $234.39 |
| 4.000 | Compound, Class I | $99,995 | $234.39 |
| 4.000 | Turbine, Class I | $123,994 | $287.12 |
| 6.000 | Singlet | $199,990 | $454.12 |
| 6.000 | Compound, Class I | $199,990 | $454.12 |
| 6.000 | Turbine, Class I | $259,987 | $585.96 |
| 8.000 | Compound, Class I | $319,984 | $717.80 |
| 8.000 | Turbine, Class I | $559,972 | $1,245.15 |
| 10.000 | Turbine, Class II | $839,958 | $1,860.40 |
| | Hotels 1 | N.A. | $0.00 |
| | Hotels 2 | N.A. | $0.00 |
| | Hydrants | N.A. | $0.00 |

## Table B: Recommended Unit Charges

| Table B: Prince George County, VA Water Modeled Rate Blocks and Unit Charges for All Meter Types | | | |
|---|---|---|---|
| Water Meter Size in Inches | Rate Block Ranges, in Gallons | | Unit Charge per 1,000 Gallons Used in Each Block |
| | Bottom | Top | |
| 0.625 | 0 | 5,999 | $3.86 |
| | 6,000 | 19,999 | $4.83 |
| | 20,000 | and greater | $6.03 |
| 0.750 | 0 | 5,999 | $3.86 |
| | 6,000 | 19,999 | $4.83 |
| | 20,000 | and greater | $6.03 |
| 1.000 | 0 | 7,999 | $3.86 |
| | 8,000 | 24,999 | $4.83 |
| | 25,000 | and greater | $6.03 |
| 1.500 | 0 | 14,999 | $3.86 |
| | 15,000 | 60,999 | $4.83 |
| | 61,000 | and greater | $6.03 |
| 2.000 | 0 | 29,999 | $3.86 |
| | 30,000 | 93,999 | $4.83 |
| | 94,000 | and greater | $6.03 |
| 2.500 | 0 | 5,999 | $3.86 |
| | 6,000 | 19,999 | $4.83 |
| | 20,000 | and greater | $6.03 |
| 3.000 | 0 | 69,999 | $3.86 |
| | 70,000 | 214,999 | $4.83 |
| | 215,000 | and greater | $6.03 |
| 4.000 | 0 | 127,999 | $3.86 |
| | 128,000 | 384,999 | $4.83 |
| | 385,000 | and greater | $6.03 |
| 6.000 | 0 | 288,999 | $3.86 |
| | 289,000 | 866,999 | $4.83 |
| | 867,000 | and greater | $6.03 |
| 8.000 | 0 | 288,999 | $3.86 |
| | 289,000 | 866,999 | $4.83 |
| | 867,000 | and greater | $6.03 |
| 10.000 | 0 | 288,999 | $3.86 |
| | 289,000 | 866,999 | $4.83 |
| | 867,000 | and greater | $6.03 |
| Hotels 1 | 0 | and greater | $3.39 |
| Hotels 2 | 0 | and greater | $4.16 |
| Hydrants | 0 | and greater | $18.40 |

## Sewer Rates

Most water issues apply to the sewer utility, too. Therefore, you can generally apply what I said about those rates to sewer rates, too.

### Recommended Rate Structures

Your regular user charge fees are already in the preferred structure, so retain that.

Unmetered Rates

You also have 307 sewer customers that do not receive metered water service. Currently, the flat rate bi-monthly bill for these customers is $108. One might wonder if that is a fair bill, so I did some research.

The average bi-monthly use for a small meter, metered-use customer on the system is 8,456 gallons. The current bill for a small meter customer of 8,000 gallons is $95.46. For 9,000 gallons it is $104.29. And for 10,000 gallons it is $113.12. Thus, the bill for an unmetered customer falls between the bills for metered customers of 9,000 and 10,000 gallons, slightly more than the average metered customer's bill.

Unmetered customers usually use more volume than metered customers, some on the order of 25 percent or more. I judge the current unmetered customer's bill at $108 to be quite reasonable as compared to the current metered rate bills.

I have calculated the recommended rate for unmetered sewer customers based on 10,000 gallons of assumed use bi-monthly, plus the minimum charge of the smallest meter on the system.

### Rate Affordability

The AI for the test year was at 1.58 percent. Under the recommended rates, the AI would rise to 1.65 percent. That, plus the water rates affordability, may position you for grants.

## Recommendations for Adjusting Sewer Rates

In the following, I summarized most of my sewer rates recommendations. In the table that follows, I list the rates and fees you should adopt:

1. Table C that follows this list states the recommended rates and fees.
2. The calculations assumed you would have made these adjustments early enough, by approximately June 30, 2020, to enable you to collect at these rates for billings starting after July 1, 2020.
3. You would need to satisfy all Statutory requirements for making rate adjustments in advance of the adjustment date. That is coming up soon, so if you want to make that date, you will need to move promptly.

4. Approximately one full year after the initial rate adjustments, examine the costs and incomes the utility experienced during that year, plus the balances that have accrued. Compare those items to the same items in Tables 3, 4, 5 and 17, of the Model.
   a) If all accrued close to the values in the Model, raise all rates by 3.0 percent, as shown near the top of Table 3, page 81. Note: This is less than the water rates.
5. Repeat recommendation Number 4 each following year and handle as described in the water section.

Table C: Recommended Sewer Rates

Table C: System Development Fees; Minimum and Unit Charges; With Zero Usage Allowance, Calculated by the Prince George County, VA, 2020 Sewer Rates Model 2

| Water Meter Size in Inches | Meter Type | Fee per New Tap, Excluding Out-of-pocket Costs | Bi-monthly Minimum Charge Each Meter Size | Unit Charge per 1,000 Gallons |
|---|---|---|---|---|
| 0.625 | Displacement | $5,000 | $33.28 | $8.79 |
| 0.750 | Displacement | $5,000 | $33.28 | $8.79 |
| 1.000 | Displacement | $12,500 | $42.64 | $8.79 |
| 1.500 | Displacement | $24,999 | $58.25 | $8.79 |
| 2.000 | Displacement | $39,999 | $76.98 | $8.79 |
| 2.500 | Displacement | $62,498 | $105.08 | $8.79 |
| 3.000 | Singlet | $79,998 | $126.93 | $8.79 |
| 3.000 | Compound, Class I | $79,998 | $126.93 | $8.79 |
| 3.000 | Turbine, Class I | $87,497 | $136.30 | $8.79 |
| 4.000 | Singlet | $124,996 | $183.13 | $8.79 |
| 4.000 | Compound, Class I | $124,996 | $183.13 | $8.79 |
| 4.000 | Turbine, Class I | $154,995 | $220.59 | $8.79 |
| 6.000 | Singlet | $249,992 | $339.22 | $8.79 |
| 6.000 | Compound, Class I | $249,992 | $339.22 | $8.79 |
| 6.000 | Turbine, Class I | $324,990 | $432.88 | $8.79 |
| 8.000 | Compound, Class I | $399,988 | $526.53 | $8.79 |
| 8.000 | Turbine, Class I | $699,979 | $901.16 | $8.79 |
| 10.000 | Turbine, Class II | $1,049,968 | $1,338.22 | $8.79 |
| | Hotels 1 | N.A. | $0.00 | $2.60 |
| | Hotels 2 | N.A. | $0.00 | $3.19 |