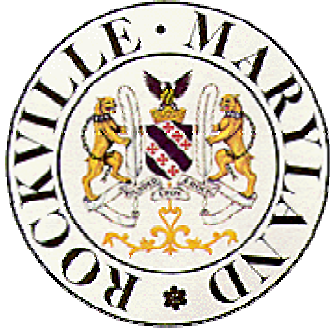


**Prepared for**



# City of Rockville

## Water and Sewer Rate Study

**Prepared by**



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## **APPENDIX**

Water and Sewer Cost of Service Model consisting of the following schedules:

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- Schedule 2 - O&M Expenses
- Schedule 3 - Debt Service
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- Schedule 5A - User CIP Cash
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## **A. EXECUTIVE SUMMARY**

This document was prepared to summarize the work performed by the Municipal & Financial Services Group (MFSG) during the water and sewer cost of service study authorized by the City of Rockville. The study is predicated on the use of a cash flow analysis to support the pricing of utility services. The cost of service analysis uses a planning period of 10 years (Fiscal Years 2007 - 2016). This portion of the report summarizes the conclusions and recommendations developed during the course of the study.

### **1. Findings**

- Based upon the projected quantities of water sold, the current water rates will produce cash revenues roughly 40% less than the cash revenue required to operate the water system in Fiscal Year 2007 with subsequent significant shortfalls annually over the projection period (FY 2007 – 2016). Based upon the projected quantities of sewer treated, the current sewer rates will produce cash revenues roughly 6% less than the required cash revenue in Fiscal Year 2007 with subsequent significant shortfalls annually over the projection period.
- The majority of the City’s cost of operating and maintaining the water and sewer system are fixed. It is estimated that roughly 77% of the water operating expenses and 97% of the sewer operating expenses are fixed. Percentage of fixed costs is in line with typical water and sewer utility operations.
- The capital connection fees for the water and sewer systems are not set at the sufficient levels based upon the cost of buying into the respective systems.
- The City has not adjusted its miscellaneous fees and charges in a number of years.
- The City does not currently meter all customer connections; the majority of City of Rockville facilities are not currently metered.
- The City does not currently have formally established reserves to provide for contingencies and major unplanned expenses.

### **2. Conclusions**

- To break even on a cash basis, water and sewer revenues need to be increased by 40% and 6%, respectively for Fiscal Year 2007. The “rate shock” and bill impact can be mitigated by drawing down available cash reserves and gradually raising rates to a break-even point over time.
- The City needs to increase capital connection fees if it does not want current customers to subsidize the cost of serving new customers.
- The absence of full metering at City facilities makes it difficult to determine the actual amount of unaccounted for water.

### 3. Recommendations

- We recommend that the City formally establish an Operating and Maintenance (“O&M”) Reserve and a Repair, Renewal and Rehabilitation (“3R”) Reserve for both the water and sewer systems. The O&M Reserve should be set at 90 days of operating expenses. The “3R” Reserve should initially be established as 0.50% of the book value of the respective systems. Both reserves should be designated as restricted reserves with policies clearly establishing uses for each reserve.
- We recommend that the City implement an alternative rate structure for water and maintain the current rate structure for sewer as shown on the below page:

*Recommended Ready-to-Serve Charge per Bill*

<b>Meter Size (inches)</b>	<b>Quarterly</b>	<b>Monthly</b>
5/8	\$ 6.00	\$ 2.00
3/4	\$ 9.00	\$ 3.00
1	\$ 15.00	\$ 5.00
1 1/2	\$ 30.00	\$ 10.00
2	\$ 48.00	\$ 16.00
3	\$ 96.00	\$ 32.00
4	\$ 150.00	\$ 50.00
6	\$ 300.00	\$ 100.00
8	\$ 480.00	\$ 160.00
10	\$ 720.00	\$ 240.00

*Recommended Consumption Charges*

<b>Water Consumption Charge (per 1,000 gallons)</b>	<b>Recommended Rate</b>
0 – <12,000 gallons per quarter	\$ 1.62
12,000 – <24,000 gallons per quarter	\$ 2.33
24,000 gallons and over per quarter	\$ 2.50
<b>Sewer Consumption Charge (per 1,000 gallons)</b>	\$ 3.63

- We recommend that the City adopt the necessary rate increases for water and sewer over the next five years to ensure that revenues equal expenses going forward. The proposed annual revenue increases are shown below.

<b>Fund</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
Water Revenue Increase	8%	8%	8%	8%	8%
Sewer Revenue Increase	4%	4%	4%	4%	4%

- We also recommend small annual increases (2% - 3%) after FY 2011 to keep revenues in line with the increasing cost of providing water and sewer service, minimizing the need for large future rate increases.

- We recommend the capital contribution fee for water be increased to \$1,600 per equivalent dwelling unit (EDU) based cost of buying capacity in the water system and the sewer capital contribution fee be increased to \$2,400 per EDU.
- Fees and charges associated with water functions should be increased/adjusted to account for changes in the cost of providing varying services.
- The City should meter all customer connections so that a true accounting of water usage can be determined and monitored.

## **B. BASIS FOR THE STUDY**

### **1. Scope of Work**

The scope of services set forth in the contract between the City of Rockville and the Municipal and Financial Services Group specifies several related tasks:

1. Determine the cost of service on a cash basis, identify revenue requirements and subsequently design a rate structure for water and sewer that is consistent with the City's goals and objectives.
2. Identify and document policy issues affecting the establishment of rates and fees for water and sewer service.
3. Develop an Excel model by which the City can project cash flows and future water/sewer rates over a 10 year period using varying revenue, expense, capital project cost assumptions and customer growth rates.

### **2. Background**

The City of Rockville operates its water and sewer utilities as an enterprise fund, meaning that the systems are designed to be self supporting via fees and charges collected from the users of the systems. The City has not formally conducted a cost of service study in the past; water and sewer rates have been established and updated in-house based upon an annual review of expenses. The capital contribution fees were reviewed and subsequently adjusted as part of a study completed in 1999 by DMG-Maximus.

### **3. Assumptions Used in the Study**

The following assumptions were used to guide the cost of service analysis and were developed with the assistance of the City staff:

- The water and sewer systems must each be self supporting. It is assumed that the cost of operating and maintaining the water system must be supported by the water fees and charges collected from water customers. The same must be true of the sewer utility.
- One of the City's principal objectives is to keep rates and fees low over time. It is possible to keep rates low for a period of time by not investing sufficiently in the maintenance of the water and sewer systems, but eventually the systems will deteriorate and require substantial investments leading to the need for significant and immediate rate increases. The assumption that the City will continually reinvest in the system is built into the analysis and allows for timely and predicable rate increases.
- The City should develop reserves to provide for contingencies and unplanned expenses.
- The expenses related to operating and maintaining the water and sewer utilities should be equitably distributed among the users of the respective systems.

In order to project future revenue requirements and offsetting revenues from water and sewer rates, several assumptions were made regarding future economic conditions and growth within the City's service area. Assumptions (which can be varied as needed from year to year) made regarding various items are shown below:

<u>Element</u>	<u>FY 07 Percentage</u>
Inflation Rate – Water and Sewer O&M Expenses	3.0%
Customer Growth Rate – Water	0.35%
Consumption Growth Rate – Water	0.35%
Customer Growth Rate – Sewer	0.35%
Consumption Growth Rate – Sewer	0.35%
Interest Rate on Borrowing	4.5%
Estimated Household Consumption Allowance	250 gallons per day per EDU*
Repair, Renewal & Replacement ("3R") Reserve	0.50% of book value of system
Operating and Maintenance Reserve	90 days of operating expenses

*\*Used for calculation of capital contribution fees, actual consumption used in rate analysis.*

These assumptions were used after discussions with the City, utilizing our experience and the City's knowledge of its customer base and historical costs. The growth in customers and consumption is based upon information provided by the Planning Department. The rationale behind the assumptions used to develop the reserves is discussed in the Reserves section of this report. A sensitivity analysis was conducted to determine the impacts of varying each assumption. The most significant drivers are the percentages used for inflation and the customer growth rate.

The study was conducted using Fiscal Year 2006 as the base year upon which forecasted figures were developed. The cost of service analysis considers what water and sewer rates need to be for the entire planning period (FY 2007 – 2016).

## C. USAGE, DEMAND AND SYSTEM CHARACTERISTICS

### 1. Customer Counts

For Fiscal Year 2006, the City's water and sewer system customer base was projected to include approximately 12,336 quarterly water and sewer customers and 167 monthly water customers. The City currently separates its customers into three customer classes: residential, commercial and tax-exempt (government, churches, non-profits, etc). Approximately 93% of total customers are residential while 5% are commercial and about 2% are tax-exempt. All residential customers and the majority of commercial and tax-exempt customers are billed on a quarterly basis. In order to project the growth in customers, the current number of customers was increased by an annual growth rate which is varied year to year (currently set at 0.35% for FY 07). Using the prospective growth rate for 2007, the City will serve approximately 12,379 quarterly water and sewer customers and 168 monthly water and sewer customers in Fiscal Year 2007 increasing to 14,600 quarterly and 198 monthly customers by Fiscal Year 2016. Customer count analysis, projections and supporting charts are shown in the Appendix to this report as Schedules 8A, 8B and 8C.

### 2. Consumption Data

Total 2006 billable water consumption for the City was forecasted as approximately 1.11 billion gallons for quarterly customers and 0.41 billion gallons for monthly customers. Quarterly and monthly sewer production for the same time period was slightly less at about 1.05 billion and 0.38 billion gallons, respectively. Roughly 39% of total consumption is consumed by residential customers, with 54% being consumed by commercial customers and the remaining 7% by tax-exempt customers. The City does not currently meter all of its customers. Many City-owned facilities are not currently metered. Therefore a true accounting of the total water delivered to all customers connected to the water system cannot be determined. In order to project future water demand and sewer production, demand and production numbers are increased in the same manner as customer counts above. Due to the fact that growth for FY 2007 is expected to be minimal (0.35%), FY 2007 water consumption and sewer production totals will not be significantly greater than in FY 2006. By the end of the planning period (FY 2016) the water consumption is estimated to be approximately 1.80 billion gallons for all customers and sewer production is estimated to be 1.70 billion gallons.

Using detailed consumption data supplied to us by the City, customer usage patterns were analyzed. A few statistics developed during the review of consumption include the following:

- The average residential customer uses about 15,700 gallons per quarter
- The average quarterly commercial customer uses about 270,000 gallons per quarter
- Approximately 37% of residential customers use 12,000 gallons or less every quarter
- Approximately 13% of quarterly customers use 12,000 gallons or less every quarter
  
- The average monthly commercial customer uses about 294,000 gallons per month
- Approximately 9% of monthly customers use 12,000 gallons or less

The detailed review of the consumption patterns are shown in the Appendix to this report as Schedule 8A.

## **D. OPERATING AND MAINTENANCE COSTS**

The day to day operations and maintenance expenses for the City's water system are currently grouped into five main operating categories: Customer Service and Billing, Distribution, Production, Engineering and General Government/Administrative. Within these divisions are such items as personnel services (salaries, benefits, etc.), operating supplies, repair & maintenance supplies, professional and contractual services and other miscellaneous operating items. The day to day operations and maintenance expenses for the City's sewer system are also broken into five main categories: Legal, Collection, Engineering, WSSC/Blue Plains (Treatment) and General Government/Administrative.

The actual FY 2004 and FY 2005, adopted FY 2006 and proposed FY 2007 budgets were used as the basis for estimating future operating and maintenance expenses. For the years after 2007 through 2016, water and sewer O&M expenses were inflated by 3% per year.

### **1. Water System Costs**

The cash basis Fiscal Year 2007 O&M expenses for the water system have been forecasted as \$4.25 million. The amount allocated for Customer Service and Billing and Distribution is \$0.71 million and \$1.22 million, respectively. Approximately \$1.58 million of total O&M expenses is attributed to Production, \$0.21 million to Engineering and \$0.53 million to General Government/Administrative. The water system operating expenses were assumed to increase annually by 3% resulting in expenses of approximately \$5.55 million by Fiscal Year 2016.

The water system operating expenses were reviewed to estimate the amount of the expenses that are fixed (not dependent upon consumption) and those that are variable. The estimation was completed at the macro-level of the current budget. The majority of the operating expenses related to the water system are fixed. The only expenses that tend to vary with increased/decreased water production are chemicals, energy and labor (seasonal and overtime employee). The total variable expense identified in the Fiscal Year 2007 O&M budget for water are approximately \$0.95 million or 23% of the total operating budget. The remaining 77% of the operating budget are fixed expenses. The percentage of fixed costs is typical for water utility operations which range from 70% to 80% fixed costs on average.

Operating and maintenance costs for the water system are presented in Schedule 2 in the Appendix to the report.

### **2. Sewer System Costs**

The cash basis Fiscal Year 2007 O&M expenses for the sewer system have been forecasted to total \$4.43 million. Approximately \$1.15 million of the total O&M expenses is attributed to Collection and \$0.30 million to Engineering. The amount allocated for WSSC/Blue Plains (Treatment) and General Government (Administrative) is \$2.34 million and \$0.64 million, respectively. The sewer system operating expenses were assumed to increase annually by 3% resulting in expenses of approximately \$5.78 million by Fiscal Year 2016.

The sewer system operating expenses were also reviewed to estimate the amount of expenses that are fixed versus variable. The total variable expenses identified in the Fiscal Year 2007 O&M budget for sewer are approximately \$0.12 million or 3% of the total operating budget. The primary reason for the lack of variable expenses is due to the fact that the City does not treat its sewage but rather contracts with WSSC and ultimately Blue Plains for treatment. Therefore the majority of the expenses related to treatment are not variable.

Operating and maintenance costs for the sewer system are also presented in Schedule 2 in the Appendix to the report.

## **E. CAPITAL COSTS**

The annualized capital costs related to providing water and sewer service are generally derived by analyzing the capital costs of projects detailed in the City's capital improvement plans and then identifying which of those projects will be funded via the issuance of debt (typically bonds or similar financial instruments) and those which will be funded from cash on hand or cash derived from operations. The capital costs are also divided between those that are related to growth and those related to repair and rehabilitation of the system. Segregating capital projects between growth and non-growth is necessary to ensure the capital costs are recovered through the appropriate group of customers (i.e., growth pays for growth). The majority of the current CIP is for non-growth projects.

### **1. Planned Capital Improvements**

The City's water system has planned capital projects of approximately \$16.80 million for the period from Fiscal Year 2007 through Fiscal Year 2016.

The sewer system has a significantly higher amount of planned total capital costs, with approximately \$44.71 million for the period from Fiscal Year 2007 to Fiscal Year 2016. This includes a cost estimate of \$26.00 million for regional treatment facilities (Blue Plains Sewer Treatment Plant).

### **2. Existing Debt**

The City currently has outstanding principal on debt related to the water system of approximately \$5.66 million. The principal and interest payment for Fiscal Year 2007 is about \$0.93 million.

Outstanding principal on debt related to the sewer system is approximately \$8.30 million. The principal and interest payment for Fiscal Year 2007 is about \$0.99 million.

### **3. Anticipated Debt Service**

The City will utilize bond funding to finance the majority of capital improvement projects in the capital improvement program. For projects spanning Fiscal Year 2007 to Fiscal Year 2016, the City plans to fund approximately \$13.52 million worth of water projects and \$41.10 million worth of sewer projects with debt.

Water principal and interest payments will range from \$0.17 million starting in Fiscal Year 2008 increasing to \$1.09 million by Fiscal Year 2016. Sewer principal and interest payments will range from \$0.54 million starting in Fiscal Year 2007 increasing to \$3.32 million by Fiscal Year 2016.

## **F. RESERVES**

Best management practices dictate that cash reserves be accumulated to provide for contingencies and unplanned major expenses. We recommend the establishment of two types of reserves for the City's water and sewer system: an Operating and Maintenance ("O&M") Reserve and a Repair, Renewal, and Rehabilitation ("3R") Reserve. Each is discussed below.

### **1. Operating and Maintenance ("O&M") Reserve**

An operating reserve is important to provide funds for unplanned minor repairs or other significant cash outlays. This type of reserve is also valuable during unusually wet or dry years, which could result in reduced revenues due to lower than anticipated consumption levels. As these reserves are accumulated, they can be used in future years to offset, decrease or defer rate increases. Operating reserves are typically established as a percentage of a system's O&M budget. We recommend that the City formally establish and maintain a 90 day operating reserve target balance (one fourth of current annual O&M expenses). An annual contribution to the reserve will need to be recovered through user fees each year to match the target reserve balance of 90 days annual operating expenses and replenishment. This annual contribution is the difference between the target balance (one fourth current annual O&M expenses) and the current balance (less any withdrawals from the reserve). This calculation of O&M reserve contribution assumes the City funds the reserve completely in Fiscal Year 2006 from available cash balances. For Fiscal Year 2007, the required contribution to operating reserves for both water and sewer combined were calculated to be approximately \$40,900.

### **2. Repair, Replacement and Rehabilitation ("3R") Reserve**

Many municipal utilities establish Repair, Replacement and Rehabilitation ("3R") reserves to provide funds to pay for unexpected major repairs and planned replacement or rehabilitation of equipment or other major fixed assets. These reserves can be used to pay for capital costs in order to avoid or minimize the amount that would otherwise be recovered through user fees (and possibly result in a significant rate increase). Typically, the annual "3R" reserve contribution is calculated as a percentage of the system's book value. We recommend the annual "3R" reserve contribution to be set at 0.50% of total book value of the water and sewer system. This percentage is selected in order to minimize the immediate impact upon user rates and due to the City's current levels of spending on repair and replacement type projects included in the capital improvement plan. We recommend that the "3R" annual contribution percentage be gradually increased to 1% by 2013. The "3R" percentage can be adjusted based on the level of reserves, planned expenditures, and the related impact on user fees in future years. For Fiscal Year 2007, the expected "3R" reserve for water and sewer combined is set at approximately \$0.33 million. The computation of the two types of reserves can be found on Schedules 7A and 7B in the Appendix to the report.

## G. REVENUE REQUIREMENTS FROM USER RATES

The gross revenue requirements (that is, the total cash needed for the water and sewer systems) can be classified into three major categories: operating and maintenance costs, capital costs (existing and planned debt service), and reserves. The total of these costs, less the amount of miscellaneous income, is the amount that needs to be recovered from user fees. The following tables show the revenue requirements, miscellaneous (non user charges) revenue and the net revenue requirement from user rates for water and sewer operations. The tables also show the net surplus or shortfall in revenues using the current water and sewer rates (assuming no rate increases).

Table 1. Water System Revenue Requirements

	FY 2007	FY 2008	FY 2009	FY 2010
Operating Expenses	4,252,905	4,380,492	4,511,695	4,647,046
Operating Reserve Contribution	3,177	31,897	32,801	33,838
Existing Debt Service	933,817	870,252	553,260	547,883
Cash Funded Capital Projects	17,200	495,000	200,000	-
Projected Debt Service	-	170,653	170,653	469,522
3R Reserve	177,790	187,445	197,605	313,631
<b>Total Revenue Requirement</b>	<b>5,384,888</b>	<b>6,135,738</b>	<b>5,666,013</b>	<b>6,011,920</b>
Less Miscellaneous Revenue	566,870	568,830	572,089	575,395
<b>Net Revenue Requirement from Rates</b>	<b>\$ 4,818,018</b>	<b>\$ 5,566,908</b>	<b>\$ 5,093,924</b>	<b>\$ 5,436,525</b>
Projected Revenue with Current Water Rates	3,440,086	3,546,815	3,706,959	3,728,122
<b>Net Surplus (Shortfall)</b>	<b>(1,377,932)</b>	<b>(2,020,093)</b>	<b>(1,386,965)</b>	<b>(1,708,403)</b>

Table 2. Sewer System Revenue Requirements

	FY 2007	FY 2008	FY 2009	FY 2010
Operating Expenses	4,426,325	4,559,115	4,695,888	4,836,765
Operating Reserve Contribution	37,725	33,197	34,193	35,219
Existing Debt Service	989,550	968,704	849,259	828,615
Cash Funded Capital Projects	202,500	218,500	476,000	243,000
Projected Debt Service	-	536,942	536,942	963,736
3R Reserve	154,475	173,017	194,302	308,076
<b>Total Revenue Requirement</b>	<b>5,810,574</b>	<b>6,489,475</b>	<b>6,786,584</b>	<b>7,215,411</b>
Less Miscellaneous Revenue	93,256	95,112	96,764	98,462
<b>Net Revenue Requirement from Rates</b>	<b>\$ 5,717,318</b>	<b>\$ 6,394,363</b>	<b>\$ 6,689,820</b>	<b>\$ 7,116,949</b>
Projected Revenue with Current Water Rates	5,393,845	5,561,190	5,812,286	5,845,468
<b>Net Surplus (Shortfall)</b>	<b>(323,473)</b>	<b>(833,174)</b>	<b>(877,534)</b>	<b>(1,271,481)</b>

The tables above show that neither the Water Enterprise Fund (with a 40% shortfall) nor the Sewer Enterprise Fund (with a 6% shortfall) appear to be self supporting under the current rates over the planning period.

## H. RATE ALTERNATIVES

The current rate design methodology and cost allocations were evaluated to determine if they reasonably reflect how costs are currently incurred by the City and to determine if the current rates adequately cover the total estimated costs of providing water and sewer service. Alternative rate designs were also developed and evaluated to determine a suitable rate design for the City.

### 1. Current Rate Design

The City's current water rate design is composed purely of a flat-rate consumption charge. The City's current sewer rate design constructed in the same manner as the water rate design: a flat-rate consumption charge. The current rates are detailed in the following table:

<u>Current Customer Rates and Charges</u>	<u>FY 2006</u>
Water Consumption Charge (per 1,000 gallons):	\$ 2.26
Sewer Consumption Charge (per 1,000 gallons):	\$ 3.75

The following section of the Report discusses potential changes to the current methodology, as well as individual rates and charges.

### 2. Rate Alternatives

Having evaluated the current rate design, the financial model was used to develop alternative rate structures. The alternative rate designs were developed using methodologies which allocate costs fairly among various user classifications while meeting the City's goals and objectives which include equitable distribution of expenses among customers, environmental protection and encouraging wise use of water. The rate alternative calculations and rates are shown on Schedule 12 in the Appendix of this report.

Four primary water rate structures were considered, each of which would produce the same amount of revenue for Fiscal Year 2007:

- Alternative A – Current Rate Structure (with updated cost data)
- Alternative B – Inclinng Block Rate Structure (“conservation” rate)
- Alternative C – Ready-to-Serve Charge and Inclinng Block Consumption Charge
- Alternative D – Ready-to-Serve Charge and Inclinng Block Consumption Charge with Flat Rate Commercial and Exempt Charge

**Alternative A** (Current Rate Structure with "Across the Board" Rate Increases) – The first alternative utilizes the same rate design the City currently has in place: a flat-rate consumption charge for all customers. This alternative implements an “across the board” change in water and sewer rates.

**Alternative B** (Inclinng Block Rate Structure) – The second alternative employs an inclinng block rate structure for water consumption. The inclinng block rates structure consists of three levels:

Level 1 (0 - <12,000 gallons per quarter), Level 2 (12,000 - <24,000 gallons per quarter) and Level 3 (24,000 gallons and over per quarter). The three levels for monthly customers are simply a third of what the levels are for quarterly customers (e.g. Level 1 for monthly customers is 0 - <4,000 gallons per month). In this structure, customers are charged an incrementally higher rate for water used per quarter. The table below shows the amount of usage in each block using this structure for both quarterly and monthly customers.

Table 3. Quarterly Water Usage Breakdown (stepping through blocks)

Monthly Water Usage (gallons)		% of Customers	% of Usage
-	12,000	36%	37%
12,000	24,000	46%	16%
24,000	and over	18%	47%

Table 4. Monthly Water Usage Breakdown (stepping through blocks)

Monthly Water Usage (gallons)		% of Customers	% of Usage
-	4,000	13%	4%
4,000	8,000	6%	4%
8,000	and over	81%	92%

The Clean Water Act (P.L. 92-500, the federal law governing sewer systems) specifies in its Section 204(b)(1) that any sewer treatment works accepting federal funds for its construction must charge all sewage dischargers on the basis of the volume and strength of their sewage for the costs of operating, maintaining and replacing the treatment works. This section of the law prohibits volume discounts for sewer customers, at least related to operating costs. Therefore all customers must pay the same unit charge per quantity of sewage discharged. Since this is the case with the City, the only practical rate alternative is the same structure that is currently utilized.

**Alternative C** (Ready-to-Serve Charge and Inclining Block Consumption Charge) – This alternative is the same as Alternative B but includes a ready-to-serve charge per bill. The ready-to-serve charge is tied to meter size, with larger meters paying a high charge due to the demand they can place on the system. The meter size equivalents are taken from the American Water Works Association (AWWA) Manual M22 meter equivalents table. The AWWA meter equivalents as well as calculated ready-to-serve charges by meter size for quarterly and monthly bills are shown below.

Table 5. Ready-to-Serve Charges

Meter Size (inches)	AWWA Equivalent	Charge per Quarterly Bill	Charge per Monthly Bill
5/8	1.00	\$ 6.00	\$ 2.00
3/4	1.50	\$ 9.00	\$ 3.00
1	2.50	\$ 15.00	\$ 5.00
1 1/2	5.00	\$ 30.00	\$ 10.00
2	8.00	\$ 48.00	\$ 16.00
3	16.00	\$ 96.00	\$ 32.00
4	25.00	\$ 150.00	\$ 50.00
6	50.00	\$ 300.00	\$ 100.00
8	80.00	\$ 480.00	\$ 160.00
10	120.00	\$ 720.00	\$ 240.00

**Alternative D** (Ready Ready-to-Serve Charge and Inclining Block Consumption Charge with Flat Rate Commercial and Tax-Exempt Charge) – Alternative D is the same structure as Alternative C; however, commercial and tax-exempt customers are not included within the inclining block structure. Commercial and exempt customers are charged a separate flat-rate consumption charge.

### 3. Sample Bills

The following tables present sample bills for various customer usage and meter sizes for each of the proposed alternatives. The customer usage associated with each meter size is based upon review of the actual usage and represents the average usage for each meter size within the City. The tables present the total customer bill for a quarterly period.

Sample Bill - Alternative A – Flat Consumption Charge – FY 2007

Meter Size	Average Usage (gallons)	Old Quarterly Bill	Alternative A Quarterly Bill	Percent Change	Dollar Change
5/8"	15,000	\$90.15	\$95.10	5.5%	\$4.95
3/4"	15,700	\$94.36	\$99.54	5.5%	\$5.18
1"	16,000	\$96.16	\$101.44	5.5%	\$5.28
1 ½"	117,000	\$703.17	\$741.78	5.5%	\$38.61
2"	157,000	\$943.57	\$995.38	5.5%	\$51.81
3"	362,000	\$2,175.62	\$2,295.08	5.5%	\$119.46
4"	543,000	\$3,263.43	\$3,442.62	5.5%	\$179.19
6"	443,000	\$2,662.43	\$2,808.62	5.5%	\$146.19
8"	353,000	\$2,121.53	\$2,238.02	5.5%	\$116.49
10"	1,374,000	\$8,257.74	\$8,711.16	5.5%	\$453.42

Sample Bills - Alternative B – Inclining Block Rates – FY 2007

Meter Size	Average Usage (gallons)	Old Quarterly Bill	Alternative B Quarterly Bill	Percent Change	Dollar Change
5/8"	15,000	\$90.15	\$88.59	(1.7%)	(\$1.56)
3/4"	15,700	\$94.36	\$92.97	(1.5%)	(\$1.39)
1"	16,000	\$96.16	\$101.16	5.2%	\$5.00
1 ½"	117,000	\$703.17	\$768.79	9.3%	\$65.62
2"	157,000	\$943.57	\$1,023.97	8.5%	\$80.40
3"	362,000	\$2,175.62	\$2,379.02	9.3%	\$203.40
4"	543,000	\$3,263.43	\$3,584.72	9.8%	\$321.29
6"	443,000	\$2,662.43	\$2,923.70	9.8%	\$261.27
8"	353,000	\$2,121.53	\$2,319.53	9.3%	\$198.00
10"	1,374,000	\$8,257.74	\$9,068.34	9.8%	\$810.60

Sample Bills - Alternative C – Ready-to-Serve Charge plus Inclining Block Rates – FY 2007

Meter Size	Average Usage (gallons)	Old Quarterly Bill	Alternative C Quarterly Bill	Percent Change	Dollar Change
5/8"	15,000	\$90.15	\$86.88	(3.6%)	(\$3.27)
3/4"	15,700	\$94.36	\$94.05	(0.3%)	(\$0.31)
1"	16,000	\$96.16	\$101.84	5.9%	\$5.68
1 1/2"	117,000	\$703.17	\$734.61	4.5%	\$31.44
2"	157,000	\$943.57	\$997.81	5.7%	\$54.24
3"	362,000	\$2,175.62	\$2,302.46	5.8%	\$126.84
4"	543,000	\$3,263.43	\$3,465.99	6.2%	\$202.56
6"	443,000	\$2,662.43	\$3,002.99	12.8%	\$340.56
8"	353,000	\$2,121.53	\$2,631.29	24.0%	\$509.76
10"	1,374,000	\$8,257.74	\$9,130.02	10.6%	\$872.28

Sample Bills - Alternative D - Ready Ready-to-Serve Charge and Inclining Block Consumption Charge with Flat Rate Commercial and Tax-Exempt Charge – FY 2007

Meter Size	Average Usage (gallons)	Old Quarterly Bill	Alternative D Quarterly Bill	Percent Change	Dollar Change
5/8"	15,000	\$90.15	\$86.91	(3.7%)	\$(3.24)
3/4"	15,700	\$94.36	\$94.09	(0.3%)	\$(0.27)
1"	16,000	\$96.16	\$101.88	5.6%	\$5.72
1 1/2"	117,000	\$320.67	\$375.42	14.6%	\$54.75
2"	157,000	\$411.07	\$491.82	16.4%	\$80.75
3"	362,000	\$874.37	\$1,044.12	16.3%	\$169.75
4"	543,000	\$1,283.43	\$1,543.38	16.8%	\$259.95
6"	443,000	\$1,057.43	\$1,447.38	26.9%	\$389.95
8"	353,000	\$854.03	\$1,405.98	39.3%	\$551.95
10"	1,374,000	\$3,161.49	\$4,157.64	24.0%	\$996.15

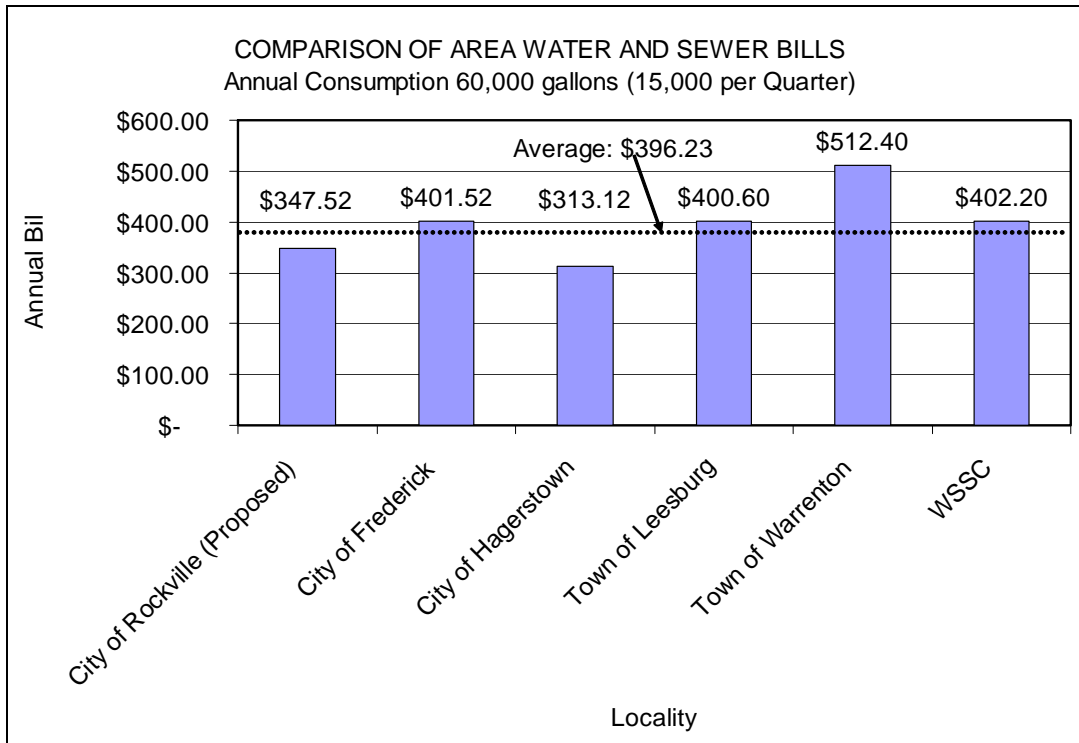
#### 4. Other Charges and Fees

In addition to fees for water and sewer service the City levies other fees and charges for various services it provides to its customers. A list of the current and proposed fees and charges are shown in the following table.

Fee	Current	Proposed
Disconnect / Reconnect Fee	Disconnect - \$20 Reconnect - \$0	Disconnect - \$25 Reconnect - \$25
Reconnect Policy	Same Day – 8:30-5:00 8:30-5:00 2 days after	Same Day – 8:30-5:00 8:30-5:00 2 days after after hours-standby man \$80 on next bill
NSF check fee	\$25	\$35
NSF policy	No Limit	After 2 – Cash/ Money order Only
Deposit required to start account	No	No
Fines for obstructed meters	No	No
Fee for re-reading at customers request	No	\$20 if reading correct
Fee for testing meter at customer’s request.	\$5	\$50 if meter ok
Leak adjustment policy - Above ground	No limit-adjust water/sewer to average with receipts	1 time every 5 years. Adjust water/sewer to average with receipts
Leak adjust policy - Underground	1 time 2/3 adjustment no receipts	With receipt sewer only to average
Late penalty policy	10% - 1 courtesy adjustment / year	10% - 1 courtesy adjustment / year

## I. COMPARISONS

It may be useful for Rockville to compare sample bills of various local utilities with a bill calculated using proposed rates for the City. The following chart represents a comparison of an annual bill for a customer who uses 15,000 gallons per quarter for various water and sewer municipalities in the same geographical area as the City of Rockville (current rates were used in the comparison; any upcoming rate increases among these utilities are not reflected):



While the chart above may be helpful in observing what local utilities charge for water and sewer service, it may also be rather misleading and should not be used as a sole determinant when calculating future rates; there are many factors that have a role in determining rates such as the relative age and size of the general system, number of customers served, amount of investment in infrastructure, etc. The most important factor in determining rates is the cost of service – how much does it cost (per unit of service) to provide water and sewer service?

## J. CAPITAL CONTRIBUTION FEES

The City currently charges capital connection fees to customers who join the water and/or sewer system. The fees are based on the capital costs of providing water and sewer capacity for new customers. Fees are proportioned based upon meter size and are intended to recover the capital cost of capacity constructed to serve a new customer. This includes treatment as well as pumping, distribution and collection facilities for systems that are off-site.

### 1. Methodology

While there are a variety of methods for calculating capital contribution fees to serve a customer in a water and sewer system, most methods of calculating these fees fall into three broad categories:

- *Average cost of capacity*, tied to the historical cost of the system plus the known costs of the utility's Capital Improvement Program.
- *Most recent increment of capacity* calculations are often used in a utility which is approaching its capacity, reflecting the situation that new customers are being served by the latest additions to the utility's infrastructure.
- *Next increment of capacity* is used to calculate the costs of serving new customers in a utility that has little or no capacity and is being heavily stressed by growth. This approach estimates what it will cost to add capacity to serve new customers.

The City's current fees were calculated using a historical cost methodology (DMG-Maximus Study, November 1999) which calculates the fees using only the historical cost of the system (i.e., how much it has cost to build the system and how many EDU's are currently using the system). However, since the City has and will continue to make investments in the system we recommend that the average cost of capacity method be used to calculate the water and sewer capital contribution fees. This method accounts for the historical and future capital investments made in the system, rather than just relying on historical expenses.

### 2. Historical Cost of System and Planning Capital Improvements

The historical cost (book value) of the water system is approximately \$34.29 million. As previously mentioned the City has a capital improvement plan for the water system totaling approximately \$16.8 million, the majority of which will be funded with debt. Adding the book value and the capital plan (including the interest related to debt financing the capital plan) results in a total cost of the water system of approximately \$58.8 million. A portion of the water system was funded with contribution from developers and grants. The estimated total contributed capital is approximately \$8.3 million. The total cost of the water system less the contributed capital results in the net cost of the system at approximately \$50.5 million.

The historical cost (book value) of the sewer system is approximately \$26.92 million. The sewer system capital improvement plan totals approximately \$44.7 million. Similar to the water system, the book value plus the capital plan (including the interest related to debt financing the capital plan) results in a total cost of the sewer system of approximately \$95.3 million. A portion of the sewer system was funded with contributions from developers and grants. The estimated total contributed

capital is approximately \$7.2 million. The total cost of the sewer system less the contributed capital results in the net cost of the system at approximately \$88.1 million.

### 3. Water and Sewer System Capacity

In order to calculate the capital connection fees, the current capacity of the water and sewer systems must be defined. With a peak permitted design capacity of 12.70 mgd, average day production of 4.83 mgd and a peak day equivalent dwelling unit (EDU) consumption of 414 gallons per day, the water system can support 30,670 EDUs.

The sewer system has an average day treatment capacity of 9.31 mgd and average day flow of 4.80 mgd. Using average day EDU production of 250, the sewer system can support 37,240 EDUs.

### 4. Capital Contribution Fees Calculation

The calculation of capital contribution fees is simply the total cost of the water and sewer system divided by the number of EDU's that can be served by each system. For water, the total cost of the water system (past and known future costs) is approximately \$50.5 million, which can serve approximately 30,670 EDU's resulting in an average cost per EDU of roughly \$1,648. For sewer, the total cost of the sewer system is approximately \$88.1 million, which can serve 37,240 EDU's resulting in an average cost per EDU of roughly \$2,368.

The calculated fees represent the maximum that the City can charge per EDU using the average cost of capacity method. The City is at liberty to charge less than these fees, however if the City charges less than the cost of buying into the system the existing users will have to pay the difference.

The following table provides a comparison capital contribution fees with various local utilities.

Utility	Water	Sewer	Combined
City of Rockville (Proposed)	\$1,600	\$2,400	\$4,000
City of Frederick,	\$4,300	\$6,000	\$10,300
City of Hagerstown	\$2,500	\$4,400	\$6,900
Town of Leesburg	\$4,288	\$6,678	\$10,966
Town of Warrenton	\$4,950	\$6,200	\$11,150
WSSC – Improved Area	\$5,900	\$10,250	\$16,150
WSSC – Unimproved Area	\$2,000	\$3,250	\$5,230

## **K. CONCLUSIONS AND RECOMMENDATIONS**

The conclusions and recommendations that were developed during the course of this rate study are presented below.

### **1. Findings**

- Current water user rates do not produce sufficient cash revenue to cover cash revenue requirements for Fiscal Years 2007 or the years following. Based upon the projected quantities of water sold, the current rates will produce cash revenues roughly 40% less than the required cash revenue in Fiscal Year 2007 with subsequent significant shortfalls annually over the planning period.
- Current sewer user rates also do not produce sufficient cash revenue to cover cash revenue requirements for Fiscal Years 2007 or the years following. Based upon the projected quantities of sewer processed, the current rates will produce cash revenues roughly 6% less than the required cash revenue in Fiscal Year 2007 with subsequent significant shortfalls annually over the planning period.
- The current capital contribution fee for the water system is not set at the appropriate level to recover the cost of providing capacity to new water connections.
- The current capital contribution fee for the sewer system is also not set at the appropriate level to recover the cost of providing capacity to new sewer connections.
- The majority of the City's cost of operating and maintaining the water and sewer system are fixed. It is estimated that roughly 77% of the water operating expenses and 97% of the sewer operating expenses are fixed. The percentage of fixed costs is inline with typical water and sewer utility operations.
- The City does not currently meter all customer connections; some City facilities receive water service without measuring use of water.

### **2. Conclusions**

- The City needs to increase water revenues by 40% and sewer revenues by 6% to break even on a cash basis. A 40% increase in one year can be avoided by drawing down available cash reserves and gradually raising rates over a 5-year period (8% annually for water and 4% annually for sewer), then adjusting rates by 2-3% per year after that time.
- The City needs to increase capital connection fees if it does not want current customers to subsidize the cost of serving new customers.
- The absence of full metering of all customers makes it difficult to determine the actual amount of unaccounted for water.

### 3. Recommendations

- We recommend that the City formally establish an O&M Reserve and a Repair, Renewal and Rehabilitation (“3R”) Reserve for both the water and sewer systems. The O&M Reserve should be set at 90 days of operating expenses. The “3R” Reserve should initially be established as 0.50% of the book value of the respective system increasing gradually to reach 1% by Fiscal Year 2013. Both reserves should be designated as restricted reserves with policy clearly establishing uses for each reserve.
- We recommend that the City adopt an alternative rate structure consisting of a ready-to-serve charge by meter size per bill with an inclining block consumption rate for all quarterly and monthly customers. This type of structure will better allocate consumption costs among customers.
- The recommended rates for Fiscal Year 2007 are shown on below:

*Recommended Ready-to-Serve Charge per Bill*

<b>Meter Size (inches)</b>	<b>Quarterly</b>	<b>Monthly</b>
5/8	\$ 6.00	\$ 2.00
3/4	\$ 9.00	\$ 3.00
1	\$ 15.00	\$ 5.00
1 1/2	\$ 30.00	\$ 10.00
2	\$ 48.00	\$ 16.00
3	\$ 96.00	\$ 32.00
4	\$ 150.00	\$ 50.00
6	\$ 300.00	\$ 100.00
8	\$ 480.00	\$ 160.00
10	\$ 720.00	\$ 240.00

*Recommended Consumption Charges*

<b>Water Consumption Charge (per 1,000 gallons)</b>	<b>Recommended Rate</b>
0 – <12,000 gallons per quarter	\$ 1.62
12,000 – <24,000 gallons per quarter	\$ 2.33
24,000 gallons and over per quarter	\$ 2.50
<b>Sewer Consumption Charge (per 1,000 gallons)</b>	\$ 3.63

- We recommend that the City adopt the rate increases outlined below for water and sewer over the next five years to ease the burden of the rate increases. The five year implementation allows for minimizing the one time “rate shock” caused by larger increases. The proposed annual revenue increases are shown below.

<b>Fund</b>	<b>FY 2007</b>	<b>FY 2008</b>	<b>FY 2009</b>	<b>FY 2010</b>	<b>FY 2011</b>
Water Revenue Increase	8%	8%	8%	8%	8%
Sewer Revenue Increase	4%	4%	4%	4%	4%

- We recommend the capital contribution fee for water be increased to \$1,600 per EDU based on the actual cost of buying into the water system.
- We also recommend the sewer capital contribution fee be increased to \$2,400 per EDU based on the actual cost of buying into the sewer system.
- Fees and charges associated with water functions should be increased/adjusted to account for changes in the cost of providing varying services.
- The City should meter all customer connections so that a true accounting of water usage can be determined and monitored.