Washington Suburban Sanitary Commission

Water and Sewer Rate Study
Technical Report

Prepared by

Municipal & Financial Services Group

In Association with

PEER CONSULTANTS, P.C.

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January 9, 2014

Municipal & Financial Services Group

January 9, 2014

Christopher Cullinan
Acting Chief Financial Officer
Washington Suburban Sanitary Commission
14501 Sweitzer Lane
Laurel, MD 20707

Dear Mr. Cullinan:

The Municipal & Financial Service Group is pleased to submit to the Washington Suburban Sanitary Commission the attached Water and Sewer Rate Study Technical Report. This document represents the results of our analysis of the cost of providing water and sewer service to the Commission's customers and our recommendations for how the Commission should recover these costs. The study provides a number of recommendations that will increase the financial health and stability of the Commission's operations while equitably charging its customers for water and sewer service.

It has been our distinct pleasure to work with and for the Commission. The assistance provided by the Commission's staff was essential in the completion of the study. The dedication you and other Commission staff providing during the study process should be acknowledged and was vital to the completion and success of the study. Thank you for the opportunity to work with and for the Washington Suburban Sanitary Commission on this study.

Very truly yours,

David Hyder
Vice President
The Municipal & Financial Services Group

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1. BASIS FOR THE STUDY

Washington Suburban Sanitary Commission ("WSSC") was created in 1918 by a special act of the Maryland General Assembly to provide water and sewer services in Montgomery and Prince George's Counties. At the time of its establishment, the two counties were predominantly rural, with development occurring primarily in the close-in suburbs of Washington, DC. Today the two counties are thriving economic forces in their own right, and WSSC provides service to about 440,000 customer accounts in a service area of about 1,000 square miles. During the 1960s and continuing through the late 1980s, WSSC experienced growth rates that were unprecedented. The two County Councils were perceived as being "pro-growth" and for many years WSSC charged only nominal fees for new customers to join the system. A famous court case (Mitchell & Best v. WSSC) overturned WSSC's initial attempts at implementing a System Expansion Offset Charge ("SEOC"), a unique approach to a system development charge ("SDC"). Much later, the General Assembly gave WSSC the explicit authority to impose an SDC, but by that time WSSC had already inherited a legacy of debt-financed expansion costs.

At one point, debt service of bonds (principal and interest) accounted for one-half of WSSC's total revenues. At the same time, strategic differences between the commissioners appointed by the two counties resulted in deadlocked decision-making, preventing the needed investment in repairing, replacing and rehabilitating the oldest parts of WSSC's water and sewer systems, which were approaching a century of use and the end of their useful life. Since then, WSSC has enjoyed a more coordinated and collegial effort from its Commissioners and has launched a substantive reconstruction program focused on this deferred maintenance.

WSSC has adopted a strategy of encouraging water conservation, reflected in its multistep inclining block rate structure tied to average daily use by customer. In 2010, WSSC established the Bi-County Infrastructure Financing Working Group (the "Working Group") focusing on devising practical and affordable approaches to addressing the issue of deferred maintenance on its aging facilities and systems. To assist the Working Group, WSSC engaged an independent consultant in 2010 to provide expertise related to best management practices for the funding WSSC. Working in concert with WSSC staff and the Working Group, the consultant completed a final Consultant Report in May of 2012 which documented several key recommendations. The key recommendations related to this report include:

- The use of longer termed bonds (30 years maturities instead of 20 years) to reduce annual debt service;
- Use debt service savings to fund capital projects from current revenues "Pay-Go Funding";
- Maintain a debt service coverage of 1.25x;
- Adoption of a separate "reconstruction charge" to appear separately on each customer's bill, in either the form of a fixed charge per billing period or a consumption-based charge; and
- Completion of a comprehensive rate study to determine the appropriate pricing of utility service.

To carry forward the recommendations included in the consultants' report, WSSC engaged the Municipal & Financial Services Group (MFSG), an independent financial management consultant.

To complete the study, MFSG and the Commission agreed on a scope of services that was developed to ensure a comprehensive cost of service and rate study. The key tasks within the scope of services set forth in the contract between the Commission and MFSG includes the following:

- ***Existing Data*:** Review existing operational and financial data along with previous reports to gain an understanding of the current operating environment and to allow for development of a comprehensive financial model.

- ***Revenue Requirements:*** Determine the annual cost of providing water and sewer service within the WSSC service area in light of the financing recommendations including the Working Groups consultant report.

- ***Customer Analysis and Demand Forecast:*** Complete a detailed review of how WSSC customers use water and develop a forecast of future demands within WSSCs service area.

- ***Cost of Service:*** Determine the appropriate allocation of costs to ensure an equitable allocation of within the water and sewer rate structures.

- ***Revenue Adequacy of Current Rates and Fees:*** Determine the adequacy of current water and sewer rates and fees in light of annual revenue requirements and in comparison to the cost allocations within the cost of service analysis.

- ***Recommended Rates:*** Review existing and develop alternative rate structure in light of the Working Group consultant report and our industry expertise. Develop a recommended rate structure and implementation plan.

The remainder of the report follows the format provided in the scope of services listed above. It should be noted that the primary focus of the study is on the evaluation of the current WSSC rates and fees and consideration of alternative rate structures. The Commission has established an annual process for the determining the necessary adjustments to water and sewer rates and therefore less time was spent in developing the annual revenue requirements. However, as documented below, MFSG did develop annual revenue requirements to ensure that the forecasting completed by WSSC staff is valid.

The study was conducted using the adopted budget for Fiscal Year 2014 (WSSC functions on a fiscal year of July 1 to June 30) 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 (2015 – 2024).

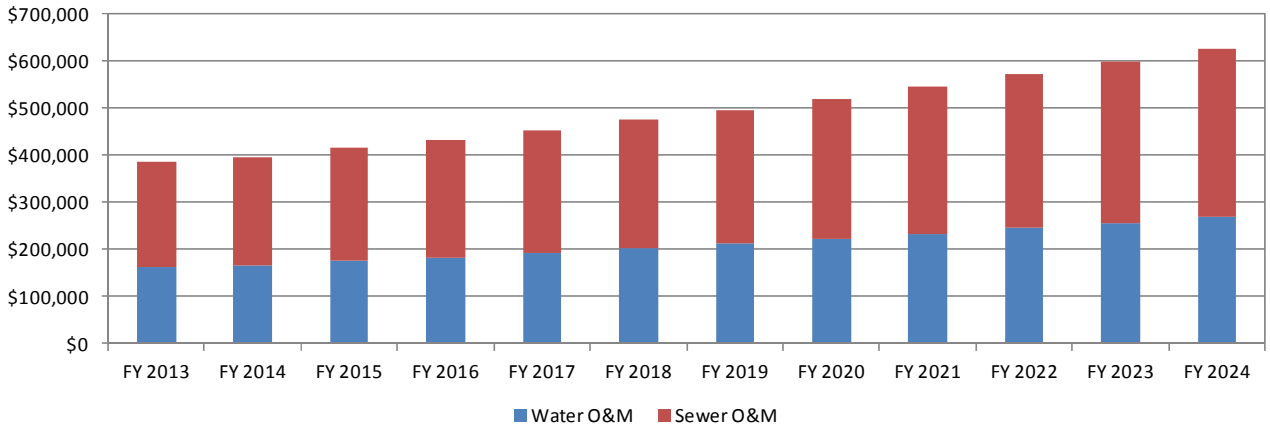
2. REVENUE REQUIREMENTS

Within the cost of service and rate study, MFSG needed to identify the revenue requirements for running WSSC's water and sewer operations. Our approach included a detailed review of each of the costs incurred by the Commission to ensure the true revenue requirements were determined. The revenue requirements can be broken down into four main categories of costs including; operating and maintenance costs, capital improvements, existing debt service and contributions to reserves. The following section of the report describes each of the categories of expenses incurred by WSSC to provide water and sewer service. The costs are all based on official documents and data provided by WSSC.

2.1 Operating and Maintenance (O&M) Expenses

The actual O&M expenses for FY 2011, FY 2012 and FY 2013 and the adopted budget for FY 2014 were used as the basis for estimating future O&M expenses for the water and sewer fund. Both the water and sewer O&M costs were provided in "team rollup" format, with the major expense categories being Staff Offices, Engineering and Construction, Production, Logistic Team Rollup, Finance Office Rollup, Customer Care Team Rollup, and IT Team Rollup. To project future O&M costs, inflation factors were used on a line item by line item basis. The inflation factors were based on historical cost increases, known future increases (such as treatment costs) and industry indexes. Exhibit 2.1 presents the projected O&M expenses for the water and sewer fund for the entire planning period.

Exhibit 2.1 - Projected Water and Sewer O&M Expenses (thousands)



2.2 Capital Costs

Planned capital costs and existing debt associated with the funding of historical investments have a significant impact on annual revenue requirements and ultimately on water and sewer rates. While the capital investments have a pronounced impact on rates, the projects are vitally important to ensure the continued operation of each system. The Commission could keep rates low initially by not completing capital projects but would pay a significant price later as system failures spike due to a lack of system maintenance, which would then result in increased costs and ultimately the

need for even higher rate increases. Proactively managing the water and sewer systems through maintenance and capital investments allows the Commission to keep rates stable and lower over time.

2.2.1 Capital Projects

WSSC maintains and updates a capital improvements program (CIP) forecast for the current fiscal year and five subsequent years. MFSG's model incorporates WSSC's projected capital spending based on the WSSC's current CIP. In order to build the revenue requirements for the projection period, MFSG incorporated both the legislative and information only projects planned over the next five years. Also, in order to calculate a fee based on line reconstruction, MFSG separated out those costs within the CIP. MFSG's model provides a summary level CIP based on how projects are financed. Table 2.1 shows the water system's CIP based on total project funding separated into several categories.

Table 2.1 - Water Fund Capital Improvement Program by Funding Source (thousands)

Water CIP	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
WSSC Bonds	$173,400	$170,800	$168,100	$137,300	$113,500
SDC & Other	25,300	24,000	18,500	3,100	-
Contribution/Other	4,400	2,500	100	-	1,900
Cash Funded (PAYGO)	12,000	16,400	26,100	39,600	57,600
Total Water CIP	**$215,100**	**$213,700**	**$212,800**	**$180,000**	**$173,000**

Table 2.1 demonstrates that WSSC plans to invest approximately $1.0 billion in water projects over the next five years (FY15 – FY19). The table also demonstrates the increase in funding from cash "Pay-Go" and the reduction in funding from bonds.

The sewer CIP summary is shown in Table 2.2 and reflects the total sewer spending separated into funding category. The sewer CIP is slightly more aggressive than the water CIP.

Table 2.2 - Sewer Fund Capital Improvement Program by Funding Source (thousands)

Sewer CIP	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Federal	$3,100	$3,200	$19,500	$20,000	$18,300
State	30,900	4,700	3,900	1,800	300
WSSC Bonds	371,600	252,800	249,200	225,800	181,200
SDC & Other	39,000	13,500	1,800	0	0
Government Cont.	3,500	3,100	2,900	1,900	700
Contribution/Other	7,400	1,400	200	0	1,900
Cash Funded (PAYGO)	12,400	14,700	23,200	34,300	45,000
Total Sewer CIP	**$467,900**	**$293,400**	**$300,700**	**$283,800**	**$247,400**

Table 2.2 demonstrates that WSSC plans to invest approximately $1.6 billion in the sewer system over the next five years. Most capital projects, namely the legislatively required projects, will be

bond funded but like the water system there is an increase in funding from current revenues. Exhibit 2.2 presents the total water and sewer capital projects planned over the next ten years and the anticipated funding source.

Exhibit 2.2 - Combined Capital Improvements Plan By Funding Source (thousands)

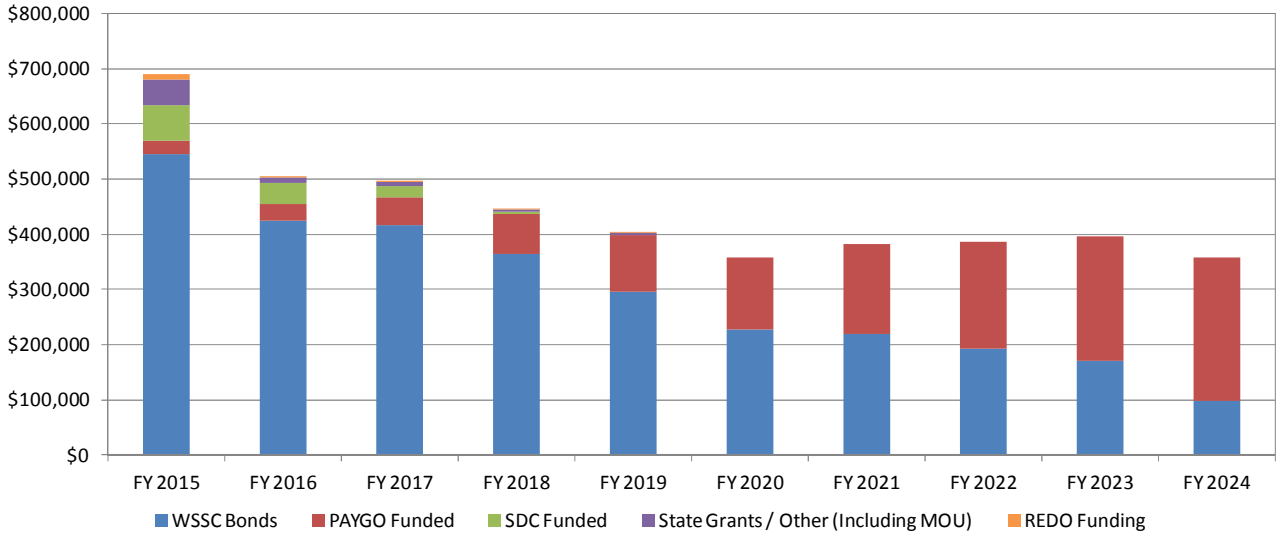
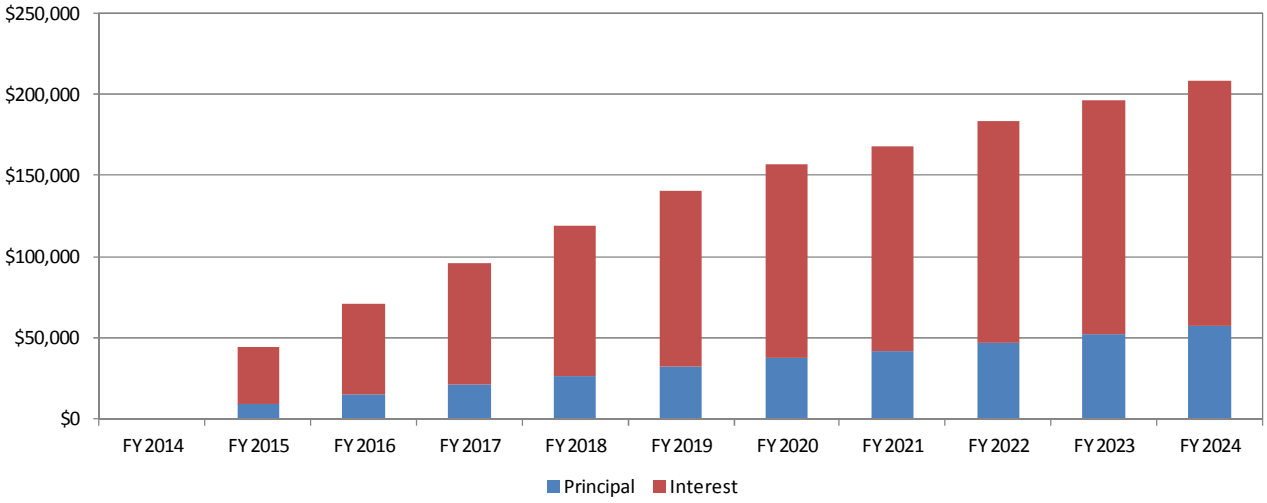


Exhibit 2.2 shows that in the outer years MFSG has projected that WSSC will increase their PAYGO financing of capital projects. The chart shows PAYGO capital spending increasing from $19.0 million in FY 2015 to over $100.0 million in FY 2019. In addition, REDO financing is projected to be $3.0 million annually for both water and sewer from FY 2015 through FY 2019. Both of these financing options ensure that WSSC maintains debt coverage on new bonds.

Exhibit 2.3 shows the resulting principal and interest payments from the debt funded projects shown above assuming bonds with 30-year maturities for both the water and sewer systems.

Exhibit 2.3 - New Projected Debt Service Payments (thousands)



2.2.2 Existing Debt

Along with any projected debt WSSC plans to issue, WSSC has issued debt in the past to fund water and sewer capital projects, and the debt service payments related to these issues must be funded. The debt service payments for this previously issued debt is illustrated in Exhibit 2.4.

Exhibit 2.4 - Existing Debt Service Payments (thousands)

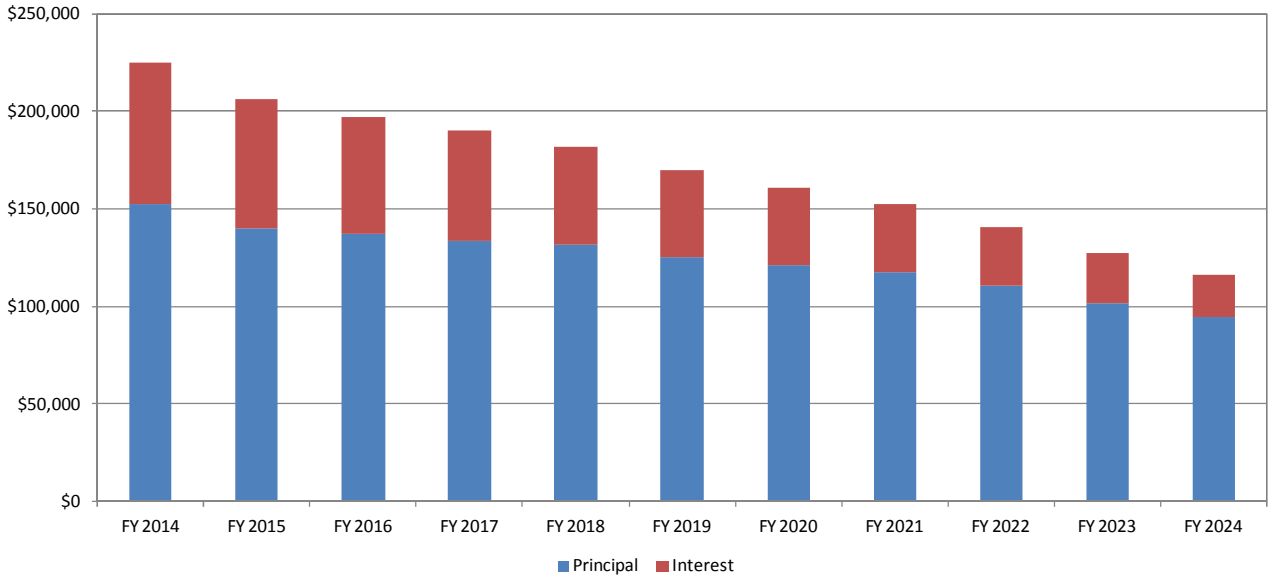
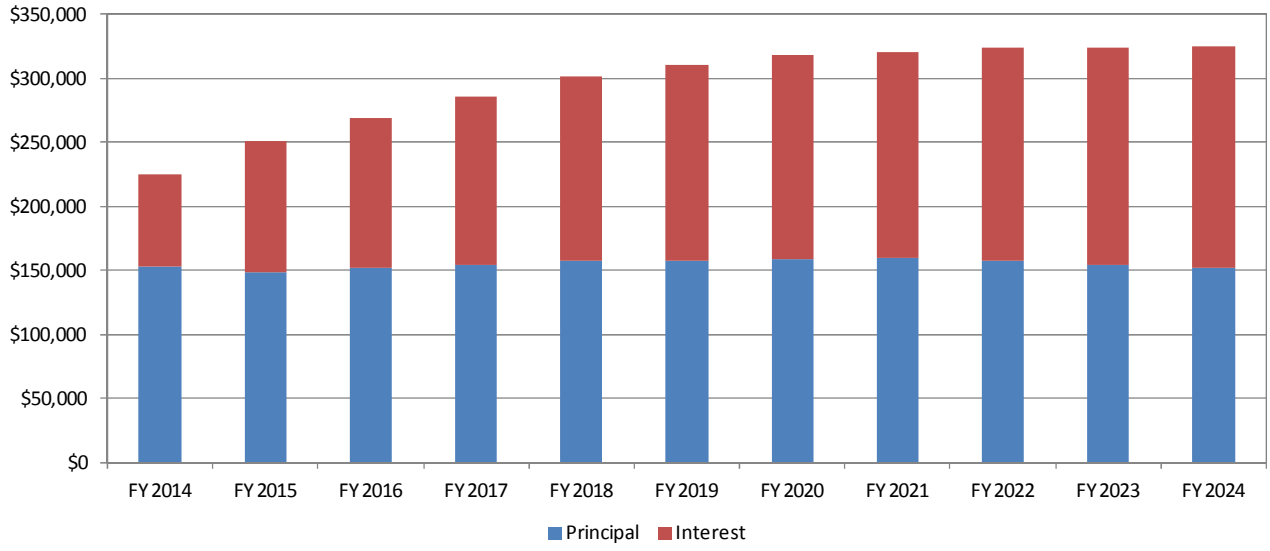


Exhibit 2.5 shows the total (projected and existing) debt that WSSC must fund through FY 2024.

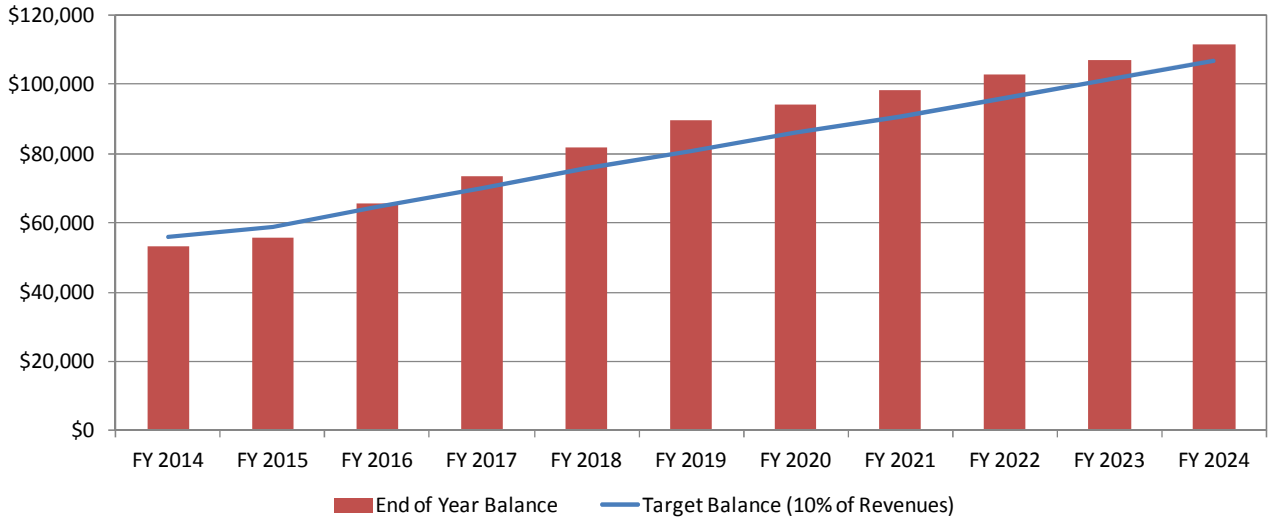
Exhibit 2.5 - Total Debt Service Payments (thousands)



2.3 Operating Reserves

One way to minimize the need for rate increases due to unbudgeted expenses is to maintain an operating reserve. Best management practices dictate that cash reserves be accumulated to provide for contingencies and unplanned major expenses. MFSG met with WSSC staff and incorporated into the rate model a reserve target of 10% of annual revenues. The rate plan set forth in this report maintains or exceeds this target in every year starting FY 2016. Exhibit 2.6 shows the total end of year cash balance for the entire projection period.

Exhibit 2.6 - Operating Reserve Projection (thousands)



2.4 Revenue Requirements

As mentioned previously, the revenue requirements (that is, the total cash needed to operate the water and sewer systems) can be classified into two major categories:

1. Operating Costs:
   Operating and Maintenance Expenses (day-to-day operations)
   Operating and Maintenance Reserve

2. Capital Costs:
   Existing Debt Service (annual principal and interest payments)
   Projected New Debt Service
   Cash-funded Capital Projects

The following table shows the revenue requirements, miscellaneous (non-user charges) revenue and the net revenue requirement from user rates for the water system.

Table 2.3 - Water System Revenue Requirements (thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Operating & Maintenance Expenses	181,195	183,610	192,561	201,960	211,829
Operating Reserve Contribution	1,173	5,000	4,000	4,000	4,000
Total Operating Expenses	*$182,368*	*$188,610*	*$196,561*	*$205,960*	*$215,829*
Cash Funded Capital Projects	29,863	42,570	56,780	68,930	78,696
Existing Debt Service Expense	12,036	16,362	26,107	39,566	57,570
Projected Debt Service Expense	73,529	67,732	63,692	59,274	54,488
Total Capital Expenses	*$115,428*	*$126,663*	*$146,579*	*$167,770*	*$190,754*
Total Revenue Requirement	**$297,796**	**$315,273**	**$343,140**	**$373,730**	**$406,583**
Less: Miscellaneous Other Revenues	(12,211)	(12,333)	(12,456)	(12,581)	(12,707)
Less: Use of Fund Balance	(14,225)	(5,250)	(2,750)	(750)	(750)
Less: Reserve Requirement	(1,173)	(5,000)	(4,000)	(4,000)	(4,000)
Net Revenue Requirement	**$270,186**	**$292,690**	**$323,934**	**$356,399**	**$389,126**

Table 2.3 demonstrates that the annual cost of running the water system will increase from about $270 million to $389 million over the course of five years, an increase of about 44%. The majority of this increase is associated with capital expenses.

Table 2.4 shows the revenue requirements, miscellaneous (non-user charges) revenue and the net revenue requirement from user rates for the sewer system.

Table 2.4 - Sewer System Revenue Requirements (thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Operating & Maintenance Expenses	248,058	250,378	261,310	273,143	285,531
Operating Reserve Contribution	1,127	5,000	4,000	4,000	4,000
Total Operating Expenses	*$249,185*	*$255,378*	*$265,310*	*$277,143*	*$289,531*
Cash Funded Capital Projects	97,149	100,278	95,981	92,878	89,439
Existing Debt Service Expense	12,418	14,743	23,205	34,346	45,001
Projected Debt Service Expense	26,501	39,434	51,382	61,514	69,989
Total Capital Expenses	*$136,068*	*$154,455*	*$170,568*	*$188,739*	*$204,429*
Total Revenue Requirement	**$385,253**	**$409,833**	**$435,878**	**$465,881**	**$493,960**
Less: Miscellaneous Other Revenues	(12,897)	(12,761)	(12,933)	(13,017)	(13,151)
Less: Use of Fund Balance	(13,668)	(5,250)	(2,750)	(750)	(750)
Less: Reserve Requirement	(1,127)	(5,000)	(4,000)	(4,000)	(4,000)
Net Revenue Requirement	**$357,561**	**$386,822**	**$416,195**	**$448,115**	**$476,059**

Similar to the water system, the sewer system's costs increase about 33% over the five year projection period, the majority of which are related to capital expenses.

The next step to prepare for discussing rates is to compare the projected revenue requirements to the projected revenue raised using current rates. Exhibit 2.7 shows the projected rates compared to the projected revenue requirements.

Exhibit 2.7 - Current Revenues vs. Projected Revenue Requirements (thousands)

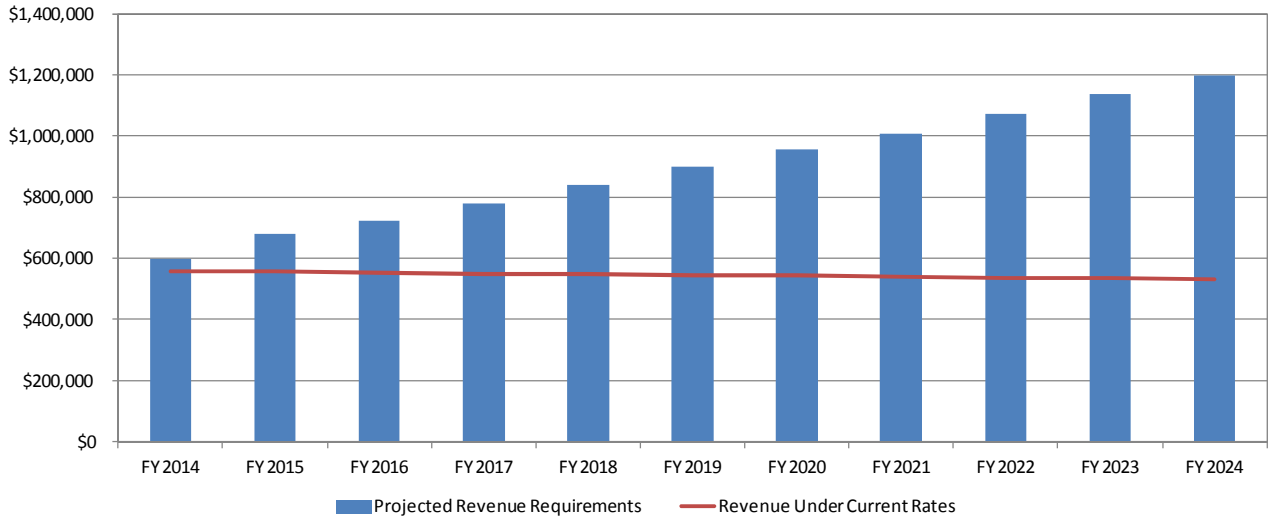


Exhibit 2.7 demonstrates the fact that WSSC will need to continue to adjust water and sewer rates in the coming years to ensure the financial health and stability of the Commission.

2.5 WSSC Modeling Comparisons and Affordability Guidelines

WSSC has developed an annual process of evaluating the financial needs of the water and sewer system. A financial model has been developed internally that is used to evaluate WSSC's finances and to arrive at an annual combined rate adjustment. In the development of MFSG's revenue requirements we evaluated the financial model used by WSSC and the results in comparison to our results of our analysis. In most cases, the results are consistent. The only differences were in the forecast of annual operating expenditures. MFSG's forecasts of operating expenses are slightly higher in some years and slightly lower in others but the differences are very minor. This is a result of the annual inflation factors used by MFSG to forecast future expenses which result in different future operating costs. However based on our analysis, it is our assessment that the current modeling completed by WSSC is valid and MFSG determined annual revenue requirements and necessary future increases in rates that are consistent with WSSC's.

To demonstrate the results of our analysis, MFSG calculated the affordability guidelines currently utilized by WSSC using our financial model. Table 2.5 shows MFSG's affordability guidelines based on the rate model that has been developed.

Table 2.5 - WSSC Affordability Guidelines (thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Combined Rate Increase	6.0%	10.4%	8.8%	8.4%	7.2%
Total Operating Budget	$678,591	$721,343	$775,209	$834,956	$895,742
Debt Service Expense	$227,042	$250,013	$267,835	$282,596	$292,612
New Debt	$384,622	$364,894	$335,620	$310,226	$241,952

It should be noted that our analysis in the remaining sections of the report assumes a revenue budget consistent with the 6% combined rate increase shown in Table 2.5.

3. CUSTOMER ANALYSIS AND DEMAND FORECAST

To complete the cost of service and rate study it is necessary to gain an understanding of the make-up of the customer base served by WSSC including the number of customers and customer usage patterns. The following section provides an overview of this analysis.

3.1 Customer Counts

MFSG analyzed customer data provided by WSSC's utility billing system. MFSG was provided with actual customer data for three full fiscal years – FY 2010, FY 2011 and FY 2012. The first part of the analysis was to determine the number of customers WSSC serves, which is shown in Table 3.1.

Table 3.1- WSSC Customer Counts (FY 2012 data)

Meter Size	Number of Customers
5/8"	144,318
3/4"	238,612
1"	47,363
1 1/2"	4,453
2"	3,763
3"	924
4"	638
6"	1,146
8"	644
10"	119
12"	6
Total	**441,986**

Table 3.1 demonstrates that the vast majority of WSSC's customers (approximately 86%) have a 5/8" or 3/4" meter, which is the typical residential meter size.

3.2 Consumption Data Analysis

To complete the consumption analysis, MFSG relied on consumption data provided by WSSC for Fiscal Years 2010 - 2012. In FY 2012, billed water consumption totaled approximately 47 billion gallons, with billed water consumption higher in FY 2010 and 2011. Table 3.3 shows the FY 2010 – FY 2012 consumption broken down into the GPD tiers of the current rate structure.

Table 3.3 - Breakdown of Water Consumption FY 2010 – FY 2012

GPD Tier	FY 2010 Consumption (1,000 gallons)	FY 2011 Consumption (1,000 gallons)	FY 2012 Consumption (1,000 gallons)
0-49	434,932	446,673	454,360
50-99	3,907,205	4,239,684	3,794,632
100-149	8,473,136	8,456,211	8,544,895
150-199	8,521,665	8,336,438	8,217,503
200-249	5,922,261	5,950,923	5,627,762
250-299	3,476,140	3,423,149	3,295,070
300-349	1,987,988	1,929,158	1,801,312
350-399	1,232,405	1,189,683	1,066,184
400-449	805,221	782,514	713,122
450-499	528,811	515,266	469,518
500-749	1,335,576	1,357,576	1,218,881
750-999	596,555	634,076	574,261
1,000-3,000	2,502,823	2,594,168	2,395,881
4,000-6,999	1,000,082	1,013,219	999,516
7,000-8,999	504,357	550,269	518,827
9,000 & Greater	7,323,959	7,555,670	7,359,042
Total	**48,553,116**	**48,974,677**	**47,050,766**

As shown in the Table 3.3, the total water consumption increased slightly in FY 2011 by about 0.9% followed by a reduction in FY 2011 to FY 2012 of 3.4%. The usage patterns were fairly consistent among all usage levels. In addition to examining overall water usage trends, the water usage patterns for the two customer types within WSSC's system were also investigated. Water consumption, and therefore sewer usage were analyzed using a block usage analysis that matched the current rate structure to see where the usage is being charged under the WSSC's current water and sewer rates.

Table 3.4 illustrates the usage on an average gallons per day basis over the last three years separated between Residential and Commercial customers by meter size followed by Table 3.5 which demonstrates the number of bills generated at each of the current tiers.

Table 3.4 - Average Gallons Per Day (FY 2010 – FY 2012)

Meter Size	# of Meters	FY 10 Average (GPD)		FY 11 Average (GPD)		FY 12 Average (GPD)	
		Commercial	Commercial	Commercial	Residential	Commercial	Residential
5/8"	144,318	171	155	172	154	164	150
3/4"	238,612	193	165	198	164	193	159
1"	47,363	490	202	491	202	470	194
1 1/2"	4,453	1,182	1,609	1,175	1,622	1,142	1,623
2"	3,763	1,906	3,064	1,887	3,088	1,937	3,088
3"	924	4,979	10,687	5,076	10,998	4,856	11,069
4"	638	6,650	14,990	6,783	15,714	6,790	15,338
6"	1,146	10,540	27,064	10,390	27,298	8,389	26,043
8"	644	25,474	46,579	27,277	46,063	25,351	43,359
10"	119	38,407	84,288	41,210	85,120	36,946	83,511
12"	6	67,974	-	79,311	-	70,969	-

Table 3.5 - FY 2012 GPD Tiered Consumption Analysis by Customer Class

GPD Tier	% of Total Bills	
	Commercial	Residential
0-49	12.9%	7.4%
50-99	11.3%	21.1%
100-149	9.2%	25.2%
150-199	7.0%	19.3%
200-249	5.4%	11.7%
250-299	4.1%	6.5%
300-349	3.0%	3.4%
350-399	2.4%	1.8%
400-449	2.1%	1.1%
450-499	1.6%	0.6%
500-749	6.5%	1.2%
750-999	4.3%	0.3%
1,000-3,000	16.9%	0.4%
4,000-6,999	4.5%	0.0%
7,000-8,999	1.8%	0.0%
9,000 & Greater	7.0%	0.0%

A review of Tables 3.4 and 3.5 reveals the following observations:

- The vast majority of WSSC's residential customers use between 150 and 159 gallons per day and 86% of the Commission's total customers use 193 gallons per day or less. The usage per account has steadily declined over the last three years for the vast majority of WSSC's customers which are residential with 5/8" or 3/4" meters.

- Over the past three years the overall distribution of water sales has not changed substantially; the slight increase and then decline in usage appear to be fairly consistent across the board with the exception of residential customers which demonstrated a consistent decline.

- Less than 9% of residential consumption is being charged above the 299 GPD Tier while about 50% of Commercial consumption is above the 299 GPD Tier

- Residential usage is concentrated within the 100 – 149 GPD Tier and Commercial usage is concentrated near the 1,000 to 3,000 GPD Tier

Exhibit 3.1 shows graphically the distribution of customer bills (Residential and Commercial combined).

Exhibit 3.1 - FY 2012 Customer Bill Distribution

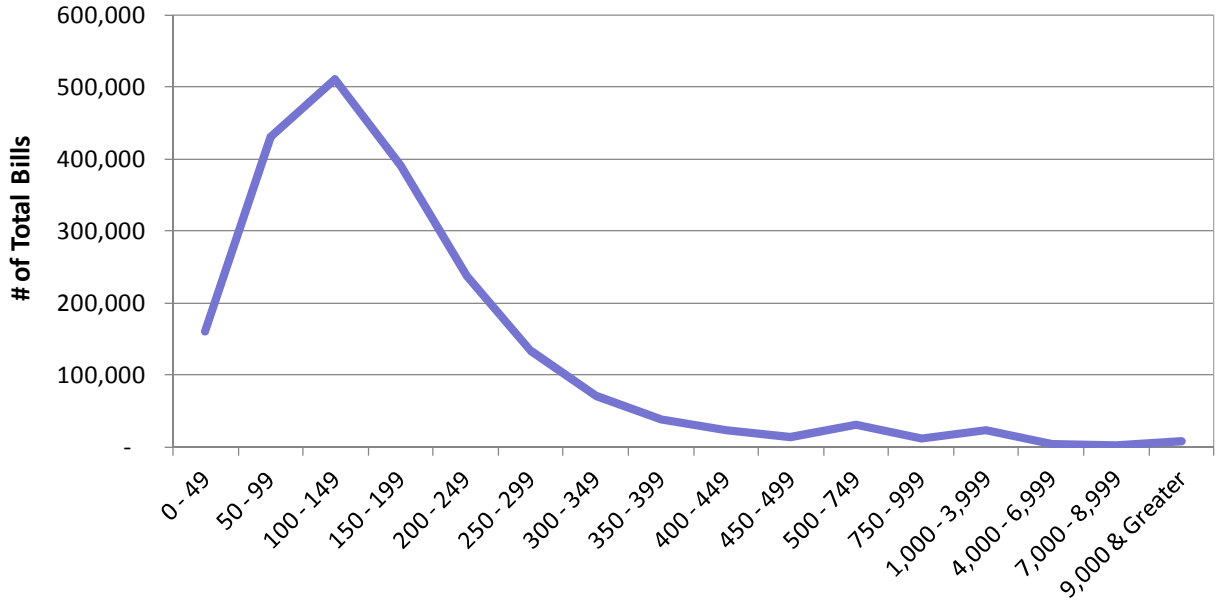
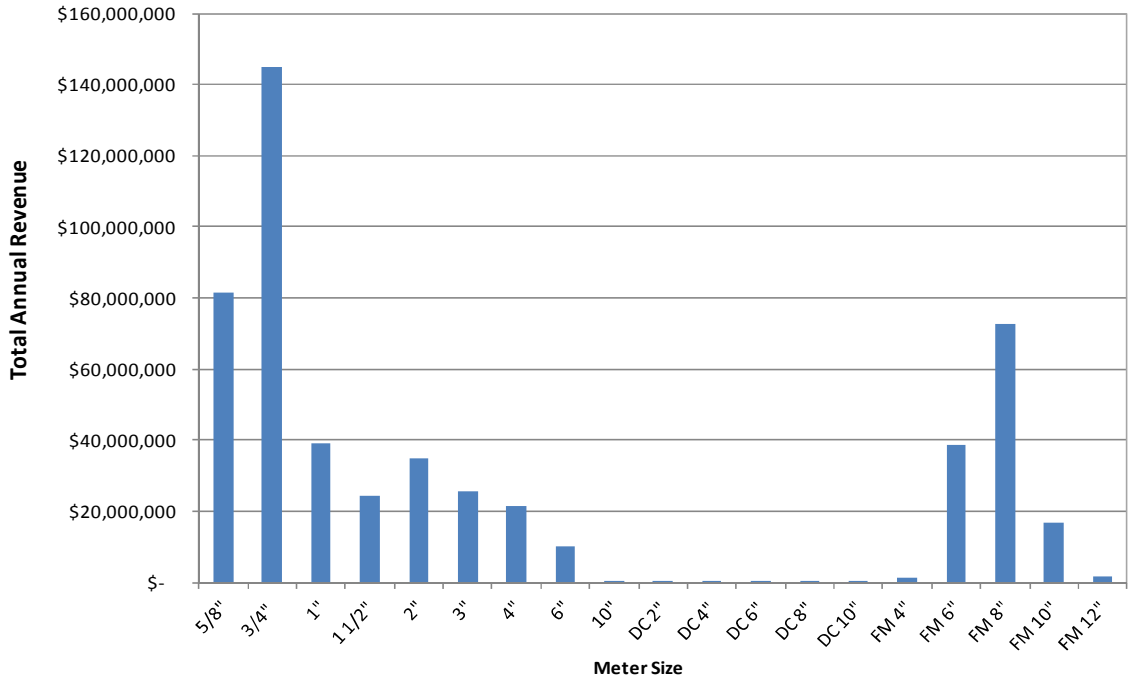


Exhibit 3.1 displays the large drop off of customers who are billed in tiers 149 GPD and 399 GPD. A vast majority of WSSC customers never consume beyond the 299 GPD tier. Based on MFSG's industry experience, this is a typical distribution of consumption habits. Typically, there are many small users who generate most of the revenue for water and sewer systems and a small number of very large users that, by virtue of their extremely high consumption, also generate a high level of revenue for the system. Exhibit 3.2 displays the revenue generated by each meter size and type in FY 2012, and shows that the larger meters served by WSSC generate significant revenue.

Exhibit 3.2 - FY 2012 Actual Revenue Generation by Meter Size



WSSC's revenue distribution by meter size is a typical distribution with peaks at either end, with many small users and a small number of large users both generating the majority of revenue. The DC meters are detector check meters are located on private fire lines which should only register usage in the case of a fire or emergency. The FM meters are meters on service connections that provide domestic water and well as fire protection through a compound meter.

The top ten revenue generators in FY 2012 are shown in Table 3.6.

Table 3.6 - Top Ten Customers (FY 2012)

Customer	Meter Size	Annual Consumption (1,000 Gallons)	FY 2012 Revenue
National Institute of Health	8"	630,845	$4,087,876
Andrews Air Force Base	10"	203,102	1,316,101
Gaylord Hotel	8"	157,727	1,022,071
University of Maryland	6"	111,015	719,377
Pepsi Cola	6"	109,732	711,063
United States Navy	10"	103,756	672,339
Leisure World of Maryland Trust	10"	183,543	646,636
NIST	10"	92,679	600,560
University of Maryland	10"	91,820	594,994
United States Navy	10"	90,934	589,252

The National Institute of Health is by far the largest user (in terms of consumption) and therefore the largest revenue generator for WSSC. Using the data generated by the customer and consumption analysis, MFSG could make several judgements on alternative rate structures and an overall financial plan for WSSC over the next five years.

3.3 Customer and Demand Projections

Given the historical reduction in water consumption, an accurate water demand forecast is a critical component of the financial plan. To develop the forecast, PEER Consultants, serving as a sub-consultant to MFSG, completed a review and update of the last demand forecasts developed internally by WSSC staff including the *2011 Water Production Projection Report* and the *2011 Wastewater Flow Projections Report*. Based on the analysis completed by PEER, future demands will be approximately 5.0% lower than those previously developed. This will primarily be driven by the reduction of water usage on a per account basis. While it is anticipated that WSSC will continue to add new customer accounts and water production will increase, the usage on a per account basis will continue to decline. There are a number of factors that contribute to the per account reduction in water usage including;

- The replacement of water using appliances and fixtures with low flow devices. A significant portion of the development within WSSC was constructed prior to the requirements put in place by the EPA in the mid-1990's requiring low flow fixtures. As a result, there remains a

significant amount of reduction on a per account basis that may result as water fixtures are replaced.

- The general water conservation ethic. Utilities have done an effective job of communicating the importance of conserving our water resources and as a result customers have and will continue to be conscience of water use.

- The increasing cost of water and sewer service will result in some customers changing habits and conserving water.

Given these factors, we have conservatively estimated that water sales will continue to decrease slightly over the next five years. Customer growth is anticipated to grow at approximately 0.5% which equates to rough 450 new accounts per and total water sales is estimated to decrease annual at 0.5%.

4. CURRENT RATES AND PRICING GOALS AND OBJECTIVES

The development of the revenue requirements, the necessary increases in rates and understanding of how WSSC customers use water provides the framework for the evaluation of how WSSC should charge for water and sewer service. The following section of the report provides an overview of WSSC's current rates and charges and pricing goals and objectives used to evaluate the rate structures.

4.1 Current Rates and Fees

WSSC currently bills all its residential customers on a quarterly basis and commercial customers on both a quarterly and a monthly basis. All customers are charged an account maintenance fee (AMF) and billed usage charges based on metered water usage. The current AMF is shown in Table 4.1.

Table 4.1 - WSSC Account Maintenance Fee (effective July 1, 2013)

Meter Size / Type	Quarterly AMF
5/8"	$11.00
3/4"	11.00
1"	11.00
1 1/2" - Residential	11.00
1 1/2"	31.00
2"	51.00
3"	92.00
4"	145.00
6"	237.00
10"	458.00
Detector Check - 2"	53.00
Detector Check - 4"	53.00
Detector Check - 6"	73.00
Detector Check - 8"	197.00
Detector Check - 10"	256.00
Flow Meter - 4"	145.00
Flow Meter - 6"	237.00
Flow Meter - 8"	379.00
Flow Meter - 10"	458.00
Flow Meter - 12"	458.00

As demonstrated in Table 4.1 the AMF varies based on the size and type of the meter serving the customer. It should be noted that Detector Check meters are meters located on fire lines only used for emergency fire service. Flow meters are service lines with compound meters that serve the account with domestic and fire service through compound meters.

WSSC's current usage rates are shown in Table 4.2.

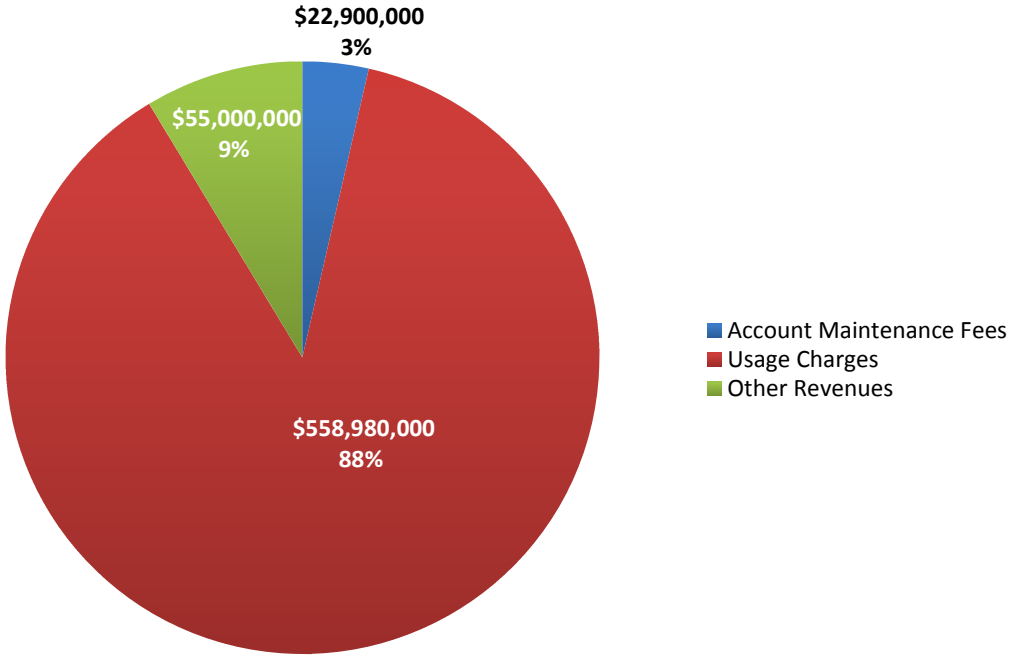
Table 4.2 - WSSC Usage Rates (effective July 1, 2013)

Average Daily Consumption (Gallons Per Day)	Water Rate Per 1,000 Gallons	Sewer Rate Per 1,000 Gallons	Combined Rate Per 1,000 Gallons
0 - 49	$2.95	$4.06	$7.01
50 - 99	3.29	4.74	8.03
100 - 149	3.61	5.53	9.14
150 - 199	4.05	6.37	10.42
200 - 249	4.73	6.96	11.69
250 - 299	5.13	7.53	12.66
300 - 349	5.42	8.04	13.46
350 - 399	5.66	8.42	14.08
400 - 449	5.88	8.61	14.49
450 - 499	6.03	8.89	14.92
500 - 749	6.14	9.07	15.21
750 - 999	6.29	9.27	15.56
1,000 - 3,000	6.41	9.67	16.08
4,000 - 6,999	6.56	9.89	16.45
7,000 - 8,999	6.64	10.03	16.67
9,000 - Greater	6.76	10.29	17.05

WSSC currently charges its customer for metered water and sewer usage within a 16-step inclining structure. All of the customers usage is charged at the rate based where the customer falls within the steps given their average daily consumption during the billing period.

The combination of the account maintenance fee and the usages charges make up the vast majority of WSSC's annual revenues, presenting approximately 91% of the total annual revenues. The split of revenues between the account maintenance fee, usage charges and other revenues is shown in Exhibit 4.1.

Exhibit 4.1 - Current Rate Structure Revenue Distribution



**Other revenues include others fees, permits, interest income and miscellaneous income*

Exhibit 4.1 demonstrates that the vast majority of WSSC's revenues are generated from usage charges, representing approximately 88% of total revenues. As a result, WSSC is currently highly dependent on revenues that vary with customer usage patterns (variable revenues). The fixed revenue collected through the account maintenance fee represents just a fraction of the total revenues. The industry standard amount of revenue collected from fixed revenues typically ranges from 10% to 30%. Additionally, due to the ongoing reductions in per account and aggregate water usage experienced by most utilities over the past decade, an increasing number of communities are increasing the amount of fixed revenue to help stabilize overall revenues. Given the minimal amount of fixed revenues generated within WSSC's current rate structure, actions should be taken to increase the amount of fixed revenue generated.

4.2 Pricing Goals and Objectives

Prior to evaluating the current rate structure and developing alternative rate structures it is important to determine how the structures should be evaluated, specifically what pricing goals and objectives should be used. As part of the work completed by the Bi-County Infrastructure Financing Working Group, twelve common pricing objectives were reviewed and ranked by the Working Group members. A listing of the objectives and the ranking by priority are provided in Table 4.3.

Table 4.3 - Prioritized Pricing Objectives from Bi-County Infrastructure Financing Working Group

Pricing Objective	Rank	Working Group Score
Financial Sufficiency	1	60
Defensibility	2	56
Revenue Stability	3	53
Rate Stability	4	46
Affordability to Disadvantaged Customers	5	45
Minimization of Customer Impacts	6	42
Cost of Service Based Allocations	6	42
Equitable Contributions from New Customers	8	37
Ease of Implementation	9	31
Simple to Understand and Update	10	29
Conservation Initiatives	11	23
Economic Development	11	23

The rankings of the pricing objectives by the Working Group are logical and consistent with our experience. The desire to ensure the financial health of the organization while charging rates and fees that are defensible, are typically the two highest priorities among water and sewer utilities. These are followed closely by the desire to ensure the financial stability of the Commission and the stability of rates for customers. While all of the pricing objectives we included in our evaluation of the rates and fees for WSSC, particular emphasis (in order of ranking) was given to the first seven objectives. It should be noted that the pricing objectives were one factor used in our evaluation of the rates and fees but not the only factor. Our industry expertise, discussion with Commission staff and knowledge of WSSC were included in the evaluation. The following sections of the report review the current and alternative rates, fees and charges included in our evaluation.

5. RECONSTRUCTION FEE

One of the key recommendations of the Bi-County Infrastructure Financing Working Group Consultant's Report was the establishment of a new fee that would be used to fund system reconstruction which would be segregated from the other system revenue requirements. The report mentioned several options for how the fee might be imposed (e.g., a fixed fee or a volumetric charge). The following section presents our analysis and evaluation of the reconstruction fee. To develop and evaluate a separate reconstruction fee it is necessary to determine the annual costs to recover from the fee and the appropriate method used to impose the fee.

5.1 Cost of Service - Annual Reconstruction Costs

Based on discussions with WSSC staff it was determined that the future costs associated with water and sewer line reconstruction (both large and small diameter) should be used to develop the fee. These costs would be in the form of annual debt service payment based on 30 year debt associated with the capital projects for line reconstruction projects identified in WSSC's approved capital improvement plan for project beginning in FY 2015. Table 5.1 presents the annual debt service associated with these projects for the next five years.

Table 5.1 - Annual Line Reconstruction Debt Service (thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Water Line Reconstruction Debt Service	$6,659	$15,501	$24,270	$32,716	$42,560
Sewer Line Reconstruction Debt Service	$3,434	$7,128	$12,234	$17,143	$22,300
Total Reconstruction Debt Service	**$10,092**	**$22,628**	**$36,504**	**$49,858**	**$64,860**
5-Year Average Reconstruction Debt Service	**$36,789**	**$36,789**	**$36,789**	**$36,789**	**$36,789**

Table 5.1 demonstrates that the new debt service issued to fund line reconstruction will ramp up over the next five years to almost $65 million per year by FY 2019 and will continue to grow as WSSC continues to fund system line reconstruction with estimated debt service of $124 million by FY 2024. In addition to the annual debt service the table shows the 5-year average to allow for the determination of a flat five year reconstruction fee should this be a preferable. The annual debt service serves as the basis for the costs to potentially recover from the reconstruction fee. *It is important to note that these costs are not "new" but are simply costs that are now segregated from expenses that would have otherwise been funded in the normal water and sewer usage rates.*

5.2 Reconstruction Fee Structure

There are a number of ways in which the reconstruction fee could be structured. The implementation of a separate reconstruction fee, while not unheard of, is still not a widely used approach by utilities around the country. While most utilities are struggling with the funding of aging infrastructure, the majority have continued to fund it through their existing water and sewer

usage rates. To provide a comprehensive analysis, MFSG evaluated a wide range of structures for the reconstruction fee. The structures can be grouped into two general categories: fixed and volumetric.

5.2.1 Fixed Fee Approach

A fixed reconstruction fee would be assessed to all customers regardless of actual metered water usage. This would be similar to the current approach used by WSSC in the assessment of the account maintenance fee (AMF). The important consideration related to the assessment of a reconstruction fee as a fixed fee is how best to reflect the customer's proportionate share of reconstruction costs in the fee. WSSC could simply charge each customer account a single reconstruction fee but using such an approach would assume an equal use of the water and sewer systems by each customer account. There are a number of ways that the fee could be structured to more proportionately allocate reconstruction costs. These include the use of meter size, average usage per account or front footage. Based on discussions with WSSC staff it was determined that the use of average usage per account would be difficult to administer within the billing system and would result in a reconstruction fee that would be very similar to using the volumetric basis and therefore was not considered. The use of front footage was also excluded due to data limitations and potential administrative concerns in using this approach. The use of meter size was determined to be the preferred fixed fee approach to calculating the reconstruction fee. While the American Water Works Association (AWWA) provides a table of demand ratios for standard meter sizes which represent industry standard average demands by meter size, MFSG is able to calculate ratios based on the average usage by meter size within the WSSC customer base. Based on the fact that the actual usage by meter size better matches the actual usage patterns of WSSC's customers we recommend that the actual usage per meter size approach be used if the fixed fee approach is selected. Table 5.2 presents the WSSC meter size ratios.

Table 5.2 - Meter Size Ratios

Meter Size	Ratios Actual Usage Per Meter Size*
5/8"	1.00
3/4"	1.07
1"	1.30
1 1/2" – Residential	10.84
1 1/2"	7.63
2"	16.78
3"	53.18
4"	73.89
6"	114.98
10"	402.24
Flow Meter - 4"	45.35
Flow Meter - 6"	56.03
Flow Meter - 8"	229.44
Flow Meter - 10"	246.75
Flow Meter - 12"	473.98

**Assumes 5/8" usage is base usage*

The annual reconstruction fee, using the five year average annual debt service, is presented in Table 5.3 using the WSSC meter ratios.

Table 5.3 - 5-Year Average Reconstruction Fee

Meter Size	Quarterly Reconstruction Fee Actual Usage Per Meter Size Ratios
5/8"	$11.00
3/4"	12.00
1"	14.00
1 1/2" – Residential	119.00
1 1/2"	84.00
2"	185.00
3"	585.00
4"	813.00
6"	1,265.00
10"	4,425.00
Flow Meter - 4"	499.00
Flow Meter - 6"	616.00
Flow Meter - 8"	2,524.00
Flow Meter - 10"	2,714.00
Flow Meter - 12"	5,214.00

Table 5.3 illustrates under the 5-year average cost of reconstruction approach, the average WSSC customer (having a 5/8" or 3/4" meter) would pay $11 or $12 per quarter.

5.2.2 Volumetric Approach

As an alternative to a fixed fee, WSSC could generate revenues for line reconstruction as a separate volumetric charge. In many instances this would be similar to the current approach used by the Commission whereby if a separate reconstruction fee is not adopted, customers will pay for system reconstruction in their usage rates. However, if a volumetric reconstruction fee is adopted the fee may be broken out separately on the customer's bill and most importantly the volumetric charge per unit of water and sewer would be charged on a uniform basis which differs from the existing volumetric charge which is applied at an increasing rate as customer usage increases. Table 5.4 presents the uniform volumetric charge, under the 5-year average reconstruction costs and the result impacts to customer based on usage.

Table 5.4 - 5-Year Average Reconstruction Fee – Volumetric Approach

Reconstruction Unit Rate	Sample Customer Quarterly Usage (gallons)	Reconstruction Charge
$0.80 per 1,000 gallons	13,500	$10.80
	20,000	$16.00
	30,000	$24.00
	50,000	$40.00

For the average WSSC customer using 150 gallons per day (13,500 a quarter) this would equate to a quarterly charge of approximately $11, very close to the charge using the fixed fee approach. However residential customers that use less than the average would pay less for the construction fee unlike the fixed fee approach.

5.3 Reconstruction Fee - Pricing Objectives Review

The reconstruction fee was evaluated in light of the pricing objectives discussed in section 5 of the report. Specifically, a comparison of the status quo (no reconstruction fee) and a fixed fee versus volumetric fee was completed. The comparison is shown in Table 5.5.

Table 5.5 - Reconstruction Fee Pricing Objectives Evaluation

Pricing Objective	Status Quo (No Fee, Funded within Existing Rates)	Fixed Meter Size Based Reconstruction Fee	Volumetric Based Reconstruction Fee
Financial Sufficiency	-	+	-
Defensibility	o	o	o
Revenue Stability	-	+	o
Rate Stability	-	+	-
Affordability to Disadvantaged Customers	o	-	o
Minimization of Customer Impacts	-	o	-
Cost of Service Based Allocations	o	+	+

+: Contributes to meeting pricing objective
O: Neutral in meeting pricing objective
-: Detracts from meeting pricing objective

Table 5.5 shows that the fixed meter size based reconstruction fee is the approach that contributes most effectively toward achieving the pricing objectives. The status quo and volumetric based reconstruction fee both function very similarly with the only exceptions being that the costs are broken out separately and therefore is based on cost of service allocations and secondly that it is uniform rate (as compared to a tiered rate) which provides slightly more revenue stability. The primary disadvantage of the fixed reconstruction fee is that it may result in an increase in the quarterly bill for the average customer including those disadvantaged customers because costs are allocated more evenly as compared to the volume based which would collect more revenue from those customers that use significant quantities of water. However, overall it is clear that the fixed reconstruction fee is clearly preferable in light of the pricing objectives.

5.4 Recommendation

The concept of a separate fee for the funding of system reconstruction is an approach that we recommend WSSC adopts. The adoption of a reconstruction fee will provide a dedicated funding

source for the tremendous reconstruction investments facing the Commission. The separation of the costs associated with reconstruction and the supporting fee will provide for greater transparency and increased customer understanding. We believe that an increasing number of communities will be adopting separate reconstruction fees as there becomes increasing public scrutiny over ongoing rate increases. In terms of the specific structure and fees themselves we recommend the following:

- The reconstruction fee should be assessed as a fixed fee that will provide a stable stream of revenue to fund the debt service associated with line reconstruction. A volumetric charge would result in a less stable revenue stream and would be subject to the ongoing reduction in water usage among WSSC customers.

- The reconstruction fee should be assessed by meter size using the average usage by meter size as the basis for the differential between meter sizes. This approach will appropriately allocate the cost of reconstruction based on the customer's share of reconstruction costs.

- The reconstruction fee should be based on the average cost of debt service over the next five years, allowing for a reconstruction fee that will remain the same for a five year period. This approach will provide predictability for WSSC and the customer over a five year period and increase the portion of WSSCs revenues that are fixed.

- The recommended reconstruction fees are presented in Table 5.6.

Table 5.6 - Recommended Reconstruction Fee

Meter Size	Quarterly Reconstruction Fee (FY 15 - FY19)
5/8"	$11.00
3/4"	12.00
1"	14.00
1 1/2" - Residential	119.00
1 1/2"	84.00
2"	185.00
3"	585.00
4"	813.00
6"	1,265.00
10"	4,425.00
Flow Meter - 4"	499.00
Flow Meter - 6"	616.00
Flow Meter - 8"	2,524.00
Flow Meter - 10"	2,714.00
Flow Meter - 12"	5,214.00

6. ACCOUNT MAINTENANCE FEE

The account maintenance fee (AMF) was established in 1990 and has not been adjusted in structure or magnitude since it was first established. Based on discussions with WSSC staff, it is their understanding that the AMF was established to recover the cost of providing customer service functions such as meter reading (including meter replacement), billing and collections. The fee is also intended to cover the cost of private fire protection in the case of customers with standby fire protection. Our review of the cost of service associated with the AMF and the structure of the fee are included in the following sections.

6.1 Cost of Service - Account Maintenance Fee

As mentioned above the AMF has not been increased since it was first established in 1990. As a result, it would reasonable to assume that with increasing costs the fee no longer recovers the full cost of services for which it was originally intended. MFSG worked with WSSC staff to determine the appropriate allocation of costs from within the WSSC budget categories associated with the customer account maintenance functions. Table 6.1 presents the cost categories associated with customer account maintenance services from the FY 2015 budget and our calculation of private fire protection. The total costs are compared with the anticipated revenues from the AMF in FY 2015.

Table 6.1 - Account Maintenance Expenditures (thousands)

Cost Category	Sub Category	Expenditure Estimate FY 2015
Customer Service / Billing	Finance Team	2,148
	Customer Care Team	21,017
	Logistics Team	1,440
	Total	**$24,605**
Meter Services	Customer Care Team	4,006
	Logistics Team	2,338
	Total	**$6,344**
Private Fire Protection*		**$1,186**
Total Cost of Service Account Maintenance Services		**$32,135**
Estimated Total Revenue from AMF FY 2015		**$23,018**

*Private Fire Protection was calculated based on National Board of Fire Underwriters and Maine Formula and represents the cost of having fire protection available for an account with private fire protection.

Table 6.1 shows that the costs associated with account maintenance services will be approximately $7.1 million more than the revenue from the account maintenance fee. To cover the cost of providing these services with the AMF, the fee would need to be increased by about 30%. The shortfall is not surprising given the fact that fee has not been increased since its inception. Increases in the AMF would better match the cost of providing account maintenance services and would increase the amount of fixed revenue WSSC would collect from its customers. In addition to

examining the costs associated with account maintenance services in FY 2015, the estimated expenditures over the next five years were developed. Table 6.2 presents the annual expenditures and the five year average.

Table 6.2 - Annual Account Maintenance Services Expenditures (thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
Customer Service / Billing	24,605	25,835	27,127	28,483	29,908
Meter Services	6,344	6,661	6,994	7,344	7,711
Fire Protection	1,186	1,268	1,377	1,500	1,632
Total	**$32,135**	**$33,764**	**$35,498**	**$37,327**	**$39,251**
5-Year Average	**$35,595**	**$35,595**	**$35,595**	**$35,595**	**$35,595**

Table 6.2 demonstrates the annual increases in the expenditures associated with account maintenance services and fire protection. The five-year average is to allow for the calculation of a five-year AMF.

6.2 Account Maintenance Fee Structure

The structure that the Commission currently uses to assess the AMF is common industry practice. The cost of providing services to larger metered customers is generally greater than that related to smaller meters and therefore a meter-sized approach is logical. However in order to arrive at a cost of service based AMF, it is necessary to examine how the various costs included in the fee (billing, meter replacement, fire protection) vary among different meter sizes. This analysis ensures that costs are allocated appropriately resulting in equitable and defensible fees. Table 6.3 provides an industry standard approach for recovery of the various costs include in the AMF based on the type of expenditure.

Table 6.3 - Account Maintenance Fee Cost of Service Allocations

Cost Category	Method of Recovery
Customer Service / Meter Reading / Billing	Assessed on a per account basis regardless of meter size. Cost of customer service, meter reading and billing does not differ by meter size.
Meter Services	Assessed based on meter size with differential between meter sizes based on actual cost of meter replacement.
Private Fire Protection	Assessed based on meter size with differential based on American Water Works Association maximum flow capacities per meter size. Applied only to customers with private fire protection (FM and DC metered customers).

The application of the approach to recovering the account maintenance costs shown in Table 6.3 will result in an AMF that better matches the true cost of providing these services. Table 6.4

presents the application of the allocations based on the five-year average account maintenance expenditures presented in Table 6.2

Table 6.4 - Calculation of Quarterly Account Maintenance Fee FY 2015 - FY 2019

Meter Size	Customer Services	Meter Services	Fire Protection	Total Quarterly AMF FY 15 - 19
5/8" - 1 ½" Residential	$14.00	$2.00	-	$16.00
1 ½"	14.00	10.00	-	24.00
2"	14.00	13.00	-	27.00
3"	14.00	52.00	-	66.00
4"	14.00	128.00	-	142.00
6"	14.00	140.00	-	154.00
10"	14.00	232.00	-	246.00
Detector Check - 2"	14.00	13.00	$6.00	33.00
Detector Check - 4"	14.00	128.00	35.00	177.00
Detector Check - 6"	14.00	140.00	101.00	255.00
Detector Check - 8"	14.00	232.00	215.00	461.00
Detector Check - 10"	14.00	232.00	387.00	633.00
Flow Meter - 4"	14.00	133.00	35.00	182.00
Flow Meter - 6"	14.00	178.00	101.00	293.00
Flow Meter - 8"	14.00	223.00	215.00	452.00
Flow Meter - 10"	14.00	281.00	387.00	682.00
Flow Meter - 12"	14.00	350.00	625.00	989.00

A couple of items should be noted regarding the AMF shown in Table 6.4. The fee was designed to recover the costs associated with providing account maintenance services and fire protection shown in Table 6.2 and as result will generate approximately 30% more revenue than the current AMF in FY 2015, should the fee be adopted. Additionally due to the use of the cost of service based approach the AMF is significantly more or less for some customers based on their particular meter size. Lastly, as demonstrated in the table, when assessing the AMF, WSSC currently groups residential customers together regardless of meter size. Based on discussions with WSSC staff it was determined that this same approach should be continued. Table 6.5 shows the difference between the current AMF and the calculated AMF.

Table 6.5 - Quarterly Account Maintenance Fee Comparison

Meter Size	Current Quarterly AMF	Calculated Quarterly AMF FY 2015 - 2019	Quarterly Dollar Change	Percent Change	Number of Meters
5/8" - 1 ½" Residential	$11.00	$16.00	$5.00	45.5%	435,227
1 ½"	31.00	24.00	(7.00)	(22.58%)	2,541
2"	51.00	27.00	(24.00)	(47.06%)	3,544
3"	92.00	66.00	(26.00)	(28.26%)	930
4"	145.00	142.00	(3.00)	(2.07%)	511
6"	237.00	154.00	(83.00)	(35.02%)	137
10"	458.00	246.00	(212.00)	(46.29%)	1
Detector Check - 2"	53.00	33.00	(20.00)	(37.74%)	244
Detector Check - 4"	53.00	177.00	124.00	233.96%	59
Detector Check - 6"	73.00	255.00	182.00	249.32%	214
Detector Check - 8"	197.00	461.00	264.00	134.01%	94
Detector Check - 10"	256.00	633.00	377.00	147.27%	16
Flow Meter - 4"	145.00	182.00	37.00	25.52%	73
Flow Meter - 6"	237.00	293.00	56.00	23.63%	802
Flow Meter - 8"	379.00	452.00	73.00	19.26%	554
Flow Meter - 10"	458.00	682.00	224.00	48.91%	103
Flow Meter - 12"	458.00	989.00	531.00	115.94%	6

As mentioned above and shown in Table 6.5 there are significant increases and decreases between the current and calculated AMF depending on the size of the customer meter.

6.3 Account Maintenance Fee - Pricing Objectives Review

The account maintenance fee was evaluated in light of the pricing objectives discussed in section 4 of the report. The evaluation was conducted between current (status quo) AMF and the calculated cost of service based AMF. The comparison is shown in Table 6.6.

Table 6.6 - Account Maintenance Fee Pricing Objectives Evaluation

Pricing Objective	Current AMF (Status Quo)	Cost of Service Based AMF
Financial Sufficiency	-	+
Defensibility	-	+
Revenue Stability	-	+
Rate Stability	-	+
Affordability to Disadvantaged Customers	+	-
Minimization of Customer Impacts	o	o
Cost of Service Based Allocations	-	+

+: Contributes to meeting pricing objective
O: Neutral in meeting pricing objective
-: Detracts from meeting pricing objective

Table 6.6 shows that the adoption of a cost of service based AMF would clearly contribute to meeting the pricing objectives as compared to the current AMF. It should be noted that part of the reason that it assists in meeting the pricing objectives is due to the fact that it increases the

amount of fixed revenue generated by the AMF which results in increase revenue and rate stability and ultimately financial sufficiency. Similar to the fixed reconstruction fee, the cost of service based AMF may result in an increase in the quarterly bill for the average customer including disadvantaged customers because costs are allocated more evenly as compared to the volume based which would collect more revenue from those customers that use significant quantities of water. In general, a high fixed charge (AMF and/or reconstruction fee) will have a greater impact on customers that use minimal quantities of water. This may or may not include disadvantaged customers depending on their usage patterns. However, it is clear that the cost of service based AMF would certainly result in an AMF that would move the Commission towards meeting the pricing objectives.

6.4 Recommendation

Based on our evaluation of the current AMF, we recommend that the Commission adopt a cost of service based AMF that will recover the five-year average cost of providing account maintenance services and fire protection. The fee would remain the same for a five year period (FY 2015 to 2019), similar to the reconstruction fee. As mentioned above, the new AMF would meeting nearly all of the pricing objectives, specifically meeting the top four objectives by providing increased revenue and rate stability within a structure that can easily be defended.

7. USAGE RATES

The final component of the Commissions rate structure includes the charges for the actual use of water and sewerage generation. WSSC's current usage rates generate the vast majority of the Commissions revenue at approximately 96% of total revenues. While the Commission has not adjusted the AMF since its inception, usage rates have been adjusted annual to ensure that revenues keep pace with annual expenditures. The following section of the report details our review of the cost to be recovered from the usage rates and analysis of the current and alternative rate structures.

7.1 Cost of Service - Usage Rates

Based on the allocation of costs to the reconstruction fee and the account maintenance fee, the costs to be recovered from the usage rates are simply the remaining revenue needs to meet the minimum revenue budget target. Table 7.1 demonstrates this calculation.

Table 7.1 - Calculation of Usage Rate Revenue Needs (thousands)

	FY 2015 Revenues
Total Revenue Needs (6% Budget)	$623,290
Reconstruction Fee (based on 5 year annual average)	(36,789)
Account Maintenance Fee (based on 5 year annual average)	(32,136)
Usage Rates	**554,365**

The revenue to be generated from usage rates totals slightly less than $560 million in FY 2015 based on the adopted 6% increase budget. It is worth noting that with the recommended reconstruction fee and the update AMF, the ratio of fixed to variable revenue changes from the current 4% fixed / 96% variable to 12% fixed / 88% variable. This brings the Commission more in line with industry standard and will help to stabilize revenues. *Additionally it results in lower usage rates in FY 2015 when compared to a status quo scenario where current usage rates are simply increased 6%.*

7.2 Usage Rate Structure

The current usage rate structure used by the Commission is fairly unique among utilities around the United States. While inclining block rates are fairly common, most utilities step customers' usage through the blocks (e.g. the first quantities of metered water is priced at the first tier, the second quantities of water is priced at the second tier and so on). Additionally, most utilities with inclining block rates maintain anywhere from three to six blocks, as compared to the Commission's rate design which includes sixteen tiers. The structure utilized by the Commission and inclining block rate structures in general are typically used to encourage the wise use of water resources.

Based on WSSC's data and our industry experience several findings were developed related to the current usage rate structure including:

- Calculating the customers' bill based on the gallons per day per billing period eliminates any issues with differing billing periods. Standard inclining block rate structures are often criticized because of the inequity of varying billing period. For example, if one customers billing period is 100 days and another is 80 days, the consumption for the customer with the shorter billing period may not fall into the higher priced tiers, while the longer billing period will result in more consumption falling higher tiers.

- Customers are charged more per 1,000 gallons as their consumption increases which matches the increasing cost of providing service.

- The current rate structure is easy for WSSC to administer and the data to calculate the rates is readily available.

- The current rate structure is not more punitive than a typical inclining block rate structure. In a typical inclining block rate structure a large customer's consumption typically quickly reaches the highest block with limited effect of having consumption at the lower tiers.

- One potentially negative aspect of the structure is that customers who generally consume about the same gallons per day, but tend to fall on a tier's edge (for example, 198 gallons per day some months, 202 gallons per month others) can see large fluctuations in their bill without any perceivable changes in consumption.

- The structure may be difficult for customers to understand and therefore may generate perceived inequity within the system.

In light of these observations, several usage rate structure alternatives were developed. A wide range of rate structures were considered and discussed with WSSC staff. To help narrow down the potential rate structures, it was determined that only rate structures that could be implemented by WSSC should be considered. Specifically, it was determined that the usage rate structures selected for evaluation had to be structures that the current billing system could actually handle and structures for which the data was actually available to calculate the rates. This important factor eliminated the inclusion of typical inclining block rate structure because of limitations within the current billing system and customer consumption information.

The usage rate structures that were considered viable include a structure which consolidates the number of tiers from the current 16 to 8, as well as a uniform rate structure. The current rate structure updated to generate the revenue required from usage rates in Table 7.1 was also modeled to provide a baseline for comparison. Table 7.2 shows the usage rates under these three structures.

Table 7.2 - Combined Water and Sewer Rate Structure Alternatives FY 2015

Average Daily Consumption (Gallons Per Day)	Current Rate Structure FY 2015 Per 1,000 Gallons	Consolidated Tiers FY 2015 Per 1,000 Gallons	Uniform Rate FY 2015 Per 1,000 Gallons
0 – 49	$7.43	$8.20	$12.97
50 – 99	8.51		
100 – 149	9.69	10.00	
150 – 199	11.05		
200 – 249	12.39	13.03	
250 – 299	13.42		
300 – 349	14.27	15.00	
350 - 399	14.92		
400 - 449	15.36	16.02	
450 - 499	15.82		
500 - 749	16.12	16.77	
750 - 999	16.49		
1,000 - 3,000	17.04	17.72	
4,000 - 6,999	17.44		
7,000 - 8,999	17.67	18.37	
9,000 & Greater	18.07		

The calculation of the rates in Table 7.2 was straightforward for the current rate structure and for the uniform rate. The rates within the current rate structure were simply increased uniformly across all tiers and the uniform rate was determined by taking the total revenue needs divided by the total annual consumption. The calculation of the rates within the consolidated tiers was more complicated. To calculate these rates, an algorithm was developed that would match, as closely as possible, what a customer's bill would be under the current tiers. This approach was taken to limit the impact of within a customer bills due to the change in the structure. However by simply examining how the rates differ at different consumption levels it is clear that changes from the current structure would have impacts on customer bills. For example, under the current structure, a customer that uses less than 49 gallons per day would be charged the lowest rate but under the consolidated tiers they would pay the same rate as those using up to 99 gallons per day or under the uniform structure would pay the same rate as all customers.

7.3 Usage Rate Structure - Pricing Objectives Review

The usage rate alternatives were evaluated in light of the pricing objectives discussed in section 4 of the report. The comparison is shown in Table 7.3.

Table 7.3 - Usage Rate Structure Alternatives Pricing Objectives Evaluation

Pricing Objective	Current Structure	Consolidated Tiers	Uniform Rate
Financial Sufficiency	O	o	+
Defensibility	O	o	o
Revenue Stability	O	o	+
Rate Stability	O	o	+
Affordability to Disadvantaged Customers	+	o	-
Minimization of Customer Impacts	+	-	-
Cost of Service Based Allocations	O	o	-

+: Contributes to meeting pricing objective
O: Neutral in meeting pricing objective
-: Detracts from meeting pricing objective

Table 7.3 shows that both the current and uniform rate structures contribute to meeting some of the pricing objectives. However, in many instances the uniform rate structure also detracts from meeting some of the objectives. In general a uniform structure is considered to provide greater financial sufficiency because of the reduced reliance on water sold at the higher tiers, which contributes to increase revenue and rate stability. Alternatively, a uniform structure would have a tremendous impact on WSSC's customers, negatively (significant increases) for small and average customers and positively (significant decreases) for large customers. The current rate structure would have the least impact on customers as all customers would experience the same percentage increase in their bill. The consolidated tiers alternative would be neutral on most objectives but would increase the customer impacts depending on the individual customer's usage.

7.4 Recommendation

Based on our review of the current usage rate structure and consideration of alternative rate structure, we recommend that at this time that the Commission maintain its current rate structure. While the current rate structure is unique and appears complicated, we do not believe that there are compelling reasons to change the structure. We were not able to identify any glaring issues with the current rate structure and nor were alternatives identified that would help to achieve the stated pricing objectives. Changes to the current structure would have significant impacts on WSSC customers. Without compelling reasons to change the structure we don't believe it is in the Commission's best interest to impact its customers just for the sake of trying to be more like other utilities.

8. CUSTOMER IMPACTS

The previous sections of the report identified our recommended rates and fees for the upcoming fiscal year. The increases to usage rates, addition of a reconstruction fee and modification to the AMF will result in varying impacts to WSSC customers' based on meter size and usage patterns. The following section of the report presented the consolidated recommended fees and rates and how the recommended rates will impact varies customers.

8.1 Recommended FY 2015 Rates

Tables 8.1 and 8.2 show the recommended FY 2015 total quarterly fixed charges and usage rates that have been established in the previous sections of this report.

Table 8.1 - FY 2015 - 2019 Fixed Fees (AMF and Reconstruction)

Meter Size / Type	AMF	Reconstruction Fee	Total Quarterly Fixed Fee
5/8"	$16.00	$11.00	$27.00
3/4"	16.00	12.00	28.00
1"	16.00	14.00	30.00
1 1/2" - Residential	16.00	119.00	135.00
1 1/2"	24.00	84.00	108.00
2"	27.00	185.00	212.00
3"	66.00	585.00	651.00
4"	142.00	813.00	955.00
6"	154.00	1,265.00	1,419.00
10"	246.00	4,425.00	4,671.00
Detector Check - 2"	33.00	-	33.00
Detector Check - 4"	177.00	-	177.00
Detector Check - 6"	255.00	-	255.00
Detector Check - 8"	461.00	-	461.00
Detector Check - 10"	633.00	-	633.00
Flow Meter - 4"	182.00	499.00	681.00
Flow Meter - 6"	293.00	616.00	909.00
Flow Meter - 8"	452.00	2,524.00	2,976.00
Flow Meter - 10"	682.00	2,714.00	3,396.00
Flow Meter - 12"	989.00	5,214.00	6,203.00

Table 8.2 - FY 2015 Recommended Usage Rates

Average Daily Consumption (Gallons Per Day)	FY 2015 Usage Rate per 1,000 Gallons
0 – 49	$7.33
50 – 99	8.39
100 – 149	9.54
150 – 199	10.88
200 – 249	12.21
250 – 299	13.22
300 – 349	14.06
350 – 399	14.71
400 – 449	15.14
450 – 499	15.58
500 – 749	15.89
750 – 999	16.25
1,000 - 3,000	16.79
4,000 - 6,999	17.18
7,000 - 8,999	17.41
9,000 & Greater	17.81

The impact of these rates on WSSC's customers will vary based on each customer's level of consumption. MFSG completed a detailed bill tabulation that calculated the additional quarterly cost that the recommended rates will impose on customers of all meter sizes ranging from consumption levels in the 0 - 49 GPD range to the 9,000 & Greater tier. The next section shows a representative summary of that analysis.

8.2 Customer Impacts of FY 2015 Rates

Whenever a water and sewer system changes the rate structure that they use to recover costs there will be impacts (both positive and negative) on the customers of that system. The purpose of this section is to compare which customers are going to experience which impacts as a result of the update to WSSC's rate structure, namely the impact of the updated AMF and the new reconstruction fee.

Table 8.3 shows a sample of the residential customer impact of MFSG's recommended FY 2015 rates.

Table 8.3 - Residential Quarterly Customer Impacts of Recommended Rate Alternative

Meter Size	Quarterly Consumption (gallons)	Current FY 2014 Quarterly Bill	Recommended FY2015 Quarterly Bill	$ Change per Quarter
5/8"	3,000	$32.03	$48.98	$16.95
5/8"	5,000	$51.15	$68.94	$17.79
5/8"	13,000	$129.82	$151.08	$21.26
5/8"	20,000	$244.80	$271.22	$26.42
5/8"	30,000	$414.80	$448.77	$33.97
5/8"	40,000	$590.60	$632.44	$41.84
5/8"	50,000	$361.50	$393.28	$31.78
5/8"	60,000	$431.60	$466.53	$34.93

**Average residential customer highlighted in red*

Table 8.4 shows a sample of the commercial customer impact of MFSG's recommended FY 2015 rates.

Table 8.4 - Commercial Customer Impacts of Recommended Rate Alternative

Meter Size	Quarterly Consumption (gallons)	Current FY 2014 Quarterly Bill	Recommended FY2015 Quarterly Bill	$ Change per Quarter
1 ½"	5,000	$89.45	$169.33	$79.88
1 ½"	10,000	$122.40	$203.73	$81.33
1 ½"	20,000	$300.20	$389.46	$89.26
1 ½"	30,000	$487.30	$584.90	$97.60
1 ½"	40,000	$674.20	$780.03	$105.83
1 ½"	50,000	$704.00	$811.23	$107.23
1 ½"	100,000	$732.00	$840.84	$108.84
1 ½"	250,000	$1,783.50	$1,939.67	$156.17

**Average commercial customer highlighted in red*

Each line of the above table represents a single customer. The first two columns define the customer, meter size and quarterly consumption. The column represents the bill this customer will see each quarter in FY 2014. The average residential customer would experience a quarterly increase in their bill of slightly over $20 per quarter ($7 per month). The average commercial customer would experience an increase of slightly less than $100 per quarter ($33 per month).

9. FINANCIAL FORECAST AND CASH FLOW

The recommended rates and fees developed during this study will assist in ensuring the financial health and stability of the Commission. This section of the report provides a financial projection based on the recommended rates and fees. As mentioned previously, the recommended fees will significantly increase the fixed portion of revenues generated from user charges. This is due to the addition of a fixed reconstruction fee based on the five-year average debt service requirements and the recommended increases in the AMF, also based on a five-year average of expenditures. The use of this approach will result in revenue exceeding expenditures in the initial years and offsetting shortfalls in the latter years. Table 9.1 shows the cash flow for the next five years under the recommended rates as compared to the budgeted revenues included in the affordability guidelines.

Table 9.1 - Projected Cash Flows: MFSG Recommendation (thousands)

	FY 2015	FY 2016	FY 2017	FY 2018	FY 2019
AMF Revenue	$32,136	$33,762	$35,498	$37,327	$39,250
Reconstruction Fee Revenue	36,789	36,789	36,789	36,789	36,789
User Rate Revenue	581,020	619,310	667,741	717,193	761,901
Other Revenues	55,301	45,594	38,889	35,098	35,358
Total Revenue	***$705,245***	***$735,454***	***$778,917***	***$826,406***	***$873,297***
Status Quo 6% Scenario Revenue	$678,591	$721,350	$778,705	$839,563	$901,473
Surplus / (Deficit)	**$26,654**	**$14,104**	**$212**	**($13,157)**	**($28,175)**

Under the MFSG Recommended scenario, over the five year projection period the net surplus that WSSC would retain as cash is slightly less than WSSC's current rate plan but is within 0.1%. WSSC would retain a high level of cash in the early years of the recommended rate scenario due to the five-year averaging of AMF and reconstruction fee.

Another important part of projecting the future health of WSSC's fund balance is calculating the debt coverage on new debt (post FY 2014). Exhibit 9.1 shows graphically the debt coverage calculated for WSSC based on projected revenues under the recommended rate plan and the projected debt based on WSSC's current CIP.

Exhibit 9.1 - Projected Debt Coverage under Recommended Rates

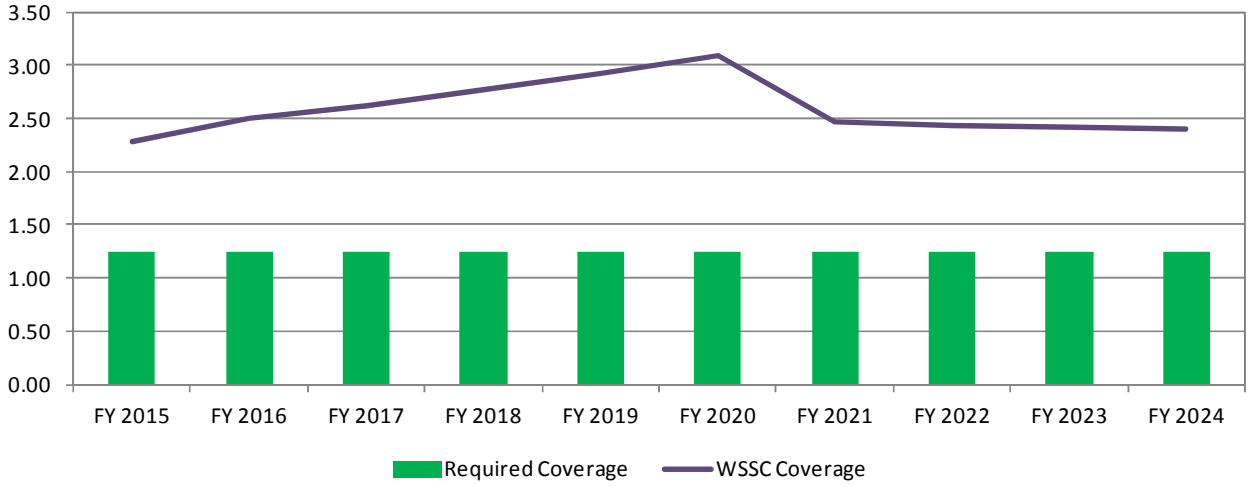


Exhibit 9.1 illustrates that WSSC maintains debt coverage throughout the whole projection period. It should be noted that this calculation assumes increased PAYGO financing of the water and sewer CIPs.