Final Report
June 2011

City of Annapolis
Comprehensive Water and Sewer Rate Study Report

Prepared by

Municipal & Financial Services Group

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Municipal & Financial Services Group

27 June 2011

David Jarrell, P.E.
Director of Public Works
145 Forman St.
Annapolis, MD 21401

Dear Mr. Jarrell:

The Municipal & Financial Service Group is pleased to submit to the City of Annapolis, the attached Comprehensive Water and Sewer Rate Study Report. The document represents the results of our analysis of the cost of providing water and sewer service to the City's customers and our recommendations for how the City should recover these costs. The study should provide a clear path forward for the City to ensure the financial health and stability of the water and sewer systems.

It has been our distinct pleasure to work with and for the City. The assistance provided by the City staff was essential in the completion of the study. The dedication you and other City staff provided 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 City of Annapolis on this study.

Very truly yours,

David Hyder
Project Manager
The Municipal & Financial Services Group

1. 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 and rate study authorized by the City of Annapolis ("the City"). 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 (2012 - 2021). To garner input from key stakeholders during the course of the study, the City formed a Citizen's Advisory Committee (CAC). The CAC was comprised of individuals representing various key stakeholder groups including business owners, City Council members and representatives from the Naval Academy. Three separate meetings were held with the CAC to brief the committee on the study findings and to solicit input. This portion of the report summarizes the findings, conclusions and recommendations developed during the course of the study.

1.1 Findings and Conclusions

The following findings and conclusions were developed during the course of the study.

- Based on projected water sales, the City's current water and sewer rates will not produce adequate revenues to cover the costs of operating and maintaining the water and sewer systems in FY 11 or during subsequent years. There are several reasons for the projected shortfalls, which include the following:
  - The City's Water Fund has been operating at a deficit over the past several years with existing water rates set at a level that has not generated sufficient revenues to cover water system expenses. Water rates have only been increased once in the past 11 years.
  - The City has not raised sewer rates since 1999 and as a result the current sewer rates do not generate sufficient revenues to cover sewer system expenses.
  - Due to aging water and sewer infrastructure the City needs to increase its level of capital investment in the water and sewer system to ensure that the system remain operational and in good condition.
- The City does not currently maintain an operating reserve or a capital repair and replacement reserve for either the Water or Sewer Funds.
  - Historically funds have been borrowed from the General Fund when not available in the Water or Sewer Funds.
- A detailed cost of service analysis revealed that the City's current water and sewer rates do not match the cost of providing service, meaning that there are currently subsidies between classes of customers.
- The current water and sewer rate structures should be modified to better match the pricing goals and objectives of the City, better match customer usage patterns and to conform with industry standards.

1.2 Recommendations

The following recommendations were developed during the course of the water and sewer rate study. The recommendations were presented to the City Staff and Council for consideration and adoption.

- We recommended that the City adopt an operating and maintenance reserve equal to 90 days of the operating budget within the Water and Sewer Funds to serve as a working capital reserve. This will supply the City with a working capital reserve and allow for rate stabilization in unusually wet years or if any other operating anomaly requires additional funds.

- We recommended that the City adopt a repair, renewal and replacement (3R) reserve (a.k.a. Capital Reserve) within the Water and Sewer Funds to accumulate funds to allow for investment in repair and replacement of the aging water and sewer systems. The 3R reserve will allow the City to proactively manage the water and sewer assets.

- During the course of the study a number of rate alternatives were developed to meet the pricing goals and objectives discussed with the City and to better match customer usage patterns. Based on discussions with the City regarding each alternative and our industry expertise, we recommend the rates shown in Tables 1.1 and 1.2.

Table 1.1: Alternative 2 - Fixed Charge

Quarterly Fixed Charge	FY 12	
	Water	Sewer
1" or Less	$9.89	$11.05
1 ½"	$49.43	$55.26
2"	$79.09	$88.42
3"	$158.19	$176.83
4"	$247.17	$276.30
6"	$494.33	$552.61

Table 1.2: Alternative 2 - Usage Rate

	FY 12	
	Water	Sewer
Residential Usage Charges		
0 - 7,000 gallons (per 1,000 gallons)	$3.12	$4.86
7,001 - 20,000 gallons (per 1,000 gallons)	$6.25	
Over - 20,001 gallons (per 1,000 gallons)	$9.37	
Non-Residential* Usage Charges (per 1,000 gallons)	$4.65	
Naval Academy Usage Charges (per 1,000 gallons)		$2.59

**Includes multi-family residential*

- Based on our analysis, the Naval Academy should be charged $4.21 per 1,000 gallon for all meter sewage. Since the usage rates charged to the Academy are set in a formal agreement and must be re-negotiated, it was assumed that this process would take up to 12 months and increased revenue from the Academy should not be included in FY12.

- The City currently imposes capital charges intended to recover the cost of providing water and sewer service to new customers. These charges include capital facility charges (used to fund capacity in the backbone water and sewer system) and connection charges (used to fund the actual cost of connection to the water and sewer systems). Based on our discussions with the City Staff and our review of the current charges, we recommend the following capacity and connection charges be adopted by the City effective in FY12.

Table 1.3 - Proposed Capital Facility Charges

	Water	Sewer
FY12 Proposed Capital Facility Charges	$4,900	$1,600

Table 1.4 - Proposed Water Connection Fees

Meter Size	FY 12 Proposed Connection Fees
1”	$3,600

Table 1.5 - Proposed Sewer Connection Fees

Lateral Pipe Size	FY 12 Proposed Connection Fees
4”	$4,900

- The City should review all capital charges periodically to ensure that the charges are set at the actual cost of providing capacity and connection to the systems.

2. BASIS FOR THE STUDY

2.1 Background

The City provides clean, safe water and sewer service to residents of the City, the United States Naval Academy (sewer only) and a relatively small number of residents located outside the City. The City serves approximately 12,200 water accounts and 11,200 sewer accounts with an estimated population of 38,000 individuals.

The City operates a water distribution system with approximately 135 miles of water lines, storage facilities and a Water Treatment Plant (WTP) that was constructed in 1927. The plant treats groundwater and had an original design capacity of 10 million gallons per day (MGD). The average daily demand and the maximum daily demand of the water system total 3.8 MGD and 6.5 MGD, respectively.

The City's wastewater system includes a collection system with approximately 125 miles of collection lines, 25 sewer lift stations and a Wastewater Treatment Plant (WWTP). The City shares ownership for the treatment plant with Anne Arundel County, which operates the plant. The City's share of the plant capacity is 6.7 MGD.

2.2 Scope of Work

The scope of services set forth in the contract between the City and MFSG specifies several related tasks:

- **Revenue Requirements** - Determine the true cost of providing water and sewer service by developing comprehensive revenue requirements for each system.

- **Cost of Service and Financial Plan** - Perform a cost of service analysis to determine appropriate cost allocations between customer classes, and develop a financial plan for the City to ensure that water and sewer rates, fees and charges provide adequate revenues over the projection period.

- **Rate Design** - Design a water and sewer rate structure that appropriately allocates costs among the City's customers based on the City's goals and objectives, specifically addressing revenue stability and cost of service allocations to each customer class.

- **Customer Impacts** - Document the impact of various rate designs on City customers to assist in development of a recommended rate alternative.

2.3 Assumptions Used in the Study

The following guiding principles were used to guide the cost of service and rate study and were developed with the assistance of the City Staff:

- The water and sewer enterprise funds 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, and the cost of operating and maintaining the sewer system must be supported by the sewer fees and charges collected from sewer customers.

- The City should develop reserves to provide for contingencies and unplanned expenses, to ensure that funds are generated to allow for appropriate system reinvestment.

- The expenses related to operating and maintaining the water and sewer utility should be equitably distributed among the users of the respective systems.

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

Element	FY 12 Assumption
Inflation Rate - Personnel Expenses	0.0% per year
Wastewater Treatment Plant Inflation Rate	4.0% per year
Water Customer Growth Rate	0.0% per year
Water Consumption Growth Rate	(-0.5%) per year
Sewer Customer Growth Rate	0.0% per year
Sewer Consumption Growth Rate	(-0.5%) per year

Further detail regarding inflation factors applied to operating and maintenance expenses can be found in Section 4 of this report.

The study was conducted using the adopted budget for Fiscal Year 2012 (the City 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 (2012 – 2021).

These assumptions were used after discussions with the City's staff, utilizing our experience and the staff's knowledge of its customer base and historical costs.

City staff should monitor the assumptions used in the model over the forecast period. The City should collect, on an annual basis, the following data items so that it can maintain the financial model and facilitate future rate studies.

- Annual number of new customers by meter size.
- Identification and classification of customers by customer class.
- Monitor customer class usage.
- Collect information on performance of water and sewer lines to assist with useful life estimates.

3. USAGE, DEMAND AND CUSTOMER ANALYSIS

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 the City including the number of customers by type and customer usage patterns. The following section provides an overview of this analysis.

3.1 Customer Counts

MFSG analyzed customer data provided by the City's current utility billing system. Due to anomalies in the most recent billing information, data for calendar year 2008 was provided as a base for future year projections. While the City separates customers into 22 separate customer classes, MFSG condensed the classes into three main classes including Single Family Residential, Multi-Family and Non-Residential. The three customer classes were developed to allow for grouping customers with similar usage patterns and to investigate several rate alternatives for different classes. Customers are also separated between Inside City and Outside City customers. The following two tables provide a breakdown of the number of City customers by meter size and location for the Water and Sewer Funds.

Table 3.1: Water Customer Breakdown

Meter Size	Inside City			Outside City			Total
	Residential	Multi-Family	Non-Residential	Residential	Multi-Family	Non-Residential	
5/8"	8,538	269	621	671		63	**10,162**
3/4"	68	6	16	1			**91**
1"	911	62	177	12	1	11	**1,174**
1 1/2"	5	174	114	1	1	8	**303**
2"	1	173	133			21	**328**
3"		23	32		1	3	**59**
4"		19	24			2	**45**
6"		1	5				**6**
Grand Total	**9,523**	**727**	**1,122**	**685**	**3**	**108**	**12,168**

Table 3.2: Sewer Customer Breakdown

Meter Size	Inside City			Outside City	Total
	Residential	Multi-Family	Non-Residential	Non-Residential	
5/8"	8,533	218	578	2	**9,331**
3/4"	68	6	15	-	**89**
1"	910	41	154	-	**1,105**
1 1/2"	5	170	98	-	**273**
2"	1	170	122	2	**295**
3"	-	20	31	1	**52**
4"	-	19	24	-	**43**
6"	-	1	5	-	**6**
Multiple	-	5	-	-	**5**
Grand Total	**9,517**	**650**	**1,027**	**5**	**11,199**

The City also provides sewer service to the U.S. Naval Academy (not included in the previous tables), which is the City's only wholesale sewer customer. The City's Comprehensive Plan, completed in 2009, forecasts a modest increase in the City's population (less than 1% per year) between 2010 and 2015. However, with little to no growth experienced in the past several years within the City, for financial forecasting purposes it was assumed that the City will not experience growth in its customer base over the planning period; therefore, the number of customers was forecasted to remain constant throughout the planning period.

3.2 Consumption Data

To complete the consumption analysis, MFSG relied on consumption data provided by the City for calendar year 2008. Due to inconsistencies in the consumption data in 2009 and 2010, it was deemed that 2008 was most representative of a typical year. In Calendar Year 2008, billed water consumption totaled approximately 1.29 billion gallons. As a customer class, Residential customers used approximately 46% of the total billed consumption. Multi-Family and Non-Residential customers used 26% and 28%, respectively. As the City has seen a slight decrease in consumption over the past several years, an annual decline of -0.5% was used to forecast future consumption levels.

Table 3.3: Analysis of CY08 Water Consumption (1,000 gallons)

	Water Consumption		
	Inside City	**Outside City**	**Total**
Single-Family Residential	571,355	23,952	595,307
Multi-Family	334,907	2,027	336,934
Non-Residential	328,400	29,809	358,209
Total	**1,234,662**	**55,788**	**1,290,450**

Sewer Usage totaled approximately 1.48 billion gallons in CY08, which includes 0.29 billion gallons from the U.S. Naval Academy. Table 3.4 illustrates a breakdown of sewer usage for CY08 by customer class and location.

Table 3.4: Analysis of CY08 Sewer Usage (1,000 gallons)

	Sewer Usage		
	Inside City	**Outside City**	**Total**
Single-Family Residential	555,399		555,399
Multi-Family	334,907		334,907
Non-Residential	302,763	1,964	304,727
US Naval Academy	285,252		285,252
Total	**1,478,321**	**1,964**	**1,480,285**

An annual decline of -0.5% was used to forecast sewer usage over the projected planning period. It is important to note that the City generates the vast majority of its revenues from water and sewer usage charges. In CY08, 90% of revenues were collected from water and sewer usage charges. As a result, the ongoing reduction in water consumption and sewer usage impacts the ability of the City to fund the operations and maintenance of the system. In general, if the City experiences a 0.5% annual reduction in water sales it will experience about a 0.5% drop in revenues.

In addition to examining overall water and sewer usage trends, the water usage patterns for various customer types within the City system were also investigated. Water consumption and 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 City's current water and sewer rates.

Tables 3.5 and 3.6 illustrate the total CY08 water consumption between inside and outside City customers as well as by customer class within the three consolidated classes created for the analysis.

Table 3.5: Tiered CY08 Consumption by Location (in 1,000 gallons)

Usage Blocks		**Water Consumption**	
		Inside City	**Outside City**
Base	Minimum Bill (Includes 5,000 gallons)	211,192	12,521
Tier 1	5,001 – 35,000 gallons Unit Rate per 1,000 gallons	491,309	18,987
Tier 2	Over 35,000 gallons Unit Rate per 1,000 gallons	532,161	24,280
Total		**1,234,662**	**55,788**

Table 3.6: Tiered CY08 Consumption by Customer Class (in 1,000 gallons)

Usage Blocks		**Water Consumption**		
		Residential	**Multi-Family**	**Non-Residential**
Base	Minimum Bill (Includes 5,000 gallons)	188,508	14,251	20,949
Tier 1	5,001 – 35,000 gallons Unit Rate per 1,000 gallons	368,054	67,857	74,399
Tier 2	Over 35,000 gallons Unit Rate per 1,000 gallons	38,745	254,826	262,861
Total		**595,307**	**336,934**	**358,209**

Review of Table 3.6 reveals the following observations:

- Less than 7% of Residential consumption is being charged the Tier 2 peak rate.
- Multi-Family and Non-Residential customers have very similar usage patterns.
- With all customers being charged the same structure, almost 75% of Multi-Family and Non-Residential consumption is being charged the Tier 2 peak rate.
- Residential consumption totals about 45% of the total water consumption in CY08.

Table 3.7 displays the sewer usage separated by location within the block rate structure along with total Naval Academy Consumption, which is billed a flat unit rate. Sewer consumption was not separated by customer class due to the industry guidance(1) that all sewer usage should be charged based on volume and strength rather than by customer class.

Table 3.7: Tiered CY 08 Usage by Location (in 1,000 gallons)

Usage Blocks		**Sewer Usage**	
		Inside City	**Outside City**
Base	Minimum Bill (Includes 5,000 gallons)	208,570	100
Tier 1	5,001 – 35,000 gallons Unit Rate per 1,000 gallons	470,340	543
Tier 2	Over 35,000 gallons Unit Rate per 1,000 gallons	514,159	1,321
Naval Academy Billed Usage		285,252	
Total		**1,478,321**	**1,964**

(1) Clean Water Act of 1972, Section 802b

4. REVENUE REQUIREMENTS

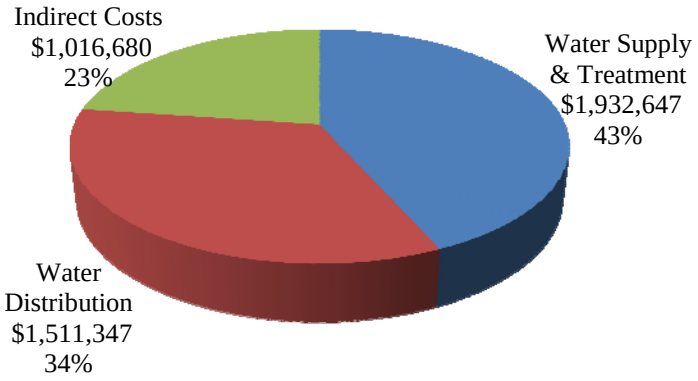
Our approach to developing the water and sewer system revenue requirements (cost of operating and maintaining the systems) included a detailed review of each of the costs incurred by the City (both identified and unidentified) to ensure the true revenue requirements are determined. Unidentified costs are necessary reinvestments in the systems that have not been formally identified by the City. These unidentified costs are necessary capital reinvestments to repair and replace buried infrastructure. 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 the City to provide water and sewer service. The costs are all based on official documents and data provided by the City.

4.1 Operating and Maintenance (O&M) Expenses

The actual O&M expenses for FY 09 and FY 10, the adopted FY 11 expenses and the FY 12 budget were used as the basis for estimating future O&M expenses for the Water and Sewer Funds. The Water Fund day-to-day O&M expenses are budgeted in three major categories including water supply and treatment, water distribution and indirect expenses. Indirect expenses represent expenses incurred by the City while providing support services from the General Fund such as human resources and information technology. Exhibit 4.1 provides a detailed look at the breakdown of the Water O&M expenses in the FY 12 budget.

Exhibit 4.1: FY 12 Water Operating & Maintenance Expenses

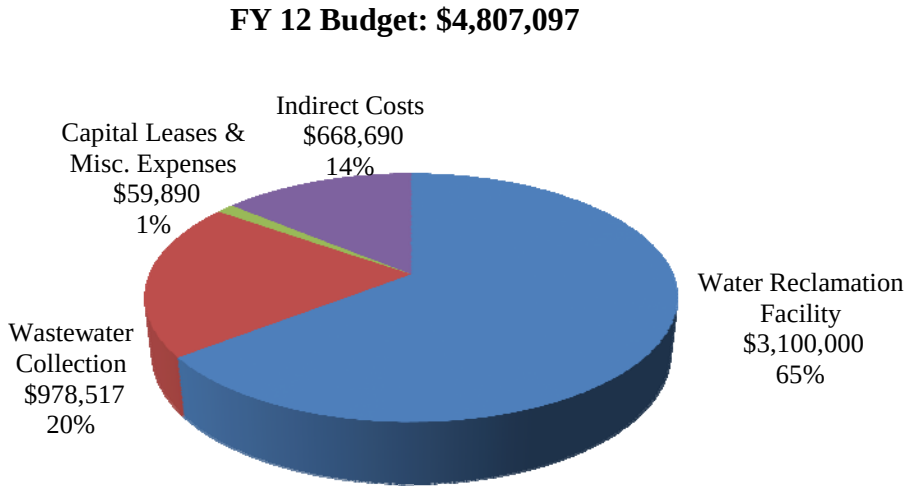
FY 12 Budget: $4,460,674



O&M expenses for the Sewer Fund are budgeted into four main categories including wastewater collection, water reclamation facility, capital leases (vehicles, major equipment, etc.) and miscellaneous expenses and indirect costs.

Exhibit 4.2 on the following page provides a detailed look at the breakdown of the Sewer O&M expenses in the FY 12 budget.

Exhibit 4.2: FY 12 Sewer Operating & Maintenance Expenses



The Water Reclamation Facility portion of the Sewer Fund's O&M expenses consists of just one budgeted line item of Contract Services. This is the payment by the City to the County of its share of the annual costs of the wastewater treatment plant (WWTP).

To project future O&M costs, several inflation factors were used on the specific line items for the City's budget. The Construction Cost Index (CCI), Consumer Product Index (CPI), Producer Price Index (PPI), Municipal Cost Index (MCI), Commodity (Fuel) Energy Index, and a Personnel Expenses inflation rate were used on line items related to each inflation factor. Within the Sewer Fund, contract services performed by the County for the WWTP were inflated by 4% per guidance from County officials. Exhibits 4.3 and 4.4 show the projected O&M expenses for each fund for the entire planning period.

Exhibit 4.3: Projected Water O&M Expenses

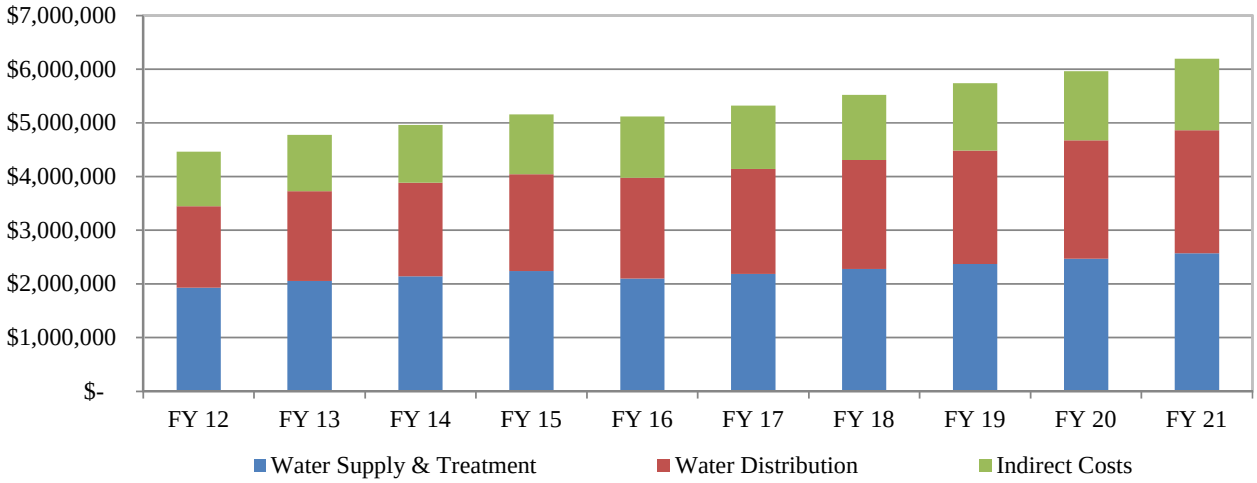
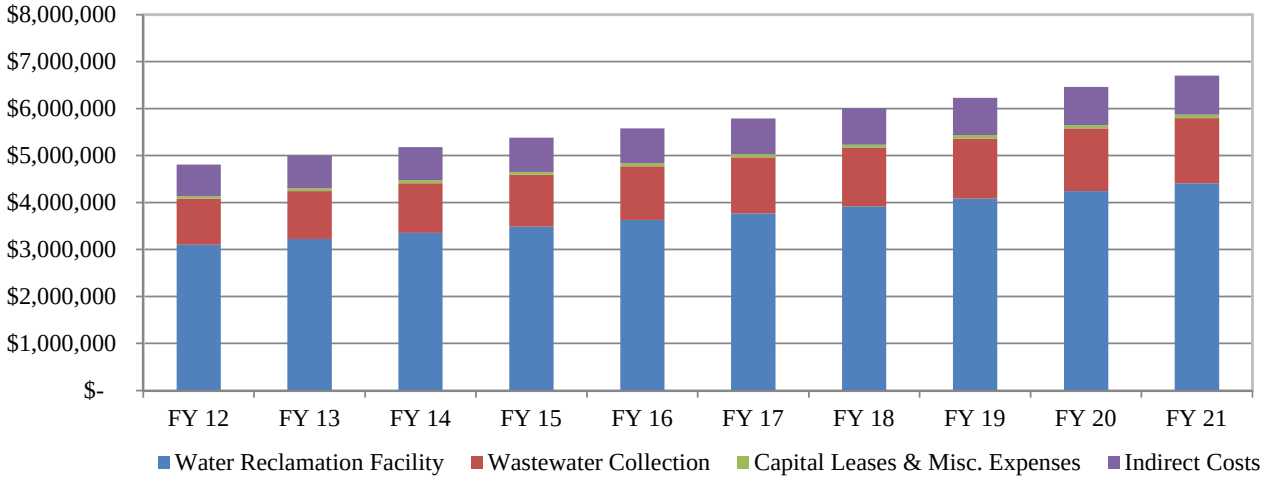


Exhibit 4.4: Projected Sewer O&M Expenses



4.2 Capital Costs

Planned capital costs and existing debt play a large part in the calculation of revenue requirements. The on-going funding of recent capital investments and future requirements has a significant impact 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 most significant upcoming project for the City is the new Water Treatment Plant expected to be built within the next several years. The City could keep rates low initially by not building a new plant 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 City to keep rates stable and lower over time.

4.2.1 Capital Projects

Several funding options for the new WTP were evaluated based on the amount of funding that could be approved through the Maryland Department of Environment (MDE) loans, as well as grants, cash funding and other bonds that would need to be issued to pay for the new plant. Along with the WTP, the City is planning capital projects that include SCADA/RADIO upgrades and annual water distribution system upgrades. Through discussions with City staff, it was recommended the City bond fund projects in early years of the planning period, but eventually to move to cash funding projects in later years. The City's water system has planned capital projects totaling approximately $63 million for the period from FY 12 through FY 17. At this time the City has not developed a plan for capital projects for FY 17 through FY 20. Table 4.1 illustrates the Water Fund's planned capital improvement projects for FY 12 through FY 17.

Table 4.1: Water Fund Capital Improvement Program

(millions)	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17
Water Treatment Plant	$0.62	$11.80	$29.42	$9.25	-	-
SCADA/RADIO Upgrades	$0.17	$0.12	$0.12	-	-	$0.21
Annual Water Dist. System Upgrades	$1.72	$1.88	$1.93	$1.99	$2.05	$2.11
Total	**$2.51**	**$13.80**	**$31.47**	**$11.24**	**$2.05**	**$2.32**

The Sewer Fund has several ongoing projects listed in the capital improvement program. Projects include sewer rehabilitation, SCADA/RADIO upgrades and annual wastewater pump and pump station control upgrades. The City is currently planning to bond fund the CIP projects in the first few years of the planning period, but will eventually move to cash fund CIP projects on an annual basis. The City's sewer system has planned capital projects totaling approximately $16 million for the period from FY 12 through FY 17. At this time the City has not developed a plan for capital projects for FY 17 through FY 20. The following table presents the planned capital projects for the Sewer Fund.

Table 4.2: Sewer Fund Capital Improvement Program

(millions)	FY 12	FY 13	FY 14	FY 15	FY 16	FY 17
Sewer Rehabilitation	$0.95	$2.32	$2.39	$2.46	$2.53	$2.60
SCADA/RADIO Upgrades	$0.24	-	-	-	$0.92	$0.29
Annual Wastewater Pump and Pump Station Control Upgrades	$1.24	$0.33	$0.00	-	-	-
Total	**$2.43**	**$2.65**	**$2.39**	**$2.46**	**$3.45**	**$2.89**

As stated earlier, most capital projects will be bond funded. The following table presents the assumed issue date for each bond and the amount to be funded.

Table 4.3: Bond Funding Schedule

Identifier	Debt Issue	Year Issued	Length	Total Amount	Annual Payment
Water Fund					
(1)	SCADA/Water Dist. System	2012	30 years	$1,919,365	$124,857
(2)	SCADA/Water Dist. System	2013	30 years	$9,104,550	$592,264
(3)	SCADA/Water Dist. System	2018	30 years	$4,222,400	$274,673
(4)	WTP – Bank Loan	2012	10 years	$192,850	$22,608
(5)	WTP – MDE 1st Draw	2013	30 years	$10,300,000	$444,236
(6)	WTP – MDE 2nd Draw	2014	29 years	$26,248,200	$1,161,857
(7)	WTP – MDE 3rd Draw	2015	28 years	$9,251,800	$420,786
Sewer Fund					
(1)	SCADA/Water Dist. System	2012	30 years	$1,919,365	$124,857
(2)	SCADA/Water Dist. System	2013	30 years	$9,104,550	$592,264
(3)	SCADA/Water Dist. System	2018	30 years	$4,222,400	$274,673

Exhibits 4.5 and 4.6 show the resulting principal and interest payments from each of the debt issuances.

Exhibit 4.5: Water Fund Projected Debt Service Payments

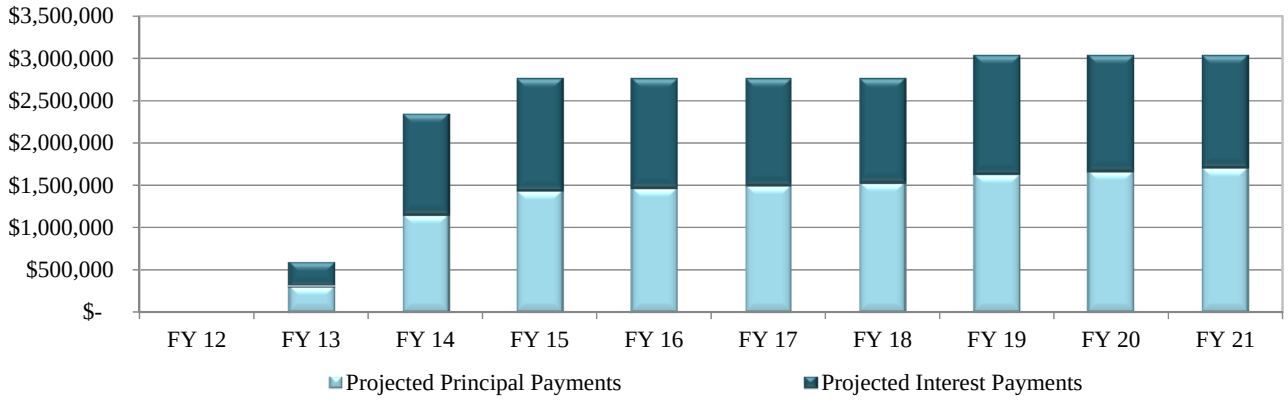
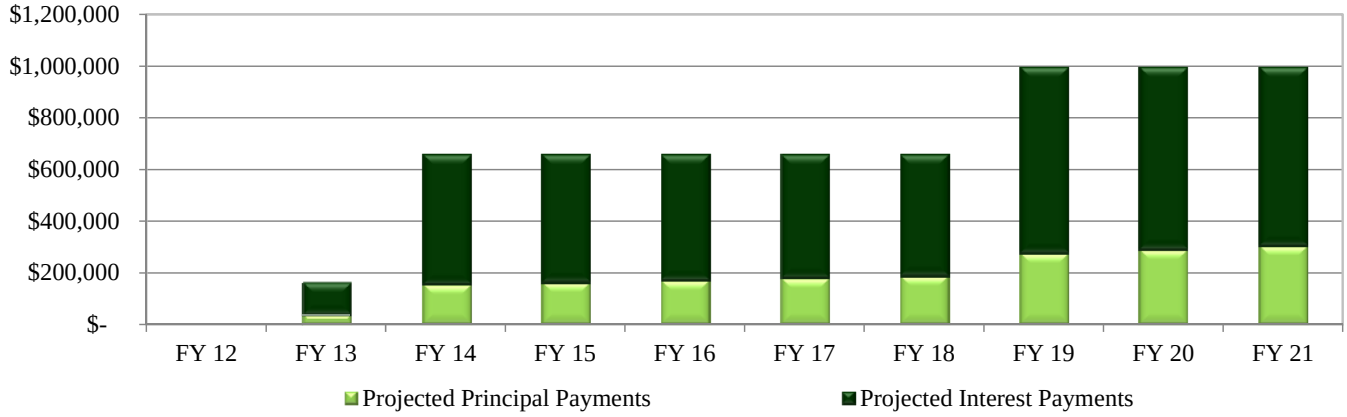


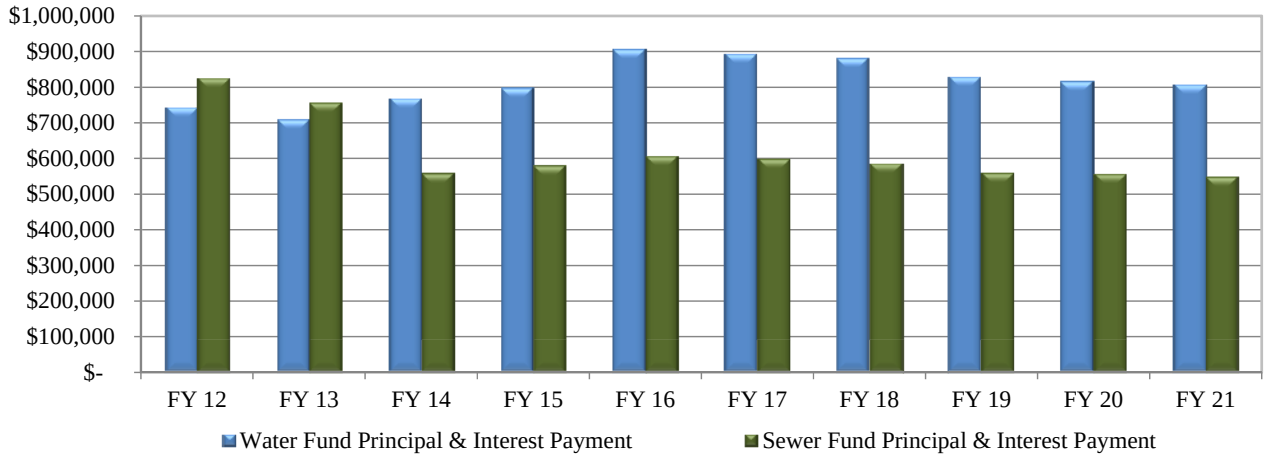
Exhibit 4.6: Sewer Fund Projected Debt Service Payments



4.2.2 Existing Debt

Along with any projected debt the City plans to issue, the City 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 City recently refinanced its debt to consolidate all existing debt payments into one annual payment for each fund. The debt service schedule for each fund is illustrated in Exhibit 4.7.

Exhibit 4.7: Existing Debt Refinanced Payback Schedule



4.3 Reserves

One way to minimize future debt issuances is to build up reserves that can be used to cash fund future capital projects. 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 systems: an Operating and Maintenance ("O&M") Reserve and a Repair, Renewal, and Rehabilitation ("3R") Reserve (a.k.a. Capital Reserve). Each is discussed in the following subsections.

4.3.1 Operating Reserve

An operating reserve is important to provide funds for unplanned minor repairs or fluctuations in the budget. This type of reserve is also valuable during unusually wet 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. Industry practice and our recommended target is maintaining a balance of 90-days of operating expenses. The City currently has no operating reserves in the Water or Sewer Fund. If the operating reserve was to be fully funded for water and sewer it would result in contributing $1.1 million and $1.2 million into each respective fund in FY 12. In order to minimize the impact on rates, a contribution of this size is not recommended in either fund, but should, as a goal, be built up over time to the recommended levels.

4.3.2 Repair, Replacement and Rehabilitation 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 system 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 based on the estimated useful life of each asset. The "3R" contribution is offset by the actual amount of investment planned by the City in its capital improvement program, as shown in Tables 4.1 and 4.2. We recommend that the City take a 30-year rolling average of the calculated annual "3R" Reserve contributions for both the buried and above ground infrastructure to even out rate increases and mitigate rate shock caused by varying annual required reinvestment values. Due to the age of the water and sewer assets, we also recommend a phase-in approach for the contribution to mitigate rate shock even further. The following exhibits present the recommended annual contribution to the 3R Reserve for the Water Fund and the Sewer Fund.

Exhibit 4.8 - Recommended Annual "3R" Reserve Contribution - Water Fund

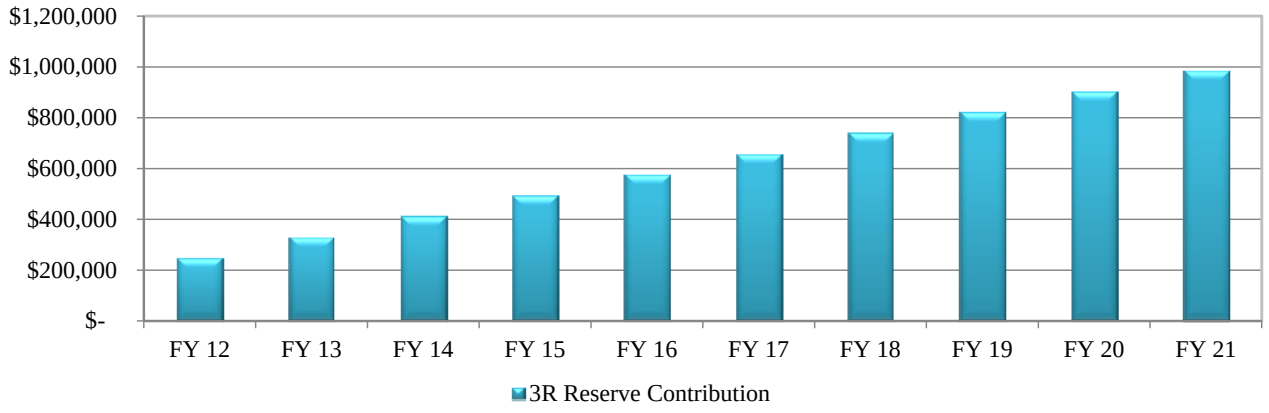
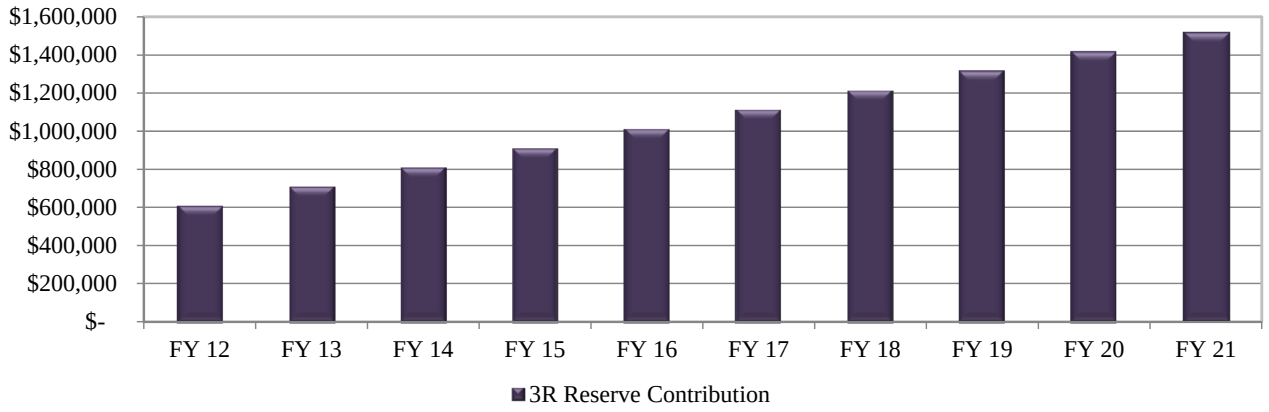


Exhibit 4.9 - Recommended Annual "3R" Reserve Contribution - Sewer Fund



4.4 Revenue Requirements

The revenue requirements (that is, the total cash needed for 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
   "3R" Reserve Contributions

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

Table 4.4 – Water System Revenue Requirements (millions)

	FY 12	FY 13	FY 14	FY 15	FY 16
Operating & Maintenance Expenses	$4.46	$4.78	$4.96	$5.16	$5.12
Total Operating Expenses	*$4.46*	*$4.78*	*$4.96*	*$5.16*	*$5.12*
Cash Funded Capital Projects	-	$0.12	$0.12	-	-
Existing Debt Service Expense	$0.74	$0.71	$0.77	$0.80	$0.91
Projected Debt Service Expense	-	$0.59	$2.35	$2.77	$2.77
The 3R Reserve Contribution	$0.25	$0.33	$0.41	$0.49	$0.57
Total Capital Expenses	*$0.99*	*$1.75*	*$3.64*	*$4.05*	*$4.25*
Total Revenue Requirement	**$5.45**	**$6.53**	**$8.61**	**$9.21**	**$9.37**
Less: Miscellaneous Other Revenues	$0.63	$0.62	$0.59	$0.58	$0.58
Net Revenue Requirement	**$4.82**	**$5.91**	**$8.01**	**$8.63**	**$8.79**
Revenues under Current Rates	$3.81	$3.81	$3.81	$3.81	$3.81
Surplus / (Shortfall)	($1.01)	($2.10)	($4.20)	($4.82)	($4.98)

Table 4.4 demonstrates that the current water rates will not generate sufficient revenue to cover the revenue requirements in FY 12 or during subsequent years. If no increase is made to the current water rate structure, Exhibit 4.10 presents the revenue requirements and the revenues with current rates over the entire planning period.

Exhibit 4.10 - Current Revenues vs. Projected Revenue Requirements

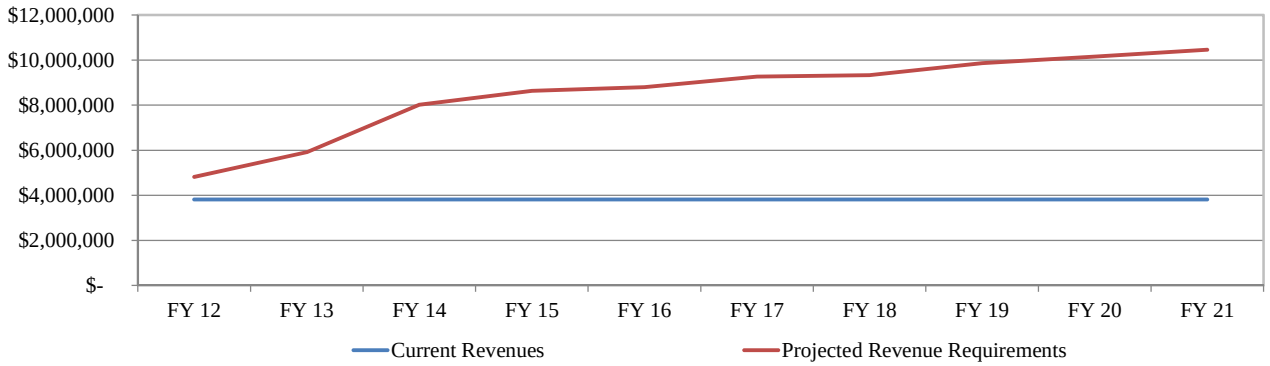


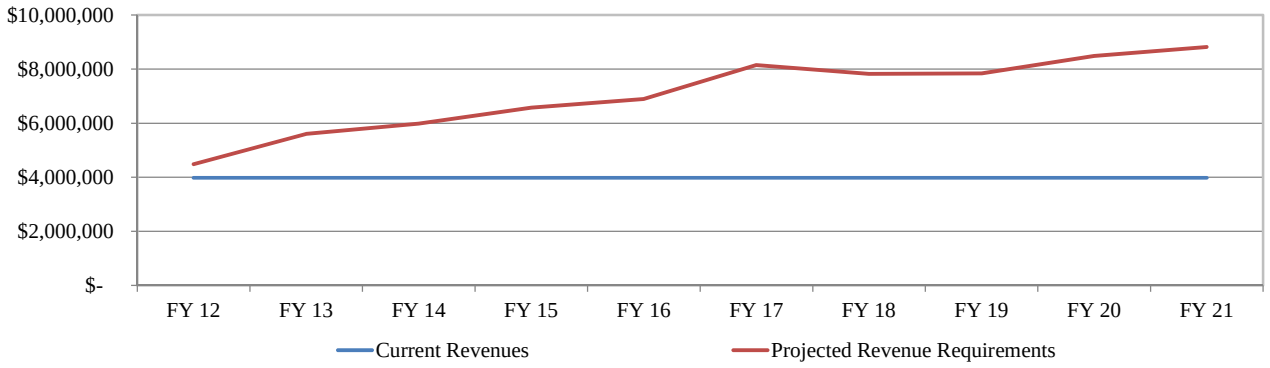
Table 4.5 shows the revenue requirements, miscellaneous (non-user charges) revenue and the net revenue requirement from user rates for the sewer system.

Table 4.5 - Sewer System Revenue Requirements (millions)

	FY 12	FY 13	FY 14	FY 15	FY 16
Operating & Maintenance Expenses	$4.81	$4.99	$5.18	$5.38	$5.58
Total Operating Expenses	*$4.81*	*$4.99*	*$5.18*	*$5.38*	*$5.58*
Cash Funded Capital Projects	-	-	-	-	$0.92
Existing Debt Service Expense	$0.82	$0.76	$0.56	$0.58	$0.61
Projected Debt Service Expense	-	$0.16	$0.66	$0.66	$0.66
3R Reserve Contribution	$0.61	$0.71	$0.81	$0.91	$1.01
Total Capital Expenses	*$1.43*	*$1.62*	*$2.02*	*$2.15*	*$3.19*
Total Revenue Requirement	**$6.24**	**$6.62**	**$7.20**	**$7.52**	**$8.77**
Less: Miscellaneous Other Revenues	$0.63	$0.63	$0.63	$0.63	$0.62
Net Revenue Requirement	**$5.60**	**$5.98**	**$6.57**	**$6.90**	**$8.15**
Revenues under Current Rates	$3.98	$3.98	$3.98	$3.98	$3.98
Surplus / (Shortfall)	($1.62)	($2.00)	($2.59)	($2.92)	($4.17)

Similar to the Water Fund, Table 4.5 demonstrates that the current sewer rates will not generate sufficient revenue to cover the revenue requirements in FY 12 or during subsequent years. Exhibit 4.11 presents the revenue requirements and the revenues with current rates over the entire planning period.

Exhibit 4.11 - Current Revenues vs. Projected Revenue Requirements



5. FINANCIAL PLAN

The development of revenue requirements in the previous section of the report, demonstrates the annual amount of revenue that needs to be generated from rates and fees to ensure that the Water and Sewer Funds are both self-supporting over the projection period. In the past, the Water Fund has been subsidized by the City's General Fund. The current balance owed to the General Fund is $3.82 million, not including an anticipated FY 11 deficit. The following section of the report reviews the required increases in rates necessary to cover the revenue requirements as a proposed financial plan, as well as paying back the General Fund over a three year period.

5.1 Financial Plan

Without corrective action in the form of a rates adjustment, the water and sewer systems will not be self-supporting (revenues will not cover revenue requirements) in FY12, and revenues will not cover expenses during the subsequent years of the projection period. It is the City's goal to immediately address the shortfall and keep subsequent year increases to a minimum. We strongly endorse this goal and agree with the approach of "righting the ship" as soon as possible. In an effort to address the City's desire for small increases after FY12, we have recommended annual increases in the water revenues as shown in Table 5.1.

Table 5.1 - Revenue Adjustments - Financial Plan

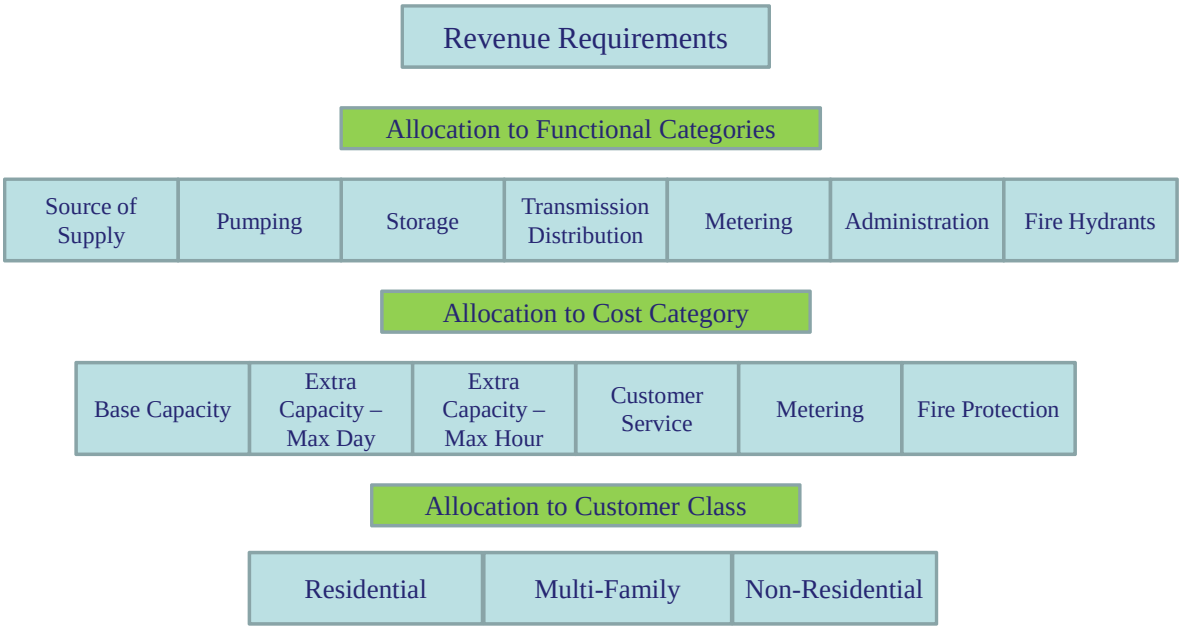
	FY 12	FY 13	FY 14	FY 15	FY 16
Water System Revenue Increase	97%	< 5%	< 5%	< 5%	< 5%
Sewer System Revenue Increase	83%	< 5%	< 5%	< 5%	< 5%

The proposed revenue increases will allow revenues to catch up to expenses in FY12, and to allow small incremental increases over the next four years. We project that additional increases will be required in years FY17 – FY21 based on our forecast of revenue requirements for each fund. However, the magnitude of any required rate increases will be influenced by a number of factors such as the level of capital investment, declining water sales and overall inflation in O&M expenses. With our current forecasted financial plan, operating reserves will be met in the Water Fund by FY21 totaling $1.4 million and operating reserves will be met in the Sewer Fund by FY13 totaling $1.3 million.

6. WATER AND SEWER COST OF SERVICE ANALYSIS

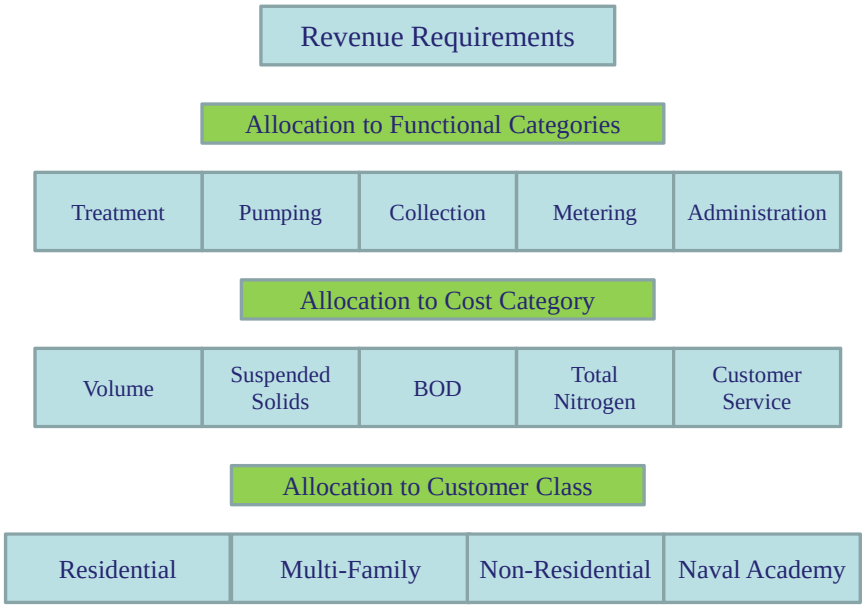
Once the water and sewer system revenue requirements are established and a financial plan has been developed, the next step is to allocate the costs of the system to the current users. The basic methodology for conducting water and sewer cost of service analysis involves a two-step process. The first step is allocating the revenue requirements to functional areas of operations (water treatment, storage, etc.) and the second step is the allocation of the functionalized revenue requirements to each customer class based on water usage patterns and wastewater volume and strength. The water cost allocation approach is the recommended "base extra-capacity" method as outlined in the American Water Works Association Manual M1. A similar methodology was used for the sewer cost allocation although the functional categories are based on volume and strength of wastewater. Exhibits 6.1 and 6.2 illustrate the flow of revenue requirements to each customer class for the Water and Sewer Funds.

Exhibit 6.1 – Water Fund Cost of Service Allocation Flow Chart



As shown in Exhibit 6.1, water costs were first broken down into seven functional categories and those categories were allocated to Base Capacity, Extra-Capacity, Customer and Meter Services, and Fire Protection. Extra-Capacity Service was defined by both Maximum-Day and Maximum-Hour criteria. Capital expenses included in the user rate revenue requirement were allocated to each of the listed functional categories by use of the rate base. The rate base is a ratio calculated using the asset values for each of the functional categories of the existing water system which represents the total capital investment in each functional category. Exhibit 6.2 illustrates the cost of service allocation methodology for the Sewer Fund.

Exhibit 6.2 – Sewer Fund Cost of Service Flow Chart



Sewer operating expenses were broken down into four major operational categories: sewage treatment, pumping, collection, metering and administration. These line items were further allocated into functional categories of Volume, Pollutant Loading, and Customer Services. The pollutant loading includes Biological Oxygen Demand (BOD), Total Suspended Solids (TSS) and Nitrogen (TKN). Capital Expenses included in the user rate revenue requirement were allocated to each of the listed functional categories by use of the rate base.

6.1 Allocation to Customer Classes

The water and sewer systems' functionalized revenue requirements will be allocated to their respective customer classes, including Single Family Residential, Multi-Family and Non-Residential for water, and Single Family Residential, Multi-Family, Non-Residential and Naval Academy for sewer.

The allocation of functionalized revenue requirements to each of the customer classes for the water system is based upon operating characteristics provided by staff. The various components of the water system are designed based primarily on system demand factors including average daily consumption, maximum day consumption, and maximum hour consumption. The City staff provided average daily use and maximum day use. Industry standard figures(2) were used for maximum hour use. Table 6.1 illustrates the peaking factors used for the water cost of service.

(2) AWWA, Principles of Water Rates, Fees, and Charges M1, 5th Edition, 2000

Table 6.1- Customer Class Peaking Factors

	Maximum Day (% of Average Day)	Maximum Hour (% of Average Day)
Single Family Residential	200%	320%
Multi-Family	175%	310%
Non-Residential	150%	275%

The allocation of functionalized revenue requirements to each of the customer classes for the sewer systems is based on the volume and strength of sewerage generated by each class of customer. The sewer system is designed to meet the design requirements of two characteristics: hydraulic loading (volume) and pollutant loading (BOD, TSS and TKN). Average daily usage is based on an average of the actual annual usage plus an infiltration and inflow factor. In the sewer system cost of service analysis, all customer classes discharging into the City's sewer system were assumed to discharge sewerage of "average" strength. The City provided sampling data from various customer classes and all samples were within the average strength of sewerage for a standard residential customer.(3) The pollutant loadings were assumed to be the same for all customer classes.

6.2 Cost of Service Results

Total costs allocated to be recovered by each customer class from projected revenues under the existing rate structure are shown in Table 6.2. The water cost of service analysis results shown below are based on the functionalized revenue requirements and customer class allocation factors discussed above.

Table 6.2- Water Cost of Service Results as a % of Required Collected Revenues

	FY 12 Estimated Cost of Service	Calculated Cost of Service	Indicated Percentage Change Required
Single Family Residential	$2,900,000	$3,700,000	10.0%
Multi-Family	$2,200,000	$1,900,000	-3.0%
Non-Residential	$2,400,000	$1,900,000	-7.0%
Total	**$7,500,000**	**$7,500,000**	

Table 6.2 shows that under the current rates the City is collecting more revenue from multi-family and non-residential customers than should be based on the calculated cost of service. Conversely, the City is not collecting enough from single family residential customers.

The sewer cost of service analysis results shown in Table 6.3 are based on the functionalized revenue requirements and customer class allocation factors discussed previously.

(3) Metcalf & Eddy, Inc., Wastewater Engineering, Maple Press Company, 1972

Table 6.3- Sewer Cost of Service Results as a % of Required Collected Revenue

	FY 12 Estimated Cost of Service	Calculated Cost of Service	Indicated Percentage Change Required
Single Family Residential	$2,700,000	$3,200,000	6.8%
Multi-Family	$2,000,000	$1,500,000	-7.2%
Non-Residential	$1,800,000	$1,400,000	-6.0%
Naval Academy	$700,000	$1,200,000	6.4%
Total	**$7,300,000**	**$7,300,000**	

Table 6.3 demonstrates similar results for the sewer cost of service analysis as the water analysis. Under the current rates, the City is collecting more revenue from multi-family and non-residential customers than should be recovered based on the calculated cost of service. The City is not collecting enough revenue from single family residential customers and the Naval Academy.

7. RATE STRUCTURE ANALYSIS

The cost of providing water and sewer service to the customers of the City has been established in the previous sections of this report. The analysis demonstrates that the City will need to increase revenues to ensure the financial health and stability of the Water and Sewer Funds, and that the allocation of costs should be adjusted among customers classes to match cost of service. The following section of the report reviews how the increased revenues are recovered from customers by examining the current and alternative rate structures.

7.1 Current Rate Structure

The current water and sewer rate structures include a fixed minimum bill that includes 5,000 gallons of metered water, and a two-tiered usage rate per 1,000 gallons of metered water above the minimum. Tier 1 includes usage from 5,001 to 35,000 gallons and tier 2 is all usage above 35,000 gallons. The current structure collects approximately 11% of water and sewer revenues from the fixed portion (minimum bill) of the rate structure. The City provides service to customers outside its corporate limits and those customers are currently charged a differential rate under the same structure as inside City customers. The current differential between inside-City and outside-City customers was established several years ago and is based on policy set by the City Council. MFSG did not complete an analysis to validate the current differential since it was developed as a Council policy to initiate an incentive to annexation of the serviced areas outside the City. The City also provides sewer service to the Naval Academy at a unit rate that was established through negotiations with the Naval Academy several years ago. Table 7.1 presents the current water and sewer rate structures.

Table 7.1 – FY11 Current Rate Structure

	Current FY11	
	Water	**Sewer**
0 – 5,000 gallons (Quarterly Minimum Bill)	$15.60	$18.19
5,001 – 35,000 gallons - Unit Rate per 1,000 gallons	$2.42	$2.82
Over 35,001 gallons - Unit Rate per 1,000 gallons	$2.82	$3.29
Naval Academy Usage Charges (per 1,000 gallons)		$2.59

7.2 Rate Alternatives

The following section of the report discusses the key policy goals and objectives related to pricing water and sewer service, and the development of several alternative rate structures designed to address the pricing goals and objectives.

7.2.1 Pricing Goals and Objectives

To examine alternative rate structures, it is necessary to determine the principal pricing goals and objectives for the structure. Based on our industry experience, there are a number of common goals and objectives related to the pricing of water service.

The most common considerations include the following:

- Cost of Service Recovery
- Revenue Stability
- Ease of Updating
- Water Conservation
- Economic Development
- Equitably Cost Allocation
- Minimizing Customer Impacts
- Affordability
- Rate Stability
- Ease of Understanding
- Ease of Implementation
- Legality

Each of the pricing goals and objectives were viewed in light of the City's overall strategies. While all of the objectives mentioned above are deemed important, there are several objectives that were identified to be most important for the study.

- *Cost of Service Recovery* - The rate structures must provide the revenues needed to operate the system, provide for capital needs and meet the financial targets for long-term financial health and stability.

- *Affordability* - The direct impact to City customers should be minimized as continued water usage is critical for the continued health and stability of the water system and sewer system.

- *Revenue Stability* - To assist in the financial stability within the Water and Sewer Funds, the rate structure should provide a reasonable amount of revenue stability.

There are a number of ways to address the key pricing goals and objectives mentioned above. The first objective, cost of service recovery, is best accomplished by ensuring that the rates are set at a level that fully recovers the cost of providing water and sewer service. While this can be accomplished with any rate structure, the cost of service recovery will be closely related to revenue stability. It is important to assess the likelihood that the rate structure will generate the anticipated revenues. If the rate structure collects a significant amount of revenue from peak rates, which fluctuate with factors such as weather and discretionary water use, the likelihood of collecting the revenues may be threatened.

The second objective, affordability, can typically be accomplished by ensuring that some quantity of non-discretionary water is provided at a reasonably low cost. However, it should be noted that in order to address the significant shortfalls in the Water and Sewer Funds, the City needs to increase revenues by raising the rates. As a result, in this instance, minimizing overall customer impacts is difficult. The rate structures considered in the study continue to provide some quantity of non-discretionary water at a low cost but will result in bill increases which are necessary to bring revenues in line with expenses.

The pricing objective related to revenue stability can be addressed in a number of ways. The most common approach is to increase the fixed portion of the water and sewer bill. The more significant the fixed portion of the bill, the more guaranteed revenue is generated from the water rates. However, it is necessary for there to be a clear cost basis for the fixed portion of the bill (the fixed portion should recover fixed costs incurred by the utility). Typical costs included in a fixed charge include, but are not limited to: customer service costs, billing and meter reading, administrative costs

and meter maintenance. Another consideration related to the fixed portion of the bill is the basis that would be used to impose the fixed portion of the bill. The City currently charges the minimum bill (fixed portion) on a per account basis. Alternatively, it is fairly common to impose fixed charges based on meter size. The size of a customer's meter represents the potential demand that they can place on the water system (i.e. a residential 5/8" meter can demand a relatively small amount of water from the system, where as a 6" meter can demand significantly more water). As a result it costs more to maintain the water supply for a larger meter and it also costs significantly more to replace and maintain a larger meter. The basis selected should be consistent with the costs recovered in the fixed charge. If meter maintenance costs, capital costs and/or general system maintenance costs are added to the fixed charge, then the charge should be applied by meter size.

7.2.2 Alternative Rate Structures

After discussions with the City Staff and in light of the pricing goals and objectives, four rate structure alternatives were developed. Each alternative will produce the same amount of revenue based on the financial plan for the water and sewer systems shown in Tables 5.1. Although outside City customers are charged a higher rate based on a specific differential, only inside City rates are shown for each of the alternatives for simplicity.

Alternative 1 (Current Rate Structure) - The current rate structure is increased to produce 97% more revenue in the Water Fund and 83% more revenue in the Sewer Fund in FY 12, while keeping the minimum charge constant, as to lessen the effect on the small user.

Table 7.2 – Alternative 1 - Water and Sewer Rates

	Water Rates		Sewer Rates	
	Current FY 11	**Proposed FY 12**	**Current FY 11**	**Proposed FY 12**
0 – 5,000 gallons (Quarterly Minimum Bill)	$15.60	$15.60	$18.19	$18.19
5,001 – 35,000 gallons Unit Rate per 1,000 gallons	$2.42	$5.32	$2.82	$5.33
Over 35,001 gallons Unit Rate per 1,000 gallons	$2.82	$6.20	$3.29	$6.22
Naval Academy Usage Charges (per 1,000 gallons)			$2.59	$2.59

Table 7.2 shows the Naval Academy rate remaining the same in FY12. This is due to the fact that the City will need to negotiate the sewer rate with the Naval Academy and it is anticipated that this process may take up to 12 months. However, based on our analysis, the Naval Academy should be charged $4.21 per 1,000 gallon for all meter sewage. It should be noted that this represents our best estimate of the actual cost of providing sewer service to the Naval Academy. Lastly, due to the time requirement for negotiations it was assumed that there will not be additional revenues from the Academy in FY12.

The current rate structure provides fixed revenue in the form of a minimum bill and charges customers a unit rate for all metered water used in a two-tiered structure above the minimum charge.

There are several shortcomings related to the current structure for the City including:

- Charging all customers based on the same structure does not take into account the differences in cost of service among the customers.
- The tiers in the current rate structure charge more than 75% of the usage by Multi-Family and Non-Residential customers at the peak rate.
- Less than 7% of consumption by residential customers falls into the top tier (over 35,000 gallons).
- Charging different sewer usage at different rates does not conform to industry standards.
- The current minimum bill does not account for potential demand on the water and sewer system.

To address several of the shortcomings, three alternatives were developed. Alternatives 2 through 4 replace the minimum bill with a fixed charge based on meter size. No usage will be included in the fixed charge and it will recover 10% of total revenues for the Water and Sewer Funds. The meter size differentials are based on equivalent dwelling units (EDU) provided by the AWWA M1 Manual. Table 7.3 illustrates the current minimum bill and the proposed fixed charges by meter size for alternatives 2 through 4.

Table 7.3 – Minimum Bill per Account vs. Fixed Charge by Meter Size

Meter Size	EDU	Water Rates		Sewer Rates	
		Current Minimum Bill FY 11	Proposed Fixed Charge FY 12	Current Minimum Bill FY 11	Proposed Fixed Charge FY 12
1" or Less	1.0	$15.60	$9.89	$18.19	$11.05
1 ½"	5.0	$15.60	$49.43	$18.19	$55.26
2"	8.0	$15.60	$79.09	$18.19	$88.42
3"	16.0	$15.60	$158.19	$18.19	$176.83
4"	25.0	$15.60	$247.17	$18.19	$276.30
6"	50.0	$15.60	$494.33	$18.19	$552.61

Alternative 2 – Includes a 3-tier residential block rate water structure, along with a uniform non-residential (including multi-family) water unit rate and a uniform sewer rate for all customers excluding the Naval Academy.

This alternative is an improvement on the current rate structure, as it applies the cost of service results to revenues required from residential vs. non-residential (including multi-family) customers. By changing the tiered levels for residential usage, it also allows for a more equitable approach to collecting revenues. The three-tiered structure for Residential customers was designed to charge 40% of consumption at tier 1, 40% at tier 2, and the final 20% at the tier 3 rate. All of the sewer alternatives have the same unit rate sewer rate structure applied, which is currently the most common and most defensible structure for sewer charges.

Table 7.4 – Alternative 2 - Water and Sewer Rates

	Proposed Rates FY 12	
	Water	**Sewer**
Quarterly Fixed Charge per EDU (no usage included)*	$9.89	$11.05
Residential Usage Charges		
0 - 7,000 gallons (per 1,000 gallons)	$3.12	$4.86
7,001 - 20,000 gallons (per 1,000 gallons)	$6.25	
Over - 20,001 gallons (per 1,000 gallons)	$9.37	
Non-Residential Usage Charges (per 1,000 gallons)	$4.65	
Naval Academy Usage Charges (per 1,000 gallons)		$2.59

**Quarterly Charge shown for a 1" meter size or less.*

Alternative 3 – Includes a two-tiered residential block rate water structure, along with a uniform non-residential water unit rate and a uniform sewer rate for all customers excluding the Naval Academy.

The two-tiered structure was designed to provide 125% of the average usage in the first block and charge a peak rate to all usage above the average. The cost of service percentages regarding collected revenues were applied to the rate structure and this alternative includes the uniform unit rate for all sewer usage.

Table 7.5 – Alternative 3 - Water and Sewer Rates

	Proposed Rates FY 12	
	Water	**Sewer**
Quarterly Fixed Charge per EDU (no usage included)*	$9.89	$11.05
Residential Usage Charges		
0 - 7,000 gallons (per 1,000 gallons)	$3.84	$4.86
7,001 - 20,000 gallons (per 1,000 gallons)	$11.51	
Non-Residential Usage Charges (per 1,000 gallons)	$4.65	
Naval Academy Usage Charges (per 1,000 gallons)		$2.59

**Quarterly Charge shown for a 1" meter size or less.*

Alternative 4 – Includes a modified three-tiered residential block rate water structure similar to alternative 2, as well as a modified three-tiered block rate for non-residential customers. Alternative 4 also includes uniform sewer rate for all customers excluding the Naval Academy.

The additional three-tiered structure for non-Residential customers was designed to charge 40% of consumption at tier 1, 40% at tier 2, and the final 20% at the tier 3 rate. The cost of service

percentages regarding collected revenues were applied to the rate structure and this alternative includes the uniform unit rate for all sewer usage.

Table 7.6 – Alternative 4 - Water and Sewer Rates

	Proposed Rates FY 12	
	Water	**Sewer**
Quarterly Fixed Charge per EDU (no usage included)	$9.89	$11.05
Residential Usage Charges		
0 - 7,000 gallons (per 1,000 gallons)	$3.12	$4.86
7,001 - 20,000 gallons (per 1,000 gallons)	$6.25	
Over - 20,001 gallons (per 1,000 gallons)	$9.37	
Non-Residential Usage Charges		
0 - 65,000 gallons (per 1,000 gallons)	$2.57	
65,001 - 315,000 gallons (per 1,000 gallons)	$5.14	
Over 315,000 gallons (per 1,000 gallons)	$7.71	
Naval Academy Usage Charges (per 1,000 gallons)		$2.59

**Quarterly Charge shown for a 1" meter size or less.*

The following tables present the current bill (under FY 11 rates) and the bills for FY 12 under each of the alternatives.

Table 7.7 – Sample Quarterly Combined Water and Sewer Bills (Residential)

Usage (gallons)*	**% of Customers In usage block shown:**	**Current Bill FY 11**	**Proposed Rates FY 12**							
			Alt. 1	**$ Increase**	**Alt. 2**	**$ Increase**	**Alt. 3**	**$ Increase**	**Alt. 4**	**$ Increase**
0 - 3,000	6.7%	$33.79	$33.79	$ -	$44.87	$11.08	$47.01	$13.22	$44.87	$11.08
3,001 - 6,000	12.8%	$39.03	$44.44	$5.41	$68.81	$29.78	$73.09	$34.06	$68.81	$29.78
6,001 - 9,000	15.9%	$54.75	$76.39	$21.64	$98.99	$44.24	$99.16	$44.41	$98.99	$44.24
9,001 - 12,000	15.8%	$70.47	$108.34	$37.87	$132.29	$61.82	$125.24	$54.77	$132.29	$61.82
12,001 - 15,000	13.1%	$86.19	$140.29	$54.10	$165.60	$79.41	$151.32	$65.13	$165.60	$79.41
15,001 - 22,000	18.1%	$122.87	$214.84	$91.97	$249.55	$126.68	$242.85	$119.98	$249.55	$126.68
(Over 22,001) 50,000	17.6%	$282.64	$539.56	$256.92	$647.83	$365.19	$701.04	$418.40	$647.83	$365.19

**Assumed Usage Billed Shown in Red*

Table 7.8 – Sample Quarterly Combined Water and Sewer Bills (Multi-Family and Non-Residential)

Usage (gallons)*	% of Customers in usage block shown:	Current Bill FY 11	Proposed Rates FY 12							
			Alt. 1	$ Increase	Alt. 2	$ Increase	Alt. 3	$ Increase	Alt. 4	$ Increase
0 – 3,000	11.7%	$33.79	$33.79	$-	$49.44	$15.65	$49.44	$15.65	$43.21	$9.42
3,001 – 8,000	16.1%	$49.51	$65.74	$16.23	$96.96	$47.45	$96.96	$47.45	$80.33	$30.82
8,001 – 15,000	14.6%	$86.19	$140.29	$54.10	$163.47	$77.28	$163.47	$77.28	$132.30	$46.11
15,001 – 36,000	18.5%	$197.10	$365.71	$168.61	$363.03	$165.93	$363.03	$165.93	$288.22	$91.12
36,001 – 63,000	10.3%	$362.07	$700.98	$338.91	$703.33	$341.26	$703.33	$341.26	$572.42	$210.35
63,001 – 100,000	8.0%	$588.14	$1,160.44	$572.30	$1,117.73	$529.59	$1,117.73	$529.59	$999.84	$411.70
(Over 100,001) 1,000,000	20.7%	$6,087.14	$12,336.34	$6,249.20	$9,837.53	$3,750.39	$9,837.53	$3,750.39	$11,920.65	$5,833.51

**Assumed Usage Billed Shown in Red*

7.2.3 Recommended Rate Structure

Based on the discussions with the City Staff and Citizen Advisory Committee members, and review of the rate structures in light of the goals and objectives, we recommend that the City adopt the Alternative 2 rate structure for the water and sewer systems with rates effective in FY12. The Alternative 2 structure is recommended for a number of reasons. It meets all of the previously stated objectives along with the following points:

- Collects 10% of water and sewer revenues in the fixed charges which will assist in keeping revenue stability within the Water and Sewer Funds.
- Imposes the fixed charge based on meter size which better matches the true cost of providing water and sewer service to larger sized meters.
- Changes tiers to charge appropriate portion of consumption in each tier.
- Creates a more defensible sewer structure by charging all customers a flat rate for sewer usage.

8. CAPITAL CHARGES

Capital charges are collected from new water and sewer customers when they connect to the water and sewer system. The City currently imposes a capital facility charge and a connection charge when a new customer joins the water and sewer system. As part of the rate study, MFSG reviewed the current capital charges to determine if they represent the true cost incurred by the City, while providing water and sewer service to new customers.

8.1 Capital Facility Charges

The City currently charges a capital facility charge to new customers which consists of a one-time initial fee, along with a recurring charge collected over a 30-year period tied to the property. These charges are imposed to recover the capital costs of providing water and sewer system capacity. The charges recover investments made by the City in the backbone facilities such as treatment plants, storage facilities, pump stations and distribution and collection systems. The capital facility charge does not recover the cost of the actual connection to the water and sewer system (items such as the meter, lateral, meter vault, etc.). Table 8.1 presents the current capital facility charges for water and sewer service.

Table 8.1 - Capital Facility Charges

Type	Water	Sewer
Capital Charge Per Residential Unit	$900	$1,800
30-year annual charge per Residential Unit	$100	

*1 Residential Unit = 250 gallons of usage per day

The current method used by the City to collect a portion of the capital facility charges over a 30-year period is not the standard approach used by most utilities around the country. Most utilities collect the entire capital facility charge at time of building permit issuance or at some point prior to connection to the system.

The current capital facility charge was analyzed to ensure that charges were recovering the cost of providing water and sewer service to new customers. While there are a variety of methods of calculating capital facility charges to serve a customer in a water and sewer system, most methods of calculating these fees fall into two broad categories:

- *Buy-in capacity* calculation is tied to the historical cost of the system. The buy-in capacity method is appropriate for utilities that have capacity to sell and don't plan to expand the current capacity in the planned capital improvements program.

- *Average cost of capacity* calculations are often used in a utility, which is approaching its capacity or is replacing major components of the existing infrastructure, reflecting the situation that new customers are being served by the latest additions to the utility's infrastructure.

The goal of each approach is to price the capacity in the water and sewer systems based on the actual costs of constructing the capacity.

The capital facility charges for the water and sewer system were calculated using each of these methods. The average cost method was deemed most appropriate for the water system due to the planned replacement of the water treatment plant which represents the current cost of constructing water treatment capacity. The buy-in method was selected as the sewer system's calculation for the capital facility charge since the City is not expanding or replacing significant portions of the sewer system. To determine the historical cost, MFSG used the book value of the sewer system less depreciation and brought this value up to current dollar values using the Engineers News Record (ENR) construction cost index. The following exhibits present the methodology used to calculate each charge and the resulting calculated charges for the water and sewer system.

Exhibit 8.1 - Capital Facility Charge Methodology

Buy-In Method Capital Cost per EDU

$$\frac{\text{Replacement Costs less Net Depreciation (RCLND)}}{\text{Existing Capacity}} * \text{gpd/EDU}$$

Average Cost of Capacity Capital Cost per EDU

$$\frac{\text{RCLND + Cost of Planned Improvements}}{\text{Capacity Available}} * \text{gpd/EDU}$$

Exhibit 8.2 - Capital Facility Charge Calculations

Calculated Water Capacity Fee: Average Cost Method

$$\frac{\$115,467,226}{5.9 \text{ mgd}} * 250 \text{ gpd/EDU} = \$4,900/\text{EDU (rounded)}$$

Calculated Sewer Capacity Fee: Buy-In Method

$$\frac{\$41,923,931}{6.7 \text{ mgd}} * 250 \text{ gpd/EDU} = \$1,600/\text{EDU (rounded)}$$

The capital facility charges calculated are slightly higher than those currently imposed by the City. The proposed capital facility charges and the current charges are shown in Table 8.2.

Table 8.2 - Capital Facility Charges

Type	FY 11 Current Capital Facility Charges	FY 12 Proposed Capital Facility Charges
Water	$900	$4,900
Sewer	$1,800	$1,600
30 - Year Portion	$100 x 30 years = $3,000	
Total	**$5,700**	**$6,500**

We recommend that the City adopt the proposed capital facility charges for FY12. We also recommend that the charges be collected all at one time rather than over a 30-year period. If the City continues to allow for a payment over 30-years the portion of the charge that is payable over time should include a factor for inflation.

8.2 Connection Charges

The cost of connecting a new water and/or sewer customer to the City's infrastructure is recovered in connection charges imposed by the City. The connection charges are based on the actual cost of connection including such items as the meter, meter vault, lateral, labor and other miscellaneous supplies and materials. The City currently provides water connections for 1" meters and sewer laterals 4" in size. Customers requiring larger connections are required to hire a certified contractor to make the connection and the customer is responsible for all costs related to the connection. To evaluate the current connection charges, MFSG requested that the City provide an itemized listing of the actual cost of providing a water and sewer connection. The current and proposed connection charges are shown in Tables 8.3 and 8.4.

Table 8.3 - Water Connection Charges

Meter Size	Equivalent	FY 11 Current Connection Charges	FY 12 Proposed Connection Fees
1"	1.23	$2,700	$3,600

Table 8.4 - Sewer Connection Charges

Lateral Pipe Size	Equivalent	FY 11 Current Connection Charges	FY 12 Proposed Connection Fees
4"	1.00	$2,800	$4,900

Table 8.5 provides an example of the overall capital charges for the proposed charges compared to the current charges imposed by the City. The table assumes a residential customer with a 1" water meter and 6" sewer lateral connecting to the water and sewer systems.

Table 8.5 - Water and Sewer Capital Charge Comparison

Charge	Residential Customer	
	Current	**Proposed**
Water Capital Facility Charge	$900	$4,900
Sewer Capital Facility Charge	$1,800	$1,600
30-Year Portion ($100 annual payment over 30 years)	$3,000	-
Total Capital Facility Charge	**$5,700**	**$6,500**
Water Connection Charge	$2,700	$3,600
Sewer Connection Charge	$2,800	$5,000
Total Fees	**$11,200**	**$15,100**

Table 8.5 demonstrates that the total increase for a standard water and sewer connection is $3,900. One of the reasons for the increase is due to the fact that the City has not adjusted either charge for a number of years. We recommend that the City periodically review the actual cost of providing system capacity and the actual cost of connection to ensure that the charges are set at the appropriate level.