



Final Report  
February 2011

# City of Falls Church Sewer Rate Study Report

Prepared by



Municipal & Financial  
Services Group

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## **APPENDIX**

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# 1. INTRODUCTION

## 1.1 BACKGROUND

The City of Falls Church was established in the late 17<sup>th</sup> century as a colonial settlement and became an independent city in 1948. Located 6 miles from Washington, DC, Falls Church covers a small area of only 2.2 square miles and is home to 11,200 residents. The top employers within the city are the Falls Church City Public Schools System followed by the City of Falls Church and Kaiser Permanente. The city is governed by a 7 member council whose members are elected at-large. The council appoints members to a Public Utilities Commission that meets quarterly to discuss important issues related to the City's Public Utilities Department, including but not limited to the sewer system rates and charges.

The Falls Church sewer system consists of 48 miles of pipe capable of handling up to 2 million gallons of discharge per day (MGD) and contains over 1000 manholes. Falls Church sends sewage to Fairfax County and Arlington County Wastewater Treatment Plants (WWTP) for wastewater treatment, and has operating and cost sharing agreements with each jurisdiction. In Combined annual wastewater treatment plant costs totaled \$1.29 million in FY09.

In FY09, Falls Church served approximately 3,963 customers. All customers are charged a unit rate per 1,000 gallons. Over 99% of customers are billed on a quarterly basis, with several large commercial and apartment customers billed monthly. The current sewer rate structure is shown below in Table 1.1. This City has not changed its sewer rates since 2005.

Table 1.1 Current Sewer Rate Structure

	<b>Current FY11 Rates</b>
Unit Rate per 1,000 gallons	\$5.91

The City's objective is to devise and implement the lowest sewer rates over time. This will be accomplished by identifying, documenting and projecting the total costs of constructing, operating and maintaining the sewer systems owned by the City of Falls Church, including required or desired financial reserves, for a 10 year period. The adequacy of current rates and fees will be determined, and baseline indicators for the measurement of financial health will be established.

For purposes of the financial model and this report, the operating and capital expenses of the Sewer Enterprise Fund are allocated to two sub-funds: the Operating Fund and the System Expansion Fund. The Operating Fund includes all costs associated with the daily operating and maintenance associated with the existing sewer system; i.e. all costs associated with the existing customer base. Revenues from the user fees, as well as other miscellaneous fees (e.g., carrying charges, interest income, etc.), are used to offset the expenses of the Operating Fund.

The System Expansion Fund includes costs associated with serving new customers and is offset by revenues collected via sewer availability fees paid for by new customers when they connect to the sewer system.

## 1.2 SCOPE OF WORK

The study supports an objective of the City to keep rates, fees and charges stable through sound financial management at a level that fully recovers the costs of providing services and appropriately allocates costs to customers.

The scope of services set forth in the contract between the City of Falls Church (the City) and the Municipal and Financial Services Group (MFSG) specifies several related tasks:

- **Policy** – Several objectives were identified through the kick-off meeting and discussions with staff, including policy issues affecting the establishment of rates, fees and charges for sewer service and the importance of revenue stability for the sewer fund. A specific policy issue the City is facing is the use of available cash reserves to fund pay-go capital. This policy is not recommended for continued use by MFSG and support for this recommendation is discussed through the report.
- **Revenue Requirements** – Developing a financial model creates an accurate review of current and future costs incurred by the sewer fund. Section 2 of the report describes each building block of the revenue requirements calculated in the financial model, including operating and maintenance costs, capital costs and any contributions to reserves. This allows the City to review each cost and determine appropriate adjustments to the current budget as well as future changes to enhance future budgets.
- **Financial Plan** – After identifying policy objectives and developing revenues requirements, the next step is creating a feasible financial plan for the City to ensure that sewer rates, fees and charges provide adequate revenues over the projection period. The financial plan will allow the sewer fund to become self-supporting over a planning period of several years that include phase-in increases to reduce rate shock to customers. The financial plan takes into account another identified objective of having a minimum cash balance of 25% or  $\frac{1}{4}$  of the annual operating and maintenance expenses. The recommended financial plan is discussed further in Section 2.5 of this report along with the resulting cash flow and cash balance discussed in Section 8.
- **Rate Design** – After a financial plan is created, the current methodology is reviewed and alternatives are designed that appropriately allocates costs among the City's customers based on the City's goals and objectives. Customer behavior plays a major part in rate design as it is an indicator of sewer usage behavior and how revenues will be collected through each alternative. Customer behavior is analyzed and discussed further in Section 3 of the report. After several rate alternatives and sample bills have been created and compared to various similar local utilities, a final alternative is chosen for implementation. Sections 4 through 6 discuss the user rate designs, sample bills, and comparisons in greater detail. Availability Fees have also been analyzed for the City of Falls Church and although no change is currently recommended, several alternative

calculations for the fee were analyzed and the results are further explained in Section 7 of the report.

### 1.3 ASSUMPTIONS

The following guidelines for the sewer rate study were developed by MFSG with the assistance of the City staff:

- The sewer system must be financially self-supporting. It is assumed that the cost of operating and maintaining the sewer system must be supported by the sewer fees and charges collected from sewer customers.
- Expenses and Capital Costs will be evaluated for allocation between the Operating Fund (Existing Users) and the System Expansion Fund (New Connections).
- One of the City's principal objectives is to keep rates and fees low over time. It is possible to keep rates low for a period of time by not investing sufficiently in the maintenance of the sewer system but eventually the system will deteriorate and require substantial investments leading to the need for significant and immediate rate increases. Although there is reinvestment into the sewer system on an annual basis, an increase in the reinvestment may be necessary to keep up with system's useful life.
- The City should develop reserves to provide for contingencies and unplanned expenses.
- The expenses related to operating and maintaining the sewer utility should be equitably distributed among the users of the respective systems.

In order the project future revenue requirements from sewer rates, several assumptions were made regarding future economic conditions and growth within the City's service area. Assumptions for FY12 (which can be varied as needed from year to year) made regarding various items are shown on the following page:

<u>Element</u>	<u>Assumption FY12</u>
Overall Operating Expenses Inflation Rate	3.00%
Number of New Equivalent Connections Per Year	25
Customer Growth Rate	0.47%
Usage Growth Rate	0.47%
Operating and Maintenance Reserve	90 days of O&M Expenses

These assumptions were used after discussions with the City, utilizing our experience and the City's knowledge of its customer base and historical costs. There are also several assumptions used to calculate future debt. Detailed information on bond funding and other assumptions used in the study can be found on Schedule 1 of the Appendix to this report. The study was conducted

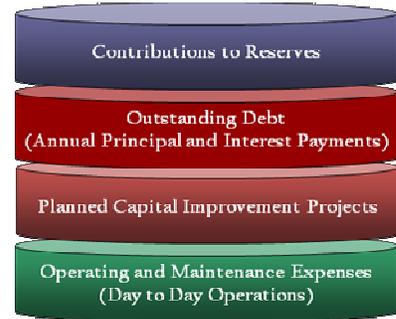
using the Fiscal Year 10 original budget and Fiscal Year 11 adopted budget as the base years upon which forecasted figures were developed. Falls Church's fiscal year starts on July 1<sup>st</sup> and ends on June 30<sup>th</sup>. The study identifies needed sewer rates on a year-by-year basis for the entire planning period (FY12 - FY20). While all years are shown in the financial model, the report has specific recommendations for a five year planning period of FY12 – FY16.

#### **1.4 SUMMARY**

This section of the report has provided a brief introduction to the general principles and used to set sewer rates. These principles, techniques, and assumptions were the basis for the rate study and the foundation used to meet City's key objective on establishing their sewer rates.

## 2. REVENUE REQUIREMENTS

One of the main objectives when completing a sewer rate study is to define rates that will collect an appropriate amount of revenue to run the sewer system efficiently and effectively. In order to determine the level at which rates need to be set, we first need to determine the amount of revenue that needs to be collected, also known as the Revenue Requirements. The Revenue Requirements outline historical, current, and future costs associated with operating and maintaining the sewer system. Our approach includes a detailed review of each of the costs incurred by the City to ensure that a true cost of service is being developed. The Revenue Requirements can be broken down into four main categories of costs including: Operating and Maintenance expenses, capital improvements, existing debt service, and contributions to reserves. The following sections describe each of the four categories and the associated costs incurred by the City as it provides sewer service. All costs are based on official documents, financial statements, and data provided by the City.



### 2.1 OPERATING AND MAINTENANCE COSTS

Operating and Maintenance (O&M) costs make up the base of the Revenue Requirements. The City must operate and maintain the existing sewer system in order to provide service to customers. Actual expenditure costs from Fiscal Year (FY) 07 through FY09, along with the FY10 original budget and the FY11 adopted budget were used as a basis for O&M expenses.

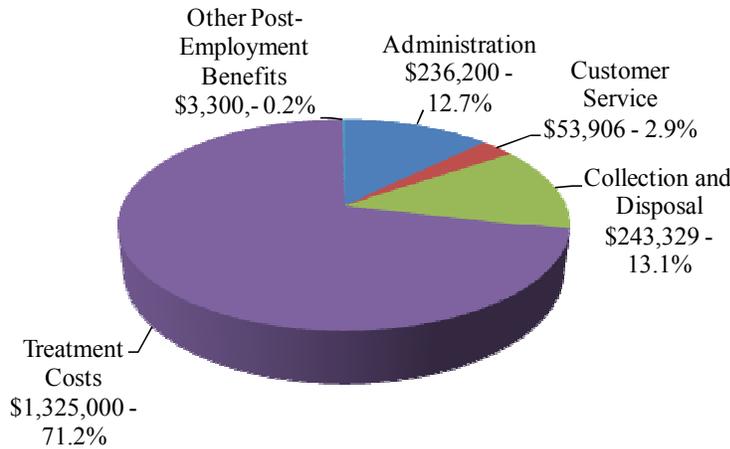
The City currently budgets and tracks sewer operating expenses using four major categories: Administration, Customer Service, Collection and Disposal and Other Post-Employment Benefits. The budgeted sewer O&M Expenses, according to the adopted budget, totals approximately \$1.86 million in FY11. Within the Collection and Disposal category, the expense line item for treatment costs for the Arlington and Fairfax Wastewater Treatment Plants total approximately \$1.3 million. This line item accounts for 71% of the entire O&M expense budget and is specifically listed in the following table and exhibit. Below, Table 2.1 shows the historical actual operating and maintenance expense budgets for FY07 through FY09, along with the original and adopted budgets for FY10 and FY11.

Table 2.1 Sewer O&M Expenses

*in millions	FY07 Actual	FY08 Actual	FY09 Actual	FY10 Orig. Budget	FY11 Adopted Budget
<b>Administration</b>	\$0.29	\$0.23	\$0.24	\$0.44	\$0.24
<b>Customer Service</b>	\$0.05	\$0.05	\$0.05	\$0.06	\$0.05
<b>Collection and Disposal</b>	\$0.56	\$0.52	\$0.79	\$0.25	\$0.24
Treatment Costs	\$1.35	\$1.20	\$1.29	\$1.33	\$1.33
<b>Transfers</b>	\$0.73	\$ -	\$0.79	\$ -	\$ -
<b>Debt Service</b>	\$ -	\$0.02	\$0.11	\$ -	\$ -
<b>Other Post-Empl. Benefits</b>	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Expense Category Total</b>	<b>\$2.98</b>	<b>\$2.02</b>	<b>\$3.28</b>	<b>\$2.08</b>	<b>\$1.86</b>

Exhibit 2.1 below gives a detailed look at the breakdown of the operating and maintenance expenses in the adopted budget for FY11.

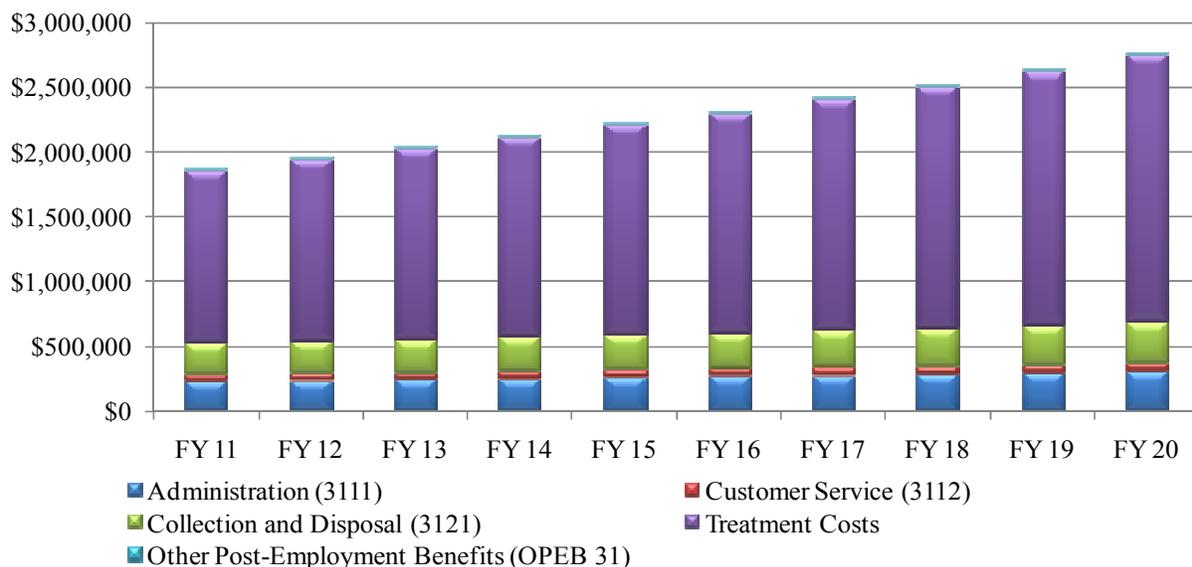
*Exhibit 2.1 – Adopted Budget FY11 – Operating & Maintenance Expenses*



A majority of the FY11 adopted budget was inflated by 3% per year to estimate future O&M costs for the planning period through FY20. The inflation rate has been set at 3% as an industry standard, because it combines the Municipal Cost Index (MCI), Construction Cost Index (CCI), Consumer Price Index (CPI), and the Producer Price Index (PPI) into one average inflation factor. One line item in the budget in particular, Treatment Costs, was inflated by 5% per year. This was deemed the appropriate inflation rate for this particular item after discussion with City staff.

Exhibit 2.2 shows the projected operating and maintenance expenses for the entire planning period. A detailed review of O&M expenses can be found on Schedule 2 of the Appendix to this report.

*Exhibit 2.2 – Projected Operating & Maintenance Expenses through FY20*



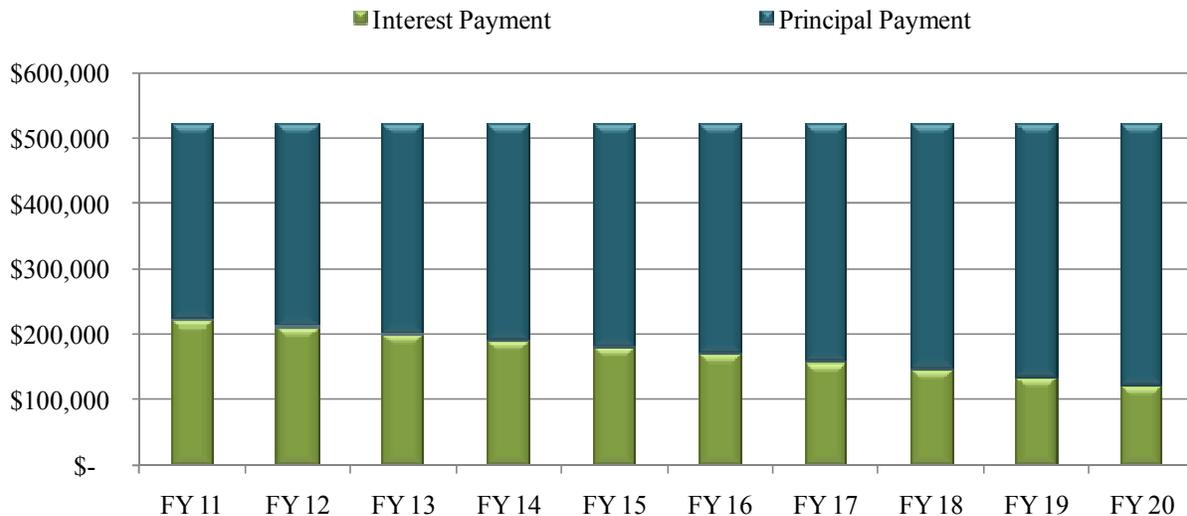
## 2.2 CAPITAL COSTS

Planned capital costs and existing debt are the next two building blocks within the revenue requirements. The annualized planned capital costs related to providing sewer service are generally derived by analyzing the capital costs of projects detailed in the City’s capital improvement plan (CIP). The CIP is funded via the issuance of debt (typically bonds or similar financial instruments) and via cash reserves or cash derived from operations. The capital costs and existing debt are also differentiated between growth of the system (System Expansion Fund) and repair and rehabilitation of the system (Operating Fund). Segregating each between operating and system expansion is necessary to ensure the costs are recovered through the appropriate group of customers (e.g., new customers pay for system expansion).

### a. Existing Debt

The City currently has approximately \$9.5 million in total outstanding debt. The existing debt consists of two VRA loans that are allocated 100% to the Operating Fund, therefore costs will need to be recovered through user fees. Exhibit 2.3 illustrates the existing debt payments for the entire planning period.

*Exhibit 2.3 – Existing Debt Service Payments*



The annual payment of approximately \$0.52 million lasts through the planning period and beyond, until FY26.

### b. Capital Improvement Plan

The City’s capital improvement plan for the sewer system has historically been paid for with existing fund balance. A recommendation from MFSG would be to move away from the current payment methodology and have the option of cash funding from current year revenues and bond funding planned capital projects. If all capital projects continue to be funded through existing fund balance, the balance will deplete to below a recommended level and eventually run out

completely. For this reason, the financial model includes increases in the user rates needed to recover funds to pay for the projects.

The current CIP contains several major ongoing projects listed in Table 2.2 below through Fiscal Year 15.

Table 2.2 Sewer System Capital Improvement Plans by Project

<b>*in millions</b>	<b>FY10</b>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>
Fairfax WWTP Upgrade Phase 1	\$0.33	\$0.33	\$0.33	\$0.33	\$0.33	\$0.33
Fairfax WWTP Upgrade Phase II	\$ -	\$1.76	\$ -	\$ -	\$0.11	\$0.07
Falls Church Sewer Rehabilitation	\$0.40	\$0.40	\$0.40	\$0.40	\$0.40	\$0.40
New Filters at Arlington	\$ -	\$0.80	\$ -	\$ -	\$ -	\$ -
Arlington WWTP Upgrades	\$ -	\$1.20	\$ -	\$ -	\$ -	\$ -
WWTP Capacity Expansion	\$ -	\$ -	\$ -	\$ -	\$ -	\$5.60
<b>Total</b>	<b>\$0.73</b>	<b>\$4.48</b>	<b>\$0.73</b>	<b>\$0.73</b>	<b>\$0.83</b>	<b>\$6.39</b>

The City’s capital improvement plan for the sewer system includes projects that will focus on the Arlington and Fairfax WWTPs. A large portion of the projects will be funded by cash, as historically done, however instead of using the current cash balance; they will be funded through current user fees. There are four projects budgeted for through bond funding, including a portion of Phase II of the Fairfax WWTP Upgrade, the Arlington WWTP Upgrade, New Filters at Arlington and the WWTP Capacity Expansion. As previously stated, capital costs have also been allocated to the Operating Fund and System Expansion Fund. The following Table 2.3 the CIP has been allocated to each fund.

Table 2.3 Sewer System Capital Improvement Plans by Fund

<b>*in millions</b>	<b>FY10</b>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>
Operating Fund	\$0.73	\$4.48	\$0.73	\$0.73	\$0.83	\$0.79
System Expansion Fund*	\$ -	\$ -	\$ -	\$ -	\$ -	\$5.60
<b>Total</b>	<b>\$0.73</b>	<b>\$4.48</b>	<b>\$0.73</b>	<b>\$0.73</b>	<b>\$0.83</b>	<b>\$6.39</b>

\*The WWTP Capacity Expansion project is currently the only CIP project allocated to the System Expansion Fund.

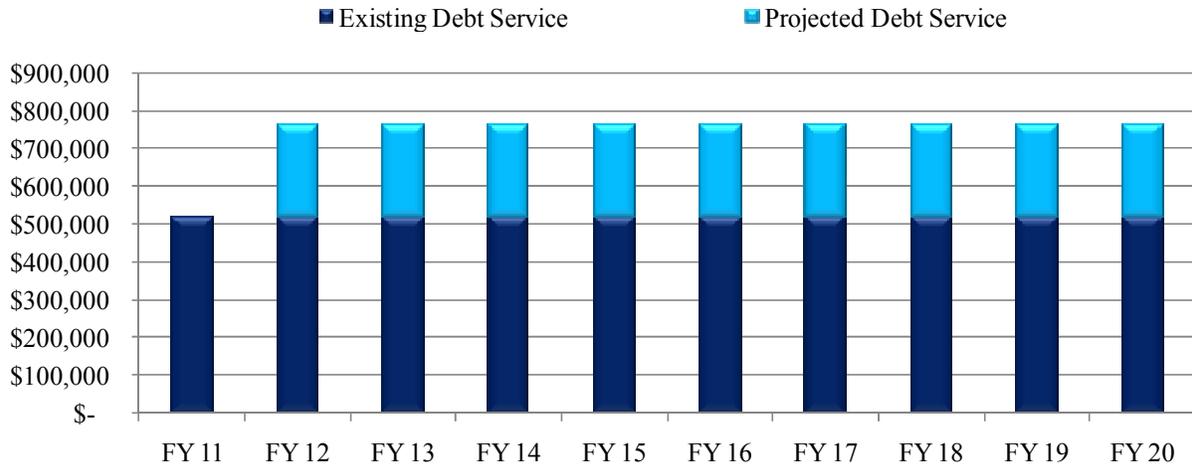
A view of total existing debt and a detailed look at the capital improvement plan can be found on Schedules 3 & 5 of the Appendix to this report.

### **b. Projected Debt Service**

Of the four bond funded CIP projects, three have been allocated to the Operating Fund with the fourth allocated to the System Expansion Fund. Currently, the three Operating Fund CIP projects are planned to take place in FY2011. One bond issue is currently budgeted to take place with a 25 year amortization with a 4% interest rate. Exhibit 2.4 illustrates the projected debt payments

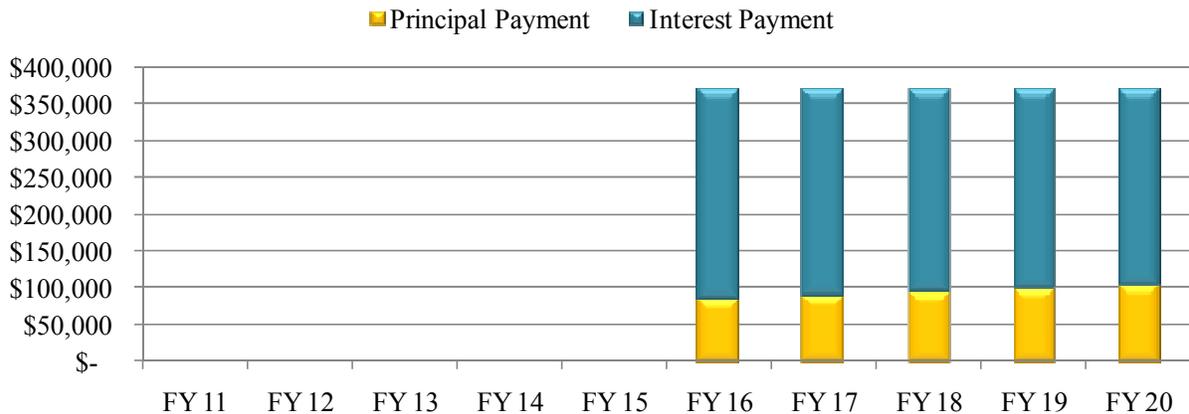
that will be created with the bond issuance along with the existing debt payments already in place.

*Exhibit 2.4 – Debt Service Payments - Operating Fund*



The WWTP Expansion capital project is currently allocated to the System Expansion Fund. A 30 year bond at 5% interest is planned to be issued in FY15 with payments starting in FY16. There is currently no existing debt allocated to the system expansion fund. The projected debt payment schedule for the System Expansion Fund is shown in Exhibit 2.5 below.

*Exhibit 2.5 – Projected Debt Service Payments – System Expansion Fund*



### 2.3 RESERVES

The final building block of the Revenue Requirements is any contributions to reserves. Best management practices dictate that cash reserves should accumulate in order to provide for contingencies and unplanned major expenses. We recommend the establishment of two types of reserves for the City’s sewer system: an Operating and Maintenance (“O&M”) Reserve and a Repair, Renewal, and Replacement (“3R”) Reserve. Each is discussed below.

### **a. Operating and Maintenance Reserve**

An important role of an operating reserve is to provide funds for unplanned minor repairs or fluctuations in the budget. As this reserve accumulates, the funds can be used in future years to offset, decrease or defer rate increases. An operating reserve is typically established as a percentage of a system's O&M budget.

We recommend that the City formally establish and maintain a 90-day operating reserve target balance (one fourth of current annual O&M expenses). An annual contribution to the reserve will need to be recovered through user fees each year to match the target reserve balance of 90 days annual operating expenses. This annual contribution is the difference between the target balance (one fourth current annual O&M expenses) and the current balance (less any withdrawals from the reserve). This calculation of O&M reserve contribution assumes the City funds the reserve completely in Fiscal Year 10 from available cash balances, which are currently adequate to fully fund the reserve.

### **b. Repair, Replacement and Rehabilitation Reserve**

Many municipal utilities establish a Repair, Replacement and Rehabilitation ("3R") Reserve to provide funds to pay for unexpected major repairs and planned replacement or rehabilitation of system assets. The reserve can be used to pay for capital costs in order to avoid or minimize the amount that would otherwise be recovered through user fees (which would 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 via the Capital Improvement Program.

Detailed asset information was not available for an in depth asset analysis. The most current book value for each asset category (Building & System and Machinery & Equipment) was provided to calculate estimated replacement costs of the entire system. A useful life and approximate age as a whole were given to compute an annualized estimated contribution to the reserve. The results of this analysis provided a very rough approximation of the annual replacement costs that theoretically the City should be incurring to replace its aging assets. However, in light of discussions with City staff, specifically those related to the costs of relining sewer collection infrastructure versus the full replacement costs of sewer collection infrastructure, a more refined approximation was developed.

Currently the City budgets approximately \$400,000 per year for Sewer Rehabilitation as part of the City's capital improvement plan. This program was established in 2006 and was based upon an asset study commissioned and completed for the City. It included a condition assessment of the assets and allows the City to work on relining and rehabilitating the highest priority assets. The program that the City has been using for the past four years is only two-thirds of the original recommendation of completing \$600,000 per year of Sewer Rehabilitation. Based on a combination of the asset analysis completed for this study, the asset study completed in 2006, and the discussions with City staff, rehabilitation program equaling \$800,000 per year is recommended as part of the 10-year financial plan. This program will be phased-in over an 8-year period, beginning in FY2014. The financial model assumes that contributions to the "3R" Reserve will start at \$50,000 in FY14 and increase \$50,000 every year until a ceiling

contribution of \$400,000 per year is reached for the reserve. It is assumed that this money will be held in a “3R” reserve fund, until specific rehabilitation projects can be added to the City’s adopted capital program. A detailed view of the sewer “3R” Reserve contribution calculation can be found on Schedule 6 of the Appendix to this report.

## 2.4 REVENUE REQUIREMENTS

After combining all building blocks of the revenue requirements (that is, the total cash needed for the sewer system), costs can be classified into two major categories:

1. Operating Costs:  
 Operating and Maintenance Expenses (day to day operations)  
 O&M Reserve Contributions
  
2. Capital Costs:  
 Debt Service – Existing & Projected (annual principal and interest payments)  
 Cash-funded Capital Projects  
 “3R” Reserve Contributions

Table 2.4, shows the revenue requirements, miscellaneous revenues and the net revenue requirements for the Sewer system through FY15.

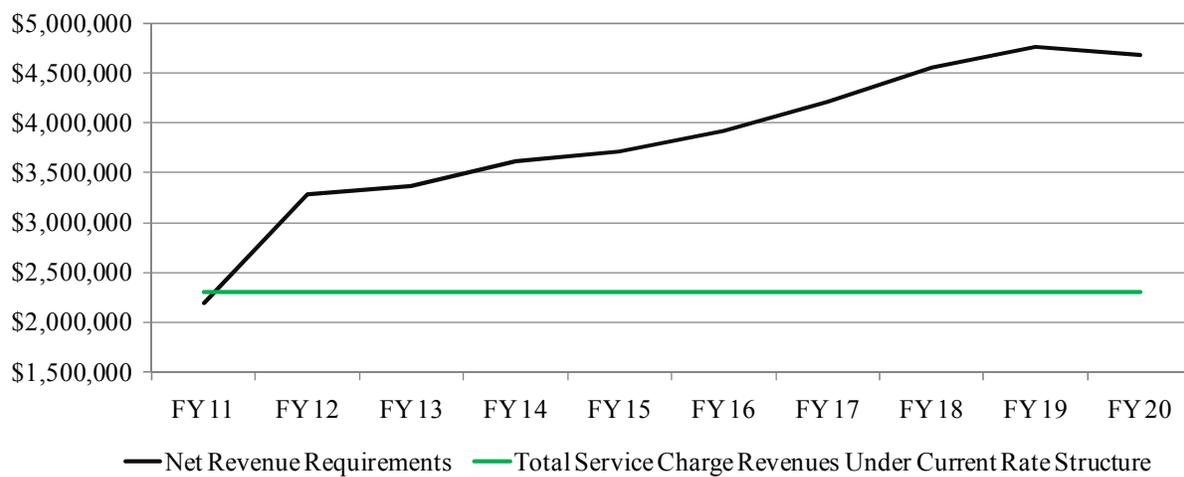
Table 2.4 Sewer Fund Revenue Requirements

<b>*in millions</b>	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>
<u>Operating Costs</u>						
Total Operating Expenses	\$1.86	\$1.94	\$2.03	\$2.12	\$2.21	\$2.31
Operating Reserve Contribution	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
<i>Total Operating Expenses</i>	<i>\$1.86</i>	<i>\$1.94</i>	<i>\$2.03</i>	<i>\$2.12</i>	<i>\$2.21</i>	<i>\$2.31</i>
<u>Capital Costs</u>						
Cash Funded Capital Projects	\$0.73	\$0.73	\$0.73	\$0.83	\$0.79	\$0.85
Debt Service Expense	\$0.52	\$0.76	\$0.76	\$0.76	\$0.76	\$0.76
3R Reserve Contribution	\$ -	\$ -	\$ -	\$0.05	\$0.10	\$0.15
<i>Total Capital Expenses</i>	<i>\$1.25</i>	<i>\$1.49</i>	<i>\$1.49</i>	<i>\$1.65</i>	<i>\$1.66</i>	<i>\$1.77</i>
<b>Total Revenue Requirement</b>	<b>\$3.11</b>	<b>\$3.44</b>	<b>\$3.52</b>	<b>\$3.77</b>	<b>\$3.87</b>	<b>\$4.08</b>
Miscellaneous Other Revenues	\$0.15	\$0.15	\$0.15	\$0.15	\$0.15	\$0.15
Use of Fund Balance	\$0.76	\$ -	\$ -	\$ -	\$ -	\$ -
<b>Net Revenue Requirement</b>	<b>\$2.20</b>	<b>\$3.29</b>	<b>\$3.37</b>	<b>\$3.62</b>	<b>\$3.72</b>	<b>\$3.93</b>
Revenues under Current Rates	\$2.30	\$2.30	\$2.30	\$2.30	\$2.30	\$2.30
Surplus / (Shortfall)	\$0.10	(\$0.99)	(\$1.07)	(\$1.32)	(\$1.42)	(\$1.63)

Table 2.4 demonstrates that the current sewer rates will generate sufficient revenue to cover the revenue requirements in Fiscal Year 11 with the use of fund balance. As stated in the previous Section 2.2, the use of fund balance to pay for capital projects is a practice that should be revised and replaced. MFSG recommends that the use of fund balance be drastically cut down and eventually, if not immediately, phased out completely. To reiterate, if the fund balance is used as it has been used historically, it will deplete to below the recommended target balance and eventually run out completely.

Exhibit 2.6 illustrates the projected revenue requirements vs. revenues under current rates with no future use of fund balance and no rate increases or adjustments.

*Exhibit 2.6 – Projected Sewer Fund Revenue Requirements vs. Current Service Charge Revenues*



Detailed views of the sewer fund revenue requirements are shown on Schedule 10 of the Appendix to this report.

## 2.5 FINANCIAL PLAN

The sewer system will not be self-supporting (revenues will not cover revenue requirements) in FY12 nor will revenues cover expenses during the subsequent years. To address the shortfalls we propose that the City consider adjusting sewer rates over a multi-year basis. The recommended annual increases in the sewer revenues are shown in the following table.

Table 2.5 - Sewer Revenue Adjustments

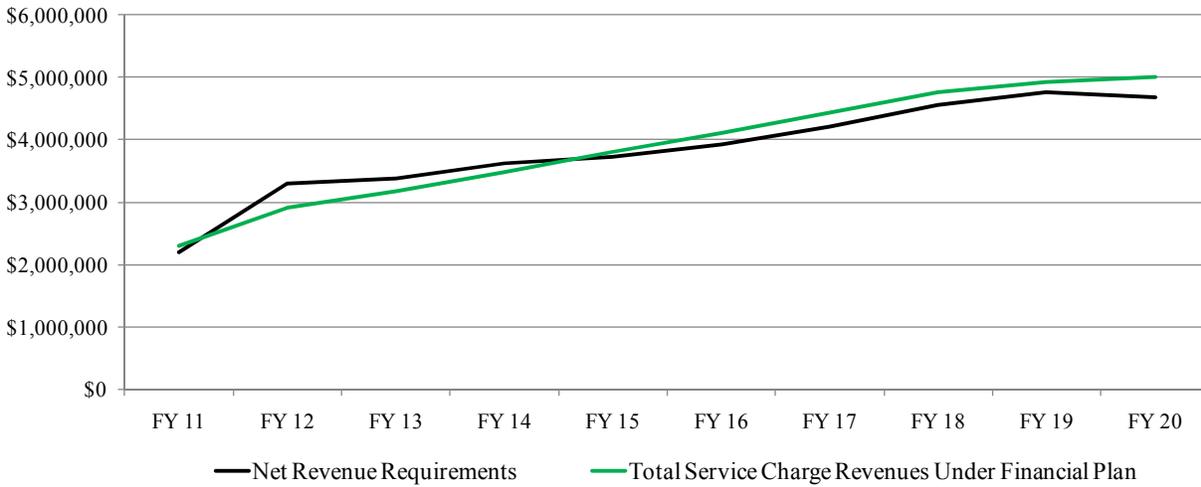
	FY12	FY13	FY14	FY15	FY16
Sewer System Revenue Increase	26.9%	9.3%	9.3%	9.8%	7.8%

The proposed revenue increases will allow revenues to keep pace with expenses over the coming years. A small portion of revenue increase needed will be made up by growth in consumption in each, however it is currently projected to be less than 1% per year. Additional increases will be required in years FY17 – FY20, based on our forecast of revenue requirements for the Sewer

Fund. However, the magnitude of the rate increases will be influenced by a number of factors such as the level of capital investment, varying sewer usage and overall inflation in O&M expenses.

Exhibit 2.7 illustrates the projected revenue requirements vs. revenues under the recommended financial plan.

*Exhibit 2.7 – Projected Sewer Fund Revenue Requirements vs. Financial Plan*



### 3. USAGE, DEMAND AND CUSTOMER ANALYSIS

The next step in the rate setting process is to review the customer and usage information of the City in order to allocate costs among those customers. Sections 3.1 and 3.2 take a detailed look at actual sewer customer account and usage information given to us by the City.

#### 3.1 CUSTOMER COUNTS

In Fiscal Year (FY) 09, the City’s sewer system customer base included almost 4,000 billed customers broken into five categories: Single Family, Town House, Apartment, Commercial, and Municipal. The following table provides a breakdown of the City customers by class and meter size. Customers are billed on a quarterly basis with the exception of large apartment and commercial customers that are billed monthly.

Table 3.1 – Sewer Customers Breakdown

Meter Size	Single Family	Town House	Apartment Monthly	Apartment Quarterly	Commercial Monthly	Commercial Quarterly	Municipal	Grand Total
5/8"	2,737	595		1		243	12	<b>3,588</b>
3/4"	29			21		28	3	<b>81</b>
1"	27			18		61	6	<b>112</b>
1 1/2"	5		2	34		48	4	<b>93</b>
2"			1	8		46	12	<b>67</b>
3"			4	1		4	1	<b>10</b>
4"			7	1	3			<b>11</b>
6"					1			<b>1</b>
<b>Total</b>	<b>2,798</b>	<b>595</b>	<b>14</b>	<b>84</b>	<b>4</b>	<b>430</b>	<b>38</b>	<b>3,963</b>

Table 3.1 demonstrates that the majority of the City customers have a 5/8” meter which is the standard residential meter size. After discussions with City staff, a growth rate of approximately 0.45% was applied to the customers for the entire planning period. By the end of the planning period in FY20, there are an estimated number of customers totaling 4,168.

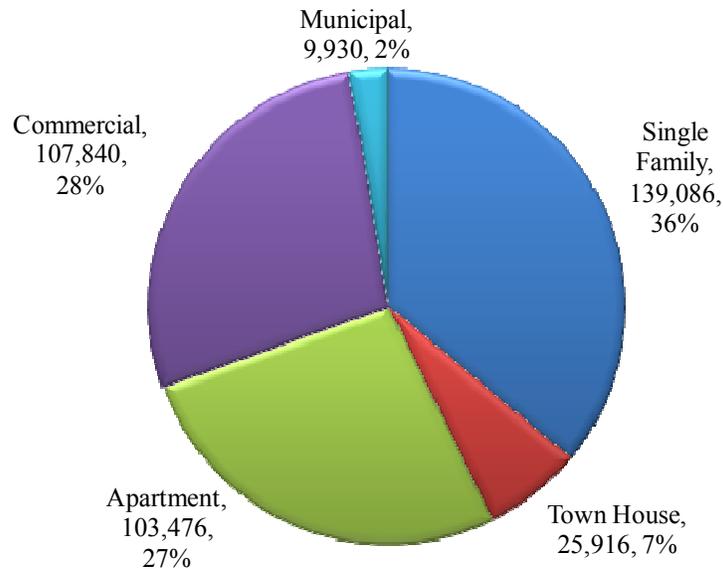
#### 3.2 USAGE DATA

Billed Sewer usage is based off of total metered water. The City’s metered water totaled approximately 386 million gallons during FY09. Single Family and Multi-Family (Townhouse) Customers are charged based on winter quarter usage. Winter quarter usage is represented by usage from January through March. If a customer is new and does not have winter quarter usage, the average of all other customers is calculated and then applied to those customers. For FY09, 15,000 gallons was applied to all customers who did not have winter quarter usage data. Due to winter quarter usage amounts, total billed usage was approximately 371 million gallons in FY09.

The total in FY09 increased from actual FY08 data, where metered water totaled 361 million gallons. A breakdown of total metered sewer usage for FY09 is shown on the following page in Exhibit 3.1.

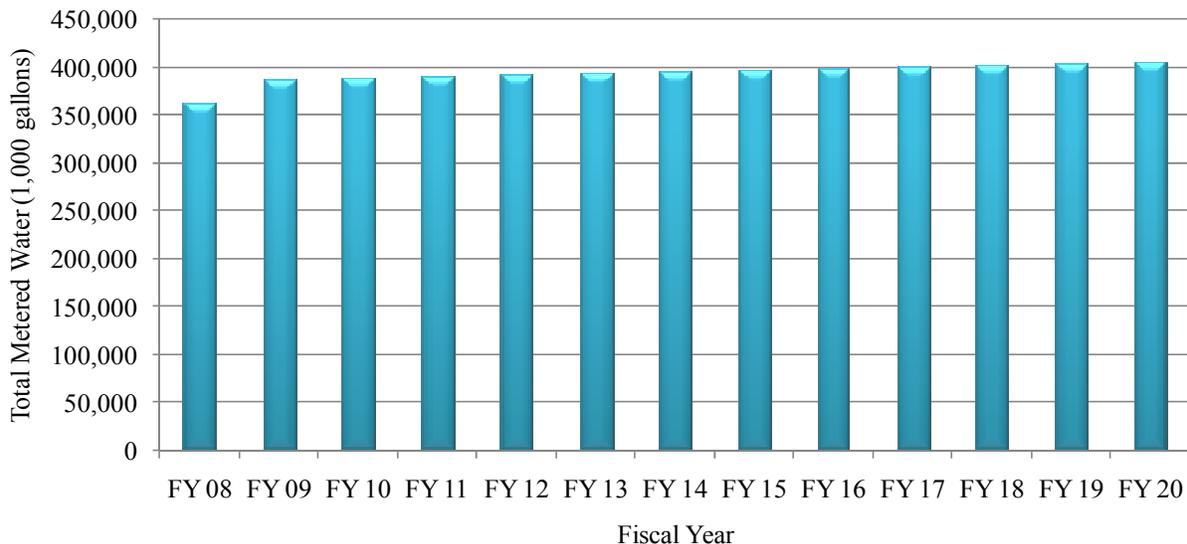
*Exhibit 3.1 – Total Metered Sewer Usage – FY09*

Total FY 09 Metered Usage - 386,248 (1,000 gallons)



For purposes of forecasting future sewer usage, as discussed earlier in the report, a growth rate of approximately 0.45% was applied each year for the planning period. Exhibit 3.2 shows an actual metered usage for FY08 & FY09, along with our estimate of metered water sales for the planning period.

*Exhibit 3.2 – Metered Water*



In addition to examining water usage trends, to evaluate alternative rate structures it is necessary to review water usage patterns for various customer types within the City system. Exhibit 3.3 shows the break-down of customer usage by quarter for single family customers.

*Exhibit 3.3 – Customer Usage Patterns- Single Family Residential*

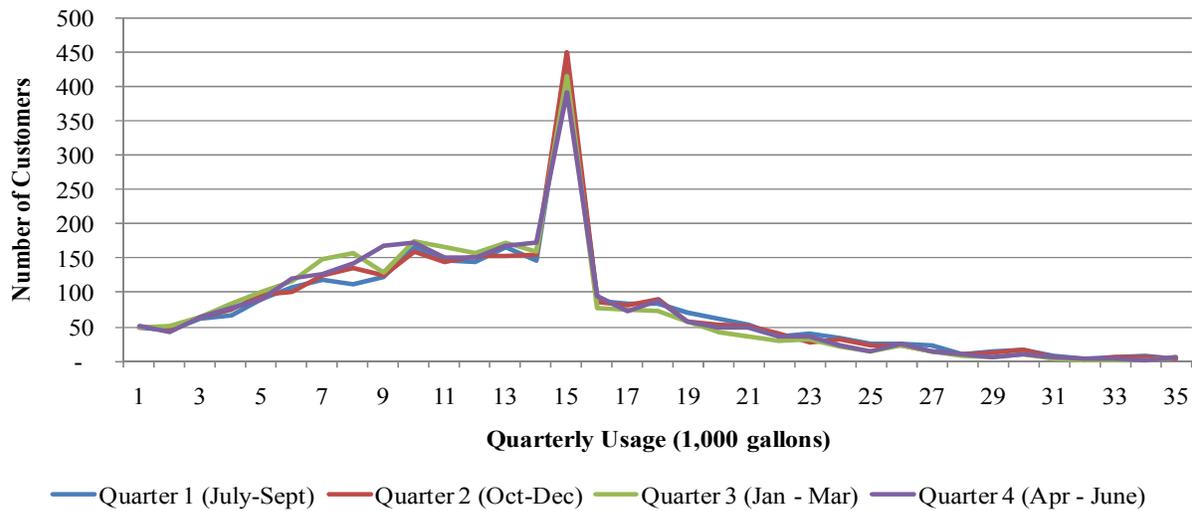
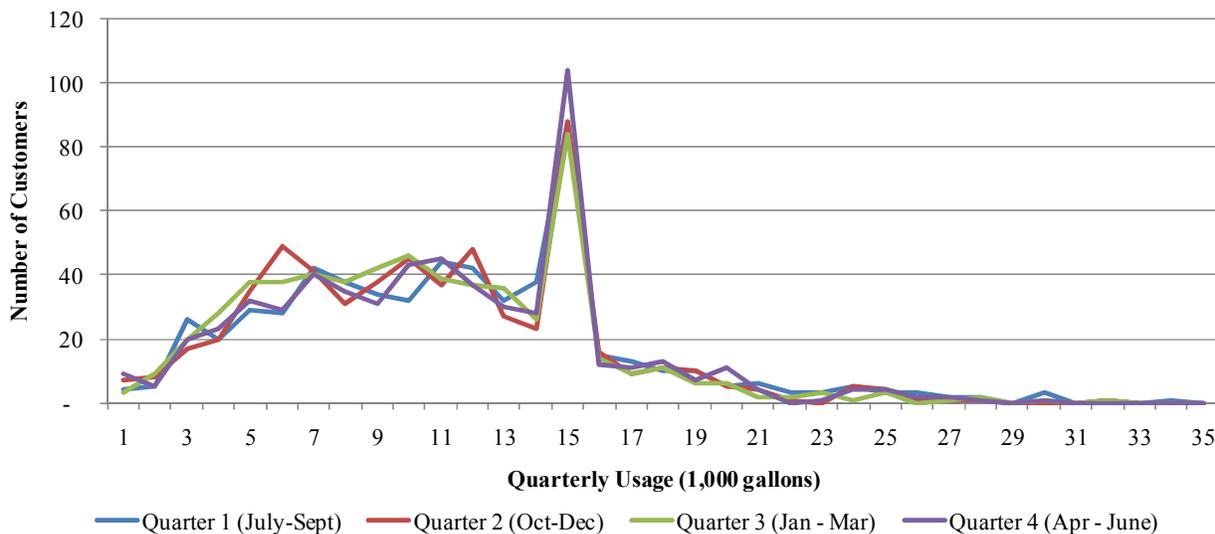


Exhibit 3.3 shows a large spike in the number of customers having approximately 15,000 gallons of usage per quarter. The spike is due to new customers being issued the average usage per quarter of 15,000 gallons in FY09. Multi-Family customer allocated usage is shown in Exhibit 3.4 and has similar usage patterns to single family residents, with the maximum number of customers in that class using 15,000 gallons per quarter.

*Exhibit 3.4 – Customer Usage Patterns- Multi-Family (Townhouse) Residential*



For all alternatives discussed in the next section, the winter quarter usage will remain for single family and multi-family rates. With all other customers billed for actual metered water usage. Detailed customer and usage information and projections can be found on Schedules 11 & 12 of the Appendix to this report.

## 4. RATE ALTERNATIVES

The current rate structure was evaluated to determine if it reasonably reflects how costs are currently incurred by the City. The current design and alternatives are discussed and illustrated below.

### 4.1 CURRENT RATE DESIGN (Alternative A)

Currently, the City charges all customers a unit rate per 1,000 gallons. Single Family and Multi-Family customers are charged based on their winter quarter usage, while all other customers are based on actual metered water. The current rate structure is shown below in Table 4.1.

Table 4.1 Current Sewer Rate Structure

	Current FY11 Rates
Unit Rate per 1,000 gallons	\$5.91

### 4.2 RATE STRUCTURE ALTERNATIVES

As stated above in the Revenue Requirements section, sewer rates will generate sufficient revenue to cover the revenue requirements in FY11. Following FY11 the projected revenues will not cover the revenue requirements over the entire planning period. Along with updated costs in FY12 for the current rate structure, two additional sewer rate alternatives have been developed during the study.

The main component of the current rate structure is the unit rate charge per 1,000 gallons. The unit rate is charged to all customers. Only 1% of customers are billed on a monthly basis and are made up of large apartment and commercial customers. The City charges all Residential customers on a Winter Quarter Billing methodology. Winter quarter billing is based on metered water in the winter months only and helps to alleviate customers paying for water use in the summer that does not go into the sewer system. MFSG recommends the continued use of the Winter Quarter billing structure for residential customers. By capping residential usage at winter quarter water consumption levels customers are not being charged for water used outdoor and it also protects revenues from seasonal fluctuations.

The alternatives discussed in this section introduce an administrative fixed charge for all customers. There are advantages and disadvantages to adding a fixed charge to the rate structure. A major advantage of adding a fixed charge is revenue stability for the City during varying times of sewer usage. Also a fixed charge is supported by the characteristics of the sewer system in that a large percentage of expenses incurred by the city to operate the system are fixed and must be recovered regardless of sewer usage. Adding a fixed charge is an industry standard rate making methodology and has supporting facts the Water Environment Federation, Manual of Practice No. 27. A major disadvantage of the fixed charge includes hurting the small user. Although they have steady sewer usage, their bill will go up by the highest percentage with the addition of any fixed charge. Adding or omitting a major component of any rate structure is also a disadvantage. By adding a major component to the bill it will most definitely heighten customer service calls

and customer confusion. MFSG recommends the addition of the fixed charge to the rate structure as we feel the advantages greatly out-weight the disadvantages.

Below are the three alternatives that were discussed with City staff for implementation.

- Current Rate Structure (Alternative A) – follows the current rate structure; with a percentage increase applied to FY12.
- Alternative B1 – an administrative fixed charge set at \$10 per quarter with unit rate per 1,000 gallons.
- Alternative B2 – an administrative fixed charge set at \$5 per quarter with unit rate per 1,000 gallons.

Tables 4.1 through 4.3 summarize the alternative rate structures and the FY12 Proposed Rates. Each alternative will produce the same amount of revenue, 26.9% more than the revenue produced by the current rates.

Table 4.2 below, illustrates Alternative A, which is the current rate structure for the sewer system, along with the same structure increased with the financial plan percentage for FY12.

Table 4.2 – Alternative A

	<b>FY11 Current Rates</b>	<b>FY12 Proposed Rates</b>
<b>Quarterly Unit Rate per 1,000 gallons</b>	<b>\$5.91</b>	<b>\$7.46</b>

Alternative B1, shown in Table 4.3, illustrates the same financial plan increase as alternative A, however there is an additional monthly administrative fixed charge. The fixed charge will collect 6% of total revenues, with the other 94% collected through a unit rate per 1,000 gallons.

Table 4.3 – Alternative B1

	<b>FY12 Proposed Rates</b>
<b>Quarterly Fixed Charge per Bill</b>	<b>\$10.00</b>
<b>Monthly Fixed Charge per Bill</b>	<b>\$3.34</b>
<b>Quarterly Unit Rate per 1,000 gallons</b>	<b>\$7.04</b>
<b>Monthly Unit Rate per 1,000 gallons</b>	<b>\$7.04</b>

Similar to Alternative B1, the final Alternative B2 also has an administrative fixed charge and a unit rate per 1,000 gallons. The fixed charge is lower and therefore only collects 3% of total revenues, with the other 97% collected through the variable charges.

Table 4.4 – Alternative B2

	<b>FY12 Proposed Rates</b>
<b>Quarterly Fixed Charge per Bill</b>	<b>\$5.00</b>
<b>Monthly Fixed Charge per Bill</b>	<b>\$1.67</b>
<b>Quarterly Unit Rate per 1,000 gallons</b>	<b>\$7.25</b>
<b>Monthly Unit Rate per 1,000 gallons</b>	<b>\$7.25</b>

A detailed view of all sewer rate alternatives and rate projections throughout the planning period can be found on Schedules 15 and 16 of the Appendix to this report.

## 5. SAMPLE BILLS

The following tables present sample bills for various customers in Fiscal Year 12 under the current and projected sewer rates.

Table 5.1: Sample Quarterly Billed Customer Sewer Bills FY12

Quarterly Usage	FY11	FY12					
	Current Bill	Alternative A	% Change	Alternative B1	% Change	Alternative B2	% Change
3,000	\$17.73	\$22.39	26.3%	\$31.11	75.5%	\$26.75	50.9%
6,000	\$35.46	\$44.77	26.3%	\$52.23	47.3%	\$48.50	36.8%
9,000	\$53.19	\$67.16	26.3%	\$73.34	37.9%	\$70.25	32.1%
12,000	\$70.92	\$89.55	26.3%	\$94.45	33.2%	\$92.00	29.7%
15,000	\$88.65	\$111.93	26.3%	\$115.57	30.4%	\$113.75	28.3%
25,000	\$147.75	\$186.55	26.3%	\$185.95	25.9%	\$186.25	26.1%
50,000	\$295.50	\$373.11	26.3%	\$361.89	22.5%	\$367.50	24.4%
100,000	\$591.00	\$746.22	26.3%	\$713.78	20.8%	\$730.00	23.5%

Table 5.2: Sample Monthly Billed Customer Sewer Bills FY12

Quarterly Usage	FY11	FY12					
	Current Bill	Alternative A	% Change	Alternative B1	% Change	Alternative B2	% Change
50,000	\$295.50	\$373.11	26.3%	\$355.22	20.2%	\$364.17	23.2%
100,000	\$591.00	\$746.22	26.3%	\$707.11	19.6%	\$726.67	23.0%
150,000	\$886.50	\$1,119.33	26.3%	\$1,059.00	19.5%	\$1,089.17	22.9%
200,000	\$1,182.00	\$1,492.44	26.3%	\$1,410.90	19.4%	\$1,451.67	22.8%
400,000	\$2,364.00	\$2,984.88	26.3%	\$2,818.46	19.2%	\$2,901.67	22.7%
800,000	\$4,728.00	\$5,969.75	26.3%	\$5,633.58	19.2%	\$5,801.67	22.7%
1,000,000	\$5,910.00	\$7,462.19	26.3%	\$7,041.14	19.1%	\$7,251.67	22.7%
1,500,000	\$8,865.00	\$11,193.28	26.3%	\$10,560.05	19.1%	\$10,876.67	22.7%

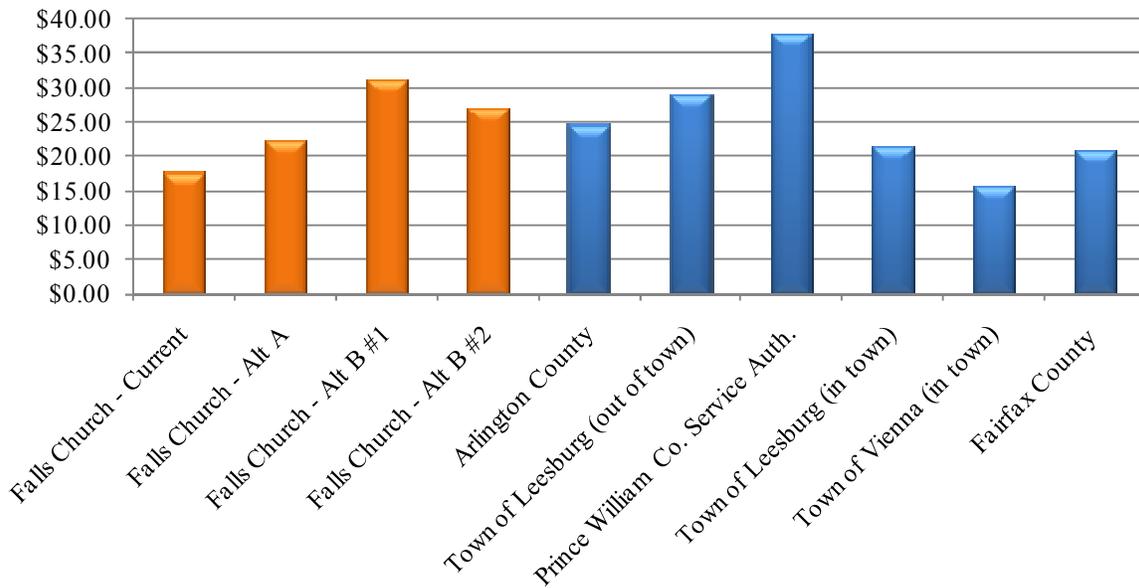
## 6. COMPARISONS

It may be useful for the City to compare sample bills of various local utilities with a bill calculated using proposed rates for the City. The following exhibits represent a comparison of a quarterly bill for customers that use 3,000 gallons, 15,000 gallons and 25,000 gallons per quarter. The usage amount chosen represent a small, average, and large user for Falls Church. The comparison is made between the City of Falls Church and 6 other utilities in the surrounding area. Exhibit 6.1 lists the most current rate schedule used to calculate the sample bills. (The most current rates were used in the comparison for FY12; the bills may not reflect unknown water and sewer rate increases within the comparison utilities).

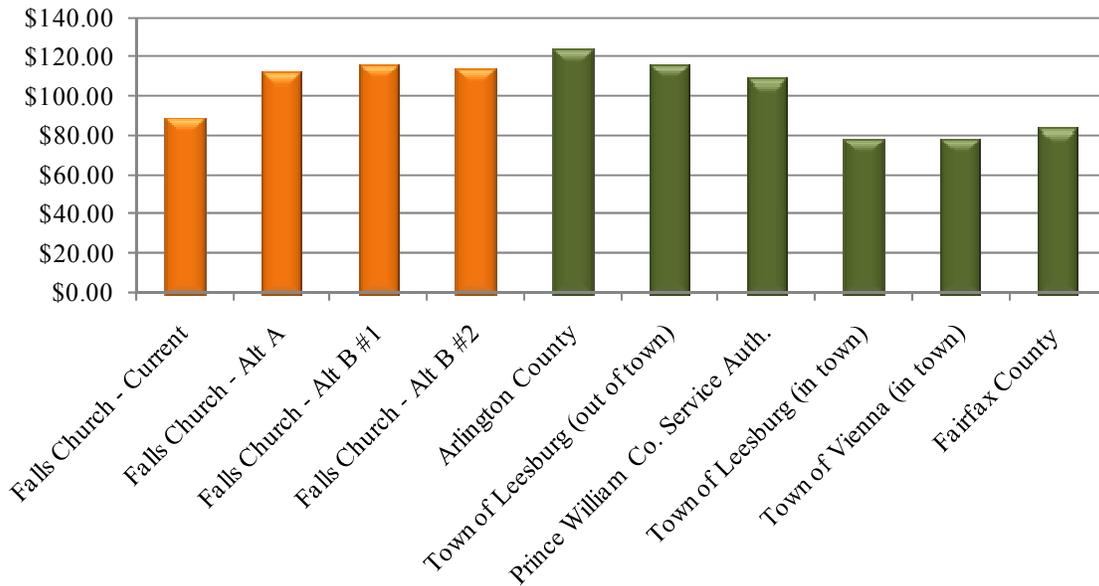
Table 6.1 – Comparison Rate Schedule

Utility	Fixed Charge	Commodity Charge	Peak Use Charge	Peak Allowance
Arlington County		\$7.78	n/a	n/a
Town of Leesburg (out of town)		\$6.91		
PWCSA		\$5.60		
Town of Leesburg (in town)	\$7.20	\$4.55		
Town of Vienna (in town)		\$4.77	\$2.00	30%
Fairfax County		\$4.50		

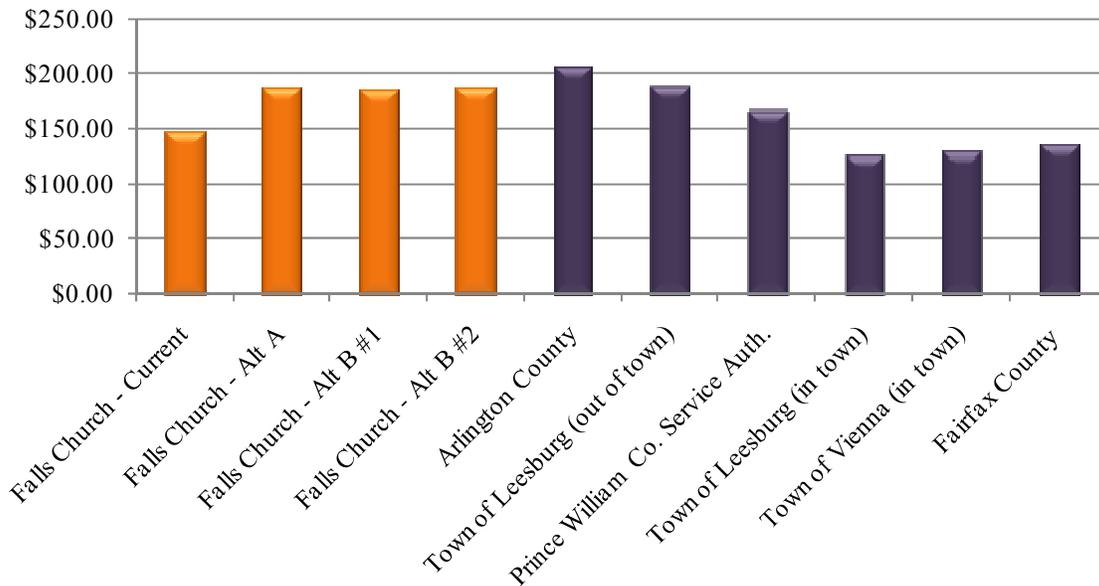
*Exhibit 6.1 – Residential Quarterly Sewer Bill (3,000 gallons)*



*Exhibit 6.2 – Residential Quarterly Sewer Bill (15,000 gallons)*



*Exhibit 6.3 – Residential Quarterly Sewer Bill (25,000 gallons)*



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

## 7. AVAILABILITY FEES

As part of this study, the City’s current Sewer Availability Fee and Availability Fee methodology were reviewed. This section of the report summarizes the findings and recommendations of that review.

Availability fees are calculated based upon what it actually costs a utility to build capacity. The fees are not based upon annual cash needs but rather on the actual cost of capacity. Therefore, the annual cash flow needs related to capital projects may not precisely match the annual revenues from availability fees. In addition, availability fees should be reviewed internally annually. The current sewer availability fee is \$6,700 per unit for a single family dwelling. The current fee for an apartment or condominium building is \$5,630 per unit, which is 80% of the single family charge. A unit is defined as a living space that is used as a permanent address. While there are a variety of methods for calculating assessment fees to serve a customer in a sewer system, most methods of calculating these sewer fees fall into two broad categories:

- *Average cost of capacity, Equity By-In Method* is tied to the historical cost of the system plus the unknown costs of the utility’s Capital Improvement Program. The average cost of capacity method is appropriate for mature utilities that have excess capacity in the sewer system.

$$\frac{\text{Cost (\$) of Existing Capacity} + \text{Cost (\$) of Planned Capacity}}{\text{Total Capacity (Gallons per day)}} = \text{Cost (\$) per Gallon per day}$$

- *Next increment of capacity* is used to calculate the costs of serving new customers in a utility that has little or no capacity and is being heavily stressed by growth. This approach estimates that it will cost to add capacity to serve new customers.

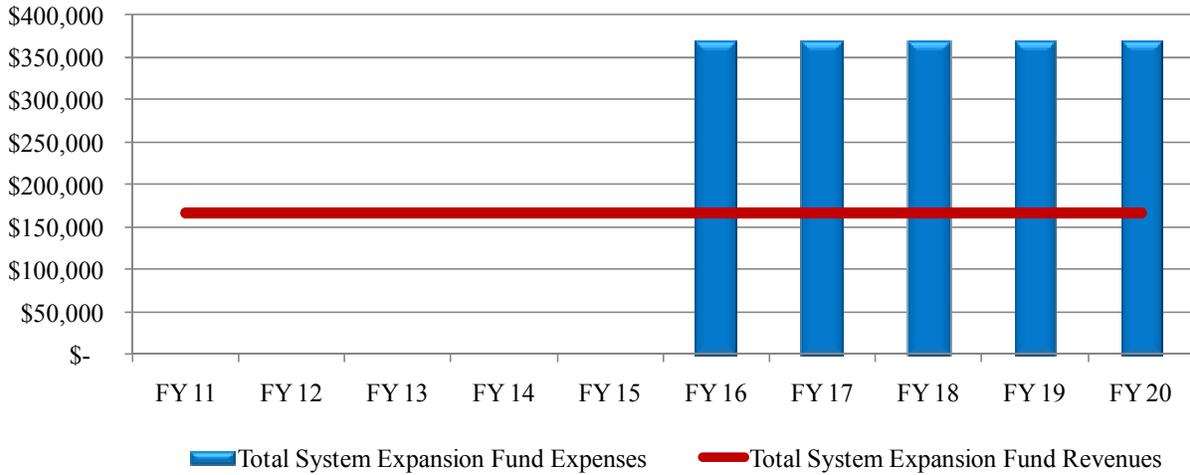
$$\frac{\text{Cost (\$) of Planned Capacity}}{\text{Planned Capacity (Gallons per day)}} = \text{Cost (\$) per Gallon per day}$$

In addition to broad categories, combinations of the methods are often utilized based upon the status of capacity within the sewer system.

A detailed analysis of alternative methodologies for Availability Fees is found on Schedule 19 of the Appendix to this report. Based on this analysis, we find the current Availability Fee is adequate and the methodology used for charging the fee is reasonable and adequate.

Exhibit 7.1 presents the System Expansion Fund Cash Flow over the next 10 years. As noted in the assumptions to this study, this assumes that 25 new units will connect to the City’s Sewer system each year.

Exhibit 7.1 – System Expansion Fund Cash Flow



There will be a small cumulative deficit of about \$9,500 at the end of the planning period. However, the addition of only 25 new units per year was used to project future revenues. This is a very low and conservative projection as the City will potentially see a huge upswing in growth due to the developments at Tyson’s Corner. If this development does occur, the cash flow will look much different. However, at this time, due to current economic conditions, we believe a conservative approach to be appropriate.

## **8. TOTAL SYSTEMS CASH FLOW**

This section of the report is intended to provide a birds-eye look at the projected financial health and stability of the City of Falls Church Sewer Enterprise Fund. As discussed in the background section of this report, for this study the City's Sewer Fund has been analyzed via two components; Operating sub-fund and the System Expansion sub-fund. The Operating sub-fund includes all costs associated with the daily operating and maintenance associated with the existing sewer system; i.e. all costs associated with the existing customer base. Revenues from the user fees, as well as other miscellaneous fees (e.g., carrying charges, interest income, etc.), are used to offset the expenses of the Operating sub-fund. The System Expansion sub-fund includes costs associated with serving new customers and is offset by revenues collected via sewer availability fees paid for by new customers when they connect to the sewer system.

The Operating Fund was evaluated first. The revenue stream for this fund is derived from Sewer Service Charges and all miscellaneous other revenues. Recommendations for user fee rate structure adjustments and increases were developed to assure the continued health and stability of the Operating Fund.

The second part of the financial health and stability of the City is the System Expansion Fund. Similar to the Operating Fund, this fund was evaluated and alternatives were calculated for sewer availability fees. As discussed in the previous section, it is recommended to keep the sewer availability fee at its current level and charged via the current methodology.

Combining the cash flow results of the Operating sub-fund and the System Expansion sub-fund into a Total System Cash Flow provides an overall view of the City's projected financial health over the planning period.

### **8.1 TOTAL SYSTEM CASH FLOW**

Exhibit 8.1 shows the Operating Fund Cash Flow by four major expense types: Operating Expenses, Debt Service, Capital Outlay and Contributions to Reserves.

*Exhibit 8.1 – Operating Fund Cash Flow*

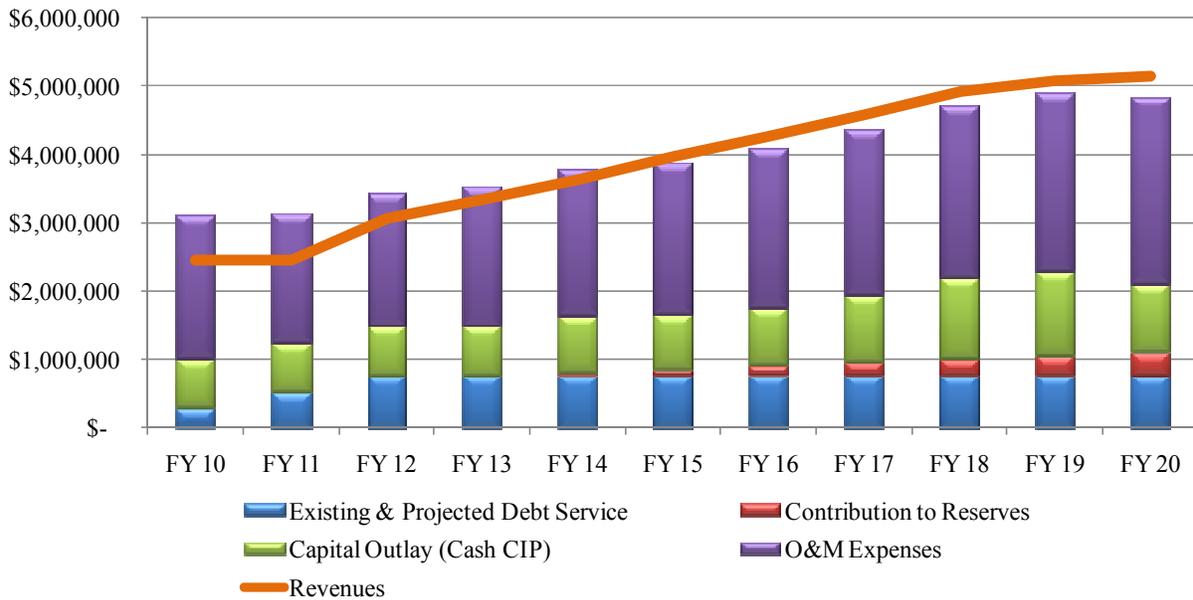
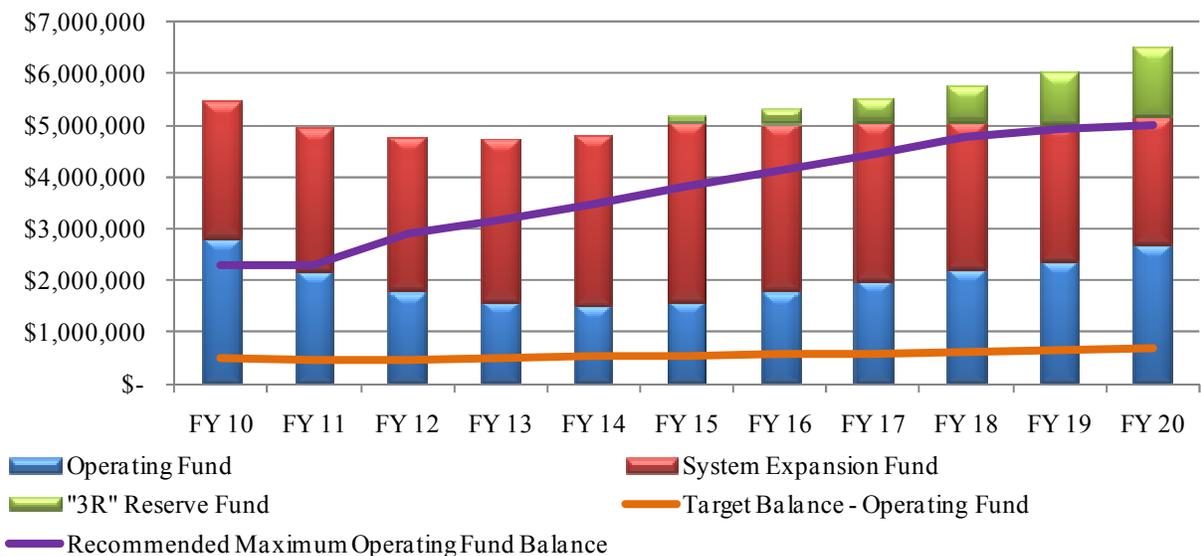


Exhibit 8.1 shows that by the end of the planning period, revenues exceed annual operating and capital expenses. This assumes that all the recommendations made to the sewer user rates are accepted and implemented. This also takes into account the use of the existing cash balance in the operating fund to offset shortfalls. Shortfalls derive from a phase-in approach to user fees so rate shock will not occur in the first year.

Combining the two funds illustrates the total system available cash as compared to the total system cash target balance over the planning period. The results of this comparison are shown in Exhibit 8.2.

*Exhibit 8.2 – Total System Cash Balance*



Under the proposed financial plan recommended in this report, the operating fund’s available cash balances will meet or exceed the minimum operating fund target balance. The minimum target is set at 90 days (25%) of the operating budget as discussed earlier in the report.

**8.2 DEBT SERVICE COVERAGE**

As shown in Exhibit 8.1, debt service held by the City ranges from 9% to 16% of the total annual revenue requirements over the planning period. Debt service plus additional commitments for projected debt service range from 9% – 20% over the planning period. An industry-wide rule of thumb is to keep annual debt service expenses less than or equal to 30% of annual revenue requirements.

The debt service held by the City is required to meet debt service coverage requirements by the Virginia State Revolving Loan Fund (VRA). This requires at least a minimum debt service coverage ratio of about 1.15; i.e. Net Revenues available for debt service must exceed the required debt service payment amount by 15%.

Table 8.1 – Results of Bond Coverage Tests

	<b>FY11</b>	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>
Coverage Test (Must be equal or greater to 1.15)	<b>1.35</b>	<b>1.59</b>	<b>1.82</b>	<b>2.08</b>

The results presented in the table above show the City exceeds the ratio required by the bond coverage test over the planning period.

## 9. SUMMARY/RECOMMENDATIONS

This document was prepared to summarize the work performed by the Municipal & Financial Services Group (MMSG) during the sewer cost of service study authorized by the City of Falls Church.

The tables and charts shown in this report were created via the Financial Planning and Cost of Service Model attached as the Appendix to the report. The model was built using Microsoft Excel software and looks at a projection period of 10 years (FY11 – FY20). The City of Falls Church is the owner of the financial model and this model can be used as a helpful planning tool for annual review of the Operating and System Expansion Funds.

This portion of the report summarizes the findings and conclusions developed during the course of the study.

The following summary points were developed during the course of the study.

- The City has historically been funding capital improvement projects with existing cash balance (reserves). Assuming continued use, available cash reserves will deplete to below the recommended target balance and eventually run out completely.
- The increases in treatment costs charged by the Fairfax and Arlington Wastewater Treatment Plants are one of the reasons for the increased costs of operating the sewer system. Treatment costs account for over 70% of the City's sewer fund operating and maintenance expenses. Based on the best information available at this time, it is assumed that the City will see 5% increases in costs every year for the planning period.
- Based on a high level review of the sewer system, an increase in the amount of sewer rehabilitation is recommended.
- Based on projected sewer usage, the City's current sewer rates will not produce adequate revenues to cover the sewer system revenue requirements in FY12 or during subsequent years.
- The annual shortfalls under existing rates will exhaust the City's Sewer Fund cash balance in FY14.

The following are recommendations to the current policies and existing rate structure for Falls Church Sewer fund.

- In addition to the rates for Fiscal Year 2010, we recommend that the City adopt the revenue increases outlined below for sewer over the next four years to ease the burden of the rate increases. The five-year implementation allows for minimizing the one time "rate shock" caused by larger one-time increases.

Table 9.1 – Recommended Financial Plan

	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>
Sewer System Revenue Increase	26.9%	9.3%	9.3%	9.8%	7.8%

- We recommend that the City adopt the following sewer rates for FY12 through FY16 to coincide with the recommended financial plan. The sewer rate structure consists of an administrative fixed charge and a unit rate per 1,000 gallons. The fixed charge is lower and therefore only collects 3% of total revenues, with the other 97% collected through the variable charges.

Table 9.2 – Proposed FY2012 Sewer Rates

	<b>Proposed Rates</b>				
	<b>FY12</b>	<b>FY13</b>	<b>FY14</b>	<b>FY15</b>	<b>FY16</b>
<b>Quarterly Fixed Charge per Bill</b>	<b>\$5.00</b>	<b>\$5.00</b>	<b>\$5.00</b>	<b>\$6.00</b>	<b>\$6.00</b>
<b>Monthly Fixed Charge per Bill</b>	<b>\$1.67</b>	<b>\$1.67</b>	<b>\$1.67</b>	<b>\$2.00</b>	<b>\$2.00</b>
<b>Quarterly Unit Rate per 1,000 gallons</b>	<b>\$7.25</b>	<b>\$7.91</b>	<b>\$8.62</b>	<b>\$9.40</b>	<b>\$10.10</b>
<b>Monthly Unit Rate per 1,000 gallons</b>	<b>\$7.25</b>	<b>\$7.91</b>	<b>\$8.62</b>	<b>\$9.40</b>	<b>\$10.10</b>

- We recommend discontinuing the City’s policy of using available cash balance to fund the annual capital investment in the sewer system and instead fund capital projects through user fees.
- We recommend the City change the current policy of having 10% of Revenues in a reserve for the operating fund to 25% of O&M Expenses. This will create a more stable target as revenues can fluctuate from year to year.
- We recommend the City increases its sewer rehabilitation program currently in place at \$400k/year to \$800k/year. The implementation would be a gradual process of \$50k incremental increases starting in FY2014 until the target \$800k/year was reached.