TASK IV: ANALYSIS OF MILLBROOK SEWER AND WATER SYSTEM CONSUMPTION CHARGES AND SEWER CAPITAL ASSESSMENTS

PREPARED FOR:

VILLAGE OF MILLBROOK, NY

PREPARED BY:

R. S. LYNCH & COMPANY

RSL

This document was prepared with funds provided by the New York State Department of State under the Local Government Efficiency Grant Program.

June 9, 2011

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Executive Summary

The purpose of this report is to compare the current Village of Millbrook sewer and water consumption charge structures to other municipally owned sewer and water systems located in Dutchess County, NY and identify the advantages and disadvantages of the various sewer and water funding options. Another important goal of this report is to provide the Village with a financial and economic analysis of its sewer and water systems under current conditions as well as under various potential expansion assumptions.

The Village bills users of the sewer and water systems based on the amount of water they consume using uniform volumetric consumption charges. Additionally, the Village also funds capital expenditures incurred by the Village sewer system with a Sewer Capital Assessment. There are numerous ways in which a municipality can fund the capital and operating expenses of a municipally owned sewer or water system. A municipality can raise some or all of the required funds through various types of taxes, service fees and/or consumption charges. A service fee is a fixed fee per billing period which is charged regardless of consumption level. A consumption charge is a price assessed per unit of water consumed. The types of units used by municipalities are typically cubic feet or gallons.

In order to determine how other municipalities located in Dutchess County are charging users of their sewer and water systems we contacted each municipality located in the County and requested several items of data. We received information from every municipality that owns a sewer or water system in Dutchess County, although not all municipalities provided complete information. Some municipalities did not provide complete information due to complexity of rate system funding, such as tax subsidy issues, or due to the multitude of sewer or water systems which the municipality owns and the corresponding amount of time it would take a municipal employee to provide the requested information.

The results of our survey indicated that 42% of the identified water systems in Dutchess County use a uniform volumetric consumption charge structure, including the Village of Millbrook. Our survey also indicated that 38% of the identified sewer systems in Dutchess County use a uniform volumetric consumption charge structure, including the Village of Millbrook. The uniform volumetric consumption charge structure was the most prevalent type of consumption charge used in Dutchess County for both sewer and water systems.

Village of Millbrook water system customers located within the Village pay less than the average municipal water system user in Dutchess County. However, users located outside the Village pay more than the average municipal water system user in Dutchess County since their rate is twice that of Village residents. The fact that residents located within the Village pay less than the municipal average is impressive considering the fact that the Village funds all system capital expenditures with consumption charges and none with taxes which typically would result in higher system consumption charges.

Village of Millbrook sewer system customers pay slightly higher consumption charge than the average municipal sewer system user in Dutchess County. It is important to note that capital improvements made to the Village's sewer system are funded through a Sewer Capital Assessment and many of the municipal systems in Dutchess County which make up the average fund capital improvements through consumption charges. Typically, if a municipality funds capital expenditures through consumption charges, it will have higher consumption charge than one that does not. If the Village's Sewer Capital Assessment was included and compared to municipalities which pay capital expenses through consumption charges, the Village consumption charge would appear higher.

In order to analyze how certain capital improvements and system expansions would affect the cost to an average household connected to the Village sewer and water systems it was necessary to first determine what the expenses and revenues would be of the current systems if no special improvements or expansions were made, referred to as "Status Quo" throughout the report. More simply, the status quo scenario details the capital and operating expenses required to keep the current sewer and water systems operating and the revenues required to fund them.

Analysis of the status quo scenario estimated that the projected 20 year average consumption charge for water system users located within the Village will be $4.60 per 1,000 gallons. Our analysis also indicated that the projected 20 year average consumption charge for water system users located outside the Village will be $9.20 per 1,000 gallons. These projected 20 year averages result in a projected 20 year average household bill of $589 for households located within the Village and $1,177 for households located outside the Village.

Analysis of the status quo scenario estimated that the projected 20 year average consumption charge for sewer system users will be $8.34 per 1,000 gallons for all households connected to the system. Our analysis also indicated that the projected 20 year average Sewer Capital Assessment for households connected to the system will be $95.47. These projected 20 year averages result in a projected 20 year average household bill of $1,162.92 for households connected to the system.

A potential expansion area analyzed in this report is the Nine Partners Lane expansion area. The Nine Partners Lane expansion area to be potentially served by the Village water system is comprised of 39 residential parcels along Nine Partners Lane, Linden Lane and Linden Court. It consists of approximately 149 acres and is located entirely within the Village. Analysis of the status quo water system with the Nine Partners Lane expansion area estimated that the projected 20 year average consumption charge for water system users located within the Village will be $5.66 per 1,000 gallons. Our analysis also indicated that the projected 20 year average consumption charge for water system users located outside the Village will be $11.33 per 1,000 gallons. These projected 20 year averages result in a projected 20 year average household bill of $725 for households located within the Village and $1,450 for households located outside the Village. This is more than what the projected 20 year average household bill is under the status quo scenario.

The Nine Partners Lane expansion area to be potentially served by the Village sewer system is comprised of 33 residential parcels along Nine Partners Lane, Linden Lane and Linden Court. It consists of approximately 130 acres and is located entirely within the Village. Analysis of the status quo scenario with the Nine Partners Lane expansion area estimated that the projected 20 year average consumption charge for sewer system users will be $8.50 per 1,000 gallons for all households connected to the system. Our analysis also indicated that the projected 20 year average Sewer Capital Assessment for households connected to the system will be $144.54. These projected 20 year averages result in a projected 20 year average household bill of $1,232 for households connected to the system. This is more than what the projected 20 year average household bill is under the status quo scenario.

The former Bennett College expansion area to be potentially served by the Village water system is comprised of 95 residential parcels, consisting of duplexes and single family homes on the former Bennett College site. The former Bennett College site is approximately 27 acres and is located entirely within the Village. Analysis of the status quo water system with the former Bennett College site expansion area estimated that the projected 20 year average consumption charge for water system users located within the Village will be $4.30 per 1,000 gallons. Our analysis also indicated that the projected 20 year average consumption charge for water system users located outside the Village will be $8.60 per 1,000 gallons. These projected 20 year averages result in a projected 20 year average household bill of $551 for households located within the Village and $1,101 for households located outside the Village. This is less than what the projected 20 year average household bill is under the status quo scenario.

The former Bennett College expansion area to be potentially served by the Village sewer system is comprised of 95 residential parcels, consisting of duplexes and single family homes on the former Bennett College site. The former Bennett College site is approximately 27 acres and is located entirely within the Village. Analysis of the status quo scenario with the former Bennett College site expansion area estimated that the projected 20 year average consumption charge for sewer system users will be $7.90 per 1,000 gallons for all households connected to the system. Our analysis also indicated that the projected 20 year average Sewer Capital Assessment for households connected to the system will be $88.53. These projected 20 year averages result in a projected 20 year average household bill of $1,099 for households connected to the system. This is less than what the projected 20 year average household bill is under the status quo scenario.

The Rodrigo Knolls expansion area to be potentially served by the Village water system is comprised of 31 residential parcels along Rodrigo Knolls, Rodrigo Court, Stanford Road and Sharon Turnpike. It consists of approximately 50 acres and is located entirely outside of the Village. Analysis of the status quo water system with the Rodrigo Knolls expansion area estimated that the projected 20 year average consumption charge for water system users located within the Village will be $4.94 per 1,000 gallons. Our analysis also indicated that the projected 20 year average consumption charge for water system users located outside the Village will be $9.88 per 1,000 gallons. These projected 20 year averages result in a projected 20 year average household bill of $633 for households located within the Village and $1,265 for households located outside the Village. This is more than what the projected 20 year average household bill is under the status quo scenario.

The Rodrigo Knolls expansion area to be potentially served by the Village sewer system is comprised of 23 residential parcels along Rodrigo Knolls, Linden Court and Stanford Road. It consists of approximately 37 acres and is located entirely outside the Village. Analysis of the status quo scenario with the Rodrigo Knolls expansion area estimated that the projected 20 year average consumption charge for sewer system users will be $8.50 per 1,000 gallons for all households connected to the system. Our analysis also indicated that the projected 20 year average Sewer Capital Assessment for households connected to the system will be $137.00. These projected 20 year averages result in a projected 20 year average household bill of $1,225 for households connected to the system. This is more than what the projected 20 year average household bill is under the status quo scenario.

The Horseshoe expansion area to be potentially served by the Village water system is comprised of a day camp area and 136 residential parcels along Horseshoe Road, College Lane, South Road, Oak Summit Road, Route 82 and Route 343. It consists of approximately 452 acres and is located entirely outside of the Village. Analysis of the status quo water system with the Horseshoe expansion area estimated that the projected 20 year average consumption charge for water system users located within the Village will be $5.62 per 1,000 gallons. Our analysis also indicated that the projected 20 year average consumption charge for water system users located outside the Village will be $11.25 per 1,000 gallons. These projected 20 year averages result in a projected 20 year average household bill of $720 for households located within the Village and $1,440 for households located outside the Village. This is more than what the projected 20 year average household bill is under the status quo scenario.

The Horseshoe expansion area to be potentially served by the Village sewer system is comprised of 72 residential parcels along Horseshoe Road and South Road. It consists of approximately 211 acres and is located entirely outside the Village. Analysis of the status quo scenario with the Horseshoe expansion area estimated that the projected 20 year average consumption charge for sewer system users will be $8.89 per 1,000 gallons for all households connected to the system. Our analysis also indicated that the projected 20 year average Sewer Capital Assessment for households connected to the system will be $233.63. These projected 20 year averages result in a projected 20 year average household bill of $1,371 for households connected to the system. This is more than what the projected 20 year average household bill is under the status quo scenario.

The former County Infirmary expansion area to be potentially provided with additional service by the Village water system covers approximately 95 acres and is located outside of the Village, in the Town of Washington. The Village water system currently services the existing building but the County is proposing to expand the existing building by 8,000 square feet of office space which would ultimately increase its water demand. Analysis of the status quo water system with the former County Infirmary site expansion area estimated that the projected 20 year average consumption charge for water system users located within the Village will be $4.57 per 1,000 gallons. Our analysis also indicated that the projected 20 year average consumption charge for water system users located outside the Village will be $9.14 per 1,000 gallons. These projected 20 year averages result in a projected 20 year average household bill of $585 for households

located within the Village and $1,170 for households located outside the Village. This is less than what the projected 20 year average household bill is under the status quo scenario.

The former County Infirmary expansion area to be potentially provided with additional service by the Village sewer system covers approximately 95 acres and is located outside of the Village, in the Town of Washington. The Village currently services the existing building but the County is proposing to expand the existing building by 8,000 square feet of office space which would ultimately increase its sewer demand. Analysis of the status quo scenario with the former County Infirmary site expansion area estimated that the projected 20 year average consumption charge for sewer system users will be $8.33 per 1,000 gallons for all households connected to the system. Our analysis also indicated that the projected 20 year average Sewer Capital Assessment for households connected to the system will be $94.84. These projected 20 year averages result in a projected 20 year average household bill of $1,160 for households connected to the system. This is less than what the projected 20 year average household bill is under the status quo scenario.

Expansion Area	Estimated Total Demand (GPD)	Estimated Demand at 80% Participation (GPD)	Estimated Maximum Probable Capital Cost
Nine Partners Lane Area: Water	13,650	10,850	$1,215,000
Nine Partners Lane Area: Sewer	11,550	9,100	$790,000
Former Bennett College Site: Water	30,000	NA	$0
Former Bennett College Site: Sewer	30,000	NA	$1,080,000
Rodrigo Knolls Area: Water	10,850	8,400	$648,000
Rodrigo Knolls Area: Sewer	8,050	6,300	$675,250
Horseshoe Area: Water	48,600	38,800	$2,706,000
Horseshoe Area: Sewer	25,200	19,950	$2,353,400
Former County Infirmary Site: Water	800	NA	$0
Former County Infirmary Site: Sewer	800	NA	$135,000

Introduction

Currently, the Village of Millbrook's sewer and water system infrastructure serves most of the Village's 1,400 residents and a portion of the Town of Washington's 4,700 residents, in addition to the former County infirmary. More specifically, as of the summer of 2010, there were a total of 696 different hookups to the Village water system. Of the 696 hookups, 80 were from the Town. There were also a total of 607 different hookups to the Village sewer system. Of the 607 different hookups to the Village sewer system, 33 were from the Town. Historically, expansions and changes to the Village's water and sewer systems have occurred without any systematic or long-term planning or inter-municipal coordination.

The Village bills users of the systems based on the amount of water they consume using uniform volumetric consumption charges. Additionally, the Village also funds capital expenditures incurred by the Village sewer system with a Sewer Capital Assessment. These are just a two examples of the numerous ways in which a municipality can fund the capital and operating costs of a sewer or water system. The purpose of this report is to compare the current Village sewer and water rate consumption charges to other municipally owned sewer and water systems located in Dutchess County, NY and identify the advantages and disadvantages of the various sewer and water funding options. In order to obtain this information we conducted a phone survey and requested information from every municipality located in Dutchess County which owns a sewer or water system. We also obtained information from the Dutchess County Water and Wastewater Authority (DCWWA) regarding the rate structures of 9 water and 3 sewer districts which they operate in Dutchess County.

Another important goal of this report is to provide the Village with a financial and economic analysis of its sewer and water systems under current conditions as well as under various potential expansion assumptions. This report is designed to assist the Village in understanding how various potential system expansions will affect current system users and the average cost which they pay per household. Therefore, in addition to comparing the Village's current system to other municipal systems in Dutchess County, the Village should use this report as a policy making tool when it comes time to evaluate future rate changes and potential system expansions.

Rate Structure Survey

The Village bills users of the systems based on the amount of water they consume using uniform volumetric consumption charges. Additionally, the Village also funds capital expenditures incurred by the Village sewer system with a Sewer Capital Assessment. There are numerous ways in which a municipality can fund the capital and operating expenses of a municipally owned sewer or water system. A municipality can raise some or all of the required funds through various types of taxes, service fees and/or consumption charges. A service fee is a fixed fee per billing period which is charged regardless of consumption level. A consumption charge is a price assessed per unit of water consumed. The types of units used by municipalities are typically cubic feet or gallons. The following types of consumption charge structures are common in the industry; however, many variations exist within some of the categories which create hybrid rate structures:

Flat Rate Structure- A customer is charged a fee for sewer or water services which is fixed and does not vary with level of usage.

Uniform Volumetric Charge- A customer is charged a fixed price per unit of water consumed which does not vary with the level of usage.

Decreasing Block Rates- The unit price for water consumed decreases as the volume consumed increases. The structure consists of a series of "price blocks," which are set quantities of water sold at a given unit price. Units are typically 100 cubic feet or 1,000 gallons but may vary between municipalities. Additionally, the number of "price blocks" utilized between municipalities may also vary greatly. Decreasing Block Rate structures are typically used to accommodate high volume consumers by providing a discount to those that consume large quantities of water.

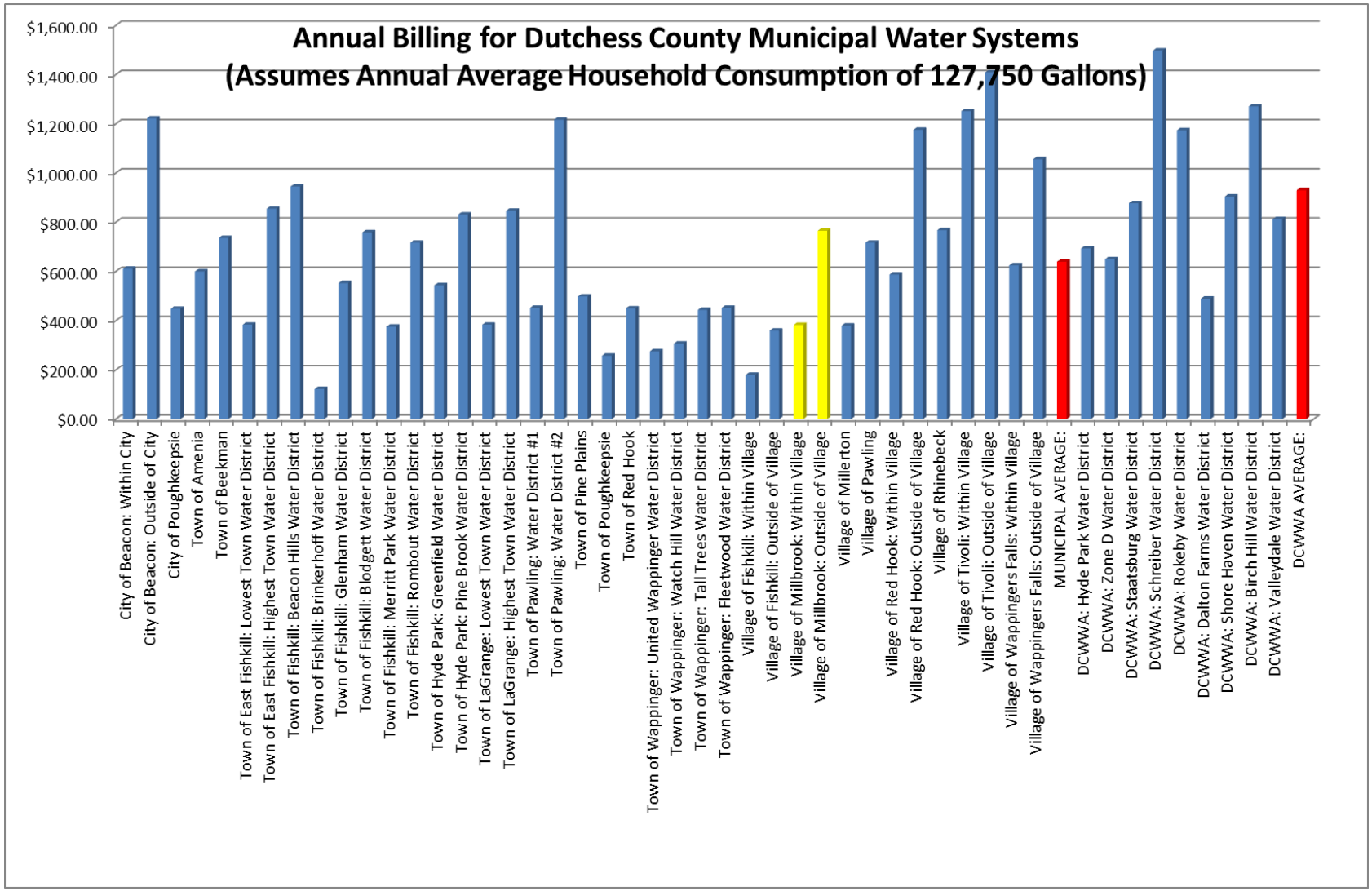
Increasing Block Rates- The unit price for water consumed increases as the volume consumed increases. The structure consists of a series of "price blocks," which are set quantities of water sold at a given unit price. Units are typically 100 cubic feet or 1,000 gallons but may vary between municipalities. Additionally, the number of "price blocks" utilized between municipalities may also vary greatly. Increasing Block Rate structures are typically used to charge higher unit prices to customers who place a higher demand on the water supply and to charge lower unit prices to customers who use average or below-average amounts of water. Therefore, Increasing Block Rate structures encourage water conservation and reward customers which effectively conserve the amount of water they consume.

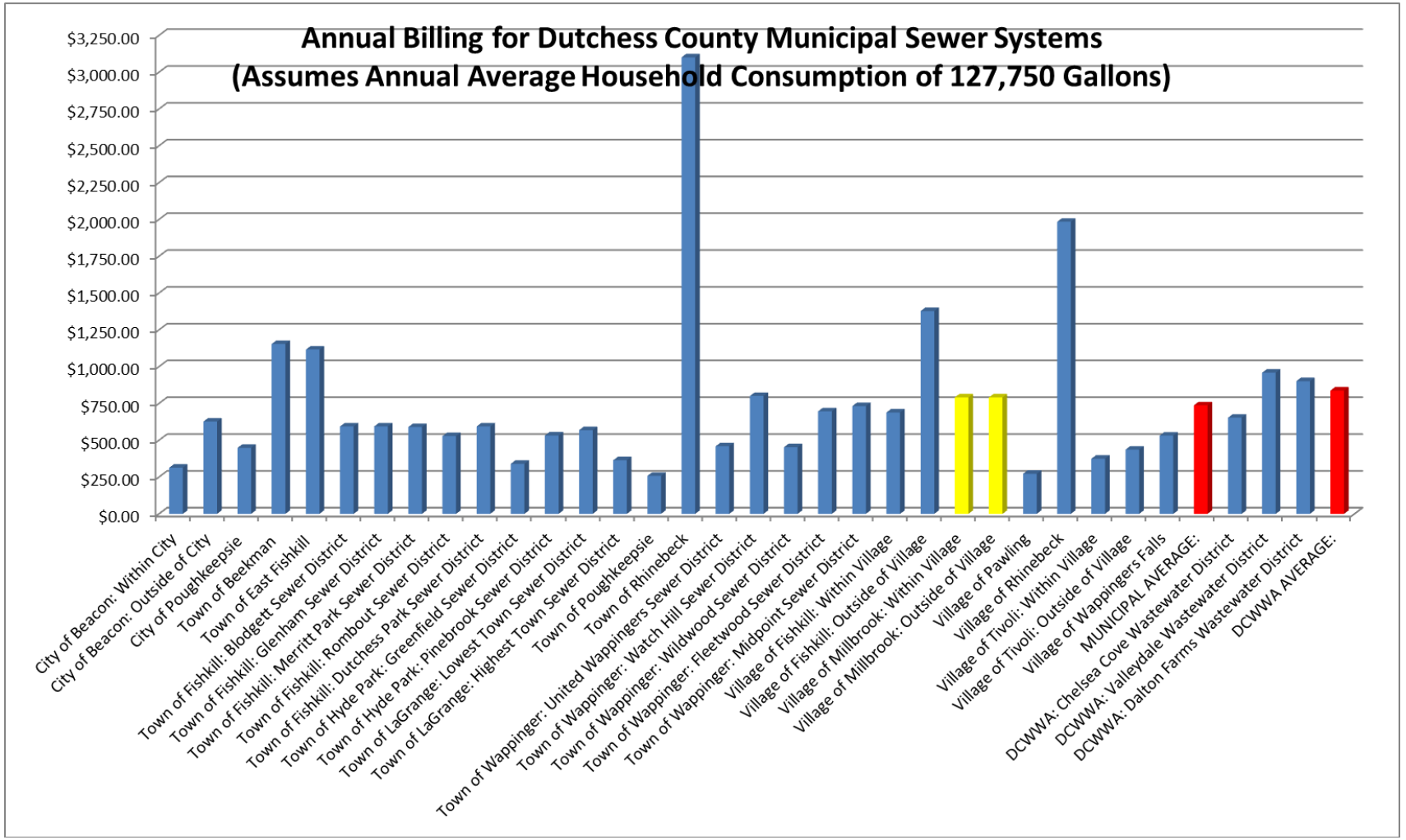
In order to determine how other municipalities located in Dutchess County are charging users of their sewer and water systems we contacted each municipality located in the County and requested several items of data. Each municipality that acknowledged that they did own a sewer or water system was asked the following questions:

1. How often do you bill your customers?

2. What type of rate structure do you utilize?
3. What are your rates?
4. Do you charge any additional service charges?
5. Do you a charge a different rate to commercial accounts?
6. Do you charge a different rate to elderly?
7. Do you charge a new user a “Hookup Fee”?

We received information from every municipality that owns a sewer or water system in Dutchess County, although not all municipalities provided complete information. Some municipalities did not provide complete information due to complexity of rate system funding, such as tax subsidy issues, or due to the multitude of sewer or water systems which the municipality owns and the corresponding amount of time it would take a municipal employee to provide the requested information. Therefore, our survey did not capture rate structure data from every municipally owned sewer or water system in Dutchess County nor does it go into detail about how different municipalities may fund their sewer or water systems with property taxes such as the Village of Millbrook does with its Sewer Capital Assessment. However, the results of our survey, as provided in Appendix A, does provide a comprehensive example of different municipal sewer and water rate structures utilized throughout Dutchess County as well as how the Village of Millbrook compares to them. The following graphs display what an average household serviced by the Village sewer and water systems would pay in consumption charges on an annual basis assuming annual consumption of 127,750 gallons.


Annual Billing for Dutchess County Municipal Water Systems
(Assumes Annual Average Household Consumption of 127,750 Gallons)
$1,600.00
$1,400.00
$1,200.00
$1,000.00
$800.00
$600.00
$400.00
$200.00
$0.00
City of Beacon: Within City
City of Beacon: Outside of City
City of Poughkeepsie
Town of Amenia
Town of Beekman
Town of East Fishkill: Lowest Town Water District
Town of East Fishkill: Highest Town Water District
Town of Fishkill: Beacon Hills Water District
Town of Fishkill: Brinkerhoff Water District
Town of Fishkill: Glenham Water District
Town of Fishkill: Blodgett Water District
Town of Fishkill: Merritt Park Water District
Town of Fishkill: Rombout Water District
Town of Hyde Park: Greenfield Water District
Town of Hyde Park: Pine Brook Water District
Town of LaGrange: Lowest Town Water District
Town of LaGrange: Highest Town Water District
Town of Pawling: Water District #1
Town of Pawling: Water District #2
Town of Pine Plains
Town of Poughkeepsie
Town of Red Hook
Town of Wappinger: United Wappinger Water District
Town of Wappinger: Watch Hill Water District
Town of Wappinger: Tall Trees Water District
Town of Wappinger: Fleetwood Water District
Village of Fishkill: Within Village
Village of Fishkill: Outside of Village
Village of Millbrook: Within Village
Village of Millbrook: Outside of Village
Village of Millerton
Village of Pawling
Village of Red Hook: Within Village
Village of Red Hook: Outside of Village
Village of Rhinebeck
Village of Tivoli: Within Village
Village of Tivoli: Outside of Village
Village of Wappingers Falls: Within Village
Village of Wappingers Falls: Outside of Village
MUNICIPAL AVERAGE:
DCWWA: Hyde Park Water District
DCWWA: Zone D Water District
DCWWA: Staatsburg Water District
DCWWA: Schreiber Water District
DCWWA: Rokeby Water District
DCWWA: Dalton Farms Water District
DCWWA: Shore Haven Water District
DCWWA: Birch Hill Water District
DCWWA: Valleydale Water District
DCWWA AVERAGE:


Annual Billing for Dutchess County Municipal Sewer Systems
(Assumes Annual Average Household Consumption of 127,750 Gallons)
$3,250.00
$3,000.00
$2,750.00
$2,500.00
$2,250.00
$2,000.00
$1,750.00
$1,500.00
$1,250.00
$1,000.00
$750.00
$500.00
$250.00
$0.00
City of Beacon: Within City
City of Beacon: Outside of City
City of Poughkeepsie
Town of Beekman
Town of East Fishkill
Town of Fishkill: Blodgett Sewer District
Town of Fishkill: Glenham Sewer District
Town of Fishkill: Merritt Park Sewer District
Town of Fishkill: Rombout Sewer District
Town of Fishkill: Dutchess Park Sewer District
Town of Hyde Park: Greenfield Sewer District
Town of Hyde Park: Pinebrook Sewer District
Town of LaGrange: Lowest Town Sewer District
Town of LaGrange: Highest Town Sewer District
Town of Poughkeepsie
Town of Rhinebeck
Town of Wappinger: United Wappingers Sewer District
Town of Wappinger: Watch Hill Sewer District
Town of Wappinger: Wildwood Sewer District
Town of Wappinger: Fleetwood Sewer District
Town of Wappinger: Midpoint Sewer District
Village of Fishkill: Within Village
Village of Fishkill: Outside of Village
Village of Millbrook: Within Village
Village of Millbrook: Outside of Village
Village of Pawling
Village of Rhinebeck
Village of Tivoli: Within Village
Village of Tivoli: Outside of Village
Village of Wappingers Falls
MUNICIPAL AVERAGE:
DCWWA: Chelsea Cove Wastewater District
DCWWA: Valleydale Wastewater District
DCWWA: Dalton Farms Wastewater District
DCWWA AVERAGE:

MUNICIPAL WATER SYSTEM SURVEY

As demonstrated on Page 11, Village of Millbrook water system customers located within the Village pay less than the average municipal water system user in Dutchess County. However, users located outside the Village pay more than the average municipal water system user in Dutchess County since their rate is twice that of Village residents. The fact that residents located within the Village pay less than the municipal average is impressive considering the fact that the Village funds all system capital expenditures with consumption charges and none with taxes which typically would result in higher system consumption charges.

Furthermore, it is important to note that just because a water system has a high consumption charge does not necessarily mean that the charge funds capital improvement expenses. For example, the Schreiber Water District has the highest reported annual consumption charge out of all of the identified water systems and the consumption charge does not fund expenditures made for capital improvements to the system. These are funded through capital assessment taxes. One explanation as to why the Schreiber District annual consumption charge is so high is due to the number of connections to the system. Fewer connections to a system typically result in higher annual consumption charges per household since fixed costs are spread out over fewer users. The Schreiber Water District has fewer than 50 connections.

The following Table identifies the consumption charge structures used by each of the 48 different water systems surveyed. For purposes of this analysis, we have assumed a different water system if a municipality charges a different rate to users outside of their jurisdiction, such as the Village of Millbrook does.

Type of Consumption Charge	Number of Systems	Percent
Flat	4	8%
Uniform Volumetric	20	42%
Decreasing Block	14	29%
Increasing Block	8	17%
Decreasing Block, Then Increasing	2	4%
TOTAL:	**48**	**100%**

As demonstrated above, 42% of the identified water systems use a uniform volumetric consumption charge structure, including the Village of Millbrook. Only 8% of the identified water systems use a flat rate consumption charge. This type of consumption charge is primarily used in municipalities which do not offer water meters to their users. The remaining 50% of the water systems use some form of block rate consumption charge, with the majority using a decreasing block rate consumption charge. Municipalities that utilize a decreasing block rate consumption charge typically do so to offer economies of scale to system users which are typically commercial entities or large housing complexes. For example, a representative of one municipality that utilizes a decreasing block rate consumption charge indicated that the system was designed to accommodate the local Laundromat since a large number of town residents use it. The most environmentally beneficial type of consumption charge utilized by the identified

water systems is the increasing block rate consumption charge. This structure encourages water conservation since the water user is charged higher rates the more water it consumes. However, municipalities which utilize increasing block rate consumption charges have found that these types of systems are not as effective if the block price increases are small or if users of the water system are unaware of how their bills are being calculated.

Block rate consumption charges can vary greatly depending on the number of blocks designated as well as the size of each of the blocks. The following Table lists the number of blocks that were present in each of the identified block rate consumption charge systems. For purposes of this analysis, we have assumed a different water system if a municipality charges a different amount to users outside of their jurisdiction. Additionally, in cases where an identified water system has two blocks at the same rate, we have assumed this to be only one block and not two different blocks at the same rate. Our survey found that municipalities which change their rates on a regular basis sometimes end up with more than one block at the same rate as place holders.

Number of Consumption Blocks	Number of Systems	Percent
2	16	67%
3	2	8%
4	4	17%
5	2	8%
TOTAL:	**24**	**100%**

A notable statistic which is not addressed above is the number of municipal water systems which implement a minimum charge per billing cycle. Of the 48 identified water systems, 25 implement a minimum charge per billing cycle, not including the Village of Millbrook. Many municipalities like to implement minimum charges in order to help with the budgeting process. However, setting minimum charges can be a disincentive for water conservation efforts if the minimum charge is set too high.

Another disincentive for water conservation efforts is the use of service fees, regardless of water consumption, especially if the service fee is set too high. However, similar to the use of minimum charges, many municipalities like to use service fees to assist with the budgeting process since it is a guaranteed revenue stream. Of the identified water systems, 9 utilize a service fee in addition to some form of consumption charge.

MUNICIPAL SEWER SYSTEM SURVEY

As demonstrated on Page 12, Village of Millbrook sewer system customers pay slightly higher consumption charge than the average municipal sewer system user in Dutchess County. It is important to note that capital improvements made to the Village's sewer system are funded through a Sewer Capital Assessment and many of the municipal systems in Dutchess County which make up the average fund capital improvements through consumption charges. Typically, if a municipality funds capital expenditures through consumption charges, it will have higher

consumption charge than one that does not. If the Village's Sewer Capital Assessment was included and compared to municipalities which pay capital expenses through consumption charges, the Village consumption charge would appear higher.

Nevertheless, as discussed above, just because a sewer system has a high consumption charge it does not necessarily mean that the charge includes capital improvement expenses. For example, the Town of Rhinebeck sewer system has the highest reported annual consumption charge out of all of the identified sewer systems and it does not fund expenditures made for capital improvements to the system. Similar to the Village of Millbrook, these are financed through capital assessment taxes. One explanation as to why the Town of Rhinebeck reported annual consumption charge is so high is due to the number of connections to the system. Fewer connections to a system typically result in higher annual consumption charges per household since there are fewer connections to spread fixed costs over. The Town of Rhinebeck sewer system has fewer than 50 household connections.

The following Table identifies the consumption charge structures used by each of the 32 different sewer systems surveyed. For purposes of this analysis, we have assumed a different sewer system if a municipality charges a different amount to users outside of their jurisdiction.

Type of Consumption Charge	Number of Systems	Percent
Flat	11	34%
Uniform Volumetric	12	38%
Decreasing Block	5	16%
Increasing Block	3	9%
Percentage of Water Bill	1	3%
TOTAL:	**32**	**100%**

As demonstrated above, 38% of the identified sewer systems use a uniform volumetric consumption charge structure, including the Village of Millbrook. The second most common type of consumption charge utilized by the identified sewer systems is a flat rate consumption charge at 34%. This type of consumption charge is primarily used in municipalities which do not offer meters to their users. It is also common for a municipality which also offers water services with a metering system to assume an amount of water consumed for sewage purposes based on the amount of water metered by the water system meter, including the Village of Millbrook. This provides the municipality with the option of implementing a consumption charge structure other than just a flat rate consumption charge, such as a uniform or block rate consumption charge structure. Another option available to municipalities which have both a sewer and water system, but no meter on the sewer system is to charge users based upon a percentage of the water bill. This form of billing was utilized in only one of the identified sewer systems.

Additionally, 25% of the identified sewer systems use some form of block rate consumption charge, with the majority using a decreasing block rate consumption charge. Similar to the water consumption charge structures discussed above, municipalities that utilize a decreasing block rate consumption charge typically do so to offer economies of scale to system users which are

commonly commercial entities. However, the most environmentally beneficial type of structure utilized by the identified sewer systems is the increasing block rate consumption charge. This structure encourages water conservation since the sewer user is charged higher rates the more water it consumes. However, municipalities which utilize an increasing block rate consumption charge have found that these types of systems are not as effective if the block price increases are small or if users of the sewer system are unaware of how their bills are being calculated.

Block rate structures can vary greatly depending on the number of blocks designated as well as the size of each of the blocks. The following Table lists the number of blocks that were present in each of the identified block rate structure systems. For purposes of this analysis, we have assumed a different sewer system if a municipality charges a different amount to users outside of their jurisdiction. Additionally, in cases where an identified sewer system has two blocks at the same rate, we have assumed this to be only one block and not two different blocks at the same rate.

Number of Consumption Blocks	Number of Systems	Percent
2	4	50%
3	0	0%
4	2	25%
5	2	25%
TOTAL:	**8**	**100%**

A notable statistic which is not addressed above is the number of municipal sewer systems which implement a minimum charge per billing cycle. Of the 32 identified sewer systems, 14 implement a minimum charge per billing cycle, not including the Village of Millbrook. Many municipalities like to implement minimum charges in order to help with the budgeting process. However, setting minimum charges can be a disincentive for water conservation efforts if the minimum charge is set too high.

Another disincentive for water conservation efforts is the use of service fees, especially if the service fee is set too high. However, similar to the use of minimum charges, many municipalities like to use service fees to assist with the budgeting process since it is a guaranteed revenue stream. Of the identified sewer systems, only 2 utilize a service fee in addition to some form of consumption charge. Fewer municipalities typically use a service fee for sewer systems as opposed to water systems due to the fact that flat fee consumption charges are more prevalent with sewer systems and a service fee can be built right into the flat fee.

Status Quo Water System Expenses and Revenues

As mentioned in the Introduction, a goal of this analysis is to analyze how certain capital improvements and system expansions would affect the cost to an average household connected to the Village water system. In order to accomplish this goal, it was necessary to first determine what the expenses and revenues would be of the current system if no special improvements or expansions were made, referred to as "Status Quo" hereafter. More simply, the status quo scenario details the capital and operating expenses required to keep the current water system operating and the revenues required to fund it. A detailed analysis of status quo water revenues and expenses can be found in Appendix B. The following data and assumptions were used to complete this analysis:

Water Consumption

The Village water system currently processes approximately 67,890,000 gallons of water on an annual basis. Approximately 95%, or 64,495,000 gallons, of water is consumed by system users and invoiced by the Village water clerk. Of the 64,495,000 gallons invoiced by the Village water clerk approximately 11%, or 7,094,505 gallons, of water is billed to Town residents.

Financed Capital Costs

The Village finances major capital improvements to the water system with Bond Anticipation Notes (BAN) and/or General Obligation Bonds. The Village has up to 5 years to repay the principal amount of a BAN. If the outstanding principal amount of BAN is not completely paid within 5 years, the Village must issue a G.O. Bond on the remaining balance.

It is expected that the Village will need to issue a $1,200,000 G.O. Bond in FY 2013-2014 at 4% for 20 Years. It is estimated that it will cost the Village $725,000 to replace the water storage tank. The water storage tank is reaching the end of its useful life. It is also expected that the Village will be required to install a new GUIDI filtration system by the New York State Department of Health. The NYS DOH is currently investigating if the raw water is under the influence of surface water. If the raw water is determined to be under the influence of surface water it will necessitate the construction of a cartridge water filtration system. This system will be made up of several stainless steel canisters with cartridge two different filters in them. The first canister will house a 5 micron filter while the second will house a 1 micron filter. These filters are designed to reduce the risk of cryptosporidium and Guardia from entering the potable water system. A new GUIDI filtration system costs approximately $200,000. We have also allocated $275,000 of the $1,200,000 G.O. Bond to replace water meters which are reaching the end of their useful life.

System Operating Costs

In order to determine status quo system operating costs we have reviewed budgets from the last three fiscal years and used individual cost items contained therein as a base. We have assumed that most of these line items would increase at 2% for the next 20 years from FY 2010-2011. However, the routine capital improvements line item for the next 5 years was determined by consulting the current system operator and the Village mayor and assessing the needs of the system. Routine capital improvements range from $40,000 to $85,000 over the next 5 years and include valve replacements, software upgrades, hydrant repairs/replacements and main pump and motor repairs. A more detailed analysis of the estimated routine capital improvements for the next five years can be found in Appendix B. Starting in year 2016-2017 we have assumed $50,000 for routine capital improvements and assumed a 2% escalation for the following years. We have also assumed a contingency of $25,000 on an annual basis without a 2% escalation.

Consumption Charge

The Village pays the majority of its expenses and financed capital costs with consumption charges with only a small portion funded with other revenues such as interest and penalties on overdue invoices. The Village has charged a water consumption charge of $2.99/1,000 gallons to Village residents and $5.98/1,000 gallons to Town residents for over the last three fiscal years. However, due to increasing operating costs, financed capital improvements and planned gradual upgrade of system water meters we have estimated that the Village would need to bill $3.02/1,000 gallons to Village residents and $6.04/1,000 gallons to Town residents in FY 2011-2012. If the average household consumes 127,750 gallons of water on an annual basis, this would result in a $386 household bill if it were located within the Village and $773 if it were located outside the Village.

Status Quo Sewer System Expenses and Revenues

As mentioned in the Introduction, a goal of this analysis is to analyze how certain capital improvements and system expansions would affect the cost to an average household connected to the Village sewer system. In order to accomplish this goal, it was necessary to first determine what the expenses and revenues would be of the current system if no special improvements or expansions were made, referred to as "Status Quo" hereafter. More simply, the status quo scenario details the capital and operating expenses required to keep the current sewer system operating and the revenues required to fund it. A detailed analysis of status quo sewer revenues and expenses can be found in Appendix B. The following data and assumptions were used to complete this analysis:

Water Consumption

The Village sewer system currently processes approximately 71,540,000 gallons of water on an annual basis. Approximately 80%, or 57,232,000 gallons, of water is consumed by system users and invoiced by the Village sewer clerk. Of the 57,232,000 gallons invoiced by the Village sewer clerk, approximately 5%, or 2,861,600 gallons, of water is billed to Town residents.

Financed Capital Costs

The Village finances major capital improvements to the sewer system with Bond Anticipation Notes (BAN) and/or General Obligation Bonds. The Village has up to 5 years to repay the principal amount of a BAN. If the outstanding principal amount of BAN is not completely paid within 5 years, the Village must issue a G.O. Bond on the remaining balance.

It is expected the Village will issue a BAN in FY 2011-2012 for the installation of a chlorine de-chlorinization tank, installation of a manhole with a meter for the overflow retention basin and a building to house the new de-chlorinization tank. The Village issued a $250,000 BAN in FY 2010-2011 for this work; however, the Project engineer recently informed the Village that the project total capital cost is approximately $500,000. The Village is in need of a chlorine de-chlorinization tank in order to satisfy new DEC SPDES permit requirements. The Village determines on a year to year basis how much outstanding principal amount of BANs it wants to pay each year with revenues raised through a Sewer Capital Assessment. We have assumed that the Village would pay the $250,000 FY 2010-2011 BAN principal over the next five years. This allows the Village to so to spread the expense out and not have to drastically raise the Sewer Capital Assessment in the first year to cover the capital expense. We have also assumed that the FY 2011-2012 BAN would be rolled over into a G.O. Bond at 4% for 20 years after 5 years. The Village does not pay interest on financed debt with revenues raised through the Sewer Capital Assessment. Interest on financed debt is paid with revenues raised through the sewer consumption charge. There are several variations as to how the Village could actually finance

this capital expense but we have chosen this scenario to remain consistent with past Village practices.

It is also expected that the Village will need to borrow $1,000,000 in FY 2015-2016 to replace the overflow retention basin which also acts as the primary clarification unit. The current overflow retention is reaching the end of its useful life. Therefore, we have assumed that the Village would issue a $1,250,000 G.O. Bond in 2015-2016 at 4% interest with a 20 year term. Debt schedule principal payments on the FY 2015-2016 bond would be paid with revenues raised through the Sewer Capital Assessment for the following 20 years.

We have also assumed that the Village will need to issue a $1,500,000 G.O. Bond at 4% for 20 Years in FY 2026-2027 to replace the current sand filter system with a membrane bio-reactor system. It is expected that by this time the DEC will require stricter permit standards which the Village would not be able to meet with its current sand filtration system. A membrane bio-reactor system greatly reduces the amount constituents in the facility's discharge. Debt schedule principal payments on the FY 2026-2027 bond would be paid with revenues raised through the Sewer Capital Assessment for the following 20 years.

System Operating Costs

In order to determine status quo system operating costs we have reviewed budgets from the last three fiscal years and used individual cots items contained therein as a base. We have assumed that most of these line items would increase at 2% for the next 20 years from FY 2010-2011. We have also assumed a contingency of $15,000 on an annual basis without a 2% escalation.

Consumption Charge

The Village pays the majority of its operating expenses and interest with consumption charges with only a small portion funded with other revenues such as interest and penalties on overdue invoices. The Village has charged a consumption charge of $6.18/1,000 gallons to both Village and Town residents for over the last three fiscal years. However, due to increasing operating costs and financed capital improvements we have estimated that the Village would need to bill $6.43/1,000 gallons to Village and Town residents in FY 2011-2012. If the average household consumes 127,750 gallons of water on an annual basis, this would result in a household bill of $863 including the estimated Sewer Capital Assessment.

Sewer Capital Assessment (SCA)

As mentioned above, the Village pays the principal due on all financed capital improvements with a Sewer Capital Assessment (SCA). The SCA is determined on a yearly basis. First the Village determines how much principal of issued BANs it wants to pay on top of any debt service principal which is owed. Once the total amount of financed capital cost principal to be paid is determined, it is divided by the total assessed property value allocated to the SCA. This figure is calculated by adding the assessed value of all of the properties connected to the system (Including Town properties) plus 33.33% of the assessed value of all properties located within

the Village which are not connected to the system. The result of this calculation is then multiplied by the assessed value of each property connected to the system (or 33.33% of the assessed property value of Village properties not connected to the system) to determine how much each tax parcel pays. In FY 2010-2011 the total assessed property value allocated to the SCA was $301,452,039. We have assumed that this value would increase .5% on an annual basis. Therefore, if the Village were to pay $30,000 in principal for the FY 2010-2011 $250,000 BAN in FY 2011-2012 and the total assessed property value allocated to the SCA was $302,959,299, the SCA would be $0.000099023. This would result in a $39.81 SCA charge to an average household connected to the system with an assessed value of $402,000.

System Expansions and Resulting Cost to the Average Household

Now that we have determined the cost to the average household for sewer and water services under the status quo scenario in the previous section and detailed in Appendix B, we can use the same type of analysis to determine what the cost for sewer and water services to the average household would be if the Village decided to expand its services. We have analyzed five different expansion area alternatives for both sewer and water services which are currently available to the Village. The five different expansion areas analyzed include the Nine Partners Lane expansion area, the former Bennett College site, the Rodrigo Knolls expansion area, the Horseshoe expansion area and the expansion of services provided to the former County Infirmary site. A more detailed description of the expansion areas evaluated as well as the capital costs needed to expand services will be provided in the following section. The capital costs required to expand services were estimated by the Project engineer, Clark Patterson Lee.

It has also been estimated by the current system operator that the incremental operating and maintenance costs for providing water service to any expansion area is $1.95/1,000 gallons and $4.59/1,000 gallons for providing sewer service to any expansion area in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis.

The following Table summarizes the FY 2011-2012 consumption charge, the projected 20 year average consumption charge, the cost to the average household in FY 2011-2012 and the projected 20 year average cost to the average household under the status quo scenario and under each of the five different expansion options:

	2011-2012 $/1,000 Gallons: In-Village	20 Year AVG $/1,000 Gallons: In-Village	2011-2012 $/1,000 Gallons: Outside Village	20 Year AVG $/1,000 Gallons: Outside Village	2011-2012 Average Household Bill: In-Village	20 Year AVG Average Household Bill: In-Village	2011-2012 Average Household Bill: Outside Village	20 Year AVG Average Household Bill: Outside Village
Status Quo: Water	$3.02	$4.60	$6.04	$9.20	$386	$589	$773	$1,177
Status Quo: Sewer	$6.43	$8.34	$6.43	$8.34	$863	$1,163	$863	$1,163
Status Quo with Nine Partners Expansion: Water	$4.15	$5.66	$8.29	$11.33	$531	$725	$1,061	$1,450
Status Quo with Nine Partners Expansion: Sewer	$6.85	$8.50	$6.85	$8.50	$950	$1,232	$950	$1,232
Status Quo with Bennett College Expansion: Water	**$2.88**	**$4.30**	**$5.75**	**$8.60**	**$368**	**$551**	**$737**	**$1,101**
Status Quo with Bennett College Expansion: Sewer	**$6.13**	**$7.90**	**$6.13**	**$7.90**	**$822**	**$1,099**	**$822**	**$1,099**
Status Quo with Rodrigo Knolls Expansion: Water	$3.47	$4.94	$6.94	$9.88	$444	$633	$889	$1,265
Status Quo with Rodrigo Knolls Expansion: Sewer	$6.81	$8.50	$6.81	$8.50	$940	$1,225	$940	$1,225
Status Quo with Horseshoe Expansion: Water	$4.43	$5.62	$8.86	$11.25	$567	$720	$1,135	$1,440
Status Quo with Horseshoe Expansion: Sewer	$7.68	$8.89	$7.68	$8.89	$1,118	$1,371	$1,118	$1,371
Status Quo with Infirmary Expansion: Water	**$3.00**	**$4.57**	**$6.00**	**$9.14**	**$384**	**$585**	**$769**	**$1,170**
Status Quo with Infirmary Expansion: Sewer	**$6.42**	**$8.33**	**$6.42**	**$8.33**	**$861**	**$1,160**	**$861**	**$1,160**

As summarized in the Table provided above and detailed in Appendix B, three of the expansion alternatives would cost current sewer and water customers more than the status quo scenario. This is due to the fact that the capital costs of the expansions would be spread out over all system users. The expansion alternative that would cost current system users the most is the Horseshoe expansion. Under the Horseshoe expansion scenario the projected 20 year average cost to the average household located within the Village would be $720 for water service and $1,371 for sewer service compared to $589 for water service and $1,177 for sewer service under the status quo scenario. This assumed an assessed value of an average household to be $400,000 with a .5% annual escalation.

However, there are two expansion alternatives which would lower the cost to current sewer and water customers compared to the status quo scenario. These are the former Bennett College and County infirmary site expansions. Under the former Bennett College site expansion scenario the projected 20 year average cost to the average household located within the Village would be $551 for water service and $1,099 for sewer service compared to $589 for water service and $1,163 for sewer service under the status quo scenario. The lower cost to current system users can be attributed to the fixed overhead costs of the status quo alternative being spread out over more users and/or gallons consumed. We have also assumed that the former Bennett College site developer would pay for all capital costs necessary to add the additional users to the system. As detailed in the following section, it is expected that the capital costs to add the former Bennett College site to the current sewer system would cost $1,080,000.

Under the former County infirmary site expansion scenario the projected 20 year average cost to the average household located within the Village would be $585 for water service and $1,160 for sewer service compared to $589 for water service and $1,163 for sewer service under the status quo scenario. The lower cost to current system users can be attributed to the fixed overhead costs of the status quo alternative being spread out over more users and/or gallons consumed. We have also assumed that the County would pay for the estimated $135,000 it would cost to provide additional sewer service to the former County infirmary site.

Nine Partners Lane: Water

The Nine Partners Lane expansion area to be potentially served by the Village water system is comprised of 39 residential parcels along Nine Partners Lane, Linden Lane and Linden Court. It consists of approximately 149 acres and is located entirely within the Village.

Since it is not expected that all of the identified households would opt to connect to the system we have assumed that 80% would do so. Therefore we have estimated that 31 residential properties located within the proposed expansion area would opt to connect to the Village water system and the water demand for these properties would be 10,850 Gallons per Day (GPD), or 3,960,250 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of 350 GPD per individual house with 3 to 4 bedrooms.

According to the project engineer, the storage and supply capacity of the existing system is adequate to provide for the water demands of the proposed Nine Partners Lane expansion area. Expanding services to the proposed expansion area involves the installation of a dual in-line booster pump station since the elevation of the proposed expansion area is too high to provide for adequate pressure. Additionally, providing services to the proposed area would also require installation of approximately 5,700 linear feet of an 8 inch water main through the expansion area. It is also proposed that if the Village expands the water system to the Nine Partners Lane area, 12 fire hydrants would also be added to the water system. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding water services to the Nine Partners Lane expansion area would be $1,215,000. This estimate also includes running laterals from the water main to each of the identified properties. Property owners which opt to connect to the system will be subject to a one-time cost of connecting their home to the service lateral which is estimated to cost approximately $25 per linear foot.

Description	Units	$/Units	Quantity	Cost
Water Distribution System	L.F.	$ 75.00	6100	$ 457,500.00
Rock Contingency on Distribution	%		40%	$ 183,200.00
Booster Pump	Each	$ 120,000.00	1	$ 120,000.00
Hydrants	Each	$ 2,500.00	12	$ 30,000.00
Valves	Each	$ 1,000.00	11	$ 11,000.00
Laterals	Each	$ 1,000.00	39	$ 39,000.00
Asphalt	L.F.	$ 50.00	750	$ 37,500.00
Subtotal				**$ 878,200.00**
Construction Contingency	%		15%	$ 133,800.00
Construction Total				**$ 1,012,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 1,012,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 152,000.00
Legal & Financial	%		5%	$ 51,000.00
Maximum Amount to be bonded				**$ 1,215,000.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing water services to the Nine Partners Lane expansion area will be $1.95/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the Nine Partners Lane expansion area scenario the projected 20 year average cost for water service to an average household located within the Village will be $725 and $1,450 for households located outside of the Village compared to $589 for an average household located within the Village and $1,163 for households located outside of the Village under the status quo scenario. This assumes an annual water consumption of 127,750 gallons.

Nine Partners Lane: Sewer

The Nine Partners Lane expansion area to be potentially served by the Village sewer system is comprised of 33 residential parcels along Nine Partners Lane, Linden Lane and Linden Court. It consists of approximately 130 acres and is located entirely within the Village.

Since it is not expected that all of the identified households would opt to connect to the system we have assumed that 80% would do so. Therefore we have estimated that 26 residential properties located within the proposed area would opt to connect to the Village sewer system and the sewer demand for these properties would be 9,100 GPD, or 3,321,500 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of 350 GPD per individual house with 3 to 4 bedrooms.

According to the project engineer, the collection and treatment capacity of the existing system is adequate to provide for the sewer demands of the proposed Nine Partners Lane expansion area. Expanding services to the proposed expansion area involves the installation of approximately 5,200 linear feet of an 8 inch sewer main through the expansion area. It is also proposed that if the Village expands the sewer system to the Nine Partners Lane area, 16 manholes would also be added to the sewer system. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding sewer services to the Nine Partners Lane expansion area would be $790,000. This estimate also includes running laterals from the sewer main to each of the identified properties. Property owners which opt to connect to the system will be subject to a one-time cost of connecting their home to the service lateral which is estimated to cost approximately $25 per linear foot.

Description	Units	$/Units	Quantity	Cost
Sewer Collection System	L.F.	$ 60.00	5200	$ 312,000.00
Manholes	Each	$ 2,500.00	16	$ 40,000.00
Rock Contingency	%		45%	$ 158,000.00
Lift Station Upgrades	Each	$ 20,000.00	0	$ -
Laterals	Each	$ 1,000.00	33	$ 33,000.00
Asphalt	L.F.	$ 50.00	600	$ 30,000.00
Subtotal				**$ 573,000.00**
Construction Contingency	%		15%	$ 86,000.00
Construction Total				**$ 659,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 659,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 98,000.00
Legal & Financial	%		5%	$ 33,000.00
Maximum Amount to be bonded				**$ 790,000.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing sewer services to the Nine Partners Lane expansion area will be $4.59/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the Nine Partners Lane expansion area scenario the projected 20 year average cost for sewer service to an average household is $1,232 compared to $1,163 for an average household connected to the system under the status quo scenario. This assumes an annual wastewater production of 127,750 gallons and an assessed value of an average household of $400,000 with a .5% annual escalation.

Former Bennett College: Water

The former Bennett College expansion area to be potentially served by the Village water system is comprised of 95 residential parcels, consisting of duplexes and single family homes on the former Bennett College site. The former Bennett College site is approximately 27 acres and is located entirely within the Village.

It is estimated that the water demand for the 95 residential properties located within the proposed expansion area is 30,000 Gallons per Day (GPD), or 10,950,000 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of approximately 315 GPD per individual dwelling with 2 to 4 bedrooms.

According to the project engineer, the storage and supply capacity of the existing system is adequate to provide for the water demands of the proposed former Bennett College expansion area. The existing water main that runs through the proposed former Bennett College development area could be used to connect to the Village water system. It would be the developer's responsibility to fund the connection as well as the distribution area throughout the development area.

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing water services to the former Bennett College site expansion area will be $1.95/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the former Bennett College site expansion area scenario the projected 20 year average cost for water service to an average household located within the Village is $551 and $1,101 for households located outside of the Village compared to $589 for an average household located within the Village and $1,163 for households located outside of the Village under the status quo scenario. This assumes an annual water consumption of 127,750 gallons.

Former Bennett College: Sewer

The former Bennett College expansion area to be potentially served by the Village sewer system is comprised of 95 residential parcels, consisting of duplexes and single family homes on the former Bennett College site. The former Bennett College site is approximately 27 acres and is located entirely within the Village.

It is estimated that the sewer demand for the 95 residential properties located within the proposed expansion area is 30,000 Gallons per Day (GPD), or 10,950,000 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of approximately 315 GPD per individual dwelling with 2 to 4 bedrooms.

According to the project engineer, the current Village collection and treatment system has the potential to be upgraded to provide for the sewer demands of the proposed former Bennett expansion area. Upgrades required to service the former Bennett College expansion area include modifications to the existing sewer lift station and modifications to the existing wastewater treatment plant to provide for the additional sewer treatment capacity required. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding sewer services to the former Bennett College expansion area would be $1,080,000. It is assumed that this estimated capital cost would be incurred by the Project developer.

Description	Units	$/Units	Quantity	Cost
Sewer Collection System	L.F.	$ 60.00	0	$ -
Manholes	Each	$ 2,500.00	0	$ -
Rock Contingency	%		0%	$ -
Lift Station Upgrades	Each	$ 50,000.00	1	$ 50,000.00
Laterals	Each	$ 1,000.00	0	$ -
Develop Additional Sewer Capicity	GPD	$ 25.00	30000	$ 750,000.00
Subtotal				**$ 800,000.00**
Construction Contingency	%		15%	$ 120,000.00
Construction Total				**$ 920,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 920,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 120,000.00
Legal & Financial	%		5%	$ 40,000.00
Maximum Amount to be bonded				**$ 1,080,000.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing sewer services to the former Bennett College site expansion area would be $4.59/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the former Bennett College site expansion area scenario the projected 20 year average cost for sewer service to an average household is $1,099 compared to $1,163 for an average household connected to the system under the status quo scenario. This assumes an annual wastewater production of 127,750 gallons and an assessed value of an average household of $400,000 with a .5% annual escalation.

Rodrigo Knolls: Water

The Rodrigo Knolls expansion area to be potentially served by the Village water system is comprised of 31 residential parcels along Rodrigo Knolls, Rodrigo Court, Stanford Road and Sharon Turnpike. It consists of approximately 50 acres and is located entirely outside of the Village.

Since it is not expected that all of the identified households would opt to connect to the system we have assumed that 80% would do so. Therefore we have estimated that 24 residential properties located within the proposed expansion area would opt to connect to the Village water system and the water demand for these properties would be 8,400 Gallons per Day (GPD), or 3,066,000 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of 350 GPD per individual house with 3 to 4 bedrooms.

According to the project engineer, the storage and supply capacity of the existing system is adequate to provide for the water demands of the proposed Rodrigo Knolls expansion area. Expanding services to the proposed expansion area involves the installation of approximately 4,000 linear feet of an 8 inch water main through the expansion area. Installation of the 4,000 linear feet of water main would require a tie-in connection across Sharon Turnpike and a bored crossing under the East Branch of the Wappinger Creek. It is also proposed that if the Village expands the water system to the Rodrigo Knolls area, 9 fire hydrants would also be added to the water system. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding water services to the Rodrigo Knolls expansion area would be $658,500. This estimate also includes running laterals from the water main to each of the identified properties. Property owners which opt to connect to the system will be subject to a one-time cost of connecting their home to the service lateral which is estimated to cost approximately $25 per linear foot.

Description	Units	$/Units	Quantity	Cost
Water Distribution System	L.F.	$ 75.00	3,900	$ 292,500.00
Rock Contingency on Distribution	%		15%	$ 43,350.00
Bore Under Sharon Turnpike	Each	$ 30,000.00	1	$ 30,000.00
Bore Under Creek	Each	$ 30,000.00	1	$ 30,000.00
Hydrants	Each	$ 2,500.00	8	$ 20,000.00
Valves	Each	$ 1,000.00	9	$ 9,000.00
Laterals	Each	$ 1,000.00	31	$ 31,000.00
Asphalt	L.F.	$ 50.00	250	$ 12,500.00
Subtotal				**$ 468,350.00**
Construction Contingency	%		15%	$ 70,650.00
Construction Total				**$ 539,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 539,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 82,000.00
Legal & Financial	%		5%	$ 27,000.00
Maximum Amount to be Bonded				**$ 648,000.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing water services to Rodrigo Knolls site expansion area would be $1.95/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the Rodrigo Knolls site expansion area scenario the projected 20 year average cost for water service to an average household located within the Village is $633 and $1,265 for households located outside of the Village compared to $589 for an average household located within the Village and $1,163 for households located outside of the Village under the status quo scenario. This assumes an annual water consumption of 127,750 gallons.

Rodrigo Knolls: Sewer

The Rodrigo Knolls expansion area to be potentially served by the Village sewer system is comprised of 23 residential parcels along Rodrigo Knolls, Linden Court and Stanford Road. It consists of approximately 37 acres and is located entirely outside the Village.

Since it is not expected that all of the identified households would opt to connect to the system we have assumed that 80% would do so. Therefore we have estimated that 18 residential properties located within the proposed area would opt to be connected to the Village sewer system and the sewer demand for these properties would be 6,300 GPD, or 2,299,500 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of 350 GPD per individual house with 3 to 4 bedrooms.

According to the project engineer, the collection and treatment system has the potential to be upgraded to provide for the sewer demands of the proposed Rodrigo Knoll expansion area. Expanding services to the proposed expansion area involves the installation of approximately 3,000 linear feet of an 8 inch sewer main through the expansion area. The installation of the 3,000 linear feet of sewer main would require suspending the sewer main along the bridge over the east Branch of the Wappinger Creek and upgrading the existing sewer lift station. It is also proposed that if the Village expands the sewer system to the Rodrigo Knolls expansion area, 13 manholes would also be added to the sewer system. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding sewer services to the Rodrigo Knolls expansion area would be $675,250. This estimate also includes running laterals from the sewer main to each of the identified properties. Property owners which opt to connect to the system will be subject to a one-time cost of connecting their home to the service lateral which is estimated to cost approximately $25 per linear foot.

Description	Units	$/Units	Quantity	Cost
Sewer Collectin System	L.F.	$ 60.00	3,000	$ 180,000.00
Manholes	Each	$ 2,500.00	13	$ 32,500.00
Rock Contengency	%		20%	$ 43,500.00
Lift Station Upgrades	Each	$ 20,000.00	1	$ 20,000.00
Attach sewer lines to bridge	Each	$ 20,000.00	1	$ 20,000.00
Laterals	Each	$ 1,000.00	23	$ 23,000.00
Asphalt	L.F.	$ 50.00	500	$ 25,000.00
Subtotal				**$ 344,000.00**
Construction Contingency	%		15%	$ 51,000.00
Construction Total				**$ 395,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 395,000.00**
Develop Additional Sewer Capacity	GPD	$ 25.00	8,050	$ 201,250.00
Egineer Design, Approval &				
Construction Support	%		15%	$ 59,000.00
Legal & Financial	%		5%	$ 20,000.00
Maximum Amount to be bonded				**$ 675,250.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing sewer services to the Rodrigo Knolls expansion area would be $4.59/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the Rodrigo Knolls expansion area scenario the projected 20 year average cost for sewer service to an average household is $1,225 compared to $1,163 for an average household connected to the system under the status quo scenario. This assumes an annual wastewater production of 127,750 gallons and an assessed value of an average household of $400,000 with a .5% annual escalation.

Horseshoe: Water

The Horseshoe expansion area to be potentially served by the Village water system is comprised of a day camp area and 136 residential parcels along Horseshoe Road, College Lane, South Road, Oak Summit Road, Route 82 and Route 343. It consists of approximately 452 acres and is located entirely outside of the Village.

Since it is not expected that all of the identified households would opt to connect to the system we have assumed that 80% would do so. Therefore we have estimated that 108 residential properties and a day camp located within the proposed expansion area would opt to connect to the Village water system and the water demand for these properties would be 38,800 Gallons per Day (GPD), or 14,162,000 gallons on an annual basis, based on New York State Department of Environmental Conservation demand estimates.

According to the project engineer, the storage and supply capacity of the existing system is adequate to provide for the water demands of the proposed Horseshoe expansion area. Expanding services to the proposed expansion area involves the installation of approximately 17,500 linear feet of an 8 inch water main and an additional 1,200 linear feet of a 4 inch booster main through the expansion area. The installation of the 17,500 linear feet of water main would require a tie-in connection across Sharon Turnpike and a bored crossing under the Wappinger Creek as well as a new pump station. It is also proposed that if the Village expands the water system to the Horseshoe area, 27 fire hydrants would also be added to the water system. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding water services to the Horseshoe expansion area would be $2,706,000. This estimate also includes running laterals from the water main to each of the identified properties. Property owners which opt to connect to the system will be subject to a one-time cost of connecting their home to the service lateral which is estimated to cost approximately $25 per linear foot.

Description	Units	$/Units	Quantity	Cost
Water Distribution System	L.F.	$ 75.00	17500	$ 1,312,500.00
Rock Contingency on Distribution	%		15%	$ 192,000.00
Booster Pressure Line	L.F.	$ 25.00	1200	$ 30,000.00
Bore Under Route 82	Each	$ 40,000.00	2	$ 80,000.00
Booster Pump	Each	$ 100,000.00	1	$ 100,000.00
Hydrants	Each	$ 2,500.00	27	$ 67,500.00
Valves	Each	$ 1,000.00	28	$ 28,000.00
Laterals	Each	$ 1,000.00	137	$ 137,000.00
Asphalt	L.F.	$ 50.00	400	$ 20,000.00
Subtotal				**$ 1,967,000.00**
Construction Contingency	%		15%	$ 294,000.00
Construction Total				**$ 2,261,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 2,261,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 335,000.00
Legal & Financial	%		5%	$ 110,000.00
Maximum Amount to be bonded				**$ 2,706,000.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing water services to Horseshoe expansion area would be $1.95/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the Horseshoe expansion area scenario the projected 20 year average cost for water service to an average household located within the Village is $720 and $1,440 for households located outside of the Village compared to $589 for an average household located within the Village and $1,163 for households located outside of the Village under the status quo scenario.. This assumes an annual water consumption of 127,750 gallons.

Horseshoe: Sewer

The Horseshoe expansion area to be potentially served by the Village sewer system is comprised of 72 residential parcels along Horseshoe Road and South Road. It consists of approximately 211 acres and is located entirely outside the Village.

Since it is not expected that all of the identified households would opt to connect to the system we have assumed that 80% would do so. Therefore we have estimated that 57 residential properties located within the proposed area would opt to connect to the Village sewer system and the sewer demand for these properties would be 19,950 GPD, or 7,281,750 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of 350 GPD per individual house with 3 to 4 bedrooms.

According to the project engineer, the collection and treatment system has the potential to be upgraded to provide for the sewer demands of the proposed Horseshoe expansion area. Expanding services to the proposed expansion area involves the installation of approximately 8,000 linear feet of an 8 inch sewer main and an additional 4,000 linear feet of 4 inch force main through the expansion area. The installation of approximately 8,000 linear feet of sewer main and 4,000 linear feet of force main would require installation of a sewer lift station and boring under Route 82. It is also proposed that if the Village expands the sewer system to the Horseshoe area, 20 manholes would also be added to the sewer system. Development of additional sewer treatment capacity at the existing facility would also be required. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of expanding sewer services to the Horseshoe expansion area would be $2,353,400. This estimate also includes running laterals from the sewer main to each of the identified properties. Property owners which opt to connect to the system will be subject to a one-time cost of connecting their home to the service lateral which is estimated to cost approximately $25 per linear foot.

Description	Units	$/Units	Quantity	Cost
Sewer Collectin System	L.F.	$ 60.00	6,600	$ 396,000.00
Forcemain	L.F.	$ 60.00	4000	$ 240,000.00
Manholes	Each	$ 2,500.00	20	$ 50,000.00
Rock Contengency	%		30%	$ 205,800.00
Forcemain in Common Trench	L.F.	$ 25.00	1,400	$ 35,000.00
Lift Station	Each	$ 120,000.00	1	$ 120,000.00
Bore Under Route 82	Each	$ 40,000.00	1	$ 40,000.00
Laterals	Each	$ 1,000.00	72	$ 72,000.00
Asphalt	L.F.	$ 50.00	1,800	$ 90,000.00
Subtotal				**$ 1,248,800.00**
Construction Contingency	%		15%	$ 187,000.00
Construction Total				**$ 1,435,800.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 1,435,800.00**
Develop Additional Sewer Capacity	GPD	$ 25.00	25,200	$ 630,000.00
Egineer Design, Approval &				
Construction Support	%		15%	$ 215,000.00
Legal & Financial	%		5%	$ 72,600.00
Maximum Amount to be bonded				**$ 2,353,400.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing sewer services to the Horseshoe expansion area would be $4.59/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the Horseshoe expansion area scenario the projected 20 year average cost for sewer service to an average household is $1,371 compared to $1,163 for an average household connected to the system under the status quo scenario. This assumes an annual wastewater production of 127,750 gallons and an assessed value of an average household of $400,000 with a .5% annual escalation.

Former County Infirmary Site: Water

The former County Infirmary expansion area to be potentially provided with additional service by the Village water system covers approximately 95 acres and is located outside of the Village, in the Town of Washington. The Village water system currently services the existing building but the County is proposing to expand the existing building by 8,000 square feet of office space which would ultimately increase its water demand.

It is estimated that the water demand for the additional 8,000 square feet of office space is 800 Gallons per Day (GPD), or 292,000 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of approximately 0.1 GPD per square foot of office space.

According to the project engineer, the storage and supply capacity of the existing Village water system is adequate to provide for the water demands of the proposed former County Infirmary expansion. Additionally, no water distribution work is required to increase service to the former County Infirmary site.

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing additional water services to the former County Infirmary site would be $1.95/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the former County Infirmary site expansion area scenario the projected 20 year average cost for water service to an average household located within the Village is $585 and $1,170 for households located outside of the Village compared to $589 for an average household located within the Village and $1,163 for households located outside of the Village under the status quo scenario. This assumes an annual water consumption of 127,750 gallons.

Former County Infirmary Site: Sewer

The former County Infirmary expansion area to be potentially provided with additional service by the Village sewer system covers approximately 95 acres and is located outside of the Village, in the Town of Washington. The Village currently services the existing building but the County is proposing to expand the existing building by 8,000 square feet of office space which would ultimately increase its sewer demand.

It is estimated that the sewer demand for the additional 8,000 square feet of office space is 800 Gallons per Day (GPD), or 292,000 gallons on an annual basis, based on a New York State Department of Environmental Conservation demand estimate of approximately 0.1 GPD per square foot of office space.

According to the project engineer, the sewer collection and treatment capacity of the existing system is capable of being modified to provide for the increased sewer demands of the proposed County Infirmary expansion. In order to make the system more efficient, it may be necessary to modify the existing lift station. Additionally, it may be necessary to include an emergency generator to make the system more reliable. As detailed in the table below provided by Clark Patterson Lee, it is estimated that the probable maximum capital cost of upgrading the existing lift station and installing an emergency generator would be $135,000. It is assumed that this estimated capital cost would be incurred by the County.

Description	Units	$/Units	Quantity	Cost
Sewer Collection System	L.F.	$ 60.00	0	$ -
Manholes	Each	$ 2,500.00	0	$ -
Rock Contingency	%		0%	$ -
Lift Station Upgrades	Each	$25,000.00	1	$ 25,000.00
Generator	Each	$75,000.00	1	$ 75,000.00
Subtotal				**$ 100,000.00**
Construction Contingency	%		15%	$ 15,000.00
Construction Total				**$ 115,000.00**
R.O.W. Acquisition	L.F.	$ 20.00	0	$ -
Subtotal				**$ 115,000.00**
Egineer Design, Approval &				
Construction Support	%		15%	$ 15,000.00
Legal & Financial	%		5%	$ 5,000.00
Maximum Amount to be bonded				**$ 135,000.00**

It has been estimated by the current system operator that the incremental operating and maintenance costs for providing additional sewer services to the former County Infirmary site would be $4.59/1,000 gallons in FY 2011-2012. It is expected that these incremental costs will

increase by 2% on an annual basis. These estimates do not include fixed overhead costs which are incurred by the status quo system.

Under the former County Infirmary site expansion area scenario the projected 20 year average cost for sewer service to an average household is $1,160 compared to $1,163 for an average household connected to the system under the status quo scenario. This assumes an annual wastewater production of 127,750 gallons and an assessed value of an average household of $400,000 with a .5% annual escalation.