

February 16, 2018

Board of Water and Sewer Commissioners
 Groveland Water and Sewer Department
 183 Main Street
 Groveland, MA 01834

RE: Sewer Rate Study

Dear Board:

This report is in accordance with our sewer rate study contract dated November 13, 2017. The Groveland Water and Sewer Department (GWSD) is currently renegotiating its inter-municipal agreement with Haverhill which will have a significant financial impact. Environmental Partners Group (EPG) has prepared this letter report to review the current sewer rates and fees and determine adjustments required to meet future needs within a 5 year planning period.

Background

The Groveland Sewer Department was founded in 1977 to pump the Town of Groveland’s sewage to the Haverhill Wastewater Treatment Facility (WWTF). The current system operates with six lift stations and one sewer pump station that move sewage through 20 miles of gravity sewers and two miles of pressure force main. The GWSD has the authority to make changes to sewer rates and fees to meet the current and future needs of the Town.

Existing Rates and Fees

The current rate structure was last updated in June 2016 and utilizes a minimum rate which increases above a threshold usage value as shown on Table 1. The minimum rate covers the first 1000 cubic feet of sewage produced, while each 100 successive cubic feet are charged at a rate of \$6.65.

Table 1 – Groveland Existing Sewer Rates

Description	Amount
Minimum Quarterly Charge up to 1000 CF	\$53.91
1000 + CF	\$6.65 / 100 CF

Other sewage collection systems in the Groveland area were surveyed for comparison. The GWSD rates are comparable to other similar size sewer systems and lower than the average for higher usage. A cost comparison based on varied discharge volumes is shown in Table 2.

Table 2 – Local Sewer Rate Comparison

Usage (cf)	Groveland	Average	Amesbury	Merrimac	North Andover	Newburyport
500	\$53.91	\$47.52	\$50.63	\$68.00	\$29.75	\$41.70
1,000	\$53.91	\$69.76	\$68.13	\$68.00	\$59.50	\$83.40
2,000	\$120.41	\$146.76	\$138.13	\$163.12	\$119.00	\$166.80
3,000	\$186.91	\$248.50	\$208.13	\$258.49	\$277.20	\$250.20
5,000	\$319.91	\$428.46	\$348.13	\$449.23	\$462.00	\$454.50

The following data has been reviewed as part of preparation of this report:

- Current sewer rate structure
- Current and historical sewer revenue
- Current and forecasted system flows
- Current and historical billing and accounting records
- Current debt
- Current retained earnings balance
- Planned capital improvements
- Current and forecasted operations and maintenance costs

Using the available data, EPG reviewed and evaluated the immediate and future revenue requirements of the GWSD with the intent of maintaining a positive accounting balance. System variables and financial assumptions used in the sewer calculations are found in Table 3.

Table 3 – Analysis Variables & Assumptions

Description	Amount
Existing Accounts	950
Estimated Annual Sewer Use Increase	0.1%
Inflation	3.0%
Annual Benefit Cost Increase	5.0%
Existing Fund Balance (as of June 30, 2016)	\$291,798

Sewer System Revenue

Sewer Collection

Revenue for the GWSD is primarily obtained from water and sewer rates. Over the last 2 fiscal years, sewer rates have generated essentially all sewer revenue, with approximately 1% generated by sewer permits and other miscellaneous fees.

The GWSD bills users on a quarterly basis and has a block rate system with a minimum charge. A minimum charge of \$53.91 per quarter (\$215.64 annual) is charged to each customer and includes the first 1,000 cubic feet (cf) of sewer collection. Any volume of consumption above 1,000 cf per quarter is charged at a rate of \$6.65 per 100 cf (HCF). For FY17, the GWSD generated approximately \$450,000 in sewer collection revenue.

Connection Fees

Revenue from connection fees is generated by charging owners a fee for connecting to the collection system. The intent of this fee is for each new customer to pay for the portion of the capital costs that have already been spent to develop the existing sewer system. The fee for adding a sewer connection is currently \$450 or \$1,950 if the connection will be serviced by a pump station. Approximately 48% of all water customers are tied into municipal sewer and development within the limits of both the water and sewer system over the past several years has been relatively low. An average of approximately 3 new sewer connections have been added over the past several years. The rate of new connections is estimated to remain at this rate over the next 10 years.

Betterments

Groveland's betterment fund facilitates extensions of the sewer system that are financed by the affected property owners. The betterment fund is independent of the sewer rate revenue and operates as a self-sustaining account. Existing betterment financing extends through FY2035.

Revenue Summary

Table 4 on the following page lists the projected sewer usage and generated revenue over the next five years if the existing sewer rate structure and fee schedule was maintained. This table assumes the following:

- New services are added at average rate of 3 services per year.
- Sewer production per capita will remain steady over the study period.
- Sewage produced is directly related to water consumption and projected to increase by less than 1% per year.

**Table 4 - Existing Revenue
Sewer Rate Study
Groveland, MA**

	2018	2019	2020	2021	2022	2023
Rates and Fees						
Minimum Charge (up to 1000 cf)	\$53.91	\$53.91	\$53.91	\$53.91	\$53.91	\$53.91
Block Rate 1 (>1,000 cf)	\$6.65	\$6.65	\$6.65	\$6.65	\$6.65	\$6.65
Connection Fee	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500	\$1,500
Annual Quantities						
Total Accounts	953	956	959	962	965	968
Total Minimum Charge Accounts	305	306	307	308	309	310
Minimum Charge Volume (cf)	1,160,781	1,164,451	1,168,120	1,171,789	1,175,459	1,179,128
Billed Volume - Block 1	6,577,761	6,598,553	6,619,346	6,640,139	6,660,932	6,681,724
Total Collected Volume (cf)	7,738,542	7,763,004	7,787,466	7,811,928	7,836,390	7,860,852
New Accounts	3	3	3	3	3	3
Revenue						
Minimum Charge Revenue	\$51,376	\$51,538	\$51,700	\$51,861	\$52,023	\$52,185
Block 1 Revenue	\$437,421	\$438,804	\$440,187	\$441,569	\$442,952	\$444,335
Usage Revenue Subtotal	\$488,797	\$490,342	\$491,886	\$493,431	\$494,975	\$496,520
Usage Revenue Collected (91%)	\$444,498	\$445,902	\$447,307	\$448,711	\$450,116	\$451,520
Connection Fee Revenue	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500
Connection Fees Revenue Subtotal	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500	\$4,500
Miscellaneous Revenue	\$3,679	\$3,789	\$3,903	\$4,020	\$4,141	\$4,265
Total Annual Revenue	\$452,677	\$454,192	\$455,710	\$457,231	\$458,756	\$460,285
Betterment Collection	\$ 27,166	\$ 31,729	\$ 26,166	\$ 25,131	\$ 24,631	\$ 24,131

Sewer Department Expenses

Haverhill Wastewater Treatment Facility Operations and Maintenance

Groveland discharges all wastewater to the Haverhill Wastewater Treatment Facility and pays an operations and maintenance (O&M) fee to the City proportional to overall loads (flow, TSS, and BOD) handled at the treatment facility. Payment to the City between 2013 and 2016 ranged from \$113K to \$139K, or approximately 25% to 30% of Groveland's total sewer expenditures. Future expenses for treatment facility O&M are directly related to projected waste flows and strengths in Groveland.

The GWSD recently completed a major capital improvement to its most significant sewer asset with the Main Street Sewer Pump Station upgrade, completed in 2013. Future capital improvements planned for the Groveland collection system within the study period include I/I removal projects and assessment of the Main Street Pump Station sewer force main. In addition to capital improvements within Groveland, the GWSD also contributes 3% of the Haverhill WWTP capital improvement costs as part of the inter-municipal agreement. Groveland's contribution to capital funding of the Haverhill WWTF is projected to range from approximately \$45,000 to \$70,000 annually over the next five years.

Debt Service

The GWSD has existing debt due to the recently completed Main Street Sewer Pump Station upgrade project. The existing scheduled bond payments extend beyond the five year study period included in this analysis. Only the payments for bonds that are projected to occur between FY 2018 and FY 2023 are included in the cost model tables, totaling a debt amount of approximately \$353k during that period.

Operation and Maintenance

Annual Operations and Maintenance (O&M) cost estimates are based on our review of past expenditures for the years 2014 to 2017 and projected expenditures for the study period. O&M costs for the GWSD are divided into the following categories:

- Salaries and Wages
- Benefits
- Expenses (Electricity, Chemicals, Equipment, Consulting, Tools, etc.)

Total expenses, including Capital Improvements, Debt Service, and O&M costs are projected to total approximately \$472k in 2018, increasing to \$568k in 2023. Expenses are summarized in Table 5.

Table 5 - Sewer System Expenses
Sewer Rate Study
Groveland, MA

	2018	2019	2020	2021	2022	2023
Operations & Maintenance						
Salaries & Wages	\$109,571	\$112,000	\$115,360	\$118,821	\$122,385	\$126,057
Benefits	\$54,170	\$56,879	\$59,722	\$62,709	\$65,844	\$69,136
Expenses	\$77,109	\$95,000	\$97,850	\$100,786	\$103,809	\$106,923
Pump Station Maintenance	\$5,000	\$5,150	\$5,305	\$5,464	\$5,628	\$5,796
O&M Expenses Subtotal	\$245,850	\$269,029	\$278,237	\$287,778	\$297,666	\$307,913
Haverhill Expenses						
WWTP Discharge	\$129,636	\$130,046	\$130,456	\$130,865	\$131,275	\$131,685
Capital Bonds	\$57,086	\$45,944	\$44,473	\$56,329	\$70,308	\$68,293
Haverhill Subtotal	\$186,722	\$175,990	\$174,929	\$187,194	\$201,583	\$199,978
Debt Service						
Pump Station	\$39,750	\$44,250	\$43,350	\$42,450	\$41,550	\$40,650
I/I Rehab				\$21,250	\$20,813	\$20,375
Debt Service Subtotal	\$39,750	\$44,250	\$43,350	\$63,700	\$62,363	\$61,025
Capital Expenditures						
Force Main Condition Assess.			\$50,000			
I/I Study						
Betterment Account Transfer		\$5,063				
Capital Improvements Subtotal	\$0	\$5,063	\$50,000	\$0	\$0	\$0
Total Annual Expenses	\$472,322	\$494,331	\$546,516	\$538,673	\$561,611	\$568,916
Betterment Payments	\$60,274	\$58,129	\$21,756	\$21,206	\$20,656	\$20,106

Evaluation of Rates and Fees

Retained Earnings Balance

Account balances, revenues, and expenses were evaluated to determine the overall account balance at the end of each year in the study period. This information is tabulated in Table 6 as well as shown graphically in Figure 1 for the fiscal years 2018 through 2023. With the existing sewer rates and proposed expenses, an operating deficit will occur in FY19 with account reserves depleted by FY 2022. The operating deficit increases dramatically starting in FY19 due to increased capital bond payments to Haverhill, increased expenses related to the new GWSD headquarters and costs for additional labor.

EPG recommends that the GWSD set a goal of maintaining a retained earnings account balance of at least 50% of the operating budget. The following sections examine modifications to the rates, fees, and other revenue sources that will be needed for Groveland to proceed with their planned capital improvements.

Sewer Rate Structure

There are several different ways to structure a sewer rate system.

- The flat fee approach – This approach charges all customers the same amount, regardless of sewer use. This approach is typically used when metering is not performed. This is not a preferred method as sewer needs vary among customers, and customers do not pay based on their own sewage production.
- Metered flat rate – Users are charged a flat rate based on customers metered volume.
- Block rates – Usage blocks are assigned and adjusted to sewer block rates accordingly. Increasing blocks charge more per unit of sewage as more sewage is used encouraging water conservation as well as increased revenue from large sewer users.
- ERU Assignments – Charges are assigned per equivalent residential unit (ERU) with 1 ERU equating to a typical single family home. ERUs for commercial users are commonly based on meter size or fixture counts.
- Additional variations on rate structure include distinguishing between user classes or varying rates seasonally.

The GWSD existing rate structure includes a minimum charge of \$53.91 per quarter that includes sewer usage of up to 1,000 cubic feet and one additional block rate. This existing structure appears adequate for a sewer system of the Groveland's size and customer base. All of the surrounding Massachusetts Towns evaluated in Table 2 also have two block groups for sewer charges. Half of these Towns used a minimum rate like Groveland, while the other half did not have a minimum rate.

Sewer Billing

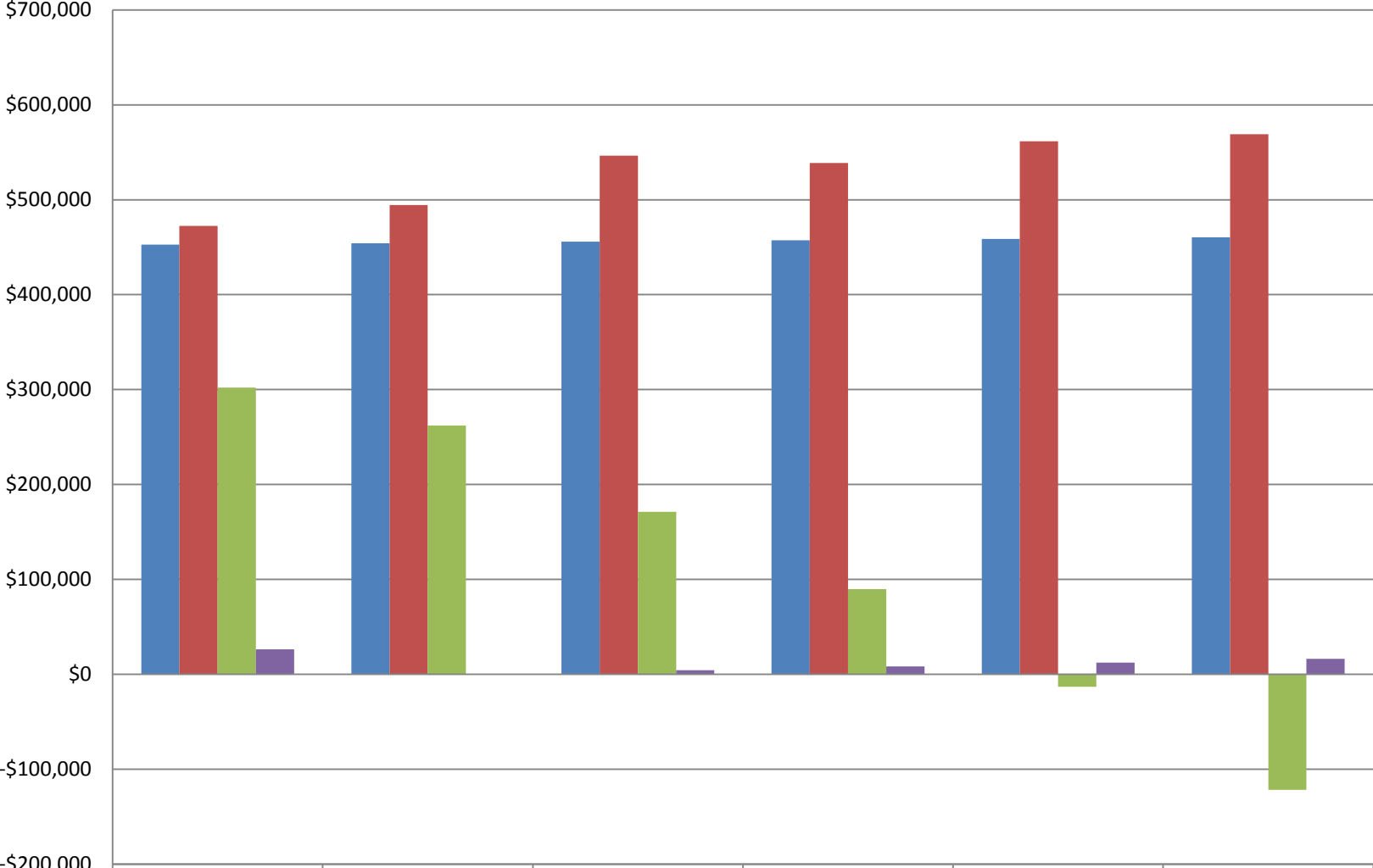
The block rates and minimum charge were most recently updated in June 2016. We recommend that the Town maintain the current increasing block sewer rate structure and increase billing rates a minimum of 8.5% immediately for FY19 and then 4.5% annually over the following 4 years. Rates should be reevaluated annually as actual capital bond payments to Haverhill become known.

**Table 6 - Existing Account Balances
Sewer Rate Study
Groveland, MA**

	2018	2019	2020	2021	2022	2023
Operating Start Balance	\$321,812	\$302,167	\$262,027	\$171,221	\$89,780	-\$13,075
Betterment Start Balance	\$59,508	\$26,400	\$0	\$4,410	\$8,334	\$12,309
Total Revenue	\$452,677	\$454,192	\$455,710	\$457,231	\$458,756	\$460,285
O&M	\$245,850	\$269,029	\$278,237	\$287,778	\$297,666	\$307,913
Debt Service	\$39,750	\$44,250	\$43,350	\$63,700	\$62,363	\$61,025
Capital Improvements	\$0	\$5,063	\$50,000	\$0	\$0	\$0
Haverhill	\$186,722	\$175,990	\$174,929	\$187,194	\$201,583	\$199,978
Total Expenses	\$472,322	\$494,331	\$546,516	\$538,673	\$561,611	\$568,916
Year End Operating Balance	\$302,167	\$262,027	\$171,221	\$89,780	-\$13,075	-\$121,706
Betterment Collection	\$27,166	\$31,729	\$26,166	\$25,131	\$24,631	\$24,131
Betterment Payments	\$60,274	\$58,129	\$21,756	\$21,206	\$20,656	\$20,106
Betterments Account Balance	\$26,400	\$0	\$4,410	\$8,334	\$12,309	\$16,333

Note: FY 2018 Operating Start Balance is projected.

Figure 1 - Account Summary with Existing Rates



	2018	2019	2020	2021	2022	2023
Total Revenue	\$452,677	\$454,192	\$455,710	\$457,231	\$458,756	\$460,285
Total Expenses	\$472,322	\$494,331	\$546,516	\$538,673	\$561,611	\$568,916
Operating Balance	\$302,167	\$262,027	\$171,221	\$89,780	-\$13,075	-\$121,706
Betterment Account	\$26,400	\$0	\$4,410	\$8,334	\$12,309	\$16,333

Connection Fee

Connection fees are considered purchasing a piece of the system capacity. Significant capital costs have already been incurred to develop the sewer system to its existing capacity. A new customer pays their portion of the capital cost via the connection fee or through betterments. The Equity Method connection fee calculation was used to calculate the connection fees based on the Groveland sewer system assets listed in Table 7. The Equity Method assigns a cost to the new connection based on average equity attributable to existing customers. System equity is determined by evaluating system assets, accumulated depreciation, system liabilities, sources of equity and system capacity.

Table 7 – Sewer Department Assets

Description	Amount
Gravity Sewer Mains ¹	\$2.08M
Force Mains ²	\$205K
Sewer Pump Station ³	\$500k
Equipment & Vehicles	\$75k
Total	\$2.86M

1. Based on 75 Year useful life @ \$200/ft (2018 Dollars)
2. Based on 50 Year useful life @ \$150/ft (2018 Dollars)
3. Based on 25 Year useful life

The average net equity investment per service connection is calculated by dividing the total assets by the number of services. Using this method, the connection fee is calculated to be \$3,000. The GWSD existing connection fee is \$450 or \$1,950 if the connection is serviced by a pump station. Based on our evaluation, the connection fees should be increased as soon as practicable to correspond with current system equity. Additionally, the connection fee should be adjusted to correspond with major CIP projects as they are implemented. The fee calculated above refers to a single family home or equivalent size services. Larger services should be evaluated on a case by case basis and scaled based on anticipated sewer usage.

Recommendations

Proposed Increases

In order to finance the planned capital improvements for this study period and to provide an adequate account balance, sewer rates and fees need to be increased. The minimum and block usage rates are recommended to be increased by 8.5% for FY19 and 4.5% annually over the following 4 years. This will allow the Department to maintain a positive revenue trend. Table 8 lists the existing sewer rates and proposed rate increase planned for FY19. Table 9 shows how various quarterly bills would increase by this new rate structure based on the amount of water consumed.

Table 8 – Existing and Proposed Sewer Rates

Description	Existing Rates	FY 19 Proposed Rates
Minimum Quarterly Charge up to 1000 CF	\$53.91	\$58.49
Over 1000 CF	\$6.65 / 100 CF	\$7.22 / 100 CF

Table 9 – Example Quarterly Water Bill Amounts

Usage (cf)	Existing Rates	FY19 Proposed Rates	Quarterly Increase	Annual Increase
500	\$53.91	\$58.49	\$4.58	\$18.32
1,000	\$53.91	\$58.49	\$4.58	\$18.32
2,000	\$120.41	\$130.69	\$10.28	\$41.12
3,000	\$186.91	\$202.89	\$15.98	\$63.92
5,000	\$319.91	\$347.29	\$27.38	\$109.52

In addition to increased consumption billing rates, EPG also recommends that connection fees be increased based on the equity method. A single family connection charge should be increased to \$3,000. All other size connections should be increased in proportion to the projected sewer use. These increases will allow the GWSD to complete all planned capital improvement projects over the five year study period. Table 11 shows the projected revenue with the proposed billing rate and fee increases. Figure 2 and Table 12 show the account balance information based on the recommended fees.

Summary

We recommend increasing the existing sewer rates and new connection fees in response to future increases in operational expenses and planned capital improvement projects. The rate structure should be reviewed annually to verify that the fees are generating enough revenue to meet the operating requirements of the GWSD and to complete the planned infrastructure improvements.

Table 10 – Local Sewer Rate Comparison with Proposed 8.5% Increase

Usage (cf)	Groveland	Average	Amesbury	Merrimac	North Andover	Newburyport
500	\$58.49	\$47.52	\$50.63	\$68.00	\$29.75	\$41.70
1,000	\$58.49	\$69.76	\$68.13	\$68.00	\$59.50	\$83.40
2,000	\$130.69	\$146.76	\$138.13	\$163.12	\$119.00	\$166.80
3,000	\$202.89	\$248.50	\$208.13	\$258.49	\$277.20	\$250.20
5,000	\$347.29	\$428.46	\$348.13	\$449.23	\$462.00	\$454.50

Based on the survey of adjacent communities, Groveland customers have lower sewer costs than most Towns in the area. Even with the proposed rate increase, the cost of sewer for Groveland customers will remain relatively low for the largely residential user base.

We appreciate the opportunity to prepare this rate study. Please feel free to contact me at (617) 657-0281 or rja@envpatners.com with any questions or concerns.

Very truly yours,
Environmental Partners Group, Inc.



Ryan J. Allgrove, P.E.
Project Manager

cc: Tom Cusick, Superintendent

**Table 11 - Proposed Revenue
Sewer Rate Study
Groveland, MA**

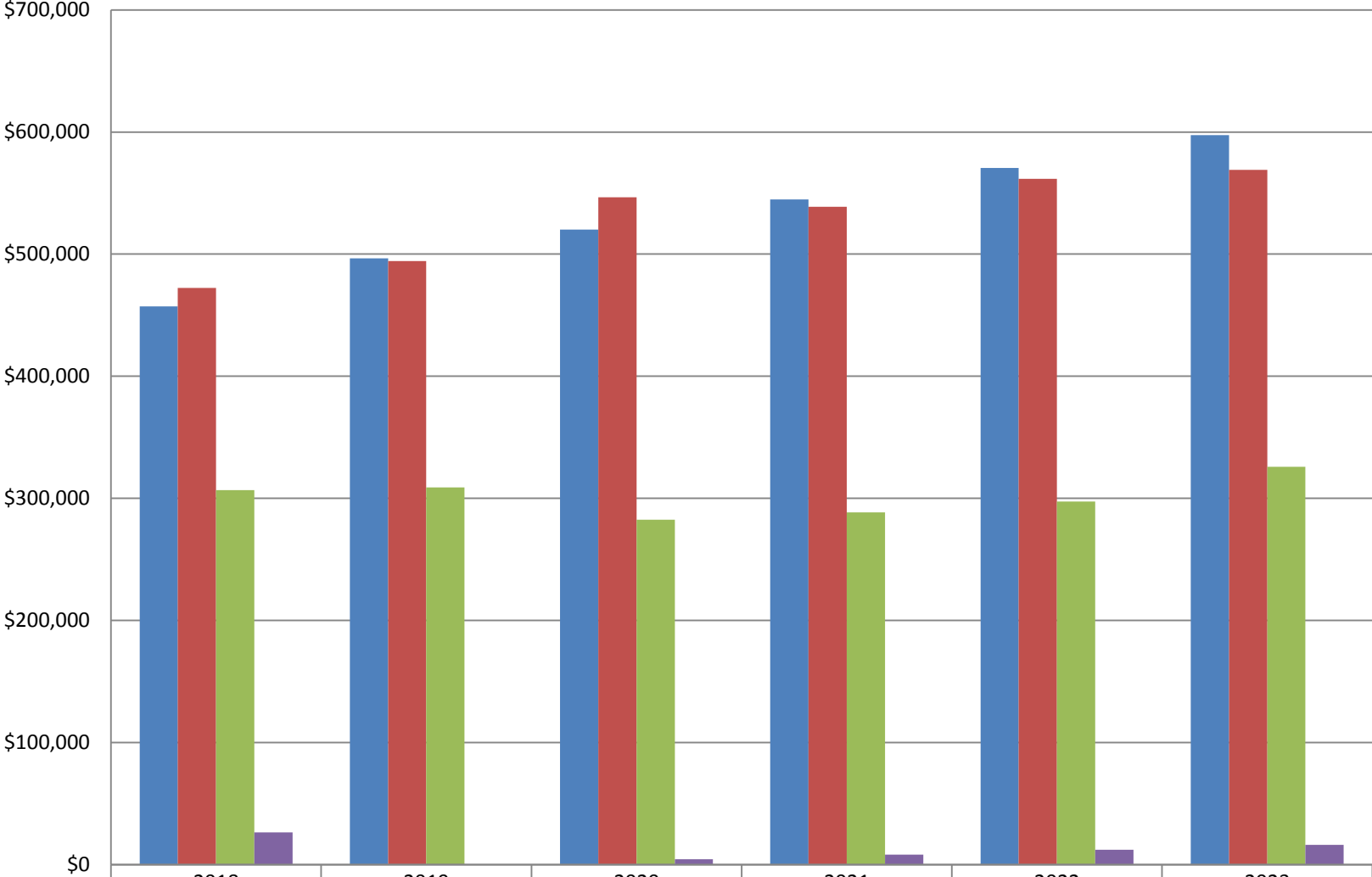
	2018	2019	2020	2021	2022	2023
Rates and Fees						
Minimum Charge (up to 1000 cf)	\$53.91	\$58.49	\$61.12	\$63.88	\$66.75	\$69.75
Block Rate 1 (<1,000 cf)	\$6.65	\$7.22	\$7.54	\$7.88	\$8.23	\$8.60
Connection Fee	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000	\$3,000
Annual Quantities						
Total Accounts	953	956	959	962	965	968
Total Minimum Charge Accounts	305	306	307	308	309	310
Minimum Charge Volume (cf)	1,160,781	1,164,451	1,168,120	1,171,789	1,175,459	1,179,128
Billed Volume - Block 1	6,577,761	6,598,553	6,619,346	6,640,139	6,660,932	6,681,724
Total Pumped Volume (cf)	7,738,542	7,763,004	7,787,466	7,811,928	7,836,390	7,860,852
New Accounts	3	3	3	3	3	3
Revenue						
Minimum Charge Revenue	\$51,376	\$55,919	\$58,618	\$61,448	\$64,413	\$67,521
Block 1 Revenue	\$437,421	\$476,102	\$499,094	\$523,192	\$548,448	\$574,917
Usage Revenue Subtotal	\$488,797	\$532,021	\$557,713	\$584,640	\$612,861	\$642,438
Usage Revenue Collected (91%)	\$444,498	\$483,804	\$507,167	\$531,654	\$557,317	\$584,214
Connection Fee Revenue	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000
Connection Fees Revenue Subtotal	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000	\$9,000
Miscellaneous Fees Revenue	\$3,679	\$3,789	\$3,903	\$4,020	\$4,141	\$4,265
Total Annual Revenue	\$457,177	\$496,593	\$520,071	\$544,674	\$570,458	\$597,479
Betterment Collection	\$ 27,166	\$ 26,666	\$ 31,229	\$ 25,131	\$ 24,631	\$ 24,131

**Table 12 - Proposed Account Balance
Sewer Rate Study
Groveland, MA**

	2018	2019	2020	2021	2022	2023
Operating Start Balance	\$321,812	\$306,667	\$308,929	\$282,483	\$288,485	\$297,332
Betterment Start Balance	\$59,508	\$26,400	\$0	\$4,410	\$8,334	\$12,309
Total Revenue	\$457,177	\$496,593	\$520,071	\$544,674	\$570,458	\$597,479
O&M	\$245,850	\$269,029	\$278,237	\$287,778	\$297,666	\$307,913
Debt Service	\$39,750	\$44,250	\$43,350	\$63,700	\$62,363	\$61,025
Capital Improvements	\$0	\$5,063	\$50,000	\$0	\$0	\$0
Haverhill	\$186,722	\$175,990	\$174,929	\$187,194	\$201,583	\$199,978
Total Expenses	\$472,322	\$494,331	\$546,516	\$538,673	\$561,611	\$568,916
Retained Earnings Balance	\$306,667	\$308,929	\$282,483	\$288,485	\$297,332	\$325,895
Betterment Collection	\$27,166	\$31,729	\$26,166	\$25,131	\$24,631	\$24,131
Betterment Payments	\$60,274	\$58,129	\$21,756	\$21,206	\$20,656	\$20,106
Betterments Account Balance	\$26,400	\$0	\$4,410	\$8,334	\$12,309	\$16,333

Note: FY 2018 Operating Start Balance is projected.

Figure 2 - Account Summary with Recommended Increase



	2018	2019	2020	2021	2022	2023
Total Revenue	\$457,177	\$496,593	\$520,071	\$544,674	\$570,458	\$597,479
Total Expenses	\$472,322	\$494,331	\$546,516	\$538,673	\$561,611	\$568,916
Operating Balance	\$306,667	\$308,929	\$282,483	\$288,485	\$297,332	\$325,895
Betterment Account	\$26,400	\$0	\$4,410	\$8,334	\$12,309	\$16,333