

2130

June 29, 2017

Alan Hardy and Nicole Hoyt, Co-Administrators
Town of Boscawen
116 North Main Street
Boscawen, NH 03303

Re: ***Sewer Rate Study Update and System Development Charge
Town of Boscawen, New Hampshire***

Dear Ms. Hoyt:

In accordance with our contract (ESR #45) with the Town of Boscawen, we have completed the sewer rate study update and system development charge (copy attached). This study supersedes the previous sewer rate model updated by Underwood Engineers in 2014, when rates were suggested to increase from \$5.88/100 CF to \$7.20/100 CF.

The goals of this study included:

- Review and update the existing rate model to include Boscawen's share of Concord WWTF CIP projects and Town sewer CIP projects.
- Review the billing and allocation of Concord's WWTF to Boscawen.
- Update I/I calculations.
- Update the rate model including rate and funding recommendations to support the recommended CIP.
- Identify suggested rate increases for the next 5 years.
- Assist the Town to develop a SDC that could be used for new and expanded connections to the collection system.

Rate History

A summary of recent rate history and information is as follows:

- Boscawen currently applies a consumption charge based on the water used, **\$7.20/100 CF**, with a minimum charge of \$43.20 per quarter for 600 CF/qtr.
- Historically, rates have changed eight times since 2005 as shown below.

	Consumption Charge Cost per 100 CF	Minimum Charge per quarter
2005, 1 st quarter	\$5.00	\$50.00
2005, 2 nd quarter	\$5.10	\$30.60
2007, 1 st quarter	\$5.00	\$30.00
2007, 3 rd quarter	\$4.90	\$29.40
2008, 3 rd quarter	\$4.80	\$29.40
2009, 2 nd quarter	\$4.70	\$29.40
2014, 1 st quarter	\$5.88	\$36.75
2015, 1 st quarter (current rates)	\$7.20	\$43.20

User Summary

- Approximately 392 customers are on the sewer system
- 95 users used the minimum consumption (600 CF/qtr.) or less in 2016. This is an increase from 72 users in 2013.

Inflow and Infiltration

Average consumption and sewer metering of the Boscawen Metering Station (BMS) from 2014 to 2016 is summarized in Table 1. Consumption has remained similar to that of previous years (2010-2013) at approximately 20,000,000 gal/year. Infiltration and inflow (I/I) is estimated by subtracting sanitary consumption records from total sanitary flows recorded at the Boscawen metering station. I/I may actually be slightly higher since not all the consumed water ends up in the sewer system. For comparison purposes, we continue to assume 100% of the water consumption becomes sewer flow.

Table 1. Historical Consumption and Sewer Metering

Year	Consumption (gal.)	Boscawen Metering Station (gal.)	I/I (%)
2014	19,940,775	62,543,400	68%
2015	19,761,274	61,645,609	68%
2016	20,444,624	50,565,400	60%
3 year avg.	20,048,891 (54,928 gpd)	58,251,470 (159,593 gpd)	66%

Estimated I/I has fluctuated between 50% and 71% between 1999 and 2004, and between 62% and 68% between 2011 and 2016. I/I has been a prominent issue for the Town, as the Town is responsible for paying for all the flow measured at the Boscawen Metering Station, including I/I. From 2014 to 2016, inflow and infiltration (I/I) made up 66% of the water sent to the Penacook Wastewater Treatment Plant. This infiltration is considered to be excessive. Lowering the I/I would likely help lower the Town's costs for the treatment of wastewater. A 25% reduction in I/I (~10,000,000 gal/yr.) could result in a yearly savings of approximately \$30,000. This is based on



current Concord charges of \$2.33 per 100 CF.

Past Revenues and Expenses 2014 to 2016

- Recent operating expenses are summarized in Table 2
- Revenues exceeded expenses from 2014 to 2016

Table 2. Past Revenues and Expenses

Year	Revenues	Operating Expenses¹	Net Revenue
2014	\$207,227	\$225,436	(\$18,209)
2015	\$243,189	\$181,368	\$61,821
2016	\$278,767	\$219,341	\$59,426
3-year avg.	\$243,061	\$208,715	\$34,346

¹Operating expenses above have not been reduced by the General Fund contribution of ~\$48,000

Currently, the General Fund contributes \$48,000 annually to the Sewer Fund for inflow. This was determined assuming 41% of BMS flow as inflow (consistent with the 2001 Sewer System Study Report). The average inflow transmitted to Concord was approximately 62,500 gpd (2011 - 2013) and the average Concord charge (2011 - 2013) was \$1.57/100 CF, resulting in an annual cost of \$48,000 to treat the water. For 2014 - 2016, the average Concord charge increased to \$2.33 per 100 CF. Using the 41% inflow estimate, this would result in a cost of \$75,000 per year to treat inflow. General fund contribution for inflow is because inflow is due to storm events, and treating stormwater can be considered the responsibility of the Town, not the sewer users only.

Additionally, the general fund contributes to the debt service for the Gage Street and Penacook WWTF improvements, completed around 2005. The general fund contribution is based on a percentage of the debt service (44% for Gage Street and 50% for the WWTF). In 2016, this resulted in a general fund contribution of \$50,500.

Projected Expenses

Future revenue needs include ongoing O&M and continued debt service payments for Boscawen's share of the Penacook Wastewater Treatment Plant and the Gage Street sewer projects (2005). Additional debt service payments will likely be required to pay for Boscawen's share of anticipated Wastewater Treatment Facility Improvements. The assumptions used for projected revenues and expenses are summarized in Table 3.



Table 3. Water Rate Model Assumptions

Consumption	<ul style="list-style-type: none"> • 55,500 gpd average based on avg. 2014-2016 billing • Minimum consumption = 600 CF/Qtr
Inflow/Infiltration	<ul style="list-style-type: none"> • I/I makes up a large portion of Boscawen's flow to the PWWTF. Approximately 66% of the wastewater is from I/I
Reserve Fund Balance	<ul style="list-style-type: none"> • Fund Balance = \$395,694 as of December, 2016
Operating budget	<ul style="list-style-type: none"> • Expenses were \$219,000 in 2016 • Projected budget per Town of Boscawen • Concord charges projected to be \$225,000 in 2017. • 0.3% interest rate on account balance • Sewer abatements were included in the operating budget • Additional recommended budget items include: <ul style="list-style-type: none"> ○ an increase to \$20k per year for Maintenance to support sewer system repairs to reduce I/I ○ an added budget item of \$20k per year to support annual CCTV and O&M reporting
General Fund (inflow)	<ul style="list-style-type: none"> • General fund contribution is currently \$48,000
Debt Payments	<ul style="list-style-type: none"> • Penacook WWTF improvements debt ends in 2031 • 30% grant reimbursement from State • 50% of yearly payment comes from General Fund • Gage St. Pump Station debt ends in 2031 • 30% grant reimbursement from State • 44% of yearly payment comes from General Fund
Capital Improvements Plan (CIP)	<ul style="list-style-type: none"> • The Penacook WWTF is planning several improvements to the WWTF over the next few years, with Boscawen's share totaling ~\$669,000 between 2017-2019. \$750k was used in the model to account for contingency and engineering. • \$30k was included in 2019 to support an I/I planning project.

Based on Boscawen's portion of unused reserved capacity at the Penacook WWTF, Boscawen could charge 59% of the Concord CIP to the General Fund as was done for the Gage St. and Penacook WWTF bonds. This is because this portion is not currently being utilized by the existing users. Based on the average residential user, the available unused capacity at the Penacook WWTF would serve approximately 1,500 additional residential units assuming no additional I/I.



Concord Billing

Concord billing is currently based on Boscawen's allocation at the Penacook WWTF per the 2005 Memorandum of Understanding with the City of Concord. The Concord charge has increased 48%, from the 2011 - 2013 estimate of \$1.57/100 CF to \$2.33/100 CF for the 2014-2016 estimate.

Concord billing for 2014, 2015 and 2016 was reviewed. Ratios of Boscawen flow, BOD and TSS to total flow, BOD and TSS were similar for all three years. It is apparent that significant increases in bills from Concord are due to increases in expenses for the WWTF, not due to increases in ratios of Boscawen flows and loads to total flows and loads.

Rate Evaluation

The rate model was evaluated under four separate scenarios:

- Existing (no rate adjustment):
 - Assuming projection of current expenses, no change in current rates and no consideration to Concord CIP items.
 - Capital Reserve Funds would begin to deplete in 2017, with increasing depletions each year. Approximately \$300,000 of reserves would be used by 2021.
- Scenario 1:
 - Assuming projection of current expenses, rate adjustments and no consideration to Concord CIP items.
 - A general fund contribution of \$75,000 and 10% rate increases in 2018 and 2021 would fund the budget through 2021.

Scenarios 2 and 3 include Concord WWTF capital expenses and will be used as a basis for rate increase recommendations. Concord capital expenses in the model were estimated at \$750k, assuming CIP items at \$669k, 10% contingency at \$67k, and engineering at \$14k.

- Scenario 2:
 - Assuming projection of current expenses, rate adjustments, inclusion of Concord CIP items, \$450,000 of the Concord CIP costs to be bonded over 10 years (\$300,000 to come from Capital Reserves).
 - A general fund contribution of \$75,000, a 45% increase in 2018 and a 10% increase in 2020 would fund the budget through 2021.
- Scenario 3:
 - Assuming projection of current expenses, rate adjustments, inclusion of Concord CIP items, all of Concord CIP costs (\$750,000) to be bonded over 20 years.
 - A general fund contribution of \$75,000, a 45% increase in 2018 and a 10% increase



in 2020 would fund the budget through 2021.

Recommended Rates

- Table 4 shows necessary changes in rates and general fund contributions for each scenario.
 - A rate increase is recommended in 2018 to match revenues to expenses.
 - A general fund contribution of \$75,000 is suggested to offset costs to treat inflow.
 - A 10-year bond of \$450,000 (Sc. 2) will result in the same needed rate and general fund increases as a 20-year bond of \$750,000.
 - Either Scenario 2 or Scenario 3 is recommended to be implemented in 2018. Scenario 2 will result in more depletion of capital reserves, but a shorter debt schedule. Scenario 3 will result in a longer debt schedule, but will not deplete capital reserves.

Table 4. Recommended Rate Increase

	Existing	Sc. 1	Sc. 2	Sc. 3
Rate Structure				
Rate increase (%)	0%	20%	45%	45%
Consumption Charge (Unit rate/100 CF)	\$7.20	\$8.64	\$10.44	\$10.44
Minimum Water (CF/qtr)	600	600	600	600
Minimum Charge (\$/qtr)	\$43.20	\$51.84	\$62.64	\$62.64
General Fund Contribution	\$48,000	\$75,000	\$75,000	\$75,000
Annual Residential Bill (Bos. EDU 143 GPD)	\$502	\$603	\$728	\$728
Annual Residential Bill (State Avg. 240 GPD)¹	\$843	\$1,012	\$1,223	\$1,223
2021 Reserve Fund Balance (Current \$395,694)	\$105,489	\$413,358	\$116,112	\$392,822

¹240 GPD NHDES 2015 Survey average

For comparison purposes, the state average sewer bill is \$593.52 per year (usage of 240 gpd). While Boscawen bills using the state average of 240 gpd are above the state average, they are comparable to sewer bills of other Towns in NH, including Enfield, Greenville, Jaffrey, Littleton, New Castle, Newfields, New London, Portsmouth, Warner and Wolfeboro.

System Development Charge

The Town of Boscawen currently charges user connection fees when a new connection is installed. These fees generally only cover the administration and construction costs associated with the new service installs and are not designed to cover the costs associated with the existing assets of the system.

A system development charge (SDC) is designed to cover the costs associated with the existing



equity of the system or the incremental cost of offsite improvements needed to serve new development. It can be charged in addition to the cost of the connection itself.

There are two primary methods for calculating a SDC (AWWA, M1):

- **Equity (Buy-In) Method:** The goal of this method is to charge new or expanding customers a “buy-in” fee to achieve an equity position with the existing users. In other words, the new customers will make an initial one-time payment that will cover their share of the value of the existing infrastructure already paid for by the existing users.
- **Incremental Cost Method:** This method assigns new development the incremental cost of system expansion needed to serve the new development. The primary objective is to provide system expansion to serve new development without unfairly impacting the existing users.

There are many advantages and disadvantages of each option and a water system may select either method or a combination of both. However, it is beyond the scope of this letter to evaluate the options in detail. Since it is in the best interest of Boscawen to develop a SDC, we recommend the equity buy-in method.

SDC - Methodology

To calculate the SDC based on the equity buy-in method, the following data is needed:

System Capacity (gpd): For the purpose of this calculation, 386,500 gpd was used, which represents Boscawen’s average daily WWTF flow allocation per the Memorandum of Understanding with the City of Concord dated July 1, 2005.

Total Boscawen Net Assets: The Boscawen net sewer system asset value is based on estimates for the number of linear feet of sewer (30,000 ft.), asset value per linear foot of sewer (\$150/LF), and Boscawen’s net asset share of the WWTF (\$3,900,000). These estimates were then adjusted downwards for grants (SAG, RD and CDGB for Gage St., and SAG and RD for the Penacook WWTF) and outstanding principal on existing debt (user portion only).

Equivalent Dwelling Unit: Per the 2017 sewer rate evaluation, a typical residential unit in Boscawen uses 143 gpd.

Based on the above (and the attached calculations), the following summarizes the recommended SDC for new service connections.



Table 5. Suggested SDC Charges

Meter Size	Meter Equivalent Ratio ⁴	Estimated Use (gpd)	Equity Buy-In Cost	Unit
5/8" and 3/4"	1	143	\$1,825	Each
1"	2.5	358	\$4,562	Each
1-1/2"	5.0	715	\$9,123	Each
2" and Greater	varies	as approved by the Town	\$12.76	per gpd

SDC Recommendations

- UEI recommends confirming the above assumptions, particularly the assets, prior to finalizing the SDC. We also suggest review by legal counsel.
- UEI recommends using the Equity (buy-in) Method for the SDC.
- New service connections will be charged by meter size per Table 5.
- Expanded services will be charged the difference between the existing service size and new service size.
- The SDC shall be charged in addition to all other existing fees charged for services.
- The Town should consider how and when the money is collected. A separate fund may be appropriate.
- The Town should identify what the funds may or may not be used for. UEI recommends the funds be available for any use upon authorization of the Board.

Rate Recommendations

- Continue to coordinate with the City of Concord on anticipated WWTF CIP items and projected budgets to better anticipate increases in Concord charges.
- Contact Concord to get payment schedule for CIP.
- Consider including a general fund contribution of up to 59% to offset Concord CIP debt allocated to unused WWTF capacity since this represents approximately an additional 1,500 residential units that could be served. The model scenarios do not consider this general fund contribution, but it does have the potential to reduce rate impacts by generating an additional \$22k - \$40k in revenue each year. See Tables 7A and 7B in the rate model.
- Create a 10-year CIP to plan future projects. Incorporate the CIP into the rate model to



adjust rates.

- Boscawen currently has a high percentage of I/I. The Town should continue to pursue identifying the sources of I/I to help reduce water sent to PWWTP and treatment costs. This includes annual CCTV of 20% of the sewer system in accordance with the 2008 Collection System O&M Plan, making sewer system repairs, and addressing private I/I. The Town should also consider implementing I/I reduction projects such as Projects 3 & 4, which would involve replacing sewer main in areas assumed to be the largest contributors to I/I. It should be noted that the previous cost estimate of \$3.2M to complete these projects is an outdated number and needs to be increased. UE recommends performing a study to determine new cost estimates (\$30k in 2019). As part of this study, a phasing program could be evaluated as an option to perform the sewer replacements.
- Keep enough funds in reserve to be able to cover 50% of the O&M budget (a minimum of approximately \$200k).
- Consider removing the Engineering Services General Fund Account (No. 4329443) from the budget in 2018 forward, because it is now included in the sewer budget beginning in 2018 (see Table 8 in the Rate Model).
- Review and/or update the sewer rates every two years.
- Review and update other standard rates for service (i.e., connection fees, service charges, etc.) to make sure they cover the cost of service.

Please call if you have any questions.

Very truly yours,
UNDERWOOD ENGINEERS, INC.



Keith A. Pratt, P.E.
President

KAP/mlm



Meagan L. McCowan, E.I.T.
Project Engineer



SEWER RATE STUDY
FOR
TOWN OF BOSCAWEN
NEW HAMPSHIRE

PREPARED BY:

UNDERWOOD ENGINEERS, INC.
PORTSMOUTH AND CONCORD, NH

June 29, 2017

TABLE OF CONTENTS / INSTRUCTIONS

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

<u>Section</u>	<u>Instructions</u>
1. REVISION INFORMATION	<i>Information on changes/updates to this program</i> Record brief description, date and initials of any changes made.
2. WATER CONSUMPTION RECORDS	<i>For information only. Used as basis to project future consumption rates.</i> Input annual water metering records for sewer users. Provides general history/trends on consumption rates, # of accounts.
3. INFILTRATION / INFLOW ESTIMATES	<i>For information only.</i> Input annual sewer metering provided by Concord (BMS station) Provides information on I/I trends.
4. DEBT SCHEDULE - SEMIANNUAL PAYMENTS WWTF Gage Street	<i>Actual debt schedules for current sewer projects. Affects rate calculations.</i> Input actual loan origination dates and payment schedules, if changed.
5. PRIOR SEWER REVENUES & ACCOUNT BALANCES	<i>For information only. Used as basis for current reserve fund balance.</i> Input actual prior year revenues and reserve fund balances. Last year reserve fund balance carries over to rate table.
6. PRIOR EXPENSES	<i>For information only. Used as basis to project future expenses.</i> Input actual prior year expenses. Last year info carries over to rate table.
7. CAPITAL IMPROVEMENT PROGRAM (DRAFT)	<i>Estimated CIP items. Affects rate calculations.</i> Input estimated CIP item, cost, and year of cost. Utilize debt schedules as necessary to project bond payment scenarios.
8. PROJECTED EXPENSES	<i>Projected future sewer dept. expenses. Affects rate calculations.</i> No input required - uses last year info (Table 5) to project future expenses.
9. CURRENT RATES AND PROJECTED ACCOUNT BALANCE	<i>Projected rates and account balances. Affects rate calculations.</i> Current rate shown on line 1, impacts reserve fund balances. Positive balance on line 23 means enough revenue is generated to add to reserves. Negative balance on line 23 means reserves will be needed to supplement expenses.
10. PROPOSED RATES AND PROJECTED ACCOUNT BALANCE	<i>Proposed rates and account balances. Affects rate calculations.</i> Change % increases for lines 1, 9 and 16 to increase projected revenues. Positive balance on line 23 means enough revenue is generated to add to reserves. Negative balance on line 23 means reserves will be needed to supplement expenses.
Key	<div style="border: 1px solid black; width: 200px; height: 15px; background-color: #e6f2ff; margin-bottom: 5px;"></div> Indicates input from Town. Bold / Bold italics Denotes important information.

1. REVISION INFORMATION

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

Description of Revision	Made By:	Date:
1 Original rate model	KAP	January 31, 2005
2 Revised debt schedules	KAP	January 17, 2006
3 Updated rate model	KAP/JVF	December 30, 2014
4 Updated rate model	KAP/MLM	June 29, 2017
5		
6		
7		
8		
9		
10		

Prepared: Underwood Engineers, Inc.

Date June 29, 2017

File 2130

2. WATER CONSUMPTION RECORDS

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

Water Billing, Penacook-Boscawen Water Precinct (gallons)^{1,2}

	2013	2014	2015	2016	3 YR AVG
Qtr 1, gallons	4,885,143	4,873,362	4,444,182	4,651,386	4,656,310
Qtr 2, gallons	4,659,314	5,342,717	5,514,705	4,707,598	5,188,340
Qtr 3, gallons	5,747,849	4,936,119	5,321,137	7,918,724	6,058,660
Qtr 4, gallons	4,556,868	4,880,176	4,210,148	4,121,368	4,403,897
Total (estim), gal	19,849,175	20,032,375	19,490,172	21,399,076	20,307,208
Total (estim), CF	2,653,633	2,678,125	2,605,638	2,860,839	2,714,867
No. of Accounts, Total	387	387	387	392	
No. of Accounts @ Minimum Usage ²	72			95	
Est. annual consumption from minimum users (CF) ³	172,800			228,000	
Daily Avg, gpd	54,381	54,883	53,398	58,467	55,583
Daily Avg, gpd/EDU	141	142	138	149	143

Notes:

¹ Water Consumption based on Calendar Year

² Consumption and minimum accounts per "Water Consumption Records" spreadsheet provided by Town

³ Minimum consumption is 600 CF/Qtr./Account

3. INFILTRATION / INFLOW ESTIMATES

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

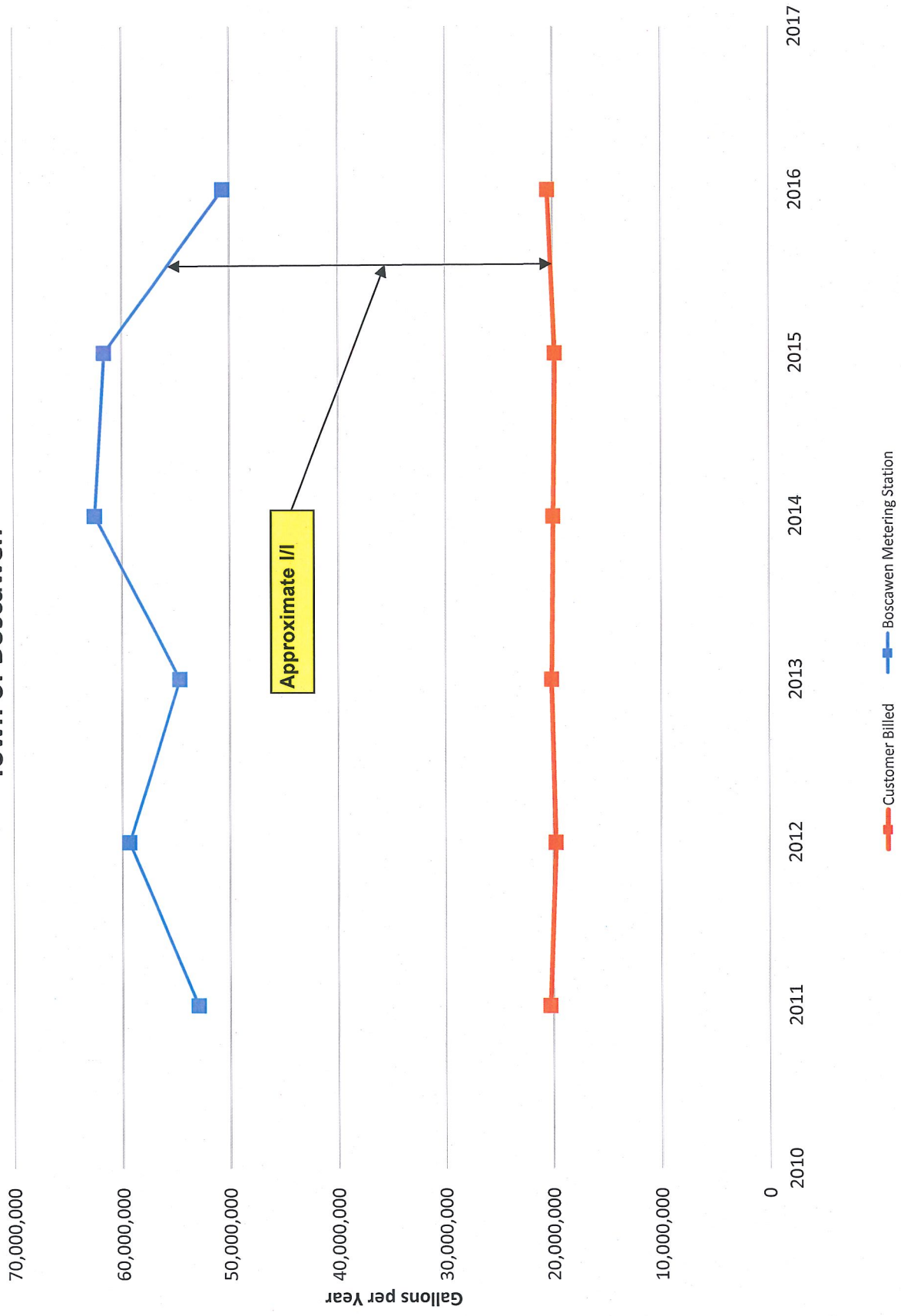
	FY 2011	FY 2012	FY 2013	FY 2014	FY 2015	FY 2016	3 YR AVG
Avg Consumption (gal) ¹	20,247,290	19,716,955	20,105,283	19,940,775	19,761,274	20,444,624	20,048,891
Sewer Metering (gal) ²	52,922,000	59,342,000	54,612,000	62,543,400	61,645,609	50,565,400	58,251,470
I & I (gal) (difference)	32,674,710	39,625,045	34,506,717	42,602,625	41,884,335	30,120,776	38,202,579
% of Wastewater Flow	62%	67%	63%	68%	68%	60%	66%

Notes:

¹ Consumption and Boscawen Meter Records adjusted to match Concord Fiscal Year (July 1 - Jun 31)

² Boscawen Metering Station flows corrected for Elm Street contribution (17,200 gpd x 365 days in

Wastewater Flows Town of Boscawen



4. DEBT SCHEDULE - SEMIANNUAL PAYMENTS

SEWER DEPARTMENT, TOWN OF BOSCAWEN, NH

Project: WWTF

Loan Origination Date (Est.):

3/28/2006

Project Cost:

\$905,540

Term (years):

26

No. of Payments:

26

Interest Rate:

4.13%

Amortization Calculation

Princ.	\$905,540
No. Payments	26
Interest	4.125%
Payment	\$45,347

Valuation (1999)

\$108,310,000

Tax Rate Impact (1st year)

\$0.23

Tax Rate Impact (amort.)

\$0.42

Annual Payment Due	Principle Remaining	Payment			Grant Reimburse	Net Due	Users	Tax
		Principal	Interest	Total			50%	50%
03/28/06	\$905,540	\$34,828	\$37,354	\$72,182	\$21,655	\$50,527	\$25,264	\$25,264
03/28/07	\$870,712	\$34,828	\$35,917	\$70,745	\$21,224		\$0.00	\$0
03/27/08	\$835,883	\$34,828	\$34,480	\$69,309	\$20,793	\$48,516	\$24,258	\$24,258
03/27/09	\$801,055	\$34,828	\$33,044	\$67,872	\$20,362	\$47,510	\$23,755	\$23,755
03/27/10	\$766,226	\$34,828	\$31,607	\$66,435	\$19,931	\$46,505	\$23,252	\$23,252
03/27/11	\$731,398	\$34,828	\$30,170	\$64,999	\$19,500	\$45,499	\$22,750	\$22,750
03/26/12	\$696,569	\$34,828	\$28,733	\$63,562	\$19,069	\$44,493	\$22,247	\$22,247
03/26/13	\$661,741	\$34,828.46	\$27,297	\$62,125	\$18,638	\$43,488	\$21,744	\$21,744
03/26/14	\$626,912	\$34,828	\$25,860	\$60,689	\$18,207	\$42,482	\$21,241	\$21,241
03/26/15	\$592,084	\$34,828	\$24,423	\$59,252	\$17,776	\$41,476	\$20,738	\$20,738
03/25/16	\$557,255	\$34,828	\$22,987	\$57,815	\$17,345	\$40,471	\$20,235	\$20,235
03/25/17	\$522,427	\$34,828	\$21,550	\$56,379	\$16,914	\$39,465	\$19,733	\$19,733
03/25/18	\$487,598	\$34,828	\$20,113	\$54,942	\$16,483	\$38,460	\$19,230	\$19,230
03/25/19	\$452,770	\$34,828	\$18,677	\$53,505	\$16,052	\$37,454	\$18,727	\$18,727
03/24/20	\$417,942	\$34,828	\$17,240	\$52,069	\$15,621	\$36,448	\$18,224	\$18,224
03/24/21	\$383,113	\$34,828	\$15,803	\$50,632	\$15,190	\$35,442	\$17,721	\$17,721
03/24/22	\$348,285	\$34,828	\$14,367	\$49,195	\$14,759	\$34,437	\$17,218	\$17,218
03/24/23	\$313,456	\$34,828	\$12,930	\$47,758	\$14,328	\$33,431	\$16,715	\$16,715
03/23/24	\$278,628	\$34,828	\$11,493	\$46,321	\$13,897	\$32,425	\$16,213	\$16,213
03/23/25	\$243,799	\$34,828	\$10,057	\$44,885	\$13,466	\$31,420	\$15,710	\$15,710
03/23/26	\$208,971	\$34,828	\$8,620	\$43,448	\$13,035	\$30,414	\$15,207	\$15,207
03/23/27	\$174,142	\$34,828	\$7,183	\$42,012	\$12,604	\$29,408	\$14,704	\$14,704
03/23/28	\$139,314	\$34,828	\$5,747	\$40,575	\$12,173	\$28,403	\$14,201	\$14,201
03/23/29	\$104,485	\$34,828	\$4,310	\$39,138	\$11,742	\$27,397	\$13,698	\$13,698
03/22/30	\$69,657	\$34,828	\$2,873	\$37,702	\$11,311	\$26,391	\$13,195	\$13,195
03/22/31	\$34,828	\$34,828	\$1,437	\$36,265	\$10,880	\$25,386	\$12,693	\$12,693
03/21/32	\$0	\$34,828	\$0	\$34,828	\$10,449	\$24,380	\$12,190	\$12,190
		\$905,540	\$504,273	\$1,409,813	\$422,944	\$937,347	\$468,674	\$468,674

Loans Refinanced
See below for new debt schedule

Refinanced Debt Schedule

Annual Payment Due	Principle Remaining	Payment			Grant Reimburse	Net Due	Users	Tax
		Principal	Interest	Total			20%	50%
03/26/14	\$600,925			\$59,668	\$21,293	\$38,375	\$8,541	\$29,834
03/26/15	\$562,000			\$56,630	\$16,836	\$39,794	\$11,479	\$28,315
03/25/16	\$528,000			\$54,610	\$16,235	\$38,375	\$11,070	\$27,305
03/25/17	\$495,000			\$53,620	\$15,938	\$37,682	\$10,872	\$26,810
03/25/18	\$462,000			\$51,630	\$15,297	\$36,333	\$10,518	\$25,815
03/25/19	\$430,000			\$50,350	\$14,961	\$35,389	\$10,214	\$25,175
03/24/20	\$398,000			\$49,390	\$14,721	\$34,669	\$9,974	\$24,695
03/24/21	\$366,000			\$47,750	\$14,139	\$33,611	\$9,736	\$23,875
03/24/22	\$335,000			\$46,510	\$13,767	\$32,743	\$9,488	\$23,255
03/24/23	\$304,000			\$45,270	\$13,395	\$31,875	\$9,240	\$22,635
03/23/24	\$273,000			\$43,030	\$12,684	\$30,346	\$8,831	\$21,515
03/23/25	\$243,000			\$41,530	\$12,234	\$29,296	\$8,531	\$20,765
03/23/26	\$213,000			\$41,030	\$12,077	\$28,953	\$8,438	\$20,515
03/23/27	\$182,000			\$39,480	\$11,612	\$27,868	\$8,128	\$19,740
03/22/28	\$151,000			\$37,930	\$11,240	\$26,690	\$7,725	\$18,965
03/22/29	\$120,000			\$36,000	\$10,575	\$25,425	\$7,425	\$18,000
03/22/30	\$90,000			\$34,500	\$10,125	\$24,375	\$7,125	\$17,250
03/22/31	\$60,000			\$33,000	\$9,675	\$23,325	\$6,825	\$16,500
03/21/32	\$30,000			\$31,500	\$9,225	\$22,275	\$6,525	\$15,750
				\$853,428	\$256,029	\$597,399	\$170,685	\$426,714

4. DEBT SCHEDULE - SEMIANNUAL PAYMENTS (cont'd)

SEWER DEPARTMENT, TOWN OF BOSCAWEN, NH

Project: **Gage Street**

Loan Origination Date (Est.):

6/5/2006

Project Cost:

\$875,000

Term (years):

26

No. of Payments:

26

Interest Rate:

4.25%

Amortization Calculation

Princ. \$875,000

No. Payments 26

Interest 4.250%

Payment \$26,871

Valuation (1999)

\$108,310,000

Tax Rate Impact (1st year)

\$0.40

Tax Rate Impact (amort.)

\$0.25

Annual Payment Due	Principle Remaining	Payment			Grant Reimburse	Net Due	Users	Tax
		Principal	Interest	Total				
					30%		56%	44%
06/05/06	\$875,000	\$33,654	\$37,188	\$70,841	\$21,252	\$49,589	\$27,770	\$21,819
06/05/07	\$841,346	\$33,654	\$35,757	\$69,411	\$20,823	\$48,588	\$27,209	\$21,379
06/04/08	\$807,692	\$33,654	\$34,327	\$67,981	\$20,394	\$47,587	\$26,648.46	\$20,938
06/04/09	\$774,038	\$33,654	\$32,897	\$66,550	\$19,965	\$46,585	\$26,088	\$20,498
06/04/10	\$740,385	\$33,654	\$31,466	\$65,120	\$19,536	\$45,584	\$25,527	\$20,057
06/04/11	\$706,731	\$33,654	\$30,036	\$63,690	\$19,107	\$44,583	\$24,966	\$19,616
06/03/12	\$673,077	\$33,654	\$28,606	\$62,260	\$18,678	\$43,582	\$24,406	\$19,176
06/03/13	\$639,423	\$33,654	\$27,175	\$60,829	\$18,249	\$42,581	\$23,845	\$18,735
06/03/14	\$605,769	\$33,654	\$25,745	\$59,399	\$17,820	\$41,579	\$23,284	\$18,295
06/03/15	\$572,115	\$33,654	\$24,315	\$57,969	\$17,391	\$40,578	\$22,724	\$17,854
06/02/16	\$538,462	\$33,654	\$22,885	\$56,538	\$16,962	\$39,577	\$22,163	\$17,414
06/02/17	\$504,808	\$33,654	\$21,454	\$55,105	\$16,532	\$38,576	\$21,602	\$16,973
06/02/18	\$471,154	\$33,654	\$20,024	\$53,678	\$16,103	\$37,575	\$21,042	\$16,533
06/02/19	\$437,500	\$33,654	\$18,594	\$52,248	\$15,674	\$36,573	\$20,481	\$16,092
06/01/20	\$403,846	\$33,654	\$17,163	\$50,817	\$15,245	\$35,572	\$19,920	\$15,652
06/01/21	\$370,192	\$33,654	\$15,733	\$49,387	\$14,815	\$34,571	\$19,360	\$15,211
06/01/22	\$336,538	\$33,654	\$14,303	\$47,957	\$14,387	\$33,570	\$18,798	\$14,771
06/01/23	\$302,885	\$33,654	\$12,873	\$46,526	\$13,958	\$32,569	\$18,238	\$14,330
06/01/24	\$269,231	\$33,654	\$11,443	\$45,096	\$13,529	\$31,567	\$17,678	\$13,890
06/01/25	\$235,577	\$33,654	\$10,012	\$43,666	\$13,100	\$30,566	\$17,117	\$13,449
06/01/26	\$201,923	\$33,654	\$8,582	\$42,236	\$12,671	\$29,565	\$16,556	\$13,009
06/01/27	\$168,269	\$33,654	\$7,151	\$40,805	\$12,242	\$28,564	\$15,995	\$12,568
06/00/28	\$134,615	\$33,654	\$5,721	\$39,375	\$11,813	\$27,563	\$15,435	\$12,128
06/00/29	\$100,962	\$33,654	\$4,291	\$37,945	\$11,383	\$26,562	\$14,874	\$11,687
06/00/30	\$67,308	\$33,654	\$2,861	\$36,514	\$10,954	\$25,561	\$14,314	\$11,246
06/00/31	\$33,654	\$33,654	\$1,430	\$35,084	\$10,525	\$24,560	\$13,753	\$10,806
06/00/32	\$0	\$33,654	\$0	\$33,654	\$10,096	\$23,559	\$13,192	\$10,365
		\$875,000	\$502,031	\$1,377,031	\$413,109	\$963,922	\$539,796	\$424,126

Refinanced Debt Schedule

Annual Payment Due	Principle Remaining	Payment			Grant Reimburse	Net Due	Users	Tax
		Principal	Interest	Total				
					30%		26%	44%
06/03/14	\$581,250			\$62,210	\$21,910	\$40,300	\$12,927	\$27,372
06/03/15	\$539,000			\$54,680	\$16,256	\$38,424	\$14,365	\$24,059
06/02/16	\$506,000			\$52,690	\$15,663	\$37,027	\$13,843	\$23,184
06/02/17	\$474,000			\$51,730	\$15,375	\$36,355	\$13,594	\$22,761
06/02/18	\$442,000			\$49,770	\$14,745	\$35,025	\$13,126	\$21,899
06/02/19	\$411,000			\$48,530	\$14,420	\$34,110	\$12,757	\$21,353
06/01/20	\$380,000			\$47,600	\$14,187	\$33,413	\$12,469	\$20,944
06/01/21	\$349,000			\$45,980	\$13,614	\$32,366	\$12,135	\$20,231
06/01/22	\$319,000			\$44,780	\$13,254	\$31,526	\$11,823	\$19,703
06/01/23	\$289,000			\$42,580	\$12,600	\$29,980	\$11,245	\$18,735
05/31/24	\$260,000			\$41,420	\$12,209	\$29,211	\$10,986	\$18,225
05/31/25	\$231,000			\$39,970	\$11,774	\$28,196	\$10,609	\$17,587
05/31/26	\$202,000			\$38,520	\$11,339	\$27,181	\$10,232	\$16,949
05/31/27	\$173,000			\$37,070	\$10,904	\$26,166	\$9,855	\$16,311
05/30/28	\$144,000			\$35,620	\$10,556	\$25,064	\$9,391	\$15,673
05/30/29	\$115,000			\$34,750	\$10,208	\$24,542	\$9,252	\$15,290
05/30/30	\$86,000			\$33,300	\$9,773	\$23,527	\$8,875	\$14,652
05/30/31	\$57,000			\$31,850	\$9,338	\$22,512	\$8,498	\$14,014
05/29/32	\$28,000			\$29,400	\$8,610	\$20,790	\$7,854	\$12,936
				\$822,450	\$246,735	\$575,715	\$213,837	\$361,878

5. PRIOR SEWER REVENUES & ACCOUNT BALANCES

Description ¹	2011	2012	2013	2014	2015	2016	3 YR AVG
Avg Sewer Rate (\$/100 CF)	\$4.70	\$4.70	\$4.70	\$5.88	\$7.20	\$7.20	\$6.76
Sewer Receipts ²	\$128,332	\$121,739	\$124,407	\$153,460	\$189,641	\$200,457	\$181,186
General Fund - Income	\$6,000	\$6,000	\$6,000	\$52,000	\$48,000	\$48,000	\$49,333
User Connection Fees	\$1,500	\$0	\$0	\$0	\$4,500	\$29,250	\$11,250
Interest Earned	\$2,885	\$1,718	\$554	\$1,768	\$1,048	\$1,059	\$1,292
Other							
Concord Refund							
TOTAL	\$138,717	\$129,457	\$130,961	\$207,227	\$243,189	\$278,767	\$243,061
Number of Accounts (from Table 2)			387	387	387	392	
End of Year Account Balance	\$488,097	\$430,341	\$353,939	\$324,917	\$444,043	\$395,694	

Notes:

¹ Revenues from Town of Boscawen Profit & Loss spreadsheets, account balances from Town of Boscawen, NH Annual Reports.

² Sewer Receipts include late fees and sewer lien penalties

6. PRIOR EXPENSES

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

Item	Description ¹	2011	2012	2013	2014	2015	2016	3 YR AVG
	Concord Charges	\$109,298	\$173,204	\$138,998	\$197,222	\$156,269	\$191,221	\$181,570
	Concord Refund	(\$34,665)	(\$32,338)	(\$768)				
A	Total Charge from Concord	\$74,633	\$140,866	\$138,230	\$197,222	\$156,269	\$191,221	\$181,570
B	Electricity	\$1,035	\$1,024	\$973	\$1,309	\$1,634	\$1,032	\$1,325
C	Supplies / Maint.	\$665	\$103	\$1,028		\$477		\$477
D	Admin / Fees	\$910	\$953	\$700		\$20	\$210	\$115
E	Other / Misc.	\$20,352	\$44	\$0			\$1,797	\$1,797
F	Long Term Debt Principal	\$34,829	\$34,829	\$38,925	\$15,380	\$14,920	\$14,920	\$15,073
G	Long Term Debt Interest	\$30,170	\$28,463	\$20,743	\$10,163	\$7,127	\$9,254	\$8,848
J	Abatements	\$171	\$353	\$920	\$1,362	\$922	\$908	\$1,064
K								
	TOTAL	\$162,765	\$206,635	\$201,519	\$225,436	\$181,368	\$219,341	\$208,715
	General Fund - Income	\$6,000	\$6,000	\$6,000	\$52,000	\$48,000	\$48,000	
	Expenses- Sewer Users²	\$156,765	\$200,635	\$195,519	\$173,436	\$133,368	\$171,341	

Source: Town of Boscawen, NH Annual Reports.

Notes:

¹ Expenditures and abatements from Town of Boscawen Profit & Loss spreadsheets² Expenditures for user paid portion only

7. CAPITAL IMPROVEMENT PROGRAM (DRAFT)

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

Capital Project	Possible Funding Source	Staff Priority	Year									
			2017	2018	2019	2020	2021	2022	2023	2024	2025	2026
Penacook WTPP - Boscawen Share												
Equipment Replacement												
Electrical System Upgrade												
SCADA Software Upgrade												
UST Replacement												
Engineering for plant wide motor control (MCC) replacements												
Boscawen Meter Station flow metering upgrade				\$109,225								
Pavement Repairs												
SBR Motive Pump Rebuild												
Implementation of MCC Upgrades Design					\$205,520							
Boscawen Collection System												
I/I Project - Planning Project (Eng.) ¹					\$30,000							
Concord Subtotal (WWTF)			\$353,788	\$109,225	\$205,520	\$0	\$0	\$0	\$0	\$0	\$0	\$0
Boscawen Subtotal (Collection System)			\$0	\$0	\$30,000	\$0	\$0	\$0	\$0	\$0	\$0	\$0
TOTAL CIP (10-year)	\$698,533		\$353,788	\$109,225	\$235,520	\$0	\$0	\$0	\$0	\$0	\$0	\$0

Notes:

¹ For sewer replacement projects 3 & 4

7A. ESTIMATED DEBT SCHEDULE - SEMIANNUAL PAYMENTS

Town of Boscawen, NH

Project: **Concord WWTF CIP A^{1,2}**

Loan Origination Date (Est.):

Project Cost: **\$450,000**

Term (years): **10**

No. of Payments: **20**

Interest Rate: **4.000%**

Amortization Calculation

Princ. \$450,000

No. Payments 20

Interest 4.000%

Payment \$27,521

Amortized Grant

\$0

Amortized payments (annual) **\$0.00**

20% SAG Reimbursement (annual) **\$0.00**

	Semiannual Payment Due	Principle Remaining	Payment			Grant Reimburse*	Grant Reimburse	Net Due	Net Due ³
			Principal	Interest	Total				
						0.0%	Amortized		
1	07/15/17	\$450,000	\$0	\$9,000	\$9,000	\$0	\$0	\$9,000	\$9,000
2	01/15/18	\$450,000	\$45,000	\$9,000	\$54,000	\$0	\$0	\$54,000	
3	07/15/18	\$405,000	\$0	\$8,100	\$8,100	\$0	\$0	\$8,100	\$62,100
4	01/15/19	\$405,000	\$45,000	\$8,100	\$53,100	\$0	\$0	\$53,100	
5	07/15/19	\$360,000	\$0	\$7,200	\$7,200	\$0	\$0	\$7,200	\$60,300
6	01/15/20	\$360,000	\$45,000	\$7,200	\$52,200	\$0	\$0	\$52,200	
7	07/15/20	\$315,000	\$0	\$6,300	\$6,300	\$0	\$0	\$6,300	\$58,500
8	01/15/21	\$315,000	\$45,000	\$6,300	\$51,300	\$0	\$0	\$51,300	
9	07/15/21	\$270,000	\$0	\$5,400	\$5,400	\$0	\$0	\$5,400	\$56,700
10	01/15/22	\$270,000	\$45,000	\$5,400	\$50,400	\$0	\$0	\$50,400	
11	07/15/22	\$225,000	\$0	\$4,500	\$4,500	\$0	\$0	\$4,500	\$54,900
12	01/15/23	\$225,000	\$45,000	\$4,500	\$49,500	\$0	\$0	\$49,500	
13	07/15/23	\$180,000	\$0	\$3,600	\$3,600	\$0	\$0	\$3,600	\$53,100
14	01/15/24	\$180,000	\$45,000	\$3,600	\$48,600	\$0	\$0	\$48,600	
15	07/15/24	\$135,000	\$0	\$2,700	\$2,700	\$0	\$0	\$2,700	\$51,300
16	01/15/25	\$135,000	\$45,000	\$2,700	\$47,700	\$0	\$0	\$47,700	
17	07/15/25	\$90,000	\$0	\$1,800	\$1,800	\$0	\$0	\$1,800	\$49,500
18	01/15/26	\$90,000	\$45,000	\$1,800	\$46,800	\$0	\$0	\$46,800	
19	07/14/26	\$45,000	\$0	\$900	\$900	\$0	\$0	\$900	\$47,700
20	01/15/27	\$45,000	\$45,000	\$900	\$45,900	\$0	\$0	\$45,900	\$45,900
			\$450,000	\$99,000	\$549,000	\$0	\$0	\$549,000	\$549,000

Notes:

¹ Concord total CIP cost = \$353,788 + \$109,225 + \$205,520 = \$668,533. Use \$750,000.

² CIP A assuming 300K of 750K CIP budget to come from capital reserves, remaining 450K to be bonded.

³ Payments could be reduced by 59% if general fund contribution were included to cover unused reserve capacity at the Penacook WWTF

7B. ESTIMATED DEBT SCHEDULE - SEMIANNUAL PAYMENTS

Town of Boscawen, NH

Project: **Concord WWTF CIP B¹**

Loan Origination Date (Est.):

Project Cost: **\$750,000**

Term (years): **20**

No. of Payments: **40**

Interest Rate: **4.000%**

Amortization Calculation

Princ. \$750,000

No. Payments 40

Interest 4.000%

Payment \$27,417

Amortized Grant **\$0**

Amortized payments (annual) **\$0.00**

20% SAG Reimbursement (annual) **\$0.00**

	Semiannual Payment Due	Principle Remaining	Payment			Grant Reimburse [*]	Grant Reimburse	Net Due	Net Due ²
			Principal	Interest	Total				
						0.0%	Amortized		
1	07/15/17	\$750,000	\$0	\$15,000	\$15,000	\$0	\$0	\$15,000	\$15,000
2	01/15/18	\$750,000	\$37,500	\$15,000	\$52,500	\$0	\$0	\$52,500	
3	07/15/18	\$712,500	\$0	\$14,250	\$14,250	\$0	\$0	\$14,250	\$66,750
4	01/15/19	\$712,500	\$37,500	\$14,250	\$51,750	\$0	\$0	\$51,750	
5	07/15/19	\$675,000	\$0	\$13,500	\$13,500	\$0	\$0	\$13,500	\$65,250
6	01/15/20	\$675,000	\$37,500	\$13,500	\$51,000	\$0	\$0	\$51,000	
7	07/15/20	\$637,500	\$0	\$12,750	\$12,750	\$0	\$0	\$12,750	\$63,750
8	01/15/21	\$637,500	\$37,500	\$12,750	\$50,250	\$0	\$0	\$50,250	
9	07/15/21	\$600,000	\$0	\$12,000	\$12,000	\$0	\$0	\$12,000	\$62,250
10	01/15/22	\$600,000	\$37,500	\$12,000	\$49,500	\$0	\$0	\$49,500	
11	07/15/22	\$562,500	\$0	\$11,250	\$11,250	\$0	\$0	\$11,250	\$60,750
12	01/15/23	\$562,500	\$37,500	\$11,250	\$48,750	\$0	\$0	\$48,750	
13	07/15/23	\$525,000	\$0	\$10,500	\$10,500	\$0	\$0	\$10,500	\$59,250
14	01/15/24	\$525,000	\$37,500	\$10,500	\$48,000	\$0	\$0	\$48,000	
15	07/15/24	\$487,500	\$0	\$9,750	\$9,750	\$0	\$0	\$9,750	\$57,750
16	01/15/25	\$487,500	\$37,500	\$9,750	\$47,250	\$0	\$0	\$47,250	
17	07/15/25	\$450,000	\$0	\$9,000	\$9,000	\$0	\$0	\$9,000	\$56,250
18	01/15/26	\$450,000	\$37,500	\$9,000	\$46,500	\$0	\$0	\$46,500	
19	07/14/26	\$412,500	\$0	\$8,250	\$8,250	\$0	\$0	\$8,250	\$54,750
20	01/15/27	\$412,500	\$37,500	\$8,250	\$45,750	\$0	\$0	\$45,750	
21	07/15/27	\$375,000	\$0	\$7,500	\$7,500	\$0	\$0	\$7,500	\$53,250
22	01/15/28	\$375,000	\$37,500	\$7,500	\$45,000	\$0	\$0	\$45,000	
23	07/15/28	\$337,500	\$0	\$6,750	\$6,750	\$0	\$0	\$6,750	\$51,750
24	01/15/29	\$337,500	\$37,500	\$6,750	\$44,250	\$0	\$0	\$44,250	
25	07/15/29	\$300,000	\$0	\$6,000	\$6,000	\$0	\$0	\$6,000	\$50,250
26	01/15/30	\$300,000	\$37,500	\$6,000	\$43,500	\$0	\$0	\$43,500	
27	07/14/30	\$262,500	\$0	\$5,250	\$5,250	\$0	\$0	\$5,250	\$48,750
28	01/15/31	\$262,500	\$37,500	\$5,250	\$42,750	\$0	\$0	\$42,750	
29	07/15/31	\$225,000	\$0	\$4,500	\$4,500	\$0	\$0	\$4,500	\$47,250
30	01/15/32	\$225,000	\$37,500	\$4,500	\$42,000	\$0	\$0	\$42,000	
31	07/15/32	\$187,500	\$0	\$3,750	\$3,750	\$0	\$0	\$3,750	\$45,750
32	01/15/33	\$187,500	\$37,500	\$3,750	\$41,250	\$0	\$0	\$41,250	
33	07/15/33	\$150,000	\$0	\$3,000	\$3,000	\$0	\$0	\$3,000	\$44,250
34	01/15/34	\$150,000	\$37,500	\$3,000	\$40,500	\$0	\$0	\$40,500	
35	07/14/34	\$112,500	\$0	\$2,250	\$2,250	\$0	\$0	\$2,250	\$42,750
36	01/15/35	\$112,500	\$37,500	\$2,250	\$39,750	\$0	\$0	\$39,750	
37	07/15/35	\$75,000	\$0	\$1,500	\$1,500	\$0	\$0	\$1,500	\$41,250
38	01/15/36	\$75,000	\$37,500	\$1,500	\$39,000	\$0	\$0	\$39,000	
39	07/15/36	\$37,500	\$0	\$750	\$750	\$0	\$0	\$750	\$39,750
40	01/15/37	\$37,500	\$37,500	\$750	\$38,250	\$0	\$0	\$38,250	\$38,250
			\$750,000	\$315,000	\$1,065,000	\$0	\$0	\$1,065,000	\$1,065,000

Notes:

¹ Concord total CIP cost = \$353,788 + \$109,225 + \$205,520 = \$668,533. Use \$750,000.

² Payments could be reduced by 59% if general fund contribution were included to cover unused reserve capacity at the Penacook WWTF

8. PROJECTED EXPENSES

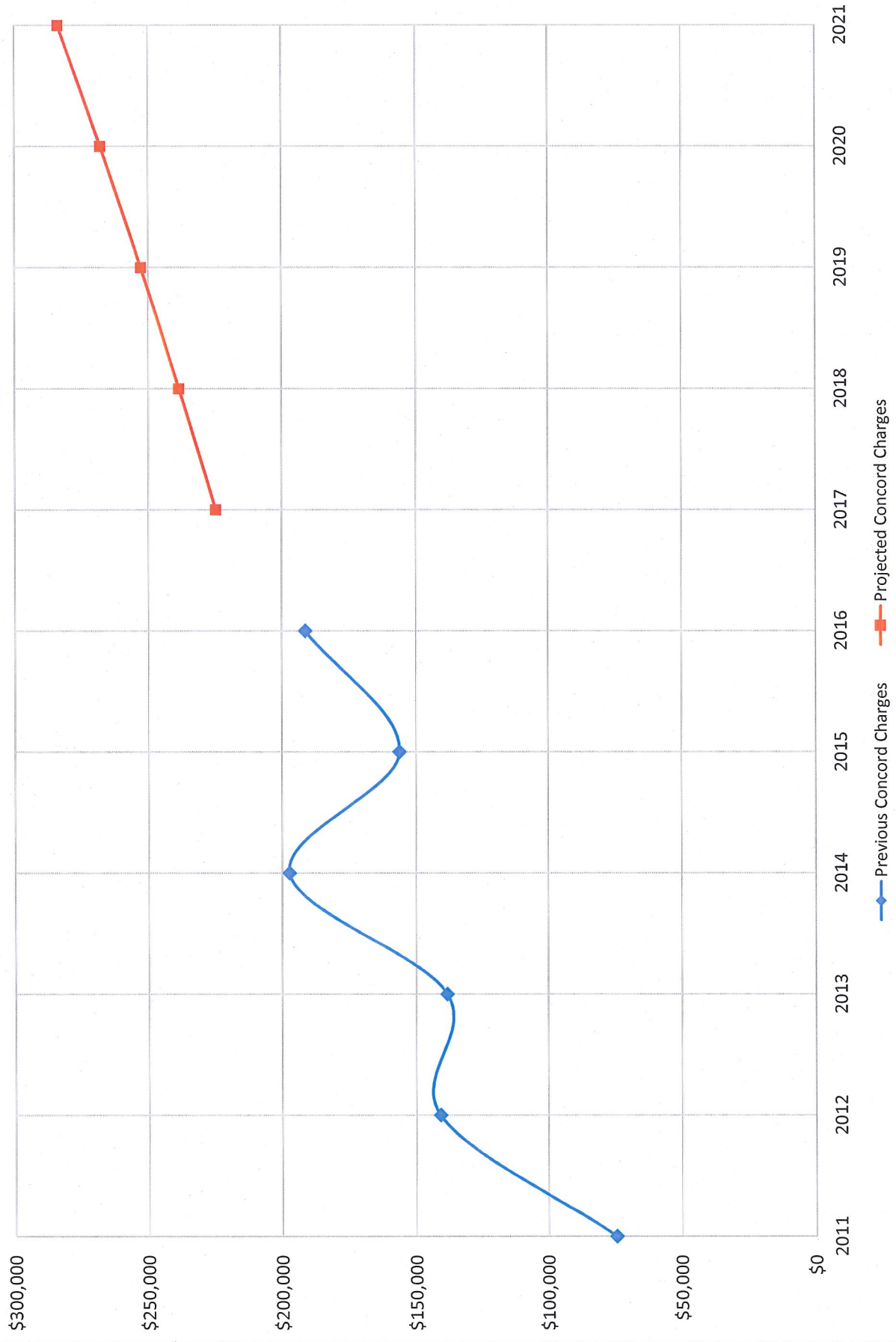
SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

APPROXIMATE ANNUAL OPERATING BUDGET								
Item	Description	3 YR AVG	Projected Increase	Estimated				
				2017	2018	2019	2020	2021
A	Total Charge from Concord ¹	\$181,570	6%	\$224,734	\$238,218.04	\$252,511	\$267,661.79	\$283,721
B	Electricity	\$1,325	2%	\$1,500	\$1,530	\$1,560.60	\$1,592	\$1,623.65
C	Supplies / Maint.	\$477	2%	\$500	\$20,000	\$20,400	\$20,808	\$21,224
D	Admin / Fees	\$115	2%	\$150	\$153	\$156	\$159	\$162
E	Other / Misc.	\$1,797	2%	\$1,500	\$1,530	\$1,561	\$1,592	\$1,624
F	Existing Debt (P&I) - WWTF ²	\$23,921	See 4. Debt schedule	\$53,620	\$51,630	\$50,350	\$49,390	\$47,750
G	Existing Debt (P&I) - Gage ²		See 4. Debt schedule	\$51,730	\$49,770	\$48,530	\$47,600	\$45,980
H	Abatements	\$1,064	0%	\$0	\$0	\$0	\$0	\$0
I	CCTV ³ & O&M Reporting		2%	\$0	\$20,000	\$20,400	\$20,808	\$21,224
J								
TOTAL				\$333,734	\$382,831	\$395,468	\$409,611	\$423,309
Debt - Tax & Grant Contribution				\$80,884	\$77,756	\$75,909	\$74,547	\$71,859
GF Contribution				\$49,333	\$48,000	\$48,000	\$48,000	\$48,000
Expenses - Sewer Users ⁴				\$204,850	\$257,075	\$271,559	\$287,064	\$303,450

Notes:

¹ Estimated Concord charge of \$224,734 from 2017 budget provided by the Town. 6% increase assumed based on historical increases² Total WWTF and Gage Street debt payments are shown (see 4. Debt Schedule) which include grants and general fund contributions³ Annual CCTV 20% of system each year⁴ Expenditures for user paid portion only

Concord Charges 2011-2016



Sewer Department Expenses (User Paid Portion Only) Town of Boscawen



9. CURRENT RATES AND PROJECTED ACCOUNT BALANCE

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

Description	Actual 2016	Projected 2017	2018	2019	2020	2021
1 Rate (\$/100 CF)	\$7.20	\$7.20	\$7.20	\$7.20	\$7.20	\$7.20
2 No. of Accounts ¹	392	392	430	430	430	430
3 Minimum Usage (CF / Qtr / Account)	600	600	600	600	600	600
4 No. of Accounts, Minimum Usage	95	95	95	95	95	95
5 Minimum Consumption (estimated), CF/yr	228,000	228,000	228,000	228,000	228,000	228,000
6 Other Consumption, CF	2,486,867	2,486,867	2,772,146	2,772,146	2,772,146	2,772,146
7 Total Consumption, CF	2,714,867	2,714,867	3,000,146	3,000,146	3,000,146	3,000,146
Water Rents / Usage Fees						
8 Minimum Account Charge, \$/yr ²	\$173	\$173	\$173	\$173	\$173	\$173
9 Projected Revenue, Min Use Accts	\$16,416	\$16,416	\$16,416	\$16,416	\$16,416	\$16,416
10 Projected Revenue, Other Accts	\$184,041	\$179,054	\$199,595	\$199,595	\$199,595	\$199,595
11 Projected Revenues, Water Rents	\$200,457	\$195,470	\$216,011	\$216,011	\$216,011	\$216,011
Interest on Sewer Fund Deposit:						
12 Reserve Account Balance on Jan 1	\$395,694	\$395,694	\$387,383	\$347,364	\$262,753	\$192,409
13 Interest Rate	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Projected Revenue, Interest	\$1,059	\$1,068	\$1,046	\$938	\$709	\$520
Other Income³:						
14 General Fund Contribution	\$48,000	\$48,000	\$48,000	\$48,000	\$48,000	\$48,000
15 Capital Reserve Fund Contribution						
16 User Connection Fees	\$29,250					
17 General Fund WWTF (Tax rate) - 50%		\$26,810	\$25,815	\$25,175	\$24,695	\$23,875
18 General Fund Gage (Tax rate) - 50%		\$22,761	\$21,899	\$21,353	\$20,944	\$20,231
19 NHDES SAG - WWTF		\$15,938	\$15,297	\$14,961	\$14,721	\$14,139
20 NHDES SAG - Gage		\$15,375	\$14,745	\$14,420	\$14,187	\$13,614
21 Projected Revenue, other income	\$77,250	\$128,884	\$125,756	\$123,909	\$122,547	\$119,859
22 Total Projected Revenues	\$278,767	\$325,423	\$342,812	\$340,858	\$339,267	\$336,389
Expenses						
23 I/I Project - Planning Project (Eng.)				\$30,000		
24 Concord CIP ⁴						
25 Debt A						
26 Total Projected Expenses (Sheet 8)	\$219,341	\$333,734	\$382,831	\$425,468	\$409,611	\$423,309
27 Difference, \$	\$59,425	(\$8,311)	(\$40,019)	(\$84,611)	(\$70,344)	(\$86,920)
<i>Positive difference means that funds can be added to reserves. Negative means that funds will be drained from reserves.</i>						
28 Projected Reserve Fund Balance (Jan 1)	\$395,694	\$395,694	\$387,383	\$347,364	\$262,753	\$192,409
29 Projected Reserve Fund Balance (Dec 31)	\$395,694	\$387,383	\$347,364	\$262,753	\$192,409	\$105,489

Notes:

¹ 38 new 2-bedroom units will be online by 2018² Minimum account charge = \$43.20/Qtr³ Beginning in 2017, income for WWTF and Gage street Taxes and SAGs shown as part of revenue⁴ Concord CIP expenses drain from capital reserve

10A. PROPOSED RATES AND PROJECTED ACCOUNT BALANCE

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

SCENARIO #1 Rate adjustments not including Concord CIP items

Description	Actual 2016	Projected 2017	2018 20%	2019	2020	2021 10%
% Increase/Decrease - Rate (\$/100CF)						
1 Rate (\$/100 CF)	\$7.20	\$7.20	\$8.64	\$8.64	\$8.64	\$9.50
2 No. of Accounts ¹	392	392	430	430	430	430
3 Minimum Usage (CF / Qtr / Account)	600	600	600	600	600	600
4 No. of Accounts, Minimum Usage	95	95	95	95	95	95
5 Minimum Consumption (estimated), CF/yr	228,000	228,000	228,000	228,000	228,000	228,000
6 Other Consumption, CF	2,486,867	2,486,867	2,772,146	2,772,146	2,772,146	2,772,146
7 Total Consumption, CF	2,714,867	2,714,867	3,000,146	3,000,146	3,000,146	3,000,146
Water Rents / Usage Fees						
% Increase/Decrease - Min. Act. Chg. \$/yr.						
8 Minimum Account Charge, \$/yr ²	172.80	172.80	207.36	207.36	207.36	228.10
9 Projected Revenue, Min Use Accts	\$16,416	\$16,416	\$19,699	\$19,699	\$19,699	\$21,669
10 Projected Revenue, Other Accts	\$184,041	\$179,054	\$239,513	\$239,513	\$239,513	\$263,465
11 Projected Revenues, Water Rents	\$200,457	\$195,470	\$259,213	\$259,213	\$259,213	\$285,134
Interest on Sewer Fund Deposit:						
12 Reserve Account Balance on Jan 1	\$395,694	\$395,694	\$387,383	\$417,566	\$403,347	\$403,585
13 Interest Rate	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Projected Revenue, Interest	\$1,059	\$1,068	\$1,046	\$1,127	\$1,089	\$1,090
Other Income³:						
% Increase/Decrease - Gen. Fund. Con.						
14 General Fund Contribution	\$48,000	\$48,000	\$75,000	\$75,000	\$75,000	\$75,000
15 Capital Reserve Fund Contribution	\$29,250					
16 User Connection Fees		\$26,810	\$25,815	\$25,175	\$24,695	\$23,875
17 General Fund WWTF (Tax rate) - 50%		\$22,761	\$21,899	\$21,353	\$20,944	\$20,231
18 General Fund Gage (Tax rate) - 50%		\$15,938	\$15,297	\$14,961	\$14,721	\$14,139
19 NHDES SAG - WWTF		\$15,375	\$14,745	\$14,420	\$14,187	\$13,614
20 NHDES SAG - Gage		\$128,884	\$152,756	\$150,909	\$149,547	\$146,859
21 Projected Revenue, other income	\$77,250	\$128,884	\$152,756	\$150,909	\$149,547	\$146,859
22 Total Projected Revenues	\$278,767	\$325,423	\$413,014	\$411,249	\$409,849	\$433,083
Expenses						
23 I/I Project - Planning Project (Eng.)				\$30,000		
24 Concord CIP ⁴						
25 Debt A						
26 Total Projected Expenses (Sheet 8)	\$219,341	\$333,734	\$382,831	\$425,468	\$409,611	\$423,309
27 Difference, \$	\$59,425	(\$8,311)	\$30,183	(\$14,219)	\$238	\$9,773
Positive difference means that funds can be added to reserves. Negative means that funds will be drained from reserves.						
28 Projected Reserve Fund Balance (Jan 1)	\$395,694	\$395,694	\$387,383	\$417,566	\$403,347	\$403,585
29 Projected Reserve Fund Balance (Dec 31)	\$395,694	\$387,383	\$417,566	\$403,347	\$403,585	\$413,358

Notes:

¹ 38 new 2-bedroom units will be online by 2018

² Minimum account charge = \$43.20/Qtr

³ Beginning in 2017, income for WWTF and Gage street Taxes and SAGs shown as part of revenue

⁴ Concord CIP expenses drain from capital reserve

10B. PROPOSED RATES AND PROJECTED ACCOUNT BALANCE

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

SCENARIO #2 Include Concord CIP items, use 300K from Capital Reserves

Description	Actual 2016	Projected 2017	2018	2019	2020	2021
% Increase/Decrease - Rate (\$/100CF)			45%		10%	
1 Rate (\$/100 CF)	\$7.20	\$7.20	\$10.44	\$10.44	\$11.48	\$11.48
2 No. of Accounts ¹	392	392	430	430	430	430
3 Minimum Usage (CF / Qtr / Account)	600	600	600	600	600	600
4 No. of Accounts, Minimum Usage	95	95	95	95	95	95
5 Minimum Consumption, CF/yr	228,000	228,000	228,000	228,000	228,000	228,000
6 Other Consumption, CF	2,486,867	2,486,867	2,772,146	2,772,146	2,772,146	2,772,146
7 Total Consumption, CF	2,714,867	2,714,867	3,000,146	3,000,146	3,000,146	3,000,146
Water Rents / Usage Fees			45%		10%	
% Increase/Decrease - Min. Act. Chg. \$/yr.			45%		10%	
8 Minimum Account Charge, \$/yr ²	172.80	172.80	250.56	250.56	275.62	275.62
9 Projected Revenue, Min Use Accts	\$16,416	\$16,416	\$23,803	\$23,803	\$26,184	\$26,184
10 Projected Revenue, Other Accts	\$184,041	\$179,054	\$289,412	\$289,412	\$318,353	\$318,353
11 Projected Revenues, Water Rents	\$200,457	\$195,470	\$313,215	\$313,215	\$344,537	\$344,537
Interest on Sewer Fund Deposit:						
12 Reserve Account Balance on Jan 1	\$395,694	\$395,694	\$78,383	\$99,634	\$78,259	\$104,444
13 Interest Rate	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Projected Revenue, Interest	\$1,059	\$1,068	\$212	\$269	\$211	\$282
Other Income³:			56%			
% Increase/Decrease - Gen. Fund. Con.			56%			
14 General Fund Contribution	\$48,000	\$48,000	\$75,000	\$75,000	\$75,000	\$75,000
15 Capital Reserve Fund Contribution	\$300,000	\$300,000				
16 User Connection Fees	\$29,250					
17 General Fund WWTF (Tax rate) - 50%	\$26,810	\$26,810	\$25,175	\$25,175	\$24,695	\$23,875
18 General Fund Gage (Tax rate) - 50%	\$22,761	\$22,761	\$21,899	\$21,353	\$20,944	\$20,231
19 NHDES SAG - WWTF	\$15,938	\$15,938	\$15,297	\$14,961	\$14,721	\$14,139
20 NHDES SAG - Gage	\$15,375	\$15,375	\$14,745	\$14,420	\$14,187	\$13,614
21 Projected Revenue, other income	\$77,250	\$428,884	\$152,756	\$150,909	\$149,547	\$146,859
22 Total Projected Revenues	\$278,767	\$625,423	\$466,183	\$464,393	\$494,295	\$491,678
Expenses						
23 I/I Project - Planning Project (Eng.)				\$30,000		
24 Concord CIP ⁴		\$300,000				
25 Debt A		\$9,000	\$62,100	\$60,300	\$58,500	\$56,700
26 Total Projected Expenses (Sheet 8)	\$219,341	\$642,734	\$444,931	\$485,768	\$468,111	\$480,009
27 Difference, \$	\$59,425	(\$17,311)	\$21,252	(\$21,375)	\$26,185	\$11,669
Positive difference means that funds can be added to reserves. Negative means that funds will be drained from reserves.						
28 Projected Reserve Fund Balance (Jan 1)	\$395,694	\$395,694	\$78,383	\$99,634	\$78,259	\$104,444
29 Projected Reserve Fund Balance (Dec 31)	\$395,694	\$78,383	\$99,634	\$78,259	\$104,444	\$116,112

Notes:

¹ 38 new 2-bedroom units will be online by 2018

² Minimum account charge = \$43.20/Cfr

³ Beginning in 2017, income for WWTF and Gage street Taxes and SAGs shown as part of revenue

⁴ Concord CIP expenses drain from capital reserve

10C. PROPOSED RATES AND PROJECTED ACCOUNT BALANCE

SEWER RATE STUDY, TOWN OF BOSCAWEN, NH

SCENARIO #3 Include Concord CIP items, \$750,000 Debt Schedule

Description	Actual 2016	Projected 2017	2018 45%	2019	2020 10%	2021
% Increase/Decrease - Rate (\$/100CF)						
1 Rate (\$/100 CF)	\$7.20	\$7.20	\$10.44	\$10.44	\$11.48	\$11.48
2 No. of Accounts ¹	392	392	430	430	430	430
3 Minimum Usage (CF / Qtr / Account)	600	600	600	600	600	600
4 No. of Accounts, Minimum Usage	95	95	95	95	95	95
5 Minimum Consumption (estimated), CF/yr	228,000	228,000	228,000	228,000	228,000	228,000
6 Other Consumption, CF	2,486,867	2,486,867	2,772,146	2,772,146	2,772,146	2,772,146
7 Total Consumption, CF	2,714,867	2,714,867	3,000,146	3,000,146	3,000,146	3,000,146
Water Rents / Usage Fees						
% Increase/Decrease - Min. Act. Chg. \$/yr.						
8 Minimum Account Charge, \$/yr ²	172.80	172.80	250.56	250.56	275.62	275.62
9 Projected Revenue, Min Use Accts	\$16,416	\$16,416	\$23,803	\$23,803	\$26,184	\$26,184
10 Projected Revenue, Other Accts	\$184,041	\$179,054	\$289,412	\$289,412	\$318,353	\$318,353
11 Projected Revenues, Water Rents	\$200,457	\$195,470	\$313,215	\$313,215	\$344,537	\$344,537
Interest on Sewer Fund Deposit:						
12 Reserve Account Balance on Jan 1	\$395,694	\$395,694	\$372,383	\$389,778	\$364,237	\$385,943
13 Interest Rate	0.27%	0.27%	0.27%	0.27%	0.27%	0.27%
Projected Revenue, Interest	\$1,059	\$1,068	\$1,005	\$1,052	\$983	\$1,042
Other Income³:						
% Increase/Decrease - Gen. Fund. Con.						
14 General Fund Contribution	\$48,000	\$48,000	\$75,000	\$75,000	\$75,000	\$75,000
15 Capital Reserve Fund Contribution						
16 User Connection Fees	\$29,250	\$26,810	\$25,815	\$25,175	\$24,695	\$23,875
17 General Fund WWTF (Tax rate) - 50%		\$22,761	\$21,899	\$21,353	\$20,944	\$20,231
18 General Fund Gage (Tax rate) - 50%		\$15,938	\$15,297	\$14,961	\$14,721	\$14,139
19 NHDES SAG - WWTF		\$15,375	\$14,745	\$14,420	\$14,187	\$13,614
20 NHDES SAG - Gage		\$128,884	\$152,756	\$150,909	\$149,547	\$146,859
21 Projected Revenue, other income	\$77,250	\$128,884	\$152,756	\$150,909	\$149,547	\$146,859
22 Total Projected Revenues	\$278,767	\$325,423	\$466,977	\$465,177	\$495,067	\$492,438
Expenses						
23 I/I Project - Planning Project (Eng.)				\$30,000		
24 Concord CIP ⁴						
25 Debt B		\$15,000	\$66,750	\$65,250	\$63,750	\$62,250
26 Total Projected Expenses (Sheet 8)	\$219,341	\$348,734	\$449,581	\$490,718	\$473,361	\$485,559
27 Difference, \$	\$59,425	(\$23,311)	\$17,395	(\$25,542)	\$21,707	\$6,879
Positive difference means that funds can be added to reserves. Negative means that funds will be drained from reserves.						
28 Projected Reserve Fund Balance (Jan 1)	\$395,694	\$395,694	\$372,383	\$389,778	\$364,237	\$385,943
29 Projected Reserve Fund Balance (Dec 31)	\$395,694	\$372,383	\$389,778	\$364,237	\$385,943	\$392,822

Notes:

¹ 38 new 2-bedroom units will be online by 2018

² Minimum account charge = \$43.20/Qtr

³ Beginning in 2018, income for WWTF and Gage street Taxes and SAGs shown as part of revenue

⁴ Concord CIP expenses drain from capital reserve

Town of Boscawen
System Development Fees
Boscawen, New Hampshire
EQUITY BUY-IN METHOD
Prepared by Underwood Engineers, Inc.
June 29, 2017

Total Boscawen Net Assets ¹	\$4,932,170
Boscawen allocation of the Penacook WWTF ² (gpd)	386,500
Existing Asset per Gallon capacity (\$/gpd)	\$12.76
EDU (gpd) ³	143
Existing Asset per EDU (\$/EDU)	\$1,825

Suggested Charges

Meter Size	Meter Equivalent Ratio ⁴	Estimated Use (gpd)	Equity Buy-In Cost
5/8" and 3/4"	1	143	\$1,825 Each
1"	2.5	358	\$4,562 Each
1-1/2"	5.0	715	\$9,123 Each
2" and Greater	varies	as approved by the Town	\$12.76 per gpd

Notes:

¹Boscawen net sewer system asset value based on the calculation below.

²Boscawen ADF allocation per Memorandum of Understanding with the City of Concord dated July 1, 2005.

³EDU usage is 143 gpd for 2014 - 2016 (see table below).

⁴Estimated average use for the 1" and 1-1/2" meters is based on Table VII.2-5 meter equivalencies from AWWA Principles of Water Rates, Fees, and Charges, 7th edition.

Estimated EDU Usage from Rate Model

FY 2014	142
FY 2015	138
FY 2016	149
Average	143

Sewer Net Asset Calculation:	
Boscawen ft. of sewer:	30,000
Asset Cost / ft. (\$/ft.)	\$150
Sewer Collection net asset value:	\$4,500,000
Boscawen net asset share of WWTF (\$10 per gpd rated capacity @ 386,500):	\$3,865,000
Subtotal Net Asset of Sewer System:	\$8,365,000
SAG 2006 WWTF Improvements:	\$433,000
SAG 2006 Gage Street:	\$423,000
RD & CDGB Grants (Gage Street):	\$1,575,000
RD Grant (WWTF):	\$714,000
Principal Balance left on debt (Users Only):	\$287,830
Total Net Asset of Sewer System:	\$4,932,170